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

CONTENTS

VOLUME 2

LIST OF PHOTOS AND CHARTS

VOLUME 2

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.

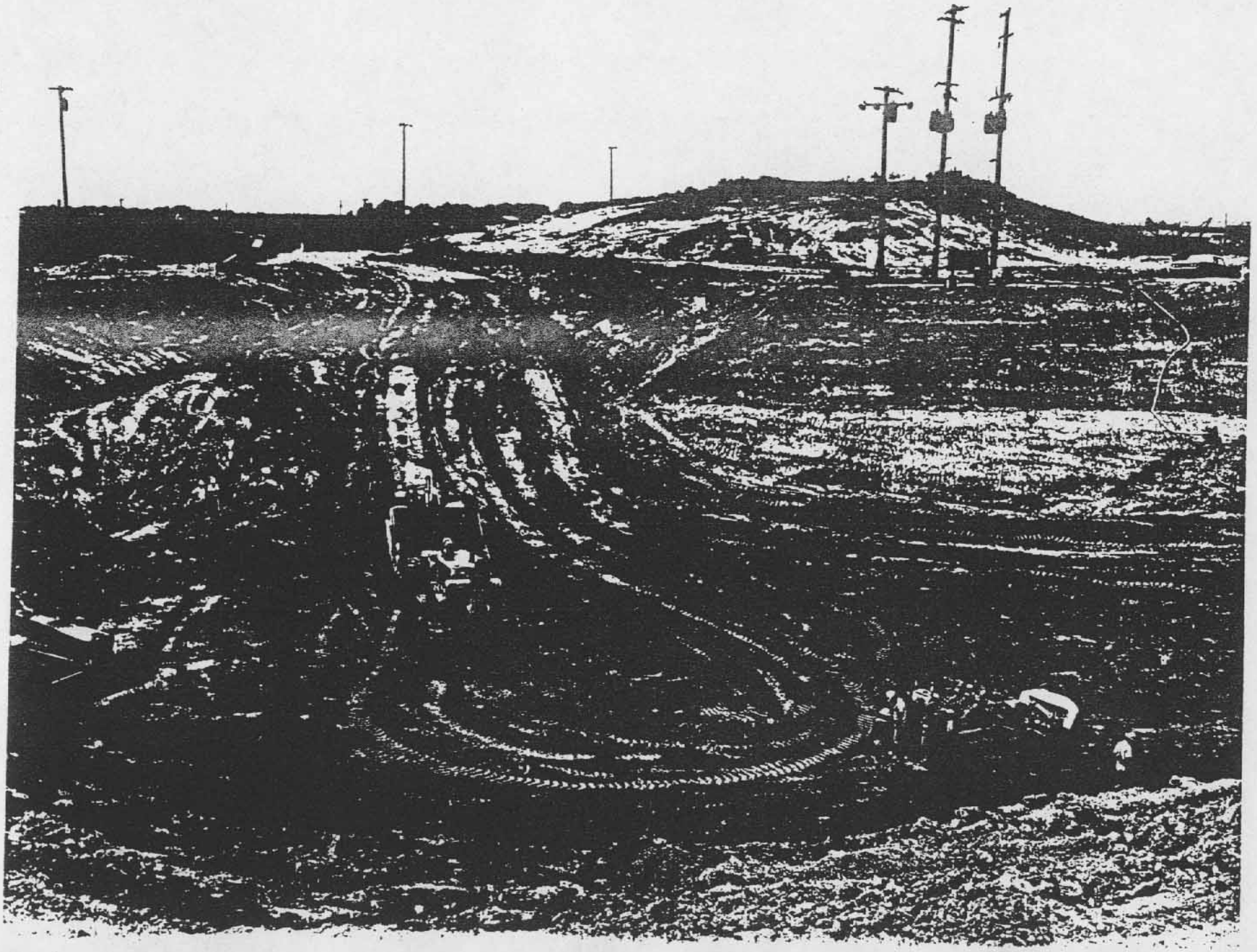
(4) The PLS Branch was officially established in November 1960. The Branch was staffed with a Military Chief (Major, CE), 5 engineers, one electrical equipment inspector and one clerk-stenographer. The PLS site personnel were under the administration and operational control of the site Project Engineers.[12]

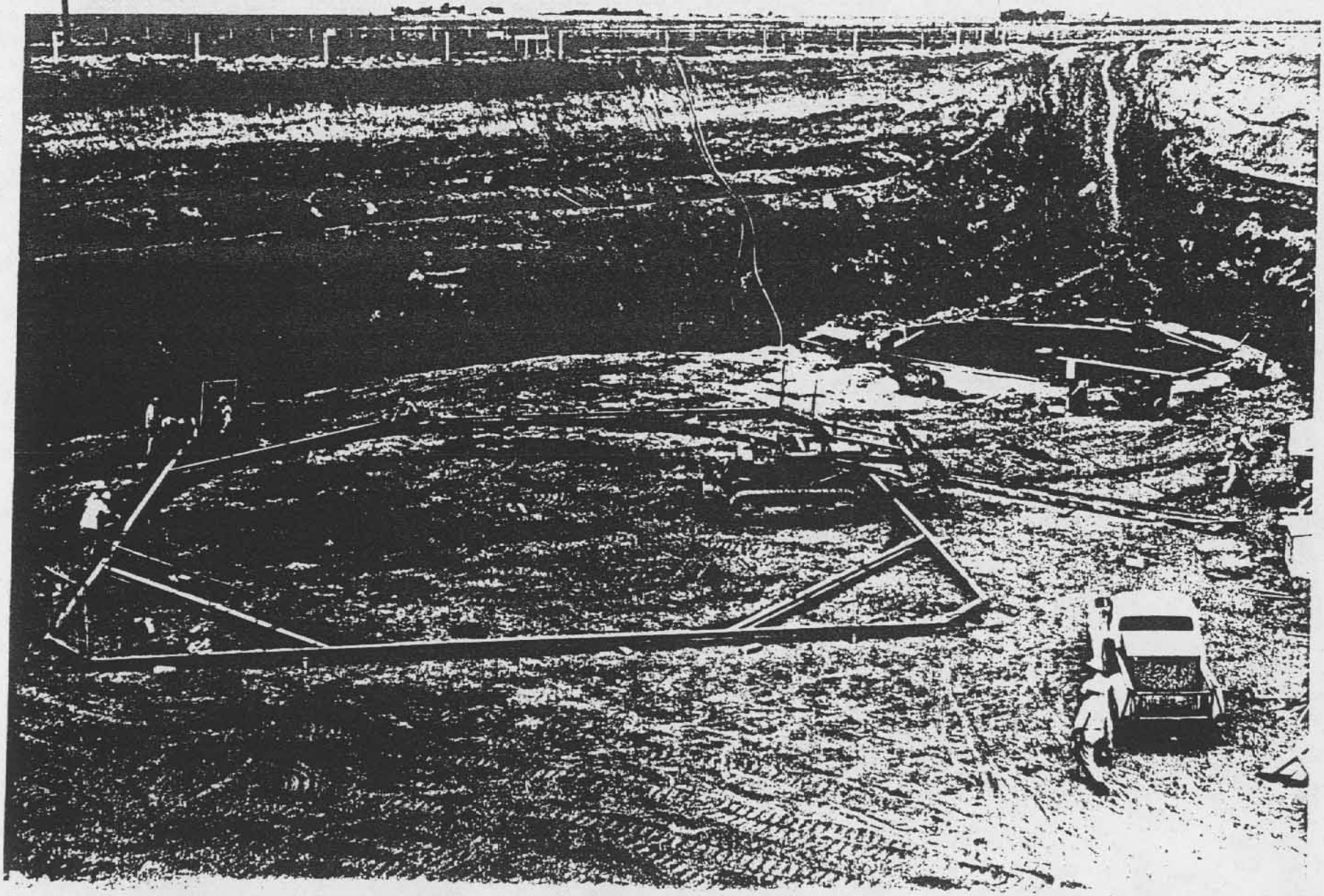
(5) In September 1961 the PLS Branch was redesignated as the PLS Section under direct control of the Construction Branch.

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.

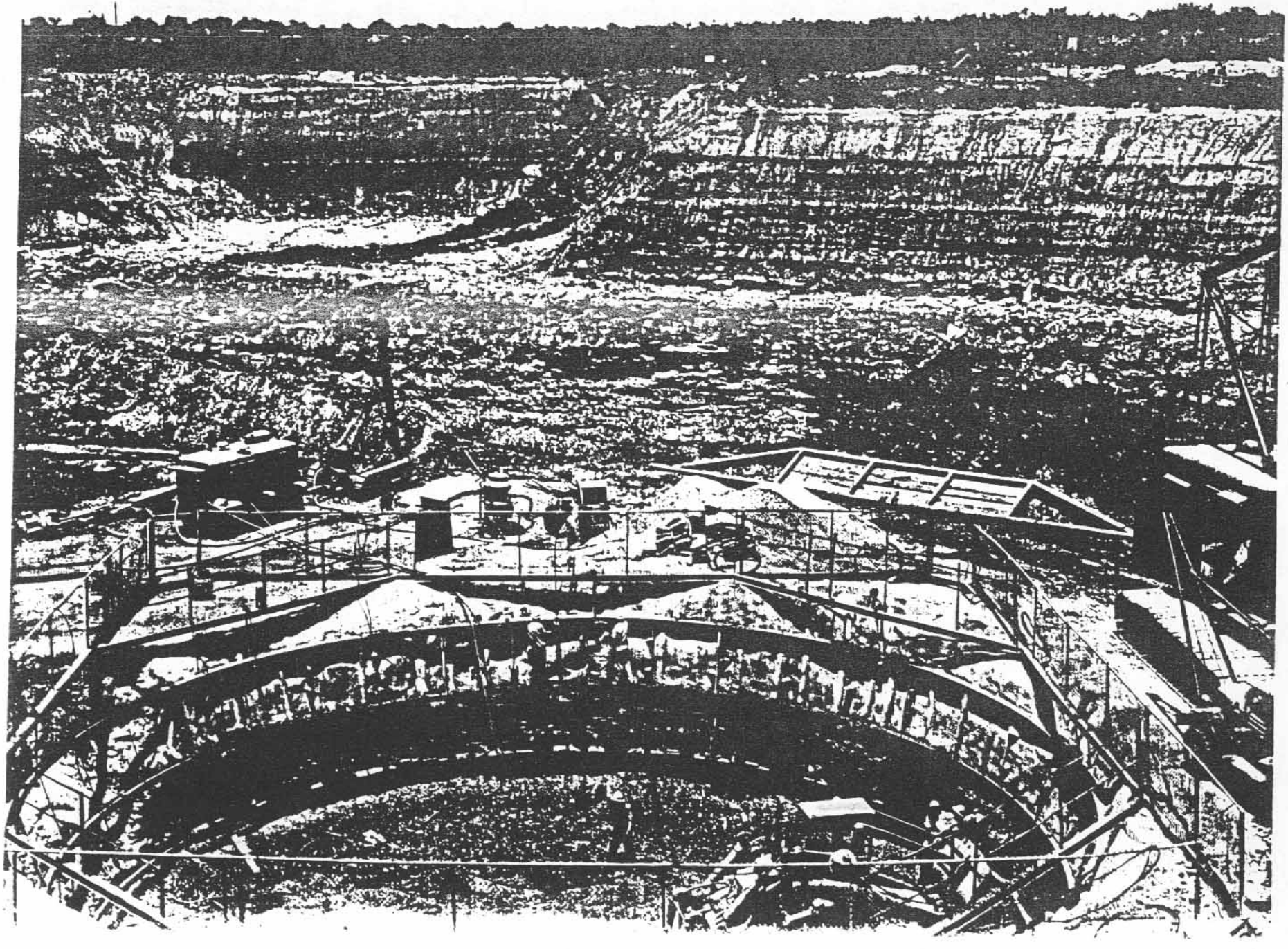
d. Unusual or Unforeseen Event - (1) Contamination of gaseous oxygen and gaseous nitrogen vessels were the major problems which confronted the Area PLS personnel. The legal positions taken

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.

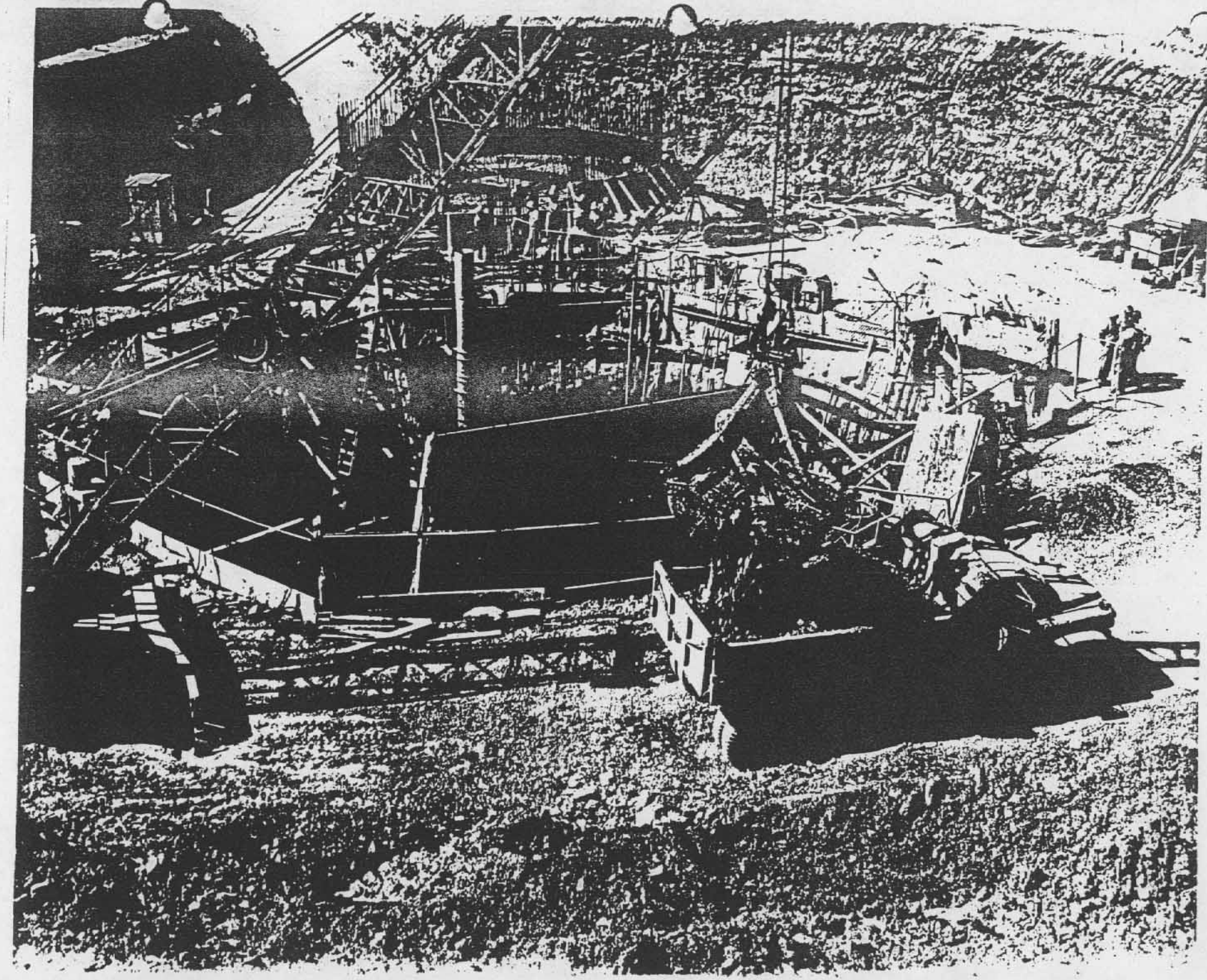


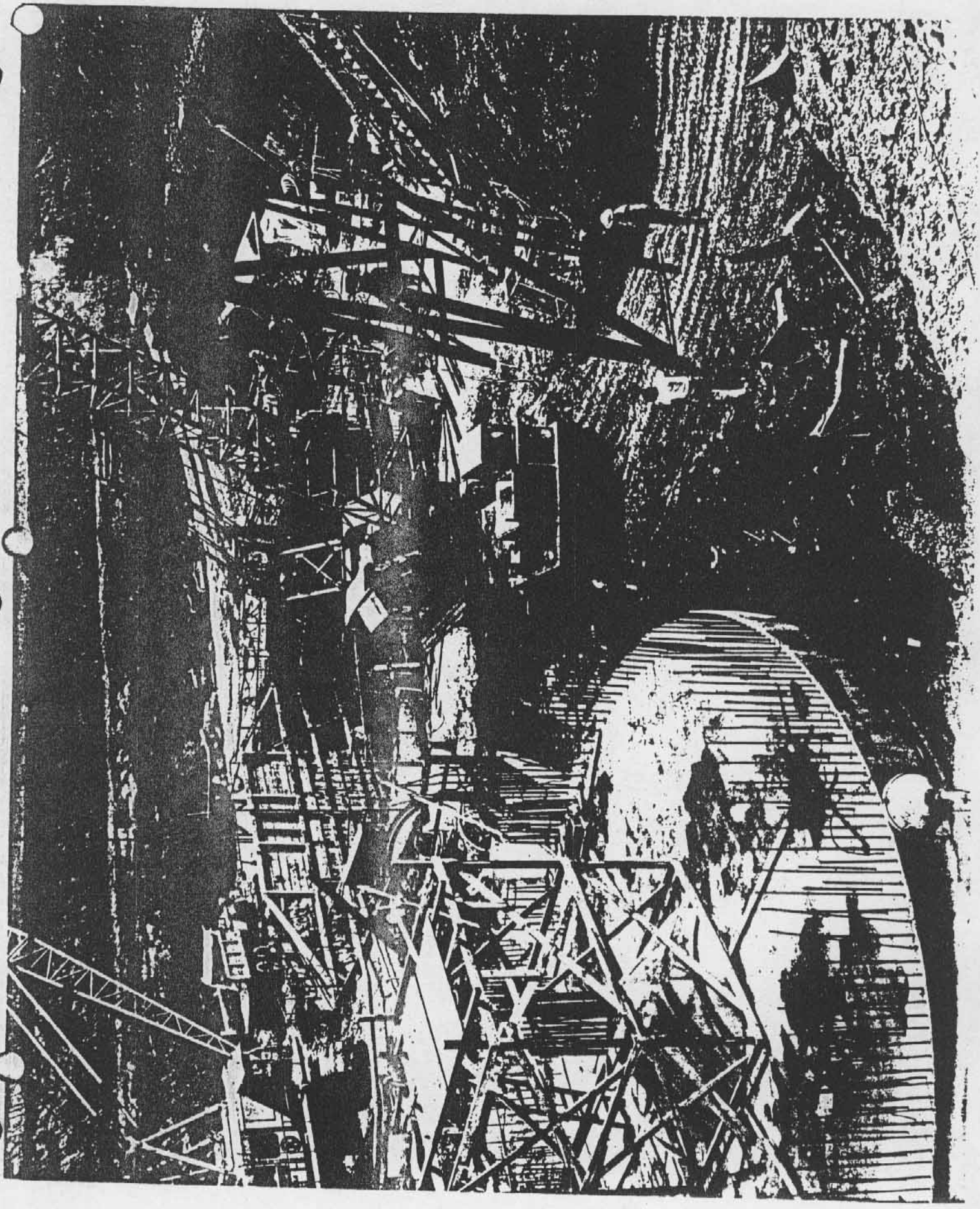


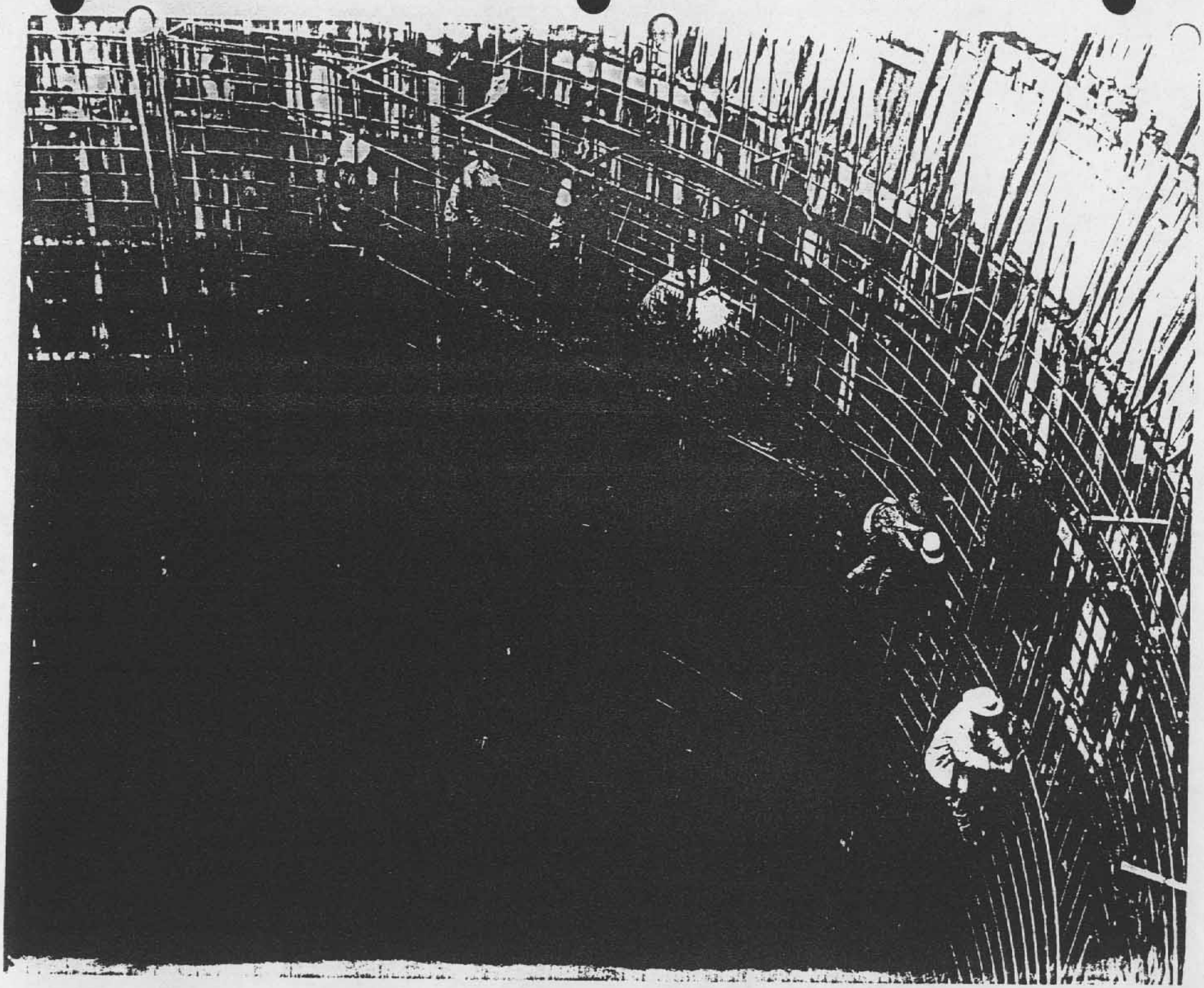
Subject - C.I.
Direction - L...h
Beginning excavation, also view of
ring beam

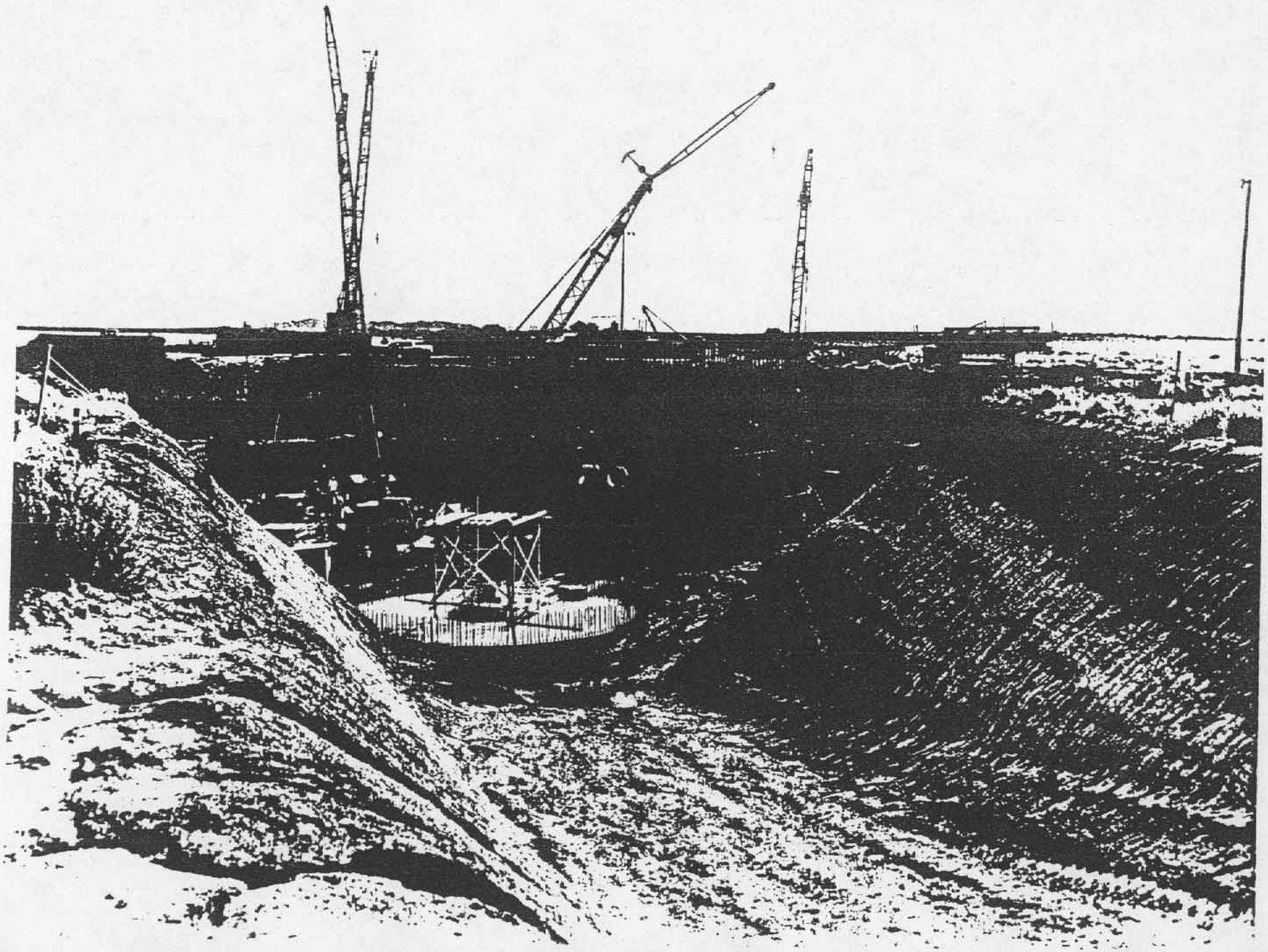


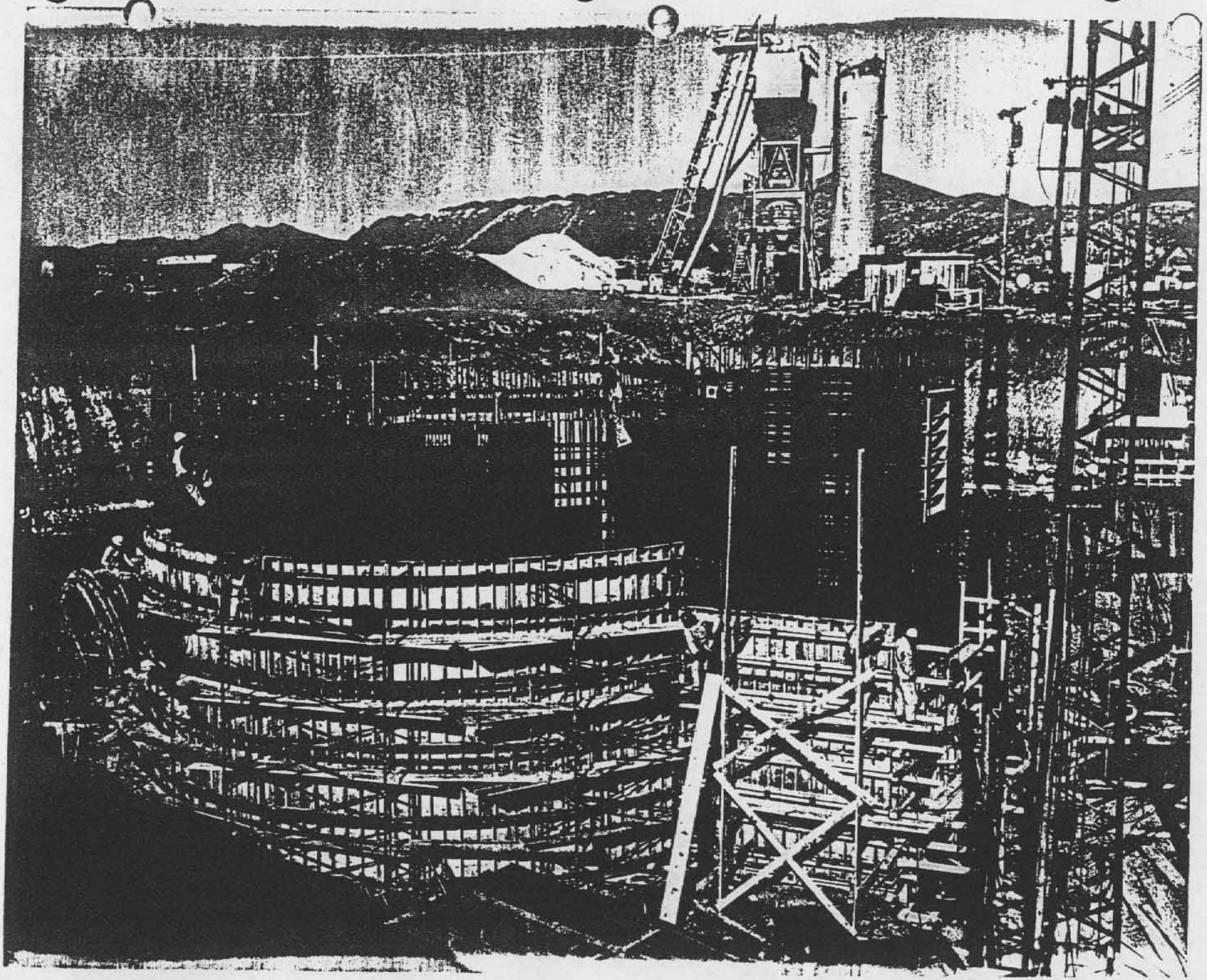
[illegible]
[illegible]
[illegible]
[illegible]
Subject - Site
Direction - Northeast
Excavating with [illegible]

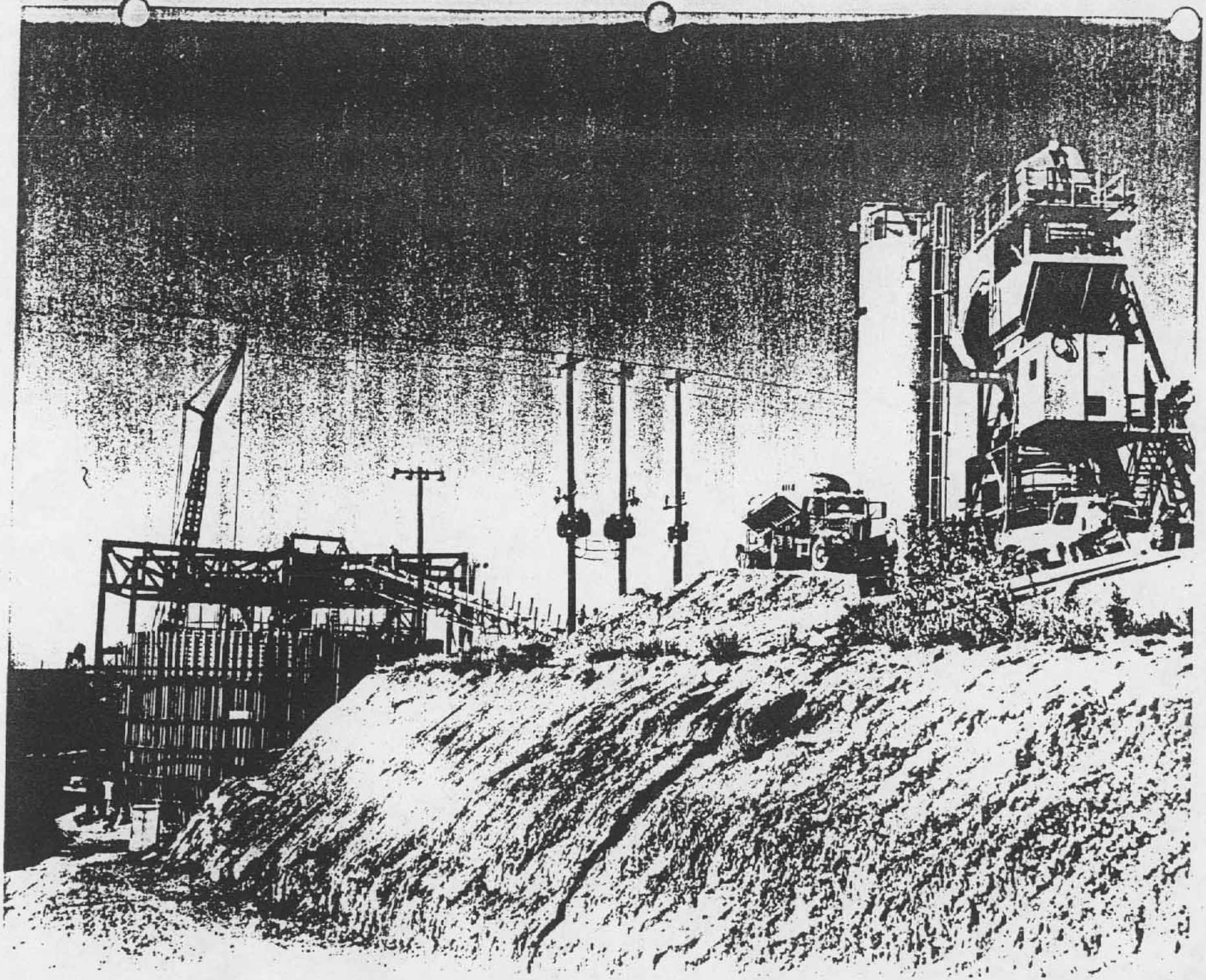


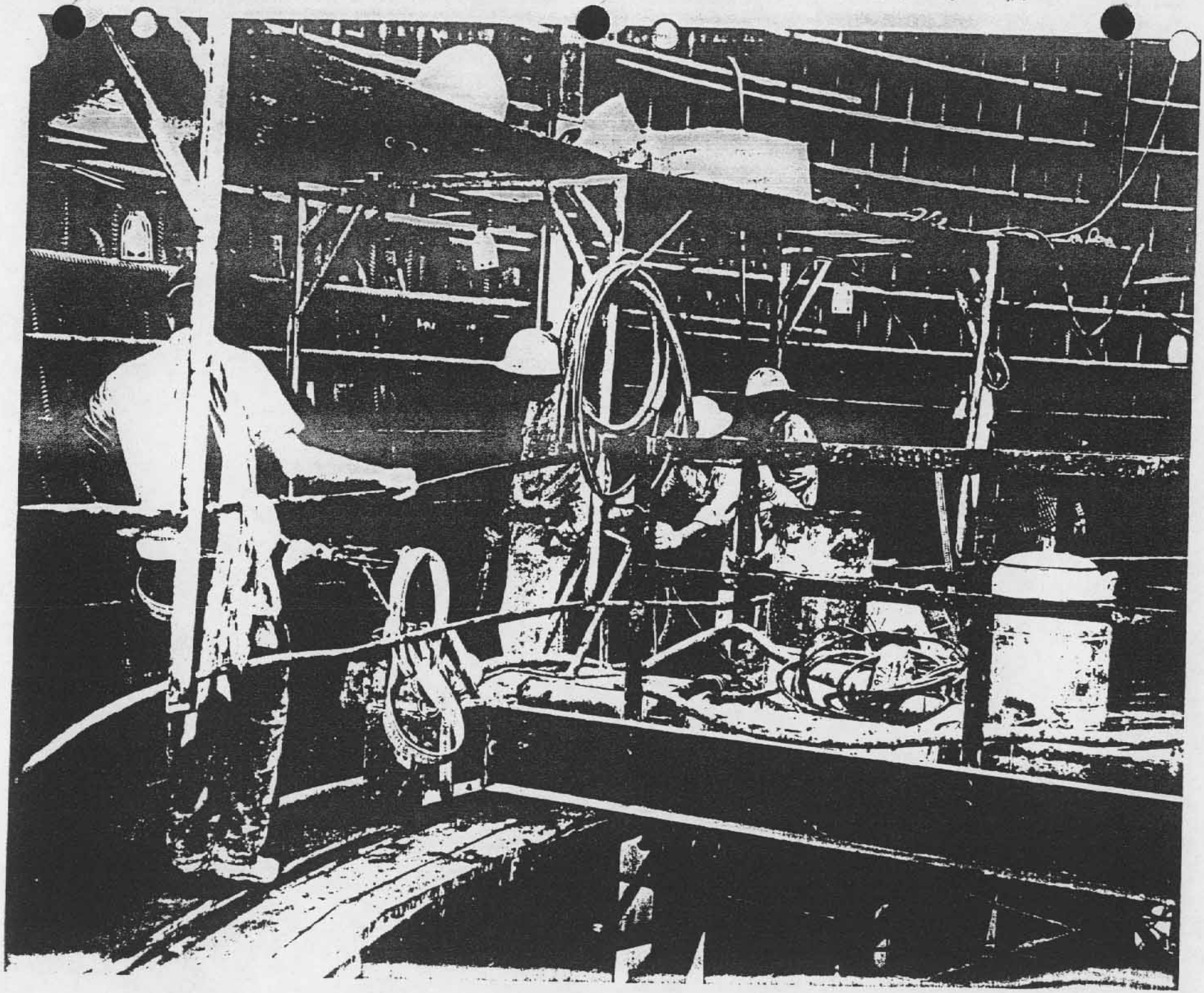


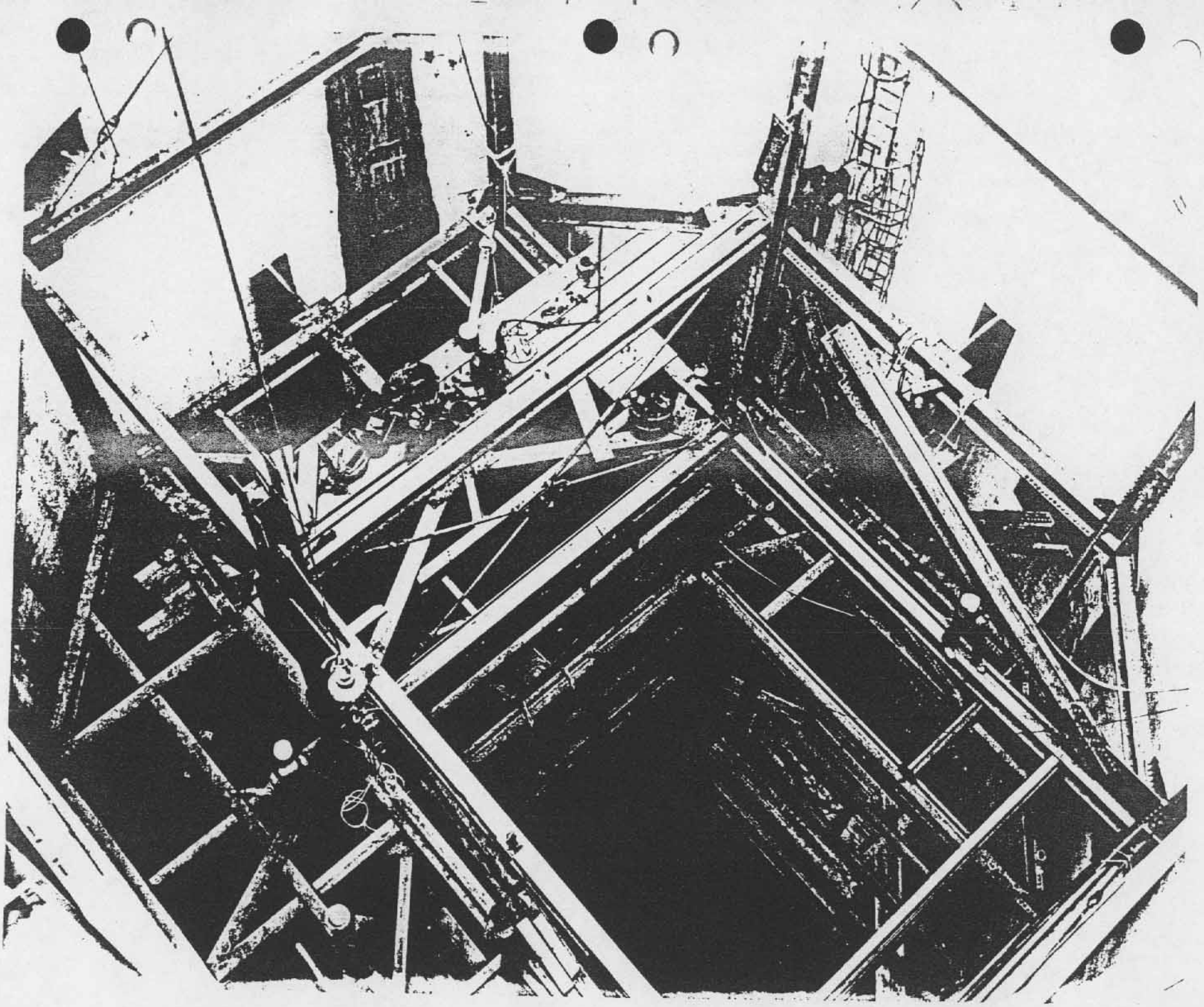


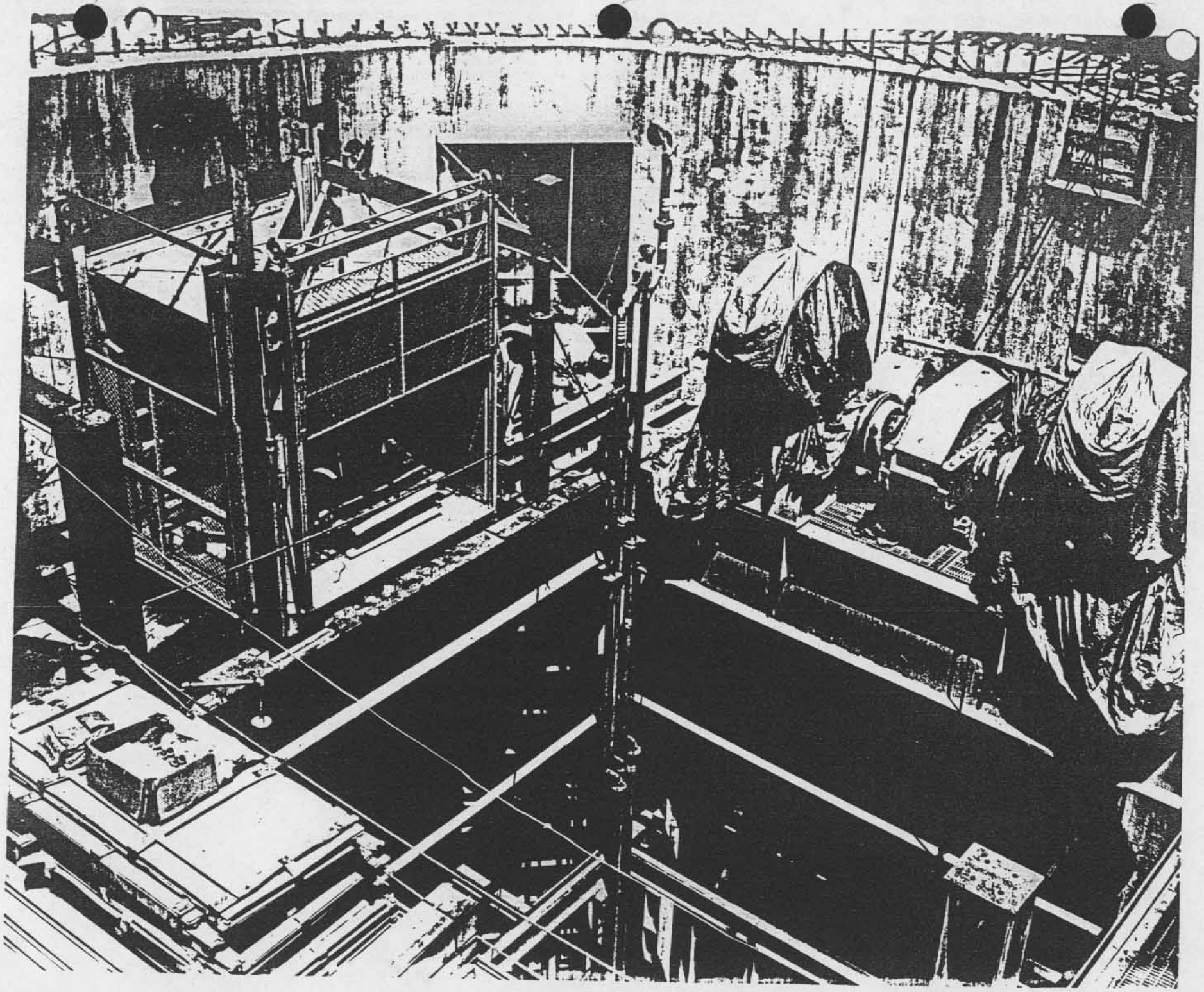


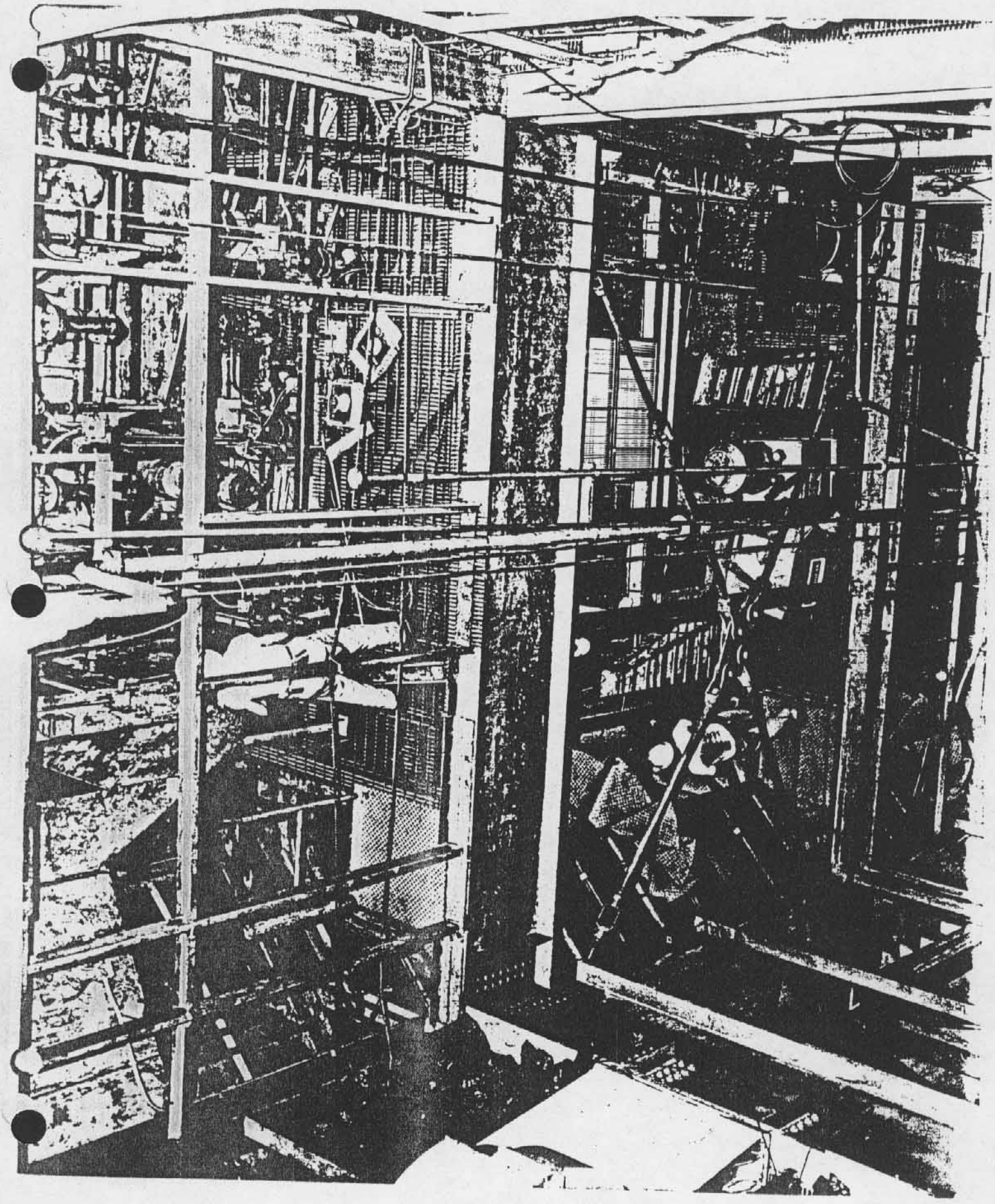


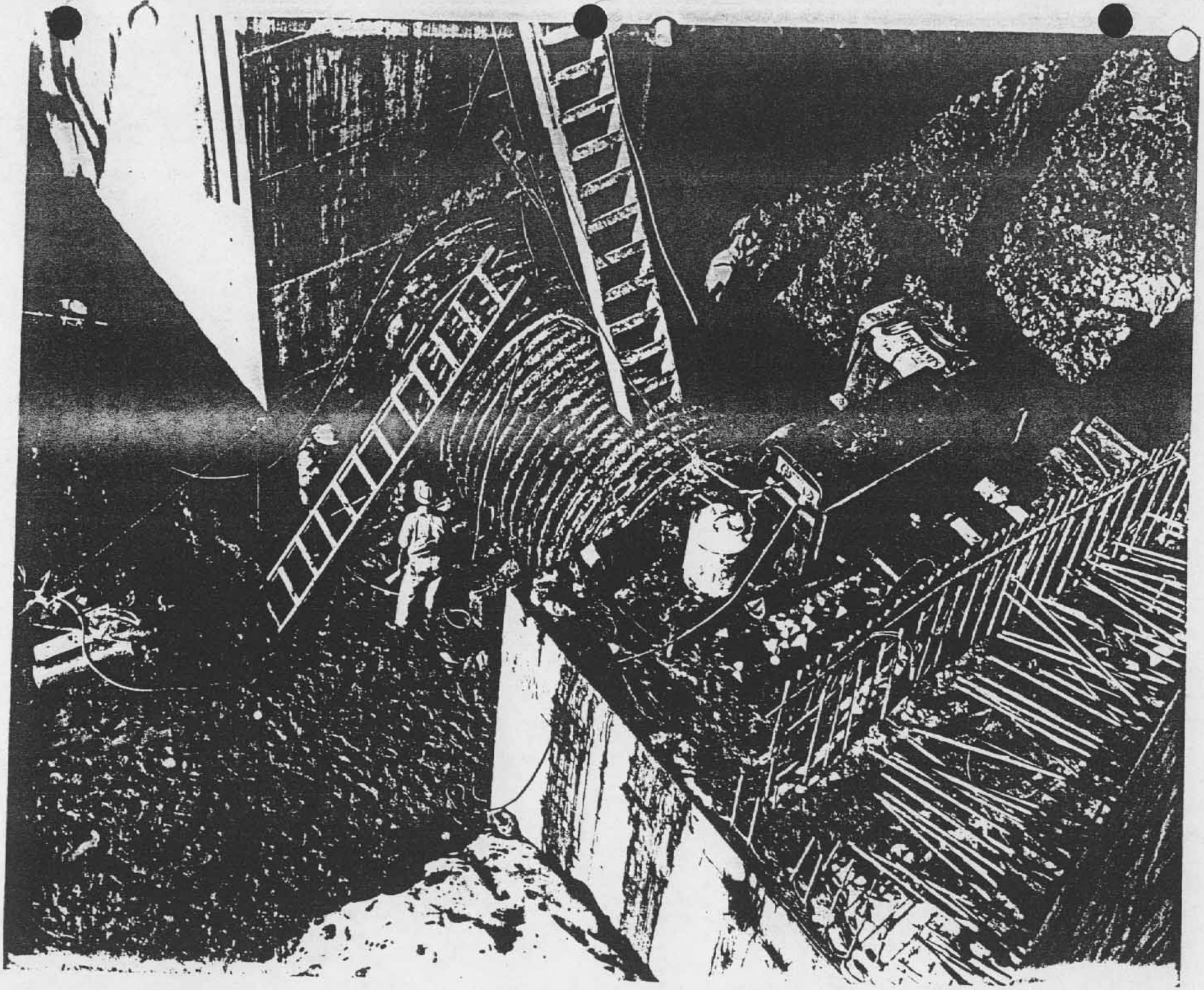


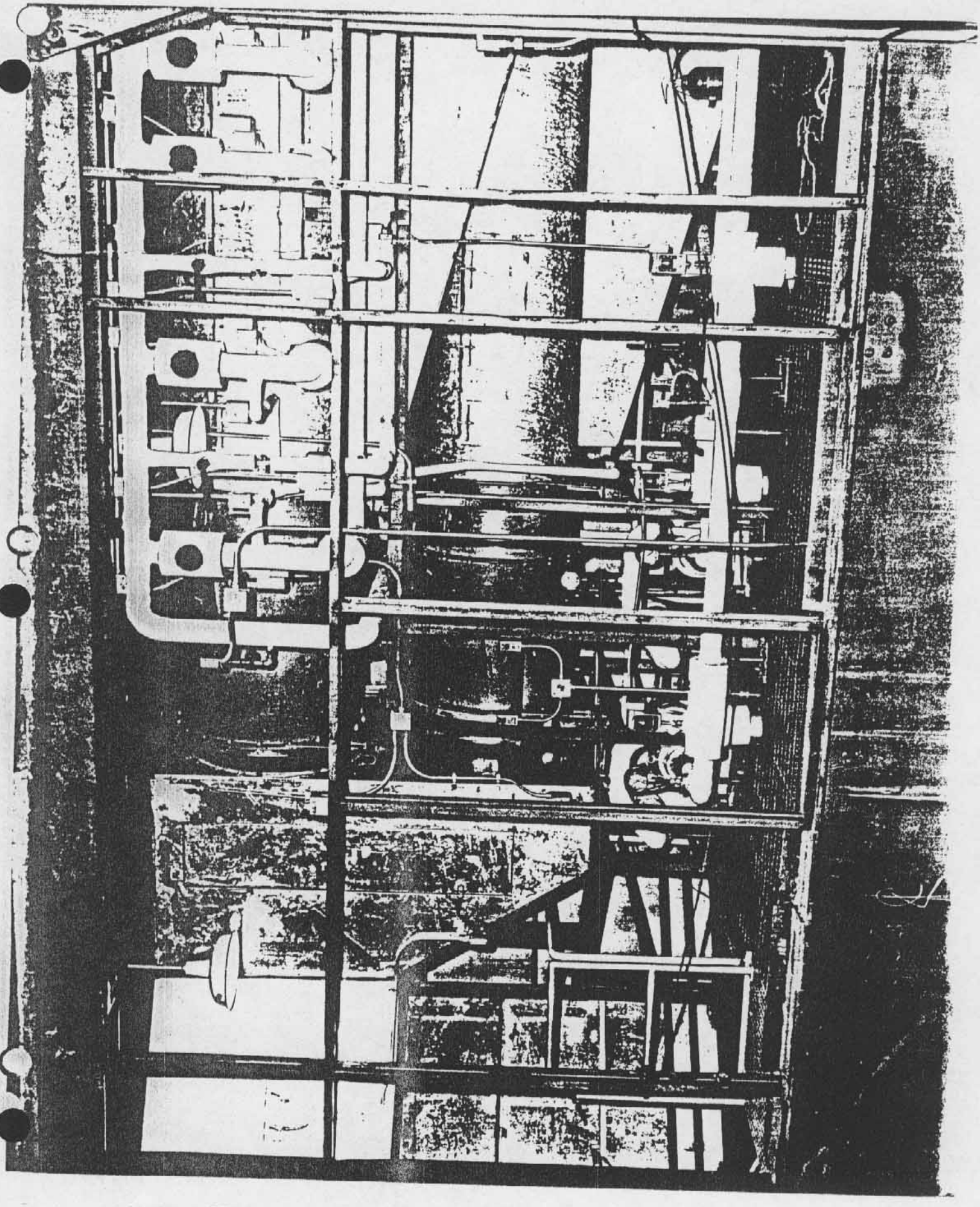


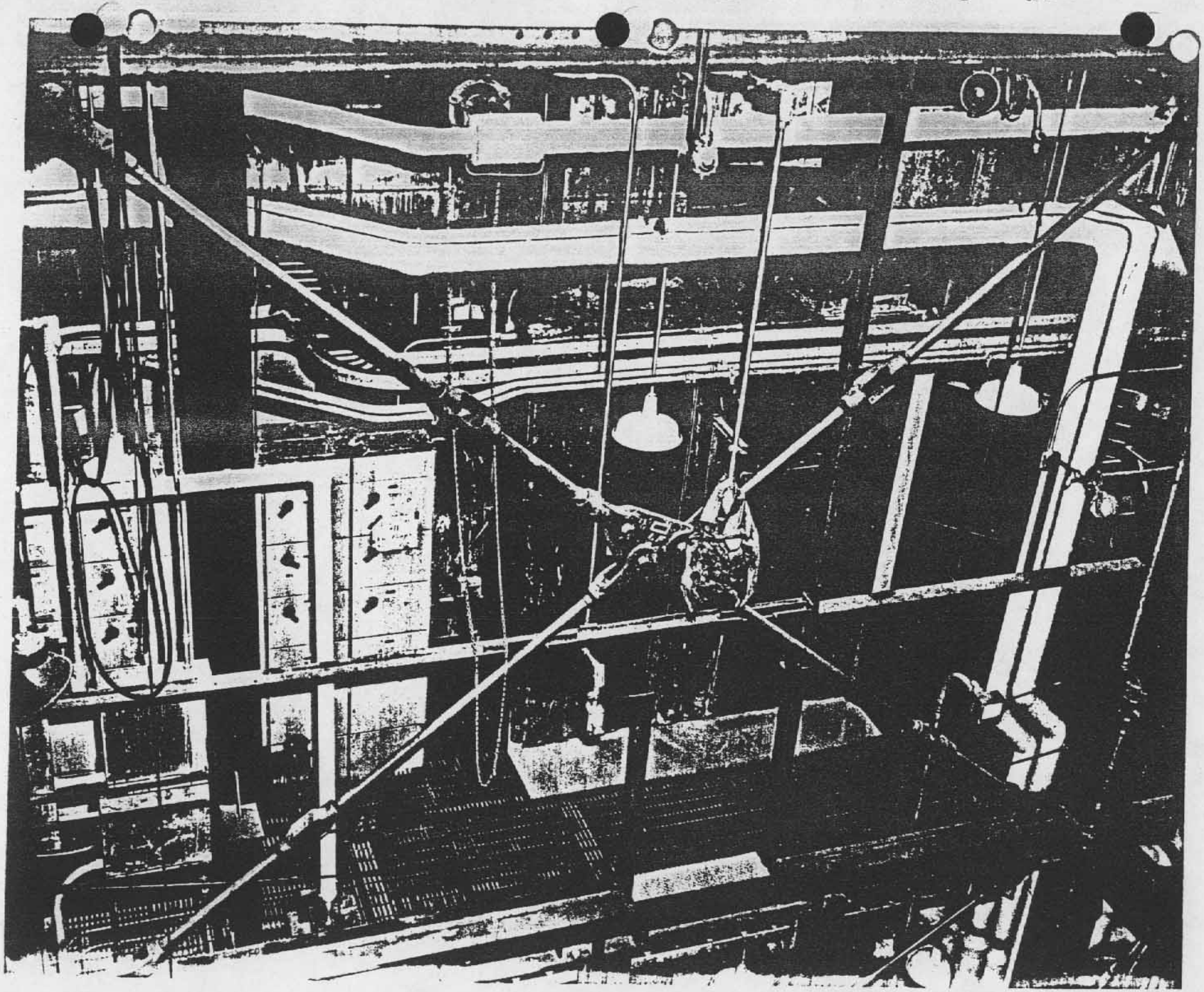


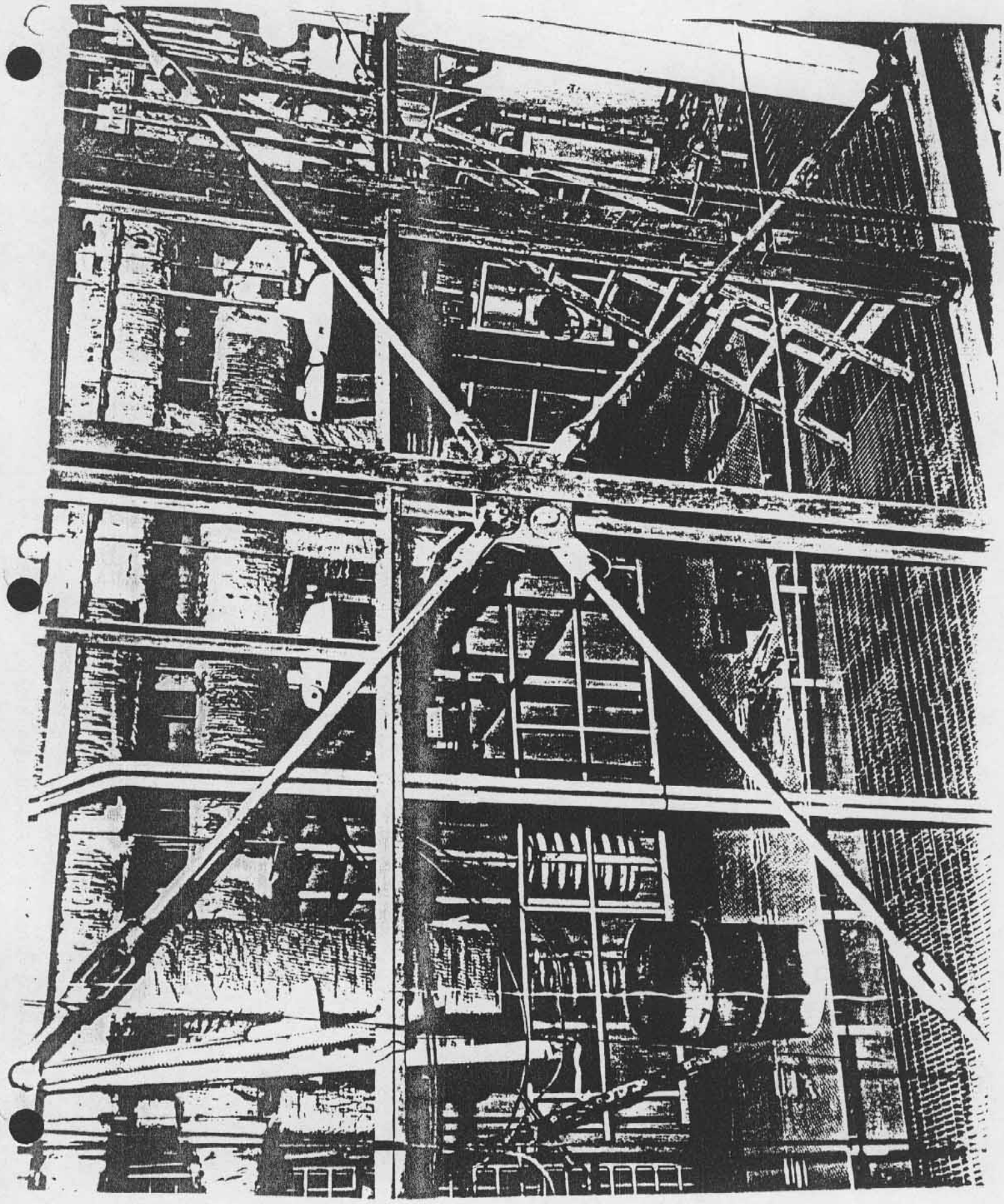


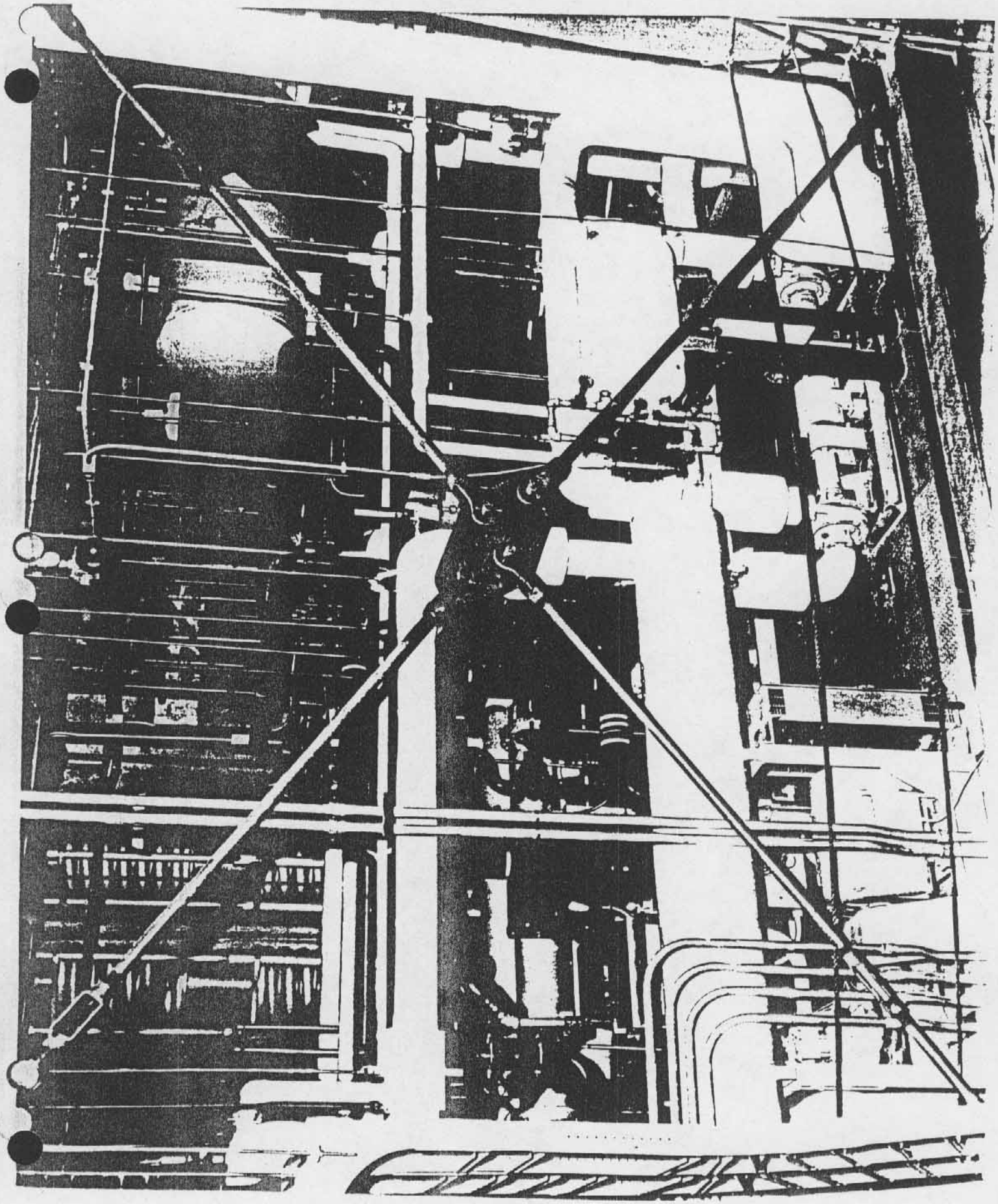


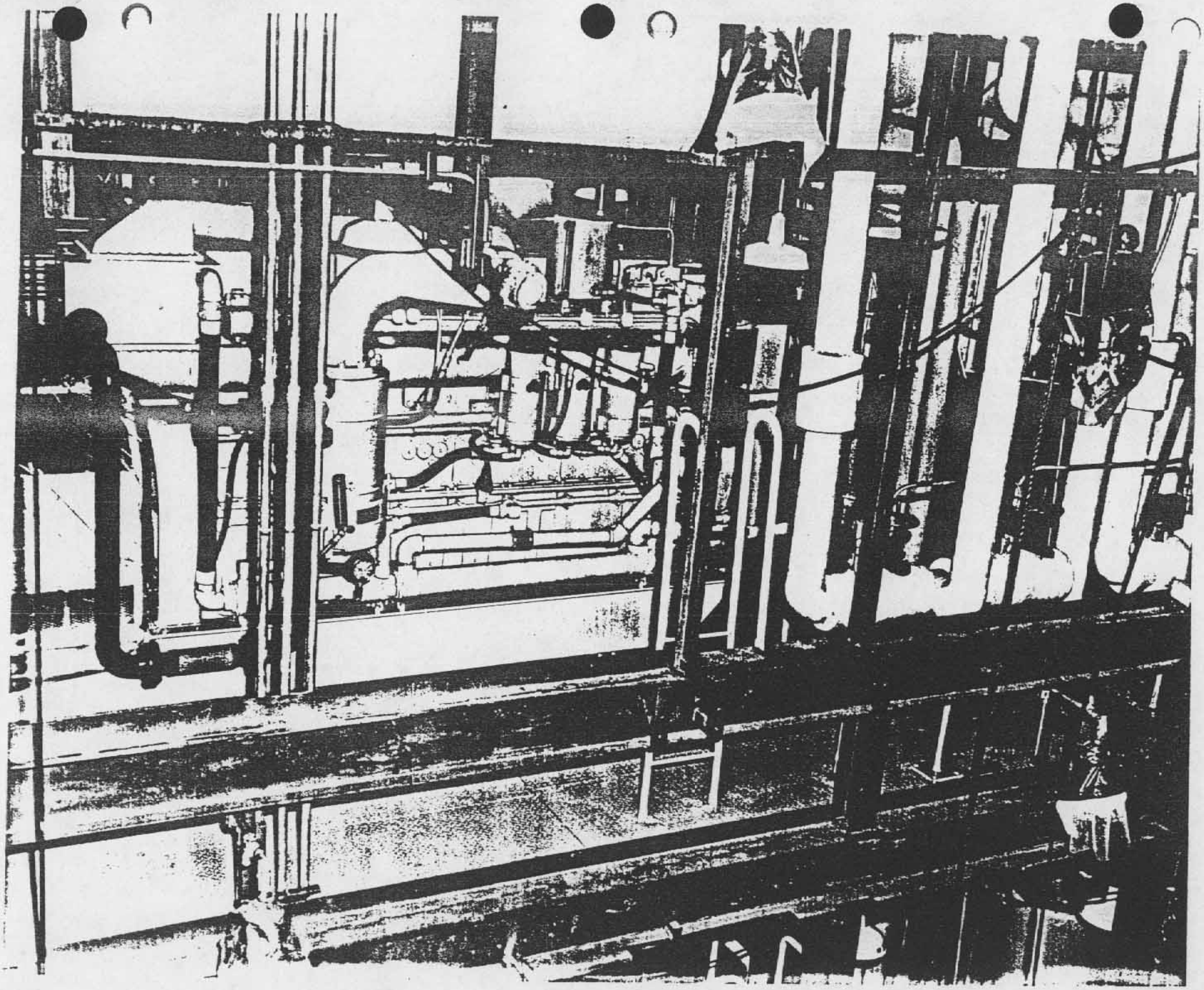


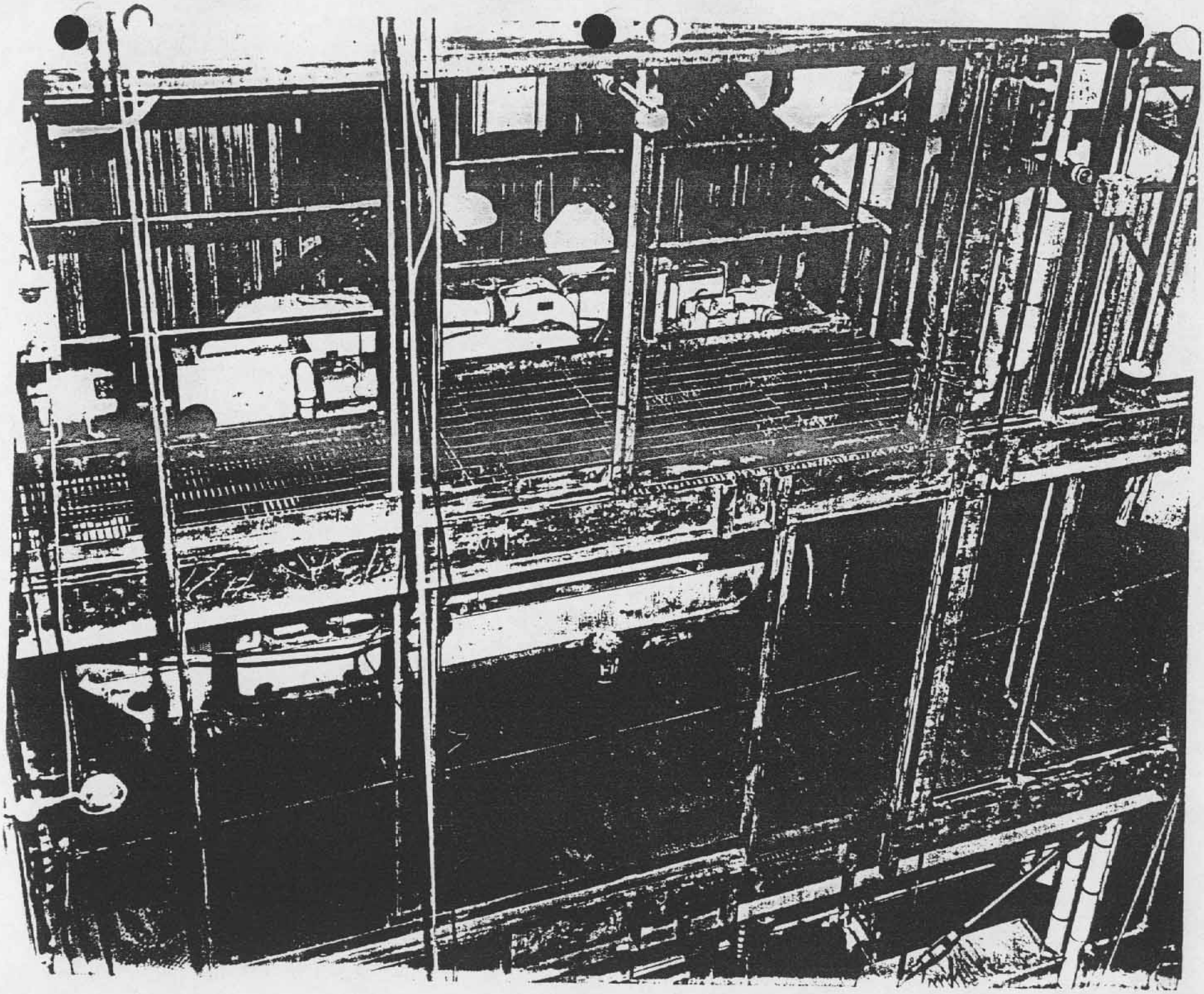


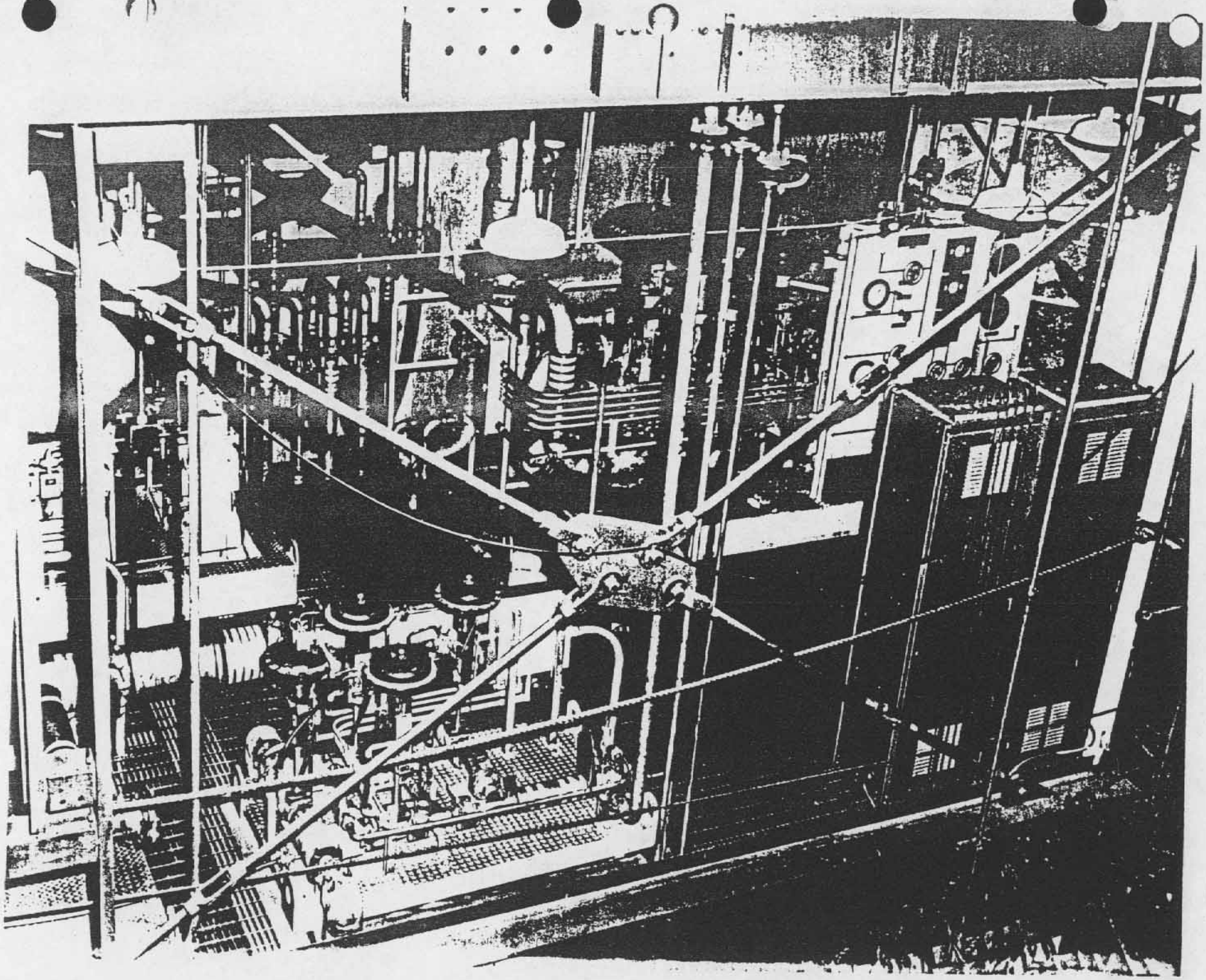




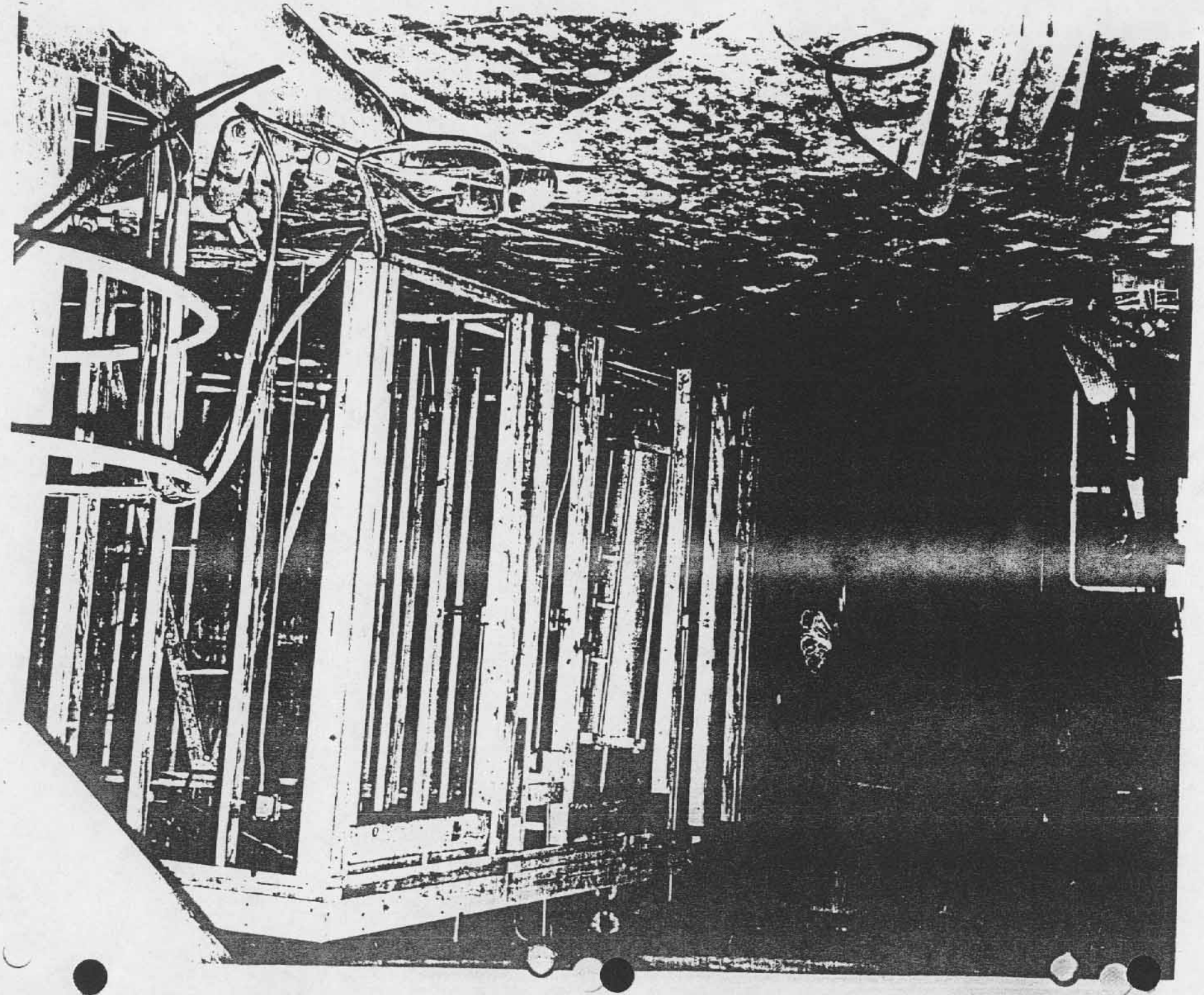




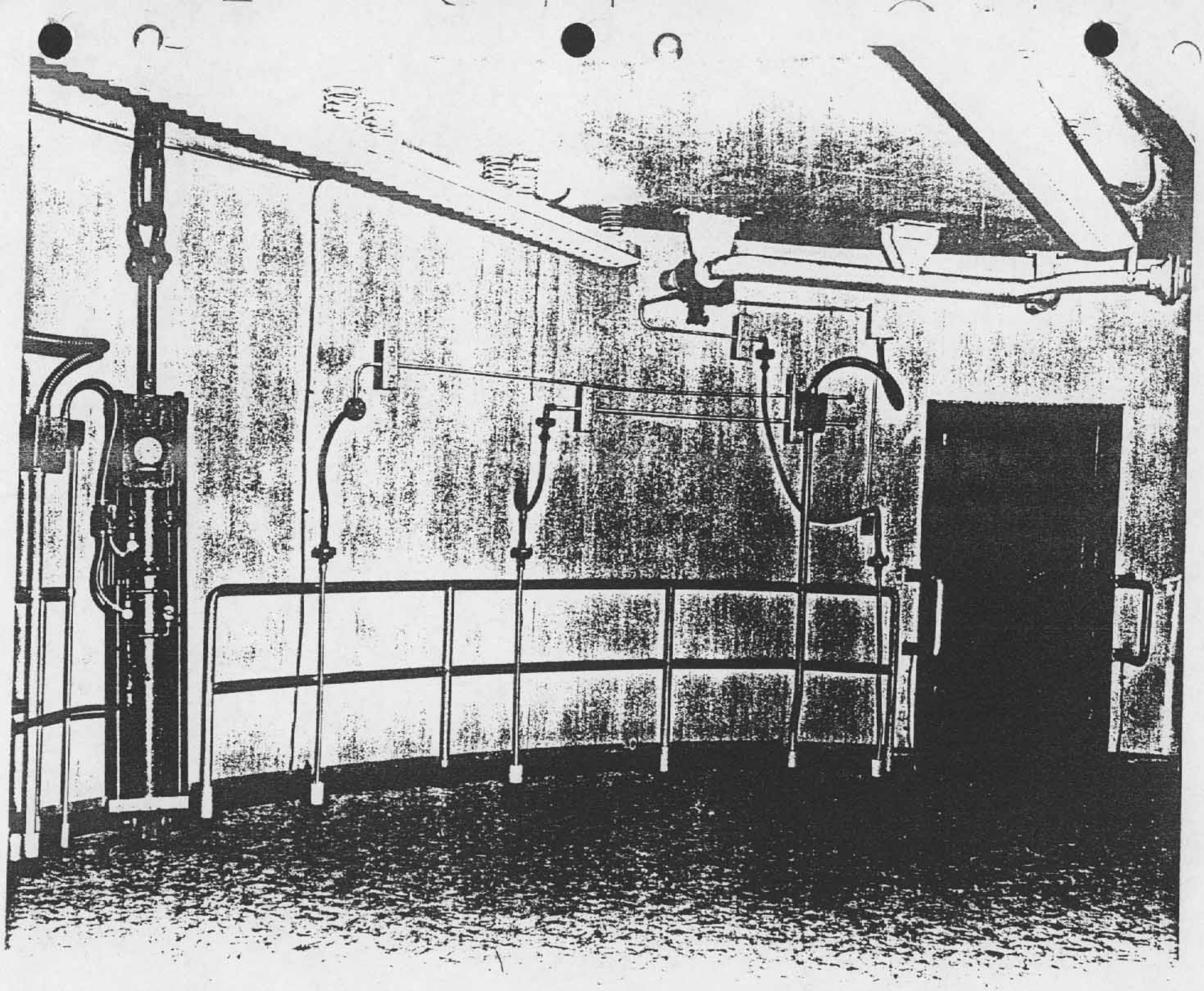


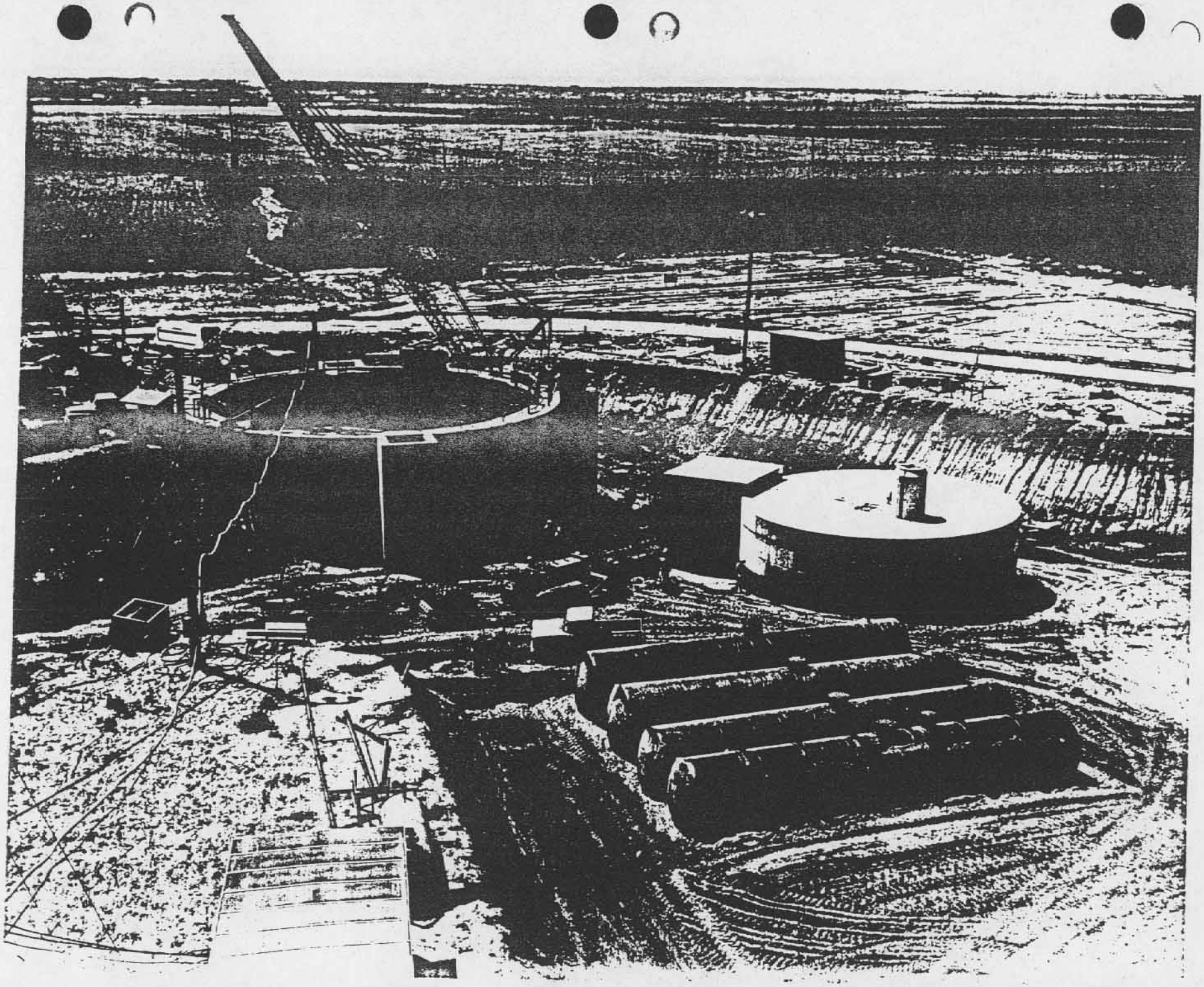


[illegible]
[illegible]
8 Jun [illegible]
DA-[illegible]
Sit: [illegible]
Subject - LOS
Direction - Interr
Level 1 - Ready rec



ATLAS AIR FORCE MISSILE SYSTEM (SM)
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.

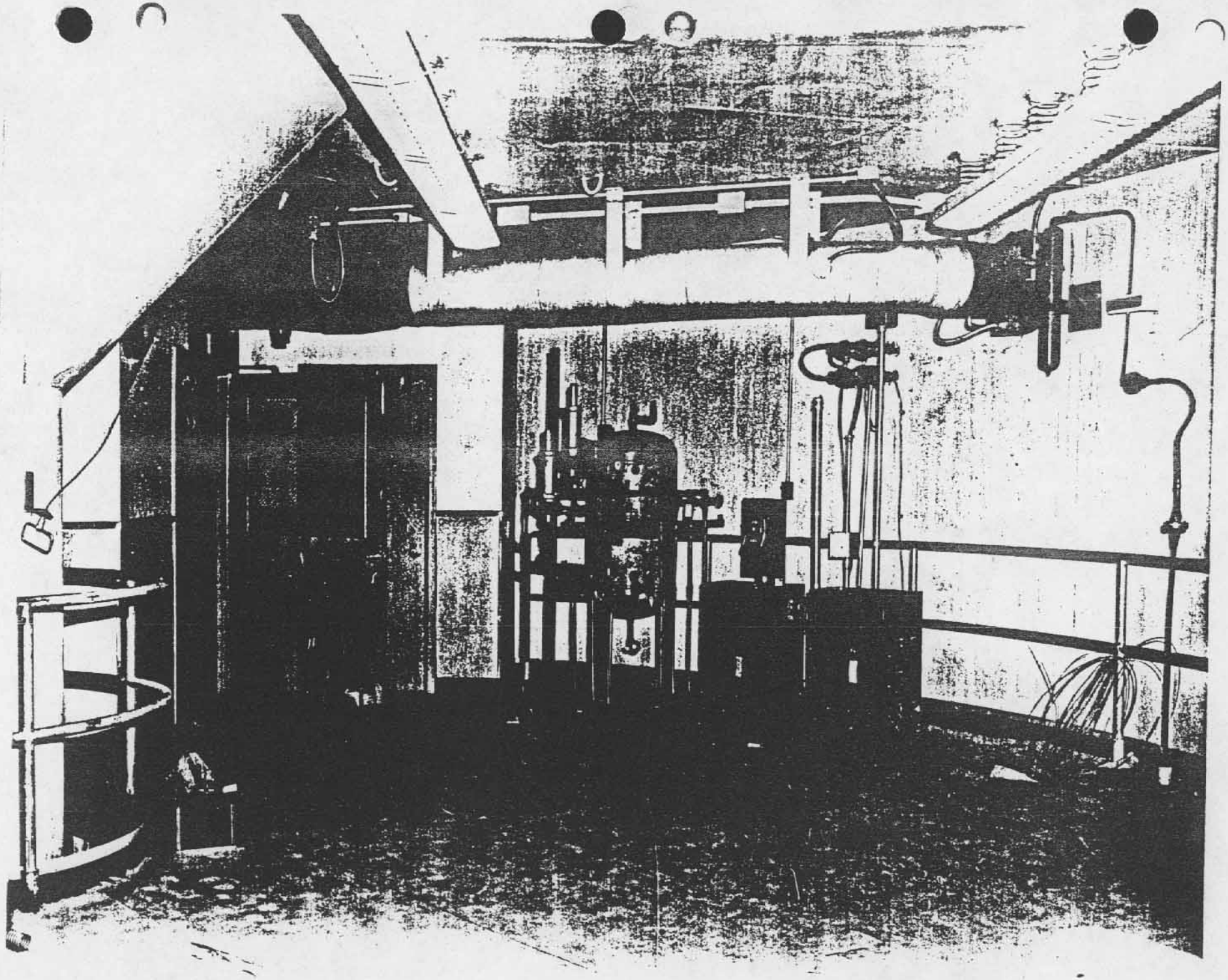
f. No. 24 - $330,000.00 - Crib Steel Revision: Extensive revisions in silo crib steel, plans and specifications which entailed additional structural steel.

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

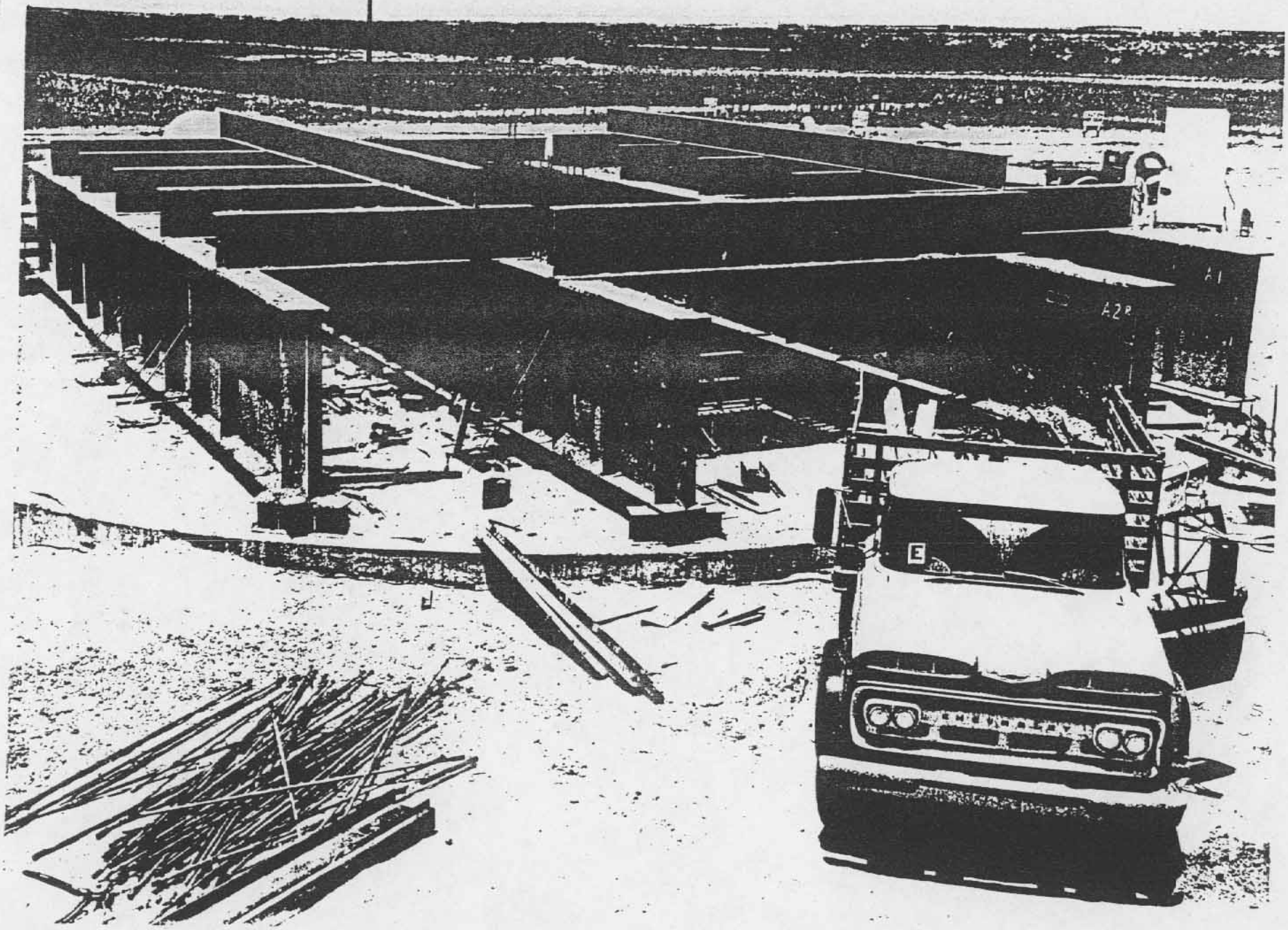
h. No. 31 - $276,588.00 - Electro-Magnetic Screen Revision: Necessary to provide Fire, Personnel and Electro-Magnetic Pulse Protection Systems.

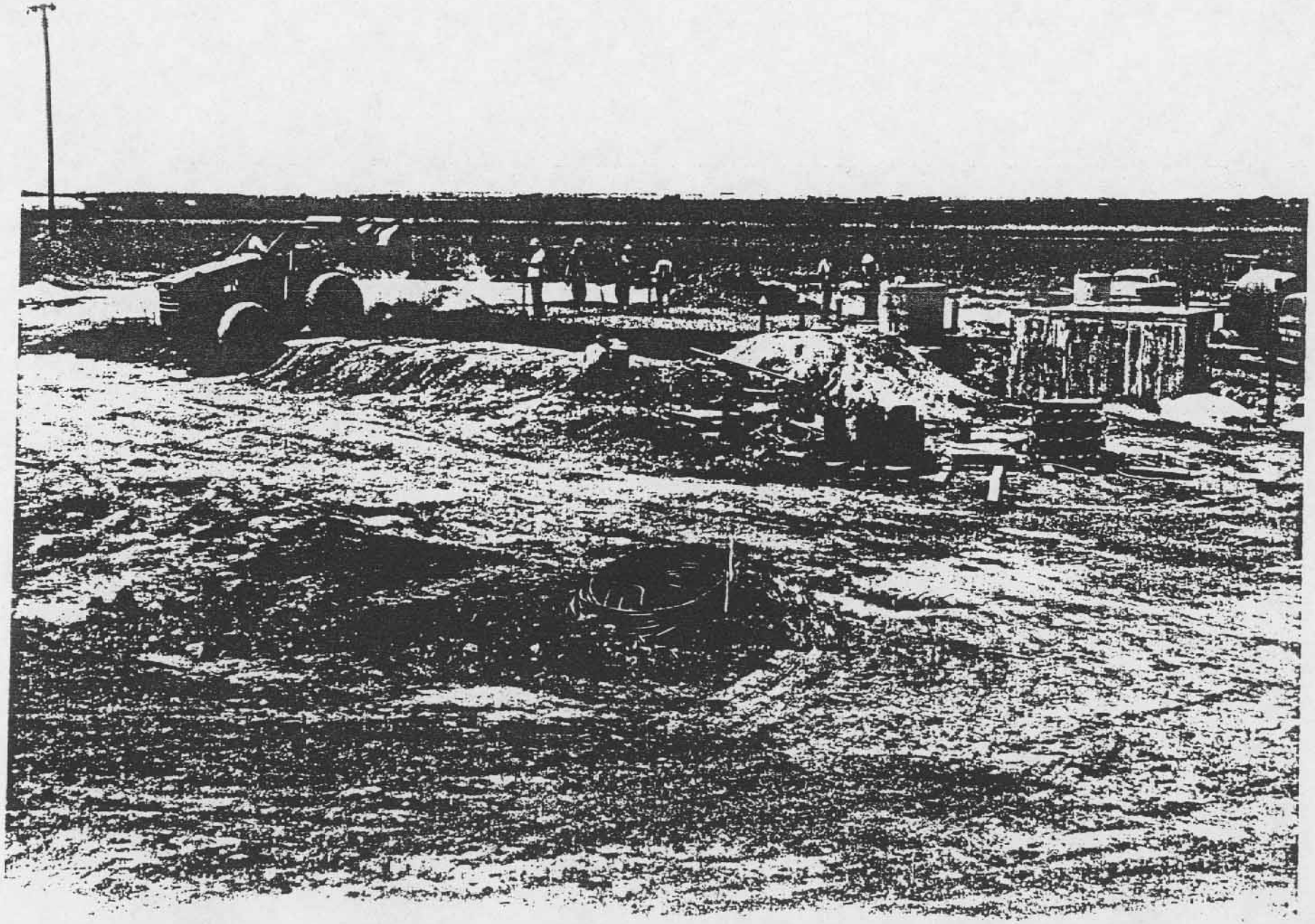
i. No. 39 - $238,913.63 - Assignment of ASC Contract DA-23-028-eng-4342, with Boeing Airplane Company for furnishing overhead door hinge assemblies.

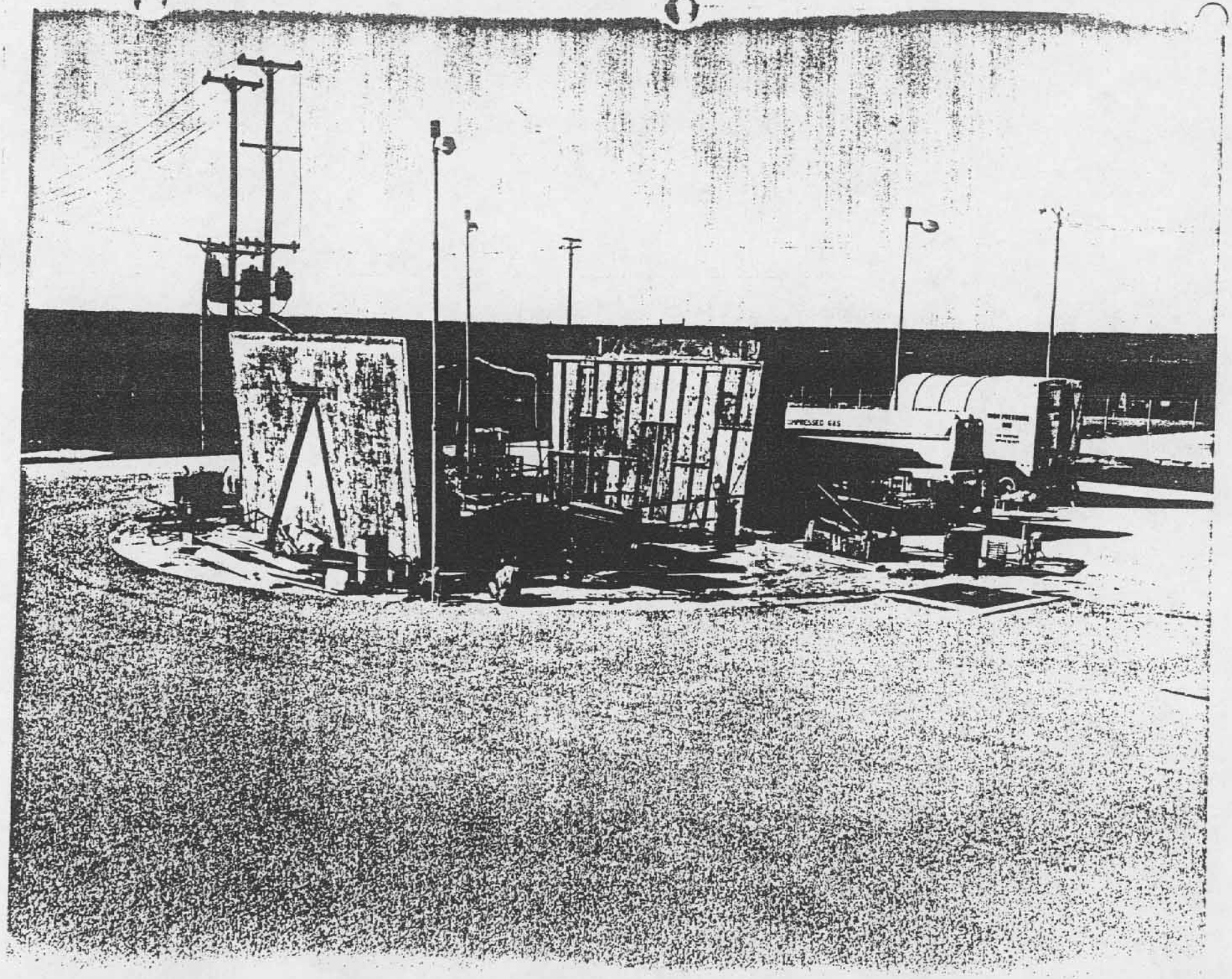
j. No. 40 - $342,143.34 - Assignment of ASC Contract No.

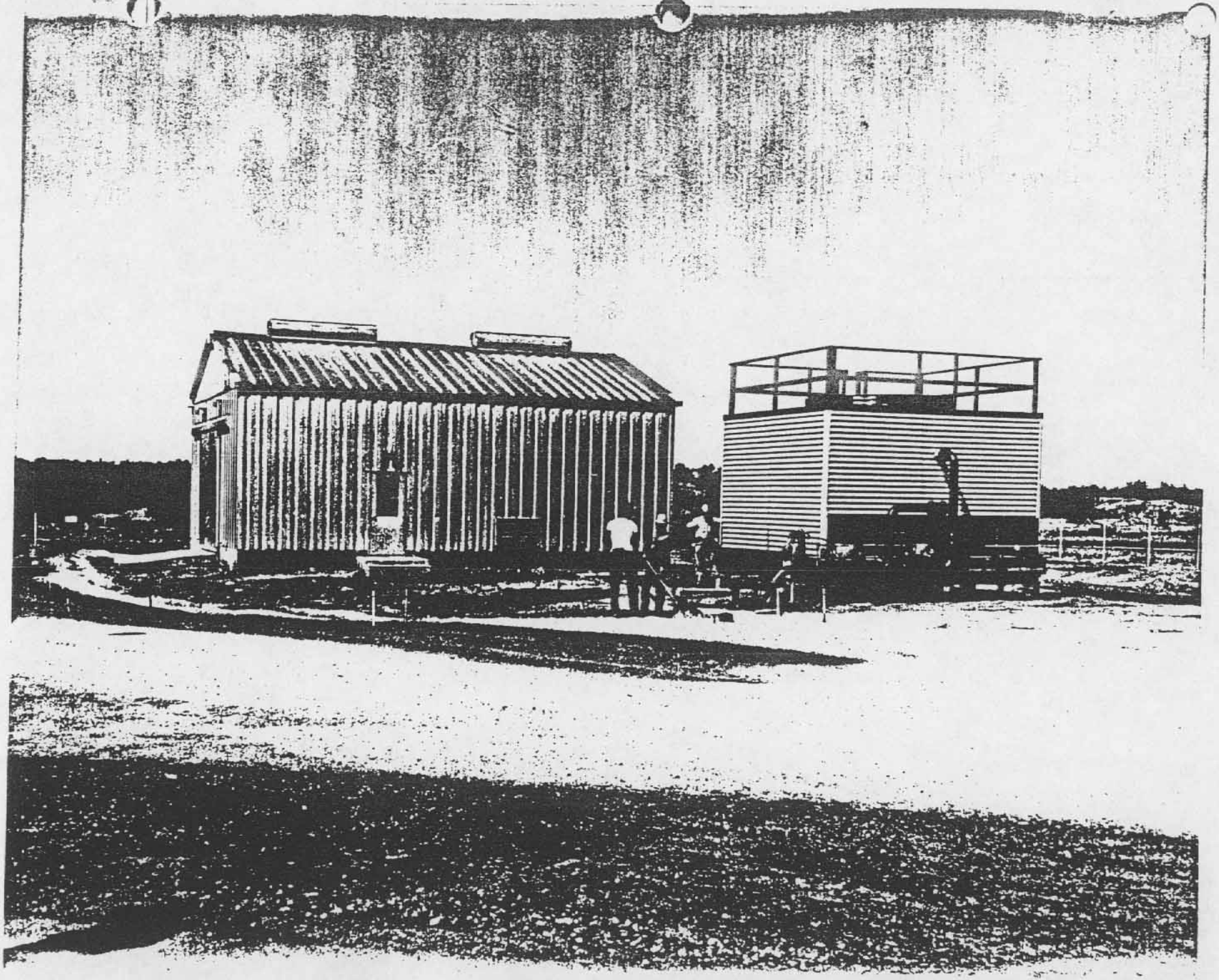


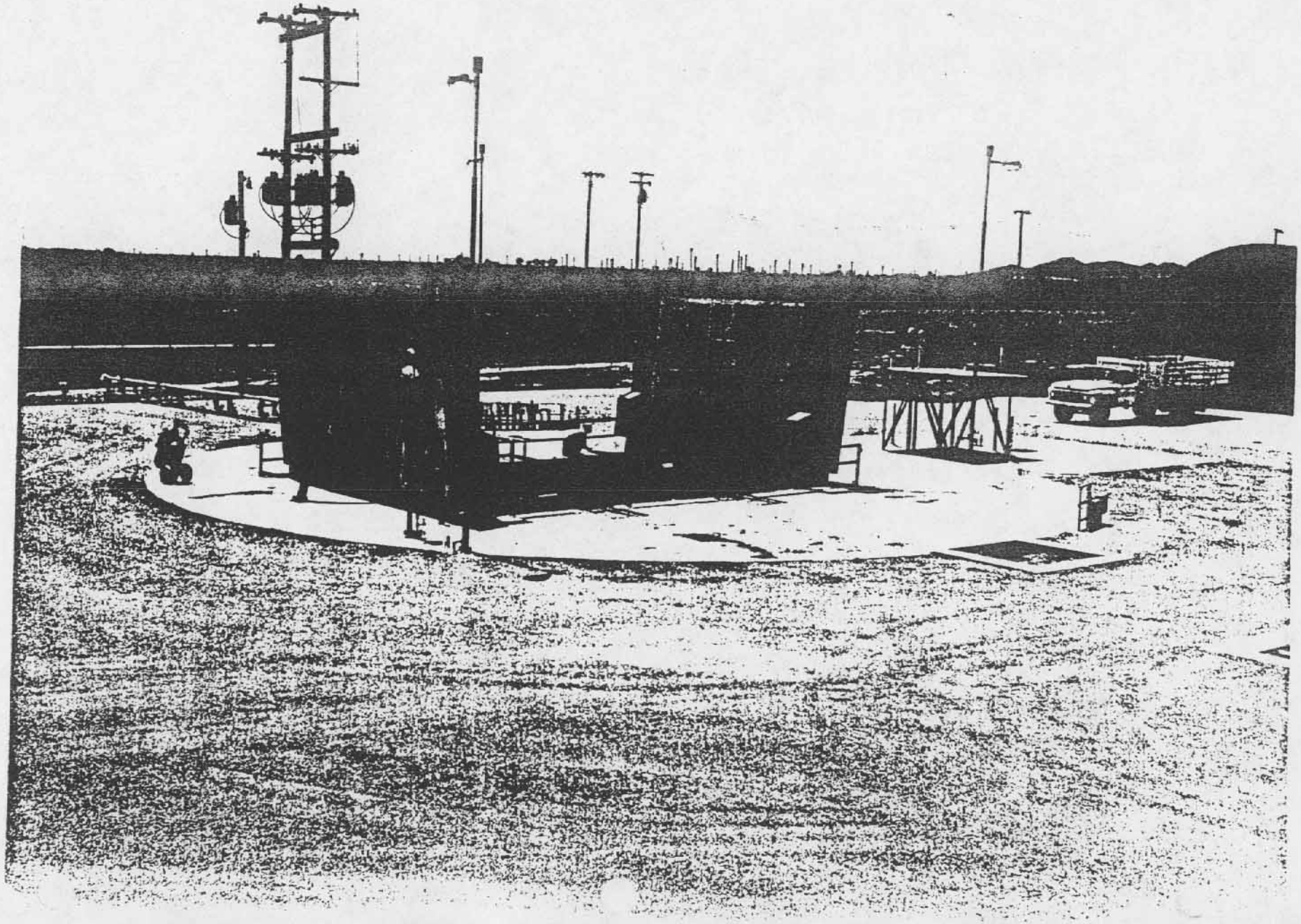
[illegible]


A1
A2R










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.