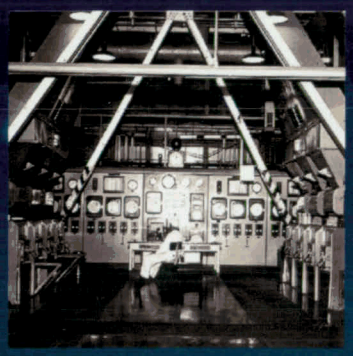
# Historical Documentation of Facilities and Structures at the Fernald Site



January 1998

1843

# FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
# FERNALD, OHIO

# HISTORICAL DOCUMENTATION OF FACILITIES AND STRUCTURES AT THE FERNALD SITE

JANUARY 1998

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

20900-RP-0002
REV. 0

000002

P-1843

# Historical Documentation of Facilities and Structures at the Fernald Site

January 1998

# TABLE OF CONTENTS

Acronyms . . . . . iii

1.0 Introduction . . . . . 1-1

2.0 Plant 1 . . . . . 2-1
- 2.1 Construction Details . . . . . 2-2
- 2.2 Design Changes . . . . . 2-2
- 2.3 Current Conditions . . . . . 2-2

3.0 Plant 2/3 . . . . . 3-1
- 3.1 Construction Details . . . . . 3-2
- 3.2 Design Changes . . . . . 3-3
- 3.3 Current Conditions . . . . . 3-3

4.0 Plant 4 . . . . . 4-1
- 4.1 Construction Details . . . . . 4-1
- 4.2 Design Changes . . . . . 4-2
- 4.3 Current Conditions . . . . . 4-2

5.0 Plant 5 . . . . . 5-1
- 5.1 Construction Details . . . . . 5-1
- 5.2 Design Changes . . . . . 5-2
- 5.3 Current Conditions . . . . . 5-2

6.0 Plant 6 . . . . . 6-1
- 6.1 Construction Details . . . . . 6-1
- 6.2 Design Changes . . . . . 6-2
- 6.3 Current Conditions . . . . . 6-3

7.0 Plant 7 . . . . . 7-1
- 7.1 Construction Details . . . . . 7-1
- 7.2 Design Changes . . . . . 7-2
- 7.3 Current Conditions . . . . . 7-3

8.0 Plant 8 . . . . . 8-1
- 8.1 Construction Details . . . . . 8-1
- 8.2 Design Changes . . . . . 8-2
- 8.3 Current Conditions . . . . . 8-3

## TABLE OF CONTENTS
(Contd.)

9.0 Plant 9 . . . . . 9-1
9.1 Construction Details . . . . . 9-1
9.2 Design Changes . . . . . 9-1
9.3 Current Conditions . . . . . 9-2

10.0 Pilot Plant . . . . . 10-1
10.1 Construction Details . . . . . 10-1
10.2 Design Changes . . . . . 10-2
10.3 Current Conditions . . . . . 10-2

11.0 Boiler Plant . . . . . 11-1
11.1 Construction Details . . . . . 11-1
11.2 Design Changes . . . . . 11-1
11.3 Current Conditions . . . . . 11-1

12.0 Services Building . . . . . 12-1
12.1 Construction Details . . . . . 12-1
12.2 Design Changes . . . . . 12-1
12.3 Current Conditions . . . . . 12-2

13.0 Analytical Laboratory . . . . . 13-1
13.1 Construction Details . . . . . 13-1
13.2 Design Changes . . . . . 13-1
13.3 Current Conditions . . . . . 13-2

14.0 Maintenance Building . . . . . 14-1
14.1 Construction Details . . . . . 14-1
14.2 Design Changes . . . . . 14-1
14.3 Current Conditions . . . . . 14-1

15.0 Other Buildings and Structures . . . . . 15-1

References . . . . . R-1

Glossary . . . . . GL-1

APPENDIX A Figures
APPENDIX B Architectural Drawings

1843

## ACRONYMS

| | |
|---|---|
| ACHP | Advisory Council on Historic Preservation |
| ADU | Ammonia Diuranate |
| AEC | Atomic Energy Commission |
| AHF | Anhydrous Hydrogen Fluoride |
| AWWT | Advanced Waste Water Treatment |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CFR | Code of Federal Regulations |
| DOE | Department of Energy |
| DP | Defense Programs |
| EM | Environmental Restoration and Waste Management |
| FDF | Fluor Daniel Fernald |
| FEMP | Fernald Environmental Management Project |
| FMPC | Feed Materials Production Center |
| $H_2$ | Hydrogen Gas |
| HF | Hydrogen Fluoride |
| MgX | Magnesium Precipitate |
| MAWS | Minimum Additive Waste Stabilization Project |
| MCW | Mallinckrodt Chemical Works |
| MT Th | Metric Tons of Thorium |
| MTU | Metric Tons of Uranium |
| NaX | Sodium Salt |
| NHPA | National Historic Preservation Act |
| NLO | National Lead of Ohio |
| OHPO | Ohio Historic Preservation Office |
| R-O-R | Reduction-Oxidation-Reduction |
| RCRA | Resource Conservation and Recovery Act |
| RIMIA | Receiving and Incoming Materials Inspection Area |
| SERF | Slightly Enriched Recovery Facility |
| TACOs | Temporary Additional Contractor Office Space |

| | |
|---|---|
| $ThO_2$ | Thorium Oxide |
| $U^{235}$ | Uranium-235 |
| $UF_4$ | Uranium Tetrafluoride, Green Salt |
| $UF_6$ | Uranium Hexafluoride |
| UNH | Uranyl Nitrate Hexahydrate |
| $UO_2$ | Uranium Dioxide, Brown Oxide |
| $UO_3$ | Uranium Trioxide, Orange Oxide |
| $U_3O_8$ | Black Oxide |

# 1.0 INTRODUCTION

1843

Since the early 1950s, the Atomic Energy Commission (AEC) and its successors, the Energy Research and Development Administration and the present-day U.S. Department of Energy (DOE), were responsible for the production of nuclear weapons for the nation's defense. The nuclear arms race between the United States and the former Soviet Union resulted in a country-wide research, production, and testing network that came to be known as the "nuclear weapons complex." At its peak, the complex consisted of 16 major facilities, from vast stretches of land in sparsely populated areas to research laboratories in major cities (DOE 1995). This nuclear weapons complex played one of the most significant roles in the history of the Cold War. DOE recognizes this historical significance and is working to preserve and promote its rich history for the benefit of future generations. At the Fernald site, information has been compiled in this report to document the construction and use of the site's major buildings and structures. A second report was written that chronicles a more general history of the site and its role within the AEC/DOE nuclear weapons complex.

The Fernald site is a 1,050 acre facility located about 18 miles northwest of downtown Cincinnati, Ohio. In 1951, construction began on the building complex, which was known as the Feed Materials Production Center (FMPC). From 1952 to 1989, the FMPC produced pure uranium metal from ores and process residues for use at other sites. The major steps in the production process are highlighted in Figure 1-1 (see Figure Attachments). A variety of materials were utilized throughout the production process, including ore concentrates and recycle materials, i.e., floor sweepings, dust collector residues, production residues, and these materials were dissolved in nitric acid to produce a uranyl nitrate (UNH) feed solution. The UNH was then concentrated and thermally denitrated to uranium trioxide ($UO_3$), or orange oxide. The orange oxide was either shipped to the gaseous diffusion plant in Paducah, Kentucky, or was converted to uranium tetrafluoride ($UF_4$), or "green salt." The green salt was blended with magnesium-metal granules and placed in a closed reduction pot to produce a mass of uranium metal called a derby. Some derbies were shipped to other facilities but the remainder were melted and

poured into pre-heated graphite molds to form ingots. Some ingots were machined or extruded to form billets. In 1989, production ceased at the FMPC due to a decrease in the demand for the feed materials and an increase in environmental restoration efforts. The site was renamed the Fernald Environmental Management Project (FEMP) in 1991, and the site was officially closed as a production facility, as DOE management of the site was switched from the Defense Programs (DP) division to the Environmental Restoration and Waste Management (EM) division. Today, the FEMP is undergoing site-wide environmental remediation pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as well as waste management under the Resource Conservation and Recovery Act (RCRA). One aspect of the remediation process is the complete dismantling of all production buildings and structures at the Fernald site. Throughout this report, the "Fernald site" will be used to identify the site, rather than the FMPC or FEMP, except within quotes or report titles. The terms "AEC" and "DOE" will be used as appropriate.

The purpose of this report is to document the major process operations and support facilities used in the production of uranium metal at the Fernald site. Written summaries of the production plants and primary support facilities are supplemented with photographic documentation. Existing photographs retrieved from the Fluor Daniel Fernald (FDF) Records Management department were used whenever possible. Additional photographs were taken when needed.

The facilities chosen for description within this report were agreed to with the Ohio Historic Preservation Office (OHPO) and the Advisory Council on Historic Preservation (ACHP) in a Programmatic Agreement that was signed by all parties in January 1996. The Programmatic Agreement was written pursuant to 36 Code of Federal Regulations (CFR) 800.13. It establishes a procedure for compliance with Sections 106 and 110 of the National Historic Preservation Act (NHPA), with respect to the facilities and structures at the Fernald site. OHPO advised DOE in 1994 that all buildings and structures at the Fernald site were eligible for listing on the National Register of Historic Places. DOE agreed with the Fernald site's eligibility and proposed this report as a way to document the

history of the buildings and structures at Fernald. Historical documentation was determined appropriate since preservation of the facilities will be impossible due to the remedial activities that have been undertaken.

The report format is in accordance with the Programmatic Agreement. The production plants and primary support facilities are documented with respect to construction details, production process descriptions or support roles, major design changes, and current conditions. A diagram of the Fernald Site is provided as Figure 1-2. This diagram demonstrates the relationships among the production plants and support facilities discussed in the text. A short text is prepared for each plant or support facility, as well as a set of representative photographs and architectural drawings. Where possible, existing photographs are used to document the buildings. Schematic representations of the production process are also included, where applicable. The architectural drawings are copies of existing drawings, currently stored on microfiche, used by the original construction contractor. There have been several modifications to the drawings over the years and they are not always to scale, but they do provide information regarding the architecture and construction of the buildings and structures at the Fernald site.

This report is by no means an exhaustive account of the history of the Fernald site. It is only intended to summarize the history of each of the production plants and the major support facilities. The reports referenced provide a much more detailed description of production processes and architectural history. It is DOE's position that a wealth of information is already available with respect to the history of the Fernald site, and that this document should consolidate and summarize this information. All historical records kept for the Fernald site, including photographs and negatives, engineering and architectural drawings, reports, letters, memos, production records, etc., are catalogued and archivally stored as directed by DOE Order 1324.5B. Historically relevant records will be sent to the National Archives while others will be destroyed according to government disposition schedules.

## 2.0 PLANT 1

Plant 1, also referred to as the Sampling Plant, is where incoming raw materials were received, weighed, sampled, and stored at the site. Plant 1 received incoming materials from off site, as well as process residues generated internally (e.g. residues processed through Plant 8). The raw materials were dried, ground, and classified by enrichment and physical state (DOE, 1985). The material was sorted by uranium content in order to maintain nuclear material and process control. This information was important, as DOE sites required different specifications of uranium enrichment over the years. Uranium enrichment is the process used to increase the percentage of a desired isotope. At the Fernald site, the isotope of concern was uranium-235 ($U^{235}$). Finished products at the Fernald site were either depleted (0.16% to 0.69% $U^{235}$), normal (0.71% $U^{235}$), or enriched (0.72% to 19.99% $U^{235}$). In order to arrive at the desired enrichment, process engineers needed to know the exact amount of uranium, including $U^{235}$, that was present in the incoming raw materials. This knowledge was also important for purchasing control, since AEC/DOE paid for feed materials based on uranium content (DOE, 1985).

Grinding of the raw materials and process residues was accomplished using mechanical crushers, mills, and other equipment. The material then passed through a three-phase sampler and was drummed for further processing [National Lead of Ohio (NLO), 1957]. Figure 2-6 is a schematic representation of the process. The types of materials received and sampled at the outset included the following: pitchblende ores mined primarily in the Belgian Congo; magnesium precipitate (MgX); black oxide ($U_3O_8$) concentrated from low-grade uranium ores from both the United States and Canada; sodium salt (NaX); and Canadian ores, which contained thorium (DOE, 1985).

Operations were conducted within five units: the Sampling Plant, the Thawing Area, the Drum Reconditioning Building, the Drum Storage Area and the Silos. The Drum Storage Area, commonly referred to as the Plant 1 Pad, was a concrete pad measuring over 200,000 $ft^2$ used to store drums of incoming material, as well as process wastes. The Plant 1 Silos were used to store bulk processed raw materials (DOE, 1985).

## 2.1 Construction Details

Construction of Plant 1 began in January 1952 and was completed by August 1953. The facility is housed in a steel frame building of beam, girder and column construction with Transite walls and roofs. The main building measures 160 ft. long, 60 ft. wide, and 62 ft. high. Attached to the main building are several small lean-tos, along with two drum conveyors reaching from the Drum Storage Area north of the main building (Catalytic Construction Co., 1953). The estimated capital value of the Plant 1 complex was $3.7 million (1953 dollars), (DOE, 1985). Representative photographs of Plant 1 and its associated structures and facilities are shown in Figures 2-1 to 2-5. Architectural drawings of the Plant 1 complex are found on Sheets 1-1 and 1-2.

## 2.2 Design Changes

As with most buildings and structures at the Fernald site, Plant 1 has undergone several modifications during the production history of the site. New processes and facilities were added through the years. A mobile hopper packing station was added in 1963 to eliminate the use of 55-gallon drums for certain materials. A 24,000-$ft^2$ concrete block warehouse was constructed on the Plant 1 Pad in 1964 for storage of "source and special" materials received from off site. A Safe Geometry Digestion system was installed in 1969 (DOE, 1985).

With the cessation of production activities in 1989 and the shift in the site mission from production to environmental remediation, several more changes have occurred to Plant 1. Today, the Plant 1 Pad is approximately 500,000 $ft^2$, and it is used for storage of drummed waste. In the late 1980s and early 1990s, several tension support structures were installed on the Plant 1 Pad. These structures protect aging drums from the elements and further deterioration. The Plant 1 Ore Silos, shown in Figure 2-3, were dismantled as a CERCLA Removal Action in 1994.

## 2.3 Current Conditions

As with all other buildings and structures at the Fernald site, Plant 1 and its associated structures will be demolished as part of remedial activities. Various steps are involved in

the demolition process. The Safe Shutdown program, initiated as a Removal Action under CERCLA, is a sitewide program that prepares buildings and structures for dismantling. Safe Shutdown entails the engineering, planning, scheduling, and actual isolation of process equipment, piping systems, and associated utilities and the removal of residual process materials, supplies, and other materials from each building.

Safe Shutdown and dismantling is taking place in two separate phases due to the availability of the buildings. Phase I Safe Shutdown activities were completed in July 1995. That part of the plant was imploded on February 22, 1997. Phase II, Safe Shutdown of the support buildings in the Plant 1 complex, is scheduled for October 1998. It is important to note that time frames are projected based on the current proposed funding scenario known as the "Accelerated Clean Up Plan." This concept involves an increase in funding in order to accelerate the cleanup of the Fernald site within 10 years, which would result in a significant cost savings of approximately $3 billion, due to reduced landlord costs of site maintenance and facility operation. Therefore, the time frames regarding remedial activities are subject to change.

# 3.0 PLANT 2/3

Plant 2/3 is so named because it is actually a series of structures and not just one building. Plant 2/3 was the Ore Refinery where incoming materials from Plant 1 and recycled scrap were converted to $UO_3$, also known as "orange oxide." Plant 2/3 consisted of three major process areas: digestion, extraction, and denitration. Major support areas within Plant 2/3 included the nitric acid recovery system, raffinate treatment and the refinery sump. The production process description below provides more detailed information regarding these processes.

In the refinery production process, shown in Figure 3-5, uranium feed materials from Plant 1 were discharged from drums into a feed hopper and transported to digestion tanks where the uranium content was converted into soluble uranyl nitrate by digestion in nitric acid. The resulting slurry was pumped into extraction columns in which the uranyl nitrate was preferentially extracted by a solvent mixture of tributyl phosphate and kerosene (DOE, 1985).

Purification of the uranyl nitrate in the solvent extract stream was accomplished by scrubbing with water in four mixer-settlers. The purified uranyl nitrate was recovered from the organic solvent stream from the mixer-settlers by re-extraction with deionized water in perforated-plate strip columns (DOE, 1985).

The aqueous uranyl nitrate product from the strip columns, often referred to as "OK liquor," was converted through a series of steps to produce $UO_3$. These steps included evaporation of the uranyl nitrate solution to produce a molten salt of UNH, which was thermally decomposed to $UO_3$ by calcination (roasting) in gas-fired pots. The $UO_3$ was ground, screened, sampled, and then loaded into portable metal hoppers (DOE, 1985).

### 3.1 Construction Details

Construction of Plant 2/3 was initiated in March 1952 and was completed by October 1953. The Ore Refinery was not a single building, but rather a series of structures that as a whole made up the Plant 2/3 complex. These facilities include the Ore Refinery building, the Hot Raffinate building, the Refinery Sump and Collection System, the Control building, and the Electric Power Center (Catalytic Construction Co., 1953). The estimated capital value was $13.5 million (1953 dollars), (DOE, 1985).

The Ore Refinery building is a steel frame structure of beam, girder, and column construction with Transite walls and roof. This structure is divided into three areas that coincide with the three major processes as described above. These areas include the Ore Digestion Area, the Extraction Area, and the Denitration Area. The Ore Refinery building is 60 ft. wide and 380 ft. long. The height of the building varies, but is generally 55 ft. The functional area within the Ore Refinery is 60,723 $ft^2$ (Catalytic Construction Co., 1953).

The Hot Raffinate building is a reinforced concrete structure of the beam and girder type combined with a steel frame of the column and truss design. The steel frame is covered with Transite siding on both roof and side walls. The building consists of three sections: the middle portion is approximately 52 ft. long, 38 ft. wide, and 51 ft. high; a lean-to on the east side is 52 ft. long by 18 ft. wide by 30 ft. high; and a projection on the west side of the main building 21 ft. in height and 20 ft. in width. The functional area within the Hot Raffinate building is 8,394 $ft^2$ (Catalytic Construction Co., 1953).

The Refinery Sump and Collection System is housed within a rigid frame building with Transite walls and roof. The building is approximately 44 ft. long, 18 ft. wide, and 24 ft. high. The functional area of the building is 1,696 $ft^2$ (Catalytic Construction Co., 1953).

The Control building is a rigid frame structure with Transite walls and roof. The building is approximately 110 ft. long, 26 ft. wide, and 14 ft. high. The functional area of the building is 2,703 $ft^2$. The Electric Power Center is housed within a rigid frame building with Transite walls and roof. The building is approximately 67 ft. long, 26 ft. wide, and

16 ft. high. The functional area of the building is 1,710 $ft^2$ (Catalytic Construction Co., 1953). Representative photographs of Plant 2/3 are shown in Figures 3-1 to 3-4. Architectural drawings are found on Sheet 2-1.

### 3.2 Design Changes

Design changes over the years have resulted primarily from changes in the demand for feed materials throughout the AEC/DOE weapons complex. Plant 2/3 was originally designed to process 4,570 metric tons of uranium (MTU) per year. In July 1955, work was initiated to increase the process capacity to 9,072 MTU per year. The refinery was expanded and additional equipment was installed in the Denitration Area. In June 1958, the process capacity of Plant 2/3 was expanded an additional 4,082 MTU per year with the addition of four more denitration pots and other equipment (DOE, 1985).

Plant 2/3 was placed on standby early in 1962 when a similar refinery was activated at the Weldon Spring site in St. Louis, Missouri. Scrap feed was the only material processed in Plant 2/3 until 1966, when the Weldon Spring site was shut down and Plant 2/3 was reactivated (DOE, 1985).

Within all plants at the Fernald site, changes in product demand resulted in changes in employment. As a result, production trends correspond to changes in the work force. For instance, employment was the greatest from the mid-1950s to the early 1960s (with a high point of 2,891 employees in 1956), which corresponds to the high point in metal production. Less than 1,000 employees worked at the Fernald site throughout the 1970s; at the same time, the production numbers were their lowest (DOE, 1985).

### 3.3 Current Conditions

Safe Shutdown of the Plant 2/3 complex will be completed by August 1998. Dismantling of Plant 2/3 is scheduled to begin in February 1999.

# 4.0 PLANT 4

Plant 4, also known as the Green Salt Plant, is where the $UO_3$ produced in Plant 2/3 (or recycled from other DOE sites) was converted to $UF_4$, or "green salt". Green salt was used to produce uranium metal, a process which took place in Plant 5. A schematic of the Plant 4 process is shown in Figure 4-4.

The $UO_3$ was delivered to Plant 4 in mobile hoppers. Within Plant 4, $UO_3$ was first converted to uranium dioxide ($UO_2$), or brown oxide, by reducing it with hydrogen. The $UO_2$ was then reacted with anhydrous hydrogen fluoride (AHF) to produce $UF_4$. The $UO_3$ recycled from other DOE sites underwent double pass reduction-oxidation-reduction (R-O-R) processing to yield high purity $UF_4$. Once the $UF_4$ was produced by the chemical processes described above, it was bended and packaged in ten-gallon cans for use in the Metals Production Plant (Plant 5), (DOE, 1985).

Twelve banks of chemical reactors were originally installed that provided a design capacity of 477 MTU of $UF_4$ per month. This is the equivalent of 2,421 pounds of $UF_4$ per hour with a yearly rate of 5,193 MTU per year, based on a monthly operating time of 520 hours (DOE, 1985).

## 4.1 Construction Details

Construction of Plant 4 was initiated on February 7, 1952 and was completed by September 1953. The facility is a steel frame of the beam, girder, and column type covered with Transite siding on both side walls and roof. The inside of all interior walls is lined with flat asbestos board. Plant 4 is approximately 200 ft. long, 160 ft. wide, and 100 ft. high. An exterior elevator shaft is located on the northwest corner of the facility. The operations of Plant 4 include the Tank Farm, where facilities are provided for unloading, storing, and transferring bulk liquid chemicals used throughout the complex (Catalytic Construction Co., 1953). The estimated capital value of the facility was $6.9 million (1953 dollars), (DOE, 1985). Representative photographs of Plant 4 and its

associated structures and facilities are shown in Figures 4-1 to 4-3. Architectural drawings are found on Sheets 3-1 to 3-4.

## 4.2 Design Changes

Initially it was planned that all $UO_3$ feed would come from the Fernald site. However, in 1957, large quantities of $UO_3$ became available from the Port Hope refinery in Canada. After Plant 2/3 shut down in 1962, all feed for Plant 4 came from Port Hope, the Savannah River site, the Hanford site, and the Mallinckrodt Chemical Works (MCW) Refinery at Weldon Spring. This continued until 1965, when enriched $UO_3$ from the Fernald site Slightly Enriched Recovery Facility (SERF) was processed (which was produced in Plant 8). Production of enriched $UF_4$ actually started in 1963, with the processing of $UO_3$ feed from the Hanford site. Plant 4 produced various types of $UF_4$ based on the kind of feed material the facility was receiving (DOE, 1985).

Initially, production of $UF_4$ did not progress as rapidly as expected. In 1953, only 1,568 MTU was produced. Although production doubled during 1955, it was not until 1956 that the design rate of 5,193 MTU was approached when 5,029 MTU was achieved. In 1957, 9,000 MTU was produced. The highpoint of production was in 1958, when over 12,000 MTU of normal $UF_4$ was produced. Both normal and enriched $UF_4$ production decreased between 1967 and 1970 (DOE, 1985). A decline in demand caused the facility to operate sporadically from the early 1970s to 1980, when the process was restarted and operated until the complete shutdown of the Fernald site in 1989.

## 4.3 Current Conditions

Plant 4 was the second building scheduled for demolishment at the Fernald site. Safe Shutdown activities were completed in March 1995, and the building was imploded on August 24, 1996. The Plant was stripped of all Transite siding and interior structures and facilities, and the remaining steel frame structure was imploded using explosive charges.

# 5.0 PLANT 5

Plant 5, the Metals Production Plant, was where $UF_4$ from Plant 4, and later from the Pilot Plant, underwent a thermite-type reaction with magnesium to produce uranium metal in the form of derbies. The derbies were then vacuum melted and poured into molds to create uranium ingots. Uranium metal was produced through the reduction of $UF_4$ with magnesium in a steel reaction vessel, which is often referred to as a "bomb." This reaction vessel was filled with proportioned amounts of $UF_4$ and magnesium metal, sealed, and placed in a muffle furnace and heated until a uranium metal "derby" is formed in the bottom of the vessel. The "derby" of uranium was separated from the liner material of the reaction vessel in the Breakout Area. The term "derby" was used because of the shape of the uranium metal. After breakout from the liner material, the mass of uranium resembled the shape of the type of man's hat (without the brim) known as a "derby." The uranium derbies were then loaded into graphite cubicles and melted in vacuum, induction-heated furnaces. The molten uranium was then poured into graphite molds and allowed to cool. The resulting shape the uranium took was termed an "ingot." These cast uranium ingots were weighed, sampled, washed, and stored for further processing at the Metals Fabrication Plant, also known as Plant 6. The ingots produced varied in size from seven to 10 inches in diameter and 23 to 40 inches in length, and weighed up to 1,400 pounds. The designed production rate for the derbies was 5,100 MTU per year, while the rate for ingot casting was 7,464 MTU per year (DOE, 1985). A schematic of the Plant 5 process is shown on Figure 5-5.

## 5.1 Construction Details

Construction of Plant 5 commenced on September 25, 1951 and was completed by June, 1953. The facility is a steel building of truss and column type construction with Transite walls and roof. Plant 5 was approximately 560 ft. long, 180 ft. wide, and 50 ft. high. An extension was constructed at the southern end of the building, where the height was approximately 60 ft. (Catalytic Construction Co., 1953). The capital value was estimated at nearly $9.5 million (1953 dollars), (DOE, 1985). Representative photographs are shown in Figures 5-1 to 5-4. Architectural drawings are found on Sheets 4-1 and 4-2.

## 5.2 Design Changes

Feed materials, which consisted of depleted, normal, and enriched $UF_4$, from both the Fernald site and elsewhere in the AEC/DOE weapons complex, were used to produce uranium metal. Since the start of production in 1953, production of derbies increased each year until it reached the 8,000 MTU level in 1956. Production was then reduced by 1,000 MTU annually in 1969 and 1970. In 1971, derby production was limited to 1,344 MTU. Derby production fluctuated around that level through 1976 (DOE, 1985).

Production of ingots rose steadily from 1953 to 1956, when 12,000 MTU were produced. Various sizes and enrichments of ingots were produced in Plant 5 and Plant 9, the Special Products Plant (see the discussion below), for use throughout the AEC/DOE weapons complex. A general reduction of ingot production was mandated in 1967 and continued through 1971. However, specific size and enrichment ingots were still produced for various programs throughout the 1970s (DOE, 1985).

Plant 5 was expanded in 1955 as part of the sitewide facility expansion effort. Several additions were made, including a single-story wing that was added to the eastern side of the facility. This expansion is illustrated in Figure 5-3 and Sheet 4-2.

## 5.3 Current Conditions

Safe Shutdown of Plant 5 was completed in May 1997. The building is slated for dismantling beginning August 1999 with an estimated completion by January 2002. Currently, Plant 5 is used for storage of containerized process materials.

# 6.0 PLANT 6

Plant 6, also known as the Metals Fabrication Plant, is where uranium metal products were treated and machined into final products. It consisted of two main sections. The first section was a rolling mill where ingots from Plant 5 were rolled into oval billets. Some billets were sent off site for extrusion into tubes of various inner-diameter and outer-diameter dimensions. Some of these tubes were then returned to the Fernald site for machining, which was the second main section of Plant 6. In the second section, rods were machined and cut to specific "slug" sizes. The machined slugs were stamped for identification, degreased, inspected, packaged, and shipped to other AEC/DOE production sites (DOE, 1985). A schematic of the Plant 6 process is shown in Figure 6-5.

The original main process equipment in the rolling mill area consisted of an ingot furnace, a blooming mill, a cropping station, an equalizing furnace, a finishing mill, a flying shear, a cooling bar, and a bar straightener. The machining area had six automatic bar machines, four turret lathes, a degreasing and pickling facility, and a briquetting facility for the recycle of uranium chips and turnings (DOE, 1985).

## 6.1 Construction Details

Plant 6 has a truss and column type double bent steel frame with Transite walls and roof. It is divided into two sections: the machine room and the mill room. Construction was initiated on July 3, 1951 and was completed by June 1, 1952. The facility was approximately 300 ft. long. The east section of the complex was approximately 75 ft. wide and 25 ft. high, while the west section was approximately 55 ft. wide and 45 ft. high. Three shafts protruded from the western side of the west section another 25 ft. Installation of the rolling mill equipment was subcontracted to the Birdsboro Steel Foundry and Machine Company (Catalytic Construction Co., 1953). Representative photographs of Plant 6 are shown in Figures 6-1 to 6-4. Architectural drawings are found on Sheets 5-1 and 5-2.

## 6.2 Design Changes

Plant 6 was expanded in 1955 as part of the sitewide facility expansion effort. Several additions were made, including a single-story extension that was added to the northeast corner of the building. This expansion is illustrated in Figure 6-3 and Sheet 5-2.

The rolling mill section of Plant 6 operated from the facility start-up in August 1952 until October 1971, when the rolling mill was shut down and placed on standby status. The rolling mill produced various sizes and enrichments of billets over the years as the customer requirements dictated. Ingots from the MCW refinery at Weldon Spring were also milled at Plant 6 in the 1950s and 1960s (DOE, 1985).

The highest production of normal uranium rods was in 1960, when 17,255 MTU were produced. The highpoint of enriched uranium rod production came in 1965, when 3,385 MTU were produced.

The demand for rods decreased steadily from 1966 as the Hanford production reactors were taken out of service through January 1971. The rolling mill area was put on standby in October 1971. Several short-duration projects were conducted within the rolling mill area throughout the 1970s (DOE, 1985).

Within the machining area, the major design change occurred in 1963, when all machining activities with the exception of blanking were performed by a multi-station transfermatic machine in a continuous process. This Cross Transfermatic machine streamlined the machining process and continued in operation through January 1971, when the last Hanford "K" reactor shut down. Modifications to the Cross Transfermatic allowed it to fabricate other elements throughout the 1970s (DOE, 1985). There were also some modifications to the heat treatment facilities in the machining area over the years, to fulfill the needs of other AEC/DOE sites.

Thorium cores were produced for Hanford and Savannah River in 1955 and 1956, resulting in the accumulation of approximately 80 tons of residues that were stored on the Plant 1

and Plant 9 pads. These residues were consumed within the Plant 6 Sludge Furnace, which was modified to handle the thorium residues in 1959. The furnace was then cleaned out and used to handle special uranium materials (DOE, 1985).

## 6.3 Current Conditions

Safe Shutdown of Plant 6 is scheduled to be completed by December 1998. Demolition of Plant 6 is scheduled to begin April 2000 and be completed by March 2002. The Plant 6 facility has recently been used to conduct the Mixed Waste Stabilization Project. This project involved the stabilization of over 2,100 drums of mixed waste (waste that is both hazardous and radioactive). This project was completed on April 22, 1996.

# 7.0 Plant 7

Plant 7 converted uranium hexafluoride ($UF_6$) to $UF_4$. It was the last facility to begin operation in 1954, and the first shut down, only two years later. Plant 7 was also the first plant demolished as a CERCLA Removal Action in 1994.

In Plant 7, uranium hexafluoride ($UF_6$) gas, vaporized from storage cylinders, was mixed with hydrogen gas ($H_2$), in a specially-designed nozzle contained within a vertical reaction tower maintained at approximately 1,000 degrees Fahrenheit with 100 Kilowatt heaters and forced-air cooling. Most of the solid $UF_4$ formed in the reaction settled downward within the tower as a fine powder and was collected in a surge hopper. Some of the product was carried out of the reactor with byproduct hydrogen fluoride (HF) and excess hydrogen and collected. The product $UF_4$ was conveyed through a micro-pulverizer, batch-blended, packaged into ten-gallon cans and weighed (DOE, 1985).

The filtered gasses, HF, $H_2$, and nitrogen leaving the solid collection system passed through a filter, were cooled to 150 degrees Fahrenheit, passed through a chemical trap and were refrigerated to minus 90 degrees Fahrenheit. The condensed anhydrous liquid HF was sent to the Tank Farm for in-plant storage prior to use or sale. The uncondensed HF was absorbed and neutralized in a lime slurry system. Hydrogen leaving the scrubbers was burned and the combustion gasses vented to the atmosphere (DOE, 1985).

The finished product of Plant 7, $UF_4$, was then used in the metals production plant (Plant 5) to produce uranium metal. Incoming $UF_4$ would be blended with magnesium and heated in an enclosed reduction pot to produce a uranium derby, which was then cast and fabricated to desired specifications (DOE, 1985).

## 7.1 Construction Details

Construction of Plant 7 was completed and process start-up tests performed during May 1954. The plant became fully operational in June 1954. Plant 7 was one of the last plants to begin operations, almost three years after the Pilot Plant began operations in

October 1951 (Catalytic Construction Co., 1953). The approximate capital value was $4.3 million (1954 dollars), (DOE, 1985). Representative photographs of Plant 7 are shown in Figures
7-1 to 7-4. Architectural drawings are found on Sheets 6-1 and 6-2.

The dimensions of Plant 7 were approximately 80 ft. by 110 ft. by 110 ft. high, or seven stories. The exterior and interior walls were constructed of Transite, with a layer of insulation between them. The roof was constructed with a double layer of Transite panels. The floor of level one was concrete, while the floors of levels two through seven were composed of steel plates supported by structural steel (Catalytic Construction Co., 1953).

## 7.2 Design Changes

The design capacity of this plant was 12 MTU per day of $UF_4$, split evenly between depleted and normal uranium from two sets of four reactors each. One on-stream, spare reactor per set was included (DOE, 1985).

At the completion of plant construction, the capability was determined to be a $UF_6$ feed rate of 300 pounds per hour. Based on a 75 percent on-stream factor for 8-reactor capacity, the $UF_4$ production rate was then 14.6 MTU. By December 1955, the $UF_6$ feed rate was at 550 pounds per hour and the $UF_4$ rate was at 26.76 MTU. The process equipment included eight Monel, electrically heated, vertical furnaces and accessories, dust collection systems, HF condensing units, vaporizing equipment, filtration units, a packaging system, a two-stage refrigeration system and ammonia dissociation equipment. Several equipment additions and modifications to the reduction process were made when Plant 7 was in production (DOE, 1985).

With the construction of a similar process plant at Paducah, Kentucky, it became uneconomical to maintain this facility. Therefore, the AEC directed that Plant 7 be shut down. On May 28, 1956, this directive was carried out. Except for the reactivation of the ammonia dissociation system early in 1957, for use by an adjoining process, the plant

remained idle for the next thirteen years. Throughout the thirteen years of idle status, a number of proposals were made for the utilization of this facility; none of which were accepted. Finally, in 1969, all equipment inside the building was excessed and sold (DOE, 1985). Plant 7 was used for storage of drums of $UF_4$ and empty containers until 1988, when it was decided to dismantle Plant 7 as a CERCLA Removal Action.

### 7.3 Current Conditions

As stated above, a decision was made to dismantle Plant 7 as a CERCLA Removal Action to reduce the potential of contaminant exposure to Fernald site workers, the public, and the environment. Also, dismantling Plant 7 would support the DOE Integrated Technology Program, as well as serve as a pilot program for the remediation of other buildings at the Fernald site.

A work plan was sent to U.S. EPA on June 30, 1993 and was approved on July 30, 1993. This work plan specified that any remaining equipment would be removed. Stored drummed material would be relocated, along with other debris. Interior Transite and insulation would be removed next, while surface decontamination of interior components takes place. Any remaining utilities would be terminated, and exterior Transite would be removed. The remaining structural steel would be dismantled through the use of shaped-charge cutting explosives. The first implosion was attempted on September 10, 1994. However, this first attempt was only partially successful, when splice cuts on the third and fifth floors did not give way as anticipated. A second round of explosives was used to completely demolish the structure on September 17, 1994.

# 8.0 PLANT 8

Plant 8, also referred to as the Scrap Plant, converted all scrap uranium metal and metal-bearing wastes from the process facilities at the FMPC and other locations into black oxide ($U_3O_8$), which was then reintroduced as feed material through the Sampling Plant (Plant 1). Residues processed in Plant 8 were generated in the various production processes, or received from off-site sources. High-grade residues included uranium chips, turnings, very fine saw chips from the metal fabrication process, and black oxide from crucible burnout. Low-grade residues included magnesium fluoride slag from the $UF_4$ reduction process, solidified salt from furnace cleanout and desludging (DOE, 1985).

All residues were roasted (calcined). The high-grade residues were processed in the feed preparation system, which consisted of a series of furnaces that burned the metallic particles to $U_3O_8$. The low-grade residues were processed through a hydrometallurgical system where the material was dissolved in hydrochloric acid and filtered to separate the uranium metal (which remained dissolved) from the filter cake. The dissolved uranium was precipitated out of solution with ammonia diuranate (ADU), roasted, and pulverized (DOE, 1985).

## 8.1 Construction Details

Construction of Plant 8 commenced on June 24, 1952 and was completed by July 27, 1953. The facility is a two-story structure of the beam, girder, and column type with Transite roofing and side walls. It consists of two sections: the Wet Area, where acidification and precipitation of scrap material took place; and the Dry Area, where feed material preparation took place. Plant 8 is approximately 260 ft. long, 60 ft. wide, and 50 ft. high. Two shafts protrude from the roof an additional 30 ft. (Catalytic Construction Co., 1953). The approximate capital value was $2.6 million (1953 dollars), (DOE, 1985). Representative photographs of Plant 8 are shown in Figures 8-1 to 8-6. Architectural drawings are found on Sheets 7-1 and 7-2.

The facility was designed to handle about 30 MTU of normal uranium residues per month. The design criteria listed the original equipment as a calciner, a muffle furnace, a graphite furnace, a preliminary crusher, a pulverizer, an air separator, a bulk scrap crusher and a diuranate oxidation furnace (Catalytic Construction Co., 1953).

## 8.2 Design Changes

Plant 8 was expanded in 1955 as part of the sitewide facility expansion effort. A two-story extension was added along the length of the southern face of the facility. This expansion is illustrated in Figure 8-3 and on Sheet 7-2.

After Plant 2/3 shut down in 1962, all products from Plant 8 were shipped to the MCW refinery in Weldon Spring for conversion to $UF_4$ (DOE, 1985).

The Winlo facility was installed in Plant 8 in July 1962. This process was designed to return relatively pure, high assay enriched uranium materials back to the production stream without refining (DOE, 1985).

Residue processing fluctuated over the years with changes in metal production. In 1963, the site placed emphasis on processing drummed residues rather than residues directly from the production process. This systematically reduced the drummed inventory until it became current with production in June 1969. Since then, operations were dependent on current generation of residues and off-site receipts. Operations were reduced, and Plant 8 was shut down by December 1971. From that point through 1980, the plant operated on an as-needed basis. By 1980, Plant 8 was again required to operate on a regular full schedule.

Thorium fluoride was processed in Plant 8 from January 1966 to June 1966, to produce $Th(OH)_4$. Later, from July 1969 to October 1969, thorium residues were processed to produce $Th(OH)_4$. Thorium production within Plant 8 peaked in 1969 with the production of 148 metric tons of thorium (MT Th), and continued until 1971, when only 62 MT Th were produced (DOE, 1985).

Filtration facilities within Plant 8 were used for other purposes at times. In 1974, the filtering systems in Plant 8 were used to filter raffinate from Plant 2/3, due to the introduction of Colorado ore concentrate into the Ore Refinery feed blend. Also, in May, 1975, the sludge from Pit 5 was pumped to Plant 8 for filtration, thus providing more space in that pit (DOE, 1985).

## 8.3 Current Conditions

Safe Shutdown for the Plant 8 complex is scheduled to be completed by March 1998. Demolishment of Plant 8 is scheduled to begin January 2002 and be completed by September 2003. The Plant 8 complex is presently being used for a mixed waste treatment project, the Fernald site "Waste Water Treatment Project." This project manages the treatment of mixed wastes in the Fernald site Waste Water Treatment System.

# 9.0 PLANT 9

Plant 9, or the Special Products Plant, was where enriched uranium ingots were cast that were larger than those being processed in Plants 5 and 6. Originally, Plant 9 was the facility for a two-stage process that was designed for the production of thorium metal. These two steps consisted of hydrofluoric acid precipitation of thorium fluoride and induction dezincing and melting. This method was unable to produce pure thorium metal. However, an oxalate precipitation process was eventually developed that was successful in producing thorium metal (DOE, 1985).

Interest in thorium metal declined in 1956 and 1957. This declining interest in thorium metal resulted in the conversion of the facility to process special products. Operations evolved to the casting of enriched uranium ingots larger than those being processed in Plants 5 and 6. Ingots were cast up to 13-inch diameter, 38-inch length, and 2,000 pound weight. Ingots were center-drilled and machined in preparation of extrusion at Reactive Metals, Inc. at Ashtabula, Ohio (DOE, 1985).

## 9.1 Construction Details

Construction of Plant 9 was completed in 1954. The facility is a rectangular, steel frame structure with Transite walls and roof. The building is approximately 140 ft. long, 100 ft. wide, and 40 ft. high. A 40 ft. long lean-to is attached on the southwest side of the facility, that extends approximately 17 ft. out from the building (Catalytic Construction Co., 1953). The approximate capital value was $2.1 million (1954 dollars), (DOE, 1985). Thorium processing began October 1954. As stated above, interest in this product declined between 1956 and 1957 and the plant equipment was adapted for the manufacture of special products. Representative photographs of Plant 9 are shown in Figures 9-1 to 9-5. Architectural drawings are found on Sheet 8-1.

## 9.2 Design Changes

Since the casting of thorium metal was not successful, the U.S. Bureau of Mines Station in Albany, Oregon used an arc melting process to cast the metal and then sent it to the

Fernald site. Within Plant 9, the thorium ingots were rolled into rods and fabricated into solid-type cores for Hanford and Savannah River. This process was shut down in 1956, when interest in thorium lagged and the reactors canceled their orders. Casting of thorium ingots resumed in 1964 after development of a high-purity melting and casting technique in the Pilot Plant. Deliveries of thorium metal were conducted from 1968 to 1972 (DOE, 1985).

A plant expansion program was initiated in 1961. This increased the production capacity of the equipment used in Plant 9 to meet the needs of the AEC/DOE complex. Several other process changes were made to increase efficiency and ingot quality.

A Zirnlo decladding process was conducted in Plant 9. Rejected fuel elements from Hanford and Savannah River were processed to remove the copper and zirconium jacket material (DOE, 1985). This operation began in 1963 and continued until plant-wide shutdown in 1989.

Plant 9 was the location of the Minimum Additive Waste Stabilization Project (MAWS). This project investigated the use of vitrification for the stabilization of waste sludges and other contaminated material. This project ran from December 1993 until November 1994.

## 9.3 Current Conditions

Safe Shutdown for Plant 9 was completed September 1997. Dismantling of the building was scheduled to begin October 1997 and be completed by September 1999.

# 10.0 PILOT PLANT

The Pilot Plant was the first production plant to be put into operation in October, 1951, as pilot-scale facilities were installed for all phases of uranium metal production at the Fernald site. Eventually, the principal function of the Pilot Plant was to convert $UF_6$ to $UF_4$ for use in the metal production process. The conversion of $UF_6$ to $UF_4$ was conducted after the shutdown of Plant 7 in 1956.

There were three main sections designed for the Pilot Plant: the Extraction Area, the Wet Processing Area, and the Dry Processing Area. The Wet Processing Area was originally designed for pilot-scale ore refinery processes. The Dry Processing Area was designed for metal recasting operations and for the reduction of $UF_6$ to $UF_4$, which became the function of the Pilot Plant after the shutdown of Plant 7 in 1956. $UF_6$ arrived at the Pilot Plant in solid form from other AEC/DOE sites. The $UF_6$ was heated and then reacted with hydrogen from dissociated ammonia (DOE, 1985).

The Pilot Plant also had the equipment to coat metal-casting crucibles by plasma spray to minimize carbon pickup in uranium metal products.

## 10.1 Construction Details

Construction of the Pilot Plant commenced on June 28, 1951, and was completed by March 3, 1952. The facility is a concrete frame structure of the beam, girder, and column type with Transite walls and a 4-ply built-up roof supported on pre-cast roof planks. The building originally consisted of three main sections housed within the concrete shell. The Extraction Area was located on the south end, and measured approximately 63 ft. long, 34 ft. wide, and 52 ft. high. The Wet Processing Area, which measured 121 ft. long, 63 ft. wide, and 35 ft. high, was adjacent to and north of the Extraction Area. Attached on the northeast side of the Wet Processing Area was the Dry Processing Area, which measured 81 ft. long, 63 ft. wide, and 45 ft. high (Catalytic Construction Co., 1953). Representative photographs of the Pilot Plant are shown in Figures 10-1 to 10-5. Architectural drawings are found on Sheets 9-1 to 9-4.

## 10.2 Design Changes

The Pilot Plant Annex was added in 1956 as part of the sitewide facility expansion effort. This expansion is illustrated on Sheets 9-3 and 9-4.

A process for purifying thorium by solvent extraction was developed in the Pilot Plant in 1964. This led to the purification of feed for the Hanford thorium oxide ($ThO_2$)program in 1966. Thorium activities continued in the Pilot Plant through 1974, with some product consumed on-site and some ultimately used by private sector processors (DOE, 1985).

Thorium nitrate solution was converted to a storable thoria gel oxide from May 1977 to January 1979. A total of 338.3 MT Th was produced. The thorium nitrate was shipped from Hanford via rail tank cars (DOE, 1985).

In 1984, new equipment was installed at the Pilot Plant to convert $UF_6$ to $UF_4$. This equipment included three autoclaves for heating solid $UF_6$ to a gaseous form. Also, twin reaction vessels with computerized control systems were installed to reduce the gaseous $UF_6$ to $UF_4$. The new equipment had a production rate of 16 MTU per day (DOE, 1985).

## 10.3 Current Conditions

Safe Shutdown of the Pilot Plant was completed in May 1996. Demolition of the Pilot Plant is slated to begin October 2001 and be completed by September 2003.

# 11.0 BOILER PLANT

The coal-fired Boiler Plant provided steam throughout the Fernald site from 1951 to 1996, when a new gas-fired boiler was installed. The Boiler Plant was a standard steam boiler, with four Riley coal-fired boilers supplying all the steam required. Facilities also included within the Boiler Plant included two air compressors for plant air, one compressor for instrument air, boiler feed pumps, water softening equipment, and a de-aerating feed water heater (DOE, 1985).

## 11.1 Construction Details

Construction of the Boiler Plant was initiated on July 10, 1951 and was completed by December 21, 1952. Operation of the first boiler commenced on Christmas Eve, 1951, prior to the completion of the building. The facility is a steel frame building of the beam, girder, and column type with Transite walls and roof (Catalytic Construction Co., 1953). Representative photographs of the Boiler Plant are shown in Figures 11-1 and 11-2. Architectural drawings are found on Sheets 10-1 and 10-2.

## 11.2 Design Changes

A fire damaged the Boiler Plant on January 20, 1992. The cause of the fire was attributed to spontaneous combustion within a coal bin. This resulted in the temporary shutdown of the Boiler Plant. Damages were repaired and the Boiler Plant was put back in operation through the first half of 1996.

## 11.3 Current Conditions

Demolition of the Boiler Plant is scheduled to be completed by March 1999. Boiler services were relocated to a new facility that is fueled by natural gas. This switch was completed by late Spring 1996.

# 12.0 SERVICE BUILDING

The Service Building contributed to operations at the Fernald site by providing the necessary support facilities for the safety and comfort of Fernald site employees. As a health and safety control, two sets of locker rooms were installed in the Service Building, with shower facilities between them; a "clean" side and a "dirty" side. The "clean" side locker room held 903 lockers while the "dirty" side locker room held 908 lockers. The showers could hold 145 employees simultaneously. A laundry facility was also installed to clean the clothes employees wore in the production area. This laundry, which started operations on March 24, 1952, was capable of washing 5,300 pounds of laundry per day. The Service Building also held the site cafeteria. The cafeteria could handle 512 employees at a time, while the attached kitchen could prepare meals for 1200 employees in two settings. Also, a self-sufficient medical department was originally located in the Service Building (DOE, 1985).

## 12.1 Construction Details

Construction of the Service Building commenced on August 3, 1951 and was completed by June 2, 1952. The facility was a reinforced concrete frame structure of flat-slab type with non-bearing concrete block walls (Catalytic Construction Co., 1953). Representative photographs of the Service Building are shown in Figures 12-1 to 12-5. Architectural drawings are found on Sheets 11-1 to 11-3.

## 12.2 Design Changes

The Service Building has undergone several renovations and expansions over the years. The first expansion was conducted in 1955. This expansion is illustrated on Sheet 11-2. The medical department was moved from the Service Building to the Health and Safety Building, which was originally built in 1955 and expanded (to eventually connect with the Service Building). This is shown on Sheet 11-3.

After over 40 years of operation, the cafeteria was shut down in 1993. The kitchen no longer provided meals, and three years later, the area was renovated for office space and meeting rooms, as well as a break area for employees.

## 12.3 Current Conditions

As part of the administrative area complex, the Service Building will be one of the last buildings at the Fernald site to be demolished. Safe Shutdown is scheduled for March 2000 and demolition is scheduled to take place in June 2003, along with all other buildings within the administrative area.

# 13.0 ANALYTICAL LABORATORY

The Analytical Laboratory provided the means to handle the routine analyses necessary for a smooth-functioning plant. Throughout the history of the Fernald site, it performed the necessary physio-chemical analyses to ensure proper operation of the entire range of production facilities, and later the environmental remediation of the site.

Originally, most analysis conducted at the Analytical Laboratory was inorganic with the objective of obtaining purities of materials. Five service areas were provided. These included an equipment washing room, a sample preparation room, an electronics shop, a glass blowing shop, and a metal and wood shop (DOE, 1985). The shops were located in a separate building called the Laboratory Machine Shop, which is now referred to as Building 30/45 and is used as offices for the Construction division (see Figure 13-5).

The Analytical Laboratory also supported analytical development work adequate to maintain plant control. In addition, processes existing at the Fernald site were researched and developed there.

## 13.1 Construction Details

Construction of the Analytical Laboratory commenced on October 20, 1951 and was completed by November 19, 1952. The facility was originally a one-story reinforced concrete frame structure with non-bearing concrete block walls. The rectangular layout of the building was complimented with an interior open courtyard. A basement was excavated on the west side of the facility with two concrete tunnels running almost the length of the building (Catalytic Construction Co., 1953). Later, a south hall was added, creating a second courtyard. Representative photographs of the Analytical Laboratory are shown in Figures 13-1 to 13-4. Architectural drawings are found on Sheets 12-1 to 12-3.

## 13.2 Design Changes

The Analytical Laboratory underwent a major expansion and renovation in 1993. A second floor was added to the north side of the building, and the laboratory facilities and offices were upgraded.

## 13.3 Current Conditions

The Analytical Laboratory coordinates the shipment and analysis of Fernald site environmental samples. Safe Shutdown is scheduled for February 2001, and as part of the administration area complex, the Analytical Laboratory is not scheduled for demolition until June 2003.

# 14.0 MAINTENANCE BUILDING

The Maintenance Building provides the various shops and supplies for maintenance of facilities at the Fernald site. The following were included within the Maintenance Building: a paint shop, a carpentry shop, an electrical shop, an instrument shop, a machine shop, a welding shop, a pipe shop, a sheet metal shop, and a tool room. These support facilities provided the Fernald site the capability to handle most maintenance and repair needs on-site. In addition to the various shops, the Maintenance Building also had an area for storage of needed supplies and equipment. Representative photographs of the Maintenance Building are found in Figures 14-1 and 14-2. Architectural drawings are found on Sheets 13-1 and 13-2.

## 14.1 Construction Details

Construction of the Maintenance Building was initiated in 1951. The building is a one-story structure with several separate shops and an open storage area.

## 14.2 Design Changes

The Maintenance Building has changed little over the years. Maintenance and repair functions are still necessary now that production has ceased, with the emphasis in environmental restoration and the large workforce still at the Fernald site.

## 14.3 Current Conditions

Safe Shutdown of the Maintenance building is scheduled for April 1998. Demolition is scheduled for September 1999, as remediation of the former production area progresses.

## 15.0 OTHER BUILDINGS AND STRUCTURES

This report also provides representative photos of other support facilities and structures (Figures 15-1 to 15-16). Construction of the Administration Building was completed in December 1952. The building is a reinforced concrete frame structure of flat-slate type with non-bearing concrete block. The Administration Building housed offices for the Department of Energy staff and the management of DOE's prime contractors (i.e., National Lead of Ohio, Westinghouse and Fluor Daniel Fernald). In, addition, the Administration Building has many support services for the Fernald Site, such as the mail room, copy center and the credit union. The Administration Building has also served as a key access point to the Administrative Area of the Fernald Site.

The use of temporary office trailer complexes is fairly widespread throughout the Administrative Area and even parts of the Process Area. These complexes are used as office space for the majority of the Fernald Work Force. The use of these offices began over the last 10-15 years as production operations stopped and site remediation was initiated. The Tenplex and the Temporary Additional Contractor Office Space Trailers (TACOs) represent typical office trailer complexes. However, they are not the only trailer complexes at the site.

There are numerous other support facilities comprising the Production Area that have not been discussed to this point. Structures that were highly visible and widely used at the site were storage warehouses (e.g., Figure 15-3). A number of buildings and structures at the site were dedicated to the storage of containerized (e.g., drummed) waste and other materials. There are designated warehouses modified for the storage of hazardous waste and thorium materials. A significant amount of low-level radioactive waste that was stored on open pads throughout most of production operations, has been stored in temporary tension support structures in recent years. These structures are common throughout the Production Area and are used on a limited basis outside the Production Area.

The other significant category of structures on the Fernald Site are those devoted to utilities. Examples are the Advanced Wastewater Treatment (AWWT) Facility (Figure 15-7), the Sewage Treatment Plant (Figure 15-13), and the Water Treatment Plant (Figure 15-14). These structures represent the key facilities for treating water and wastewater at the Fernald Site. The AWWT is a key component of the remediation of the Fernald Site. The AWWT will treat contaminated groundwater pumped from the Great Miami Aquifer that underlies the site, in addition to other contaminated sources. Other key components of the utilities that support the Fernald Site are the General Sump (process and wastewater storage and treatment tanks and associated equipment)(Figure 15-6), the water towers (e.g., Figure 15-15), and a variety of electrical support structures and substations.

A number of other individual structures warrant mentioning. These include the maintenance garage (Figure 15-16); the Receiving and Incoming Materials Inspection Area (RIMIA) building, which is the receiving point for all site deliveries of material and equipment (Figure 15-11) and the old and new Decontamination Buildings (Figures 15-9 and 15-10, respectively).

## REFERENCES

Catalytic Construction Company, 1953, "Contract Completion Report of the Feed Materials Production Center, Fernald, Ohio," U.S. Atomic Energy Commission Contract AT (30-1)-1060, FERMCO Records Management Index No. 0236612.

National Lead Company of Ohio, 1957, "Tour Book," Feed Materials Production Center, U.S. Atomic Energy Commission, Fernald Area.

National Lead Company of Ohio, 1978, "Uranium," Feed Materials Production Center, U.S. Department of Energy, Fernald Area.

U.S. Department of Energy, 1985, "Draft History of the FMPC," unpublished draft report, FERMCO Records Management Index No. 3295109.

U.S. Department of Energy, 1988, "A Closer Look at Uranium Metal Production - A Technical Overview," U.S. Department of Energy, Feed Materials Production Center.

U.S. Department of Energy, 1995 "Closing the Circle on the Splitting of the Atom," U.S. Department of Energy, Office of Environmental Management.

# GLOSSARY

Billet - the form of uranium metal that results from cropping ingots and that is further machined within Plant 6, Plant 9, and/or off-site to produce a final product.

Blanking - the cutting of extruded uranium tubes into specific lengths for further machining.

Brown Oxide - uranium dioxide, $UO_2$, an intermediate product in the conversion of $UO_3$ to UF4 within Plant 4.

Calcination - the chemical process used within Plant 2/3 and Plant 8 where materials are roasted in order to change the chemical composition.

Comprehensive Environmental Response, Compensation, and Liability Act - the Federal law that governs the cleanup of hazardous, toxic, and radioactive substances.

Core - a fuel core; the target material in DOE production reactors. This was the primary use of the uranium metal produced at the Fernald site.

Denitration - the chemical process used within Plant 2/3 where uranyl nitrate is calcined to produce $UO_3$.

Depleted Uranium - uranium that has been stripped of most of the Uranium-235 isotope.

Derby - the mass or uranium metal formed during the Plant 5 reduction process.

Digestion - the chemical process used within Plant 2/3 where impure uranyl nitrate is produced from mixing incoming uranium-bearing materials with nitric acid.

Enriched Uranium - uranium that has an increased percentage of $U^{235}$. At the Fernald site, enriched uranium usually consisted of approximately 1.25% $U^{235}$. In some cases, uranium was enriched to 10% $U^{235}$.

Enrichment - the process of separating different isotopes of elements, such as the separation of $U^{235}$ from $U^{238}$.

Extrusion - the process by which billets are converted into tubes of various inner-diameter and outer-diameter dimensions.

Extraction - the chemical process used within Plant 2/3 where uranyl nitrate is purified.

Feed Material - Purified and formed uranium metal that is machined to exact specifications for use at the other DOE sites.

1843

## GLOSSARY
(Cont'd)

Green Salt - uranium tetrafluoride, $UF_4$

Ingot - the cylindrical-shaped form of pure uranium metal that, once machined to exact specifications, was the basic end-product of the feed material production process.

Mixed Waste - waste that contains both hazardous and radioactive materials.

National Historic Preservation Act - the Federal law that establishes the National Register of Historic Places and requires federal agencies to take into consideration impacts to National Register-eligible properties during the decision making process.

Normal Uranium - uranium that has a naturally-occurring ratio of uranium isotopes, which consists of approximately 0.71% to 1% $U^{235}$.

Nuclear Weapons Complex - the chain of research, production, assembly, and testing facilities that produces nuclear weapons. There are 16 major facilities in the United States located in 12 states.

OK Liquor - uranyl nitrate produced within Plant 2/3 through the digestion and extraction processes.

Orange Oxide - uranium trioxide, $UO_3$.

Process Residues - production process by-products that contain some amount of recoverable uranium.

Raffinate - a chemical process waste product.

Reduction - the chemical process within Plant 5 where $UF_4$ is heated with magnesium to produce uranium metal.

Removal Action - an action taken under CERCLA to abate an immediate threat to human health and the environment.

Resource Conservation and Recovery Act - the Federal law that addresses the treatment, storage, and disposal of hazardous waste.

Slug - a specifically-cut section of an extruded uranium tube that was further machined into the final product.

Thorium - a radioactive element that is a by-product of the decay or uranium.

## GLOSSARY
(Cont'd)

1843

Transite - a commercial brand name of asbestos-containing material historically used throughout the Fernald site as siding and roofing material for production facilities.

Uranium Trioxide - an intermediate product in the uranium metal production process, often referred to as "orange oxide" or $UO_3$.

Uranium - a dense, sightly radioactive, naturally occurring metal that is the basic material for nuclear technology.

Uranium-235 - an isotope of uranium that makes up less than 1% of naturally occurring uranium.

# APPENDIX A

# FIGURES

1843

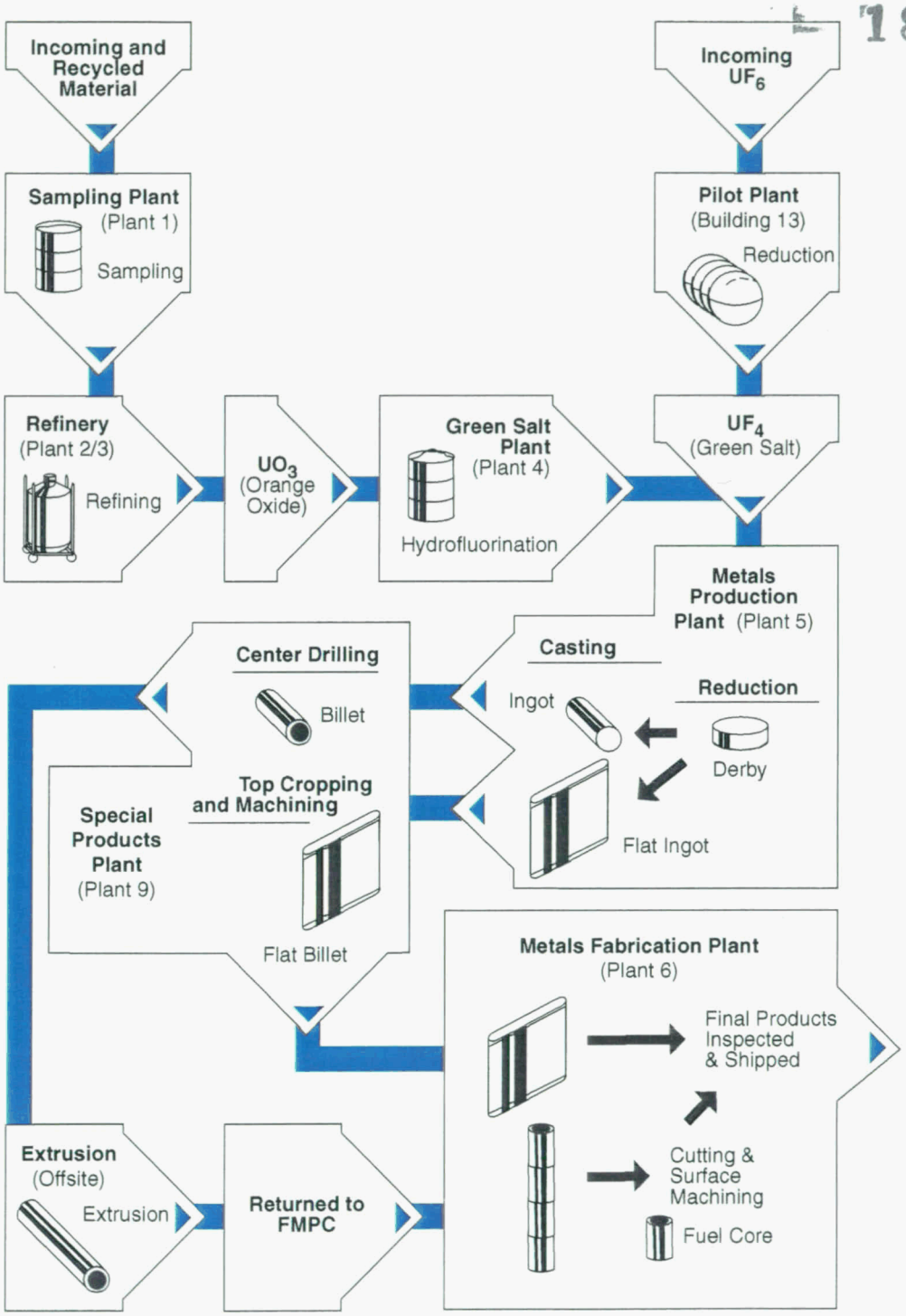



**FIGURE 1-1**
**Former Site Production Process**

Graphics #5039B.1A

# FMPC SITE

1843

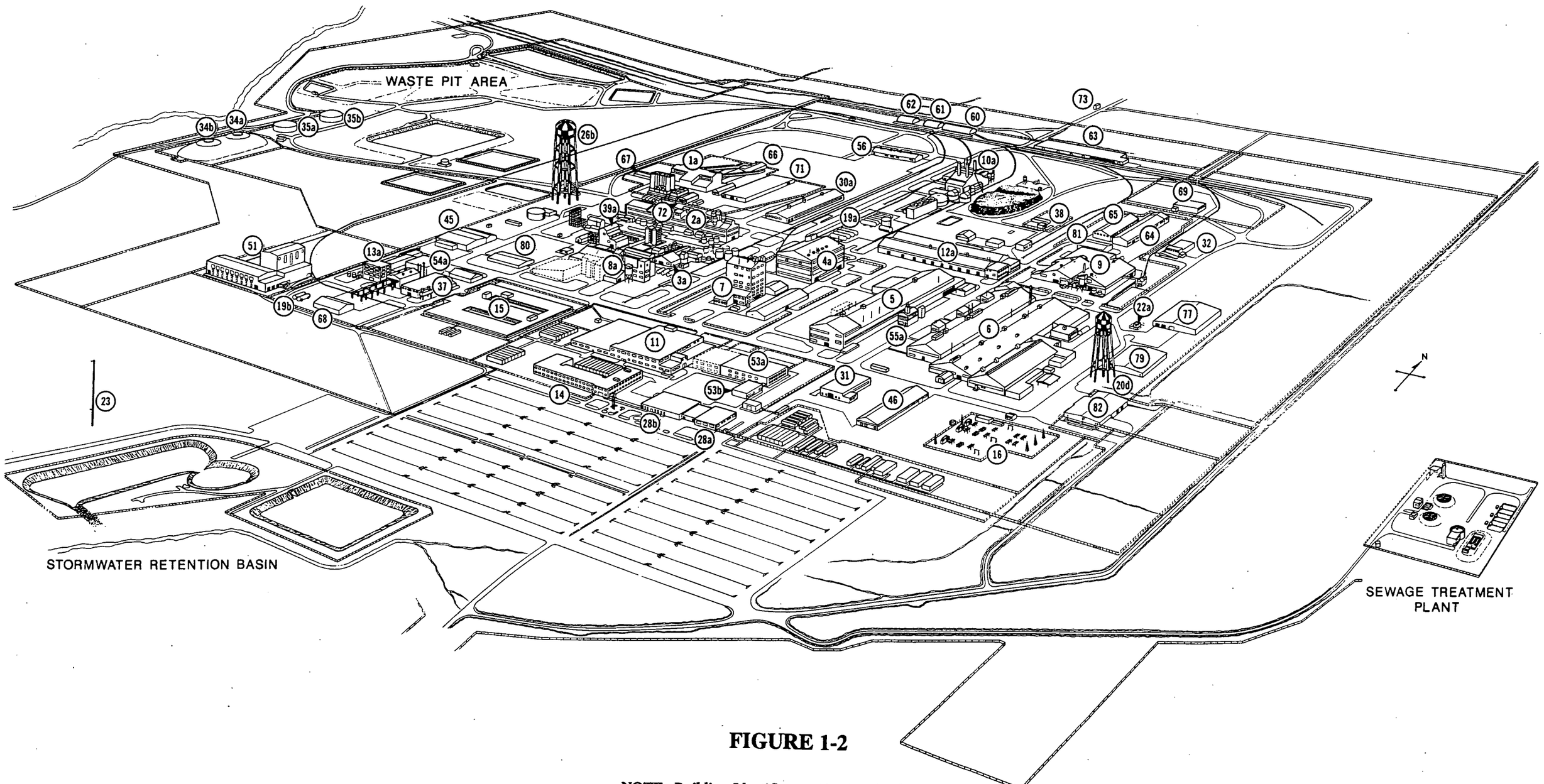



**FIGURE 1-2**

**NOTE:** ***Building Identification listed on back of map.***

## BUILDING IDENTIFICATION

| Building ID No. | Building Name/Function |
|---|---|
| 1a | Plant 1, Sampling Plant* |
| 2a | Plant 2/3, Ore Refinery Plant* |
| 3a | Maintenance Building |
| 4a | Plant 4, Green Salt Plant* |
| 5 | Plant 5, Metals Production Plant* |
| 6 | Plant 6, Metals Fabrication Plant* |
| 7 | Plant 7* |
| 8a | Plant 8, Scrap Plant (Recovery Plant)* |
| 9 | Plant 9, Special Products Plant* |
| 10a | Boiler Plant* |
| 11 | Service Building* |
| 12a | Maintenance Building (Main)* |
| 13a | Pilot Plant* |
| 14 | Administration Building* |
| 15 | Analytical Laboratory* |
| 16a | Main Electrical Station |
| 19a | Main Metal Tank Farm |
| 19b | Pilot Plant Ammonia Tank Farm |
| 20d | Elevated Storage Tank (Potable $H_2O$)* |
| 22a | Gas Meter Building |
| 23 | Meteorological Tower |
| 26b | Elevated Water Storage Tank* |
| 28a | Security Building* |
| 28b | Human Resources Building |
| 30a | Chemical Warehouse |
| 31 | Engine House - Garage* |
| 32 | Magnesium Storage |
| 34a | K-65 Storage Tank - North* |
| 34b | K-65 Storage Tank - South* |
| 35a | Metal Oxide Storage Tank - North |
| 35b | Metal Oxide Storage Tank - South |
| 37 | Pilot Plant Annex |
| 38 | Propane Storage |
| 39a | Incinerator Building |
| 45 | Laboratory Machine Shop (Building 30/45)* |
| 46 | Heavy Equipment Garage* |
| 51 | $UF_6$ to $UF_4$ Reduction Facility 11 |
| 53a | Occupational Safety and Health |
| 53b | In-Vivo Building |
| 54a | $UF_6$ to $UF_4$ Reduction Facility 1 |
| 55a | Slag Recycling Plant |
| 56 | CP Storage Warehouse |
| 60 | Quonset Hut #1 |
| 61 | Quonset Hut #2 |
| 62 | Quonset Hut #3 |
| 63 | KC-2 Warehouse |
| 64 | Thorium Warehouse |
| 65 | (Old) Plant 5 Warehouse |
| 66 | Drum Reconditioning Building |
| 67 | Plant 1 Thorium Warehouse |
| 68 | Pilot Plant Warehouse |
| 69 | Decontamination Building* |
| 71 | General In-Process Storage Warehouse |
| 72 | Drum Storage Building |
| 73 | Fire Brigade Training Center building |
| 77 | Finished Products Warehouse |
| 79 | Plant 6 Warehouse |
| 80 | Plant 8 Warehouse |
| 81 | Plant 9 Warehouse |
| 82 | Receiving & Incoming Materials Inspection Area (RIMIA)* |

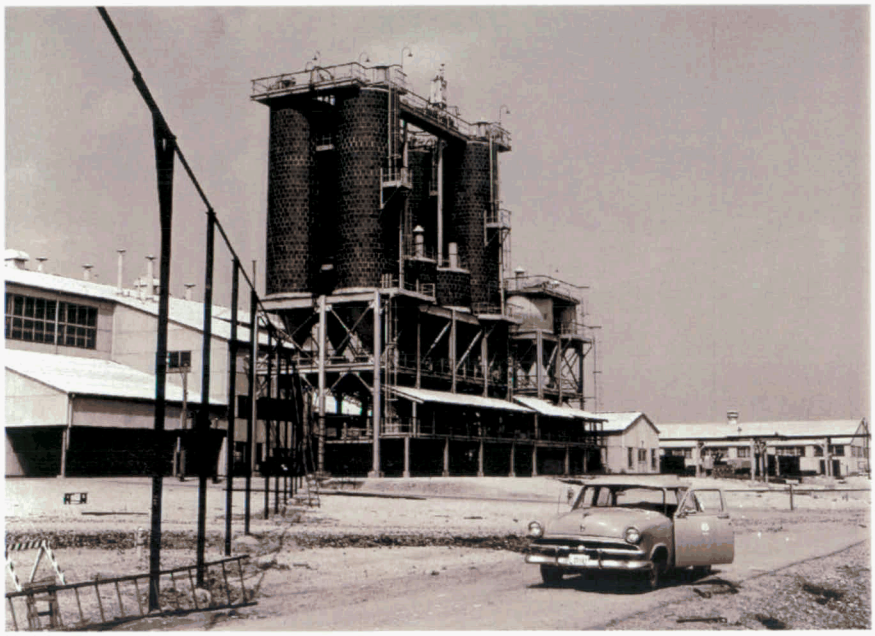
** = Buildings identified in text*

## PLANT 1

1843

6333-178

**FIGURE 2-1**
**Northeast view of Plant 1 (1996)**



89-497-1

**FIGURE 2-2**
**Northeast view of Plant 1 Ore Silos (ca. 1954)**

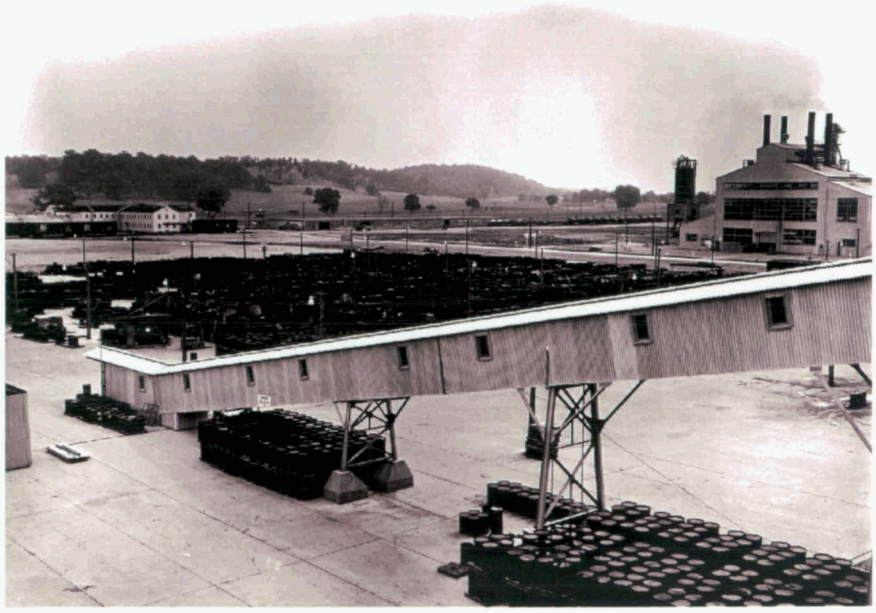
000049

## PLANT 1

1843

89-366-1

**FIGURE 2-3**
**Close-up Southwest view of the Plant 1 Ore Silos (ca. 1954)**



89-146-1

**FIGURE 2-4**
**Elevated Northeast view of Plant 1 Pad with Drum Conveyor in the foreground. Notice the Boiler Plant on the right and the former Administration Building in the background on the left (ca. 1954)**

## PLANT 1

1843

89-202-1

**FIGURE 2-5**
**Interior view of Plant 1 (ca. 1954)**

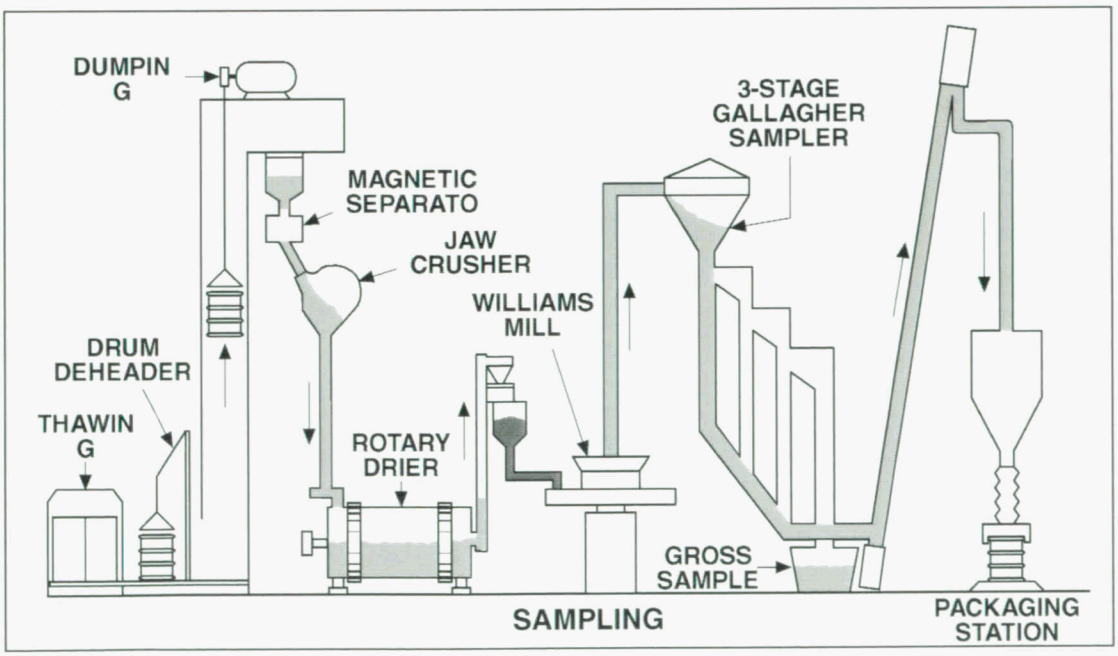



**FIGURE 2-6**
**Schematic of Plant 1 Process**

000051

Graphics #5039B.3

## PLANT 2/3

1843

89-148-1

**FIGURE 3-1**
**Southwest view of Plant 2 (ca. 1954)**

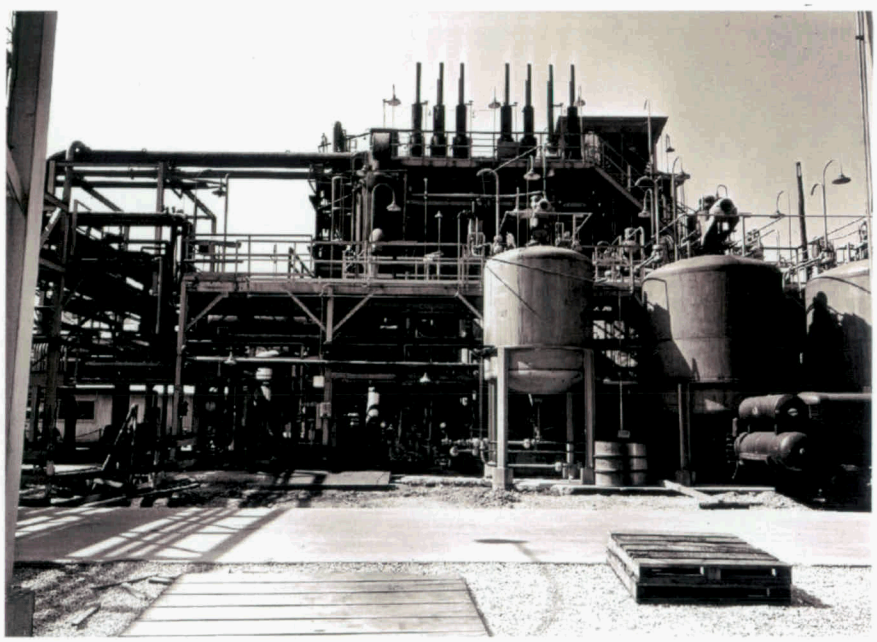
6333-109

**FIGURE 3-2**
**Northeast view of Plant 2 (1996)**

000052

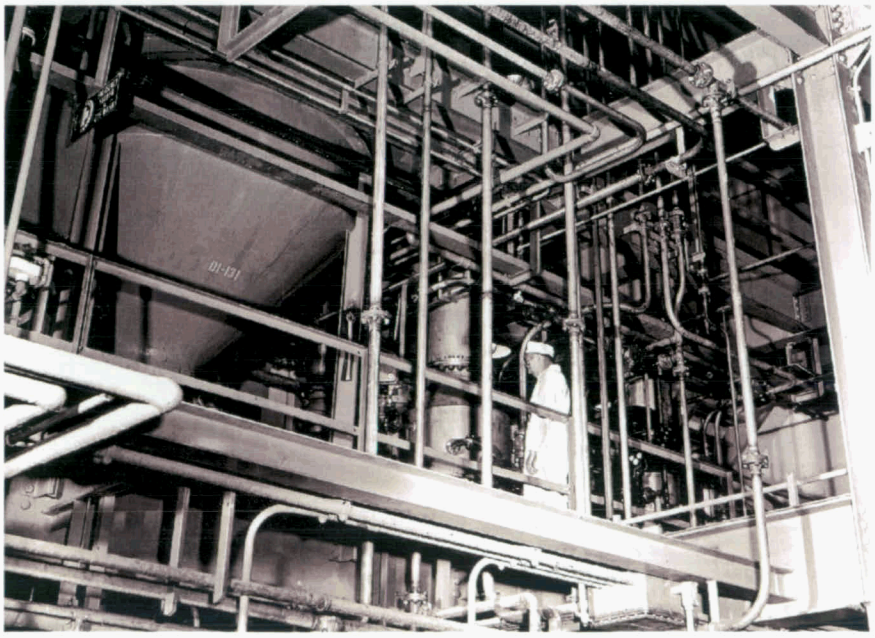
## PLANT 2/3

1843



89-477-1

**FIGURE 3-3**
**Nitric Acid Recovery System north view (ca. 1955)**



89-203-1

**FIGURE 3-4**
**Interior view of Plant 2 & 3 (ca. 1954)**

000053

## PLANT 2/3

1843

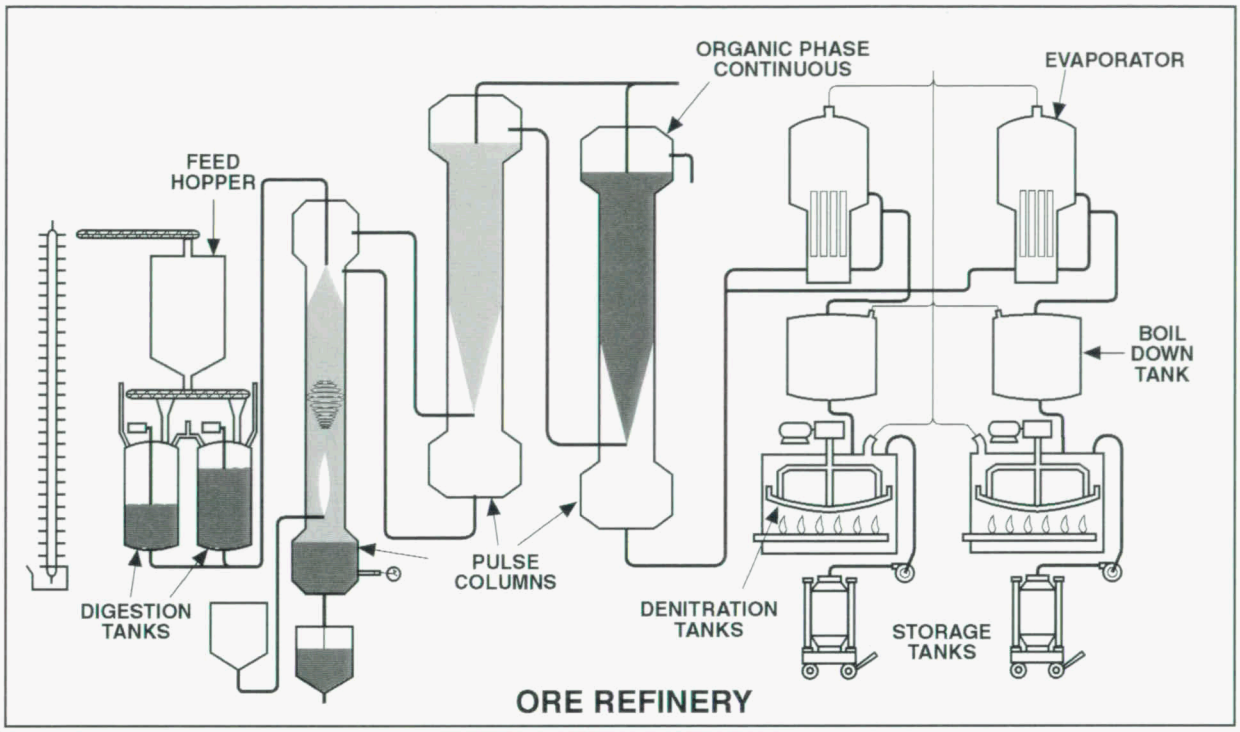



**FIGURE 3-5**
**Schematic of the Plant 2/3 Process**

000054

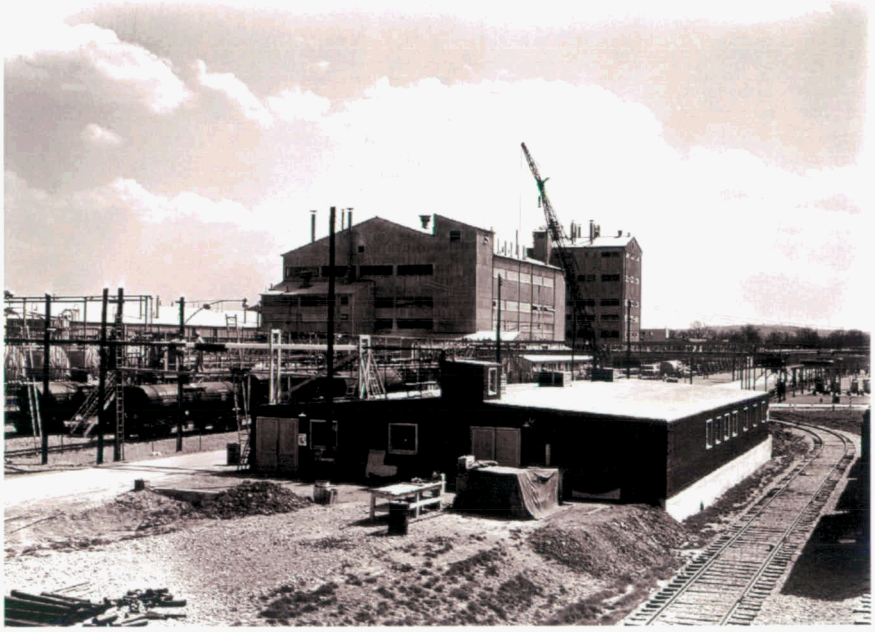
Graphics #5039B.6

## PLANT 4

1843

89-319-1

**FIGURE 4-1**
**Northwest view of Plant 4 (ca. 1954)**



89-421-1

**FIGURE 4-2**
**Southeast view of Plant 4**
**Notice the Change House under construction in the foreground and Plant 7 in the background (ca. 1955)**

000055

Graphics #5039B.7

## PLANT 4

89-319-1

**FIGURE 4-3**
**Interior view of Plant 4 Control Board (1958)**

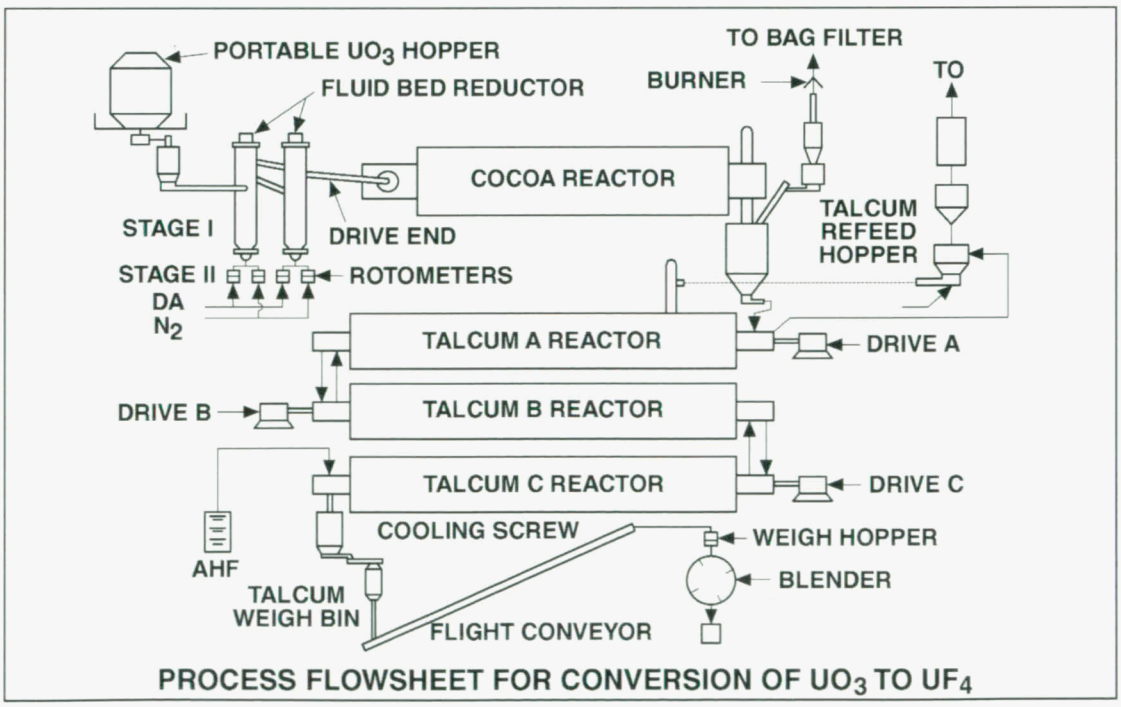



**FIGURE 4-4**
**Schematic of Plant 4 Process**



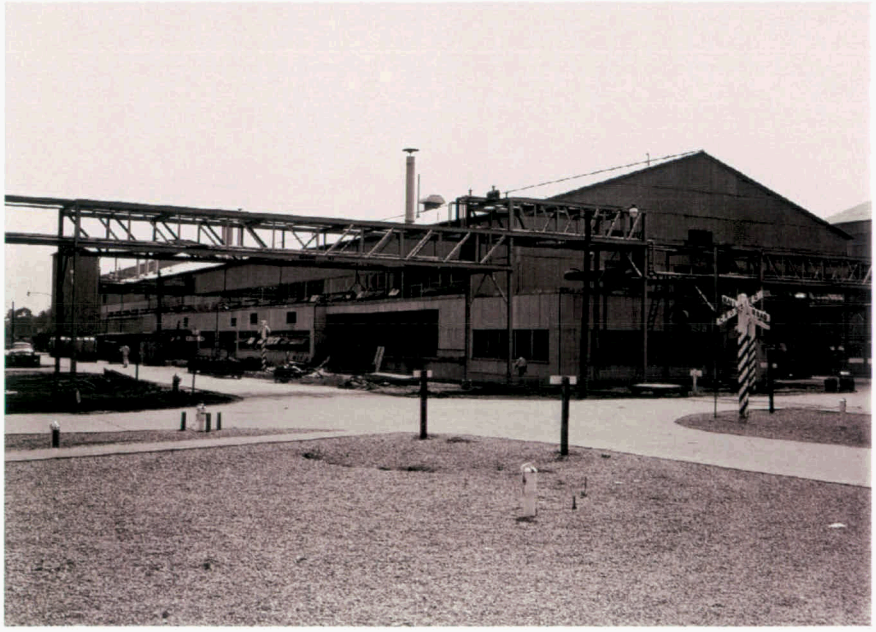
Graphics #5039B.8

## PLANT 5

1843

479-9

**FIGURE 5-1**
**Northeast view of Plant 5 (1958)**



89-494-1

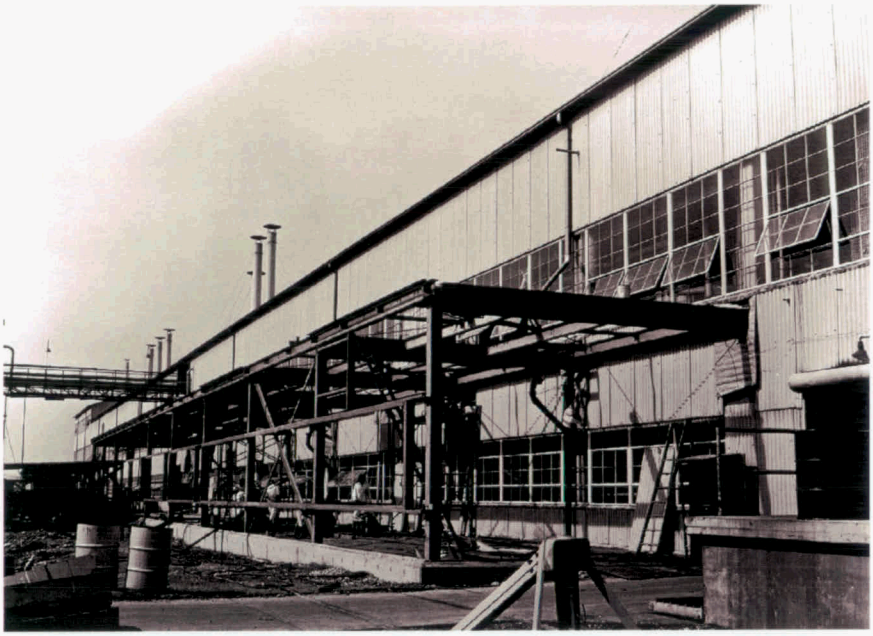
**FIGURE 5-2**
**Southwest view of Plant 5**
**Notice construction of expansion on the east of the building (ca. 1955)**

000057

Graphics #5039B.9

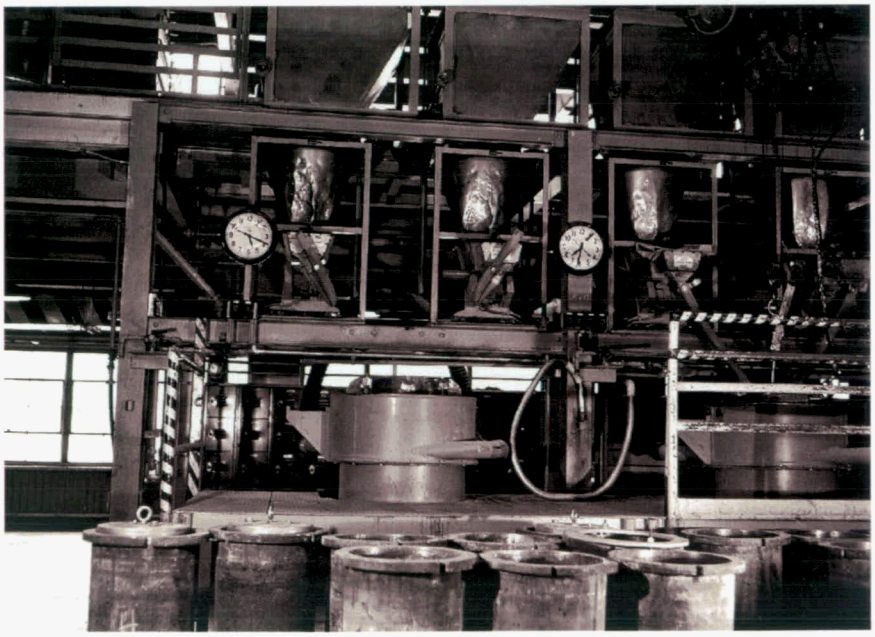
## PLANT 5

1843



89-439-1

**FIGURE 5-3**
**Close-up view of Plant 5 East Expansion (ca. 1955)**



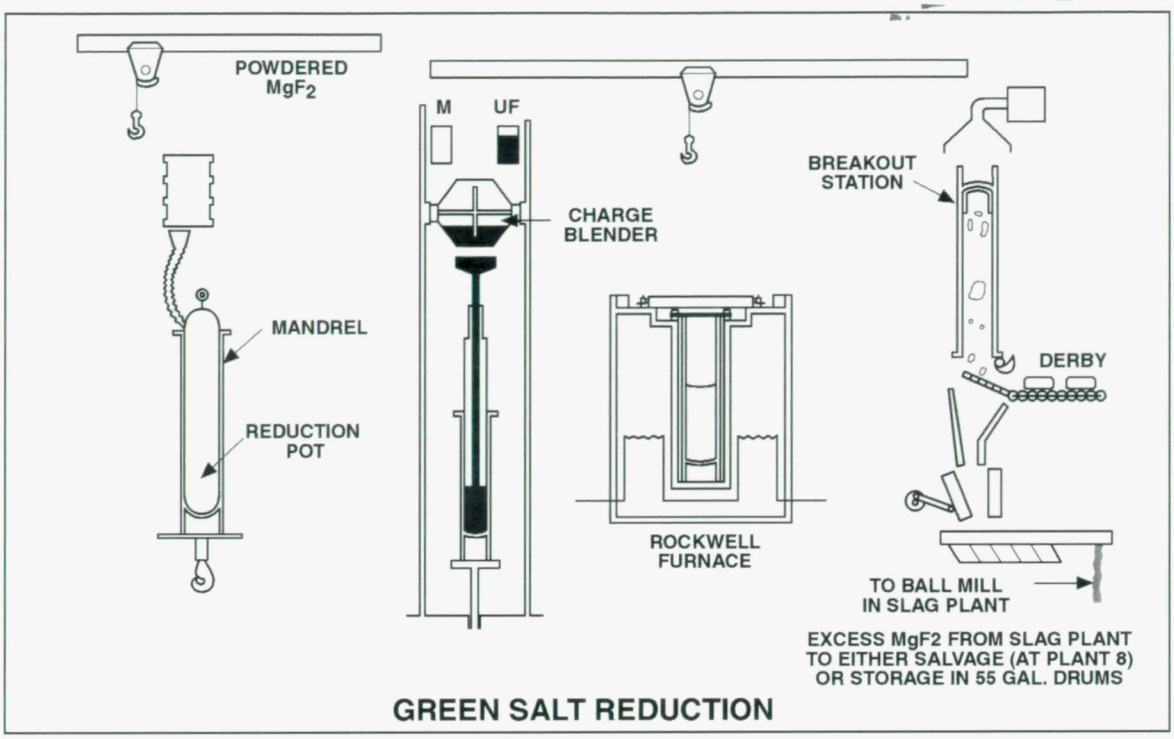
369-2

**FIGURE 5-4**
**Interior view of Plant 5 (1958)**

000058

## PLANT 5

1843



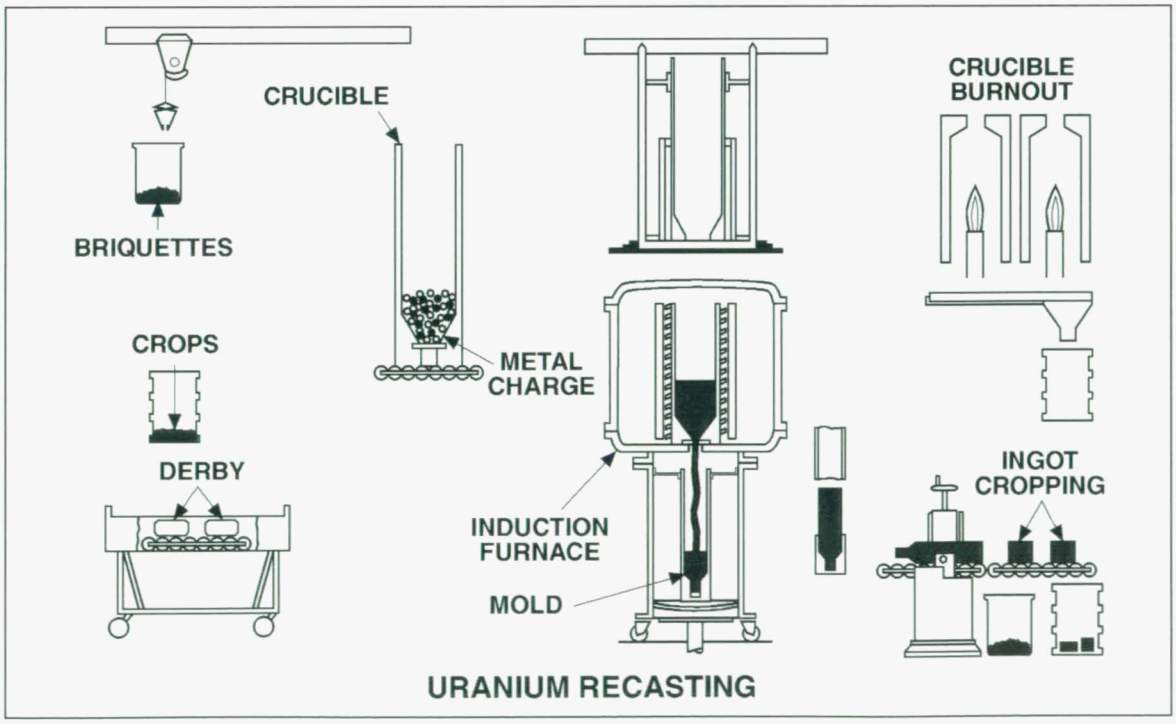




**FIGURE 5-5**

**Schematics of Plant 5 Processes**

000059

Graphics #5039B.11

## PLANT 6

1843

479-4

**FIGURE 6-1**
Northeast view of Plant 6 (1958)

89-169-1

**FIGURE 6-2**
Southwest view of Plant 6 (ca. 1954)

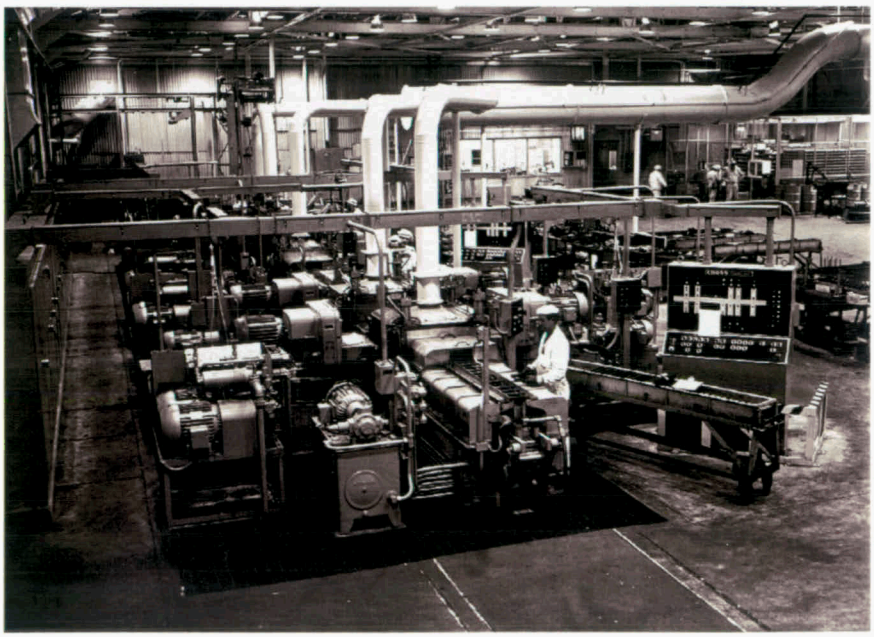
000060

## PLANT 6

1843

89-639-1

**FIGURE 6-3**
**West view of Plant 6 East Side Expansion (ca. 1955)**

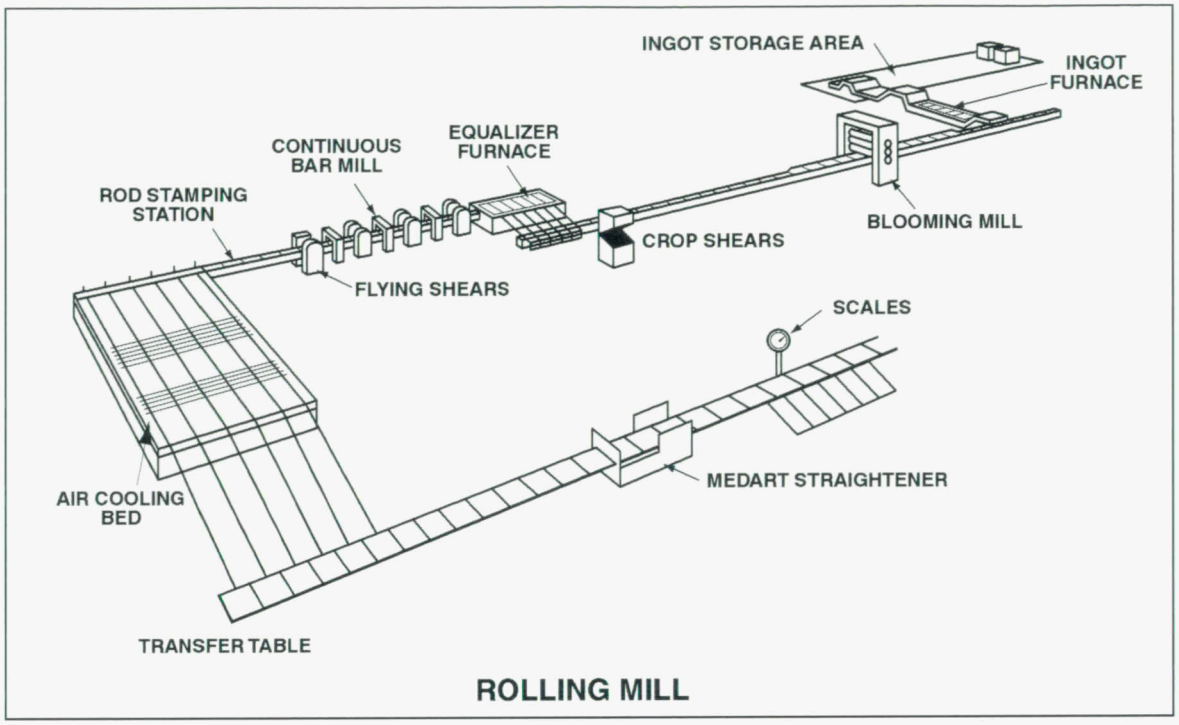


1281-6

**FIGURE 6-4**
**Interior view of Plant 6 (1962)**

1843

## PLANT 6



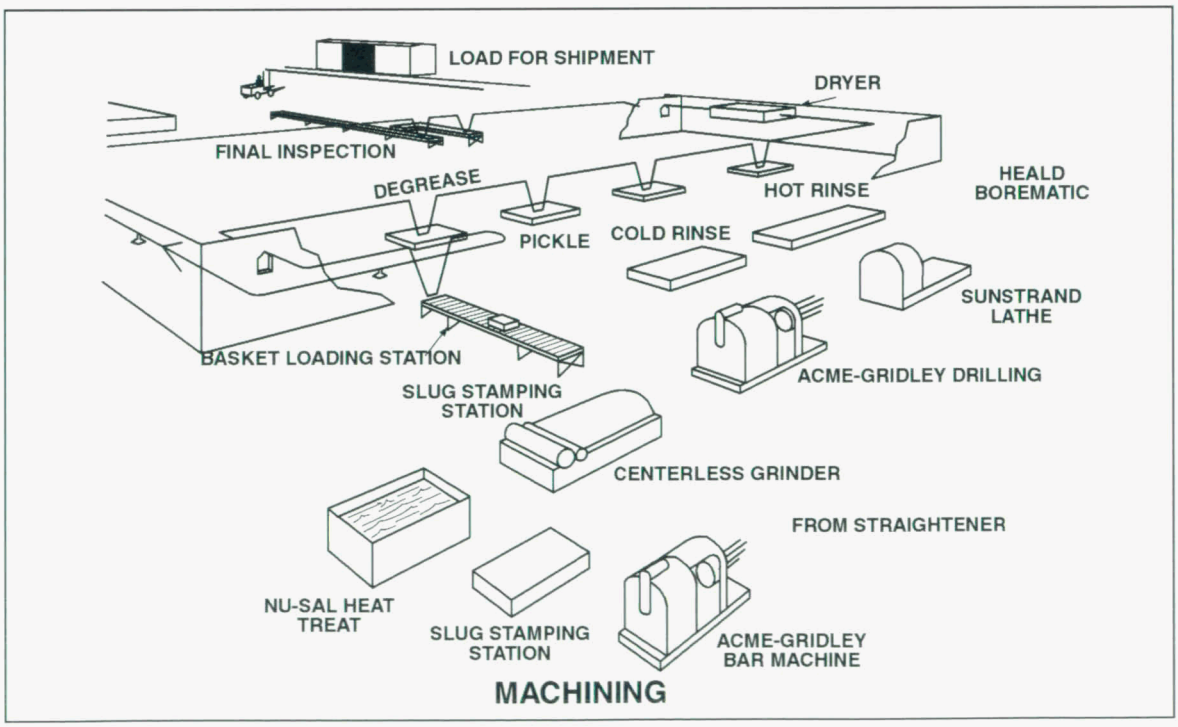



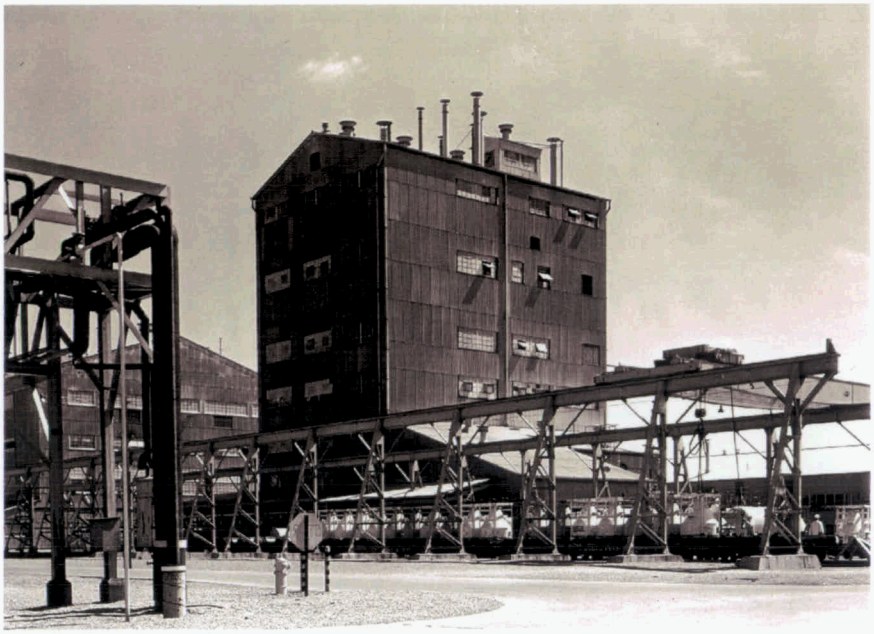

**FIGURE 6-5**
**Schematics of Plant 6 Processes**

000062

Graphics #5039B.14

## PLANT 7

1843



479-13

**FIGURE 7-1**
**Northeast view of Plant 7 (1958)**

479-2

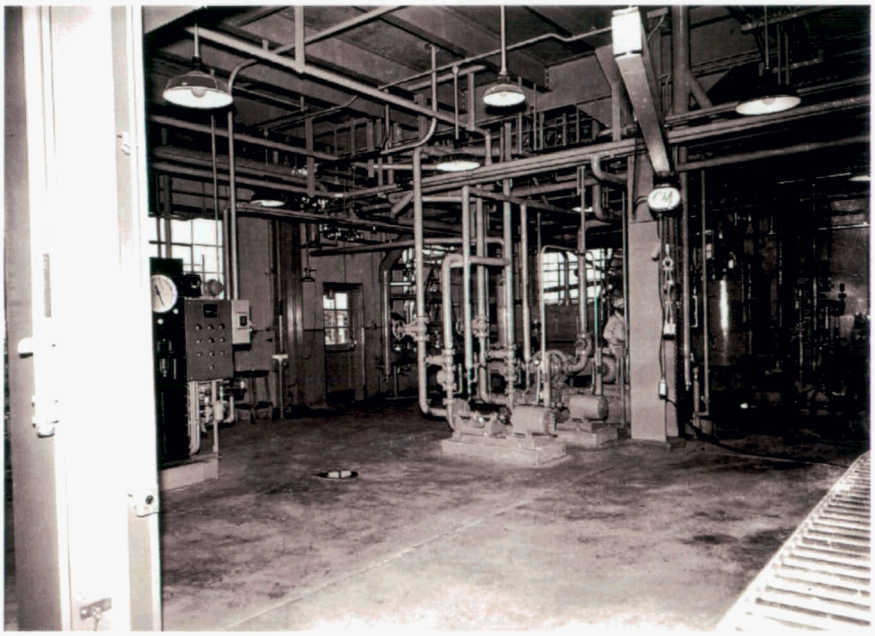
**FIGURE 7-2**
**Northwest view of Plant 7**
**Notice Plant 4 in the background on right (1958)**

000063

## PLANT 7

89-173-1

**FIGURE 7-3**
**Southeast view of Plant 7 (ca. 1954)**



479-2

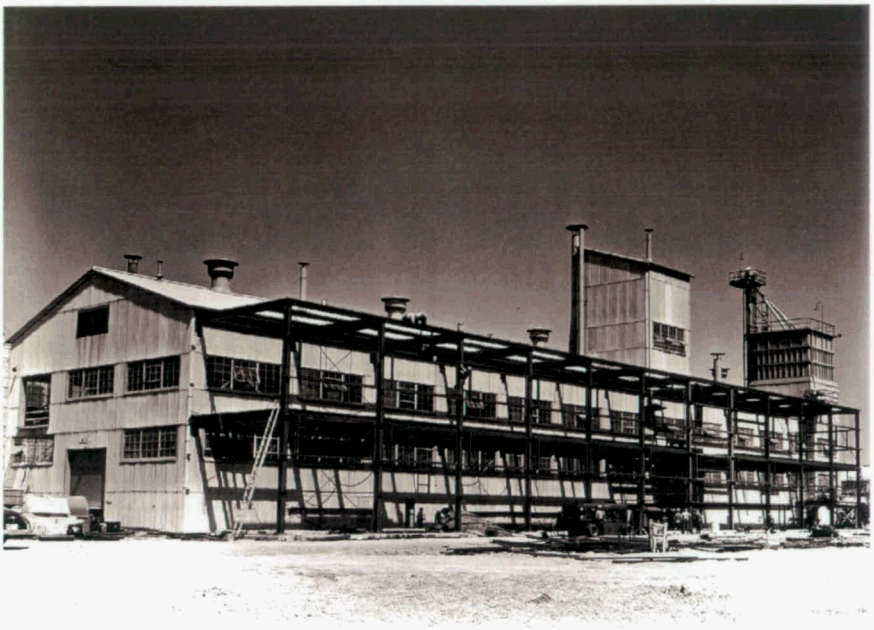
**FIGURE 7-4**
**Interior view of Plant 7 (ca. 1954)**



Graphics #5039B.16

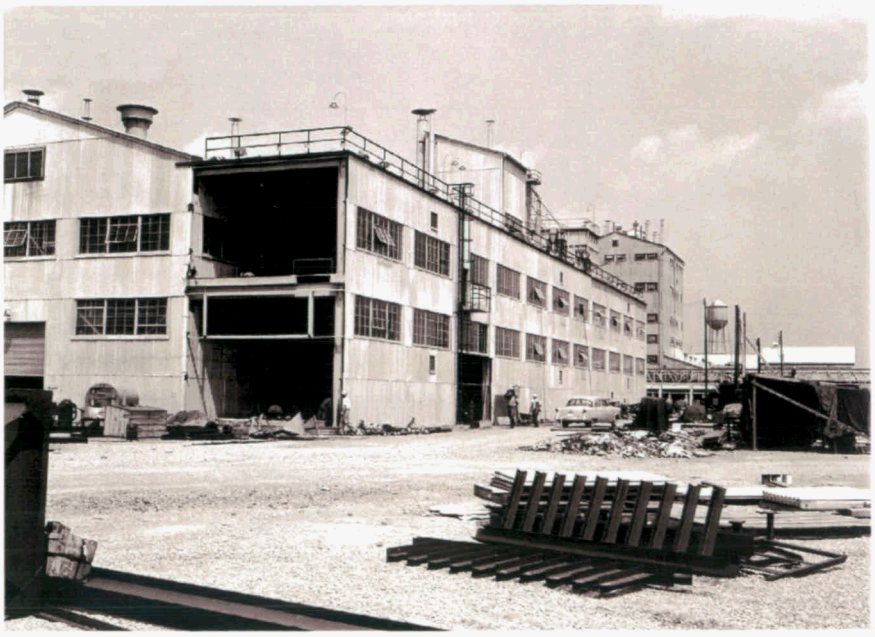
## PLANT 8

1843



89-427-1

**FIGURE 8-1**
**Northeast view of Plant 8**
**Notice South Expansion (ca. 1955)**



89-492-1

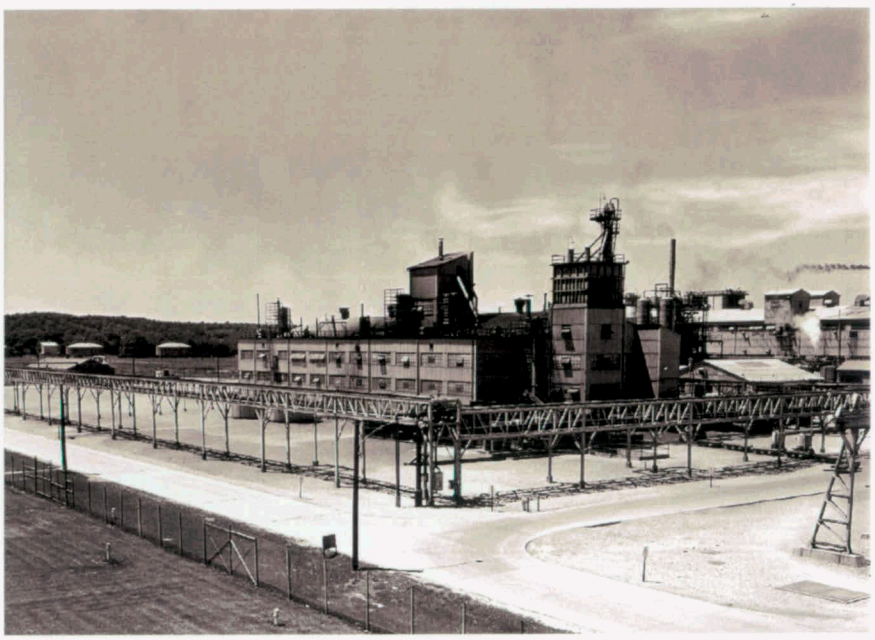
**FIGURE 8-2**
**Northeast view of Plant 8**
**Notice South Expansion (ca. 1955)**

000065

Graphics #5039B.17

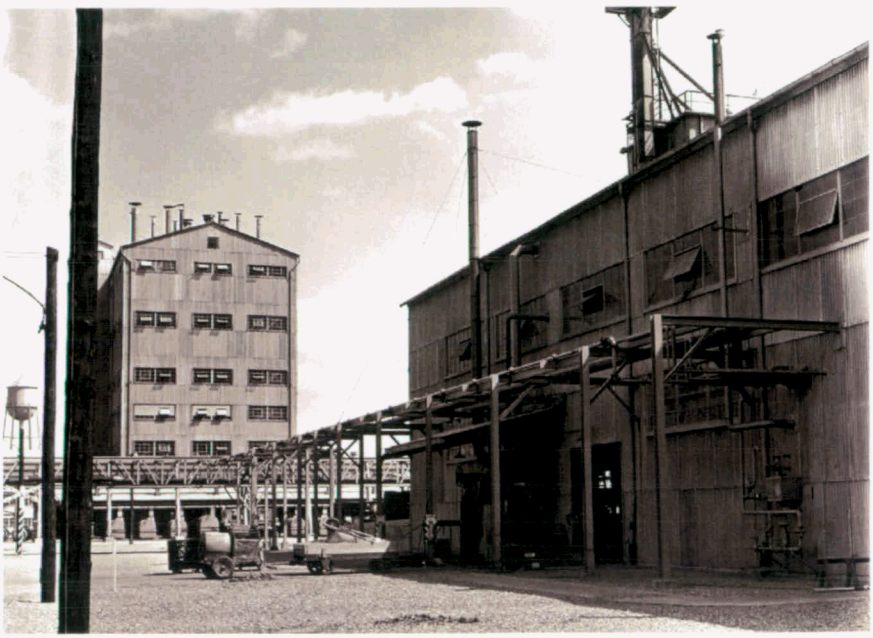
## PLANT 8





479-6

**FIGURE 8-3**
**Northwest view of Plant 8**
**Notice completion of South Expansion and K-65 Silos in background to the left (1958)**

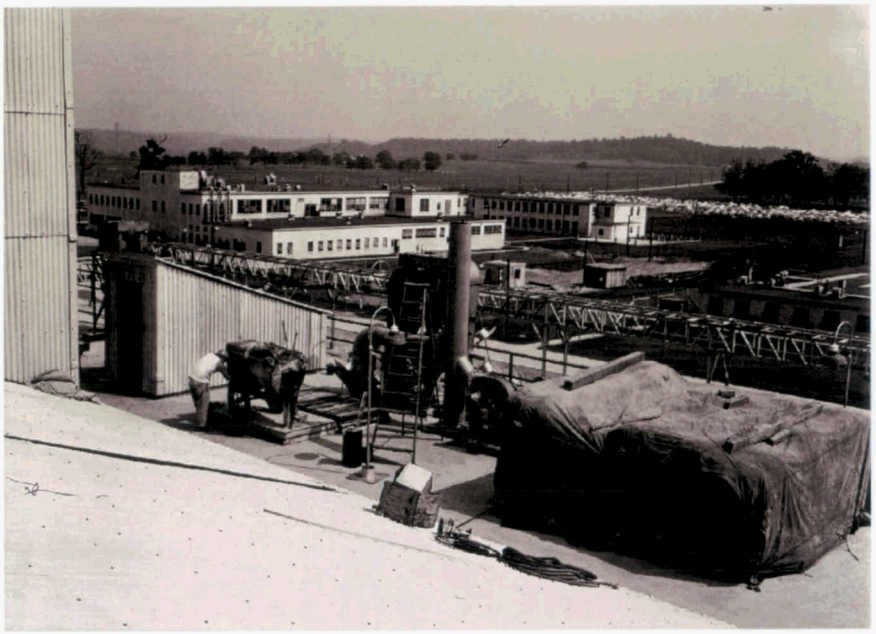


89-426-1

**FIGURE 8-4**
**Southeast close-up view Plant 8 (ca. 1955)**

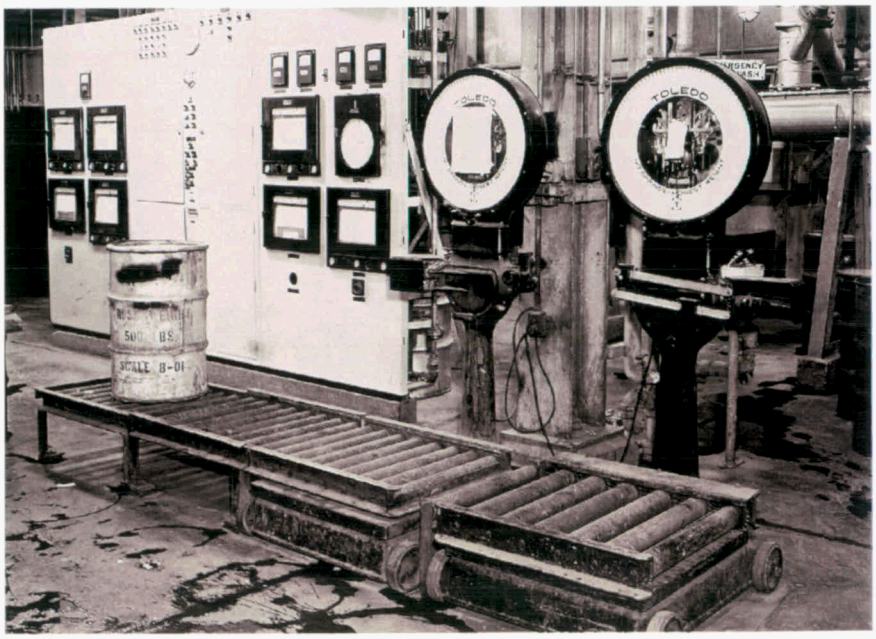
## PLANT 8

1843



89-499-1

**FIGURE 8-5**
**Southeast view of Services and Administration Buildings from roof of Plant 8 (ca. 1955)**




731-3

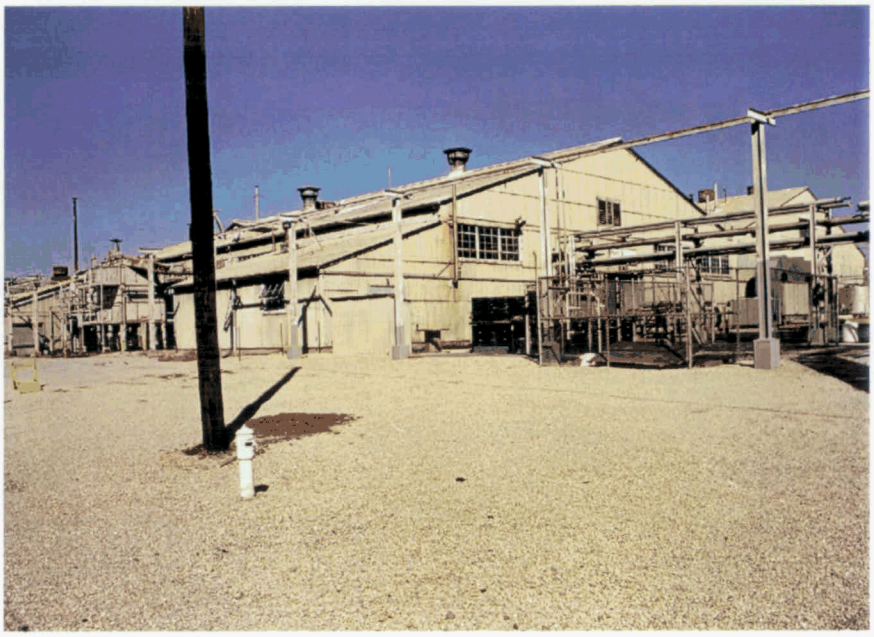
**FIGURE 8-6**
**Interior view of Plant 8 (1959)**

000067

Graphics #5039B.19

## PLANT 9

1843



6333-24

**FIGURE 9-1**
**Northeast view of Plant 9 (1996)**

6333-15

**FIGURE 9-2**
**Northwest view of Plant 9 (1996)**



Graphics #5039B.20

1843

## PLANT 9

6333-20

**FIGURE 9-3**
Southeast view of Plant 9 (1996)

6333-26

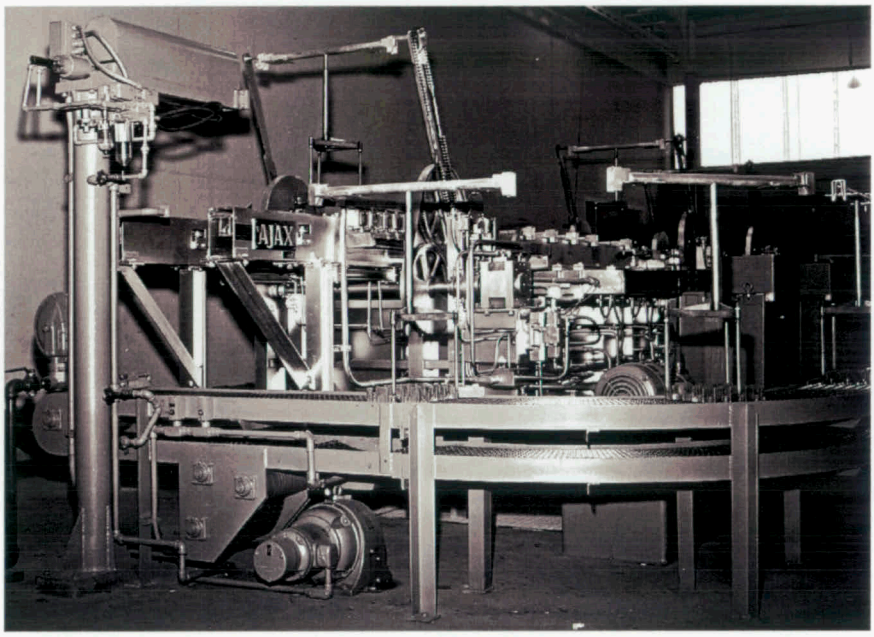
**FIGURE 9-4**
Southwest view of Plant 9 (1996)



Graphics #5039B.21

## PLANT 9

1843




1140-4

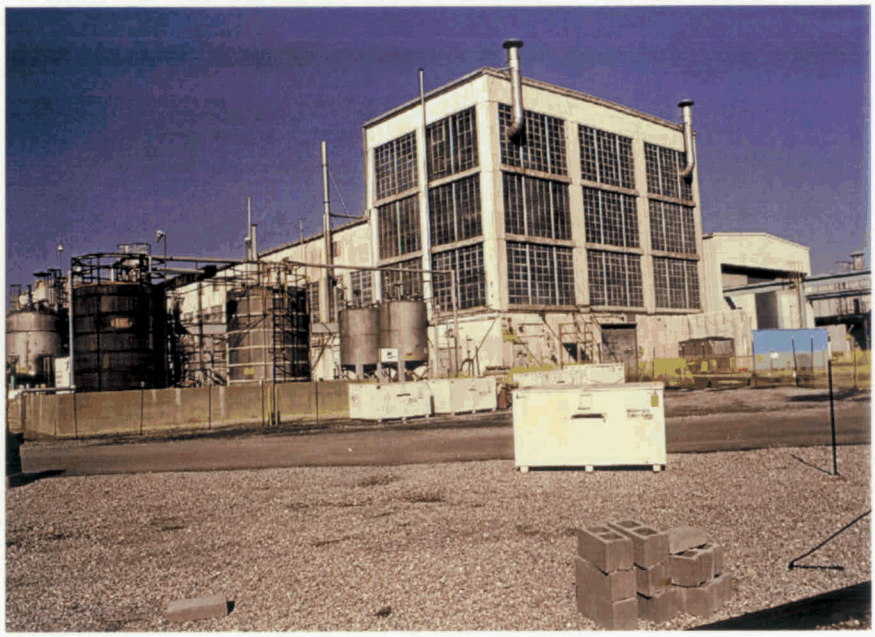
**FIGURE 9-5**
**Interior view of Plant 9 (1961)**



Graphics #5039B.22

1843

# PILOT PLANT



6333-1

**FIGURE 10-1**
**Northeast view of Pilot Plant (1996)**

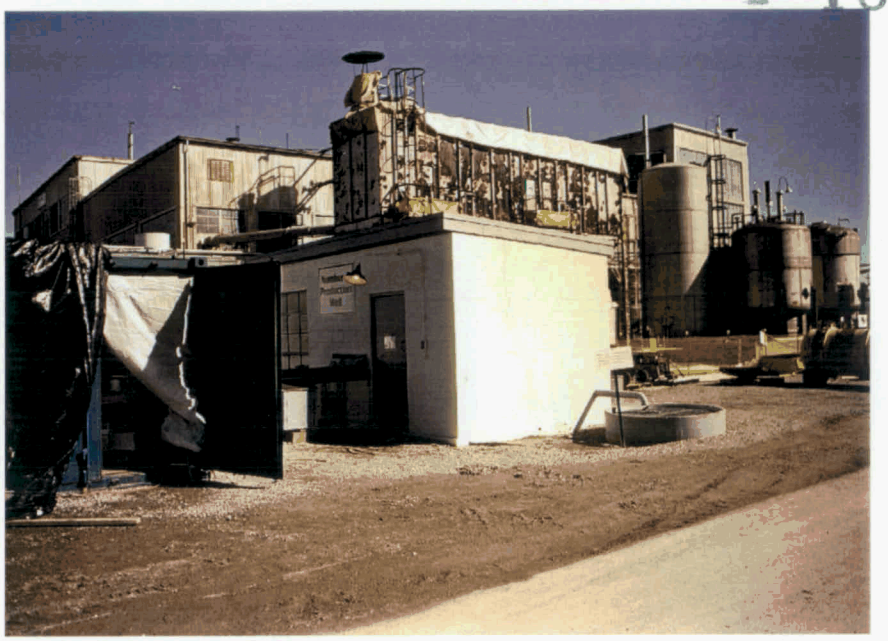
6333-3

**FIGURE 10-2**
**Northwest view of Pilot Plant (1996)**

000071

## PILOT PLANT

1843



6333-52

**FIGURE 10-3**
**Southeast view of Pilot Plant with Production Well House in foreground (1996)**

6333-49

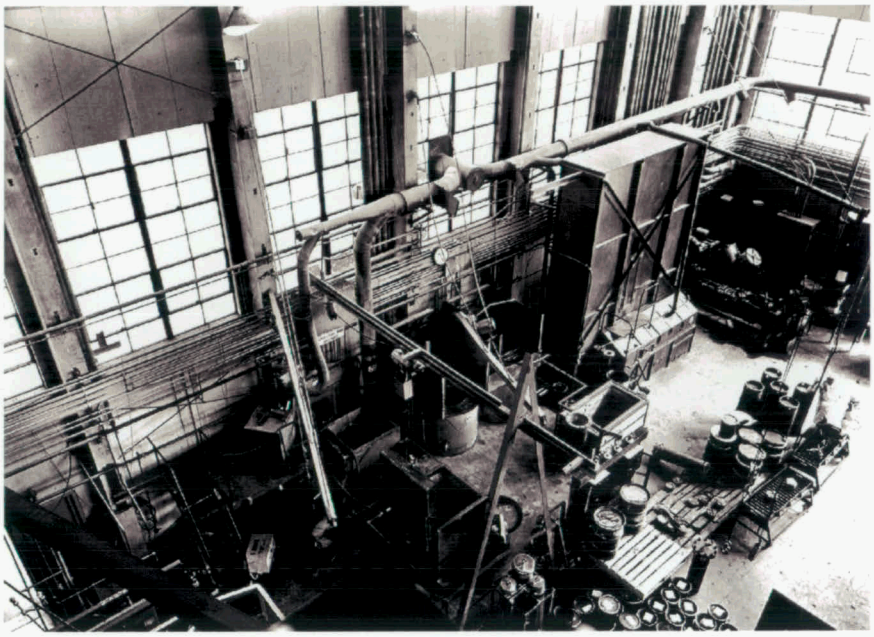
**FIGURE 10-4**
**Southwest view of Pilot Plant with Pilot Plant Storage Facility in foreground (1996)**

000072

Graphics #5039B.24

## PILOT PLANT

1843



89-340-1

**FIGURE 10-5**
**Interior view of Pilot Plant (ca. 1954)**

## BOILER PLANT

1843

89-424-1

**FIGURE 11-1**
**Southeast view of Boiler Plant**
**Notice construction of the CP warehouse in the foreground (ca. 1955)**

6333-83

**FIGURE 11-2**
**Northeast view of the Boiler Plant (1996)**

000074

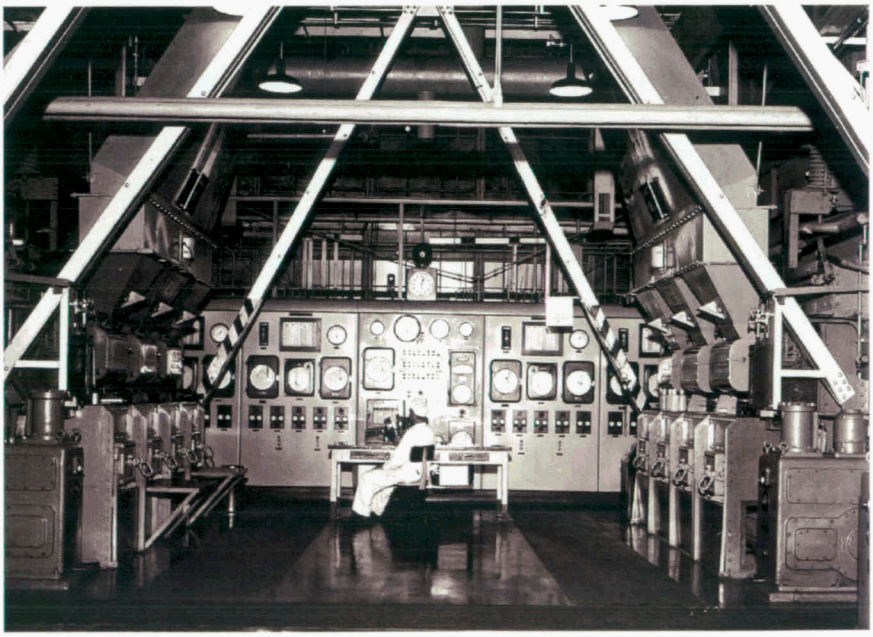
Graphics #5039B.26

## BOILER PLANT

1843

6333-96

**FIGURE 11-3**
**Northeast view of Boiler Plant (1996)**



89-586-2

**FIGURE 11-4**
**Interior view of the Boiler Plant (ca. 1956)**



Graphics #5039B.27

## SERVICES BUILDING

89-557-1

**FIGURE 12-1**
**Southwest view of the Services Building Prior to East Expansion (ca. 1956)**

89-608-1

**FIGURE 12-2**
**Southeast view of the Services Building Notice the Administration Building in the Background (ca. 1956)**

## SERVICES BUILDING

1843

89-402-2

**FIGURE 12-3**
**Northwest view of Services Building**
**Notice turnstiles in foreground and Plants 4 and 7 in background (ca. 1954)**

1356-2

**FIGURE 12-4**

000077

**Interior view of the Services Building Cafeteria (1963)**

## LABORATORY

1843

6333-11

**FIGURE 13-1**
**Northeast view of the Laboratory Building (1996)**

6333-47

000078

**FIGURE 13-2**
**Southeast view of the 1992 Laboratory Building Expansion (1996)**

## LABORATORY

1843

6333-46

**FIGURE 13-3**
**Southwest view of the 1993 Laboratory Building Expansion (1996)**

6333-55

**FIGURE 13-4**
**Laboratory Machine Shop**
**Referred to now as Building 30/45 (1996)**

000079

Graphics #5039B.31

## LABORATORY

3701-1

**FIGURE 13-5**
**Interior view of the Laboratory Machine Shop (1963)**

## MAINTENANCE BUILDING

1843

6333-163

**FIGURE 14-1**
**Northeast view of Maintenance Building (1996)**

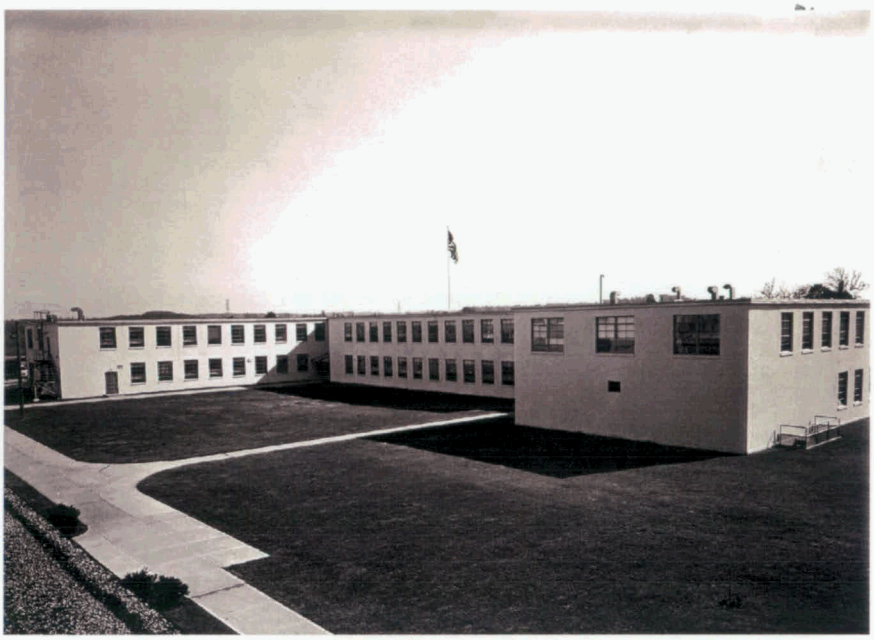
6333-166

**FIGURE 14-2**
**Northwest view of Maintenance Building (1996)**

000081

## REPRESENTATIVE FACILITIES AND STRUCTURES AT THE FERNALD SITE

1843



479-16

**FIGURE 15-1**
**Administration Building (1958)**

89-671-1

**FIGURE 15-2**
**Security Building/Turnstiles (ca. 1956)**

000082

## REPRESENTATIVE FACILITIES AND STRUCTURES AT THE FERNALD SITE

1843

89-506-1

**FIGURE 15-3**
**Warehouses (ca. 1955)**

6333-68

**FIGURE 15-4**
**Ten-Plex Trailer Complex (1996)**

000083

## REPRESENTATIVE FACILITIES AND STRUCTURES AT THE FERNALD SITE

1843

6333-70

**FIGURE 15-5**
**TACO Trailer (1996)**

6333-34

**FIGURE 15-6**
**General Sump (1996)**

000084

## REPRESENTATIVE FACILITIES AND STRUCTURES AT THE FERNALD SITE

1843

6333-6

**FIGURE 15-7**
**Advanced Wastewater Treatment Plant (1996)**

6333-161

**FIGURE 15-8**
**Tank Farm (1996)**

000085

## REPRESENTATIVE FACILITIES AND STRUCTURES AT THE FERNALD SITE

1843

6333-98

**FIGURE 15-9**
**Old Decontamination Building (1996)**

6333-75

**FIGURE 15-10**
**New Decontamination Building (1996)**

000086

Graphics #5039B.38

## REPRESENTATIVE FACILITIES AND STRUCTURES AT THE FERNALD SITE

1843

5973-2

**FIGURE 15-11**
**RIMIA Building (1995)**

6333-170

**FIGURE 15-12**
**K-65 Silos/Vitrification Facilities (1996)**

000087

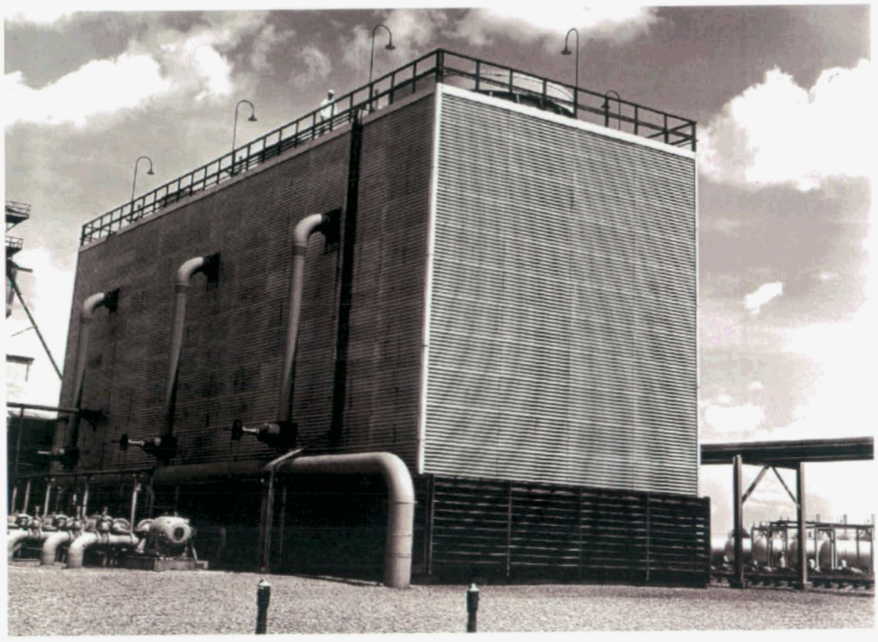
Graphics #5039B.39

# REPRESENTATIVE FACILITIES AND STRUCTURES AT THE FERNALD SITE

1843

89-248-1

FIGURE 15-13
Sewage Treatment Plant (ca. 1954)



89-193-1

FIGURE 15-14
Water Treatment Plant (ca. 1954)

000088

## REPRESENTATIVE FACILITIES AND STRUCTURES AT THE FERNALD SITE

1843

89-194-1

**FIGURE 15-15**
**Water Tower (ca. 1954)**

6333-151

**FIGURE 15-16**
**Garage (1996)**

000089

# APPENDIX B

# ARCHITECTURAL DRAWINGS

Copies of Appendix B are located at the DOE Records Center, the Public Environmental Information Center, and the Cultural Resources Management Section at the Fernald Environmental Management Project.

1843

## INDEX TO ARCHITECTURAL DRAWINGS

| SHEET # | FDF INDEX CODE | OLD DRAWING NUMBER |
|---|---|---|
| 1-1 | 01X-1450-A-00017 | 3002-C-1005-A (Rev. 1) |
| 1-2 | 01X-1450-A-00027 | 3002-C-2006-A |
| 2-1 | 02X-1450-A-00001 | 3001-C-1001-A (Rev. 3) |
| 3-1 | 04x-1450-A-00032 | 3004-C-1018-A (Rev. 3) |
| 3-2 | 04X-1450-A-00033 | 3004-C-1019-A (Rev. 1) |
| 3-3 | 04X-1450-A-00034 | 3004-C-1020-A (Rev. 2) |
| 3-4 | 04X-1450-A-00036 | 3004-C-1021-A (Rev. 1) |
| 4-1 | 05X-1450-A-00009 | 3005-C-1002-A (Rev. 3) |
| 4-2 | 05X-7000-A-00075 | 5250-5A-5036 (Rev. 3) |
| 5-1 | 06X-1450-A-00225 | 3006-C-1002-A (Rev. 3) |
| 5-2 | 06X-7000-A-00531 | 5250-6A-5060 (Rev. 4) |
| 6-1 | 07X-1450-A-00305 | 3241-A-20031 (Rev. 6) |
| 6-2 | 07X-1450-A-00306 | 3241-A-20032 (Rev. 6) |
| 7-1 | 08X-1450-A-00011 | 3043-C-1001-A (Rev. 1) |
| 7-2 | 08X-5945-A-00291 | 3014-8-4222 (Rev. 3) |
| 8-1 | 09X-1450-A-00008 | 3542-C-1002-A (Rev. 1) |
| 9-1 | 13X-3595-A-00439 | 3013-C-GAFC-4* |
| 9-2 | 13X-3595-A-00441 | 3013-C-GAFC-5A* |
| 9-3 | 37A-5500-A-00555 | 37-4130 |
| 9-4 | 37A-5500-A-00556 | 37-4131 |
| 10-1 | 10X-1450-A-00001 | 3007-C-1001-A (Rev. 2) |
| 10-2 | 10X-1450-A-00002 | 3007-C-1002-A (Rev. 3) |
| 11-1 | 11X-1450-A-00004 | 3011-C-1005-A |
| 11-2 | 11X-7000-A-00056 | 5250-11A-5015 (Rev. 2) |
| 11-3 | 53X-5500-E-00240<br>53X-7000-A-00007 | 5250-53A-5007 (Rev. 3) |

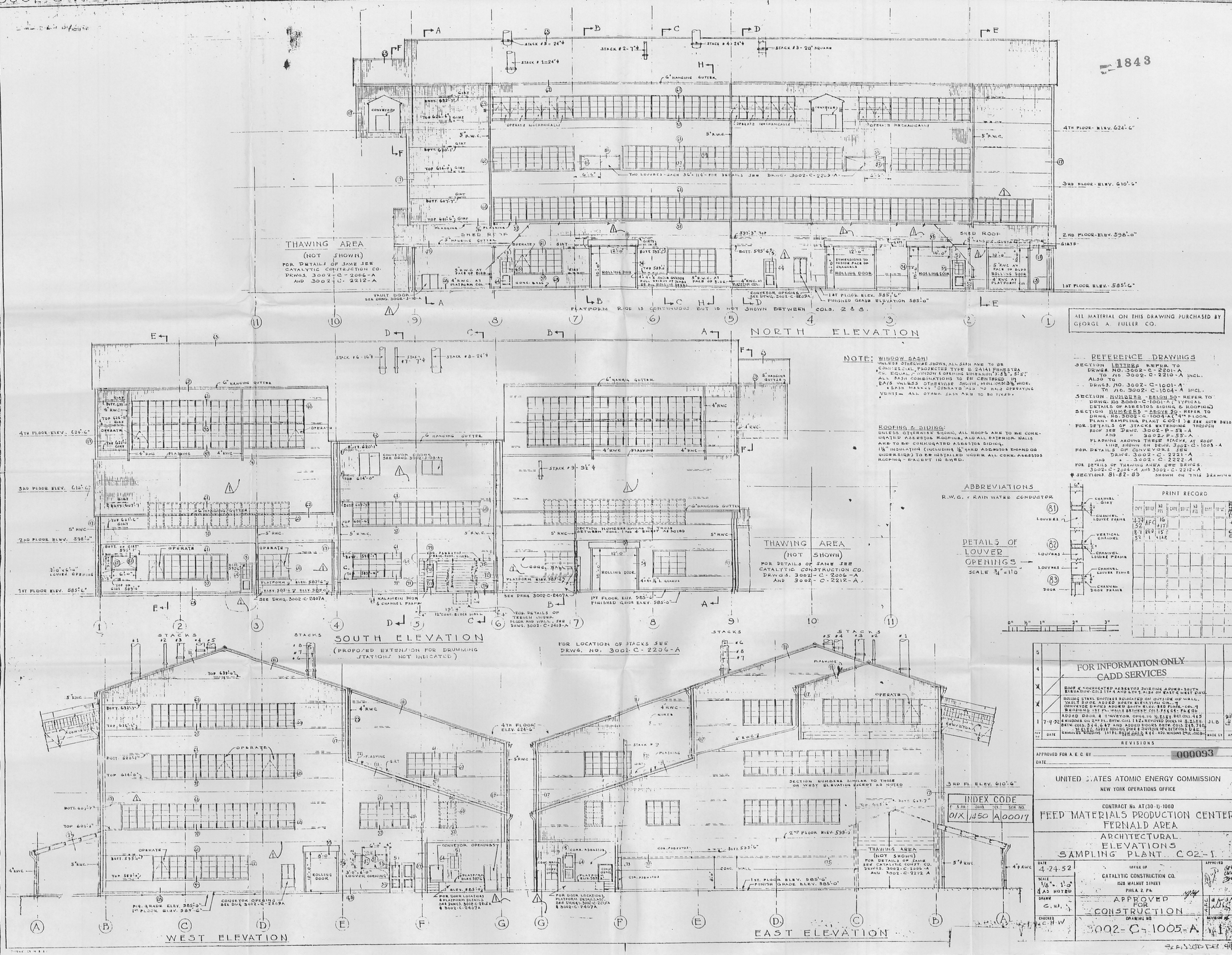
000091

| SHEET # | FDF INDEX CODE | OLD DRAWING NUMBER |
|---|---|---|
| 12-1 | 15X-1450-A-00008 | 3015-C-1014-A (Rev. 2) |
| 12-2 | 15X-7000-A-00067 | 5250-15A-5007 (Rev. 2) |
| 12-3 | 15X-7000-A-00068 | 5250-15A-5008 (Rev. 4) |
| 13-1 | 12X-1450-A-00008 | 3012-C-2005-A (Rev. 2) |
| 13-2 | 12X-1450-A-00009 | 3012-C-2006-A (Rev. 1) |

* *Drawing number is questionable*

3002-C-1005-A

1843




ALL MATERIAL ON THIS DRAWING PURCHASED BY GEORGE A. FULLER CO.

NOTE: WINDOW SASH: UNLESS OTHERWISE SHOWN, ALL SASH ARE TO BE COMMERCIAL PROJECTED TYPE B 24141 FENESTRA OR EQUAL, WINDOW & OPENING DIMENSION 3'-8½" x 5'-5". ALL SASH COMBINATIONS TO BE CENTERED IN BAYS UNLESS OTHERWISE SHOWN, MULLIONS 3⅝" WIDE. ★ SASH MARKED "OPERATE" ARE TO HAVE OPERATING VENTS — ALL OTHER SASH ARE TO BE FIXED.

ROOFING & SIDING: UNLESS OTHERWISE SHOWN, ALL ROOFS ARE TO BE CORRUGATED ASBESTOS ROOFING, AND ALL EXTERIOR WALLS ARE TO BE CORRUGATED ASBESTOS SIDING, 1½" INSULATION (INCLUDING ⅛" HARD ASBESTOS BOARD ON UNDERSIDE) TO BE INSTALLED UNDER ALL CORR. ASBESTOS ROOFING - EXCEPT IN SHED.

REFERENCE DRAWINGS

SECTION LETTERS REFER TO DRWGS. NO. 3002-C-2201-A TO NO. 3002-C-2210-A INCL. ALSO TO DRWGS. NO. 3002-C-1001-A TO NO. 3002-C-1004-A INCL.

SECTION NUMBERS - BELOW 50 - REFER TO DRWG. No 3000-C-1001-A (TYPICAL DETAILS OF ASBESTOS SIDING & ROOFING)

SECTION NUMBERS - ABOVE 50 - REFER TO DRWG. NO. 3002-C-1004-A (4TH FLOOR PLAN - SAMPLING PLANT C-02-1) & SEE NOTE BELOW

FOR DETAILS OF STACKS EXTENDING THROUGH ROOF SEE DRWG. 3002-P-53-A AND 3002-P-55-A

FLASHING AROUND THESE STACKS AT ROOF LINE SHOWN ON DRWG. 3002-C-1003-A

FOR DETAILS OF CONVEYORS SEE DRWG. 3002-C-2221-A AND 3002-C-2222-A

FOR DETAILS OF THAWING AREA SEE DRWGS. 3002-C-2206-A AND 3002-C-2212-A

# SECTIONS 81-82-83 SHOWN ON THIS DRAWING.

ABBREVIATIONS

R.W.C. = RAIN WATER CONDUCTOR

DETAILS OF LOUVER OPENINGS — SCALE 3/4" = 1'-0"




PRINT RECORD

| DATE | STATUS | AD PTS | DATE | STATUS | AD PTS | DATE | STATUS | AD PTS |
|---|---|---|---|---|---|---|---|---|
| 4-24-52 | AFC | 16 | | | | | | |
| 8-7-52 | REV | 15 | | | | | | |

| REV. NO. | DATE | REVISIONS | MADE BY | APPD |
|---|---|---|---|---|
| 5 | | | | |
| 4 | | | | |
| 3 | | | | |
| 2 | | | | |
| 1 | 7-9-52 | ADDED DOOR & CONVEYOR OPNG. IN W. ELEV. BET. COLS. 4-5 WINDOWS ON 2ND FL. BETW. COLS. 1 & 2 REMOVED DOOR IN S. ELEV. BETW. COLS. 3 & 4, & 6-7 AND ADDED DOORS BETW. COLS. 2 & 3, 7 & 8 IN ELEV. ADDED ROOFING DOORS & WINDOWS ON EAST COLS. 1 & 2 REMOVED WINDOWS INSTALL DOOR OPENING & C.C. ADD. WINDOWS 2ND FL. COL. 2 | JLD | |

FOR INFORMATION ONLY
CADD SERVICES

APPROVED FOR A.E.C. BY _____ 000093
DATE _____

UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE

CONTRACT No. AT(30-1)-1060

FEED MATERIALS PRODUCTION CENTER
FERNALD AREA

ARCHITECTURAL
ELEVATIONS
SAMPLING PLANT C02-1.

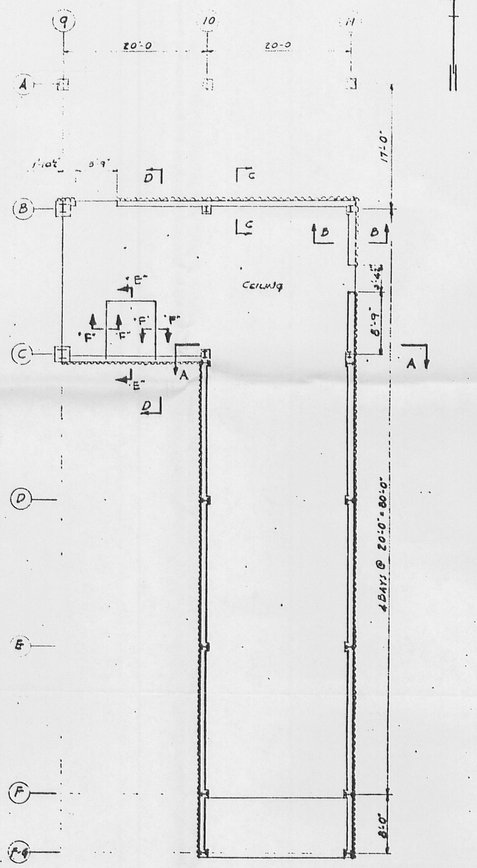
| INDEX CODE | | | |
|---|---|---|---|
| F & AR | DWG | CL | SER NO. |
| 01X | 1450 | A | 00017 |

| | | |
|---|---|---|
| DATE 4-24-52 | OFFICE OF CATALYTIC CONSTRUCTION CO. 1520 WALNUT STREET PHILA 2, PA. | APPROVED |
| SCALE 1/8" = 1'-0" (AS NOTED) | APPROVED FOR CONSTRUCTION | |
| DRAWN C.W.J. | | |
| CHECKED H.W. | DRAWING NO. 3002-C-1005-A | REVISION NO. |

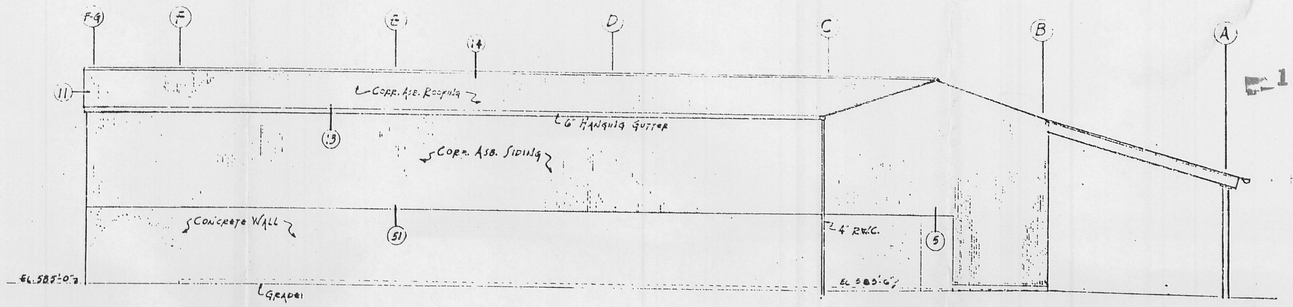
SHEET #1-1

REVISED DEC 90

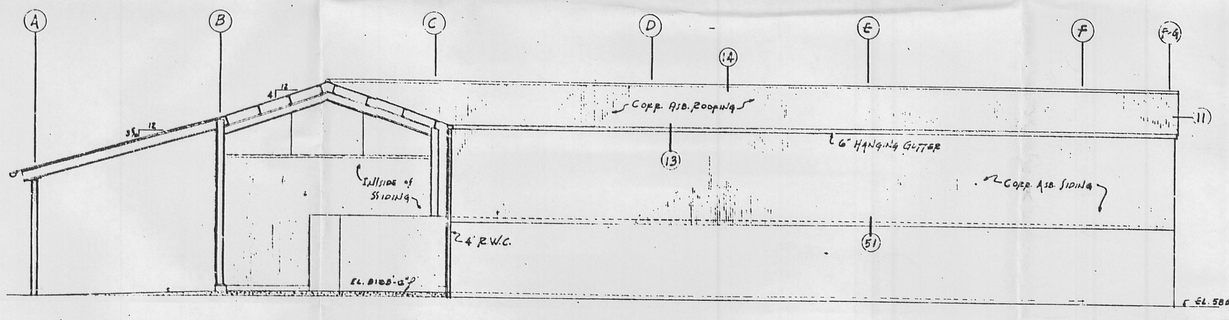
3002-C-2006A




PLAN
Scale 1/8" = 1'-0"

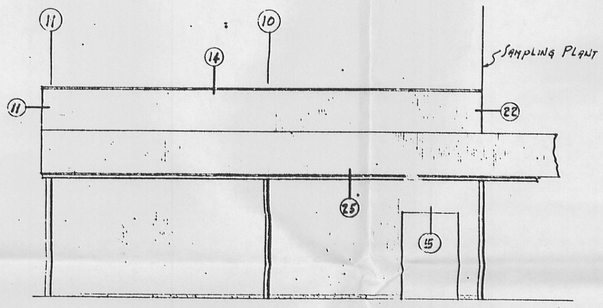



EAST ELEVATION
Scale 3/16" = 1'-0"

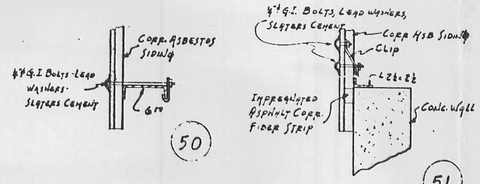



WEST ELEVATION
Scale 3/16" = 1'-0"

REFERENCE DWGS
TYP. DETAILS OF CEMENT ASBESTOS SIDING & ROOFING - 3000-C-1001-A

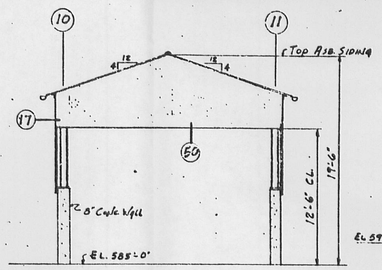



NORTH ELEVATION
Scale 3/16" = 1'-0"

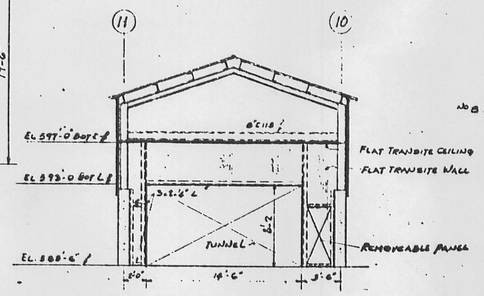



EXTERIOR DETAILS
Scale 1½" = 1'-0"

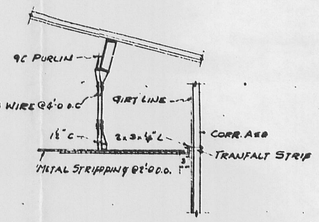
SCALE FOR THIS DRAWING



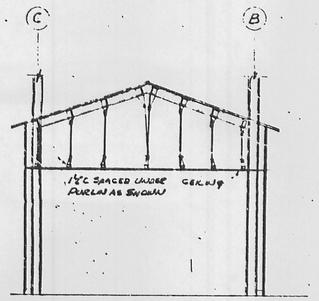

SOUTH ELEVATION
Scale 3/16" = 1'-0"



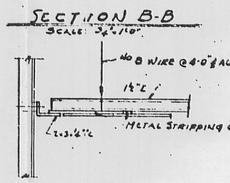

SECTION A-A
Scale 3/16" = 1'-0"



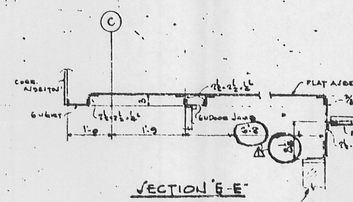

SECTION B-B
Scale 3/4" = 1'-0"



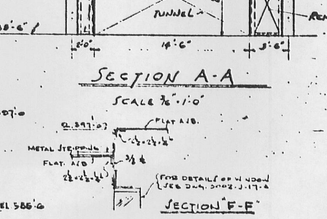

SECTION D-D
Scale 3/16" = 1'-0"




SECTION C-C
Scale 1½" = 1'-0"




SECTION E-E




SECTION F-F

INDEX CODE

| FL & AC | CODE | CL | SER NO |
|---|---|---|---|
| 01X | 1450 | A | 00027 |

FOR INFORMATION ONLY
~~CADD SERVICES~~
000094

| REV NO. | DATE | DESCRIPTION | DRAWN BY | APP'D |
|---|---|---|---|---|
| 5 | | | | |
| 4 | | | | |
| 3 | | | | |
| 2 | | | | |
| 1 | | | | |

REVISIONS

APPROVED FOR A. E. C. BY
DATE

UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE

CONTRACT No. AT(30-1)-1060
FEED MATERIALS PRODUCTION CENTER
FERNALD AREA

ARCHITECTURAL
THAWING AREA
SAMPLING PLANT

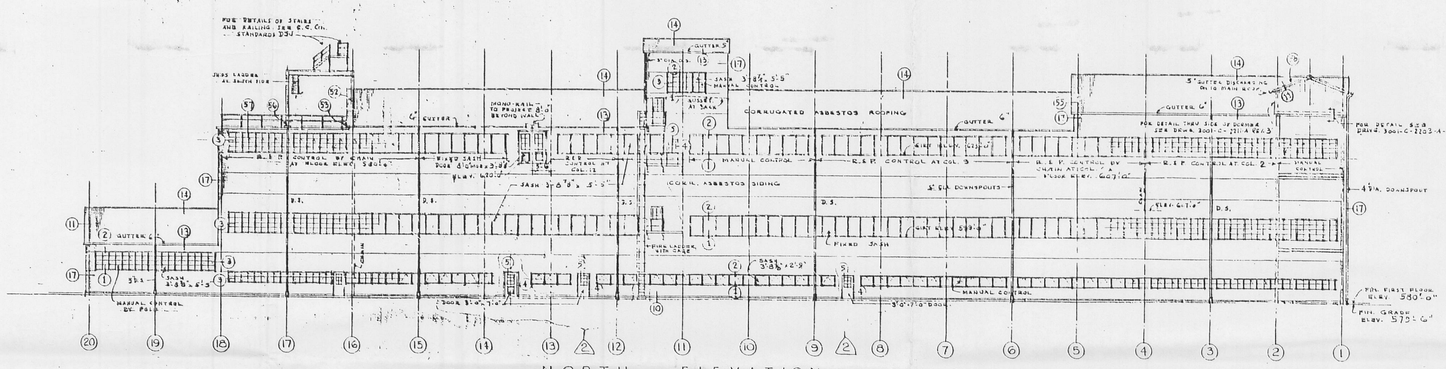
| | | |
|---|---|---|
| DATE 6-27-52 | OFFICE OF CATALYTIC CONSTRUCTION CO. 1520 WALNUT STREET PHILA. 2, PA. | APPROVED PER LIN |
| SCALE As Noted | | |
| DRAWN Class | APPROVED FOR CONSTRUCTION | |
| CHECKED Flowerty | DRAWING NO. 3002-C-2006-A | REVISION NO. |

SHEET # 1-2

7-16-98

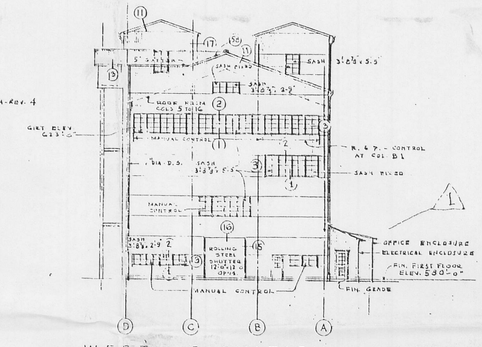
JUL 1 5 1998

1843




NORTH ELEVATION

SCALE: 1/8" = 1'-0"

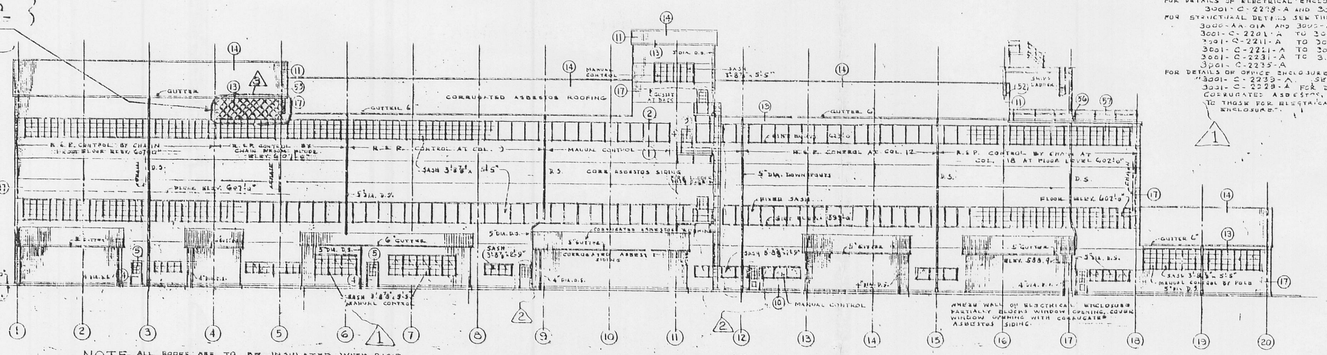



WEST ELEVATION

SCALE: 1/8" = 1'-0"

REFERENCE DRAWINGS

SECTION NUMBERS BELOW #30 REFER TO DRWG. 3000-C-1001-A
SECTION NUMBERS ABOVE #30 REFER TO DRWG. 3001-C-1002-
FOR DETAILS OF ELECTRICAL ENCLOSURES SEE DRWGS.
3001-C-2228-A AND 3001-C-2229-A.
FOR STRUCTURAL DETAILS SEE THE FOLLOWING DRWGS.-
3000-AA-01A AND 3000-AA-03A
3001-C-2201-A TO 3001-C-2207-A INCL.
3001-C-2211-A TO 3001-C-2213-A "
3001-C-2221-A TO 3001-C-2223-A "
3001-C-2231-A TO 3001-C-2233-A "
3001-C-2235-A
FOR DETAILS OF OFFICE ENCLOSURE SEE DRWG.
3001-C-2232-A SEE ALSO DRWG.
3001-C-2229-A FOR DETAILS OF
CORRUGATED ASBESTOS SIDING TO THOSE FOR ELECTRICAL ENCLOSURE.
CONTINUOUS RAILING ALONG COL. LINE 15 FROM COL. A TO COL. D



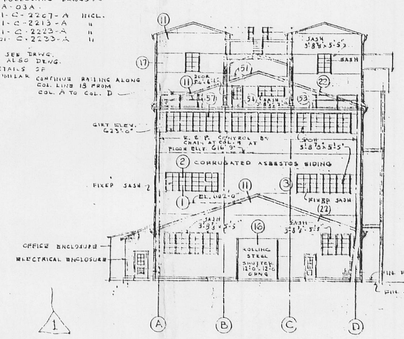

NOTE: ALL DOORS ARE TO BE INSULATED WITH RIGID INSULATION 1" THICK FACED ON UNDER SIDE WITH 1/8" ASBESTOS BOARD. SEE WING DOOR DETAILS 3000-C-1001-A. ALLOWANCE MUST BE MADE FOR THIS INSULATION, TO BE PLACED BETWEEN THE CORRUGATED ASBESTOS ROOFING AND THE STRUCTURAL STEEL OF DOORS.
OMIT 1/8" ASBESTOS BOARD FACING WHERE INSULATION IS PLACED ON TOP OF VOLCANITE SLAB.

SOUTH ELEVATION

SCALE: 1/8" = 1'-0"

NOTE

FIRST FLOOR SASH-COLS. 18 TO 20 A; 15 TO 20 B; 20 A TO 20 D. TO BE OPERATED BY PCLS. ALL OTHER FIRST FLOOR SASH TO BE MANUALLY OPERATED.
AT GIRT ELEV. 599'-0", SASH BETWEEN COLS. 18 & 19 TO BE MANUALLY OPERATED.
AT GIRT ELEV. 559'-0" ALL SASH, EXCEPT THOSE NOTED ABOVE TO BE FIXED.
AT GIRT ELEV. 615'-6" ALL SASH TO OPERATE; METHOD OF OPERATION NOTED ON ELEVATIONS.
AT GIRT ELEV. 647 AND 630'-0" SASH BETWEEN B & C 16, TO BE MANUALLY OPERATED.
AT GIRT ELEV. 640'-0", NORTH AND SOUTH WINDOWS OF PENT HOUSES TO BE OPERATED MANUALLY.
ALL OTHER SASH, NOT OTHERWISE NOTED TO BE FIXED.
ALL MULLIONS TO BE 2-3/4" WIDE.




EAST ELEVATION

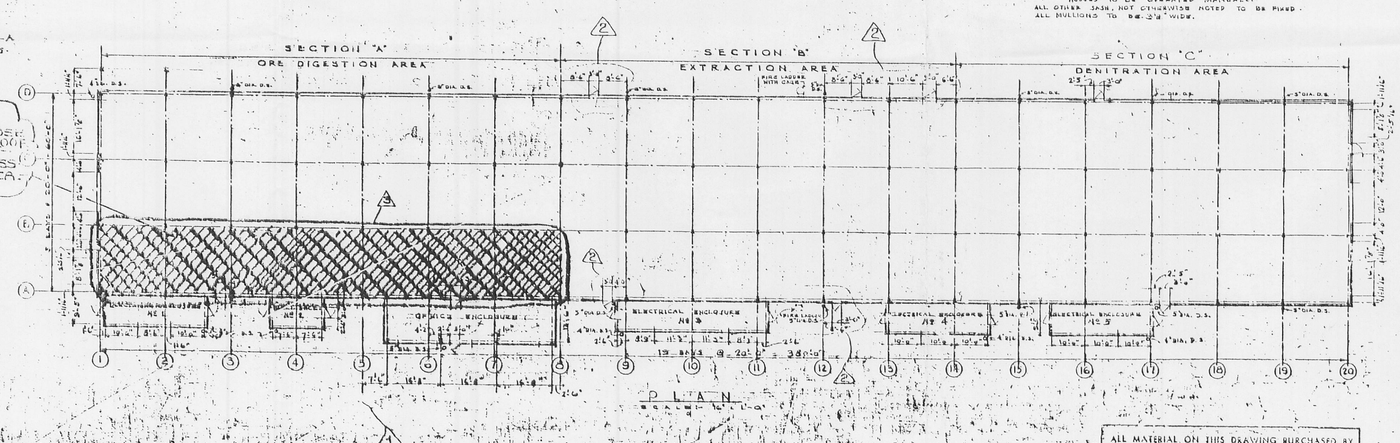
SCALE: 1/8" = 1'-0"

REMOVE & DISPOSE OF INTERIOR WALL BOARD & INSULATION IN CROSS-HATCHED AREA.

TYPICAL DOOR TO "ELECTRICAL ENCLOSURE"
SEE ALSO DWG. No. 3001-C-2228-A
10 DOORS LIKE THIS.
SCALE 3/4" = 1'-0"

ABBREVIATIONS

D.S. - DOWNSPOUT
R.E.P. - RACK AND PINION




PLAN

SCALE: 1/8" = 1'-0"

REMOVE & DISPOSE OF INTERIOR ROOF BOARD & INSULATION IN CROSS HATCHED AREA.

N

REDUCED DRAWING
DO NOT SCALE

ALL MATERIAL ON THIS DRAWING PURCHASED BY GEORGE A. FULLER CO.

INDEX CODE

| N.S.A. | OBJ. | CL. | SER. NO. |
|---|---|---|---|
| 02X | 1450 | A | 00001 |

000095

| REV. NO. | DATE | DESCRIPTION | DRN. BY | APPD. |
|---|---|---|---|---|
| 4 | | | | |
| 3 | | | | |
| A | 11-5-54 | CROSSED-HATCHED AREA BETWEEN COLS. 14 & 15 ADDED NOTES. | M.S.H. | |
| 2 | 6-16-52 | CROSSED-HATCHED AREAS BETWEEN COLS. 1 & 2. FIRST LADDERS (WITH CAGES), PLATFORMS & DOORS ADDED - N & S ELEVATIONS BETW. COLS. 11 & 12 ADDED FIXED SASH BETW. COLS. 8 & 9, 12 & 13 ALSO, 2 ELEV. BETW. COLS. 8 & 9 | M.L.S. | |
| 1 | 5-27-52 | OFFICE ENCLOSURE ADDED | C.H.W. | |

REVISIONS

APPROVED FOR A.E.C. BY
DATE

UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE

CONTRACT No. AT(30-1) 1089

FEED MATERIALS PRODUCTION CENTER
FERNALD AREA

ARCHITECTURAL
PLAN & ELEVATIONS
ORE REFINERY BLDG. C-1-1

| | |
|---|---|
| DATE 4-15-52 | DESIGNED BY GATALYTIC CONSTRUCTION CO. 624 WALNUT STREET PHILA. 2, PA. |
| SCALE 1/8" = 1'-0" / 3/4" = 1'-0" | APPROVED FOR CONSTRUCTION |
| DRAWN E.G. | |
| CHECKED C.H.W. | DRAWING NO. 3001-C-1001-A |
| | REVISION NO. 3 |

FOR INFORMATION ONLY
CADD SERVICES

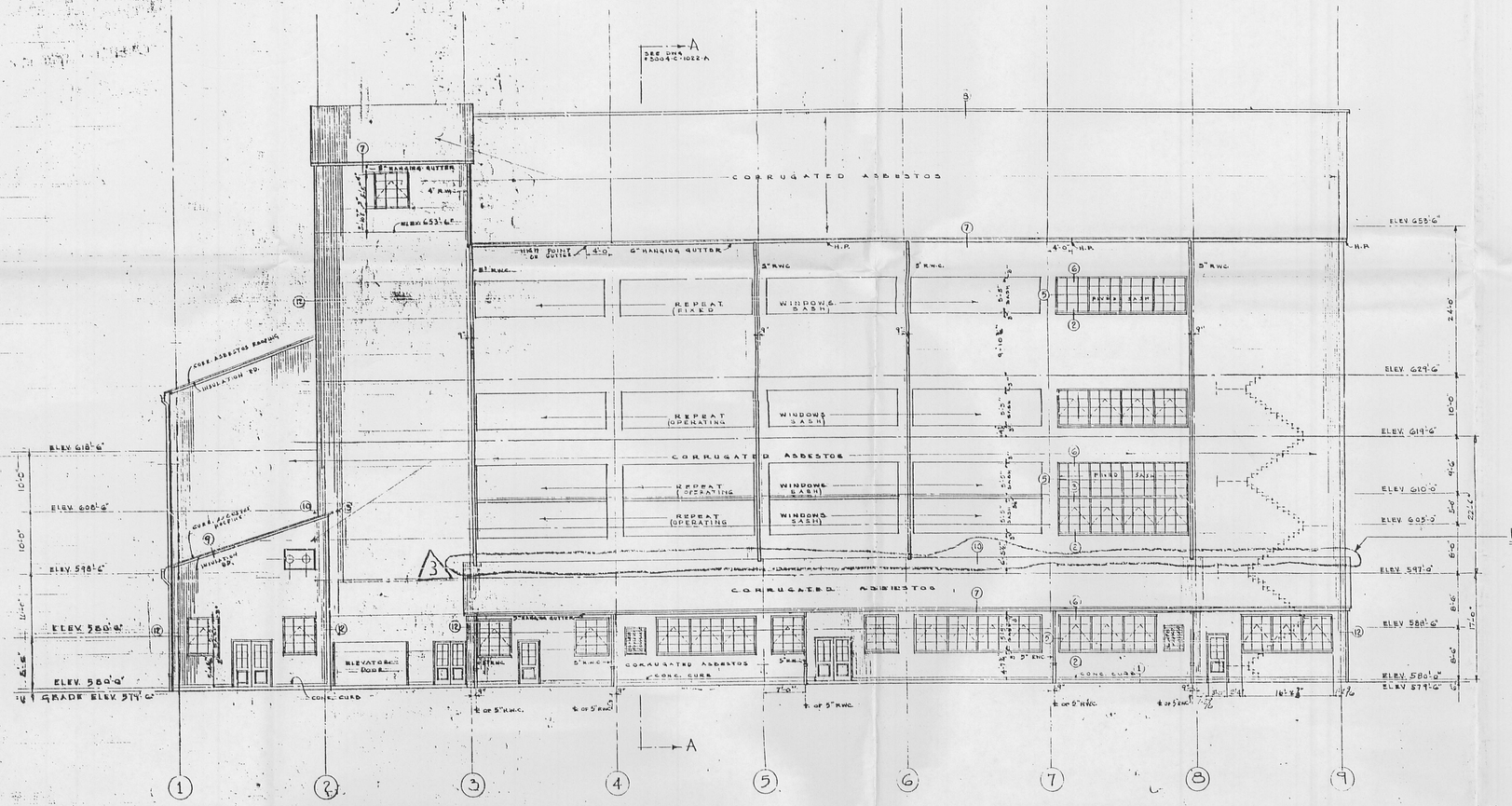
APR 2 4 '96

SHEET #2-1

3004-C-1016-A

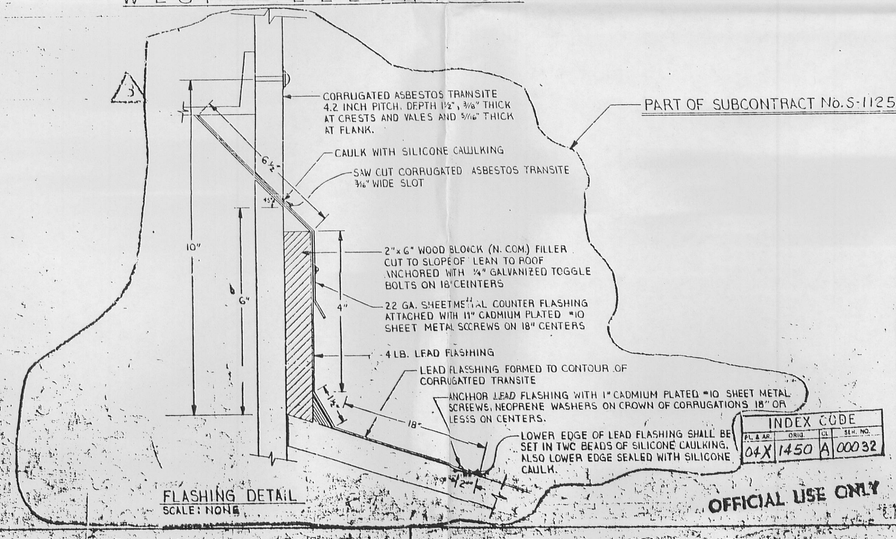
OFFICIAL USE ONLY

1843




WEST ELEVATION

NOTE!
FOR DOOR DETAILS SEE DWG. Nº 3004-C-1022A. FOR OTHER (NUMBERED) DETAILS SEE DWGS. Nº 3004-C-1021A & 1020A




FLASHING DETAIL
SCALE: NONE

| INDEX CODE | | | |
|---|---|---|---|
| FL. & AR. | DWG. | CL. | SH. NO. |
| 04X | 1450 | A | 00032 |

OFFICIAL USE ONLY

| PRINT RECORD | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| DATE | BY | NO. PRINTS | DATE | BY | NO. PRINTS | DATE | BY | NO. PRINTS |
| 7/21 | A.F.C. | 31 | | | | | | |
| 10/21 | E.F.C. | 31 | | | | | | |

FOR INFORMATION ONLY
CADD SERVICES
000096

| NO. | DATE | DESCRIPTION | MADE BY | APP'D |
|---|---|---|---|---|
| 5 | | | | |
| 4 | | | | |
| 3 | 6-20-83 | INDICATED SUBCONTRACT Nº S-1125 WORK<br>LOUVRE & OFFICE ADDED | T.J.G. | |
| 2 | | | O.J.L. | |
| 1 | 7/6/56 | ADDED FLOOR BETWEEN COLS. 1 & 2, TWO SASH OMITTED, ONE DOOR ADDED. | C.M.W. | |

REVISIONS

APPROVED FOR A.E.C. BY
DATE

UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE

CONTRACT No. AT(30-1)-1060

FEED MATERIALS PRODUCTION CENTER
FERNALD AREA

ARCHITECTURAL
WEST ELEVATION
GREEN SALT PLANT 04-C-L

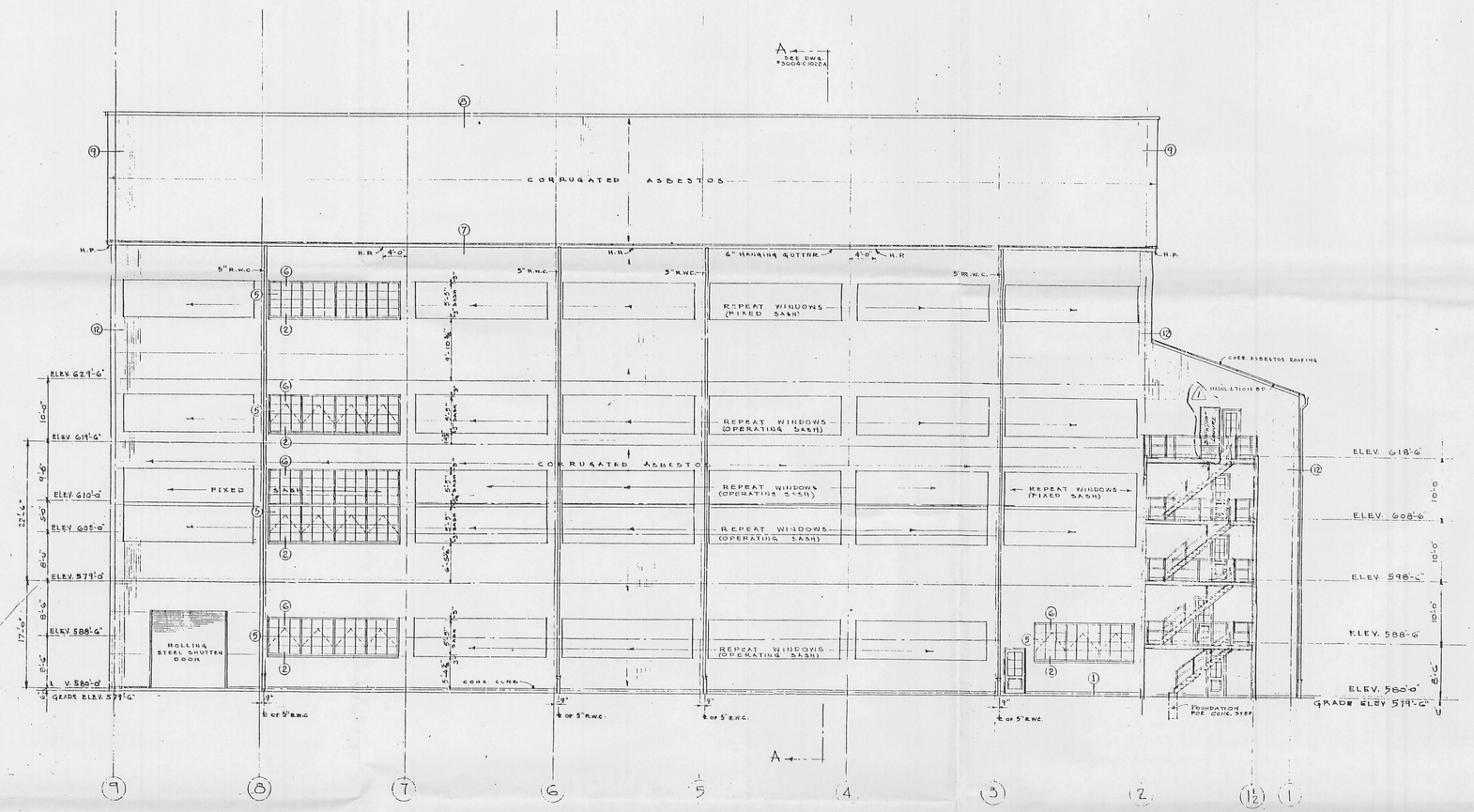
| | | |
|---|---|---|
| DATE 1-14-52 | BUILDER CATALYTIC CONSTRUCTION CO. 1520 WALNUT STREET PHILA. PA. | APPROVED |
| SCALE 1/8" = 1'-0" | | |
| DRAWN Scott J.S. | APPROVED FOR CONSTRUCTION | |
| CHECKED C.H.V. | DRAWING NO. 3004-C-1016A | REVISION 3 |

APR 2 4 '96

SHEET #3

3004-C-1019-A

1843




EAST ELEVATION

NOTE:
FOR DOOR DETAILS SEE DWG. No 3004-C-1022A. FOR OTHER (NUMBERED) DETAILS SEE DWGS. No 3004-C-1021A & -1020A

FOR INFORMATION ONLY
CADD SERVICES

REDUCED DRAWING!
DO NOT SCALE

| REV NO | DATE | DESCRIPTION | MADE BY | APP'D |
|---|---|---|---|---|
| 5 | | | | |
| 4 | | | | |
| 3 | | 000097 | | |
| 2 | | | | |
| 1 | | ADDED LOUVRE | O.S.L. | |

REVISIONS

APPROVED FOR A.E.C. BY _____
DATE _____

UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE

CONTRACT No. AT(30-1)-1060

FEED MATERIALS PRODUCTION CENTER
FERNALD AREA

ARCHITECTURAL
EAST ELEVATION
GREEN SALT PLANT 04-C-1

| | | |
|---|---|---|
| DATE 1-14-52 | OFFICE OF CATALYTIC CONSTRUCTION CO. 1520 WALNUT STREET PHILA 2, PA. | APPROVED |
| SCALE 1/8"=1'-0" | | |
| DRAWN SCOTT J.B. | APPROVED FOR CONSTRUCTION | |
| CHECKED C.H.W. | DRAWING NO. 3004 C-1019-A | REVISION NO. 1 |

INDEX CODE

| FL. & AR. | ORIG. | SEQ. | SEQ. NO. |
|---|---|---|---|
| 04X | 1450 | A | 00033 |

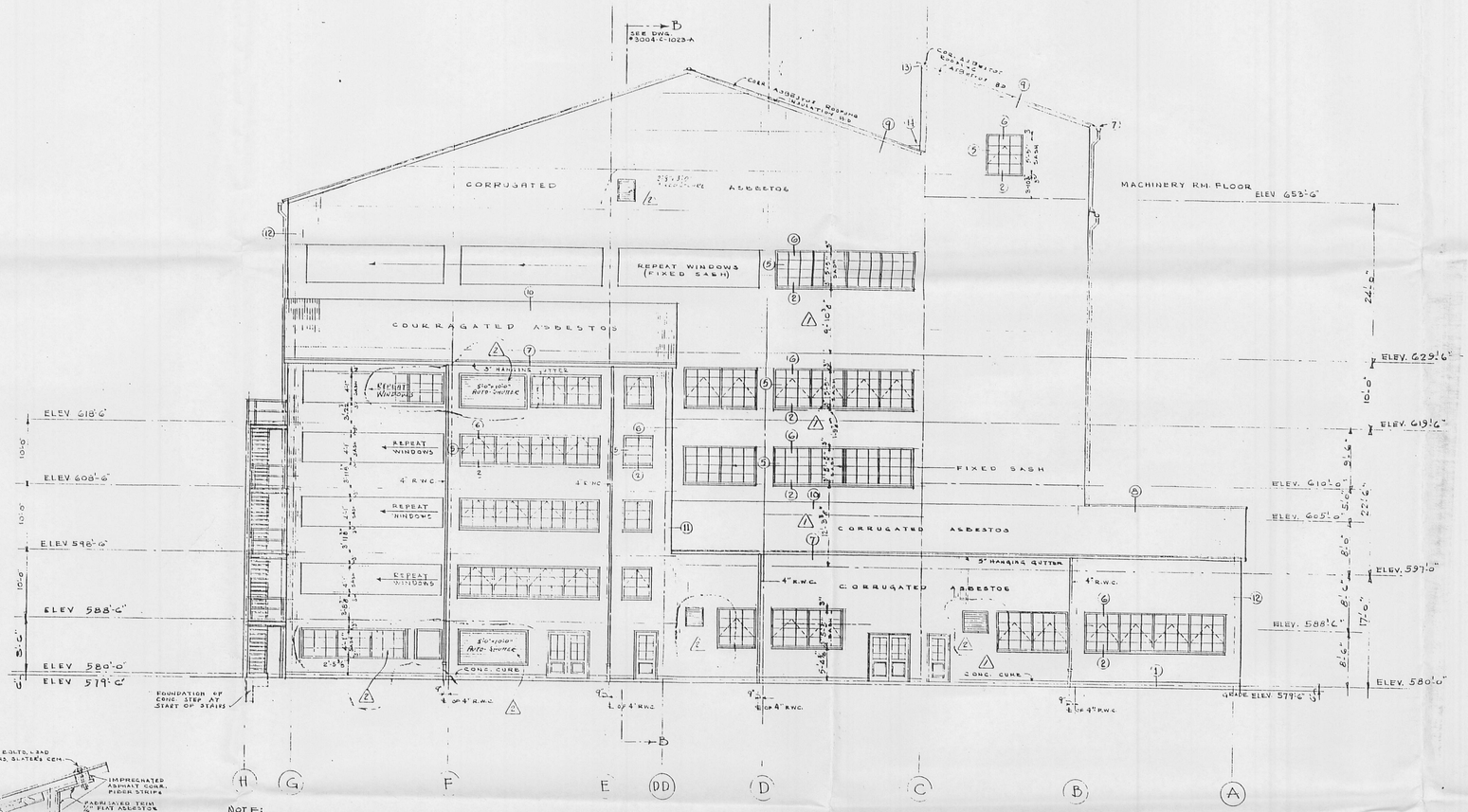
APR 2 4 '96

SHEET # 3-2
7-16-98

SHEET #3-2

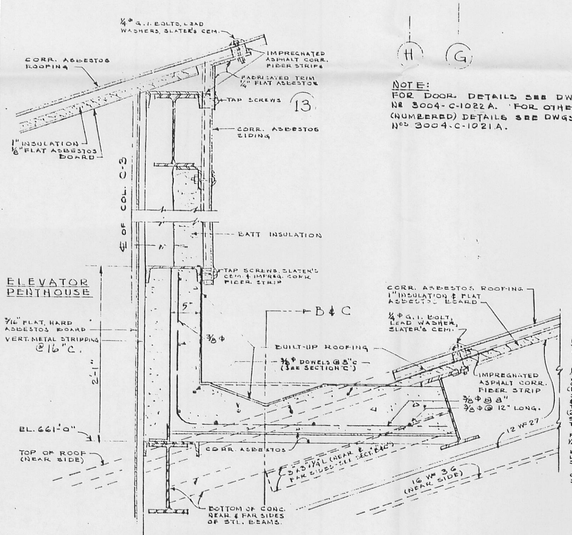
3004-C-1020-A

1843

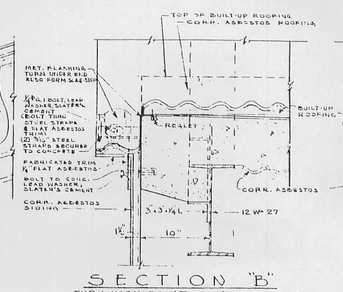



NOTE:
FOR DOOR DETAILS SEE DWG. No 3004-C-1022-A. FOR OTHER (NUMBERED) DETAILS SEE DWGS. No 3004-C-1021-A.

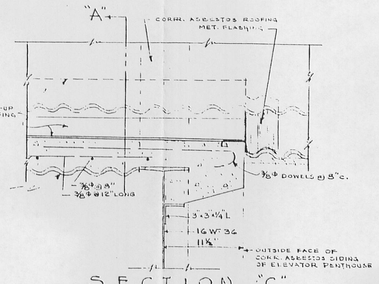
NORTH ELEVATION




SECTION "A"
(LOOKING NORTH)




SECTION "B"
THRU HIGH POINT — NORTH END
SCALE 1½"=1'-0"




SECTION "C"
THRU LOW POINT — SOUTH END

DETAIL OF GUSSET
BETWEEN ELEVATOR PENTHOUSE AND HIGH ROOF.

NOTE:
FOR PLAN OF GUSSET SEE PENTHOUSE PLAN: DWG 3004-C-1017A

FOR INFORMATION ONLY
CADD SERVICES

| REV NO | DATE | DESCRIPTION | MADE BY | APPD |
|---|---|---|---|---|
| 5 | | --- | | |
| 4 | | 000098 | | |
| 3 | | | | |
| 2 | | WINDOWS CHANGED TO SUIT AUTH. CHUTORE. | D.S.L. | |
| 1 | 7/6/52 | AT 1st FLOOR BETWEEN COLS. B & C, ONE SASH CHANGED, GIB DOOR ADDED. DIMENSIONS OFF FLOOR CHANGED FOR 3 WINDOWS BETWEEN COLS. C & R | C.H.W. | H.N.S. |

REVISIONS

APPROVED FOR A. E. C. BY _____
DATE _____

UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE

CONTRACT No. AT(30-1)-1060

FEED MATERIALS PRODUCTION CENTER
FERNALD AREA

ARCHITECTURAL
NORTH ELEVATION
GREEN SALT PLANT 04-C-1

| | | |
|---|---|---|
| DATE 1-14-52 | OFFICE OF CATALYTIC CONSTRUCTION CO. 1528 WALNUT STREET PHILA 2, PA. | APPROVED H.N.S. 12-17-52 H.L. C.H.W. |
| SCALE 1/8" = 1'-0" | | |
| DRAWN SCOTT J.B. | APPROVED FOR CONSTRUCTION | |
| CHECKED C.H.W. | DRAWING NO. 3004 C-1020-A | REVISION NO. 2 |

INDEX CODE
04X1450 A 00034

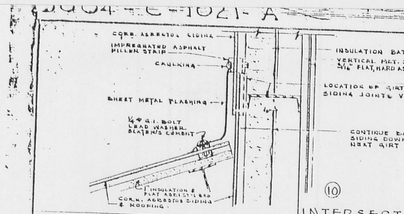
OFI

SHEET #3-3

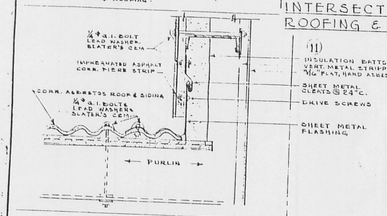
OFFICIAL USE ONLY

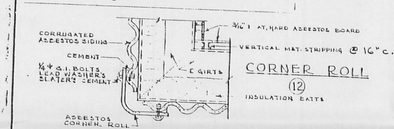
NOTE

SEE STRUCTURAL DRAWINGS FOR VARIATIONS IN STRUCTURAL DETAILS, IN SOME LOCATIONS, FROM THOSE SHOWN ON THIS DRAWING.



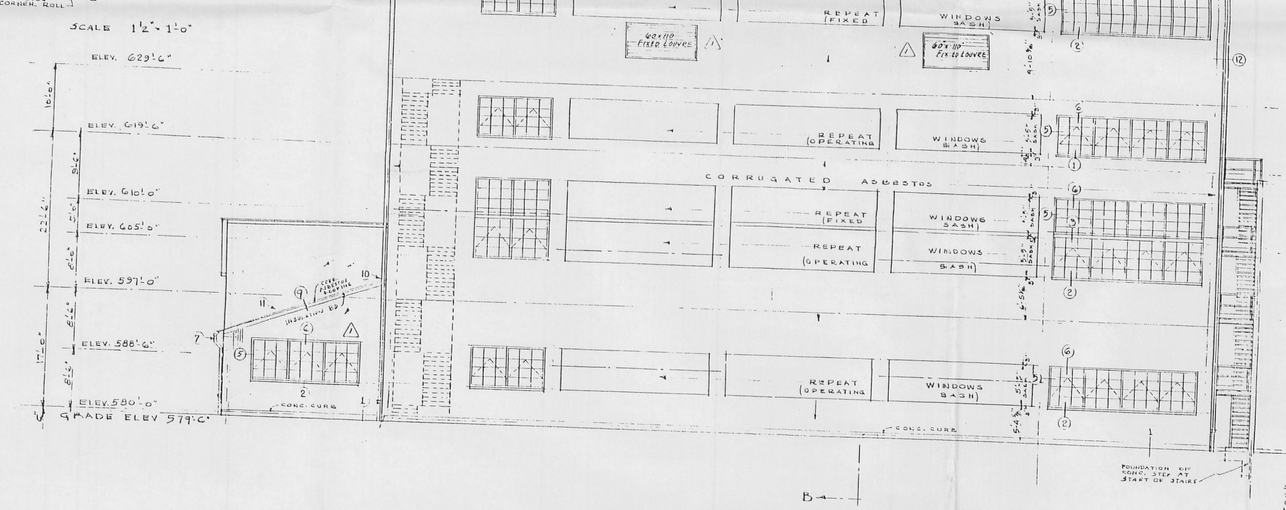

(10) INTERSECTIONS OF ROOFING & SIDING



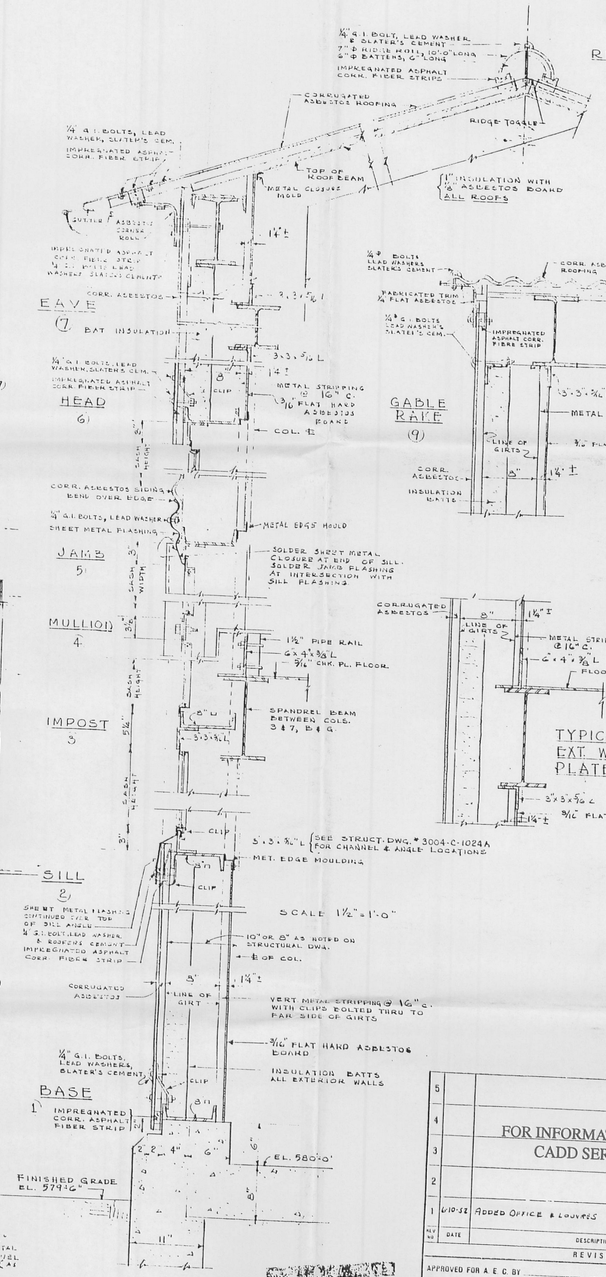

(12) CORNER ROLL

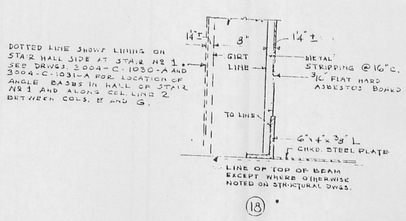
SCALE 1 1/2" = 1'-0"




SOUTH ELEVATION

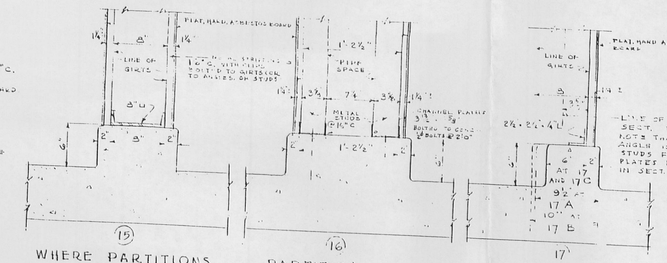
NOTE: FOR DOOR DETAILS SEE DWG. № 3004-C-1022A.




(18) BASES FOR PARTITIONS ON CHKD. STEEL PLATE FLOORS

NOTE THAT IN SOME INSTANCES THE 6"x4"x3/8" L BASE WILL REST ON TOP OF THE CHKD. STEEL PLATE SO THAT THE CHKD. STEEL PLATE WILL GET BEARING ON THE BEAMS AND GIRDERS.




(15) WHERE PARTITIONS ARE LINED ON BOTH SIDES

(16) PARTITION BETWEEN TOILET & OFFICE

(17) WHERE PARTITIONS ARE LINED ON ONE SIDE

INTERIOR CONCRETE CURBS

SCALE 1 1/2" = 1'-0"

0" 1/2" 1" 2" 3"

| REV. NO. | DATE | DESCRIPTION | MADE BY | APP'D |
|---|---|---|---|---|
| 5 | | | | |
| 4 | | | | |
| 3 | | | | |
| 2 | | | | |
| 1 | 6-10-52 | ADDED OFFICE & LOUVRES | G.S.C. | |

REVISIONS

000099

FOR INFORMATION ONLY
CADD SERVICES

APPROVED FOR A.E.C. BY _____
DATE _____

UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE

CONTRACT No. AT(30-1)-1060

FEED MATERIALS PRODUCTION CENTER
FERNALD AREA

ARCHITECTURAL
SOUTH ELEVATION
GREEN SALT PLANT 04-C-1

| | | |
|---|---|---|
| DATE 1-14-52 | OFFICE OF CATALYTIC CONSTRUCTION CO. 1528 WALNUT STREET PHILA 2, PA. | APPROVED |
| SCALE 1/8" = 1'-0" & AS NOTED | | |
| DRAWN S. SCOTT, J.B. & C.W. | APPROVED FOR CONSTRUCTION | |
| CHECKED C.H.W. | DRAWING NO. 3004 C-1021-A | REVISION NO. 1 |

APR 24 '96

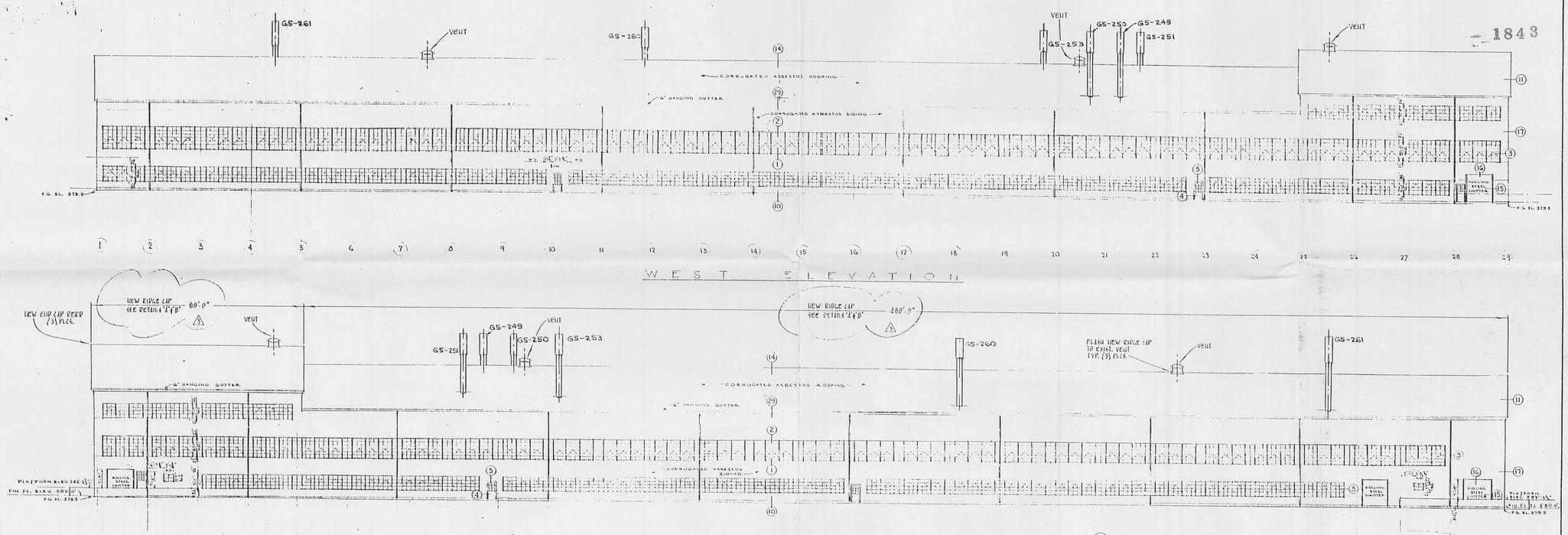
04X 1450 A 00035

04X 1450 S 00036

SHEET # 3-4
7-16-98

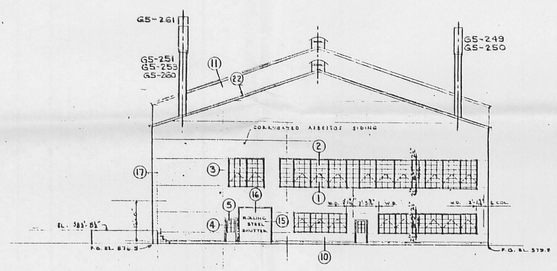
3005-C-1002-A

1843

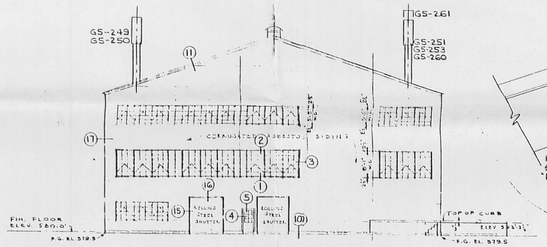



WEST ELEVATION

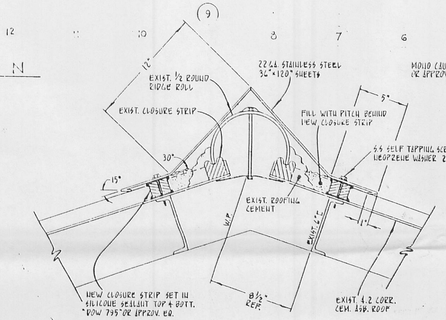
EAST ELEVATION



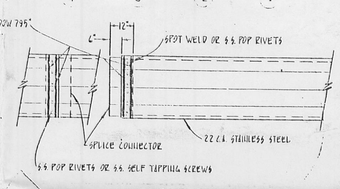

NORTH ELEVATION




SOUTH ELEVATION




DETAIL 'A'
NEW RIDGE CAP




DETAIL 'B'
CAP FABRICATION

FOR SECTIONS INDICATED THUS -(0)
SEE DRAWING No 3000-C-1001-A

FOR INFORMATION ONLY
CADD SERVICES

DO NOT SCALE
REDUCED DRAWING

| INDEX CODE | | | |
|---|---|---|---|
| PL. & AN. | CONC. | CL | SER. NO. |
| 05X | 1450 | A | 00005 |

| REV. No. | DATE | DESCRIPTION | MADE BY | APPD |
|---|---|---|---|---|
| 5 | | 000100 | | |
| 4 | | | | |
| 3 | 6-13-88 | ADDED DETAILS 'A' & 'B' 00-88307<br>ADDED VENTS, REPL. LENGTH DIMENS. DCS 903 | | 2005<br>6/14/88 |
| 2 | 11-14-85 | REPLACED WEATHER CAPS AS REQUIRED BY SUB CONTRACT NO. S-1181 | DJH | |
| 1 | 4-18-52 | DOORS (EAST ELEVATION) BETWEEN C.L.S. 1-2 & 28-29 RAISED TO TOP OF PLATFORM.<br>PLATFORMS ADDED.<br>WINDOWS (EAST & WEST ELEVATION) BETWEEN C.L.S. E-F OMITTED | R. S. | |

REVISIONS

APPROVED FOR A E C BY:
DATE

UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE

CONTRACT No. AT(30-1)-1060

FEED MATERIALS PRODUCTION CENTER
FERNALD AREA

ARCHITECTURAL
ELEVATIONS
METALS PLANT

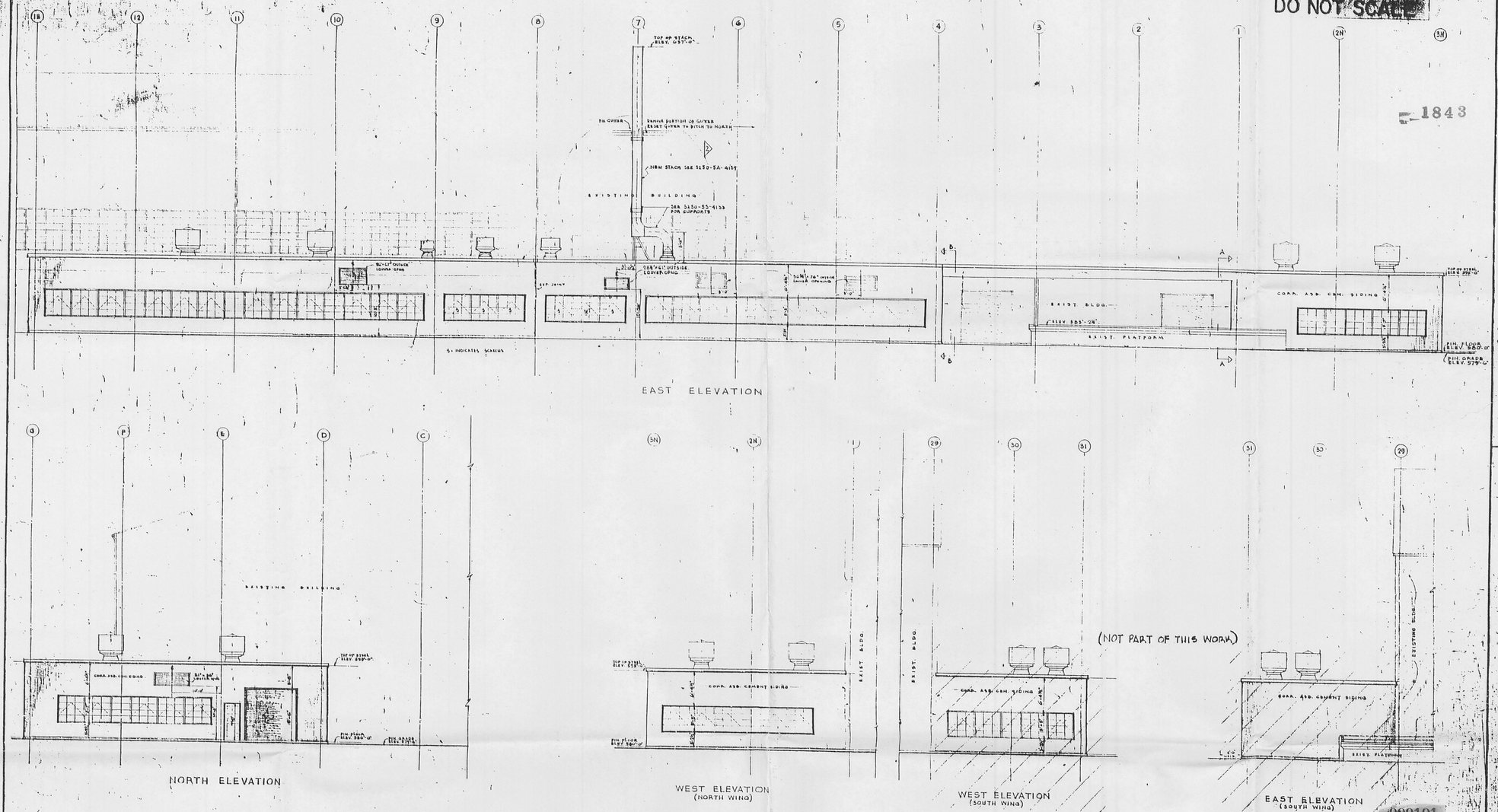
| | | |
|---|---|---|
| DATE 12-15-51 | OFFICE OF CATALYTIC CONSTRUCTION CO. 1520 WALNUT STREET PHILA 2, PA. | APPROVED |
| SCALE 1/4"=1'-0" | | |
| DRAWN C.B. | APPROVED FOR CONSTRUCTION | |
| CHECKED J.B. | DRAWING NO. 3005-C-1002-A | REVISION NO. 3 |

APR 2 4 '96

SHEET #4-1

REDUCED DRAWING
DO NOT SCALE

1843



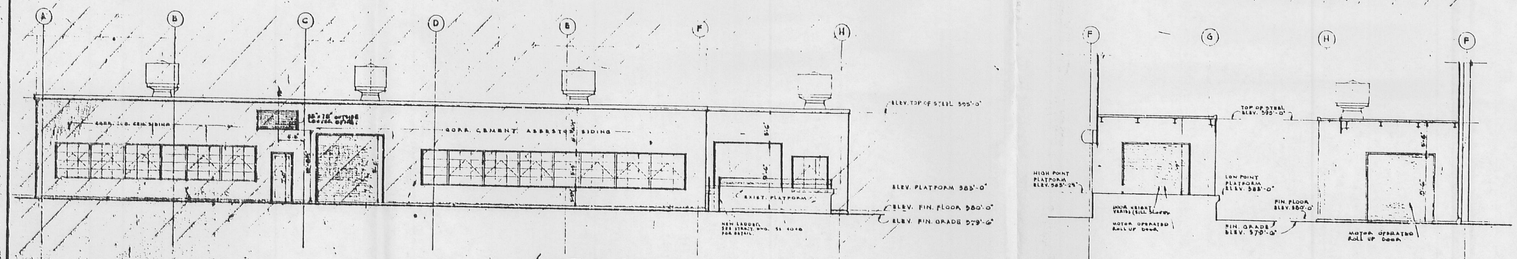

EAST ELEVATION

NORTH ELEVATION

WEST ELEVATION (NORTH WING)

WEST ELEVATION (SOUTH WING)

EAST ELEVATION (SOUTH WING)




SOUTH ELEVATION (NOT PART OF THIS WORK)

SECTION A-A

SECTION B-B

| INDEX CODE | | | |
|---|---|---|---|
| PL & SH. | ORIG. | CL | SER. NO. |
| 05X | 7000A | | 00075 |

FOR INFORMATION ONLY
CADD SERVICES

| NO. | REVISIONS | DATE | BY | CHK. |
|---|---|---|---|---|
| 4 | CHANGED INDEX CODE, WAS "H" | 9-10-86 | SAF | |
| 3 | ADDED STACK SUPPORTS & REFERENCES | 5-13-86 | LJB | |
| 1 | ISSUED FOR CONSTRUCTION | 6-3-54 | LVL | JRC |

000101

| DIRECTIVE NO. | REV. |
|---|---|
| 5250-SA-5036 | 1 |

| REFERENCE DRAWING | NO. |
|---|---|
| SECTIONS & DETAILS - SHEET #2 | 5250-SA-5036 |
| STACK SUPPORT FRAMING | 5250-SS-4133 |
| EXHAUST STACK ASSEMBLY & DETAILS | 5250-SA-4139 |
| | |
| | |
| BILL OF MATERIAL REF. | |
| SPECIFICATION REF. | |

U. S. ATOMIC ENERGY COMMISSION

SINGMASTER & BREYER
METALLURGISTS & CHEMICAL ENGINEERS
480 LEXINGTON AVE. NEW YORK 17, N. Y.

NATIONAL LEAD COMPANY OF OHIO
OPERATING CONTRACTOR OF
FEED MATERIALS PRODUCTION CENTER
FERNALD OHIO

METALS PLANT No 5 - NEW WINGS
ELEVATIONS
ARCHITECTURAL DRAWING

| DEPT. CHECK | |
|---|---|
| ARCH | JWB |
| CHEM. | RLS |
| ELEC. | |
| MECH. | |
| PROJ. ENGR. | |

| APPROVED | | DATE |
|---|---|---|
| G & B | NAME | |
| N. L. CO. | NAME | |
| A. E. C. | NAME | |
| DRAWN CROLL | CHECKED | |
| DATE 3-22-55 | DWG. NO. 5250-SA-5036 | 3 |
| SCALE 1/8"=1'-0" | | |

APR 2 4 '96

SHEET #4-2