

THIS FILE IS MADE AVAILABLE THROUGH THE DECLASSIFICATION EFFORTS AND RESEARCH OF:

THE BLACK VAULT

THE BLACK VAULT IS THE LARGEST ONLINE FREEDOM OF INFORMATION ACT / GOVERNMENT RECORD CLEARING HOUSE IN THE WORLD. THE RESEARCH EFFORTS HERE ARE RESPONSIBLE FOR THE DECLASSIFICATION OF THOUSANDS OF DOCUMENTS THROUGHOUT THE U.S. GOVERNMENT, AND ALL CAN BE DOWNLOADED BY VISITING:

[HTTP://WWW.BLACKVAULT.COM](http://www.blackvault.com)

YOU ARE ENCOURAGED TO FORWARD THIS DOCUMENT TO YOUR FRIENDS, BUT PLEASE KEEP THIS IDENTIFYING IMAGE AT THE TOP OF THE .PDF SO OTHERS CAN DOWNLOAD MORE!

UNCLASSIFIED

Doc 0030562

MANHATTAN DISTRICT HISTORY
 BOOK IV - PILE PROJECT
 X-10
 VOLUME 6 - OPERATION
 APPENDIX - A

4A

PS230

Department of Energy Declassification Review	
1 st Review Date: <u>7/22/13</u>	Determination: [Circle Number(s)]
Authority: <input type="checkbox"/> DC <input checked="" type="checkbox"/> DD	1. Classification Retained
Derived From:	2. Classification Changed To:
Declassify On:	3. Contains No DOE Classified Info
2 nd Review Date: <u>7-25-17</u>	4. Coordinate With:
Name: <u>Robert</u>	<input type="checkbox"/> Declassified
Authority: <u>DD</u>	<input type="checkbox"/> Classified Info Bracketed
	7 Other (Specify)
	<u>Appendix A-104</u>

through A-107 missing
 for Jim unclass sig
 does not contain uncl

2013 0006935

This folder confirmed as
~~Secret Restricted Data~~
~~Excluded~~
Nuclear Branch ORE.
-13-59

ORO 94377

~~SECRET~~

THIS DOCUMENT CONSISTS OF 227 PAGES
NO. 4 OF 4 COPIES, SERIES A

APPENDIX A

MAPS, DRAWINGS, PHOTOS, AND DESCRIPTIONS

~~RESTRICTED DATA~~

This document contains restricted data as defined in the Atomic Energy Act of 1946.

Su Cava

DEPARTMENT OF ENERGY DECLASSIFICATION REVIEW	
1st REVIEW DATE: <u>11/15/78</u>	DETERMINATION (CIRCLE NUMBER(S)) 1. CLASSIFICATION RETAINED 2. CLASSIFICATION CHANGED TO: _____ 3. CONTAINS NO DOE CLASSIFIED INFO 4. COORDINATE WITH: _____ 5. CLASSIFICATION CANCELED 6. CLASSIFIED INFO BRACKETED 7. OTHER (SPECIFY): _____
AUTHORITY: <u>9805</u>	
2nd REVIEW DATE: _____	
AUTHORITY: <u>BB</u>	

CLASSIFICATION CANCELLED	
OR CHANGED TO _____	
BY AUTHORITY OF DOE/DPC	
JOHN K. WATSON	<u>9/6/79</u>
REVIEWER BY	DATE

P9236

~~SECRET~~

1325/17/1/1

~~SECRET~~

MANHATTAN DISTRICT HISTORY

BOOK IV - X10 PROJECT

VOLUME 6 - OPERATION

APPENDIX A

MAPS, DRAWINGS, PHOTOGRAPHS, AND DESCRIPTIONS

<u>No.</u>	<u>Description</u>
1	Flow Sheet - Rod Extrusion, Building 314
2	Flow Sheet - Slug Machining, Building 313
3	Flow Sheet - Assembly Operation
4	Flow Sheet - Water Circuits at Charging Pile Face
5	Flow Sheet - Water Circuits at Discharging Pile Face
6	Flow Sheet - Helium System
7	Flow Sheet - Helium Drying Unit
8	Flow Sheet - Helium Purification Unit
9	Flow Sheet - Helium Circulation Through Pile
10	Flow Sheet - Water Plant B-Area
11	Flow Sheet - Water Plant D-Area
12	Flow Sheet - Steam Lines, 100 Area
13	Flow Sheet - Filter Plant Process Water
14	Flow Sheet - Demineralizing Plant Process Water
15	Flow Sheet - Deaeration Plant Process Water
16	Flow Sheet - Refrigeration Plant Process Water
17	Flow Sheet - Valve Pit Process Water
18	Flow Sheet - Bismuth Phosphate Separation Process
19	Diagram - Sample Can and Case Assembly

A20 - 28 PHOTOS - METAL FABRICATION AND TESTING AREA

20	Photo - Aerial View Metal Fabrication and Testing (300) Area ✓
21	Photo - Press Building (314) ✓
22	Photo - Metal Fabrication Building (313) ✓
23	Photo - Office, Library, and Laboratory (300 Area) ✓
24	Photo - Test Pile Building (305) ✓
25	Photo - Separation Plant (321 Building) ✓
26	Photo - Instrument Shop (3717 Building) ✓
27	Photo - Standard Building (3745) ✓
28	Photo - Heating Plant (384 Building) ✓

CLASSIFICATION CANCELLED
OR CHANGED TO.....
BY AUTHORITY OF DOE/DPG
JOHN K. HARTSOCK
REVIEWED BY
DATE 9/6/74

~~SECRET~~

No.

Description

A29 - 62 PHOTOS - PILE AREAS

29 Photo - Aerial View of Pile (100 B) Area ✓
30 Photo - Aerial View of Pile (100 D) Area ✓
31 Photo - Aerial View of Pile (100 F) Area ✓
32 Photo - Pile Charge Face (105 Pile Building) ×
33 Photo - Pile Discharge Face (105 Pile Building) ×
34 Photo - Halium Purification Building (115 F) ✓
35 Photo - Gas Storage Tanks (110 D) ✓
36 Photo - Pile Control Rods ×
37 Photo - Pile Safety Rods ×
38 Photo - Safety Rod Winches ×
39 Photo - Pile Main Control Panel ×
40 Photo - Pile Miscellaneous Control Panel ×
41 Photo - Pile Inlet Water Panel ×
42 Photo - Pile Pressure Control Panel ×
43 Photo - Rear View of Control Board (105 Pile Building) ×
44 Photo - River Pump House (181 D) ✓
45 Photo - River Pumps (181 D) ✓
46 Photo - Reservoir and Pump House (182 D) ✓
47 Photo - Reservoir Pump Gallery ×
48 Photo - Aerial View of Filter Plant (183 D) ✓
49 Photo - Filter Plant Pumps ×
50 Photo - Filtration Beds ×
51 Photo - Chemical Pump House (108 D) ✓
52 Photo - Aerial View of Demineralization Plant (186 D) ✓
53 Photo - Deaerating Building (185 D) ✓
54 Photo - Deaerator Control Gallery ×
55 Photo - Deaerator Acid Pumps ×
56 Photo - Final Water Conditioning Equipment ×
57 Photo - Refrigeration Equipment (100 F Building) ×
58 Photo - Pile Area Process Water Tank ×
59 Photo - Pile Area Process Water Pumps ×
60 Photo - Retention Basin ✓
61 Photo - Primary Substation (151 D) ✓
62 Photo - Power House (100 Area) ✓

A63 - 95 PHOTOS - SEPARATION AREAS

63 Photo - Aerial View of Separation (200 N) Area
64 Photo - Lag Storage (212 Building)
65 Photo - Aerial View of Separation (200 E) Area
66 Photo - Aerial View of Separation (200 T) Area
67 Photo - Aerial View of Separation (221 T Building)
68 Photo - Bulk Reduction Building (224 T)
69 Photo - Process Waste Storage (241 T Building)
70 Photo - Stack and Ventilation Building (291)

~~SECRET~~

No.	Description
71	Photo - Vertical Acid Storage Tanks (211)
72	Photo - Horizontal Acid Storage Tanks (211)
73	Photo - Chemical Preparation and Service Building (271 T)
74	Photo - Sample Preparation Laboratory (222 T Building)
75	Photo - Isolation Building (231 W)
76	Photo - Area Shop (272 E Building)
77	Photo - Power Plant (200 E Area)
78	Photo - Reservoir and Pump House (282 W)
79	Photo - Filter Plant (283 W)
80	Photo - Heat Treating Furnace Building (273 E)
81	Photo - Meteorological Tower
82	Photo - Operating Gallery (221 Building)
83	Photo - Pipe Gallery (221 Building)
84	Photo - Electrical Gallery (221 Building)
85	Photo - Cell Covers (221 Building)
86	Photo - Separation Plant Dissolver (221 Building)
87	Photo - Precipitator and Solution Tank (221 Building)
88	Photo - Centrifuge and Catch Tank (221 Building)
89	Photo - Operation Gallery (224 Building)
90	Photo - Standard Cells in 224 Building
91	Photo - Weigh Tank and Filling Enclosure for Conc. Product Sol. (224 Building)
92	Photo - Typical Unit in Isolation Building
93	Photo - Typical Laboratory (231 Building)
94	Photo - Ventilation System in 231 Building
95	Photo - Magazine Storage (213 Building)

A96 - 151 PHOTOS - RICHLAND VILLAGE

96	Photo - Aerial View of Richland Village (1100 Area) Looking North
97	Photo - Aerial View of Administration Area
98	Photo - Substation
99	Photo - Substation
100	Photo - Reservoirs and Pump House
101	Photo - Reservoirs and Pump House
102	Photo - Water Tank
103	Photo - Sewage Disposal Plant
104	Photo - Richland Village Typical Concrete Walk
105	Photo - Richland Village Typical Bituminous Walk
106	Photo - Professional Building - Hospital
107	Photo - Jefferson Grade School
108	Photo - Lewis and Clark Grade School
109	Photo - Marcus Whitman Grade School
110	Photo - Sacajawes Grade School
111	Photo - Columbia High School
112	Photo - Protestant Church
113	Photo - Catholic Church
114	Photo - Red Cross Building

~~SECRET~~

~~SECRET~~

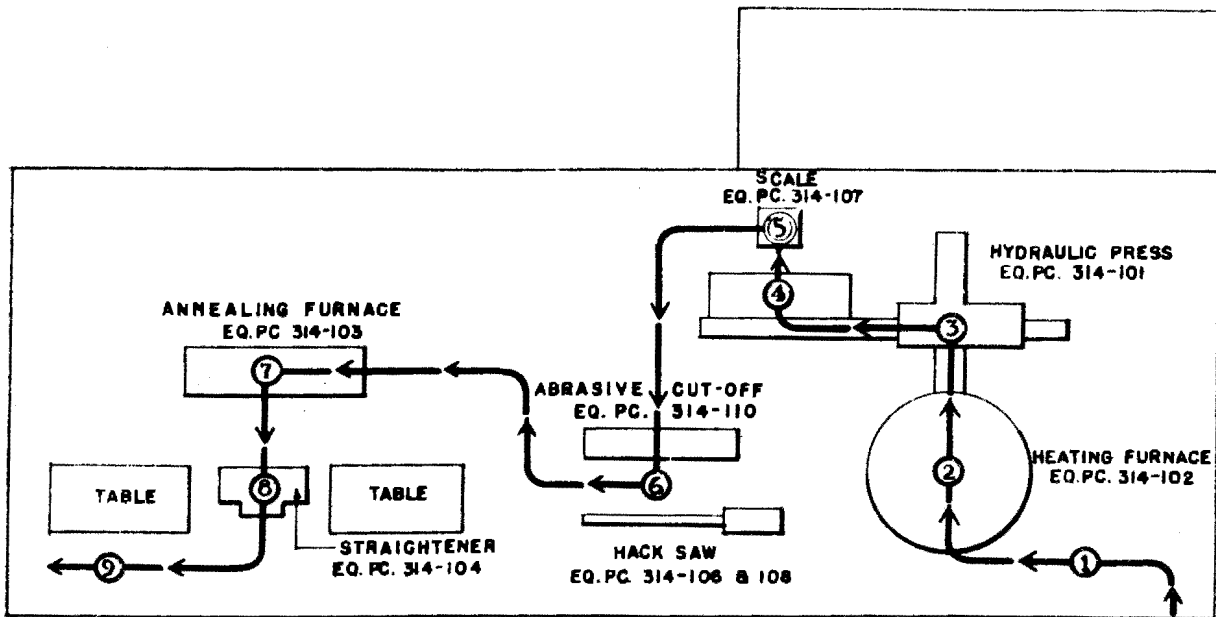
<u>No.</u>	<u>Description</u>
115	Photo - Nursery
116	Photo - Dormitory
117	Photo - Transient Quarters
118	Photo - Conventional Type A House
119	Photo - Conventional Type B House
120	Photo - Conventional Type D House
121	Photo - Conventional Type E House
122	Photo - Conventional Type F House
123	Photo - Conventional Type H House
124	Photo - Conventional Type G House
125	Photo - Conventional Type L House
126	Photo - Typical Prefabricated-House Street
127	Photo - Prefabricated Type A House
128	Photo - Prefabricated Type B House
129	Photo - Prefabricated Type C House
130	Photo - Aerial View of Commercial Facilities
131	Photo - Drug Store
132	Photo - Western Union Building
133	Photo - Post Office
134	Photo - Women's Apparel Shop
135	Photo - Optical Shop
136	Photo - Men's Apparel Shop
137	Photo - Milk Depot
138	Photo - Bus Depot
139	Photo - Barber Shop
140	Photo - Food Store
141	Photo - Service Station
142	Photo - Department Store
143	Photo - Cafeteria
144	Photo - Hardware Store
145	Photo - Bank
146	Photo - Electrical Shop
147	Photo - Recreation Building
148	Photo - Theater
149	Photo - Typical Baseball Field
150	Photo - High School Football Field
151	Photo - Richland Village Park

~~SECRET~~



FLOW SHEET

BLDG. NO. 314 - ROD EXTRUSION



LIST OF OPERATIONS

OPER. NO.	NAME	EQUIPMENT	E.P. NO.
①	TRANSFER	TRUCK	314
②	PRE-HEAT	FURNACE	314-102
③	EXTRUDE	HYDRAULIC PRESS	314-101
④	STRAIGHTEN & QUENCH	TABLE & TANK	314-107
⑤	WEIGH	SCALES	314-107
⑥	CROP	SAW	314-106, 8, 10
⑦	ANNEAL & OUTGAS	FURNACE	314-103
⑧	STRAIGHTEN	STRAIGHTENING ROLLS	314-104
⑨	TRANSFER	TRUCK	314

AI

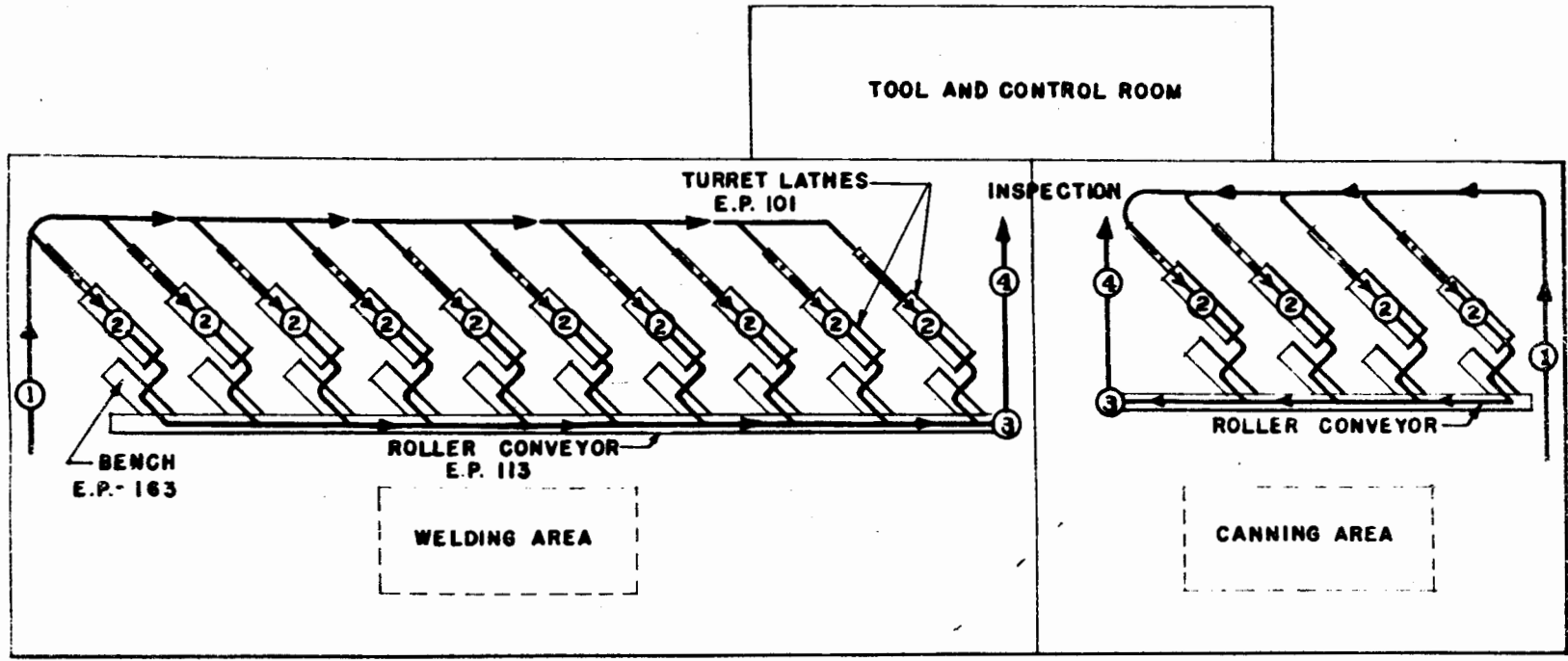
~~SECRET~~

1978-11-2

FLOW SHEET

BLDG. 313 - SLUG MACHINING

~~SECRET~~



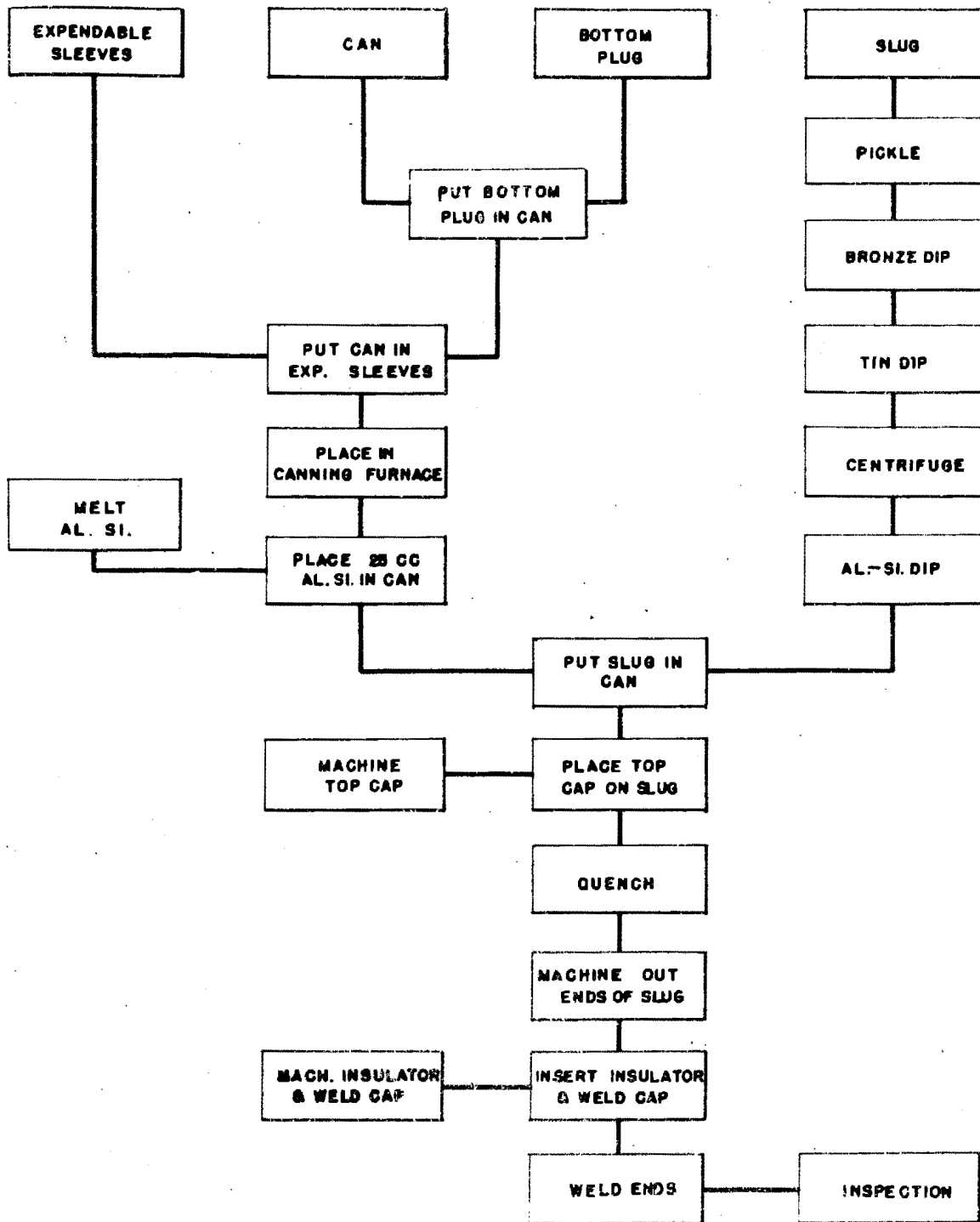
LIST OF OPERATION

- ① TRANSFER
- ② MACHINE
- ③ TRANSFER
- ④ INSPECTION & TRANSFER

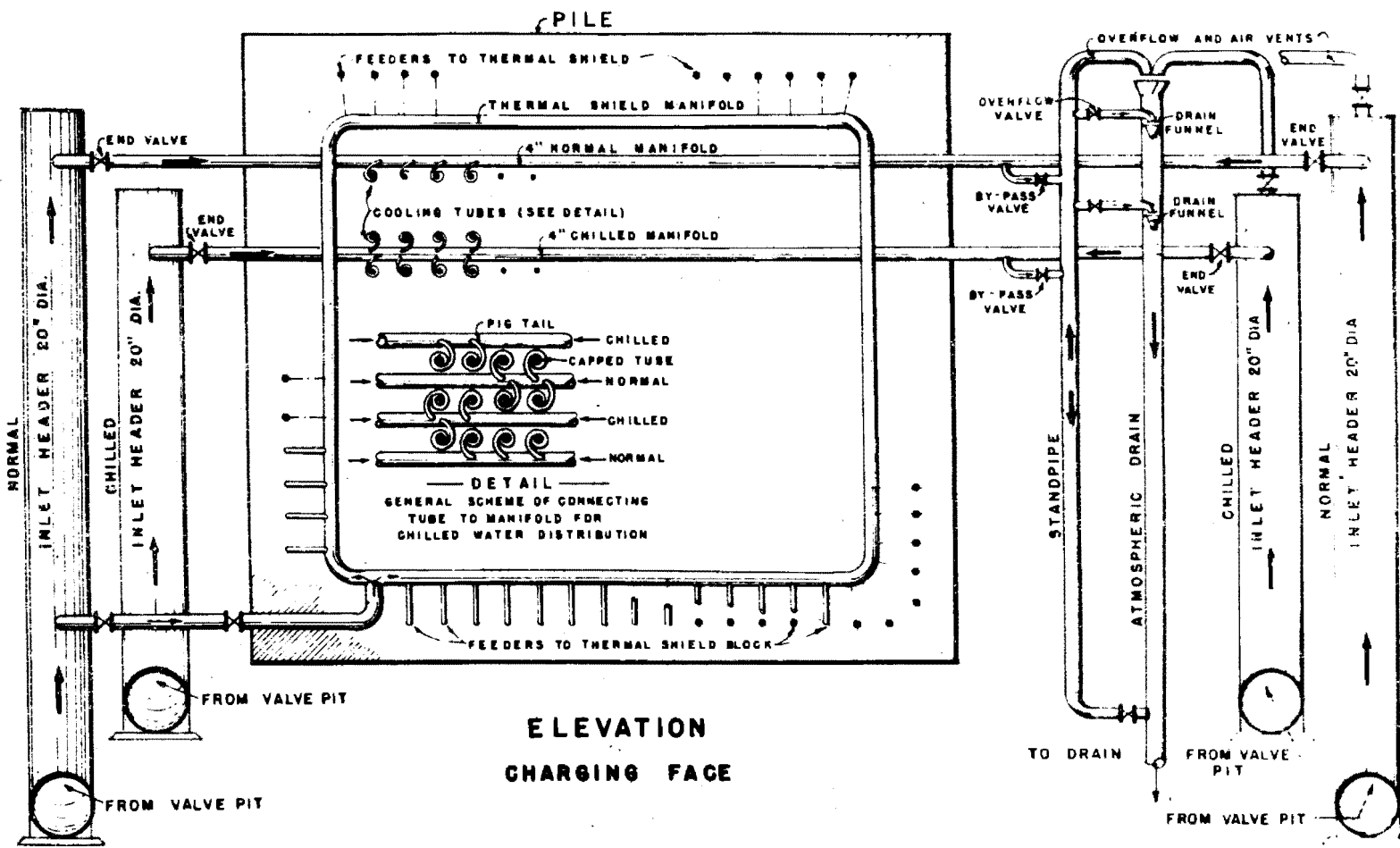
~~SECRET~~
A2

FLOW SHEET

ASSEMBLY OPERATION



~~H-M-N~~

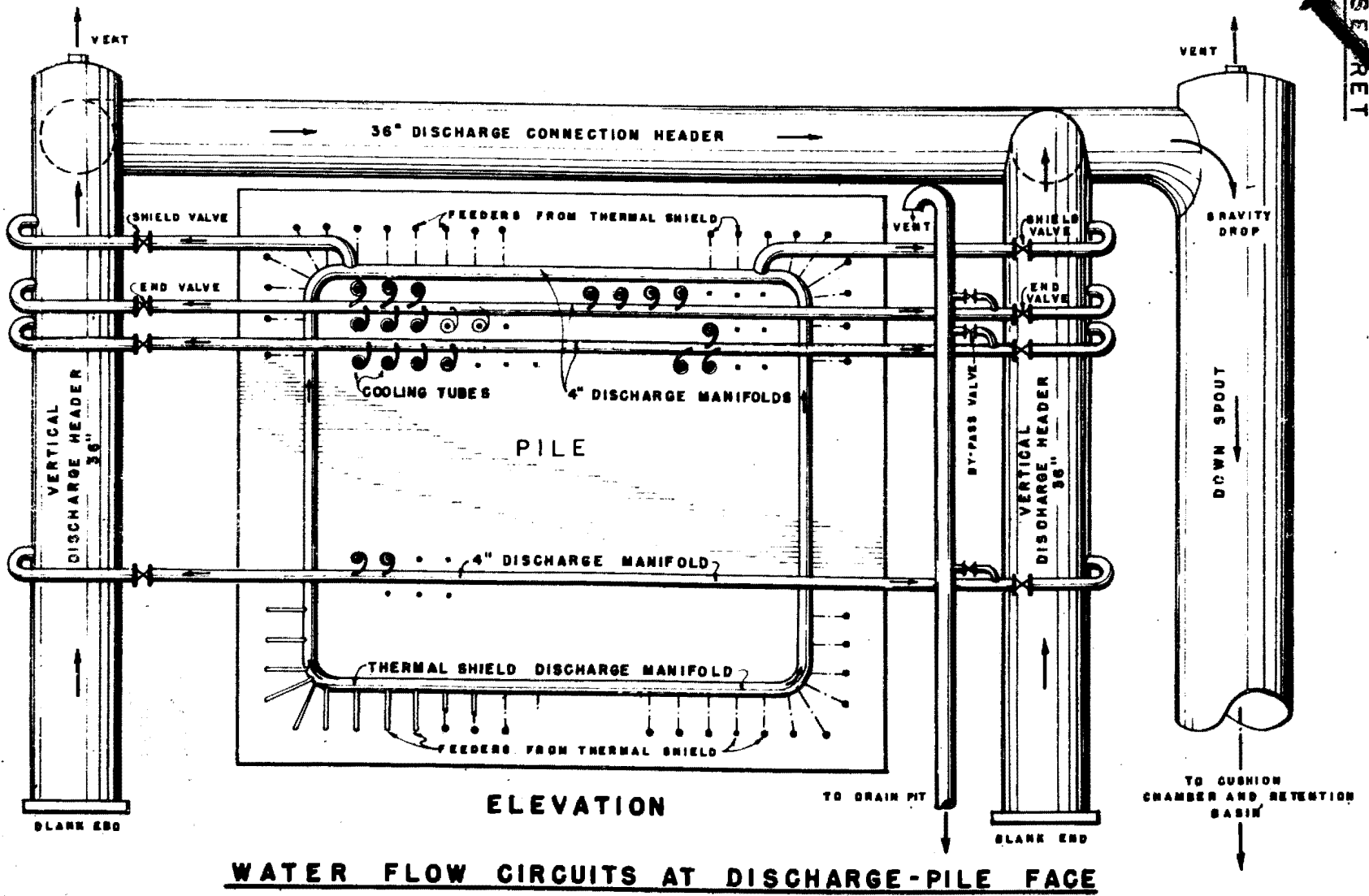


ELEVATION
CHARGING FACE

WATER FLOW CIRCUITS AT CHARGING - PILE FACE

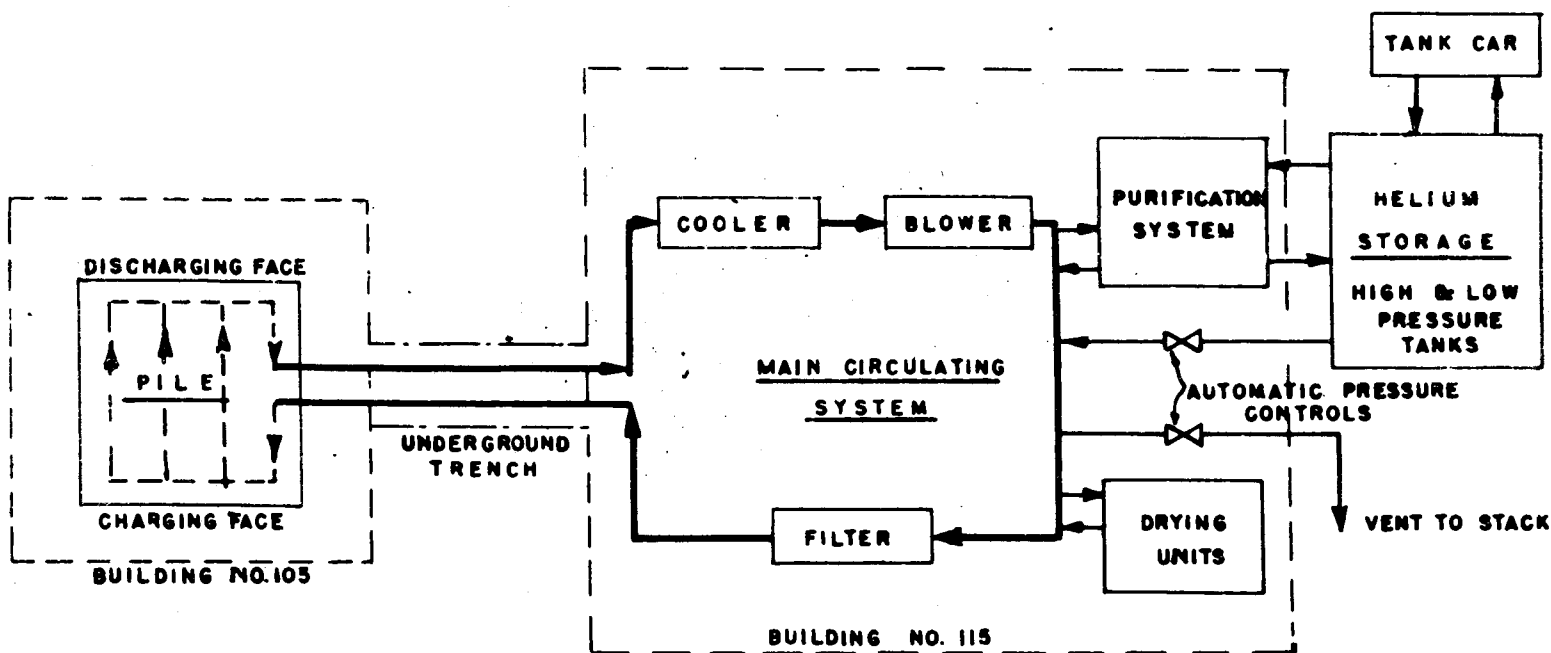
~~SECRET~~
H-M-D
2

~~SECRET~~



~~SECRET~~
H-M-1-1-2-2

A5

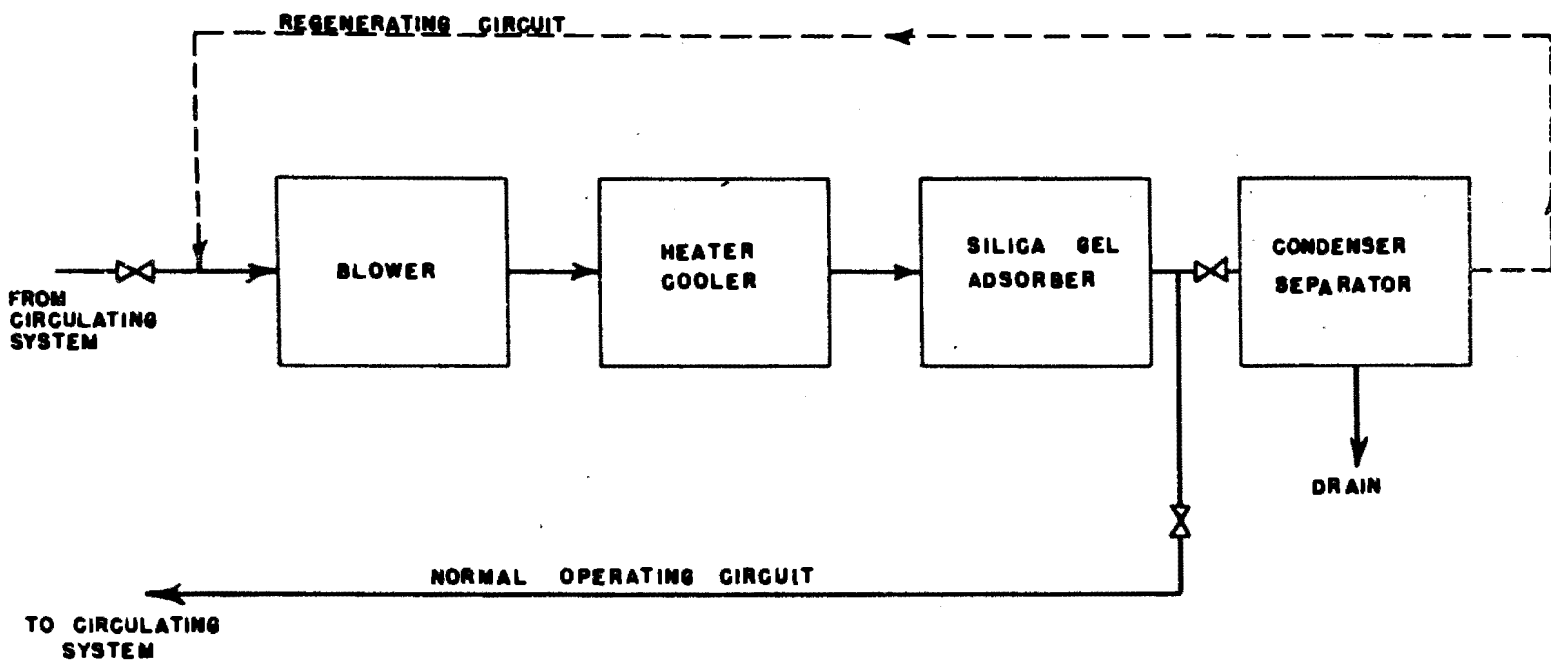


SCHEMATIC DIAGRAM OF THE HELIUM SYSTEM

R 7/45
H-111
SECRET
A6
1019-4

~~SECRET~~

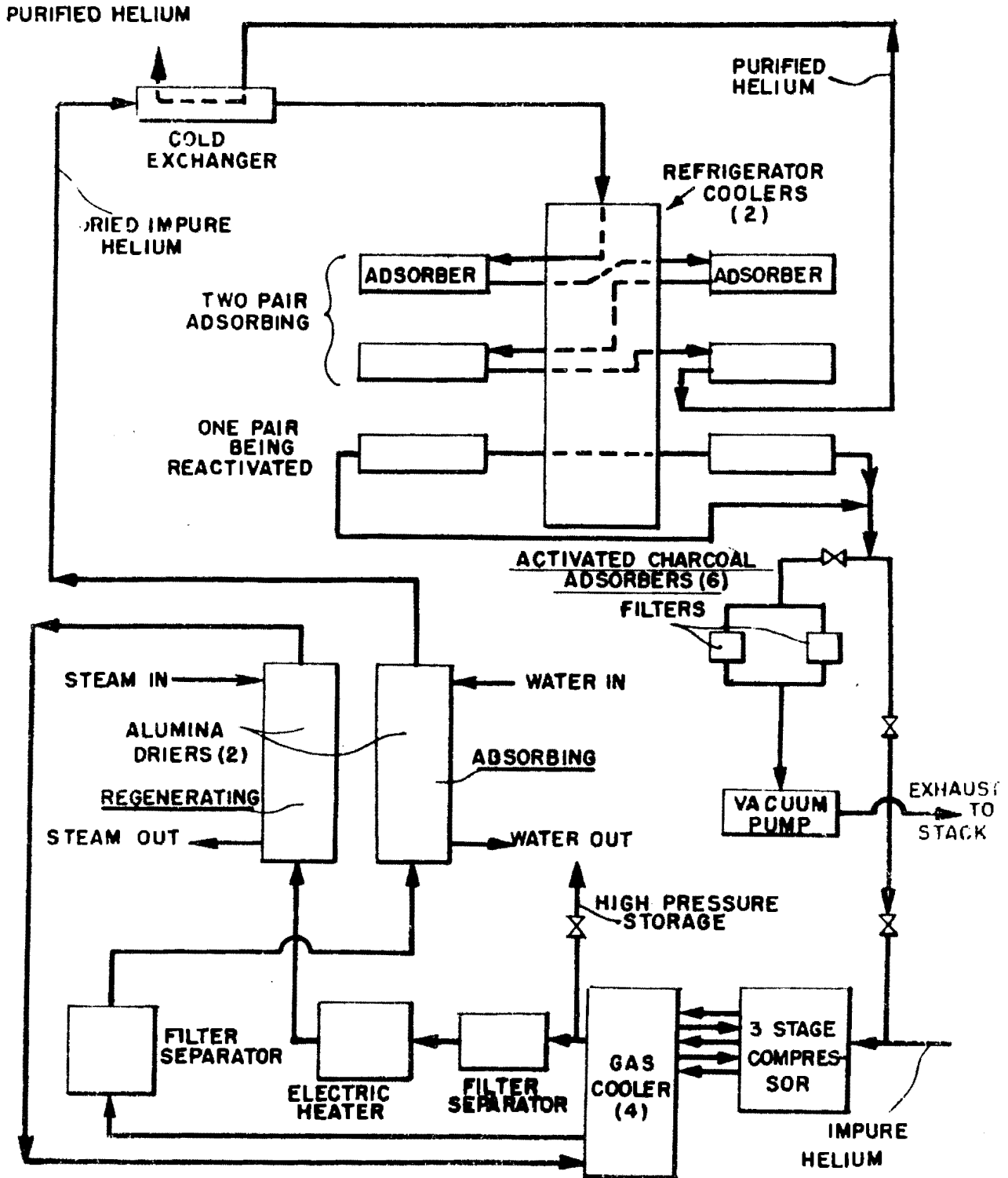
ARRANGEMENT OF DRYING UNIT



~~SECRET~~
H-M-B-1024-4
R 7/45

A7

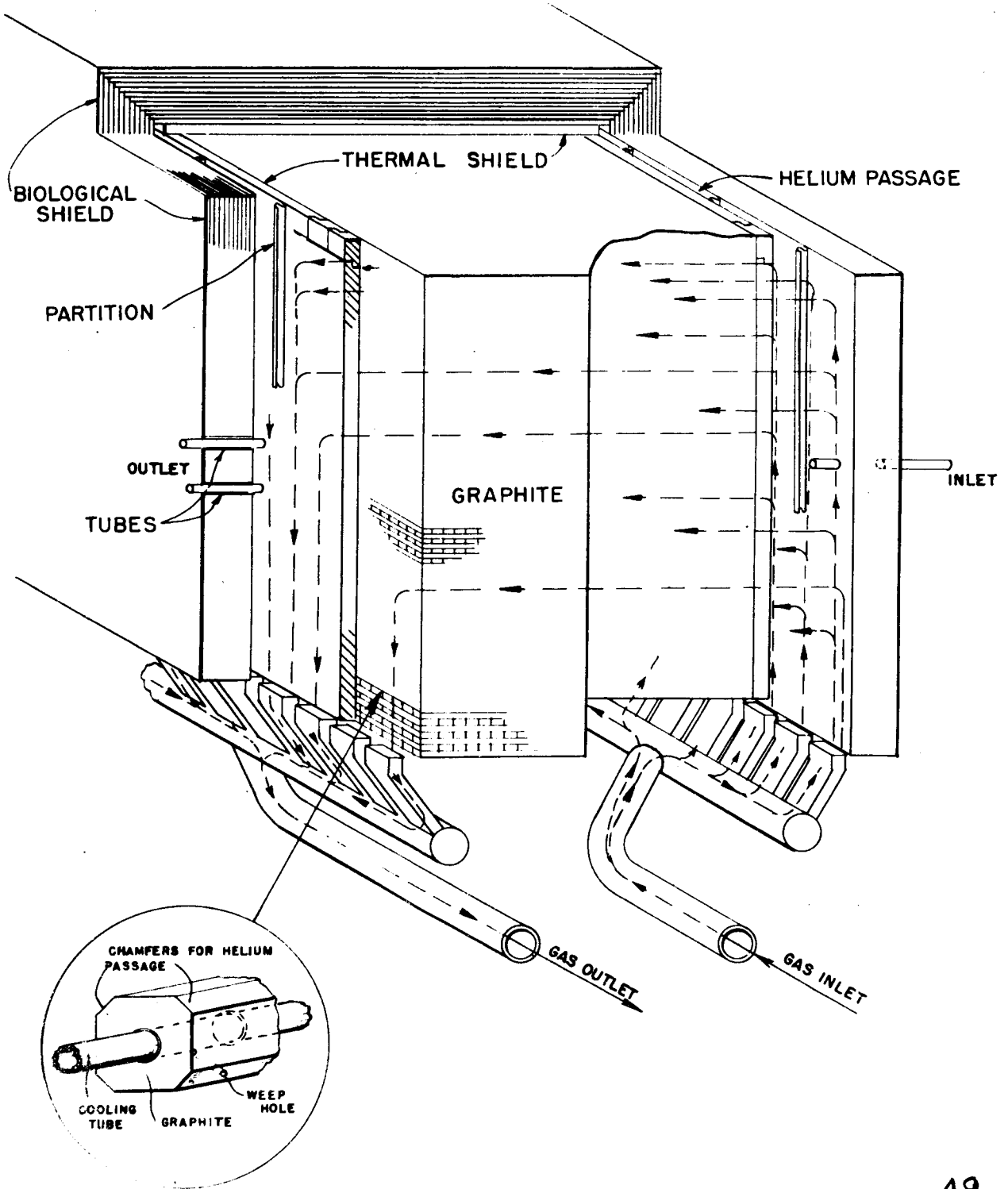
FLOW CIRCUIT - HELIUM PURIFICATION UNIT



A8

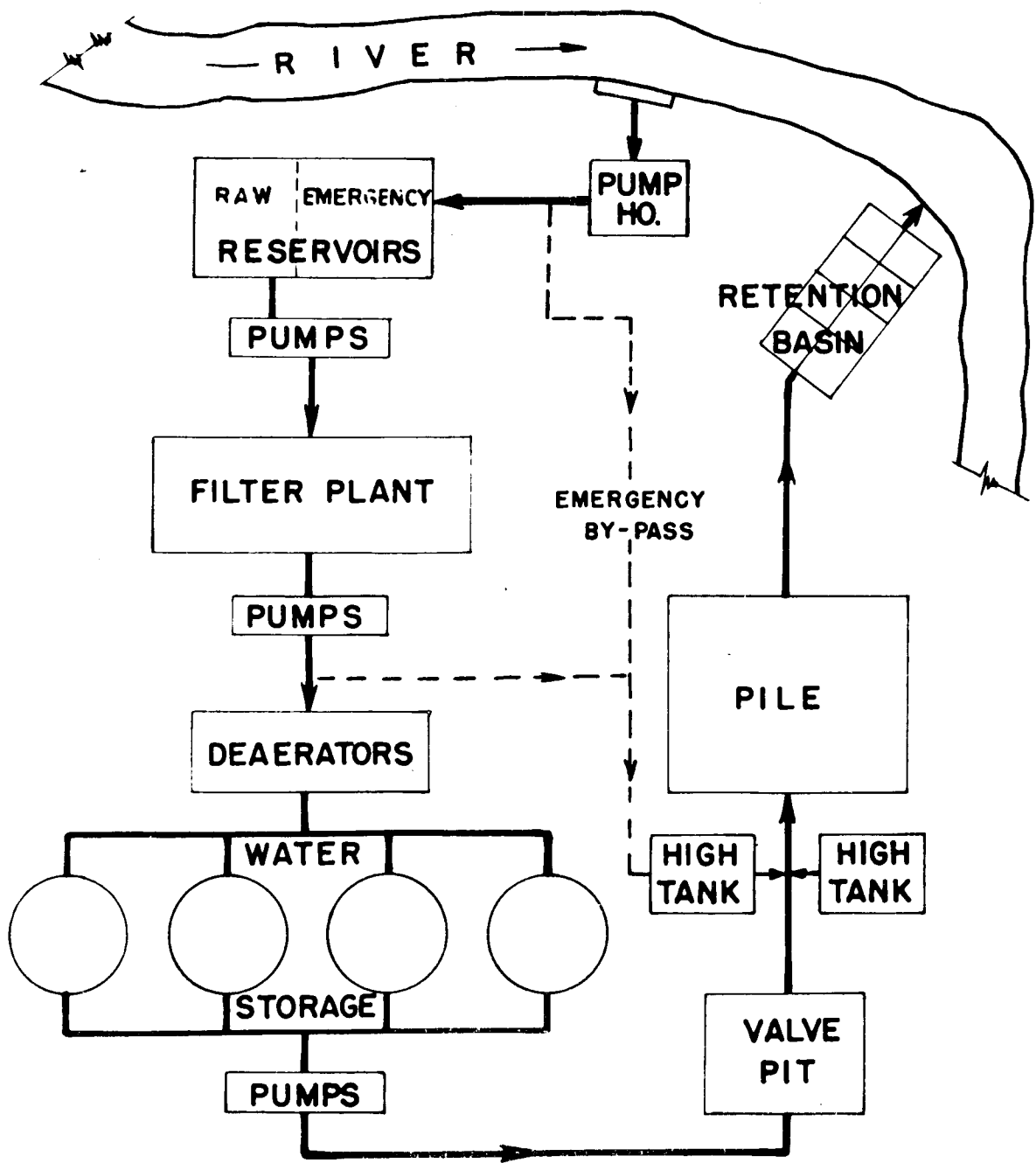
SECRET
H-M-D-1026-4
R 7/45

HELIUM CIRCULATION THROUGH PILE



~~SECRET~~

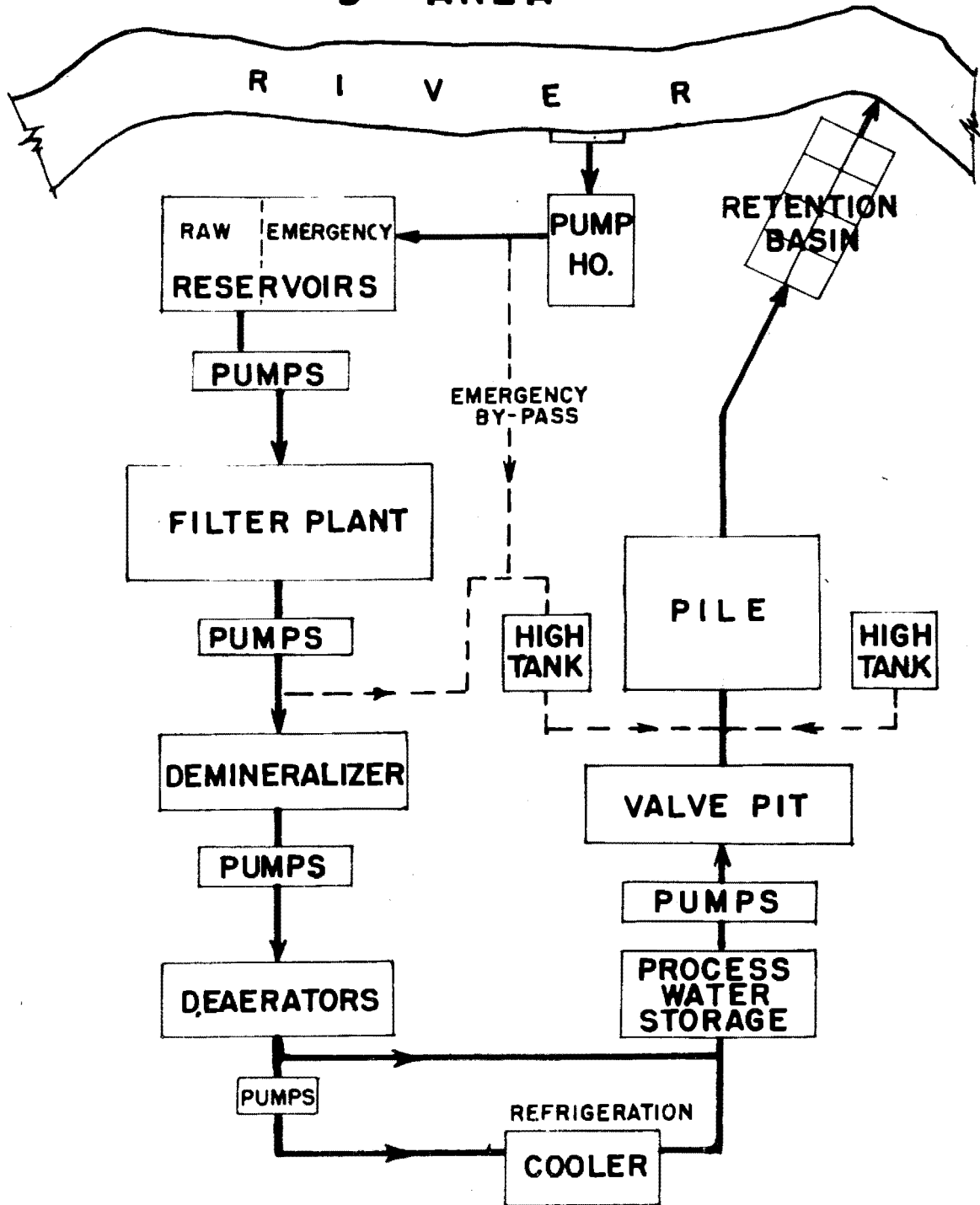
FLOW CIRCUIT - WATER PLANT B-AREA



A10

~~SECRET~~
H-M-B-1004-3

FLOW CIRCUIT - WATER PLANT D - AREA



All

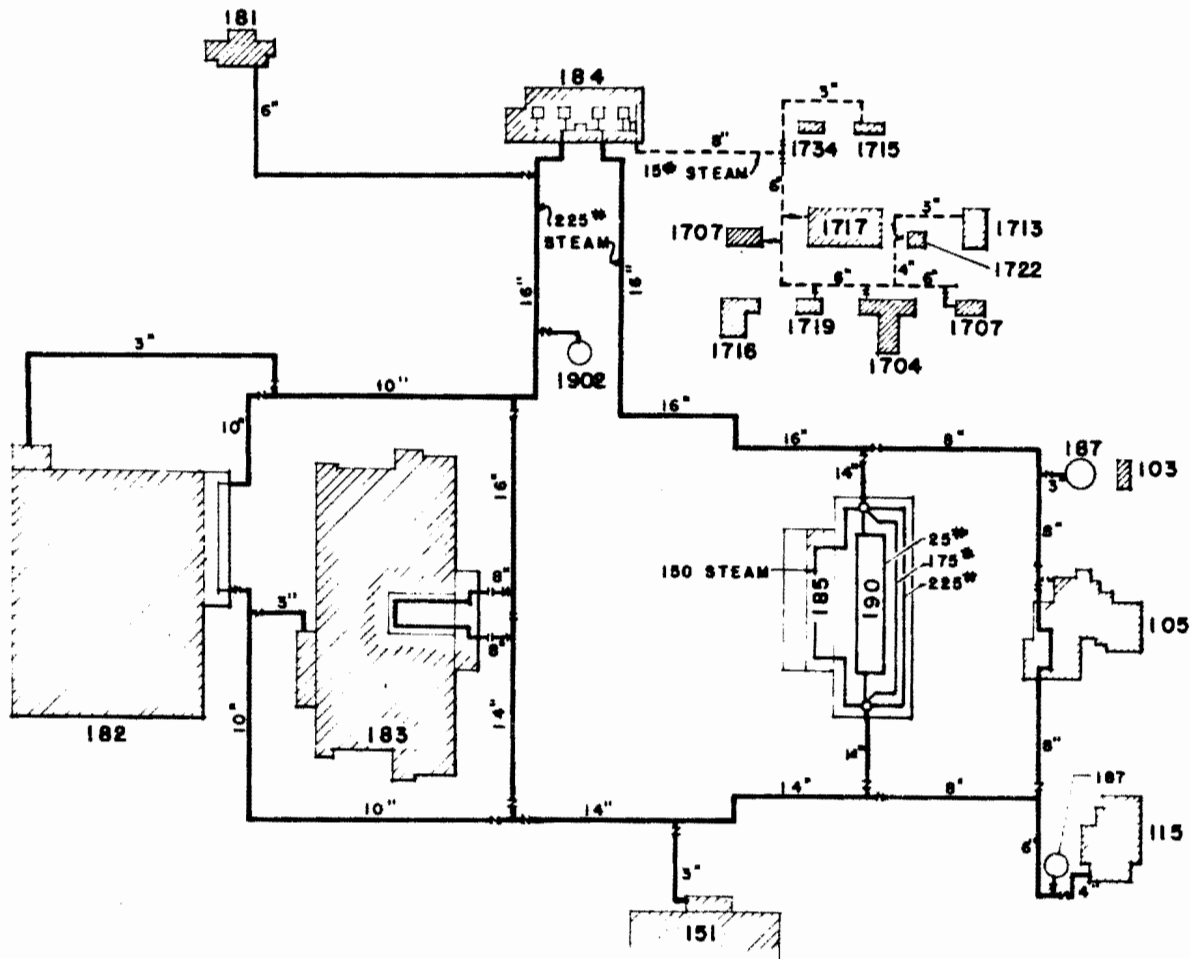
100 AREA STEAM LINES

LEGEND

- 181 - RIVER PUMP HOUSE
- 182 - RESERVOIR & PUMP HOUSE
- 183 - FILTER PLANT & PUMPS
- 184 - POWER HOUSE
- 185 - REAERATING PLANT
- 187 - ELEVATED TANKS
- 189 - REFRIGERATOR HOUSE
- 190 - MAIN PUMP HOUSE

- 103 -
- 105 - PILE BUILDING
- 115 - HELIUM CIRCULATION & PUR.
- 151 - PRIMARY SUB-STATION

- 1704 - SUPERVISOR'S OFFICE & LAB.
- 1707 - CHANGE HOUSE
- 1713 - STORE ROOM
- 1715 - OIL & PAINT STORAGE
- 1716 - AUTOMOTIVE REPAIR SHOP
- 1717 - COMBINED SHOPS
- 1719 - FIRST AID
- 1722 - AREA SHOP
- 1734 - CYLINDER STORAGE

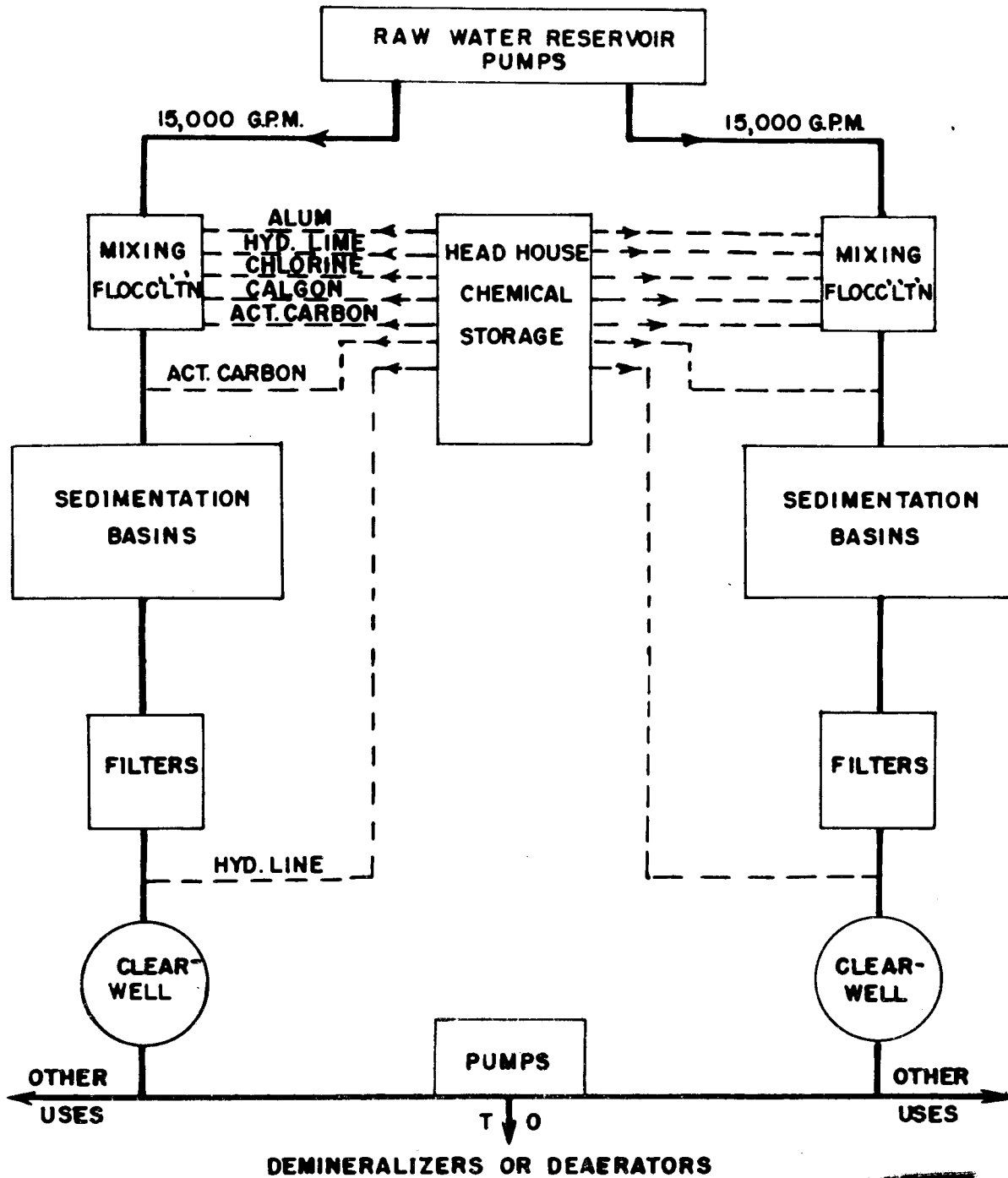


H-M-B-1032-3

A12

~~SECRET~~

FLOW CIRCUIT-FILTER PLANT PROCESS WATER

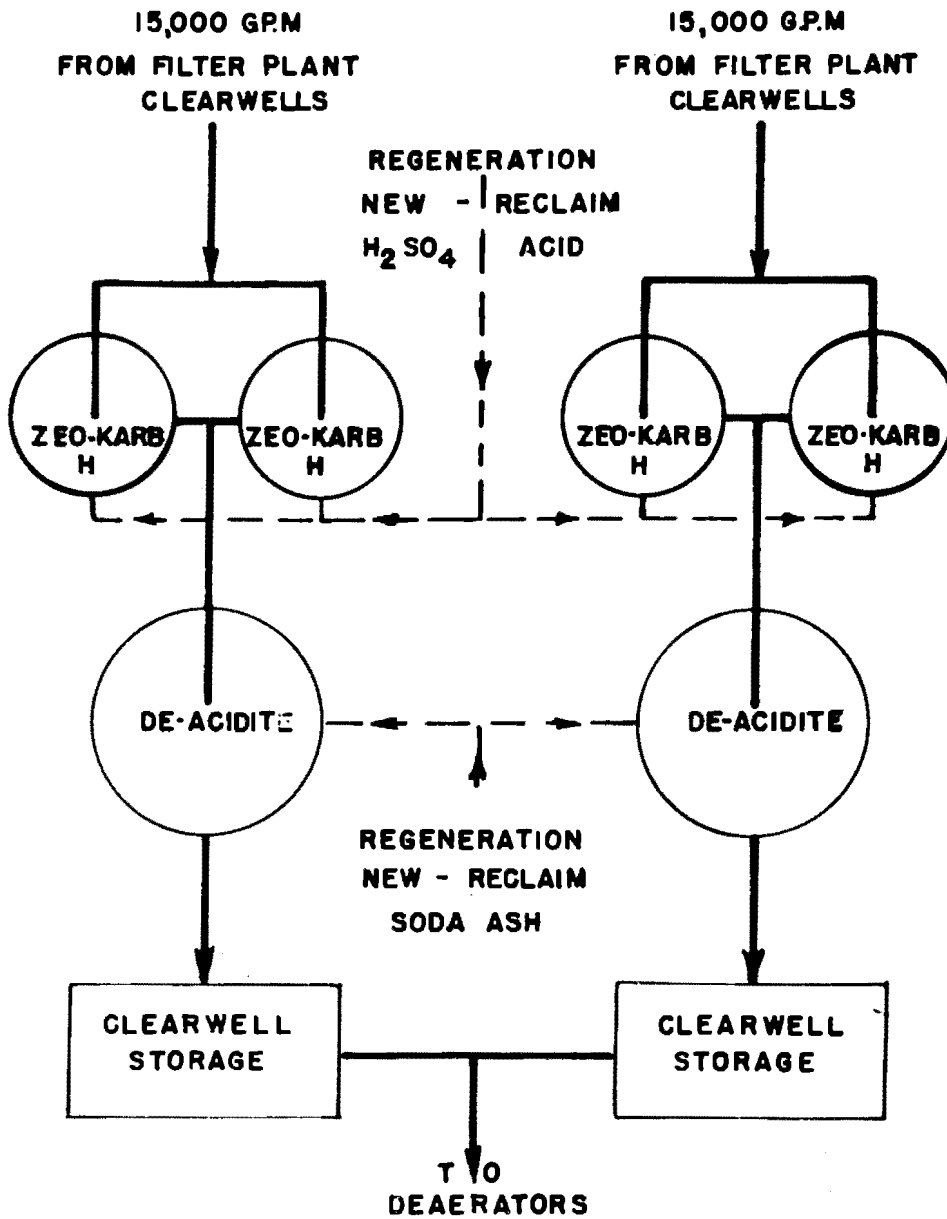


A13

~~SECRET~~
H-M-B-1008-4

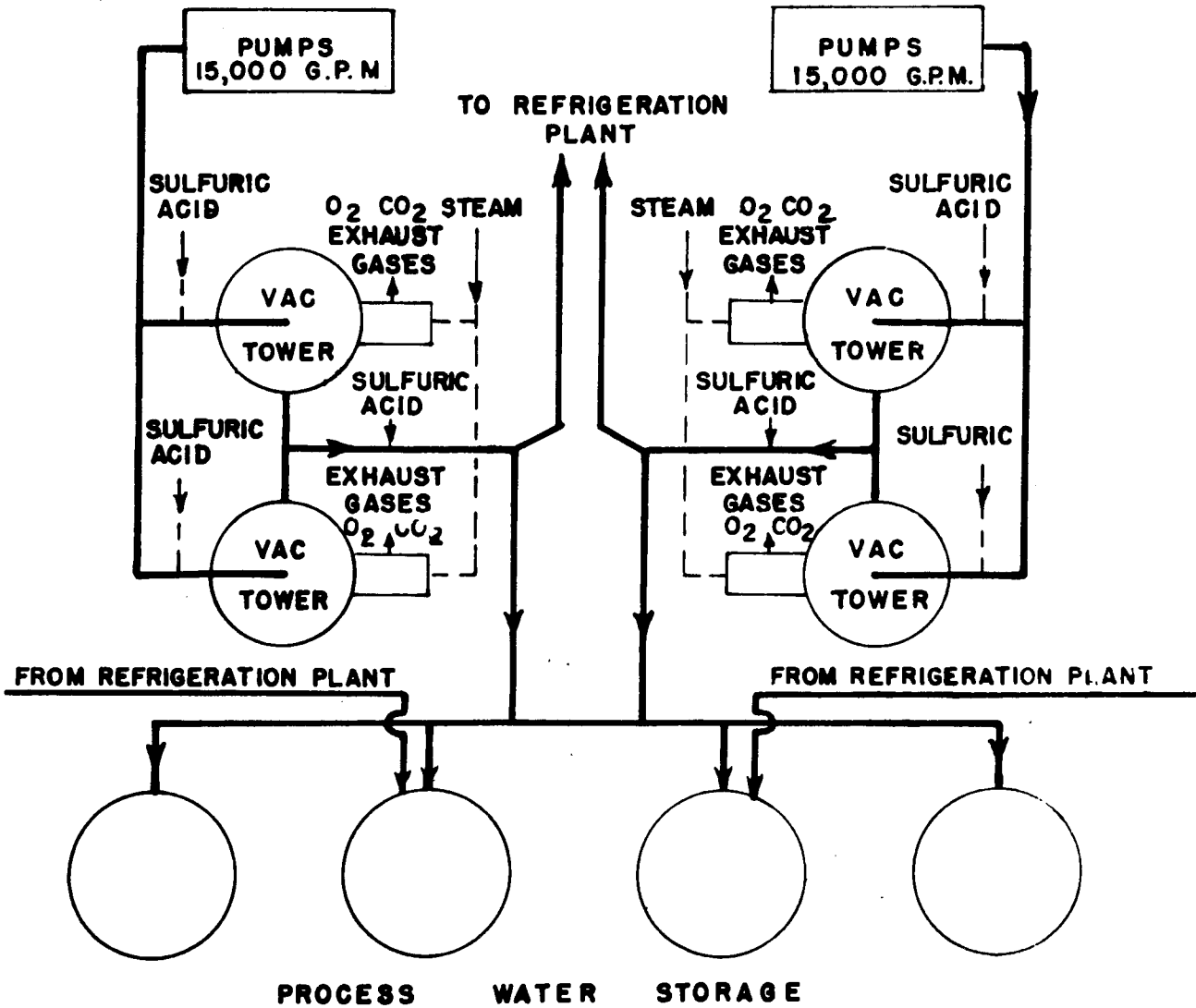
~~SECRET~~

FLOW CIRCUIT - DEMINERALIZING PLANT PROCESS WATER



~~SECRET~~

FLOW CIRCUIT — DEAERATION PLANT PROCESS WATER

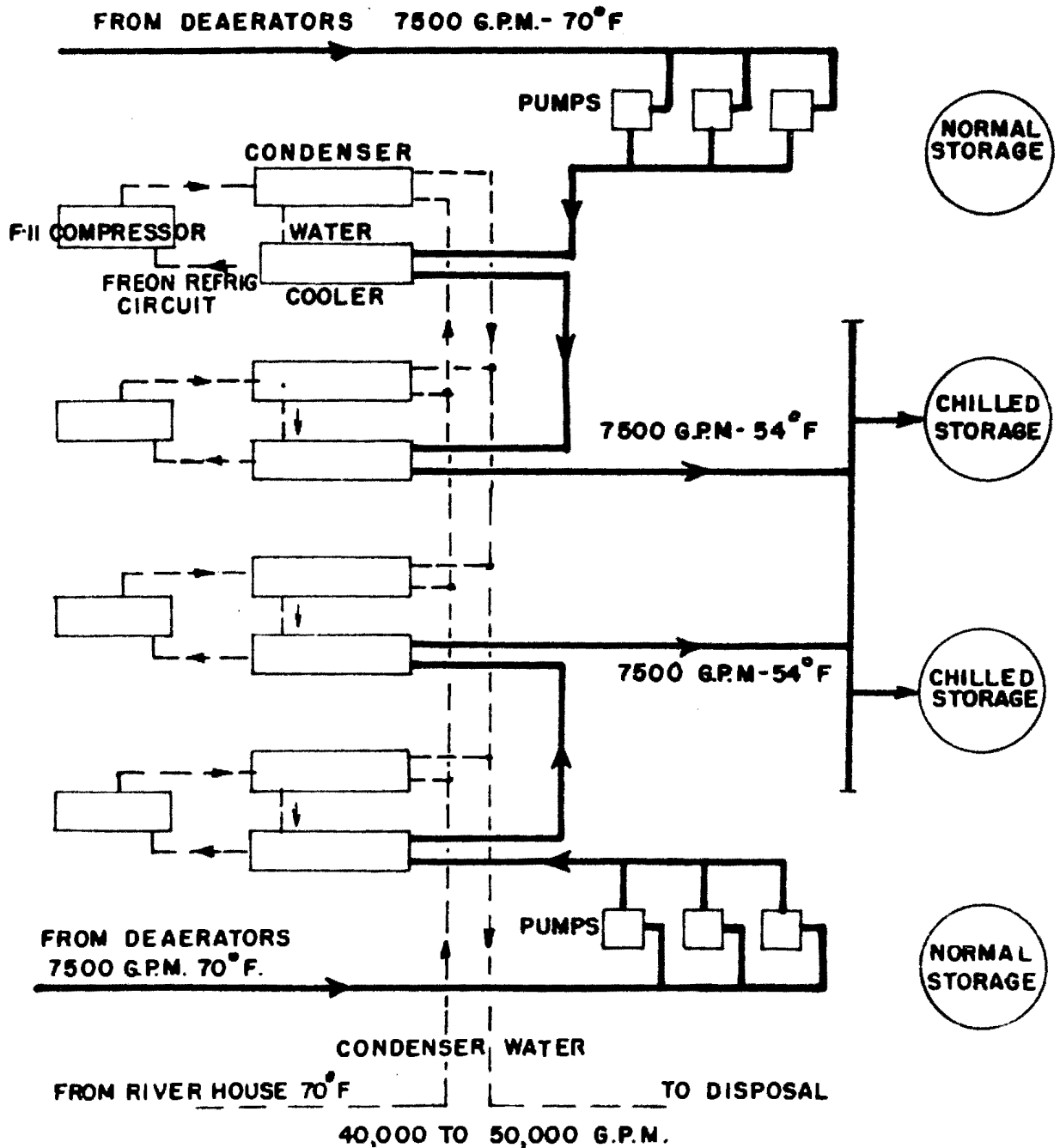


A15

~~SECRET~~
H-M-B-1012-4

~~SECRET~~

FLOW CIRCUIT - REFRIGERATION PLANT PROCESS WATER



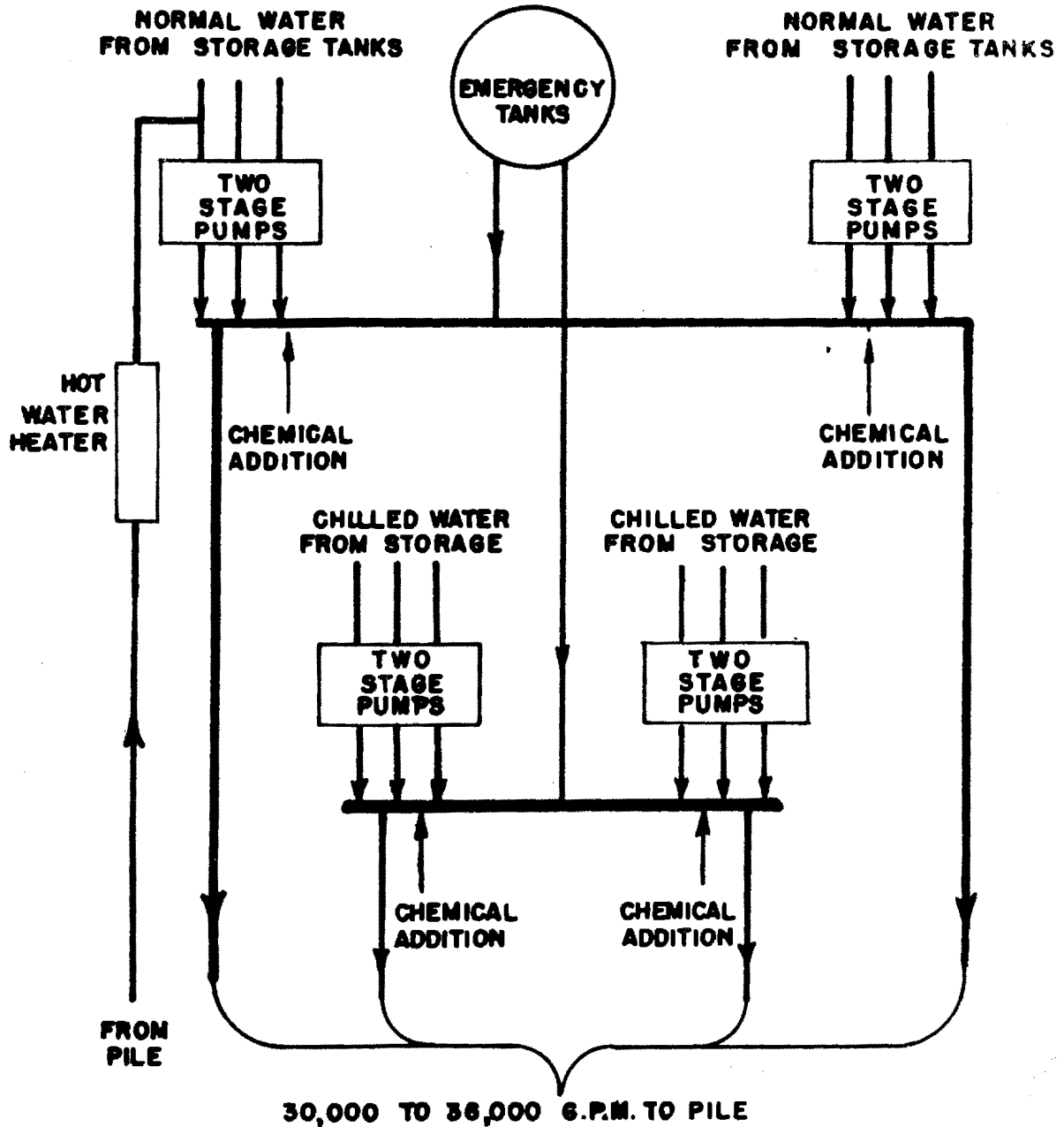
A16

~~SECRET~~

MEM-B-1013-4
R 7/45

~~SECRET~~

FLOW CIRCUIT- VALVE PIT PROCESS WATER



A17

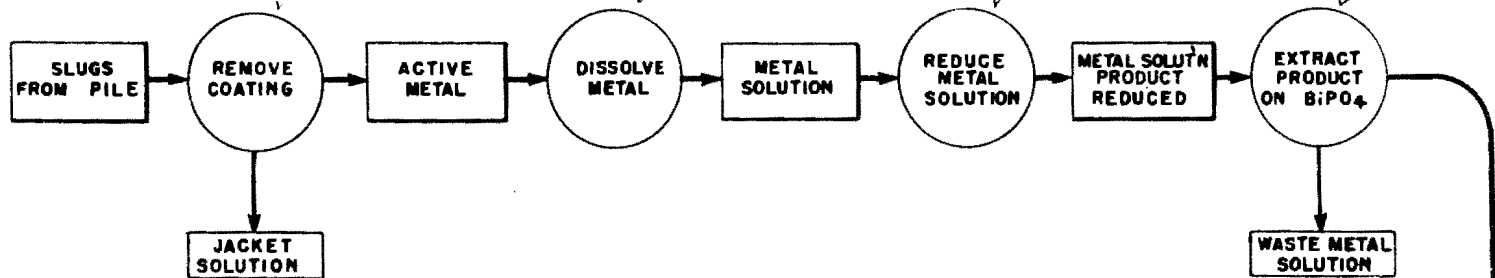
~~SECRET~~

H-M-B-1015-4

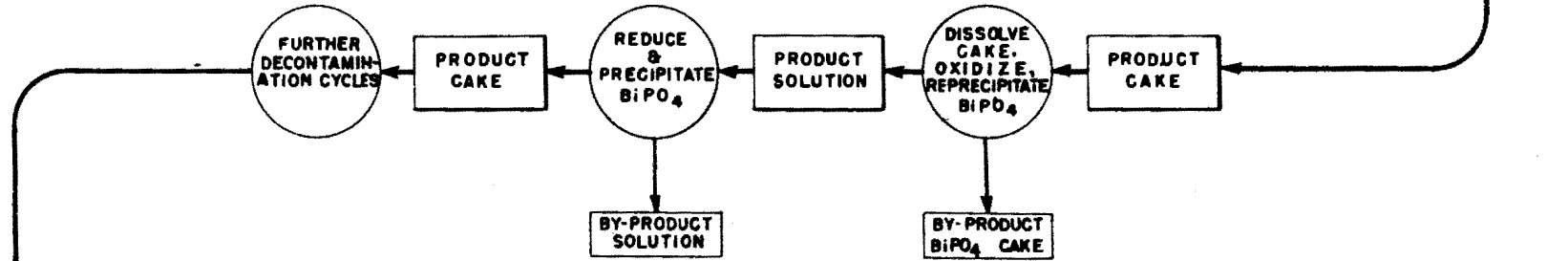
R 7/45

~~SECRET~~

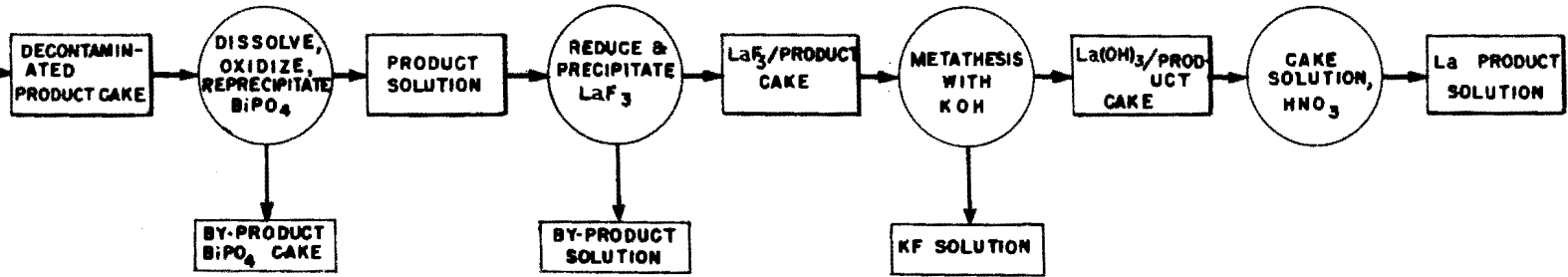
- EXTRACTION -



- DECONTAMINATION -



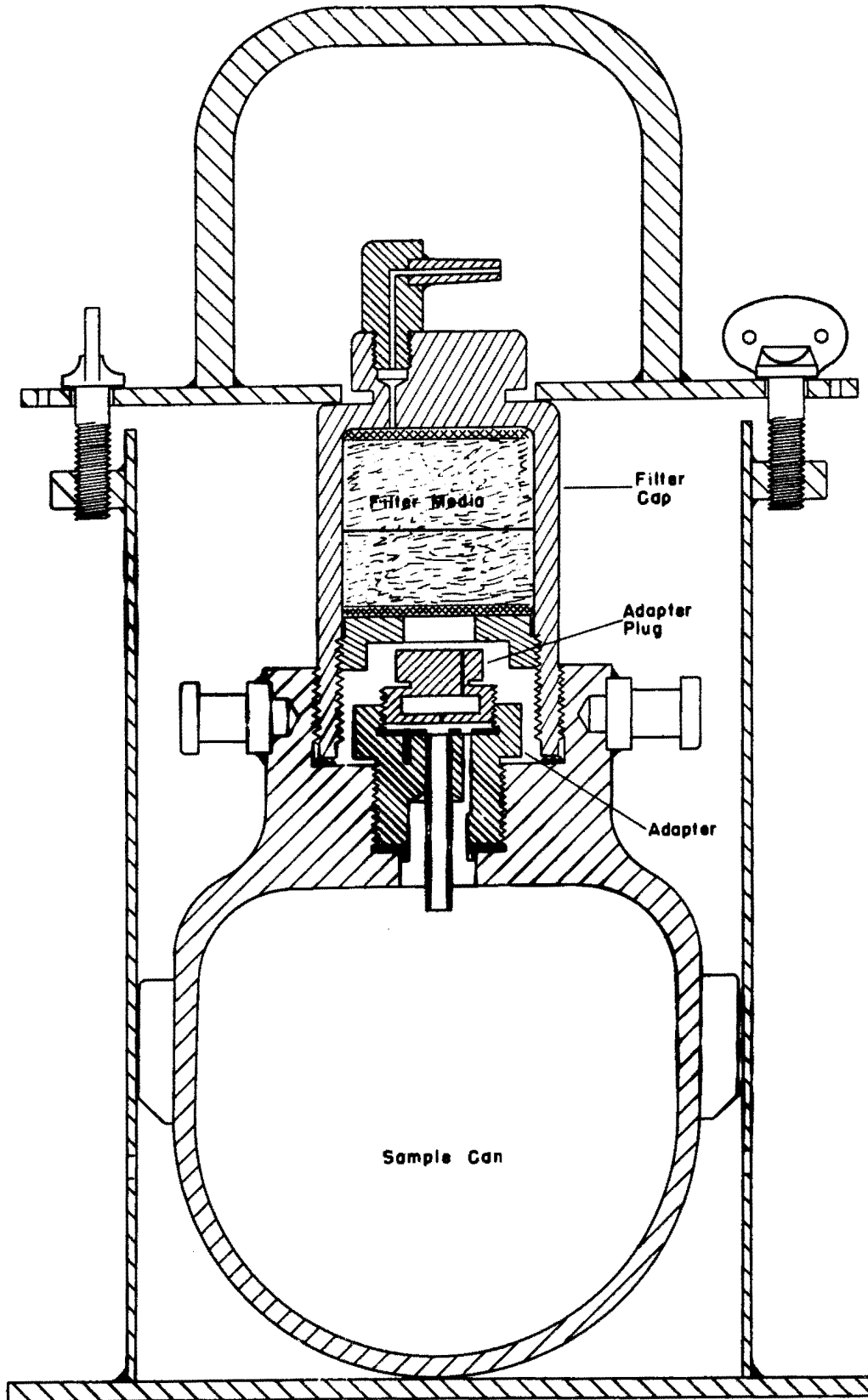
- CONCENTRATION -



BISMUTH PHOSPHATE SEPARATION PROCESS

~~SECRET~~
HM-C-207-3
A18

SAMPLE CAN AND CASE ASSEMBLY



A19

~~SECRET~~

Metal Fabrication and
Testing Area

METAL FABRICATION AND TESTING (300) AREA



~~SECRET~~

APPENDIX A 20

AERIAL VIEW OF METAL FABRICATION AND TESTING (300) AREA

~~SECRET~~



~~SECRET~~

APPENDIX A 21

PRESS BUILDING (314)

This building contains an hydraulic press where billets are extruded into rods, and equipment for out-gassing, cropping, and final straightening of the uranium rods.

~~SECRET~~



P 8022

~~SECRET~~

APPENDIX A 22

METAL FABRICATION BUILDING (313)

This building contains facilities for machining uranium rods into short cylinders (slugs); canning the slugs; and testing the canned slugs preparatory to use in the transmutation process.



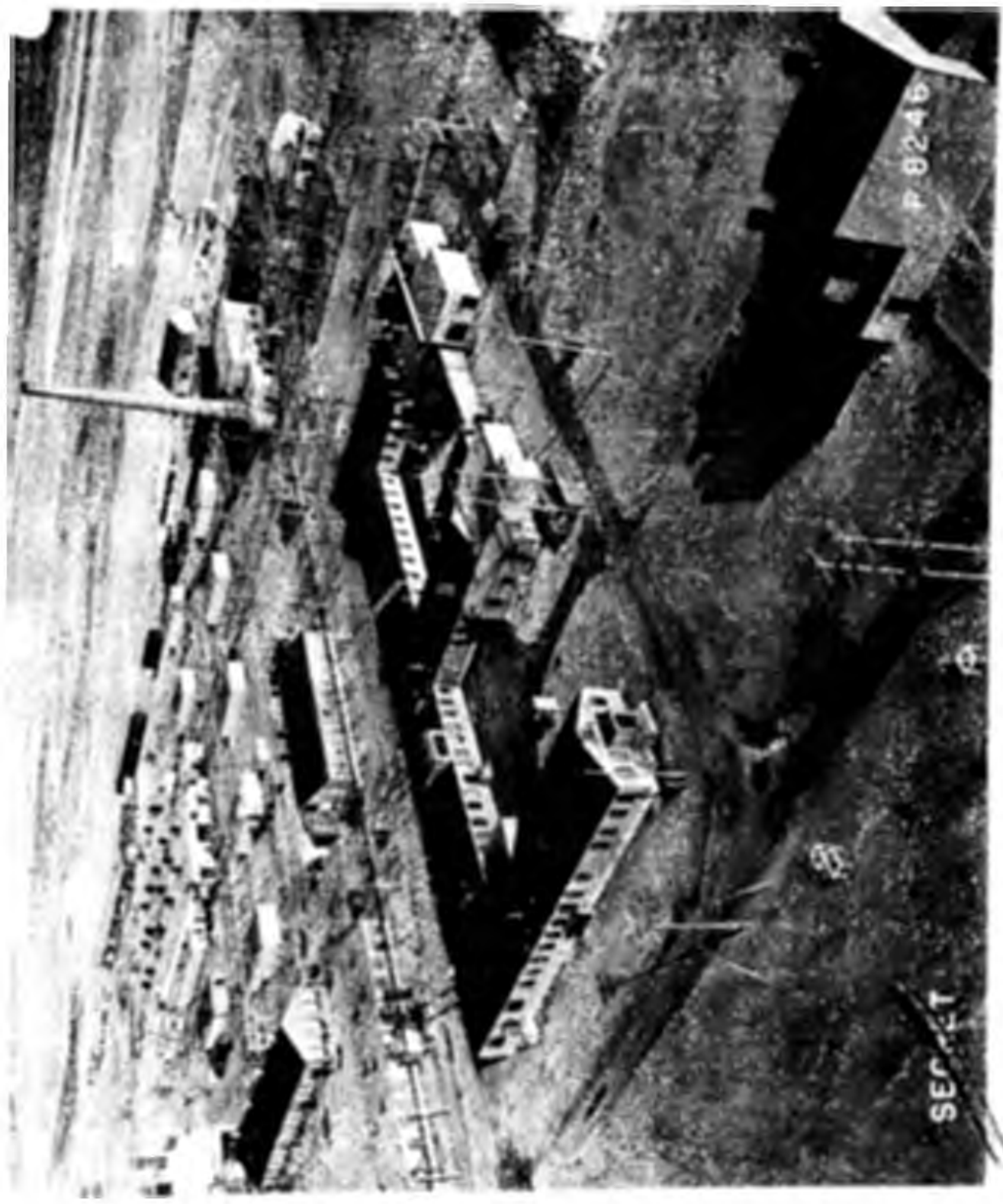
SECRET

P 8028

APPENDIX A 23

OFFICE, LIBRARY, AND LABORATORY (300 AREA)

This building includes laboratories for instrument development and analytical control and the development necessary in connection with the plant processes.



F 8246

SECRET

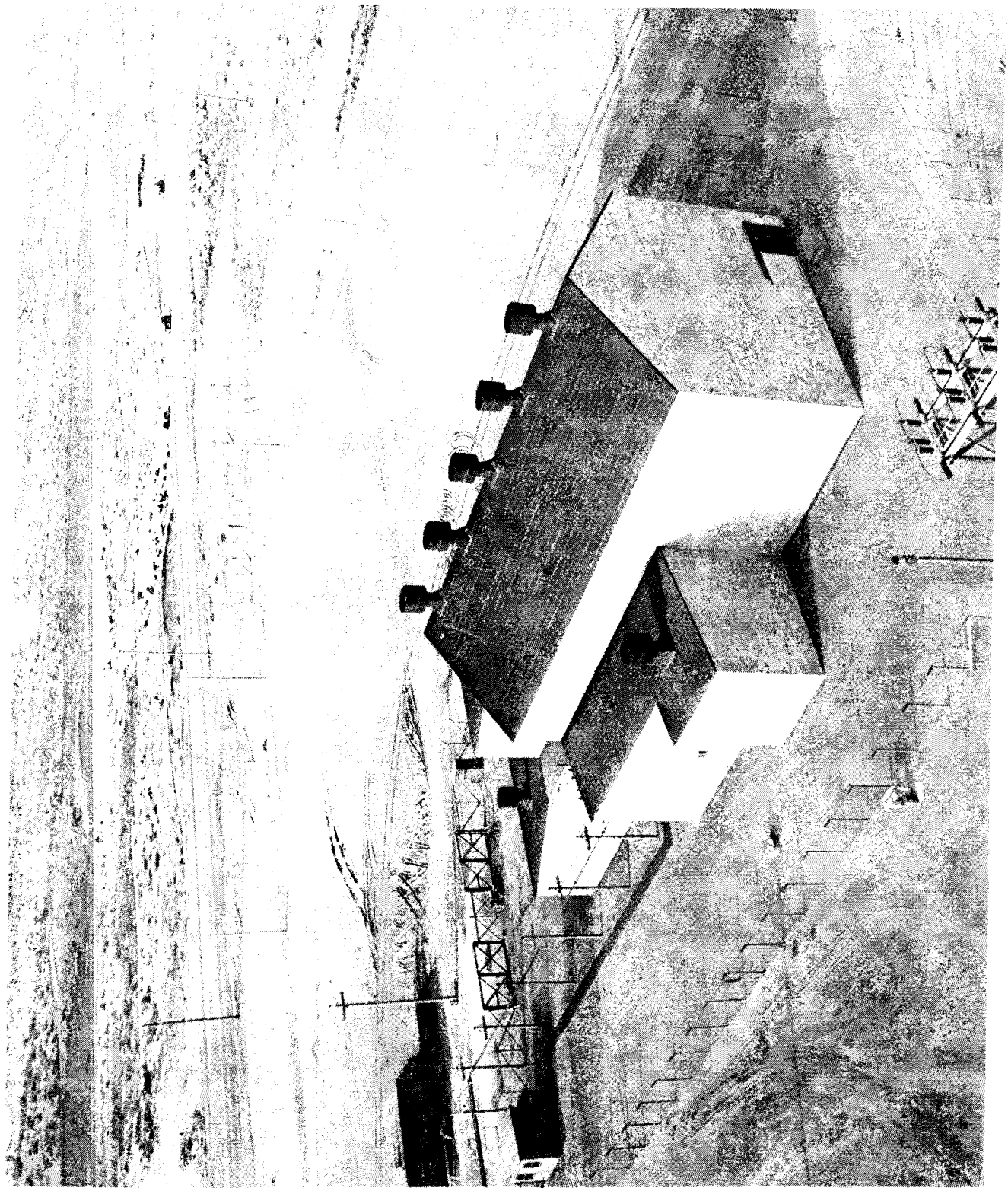
~~SECRET~~

APPENDIX A 24

TEST PILE BUILDING (305)

This building houses a test pile for determining the neutron absorption or emission properties of all materials such as graphite and uranium used in the manufacturing piles.

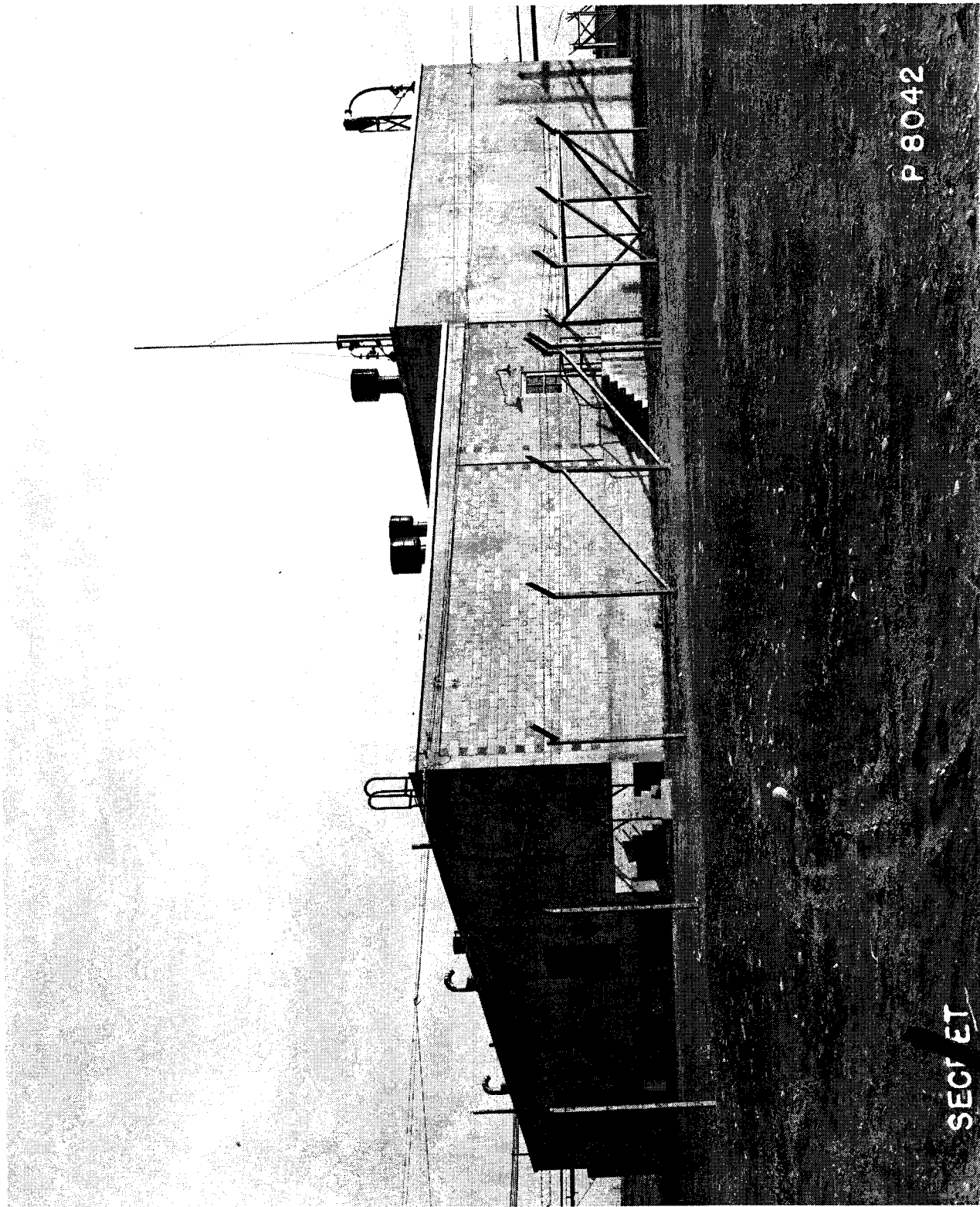
~~SECRET~~



APENDIX A 25

SEPARATION PLANT (321 BUILDING)

This Semi-works is located in the 300 Area for investigating problems arising in the separation and isolation of plutonium from uranium and fission by-product elements.



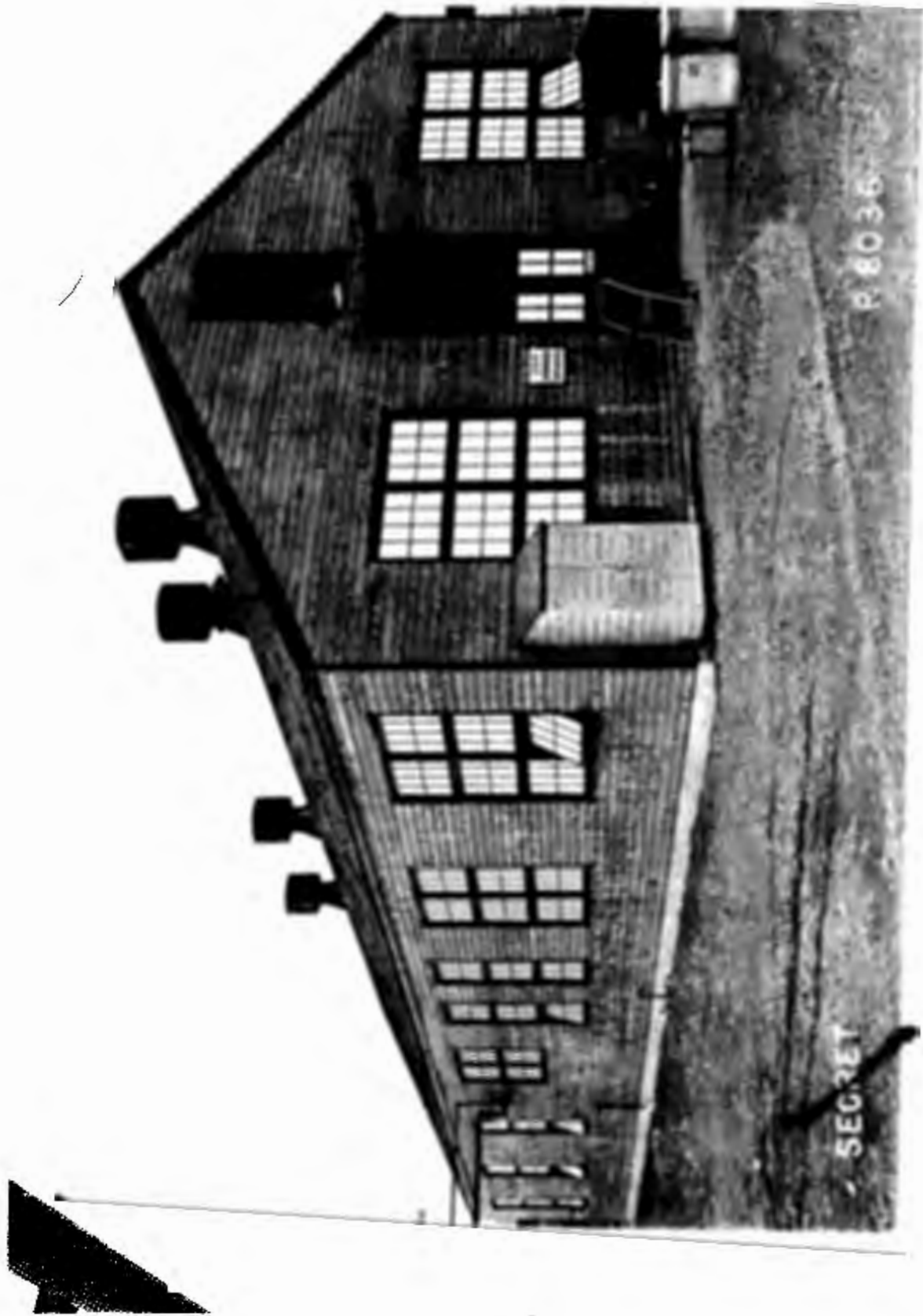
P 8042

~~SECRET~~

APPENDIX A 26

INSTRUMENT SHOP (3717 BUILDING)

This building contains facilities for maintenance, modification, and calibration of the many types of electronic and other instruments required in the manufacturing processes and safety surveys.



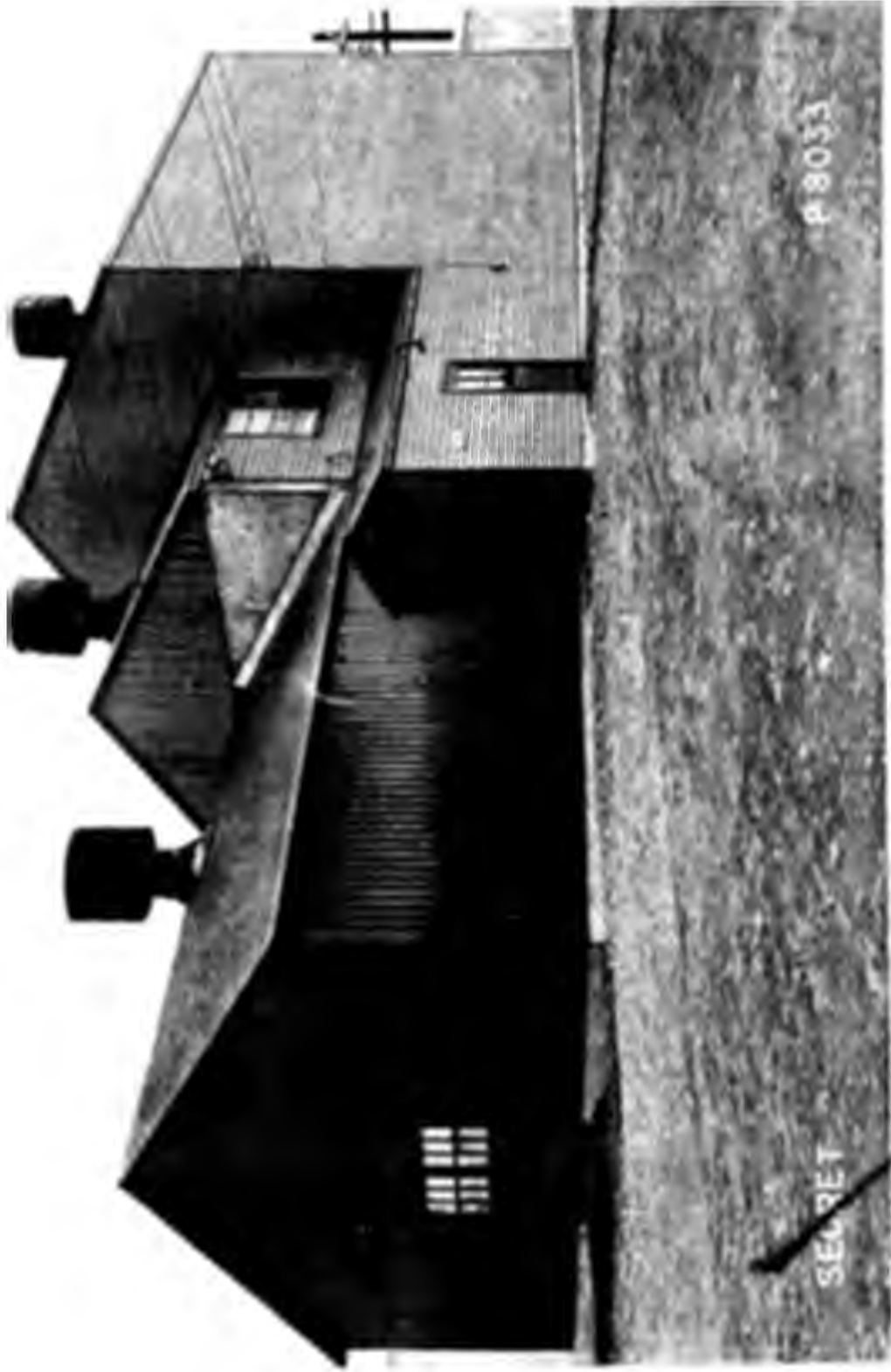
~~SECRET~~

APPENDIX A 27

STANDARD BUILDING (3745)

This building provides for the storage and the use of radium and radium-beryllium sources required for calibration of special instruments. A small special file for calibrating the monitoring and control equipment is also located here.

~~SECRET~~



P 8033

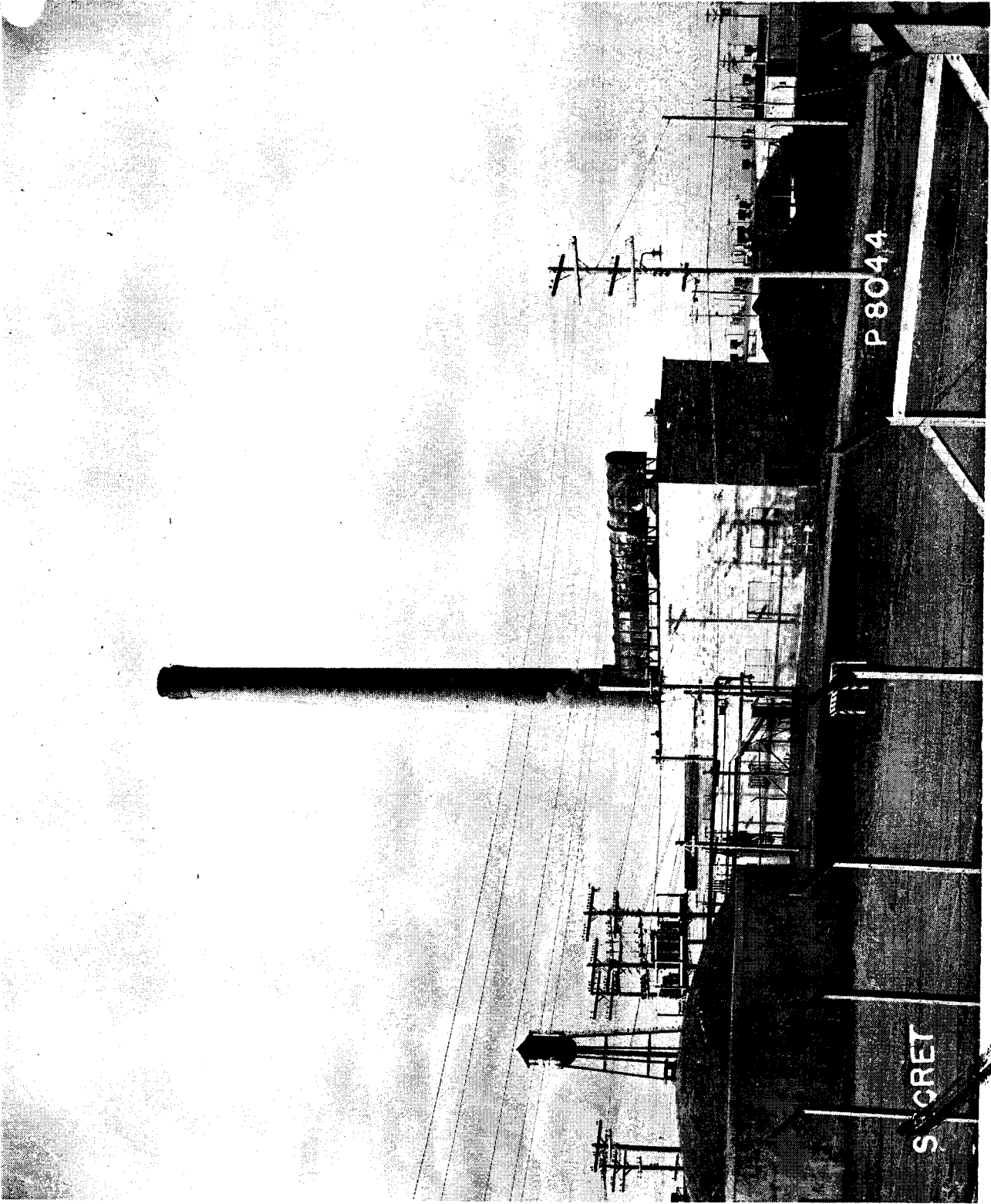
SECRET

~~SECRET~~

APPENDIX A 28

HEATING PLANT (304 BUILDING)

~~SECRET~~



P 8044

SECRET

~~SECRET~~

FILE (100) AREA

File Area

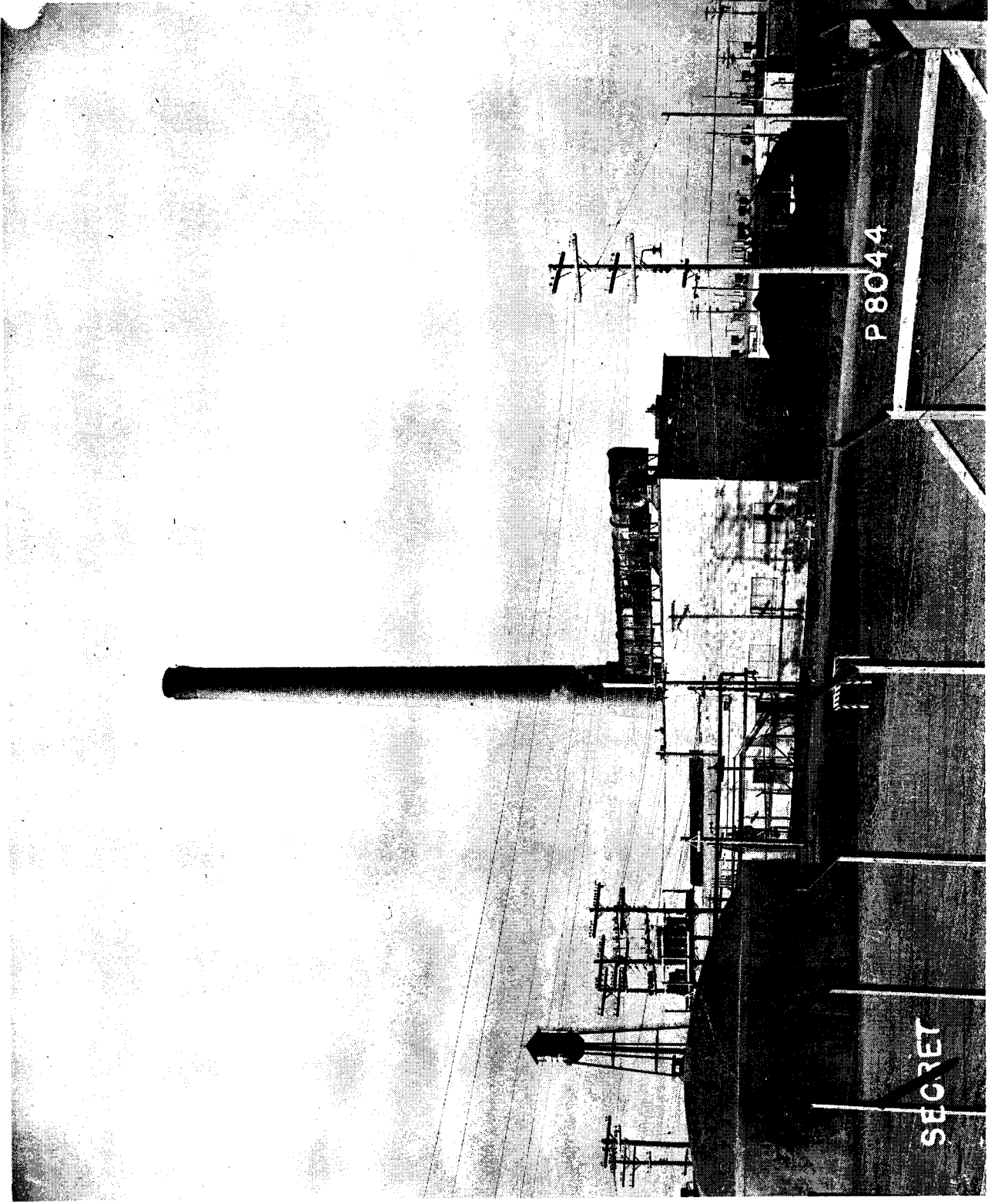
~~SECRET~~

~~SECRET~~

APPENDIX A 29

AERIAL VIEW OF PILE (100 B) AREA

~~SECRET~~

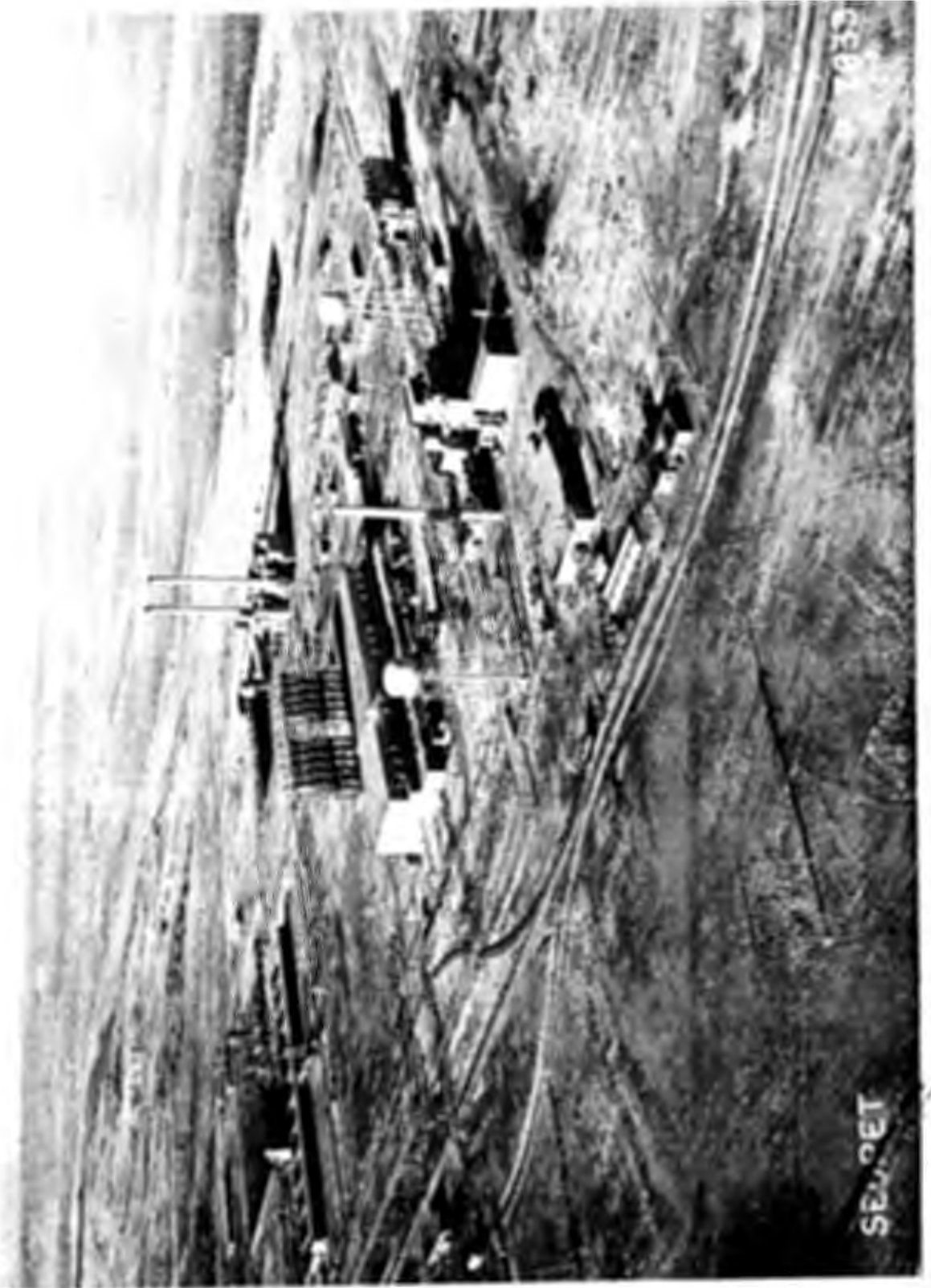


P 8044

~~SECRET~~

APPENDIX A 30

AERIAL VIEW OF FIVE (100 D) AREA



1933

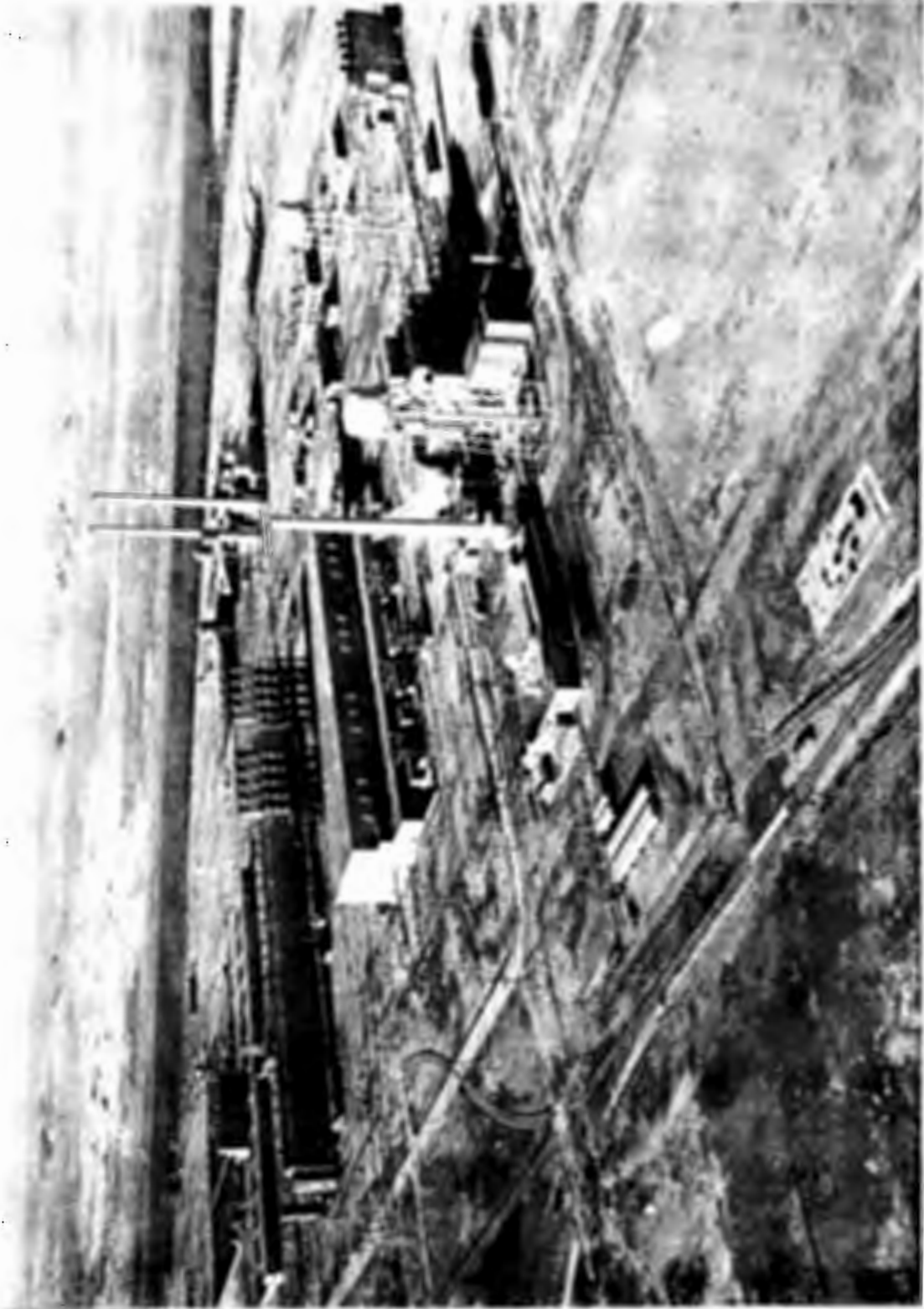
SEV. 0ET

UNCLASSIFIED

APPENDIX A 31

AERIAL VIEW OF PILE (100 F) AREA

UNCLASSIFIED



~~SECRET~~

APPENDIX A 32

PILE CHARGE FACE (105 PILE BUILDING)

42

~~SECRET~~

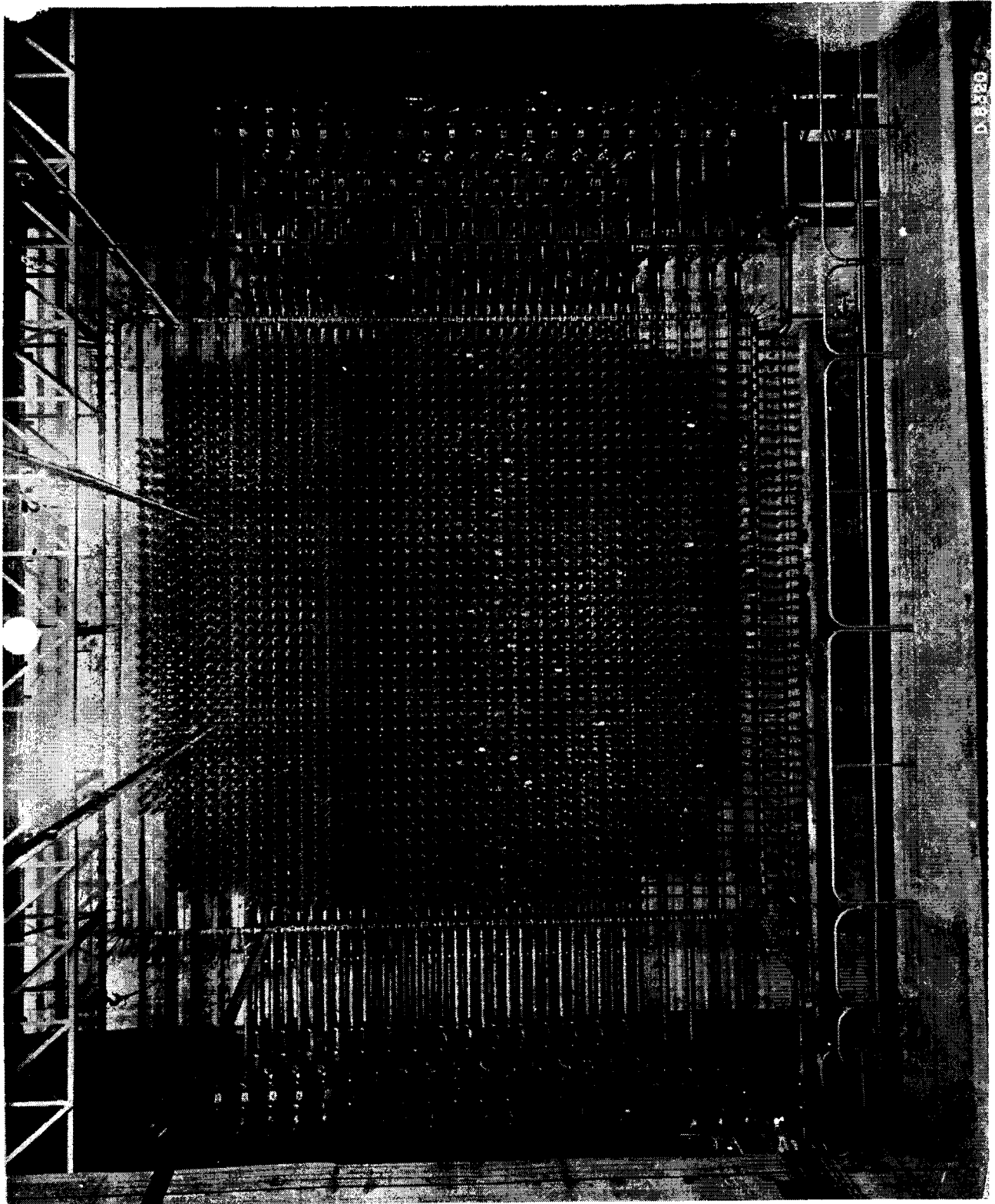


~~SECRET~~

APPENDIX A 33

PILE DISCHARGE FACE (105 PILE BUILDING)

~~SECRET~~

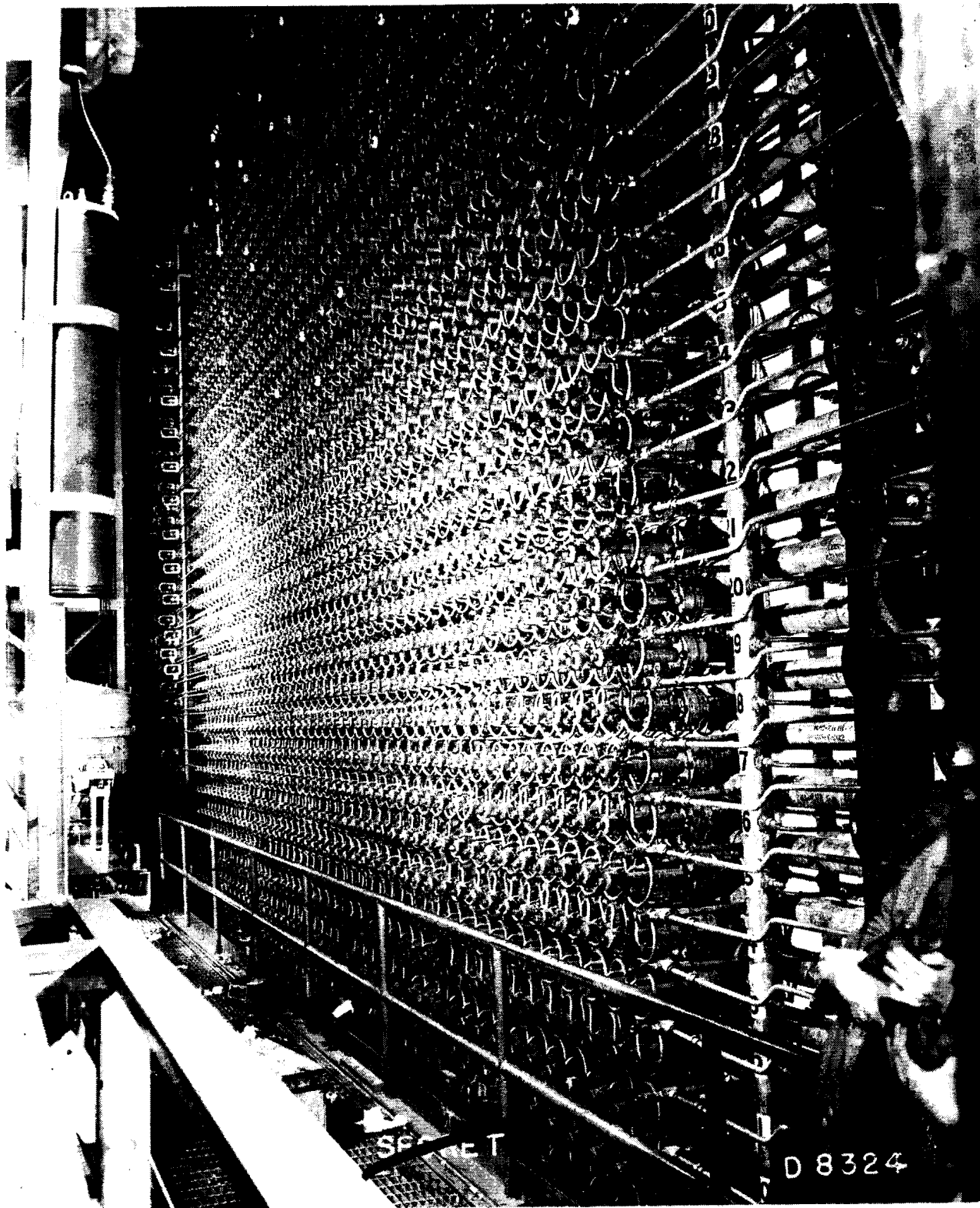


~~SECRET~~

APPENDIX A 34

HELIUM PURIFICATION BUILDING (115 F)

~~SECRET~~



SECRET

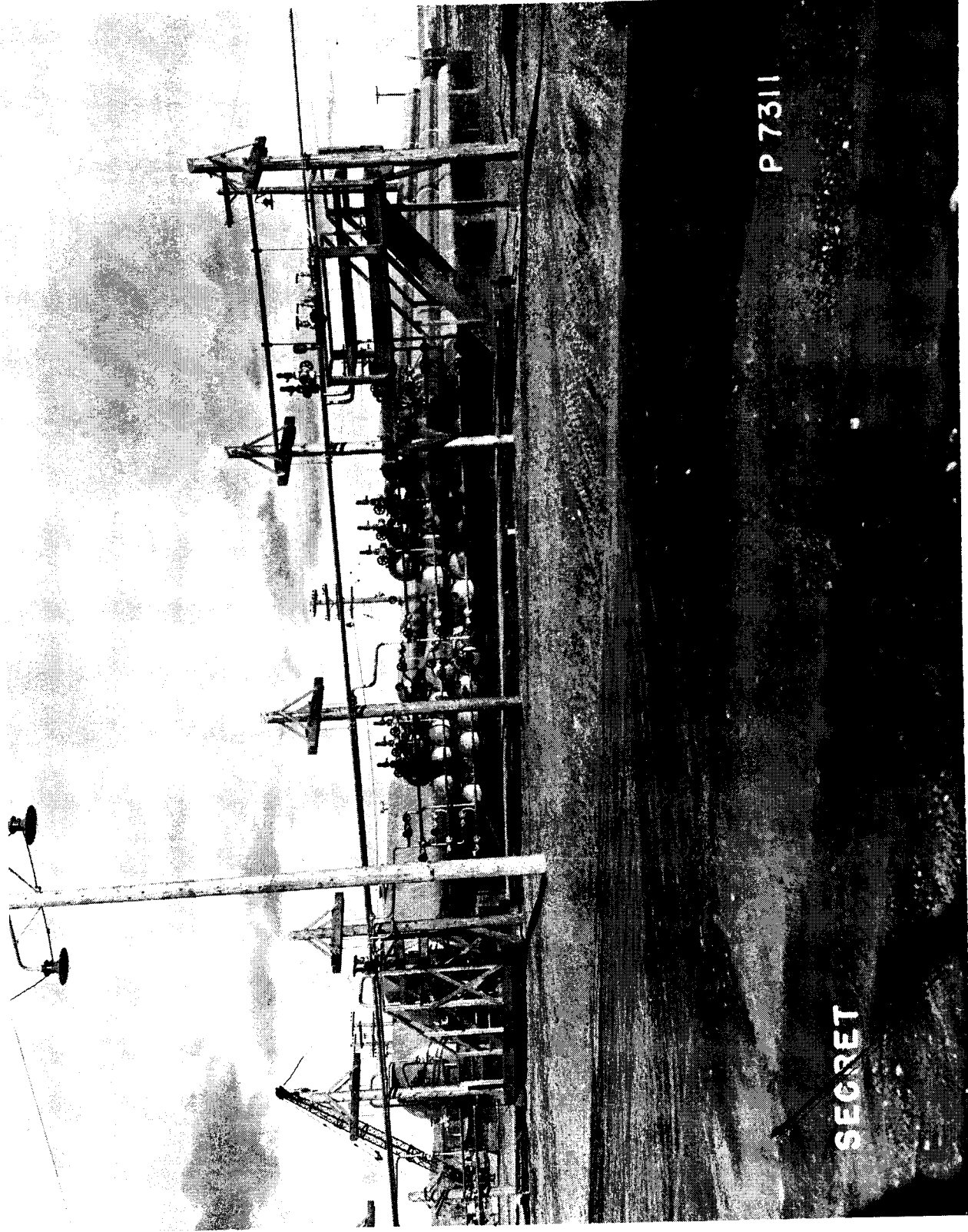
D 8324

~~SECRET~~

APPENDIX A 35

GAS STORAGE TARESS (110 D)

~~SECRET~~



P 7311

SECRET

~~SECRET~~

APPENDIX A 36

PILE CONTROL RODS

The rods enter the Pile through a specially constructed hole in the Pile shield and equipped so that they can be remotely operated. The rear section, not shown, is primarily a mechanical linkage between the section of the rod that enters the Pile and the drive and water supply.

~~SECRET~~



P 8447

SECRET

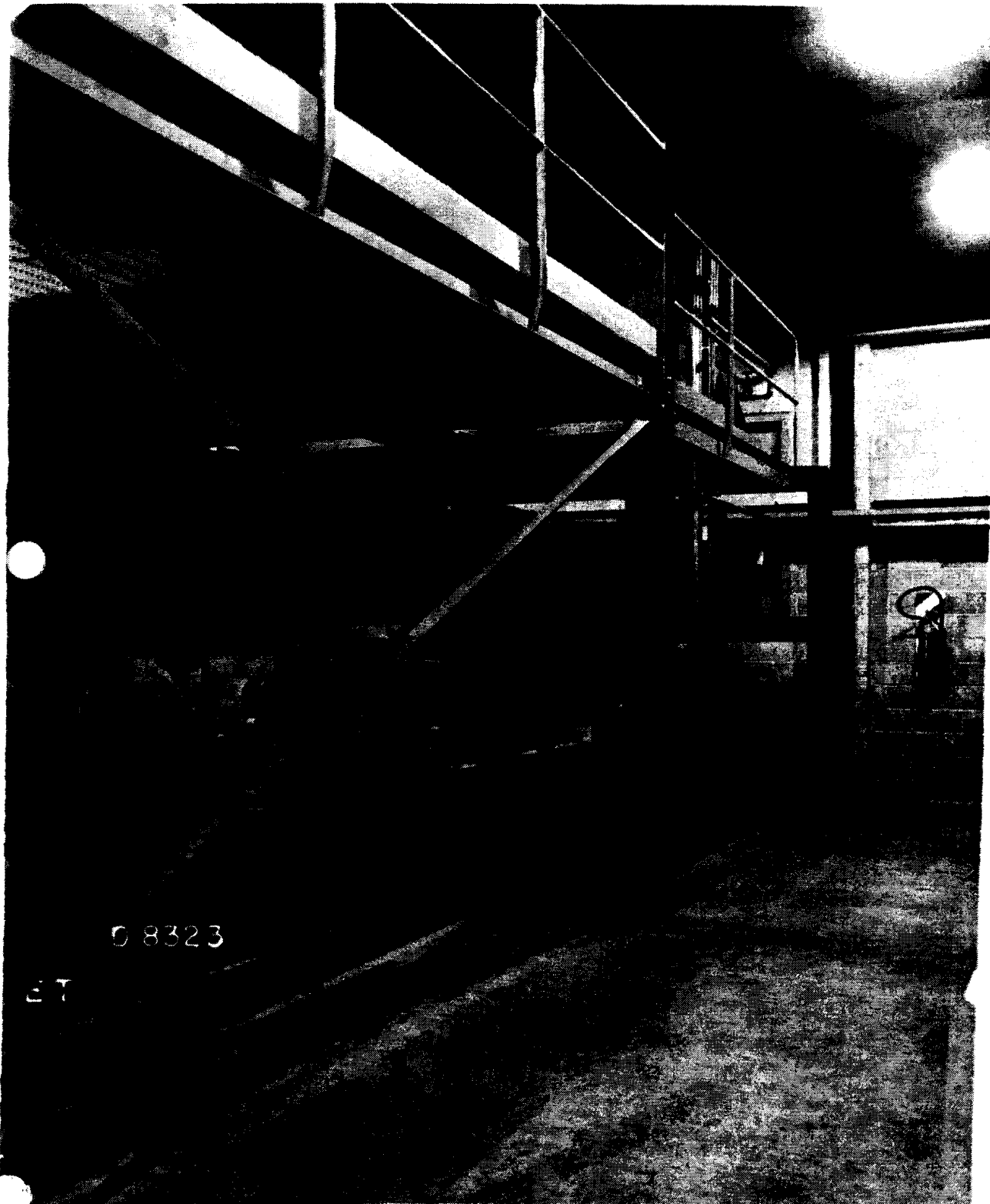
~~SECRET~~

APPENDIX A 37

SAFETY RODS

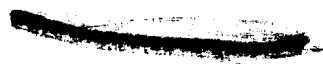
The rod is suspended above the pile with the lower end of the rod coinciding with the bottom face of the top thermal shield. The rod is suspended by two cables that are wound right and left handed around the barrel of the winch, which is supported 40 feet above the top of the pile.

~~SECRET~~



08323

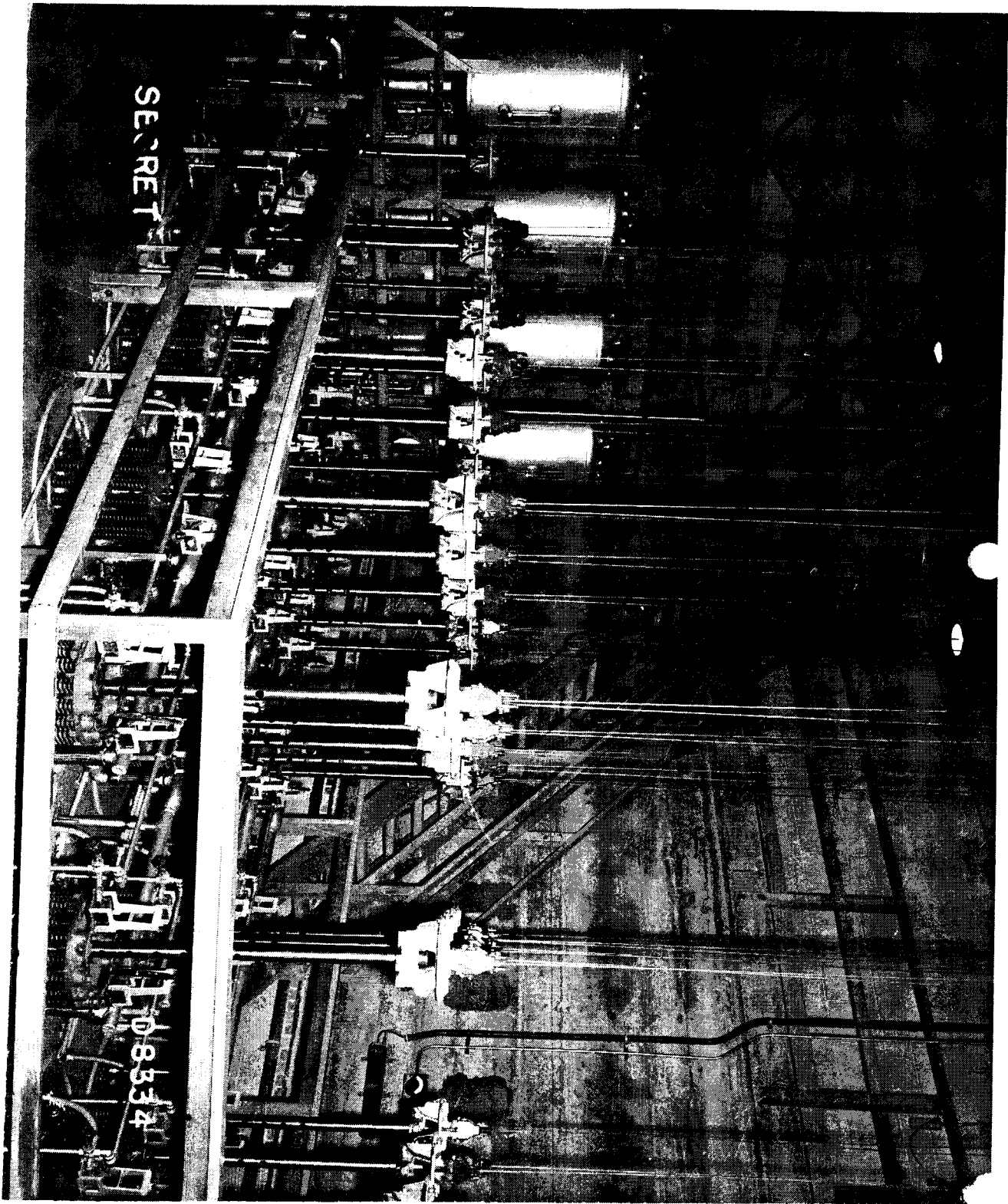
ET



~~SECRET~~

APPENDIX A 38
SAFETY ROD WINCHES

~~SECRET~~



SECRET

1108334

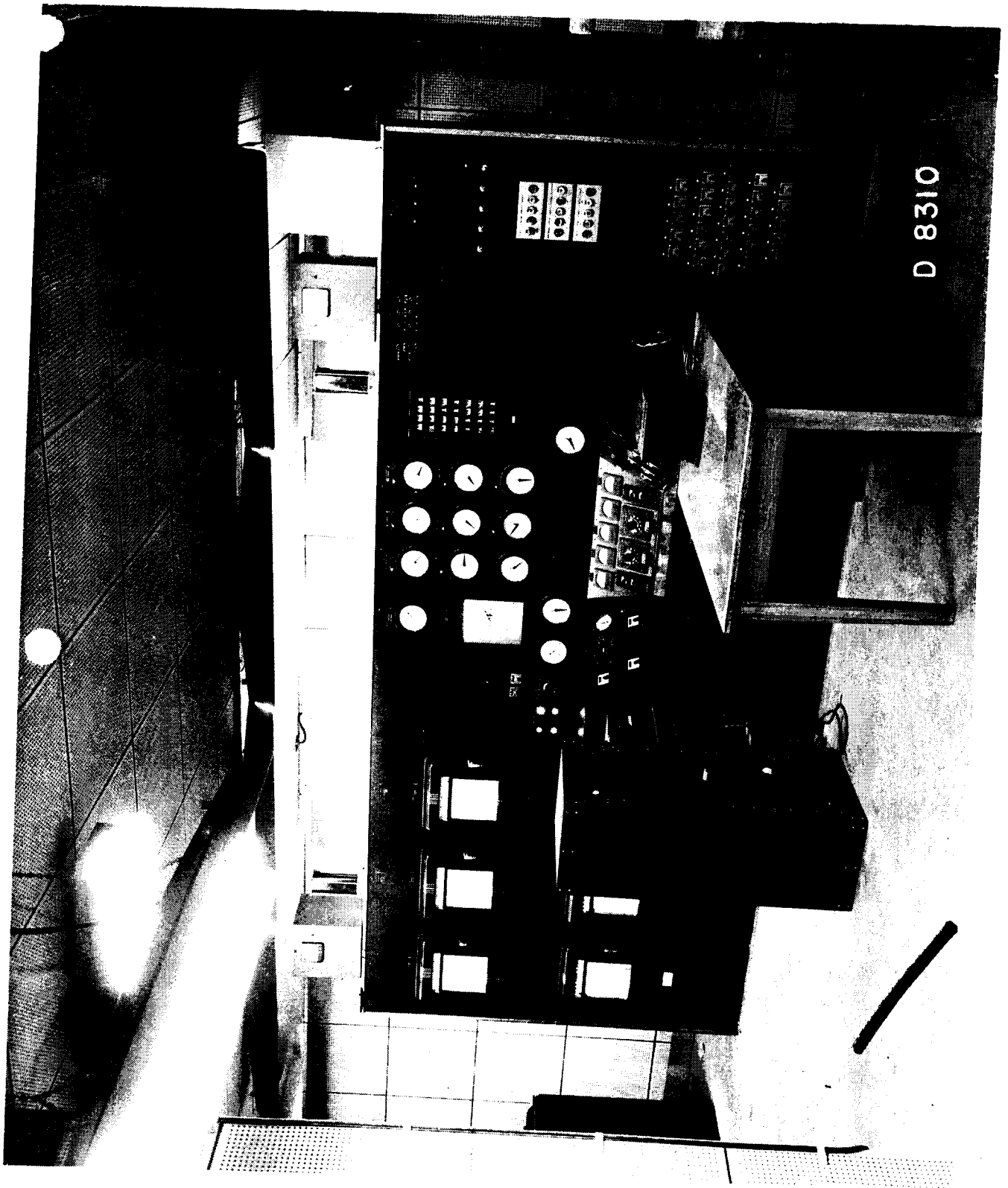
~~SECRET~~

APPENDIX A 39

PILE MAIN CONTROL PANEL

The nine Selsyn indicators on the top-center of the panel indicate the position of 7 shim and 2 regulating rods. All the controls for moving the regulating rods are located on the right-hand sloping panel of the control desk. The controls on the lower right of the panel are for withdrawing or lowering safety rods individually or in groups.

~~SECRET~~

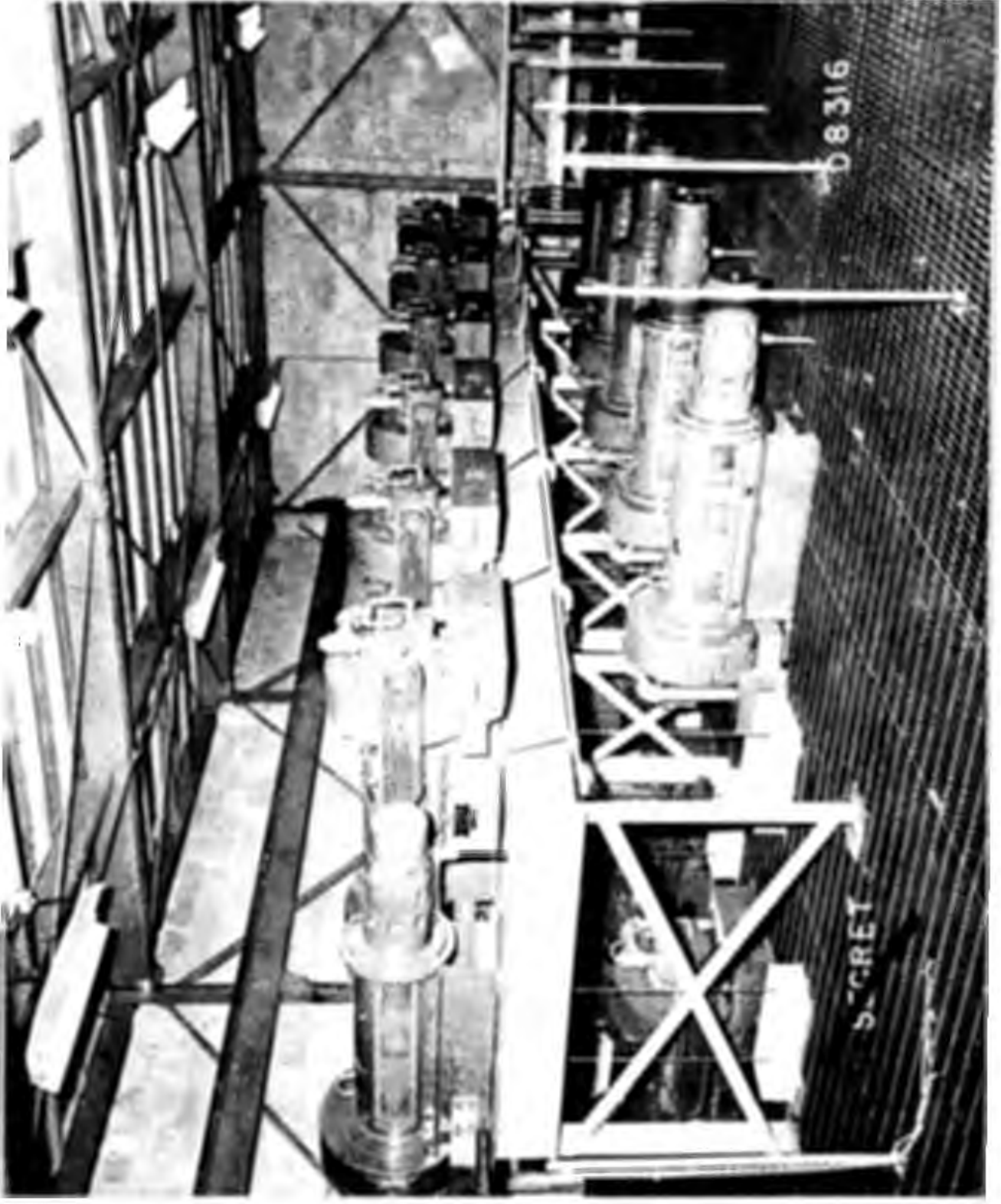


D 8310

APPENDIX A 40

PILE MISCELLANEOUS CONTROL PANEL

The two gauges at top-left indicate the Helium pressure. The other 20 at the top indicate shim rod exit water temperatures and pile exit water pressure. The recorders indicate percent of air and water in Helium and exit water temperature of rods. The panel at the extreme right is the temperature monitor. The center is a jack board containing a jack for temperature measurement of each individual tube. The other instruments are temperature recorders.



68316

SECRET

~~SECRET~~

APPENDIX A 41

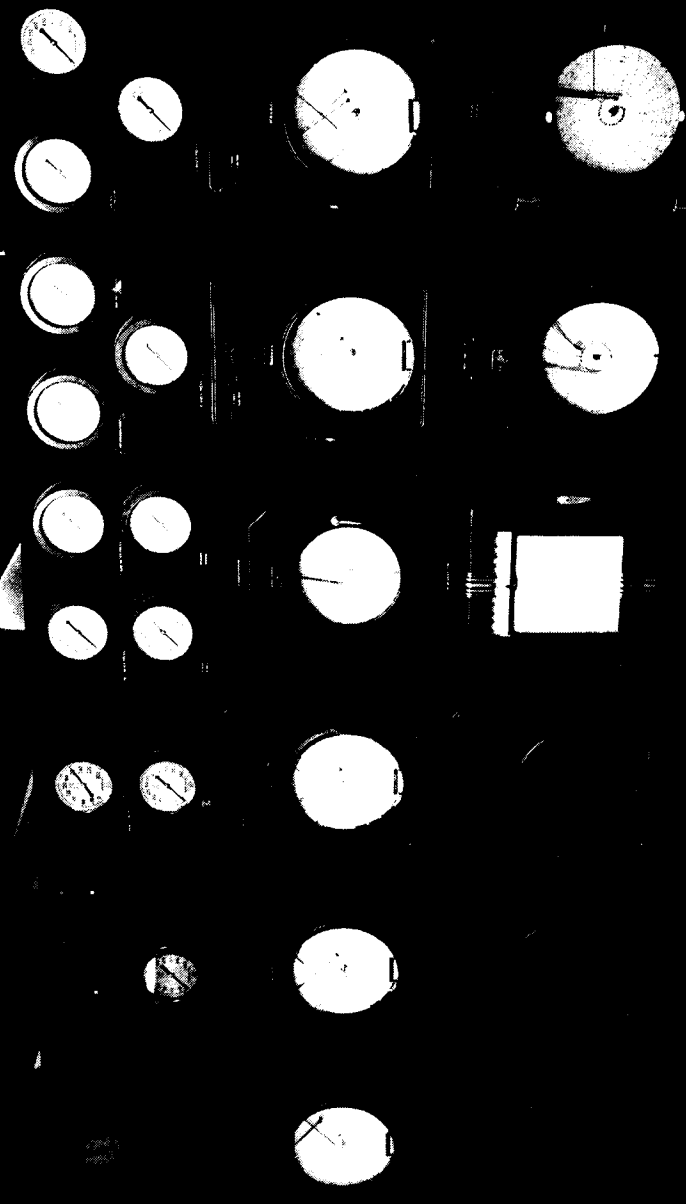
PILE INLET WATER PANEL

This panel contains instruments for measuring and recording water pressure and temperature on the inlet and exit side of the Pile.

~~SECRET~~

D 8309

COLEY



~~SECRET~~

APPENDIX A 42

PILE PRESSURE CONTROL PANEL

This panel, divided into three sections, indicates the inlet water pressure on each tube. The gauges have, instead of the usual dial face and pointer, a rotating drum set behind the panel with only a small portion of the drum visible through a slot. The right section indicates the pressure of the top face of the Pile, and the middle section and left section indicate the middle face and bottom face of the Pile, respectively.

~~SECRET~~



D 8311

~~SECRET~~

APPENDIX A 43

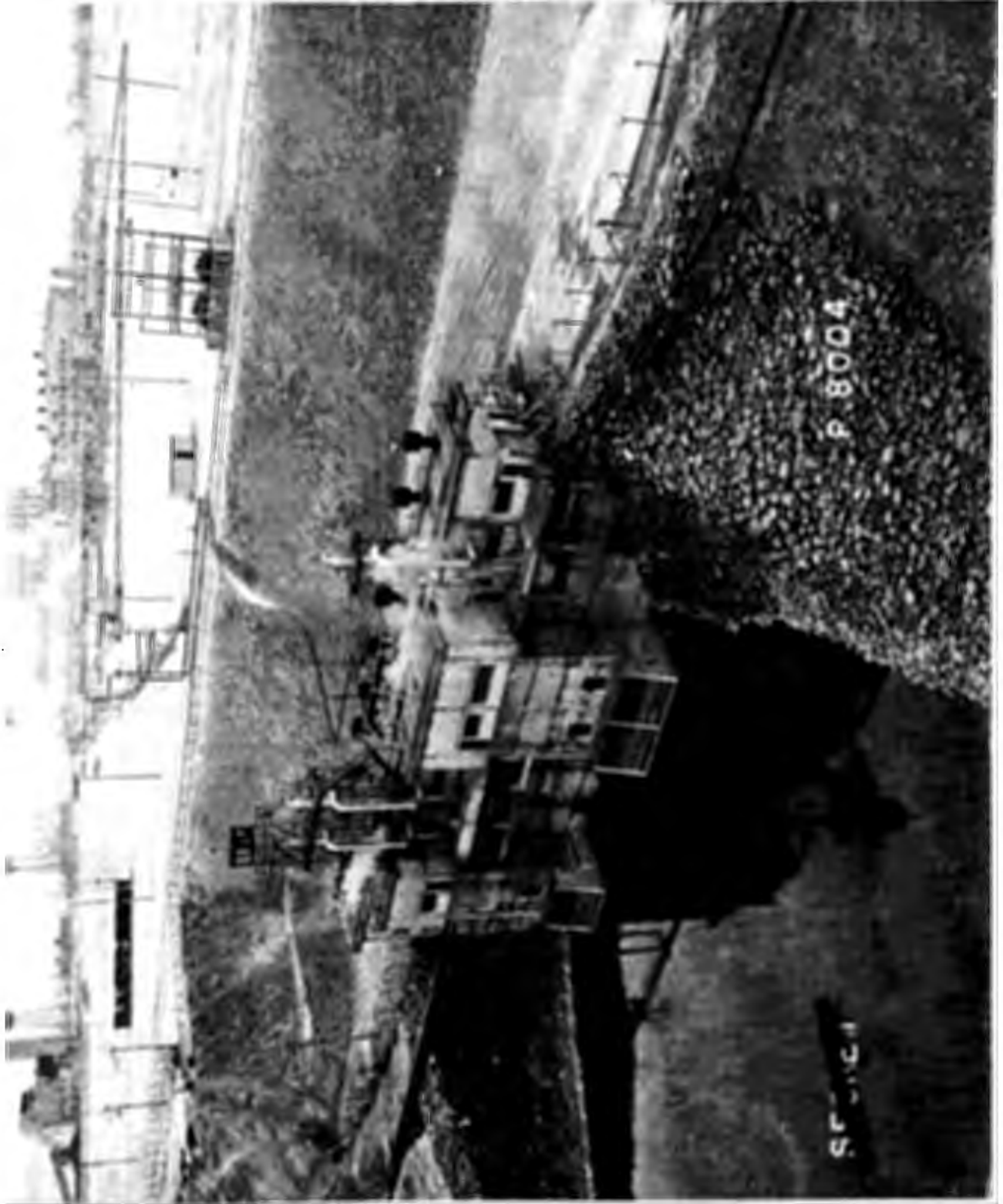
REAR VIEW OF CONTROL BOARD (105 FILE BUILDING)

~~SECRET~~



APPENDIX A 44

RIVER PUMP HOUSE (181 D)



P 8004

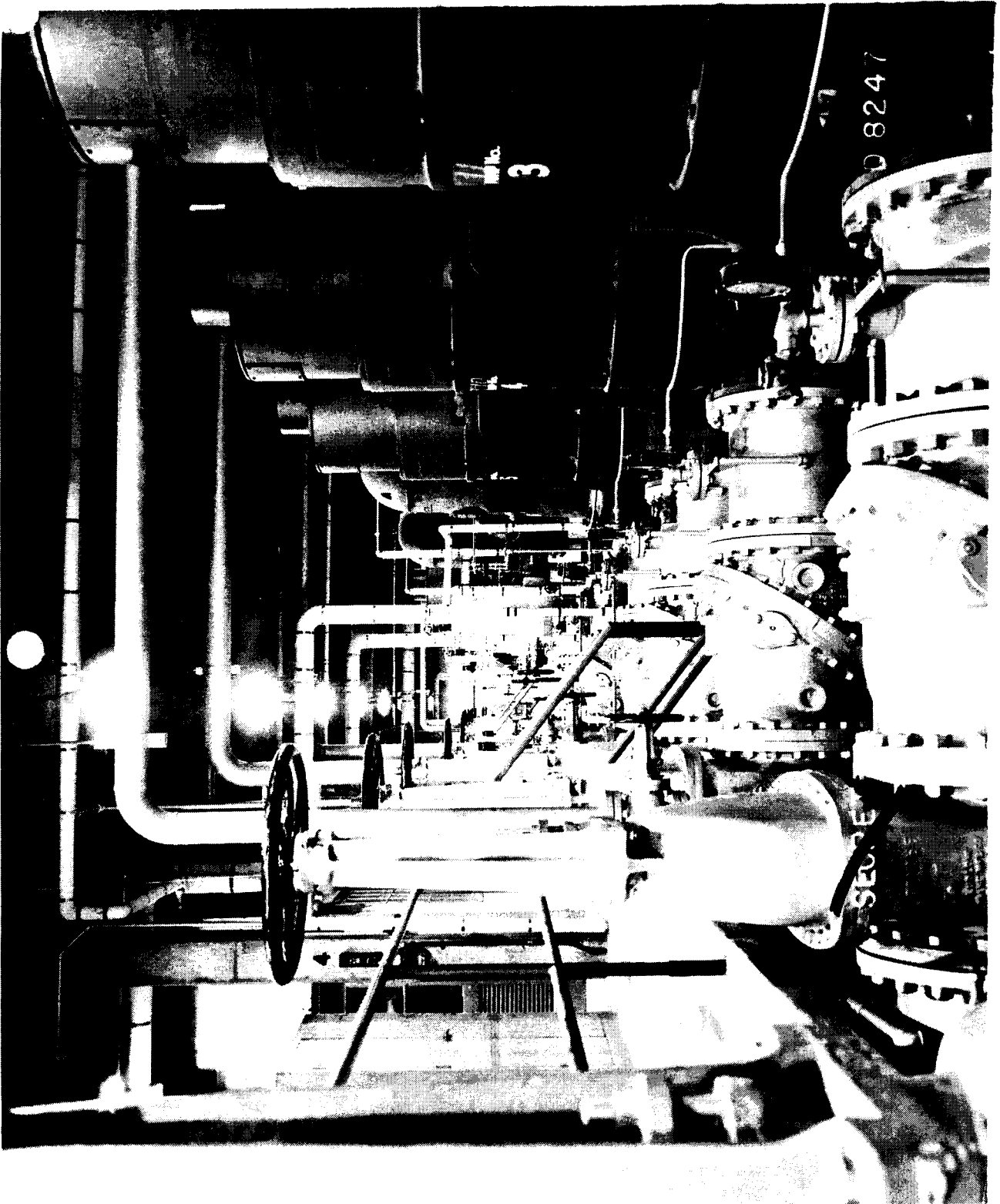
SF 1111

~~SECRET~~

APPENDIX A 45

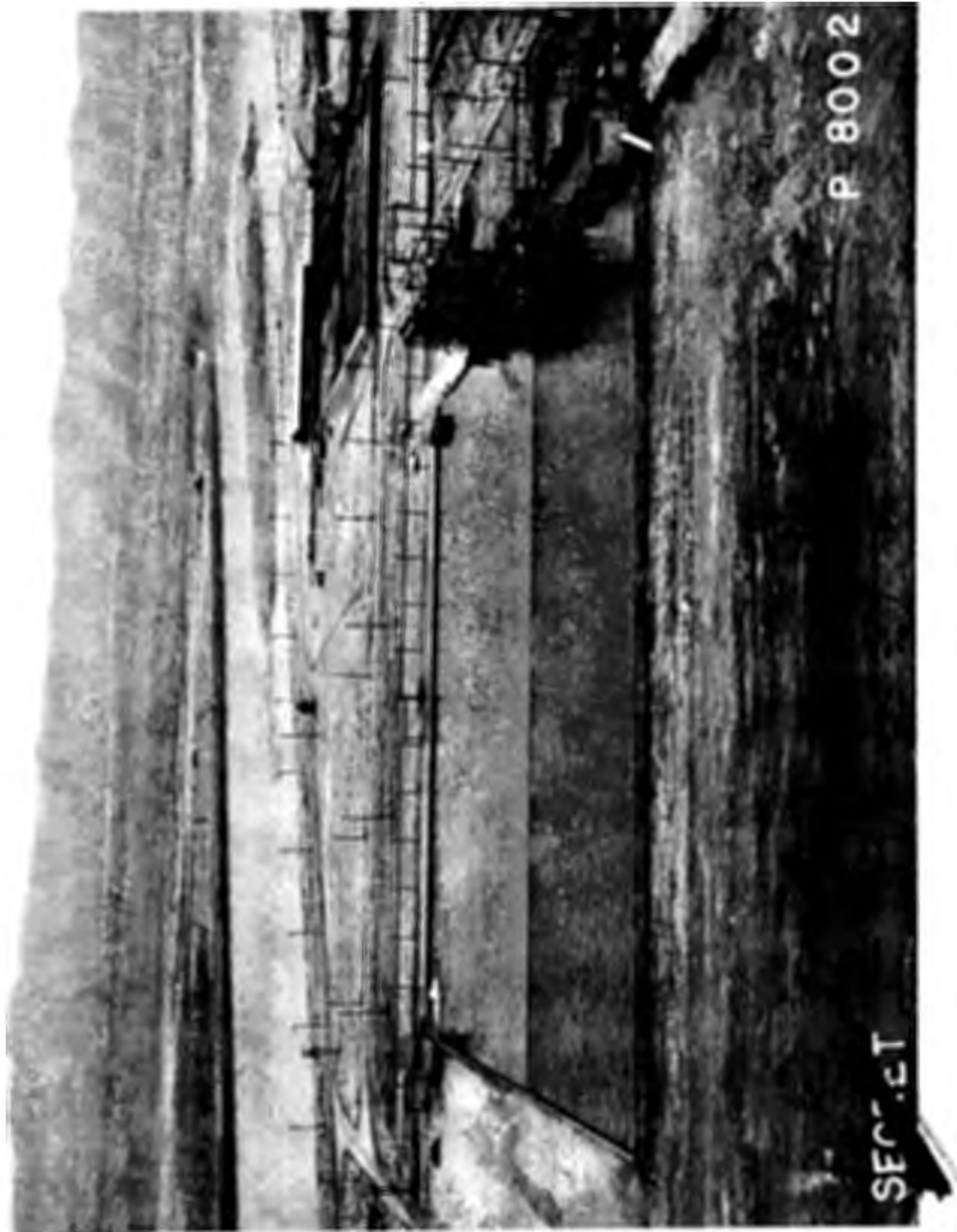
RIVER PUMPS (151 D)

~~SECRET~~



APPENDIX A 46

RESERVOIR AND PUMP HOUSE (102 D)



P 8002

SEC. 5T

~~SECRET~~

APPENDIX A 47

RESERVOIR PUMP GALLERY

~~SECRET~~

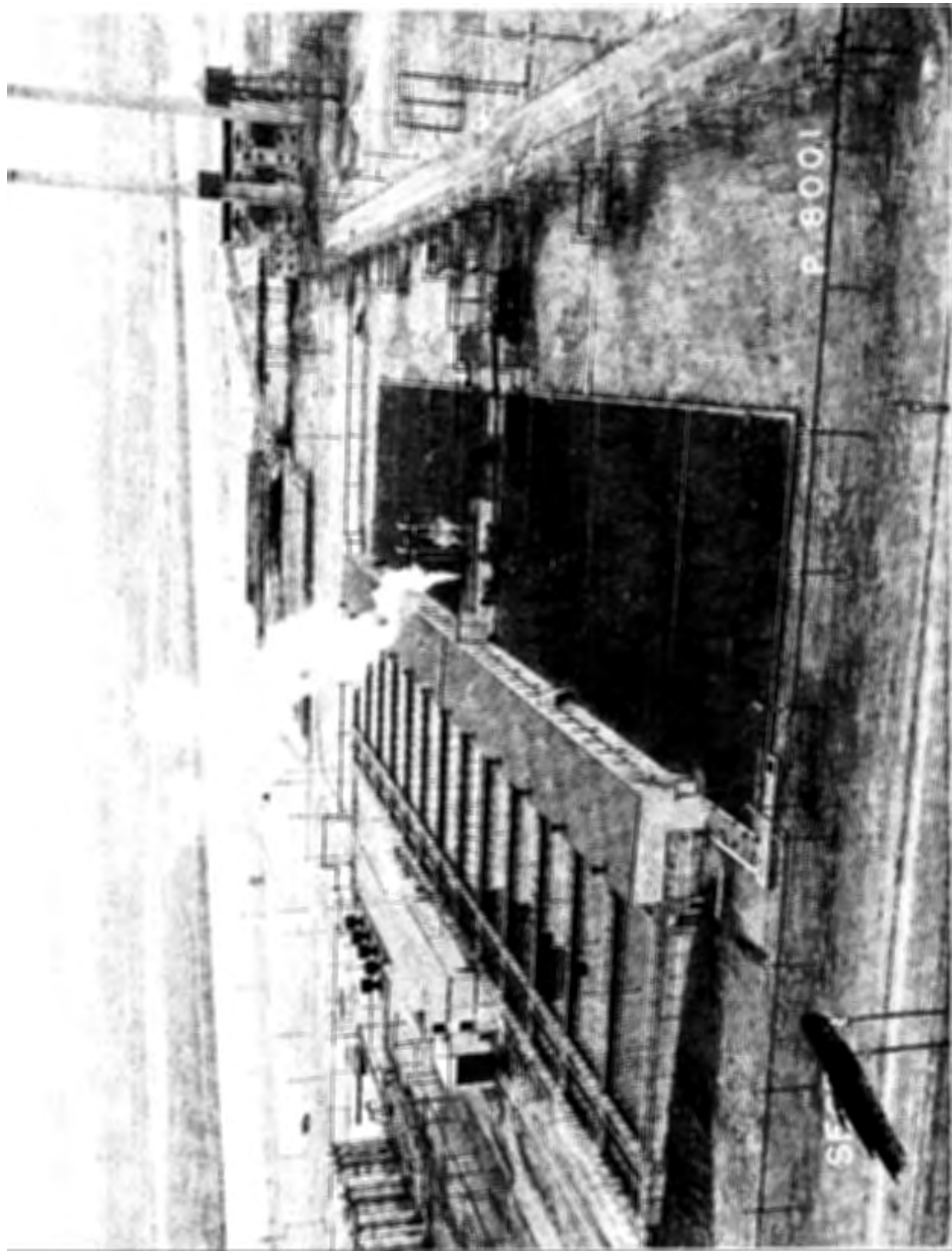


~~SECRET~~

APPENDIX A 48

AERIAL VIEW OF FILTER PLANT (183 D)

~~SECRET~~



P. 8001

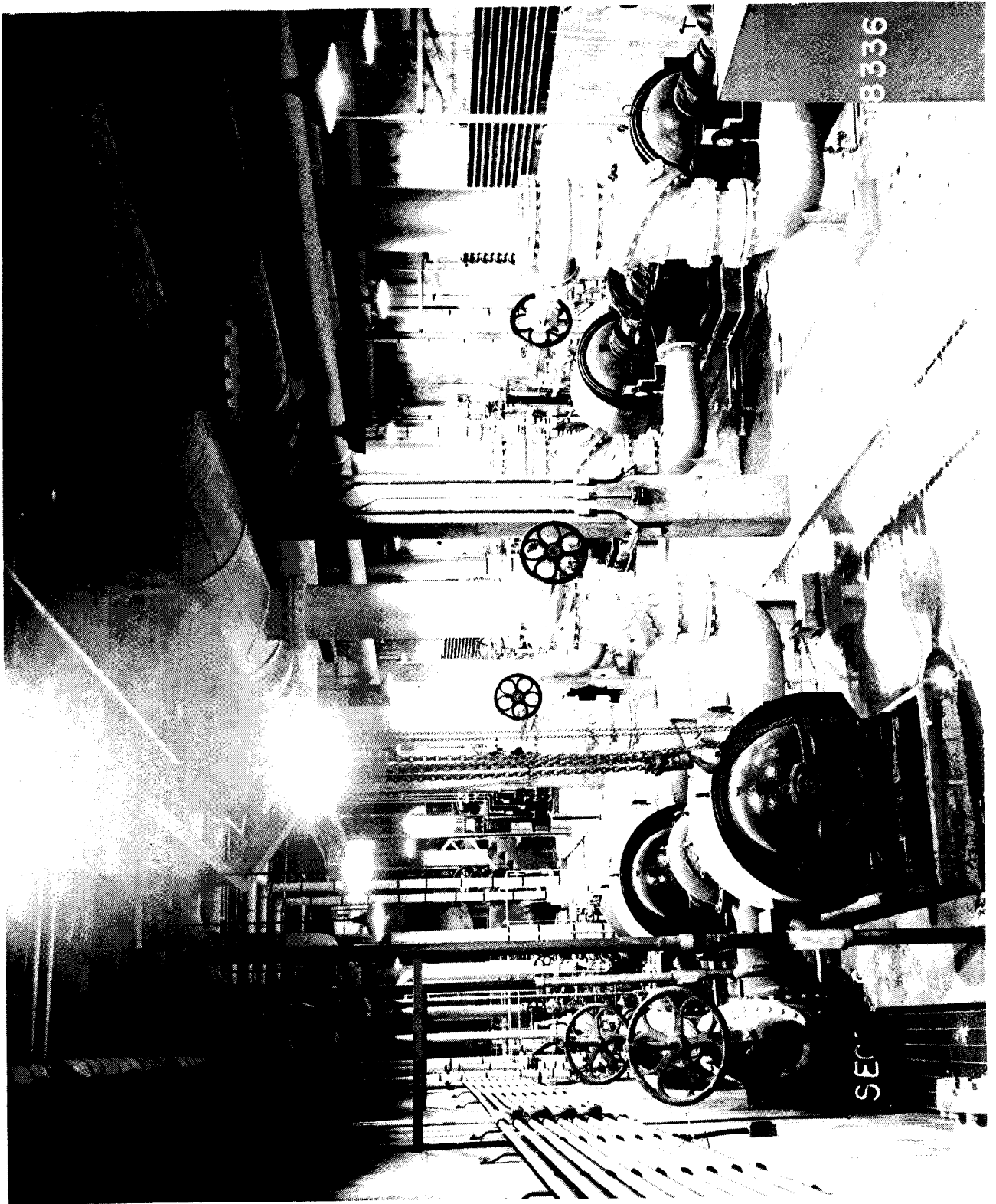
SF

~~SECRET~~

APPENDIX A 49

FILTER PLANT PUMPS

~~SECRET~~

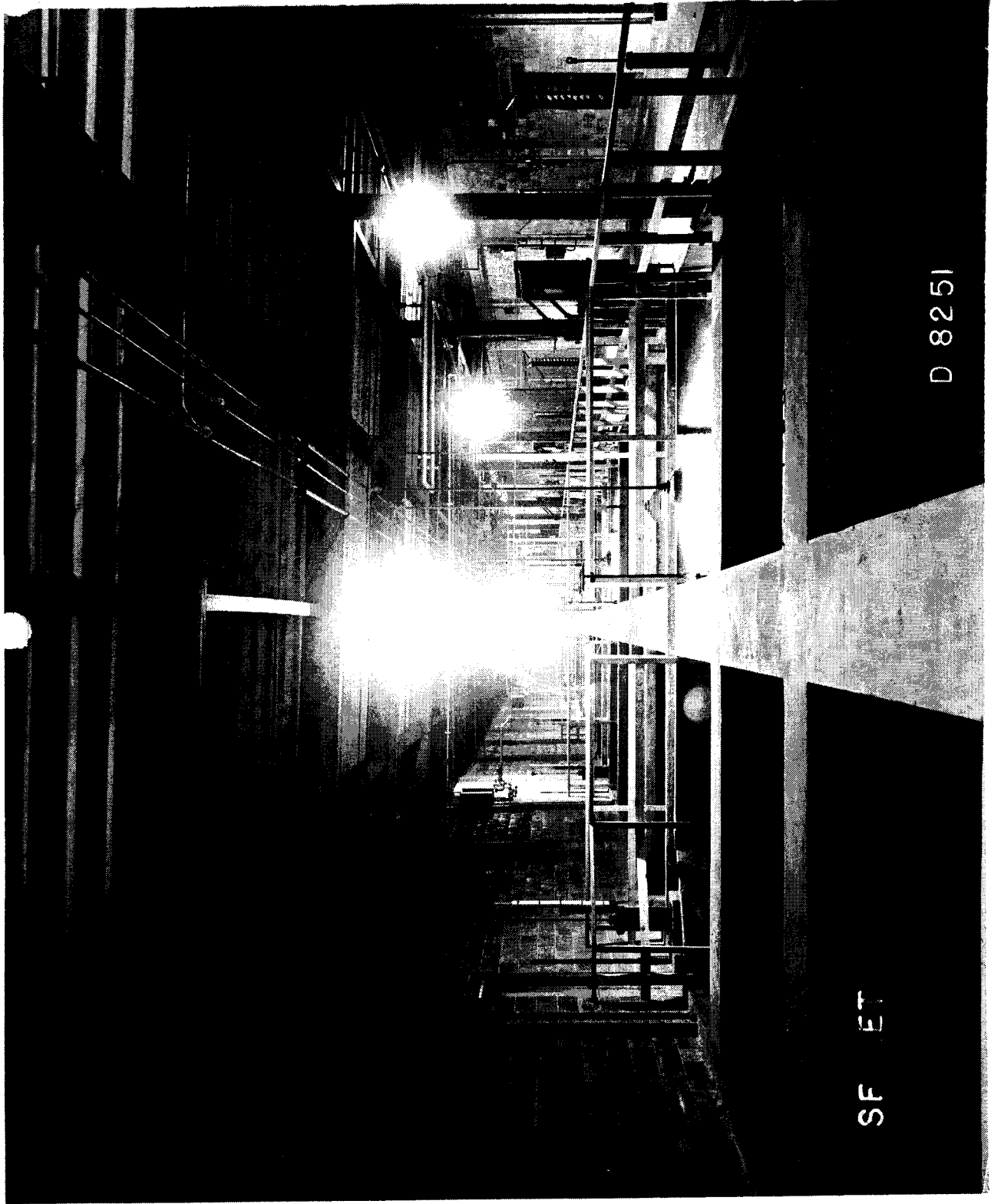


~~SECRET~~

APPENDIX A 50

FILTRATION BEDS

~~SECRET~~



SF ET

D 8251

SECRET

APPENDIX A 51

CHEMICAL PUMP HOUSE (108 D)

SECRET



P 7290

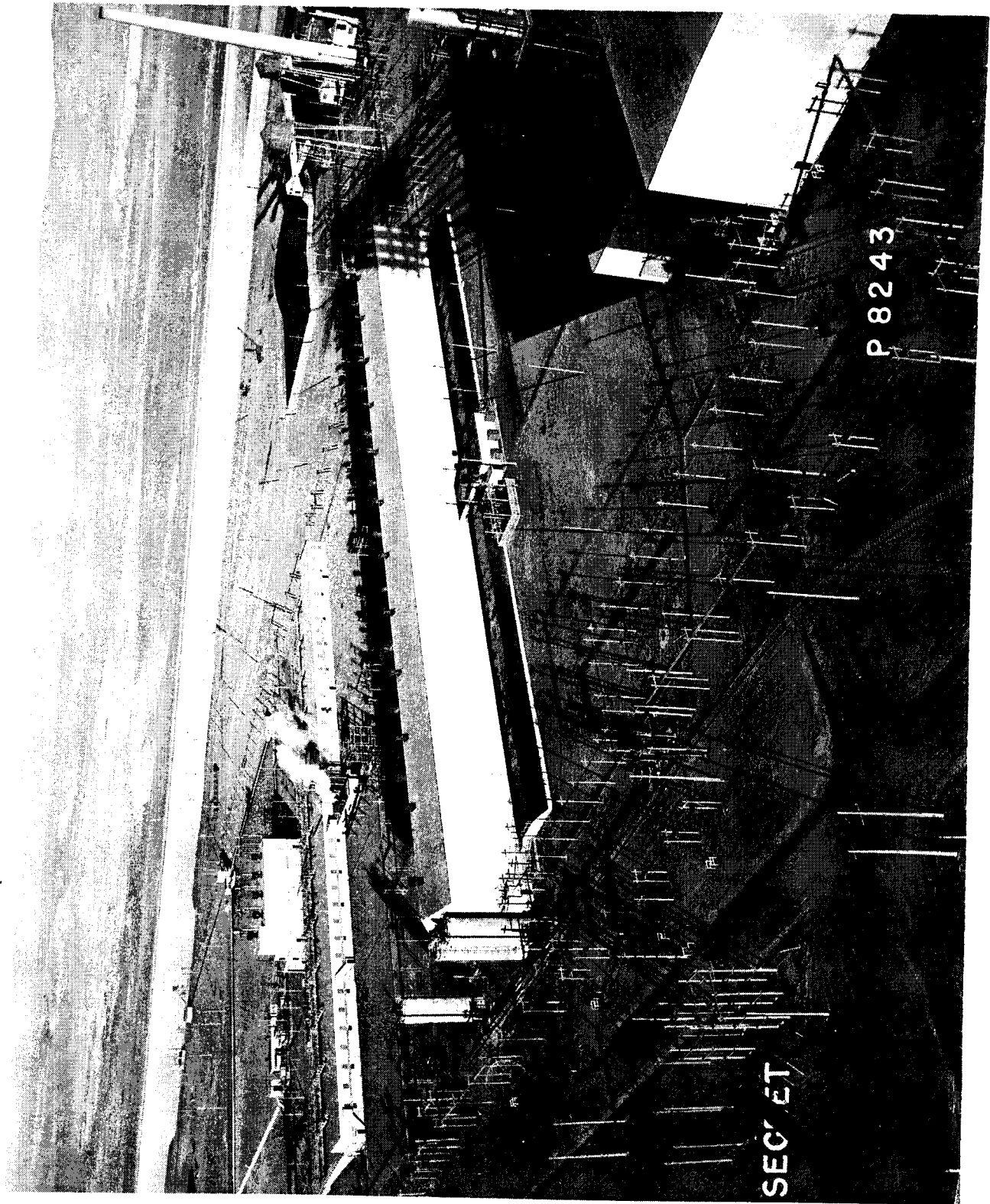
SECRET

~~SECRET~~

APPENDIX A 52

AERIAL VIEW OF DEMINERALIZATION PLANT (136 D)

~~SECRET~~



SECRET

P 8243

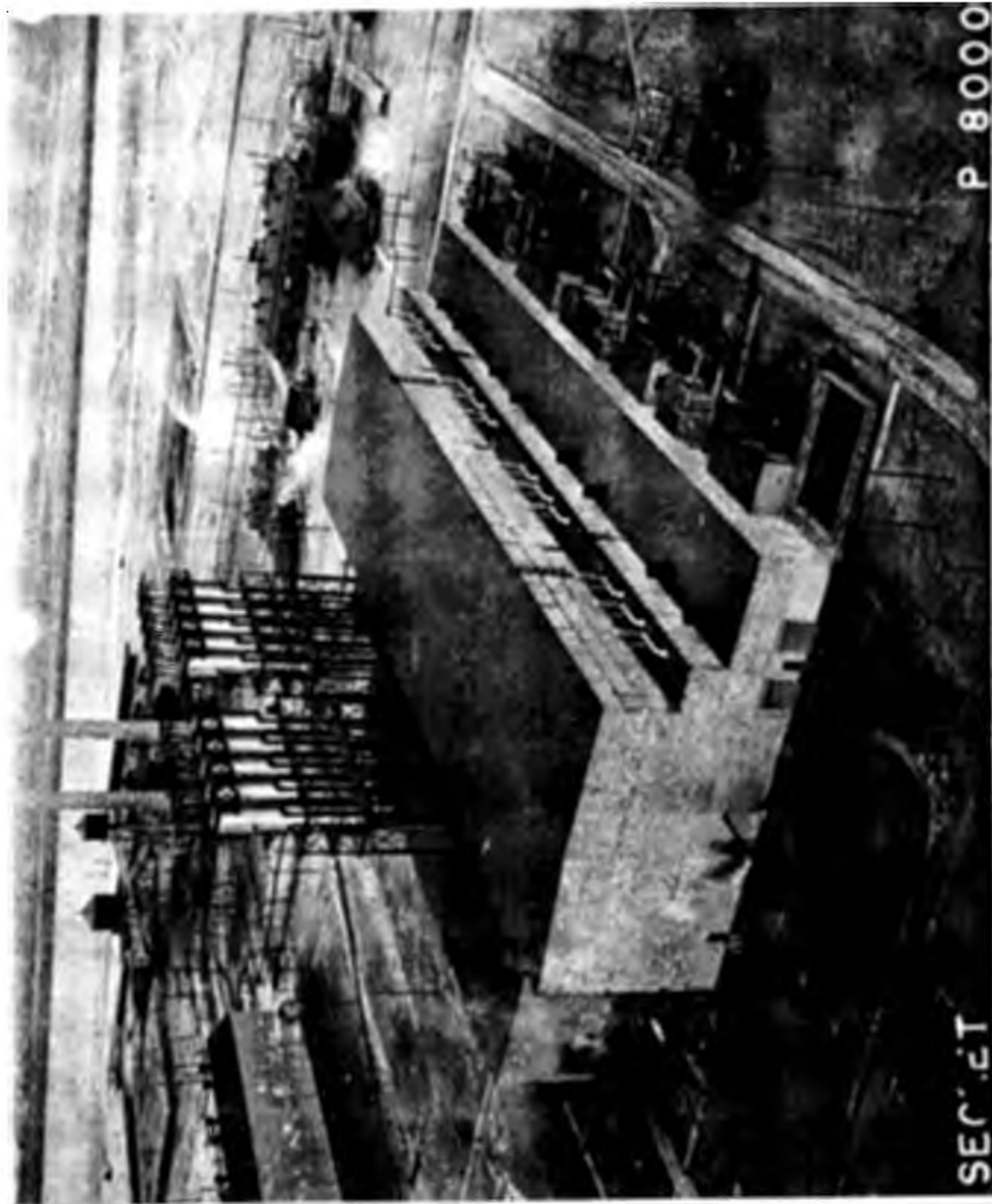
~~SECRET~~

APPENDIX A 53

DEAERATING BUILDING (185 D)

The Deaerating Building is the large two-story structure with ten deaeration units mounted vertically on steel structures on the left side of the building. The Refrigeration Building is the one-story structure adjacent on the left, and the main pump house is the one-story structure adjacent to the Deaerating Building on the right.

~~SECRET~~



SECRET

P 8000

~~SECRET~~

APPENDIX A 54

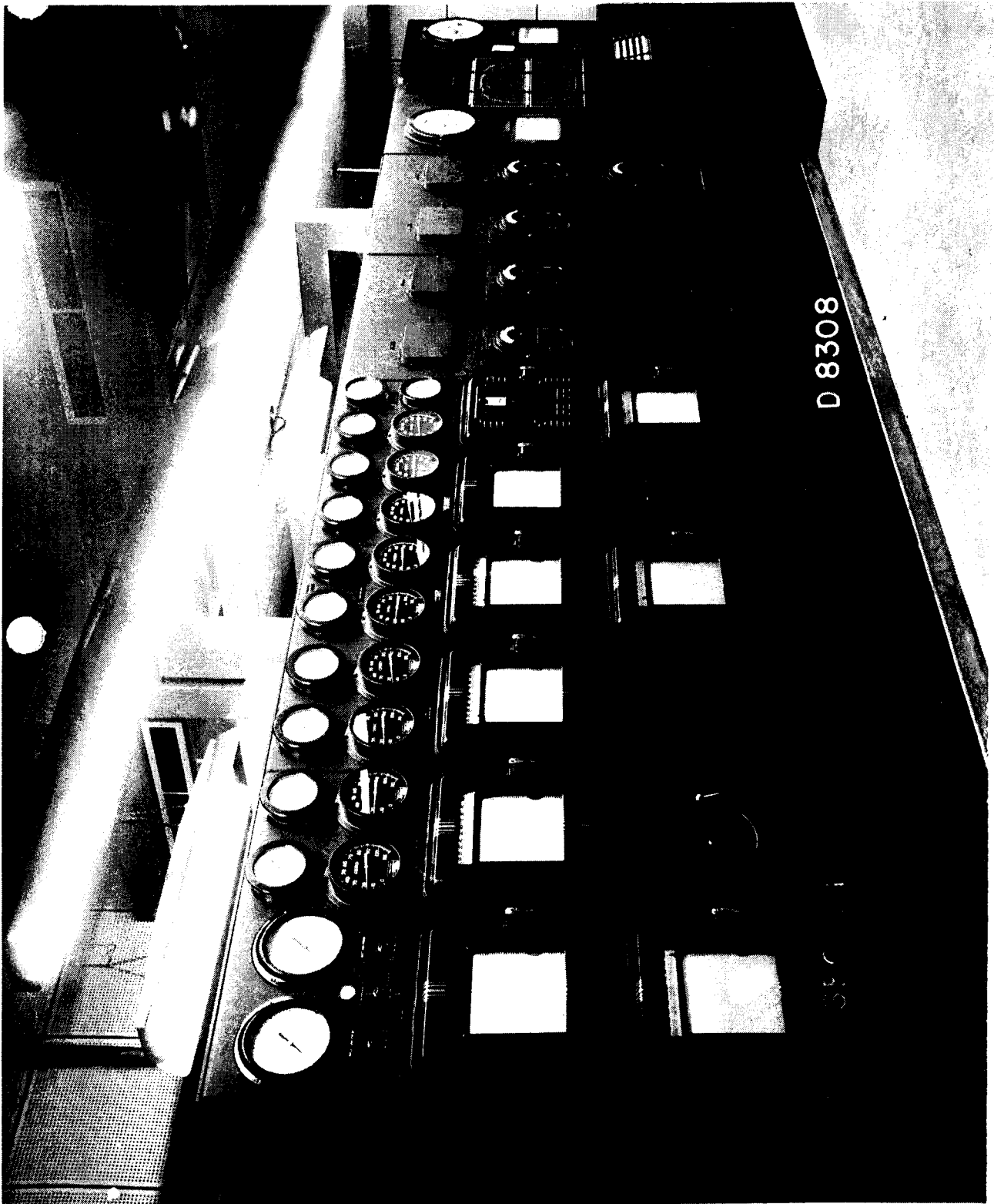
REACTOR CONTROL GALLERY

~~SECRET~~



D8443

SECRET



D 8308

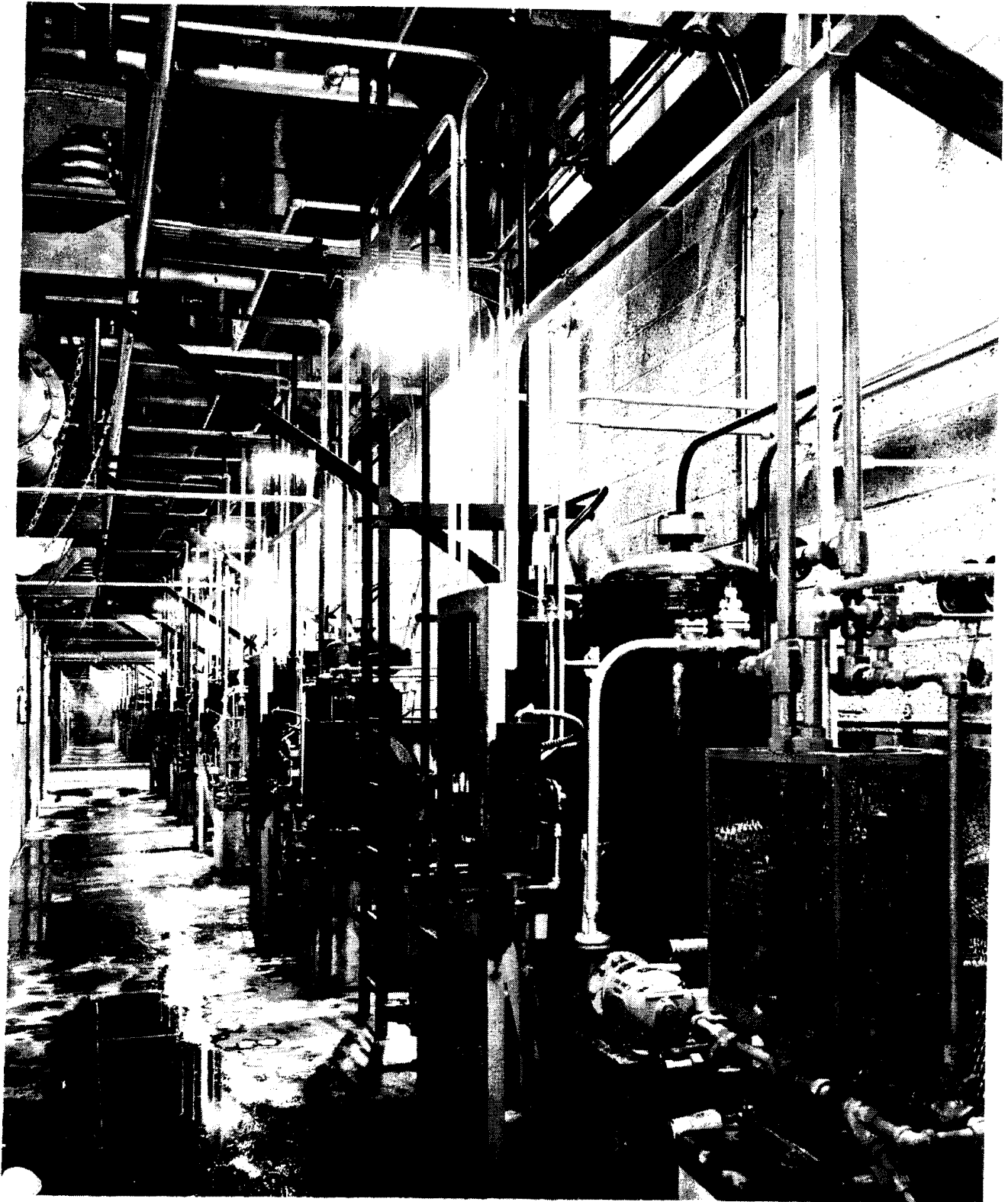
3500

~~SECRET~~

APPENDIX A 55

DEAERATOR ACID PUMPS

~~SECRET~~

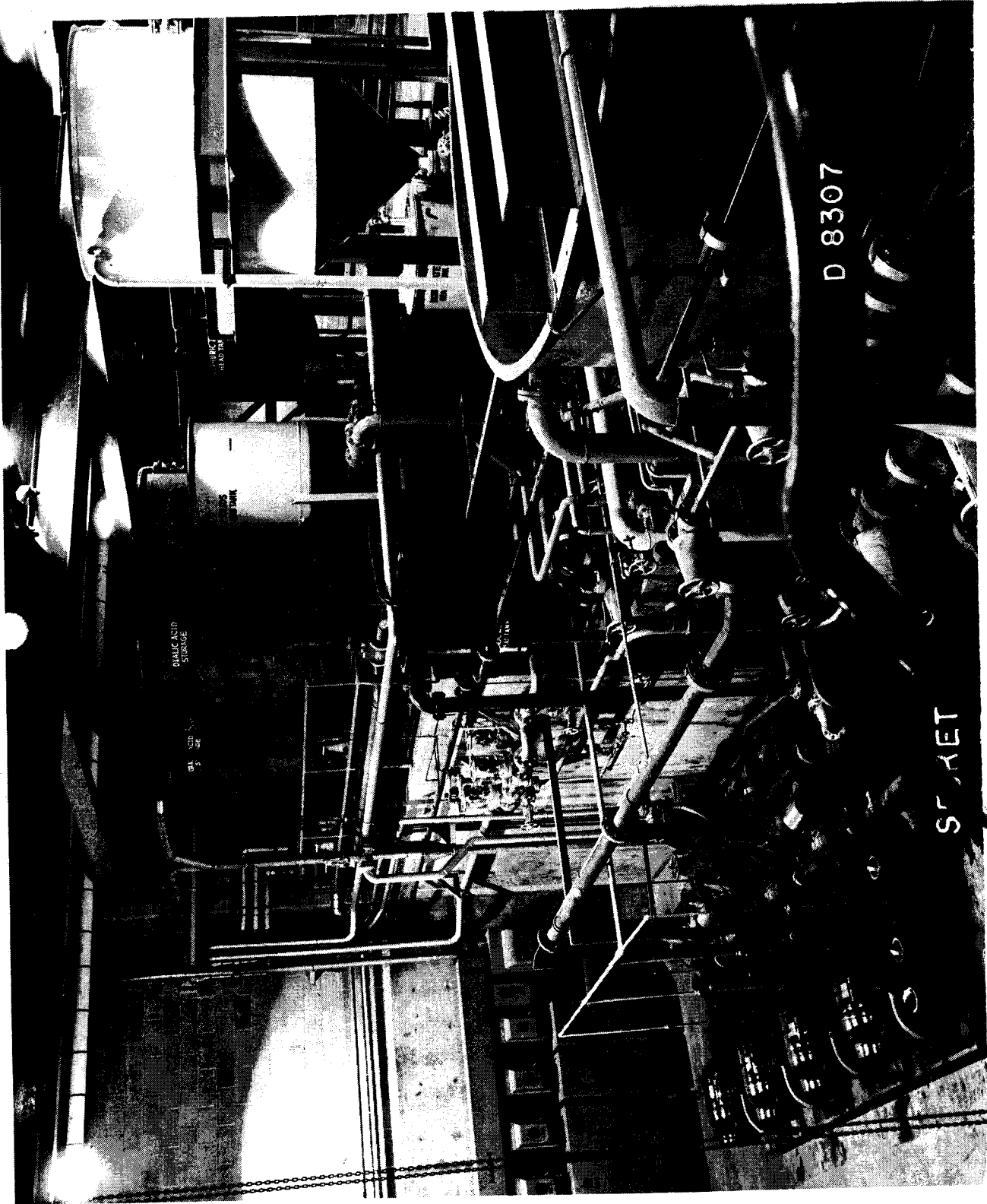


~~SECRET~~

APPENDIX A 56

FINAL WATER CONDITIONING EQUIPMENT

~~SECRET~~



D 8307

SECRET

DUAL ACID STORAGE

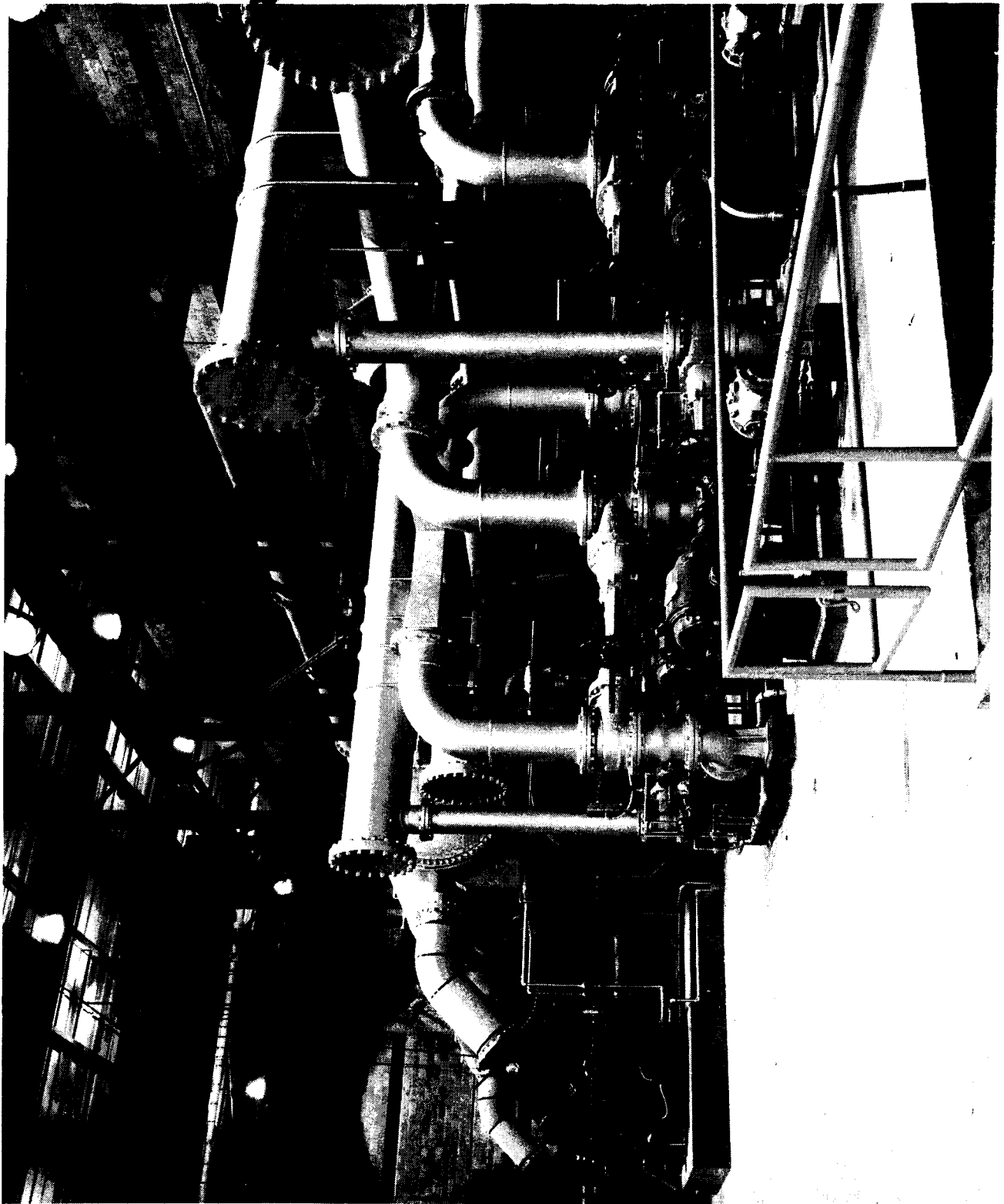
SUBJECT HEAD TANK

~~SECRET~~

APPENDIX A 57

REFRIGERATION EQUIPMENT (100 F BUILDING)

~~SECRET~~

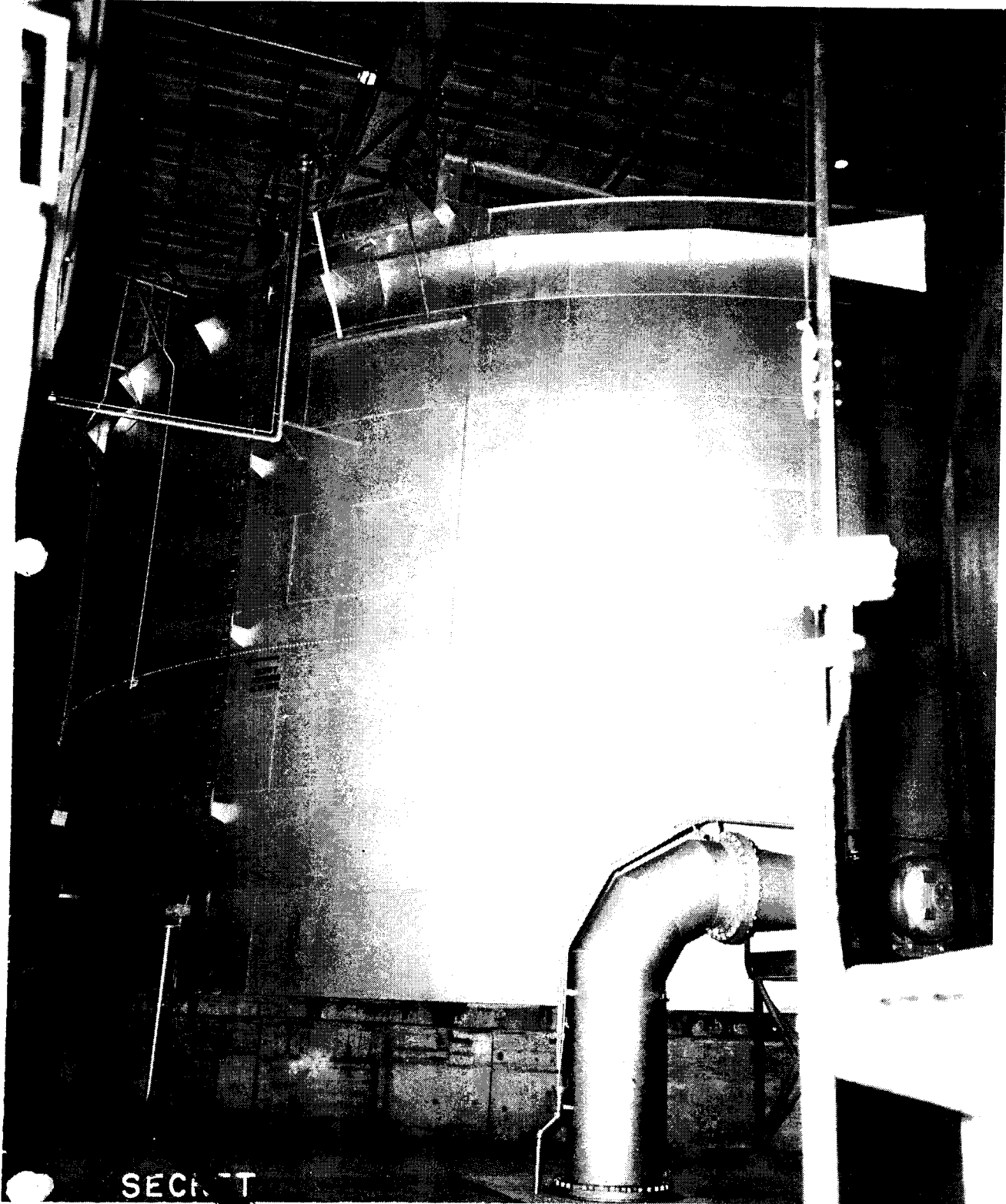


~~SECRET~~

APPENDIX A 58

PILE AREA PROCESS WATER TANK

~~SECRET~~



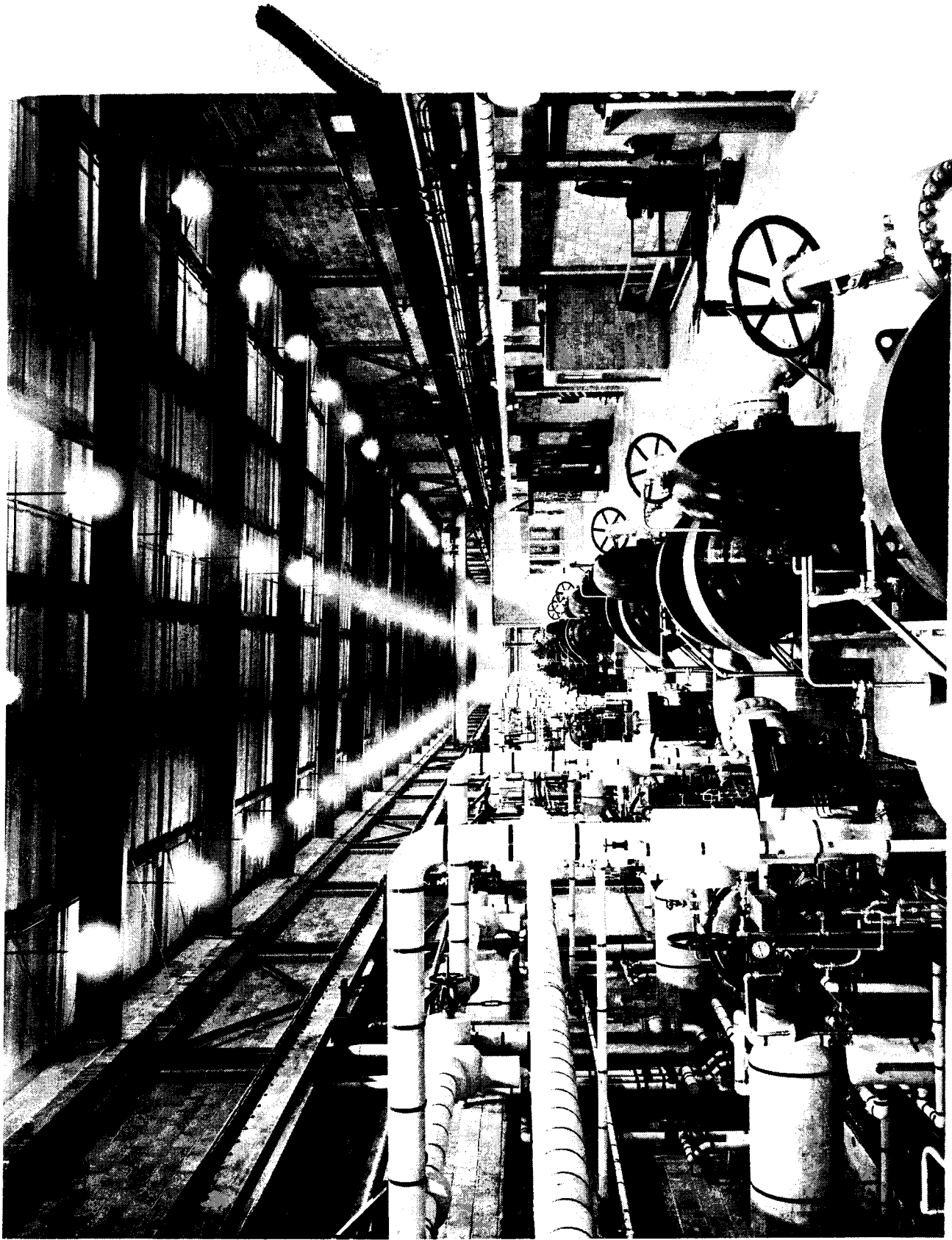
SECRET

~~SECRET~~

APPENDIX A 59

PILE AREA PROCESS WATER PUMPS

~~SECRET~~



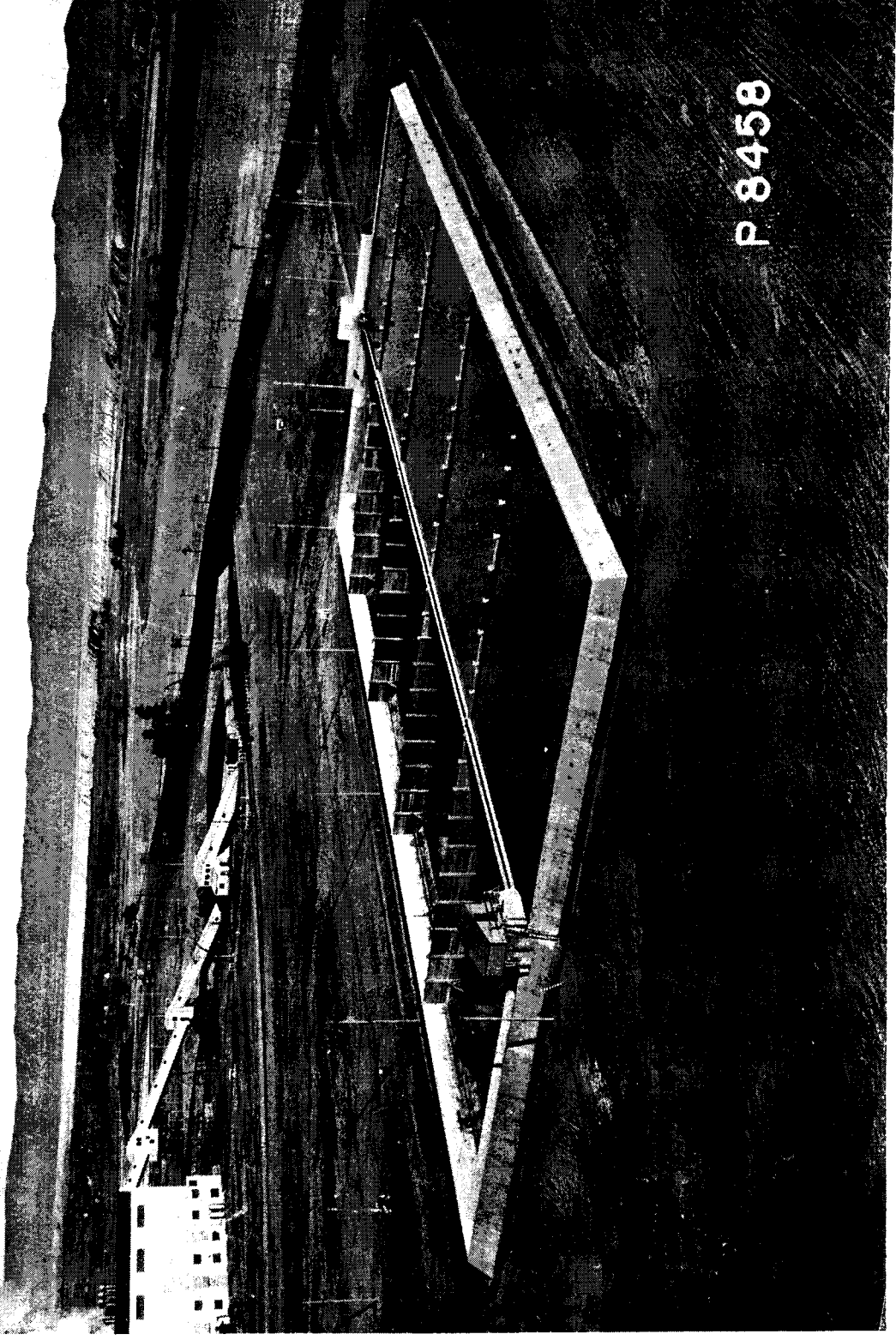
~~SECRET~~

APPENDIX A 60

RETENTION BASIN

The Retention Basin consists essentially of two different reservoirs each about 465 feet long and separated by an overflow flume extending from the intake chamber to the discharge flume. This basin holds up the discharged cooling water from the Pile for a period sufficient to permit decay of the radioactivity which the water has acquired in its passage through the Pile.

~~SECRET~~



P 8458

APPENDIX A 61

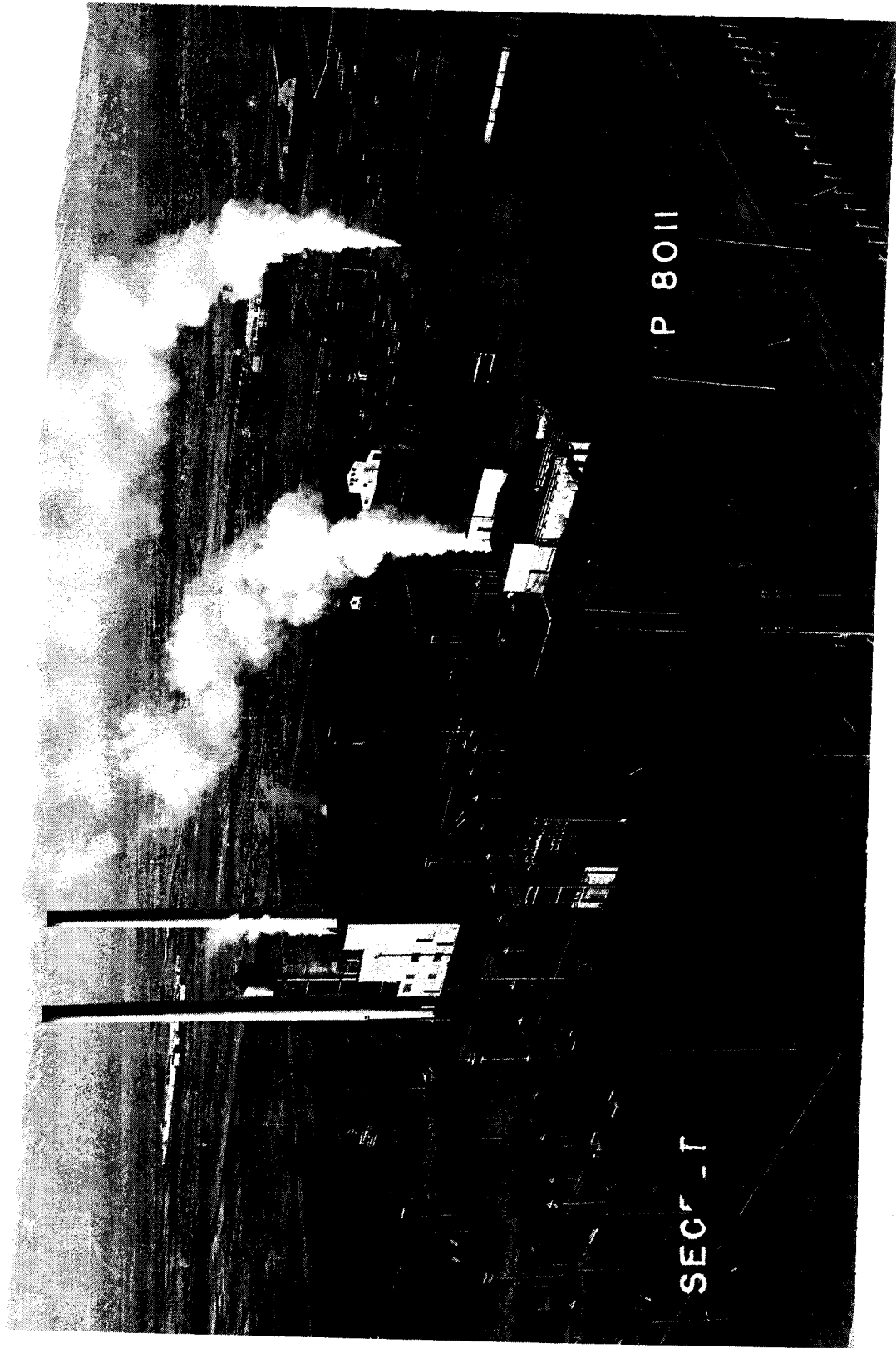
PRIMARY SUBSTATION (151 D)

~~SECRET~~

APPENDIX A 62

POWER HOUSE (100 AREA)

~~SECRET~~



P 8011

SECRET

~~SECRET~~

MEMORANDUM (S) AREA

~~SECRET~~

APPENDIX A 63

AERIAL VIEW OF SEPARATION (200 N) AREA



~~SECRET~~

APPENDIX A 64

LAG STORAGE (212 BUILDING)

~~SECRET~~

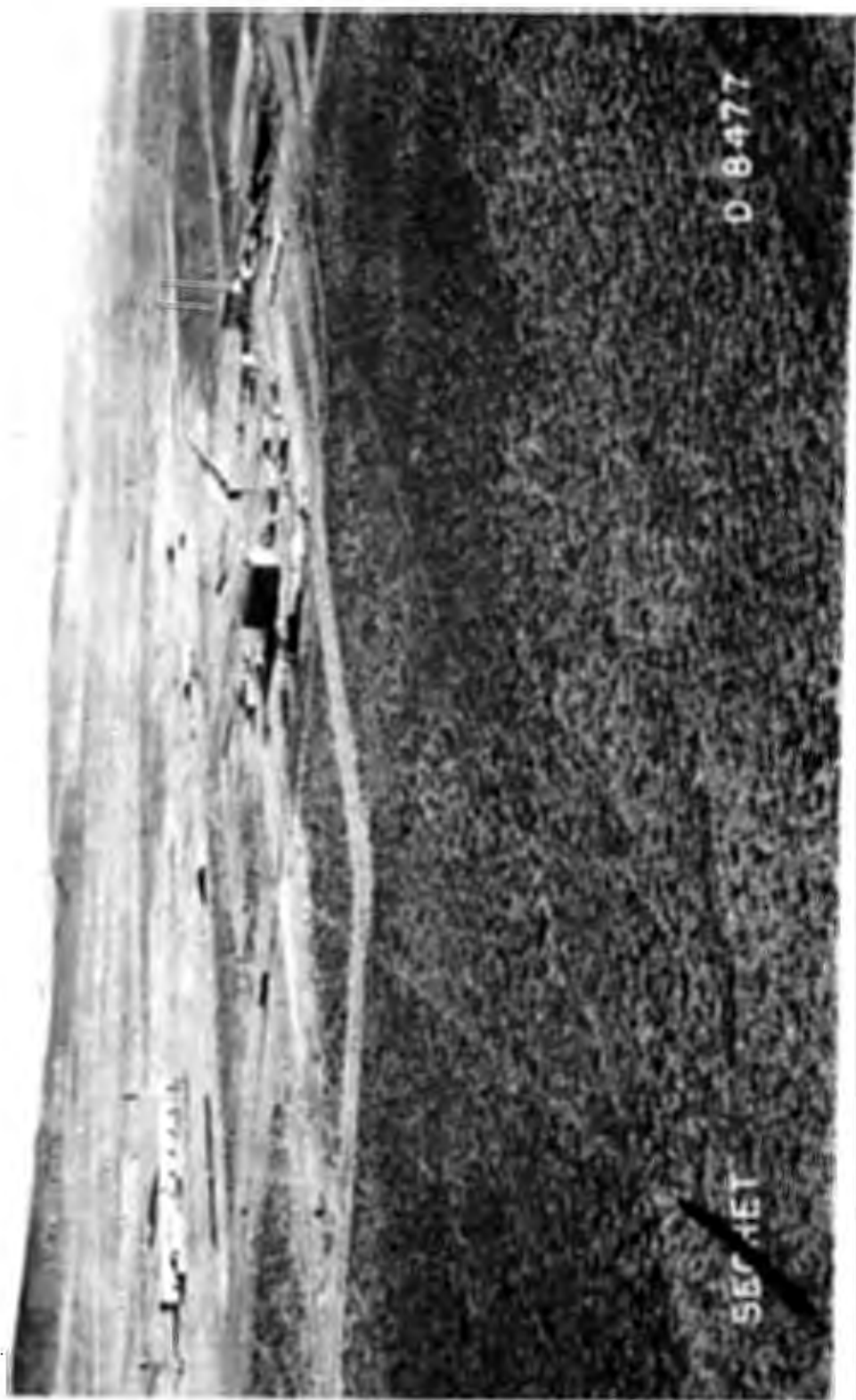


SECRET

APPENDIX A 65

AERIAL VIEW OF SEPARATION (200 E) AREA

SECRET



D 8477

SECRET

~~SECRET~~

APPENDIX A 66

AERIAL VIEW OF SEPARATION (200 T) AREA

~~SECRET~~



P 7816

~~SECRET~~

APPENDIX A 67

AERIAL VIEW OF SEPARATION (221-T BUILDING)

~~SECRET~~

APPENDIX A 68

BULK REDUCTION BUILDING (224 T)

This is a concentration building where the crude product from the separation plant is bulk reduced and further decontaminated.

~~SECRET~~

~~SECRET~~



~~SECRET~~

SECRET

APPENDIX A 69

PROCESS WASTE STORAGE (241 T BUILDING)

The radioactive by-products of the separation process are stored here in shielded tanks buried in order to eliminate radiation hazards. The most active wastes (metal solution and first by-product precipitate) eventually heat up to boiling and air-cooled reflux condensers, shown on the right, are provided to eliminate tanks boiling dry. The low active waste from 224 Building and the "decayed" wastes from the storage tanks are stored in a retention pond, shown on the left.

SECRET



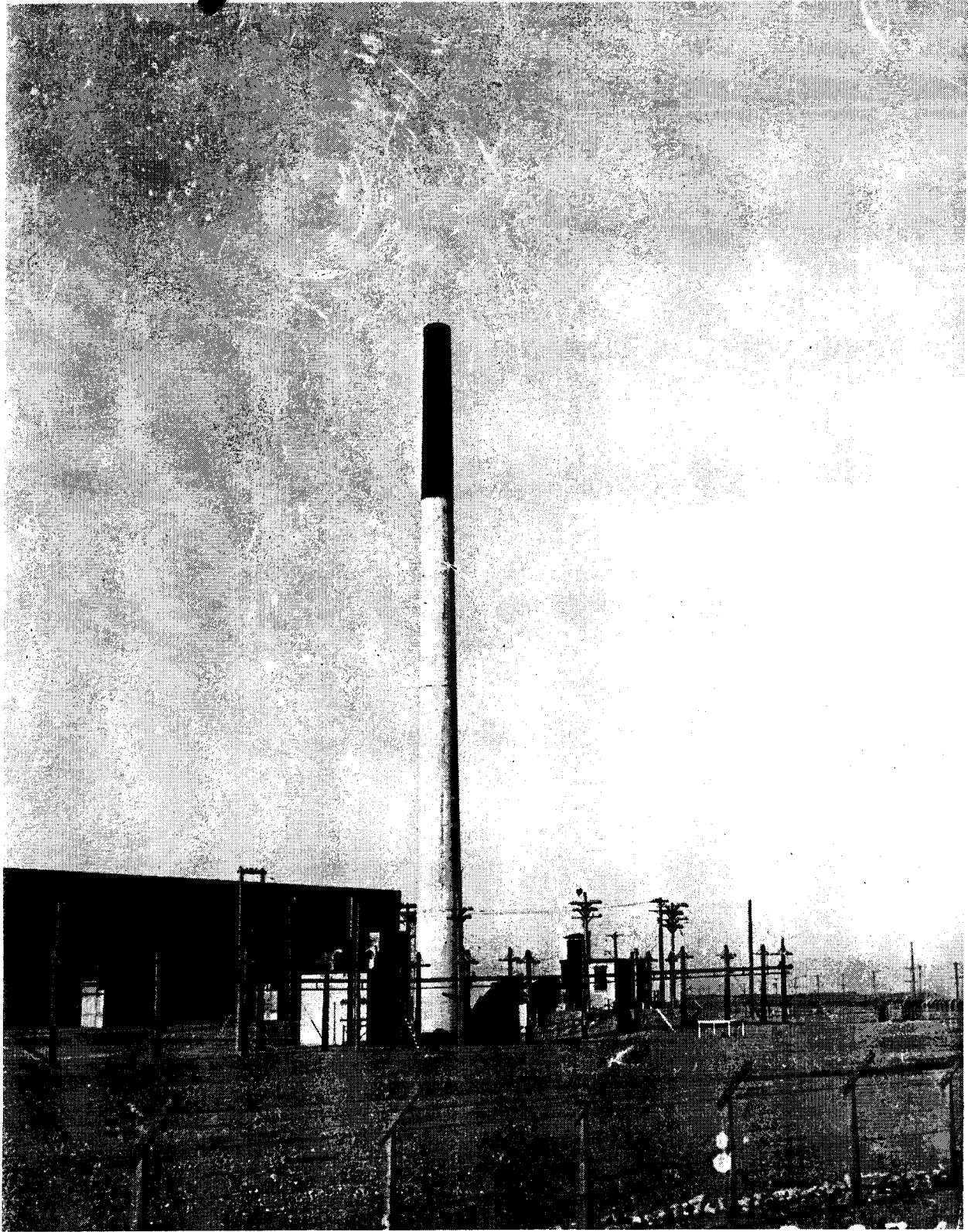
SECRET

D 7994

APPENDIX A 70

STACK AND VENTILATION BUILDING (291)

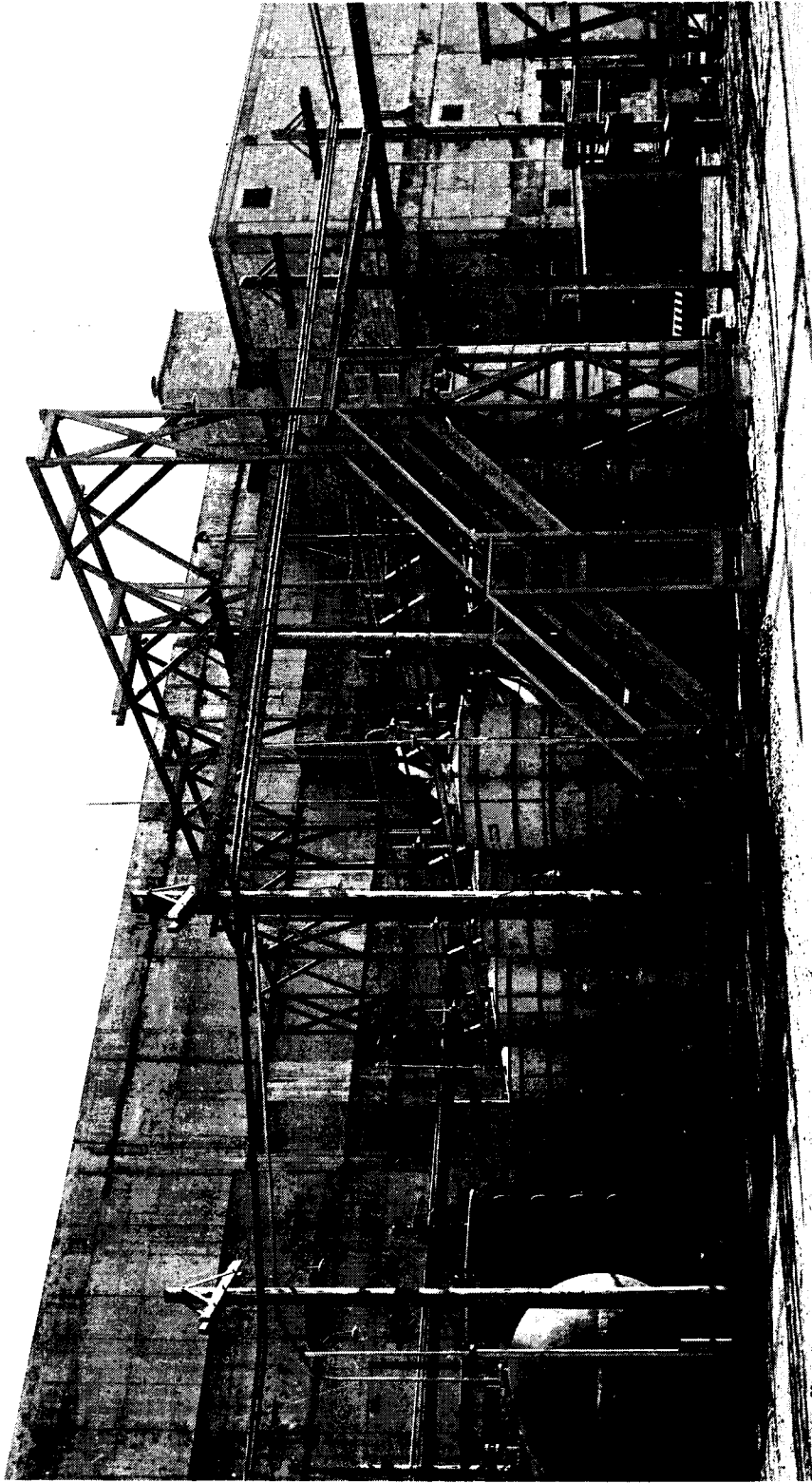
This building provides the facilities for handling the main ventilation requirements for Building No. 221 and for disposing of gaseous radioactive products into the atmosphere.



~~SECRET~~

APPENDIX A 71

VERTICAL ACID STORAGE TANKS (211)

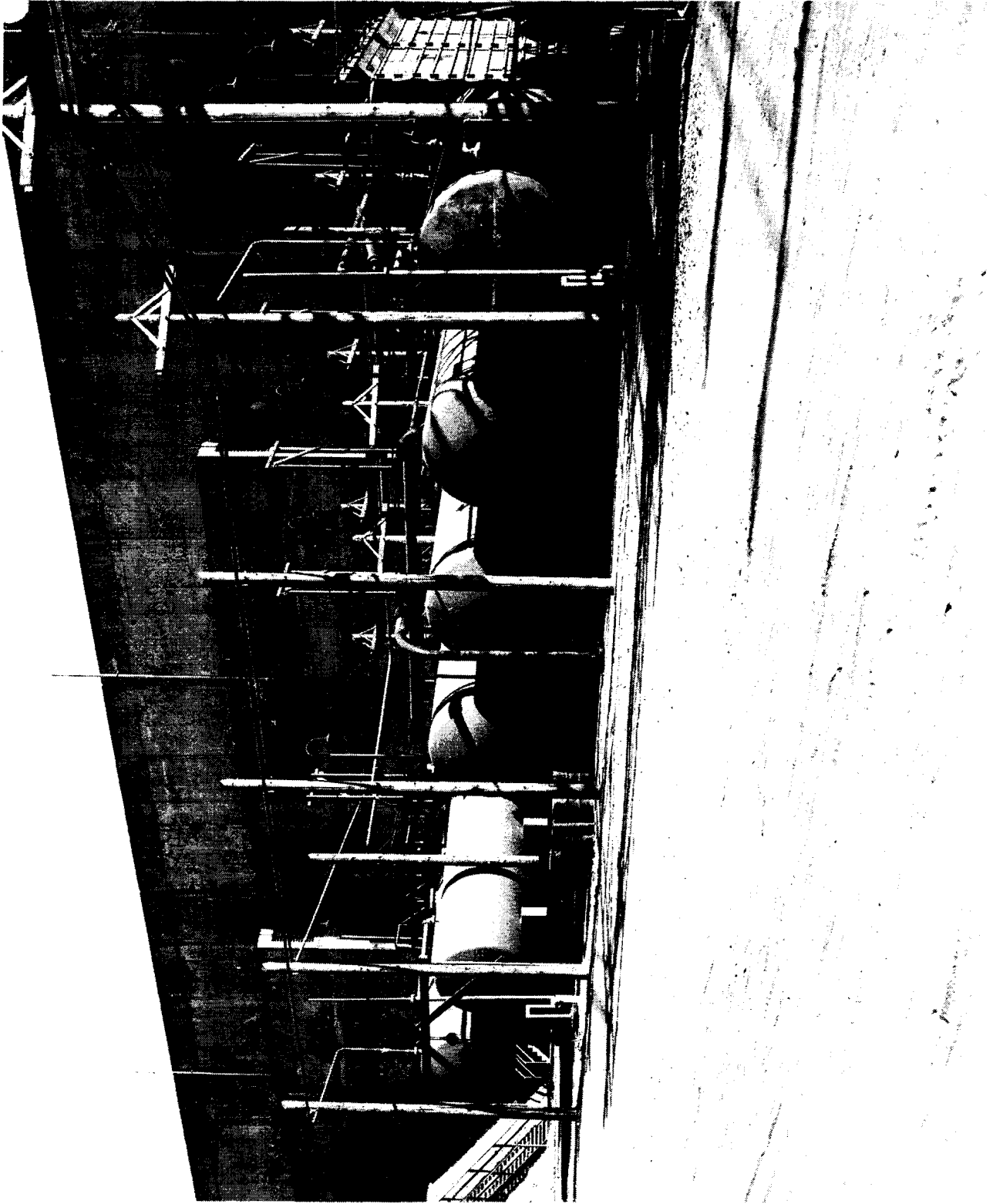


~~SECRET~~

APPENDIX A 72

HORIZONTAL ACID STORAGE TANKS (211)

~~SECRET~~



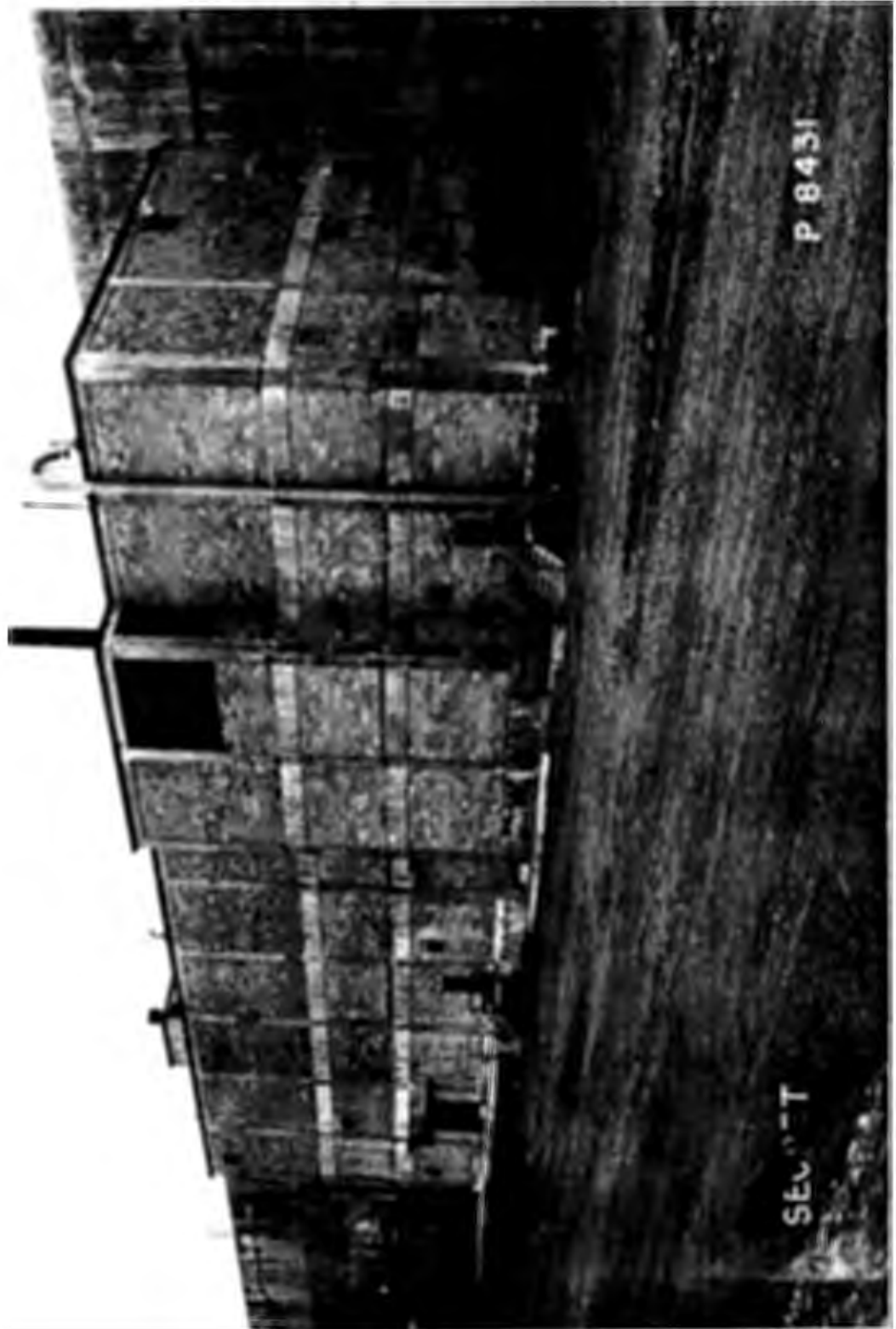
~~SECRET~~

APPENDIX A 73

CHEMICAL PREPARATION AND SERVICE BUILDING (271 T)

Provides facilities for preparation of process chemicals and serves as administrative headquarters for the operation of the process.

~~SECRET~~



SEU...T

P 843I

~~SECRET~~

APPENDIX A 74

SAMPLE PREPARATION LABORATORY (222-T BUILDING)

This building houses the control laboratories for the process.

~~SECRET~~

ST-11



11

~~SECRET~~

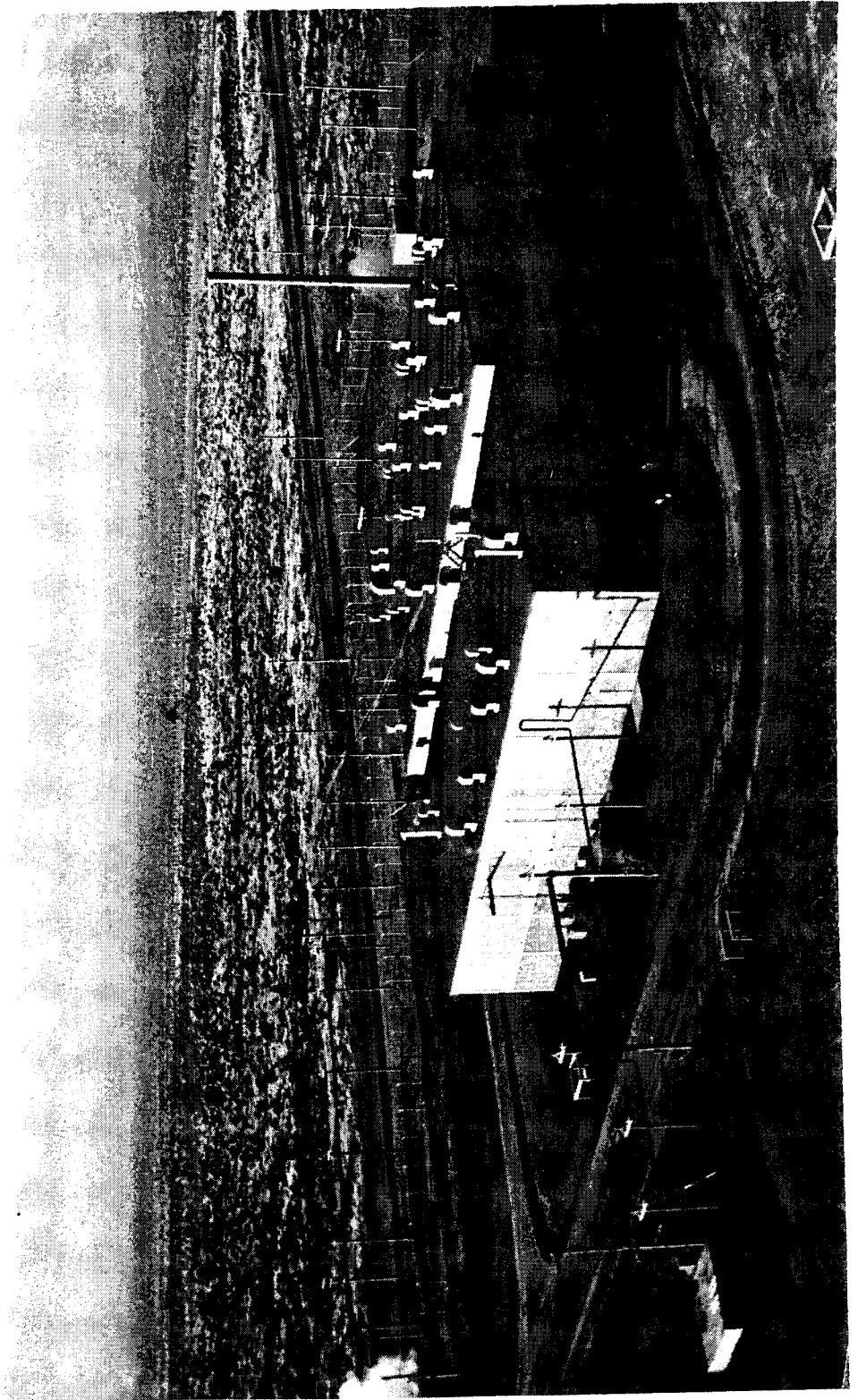
SECRET

APPENDIX A 75

ISOLATION BUILDING (231 W)

Contains equipment for the final isolation of the product. Only one 231 Building is provided to handle the output from all the 200 Area separation plants.

~~SECRET~~



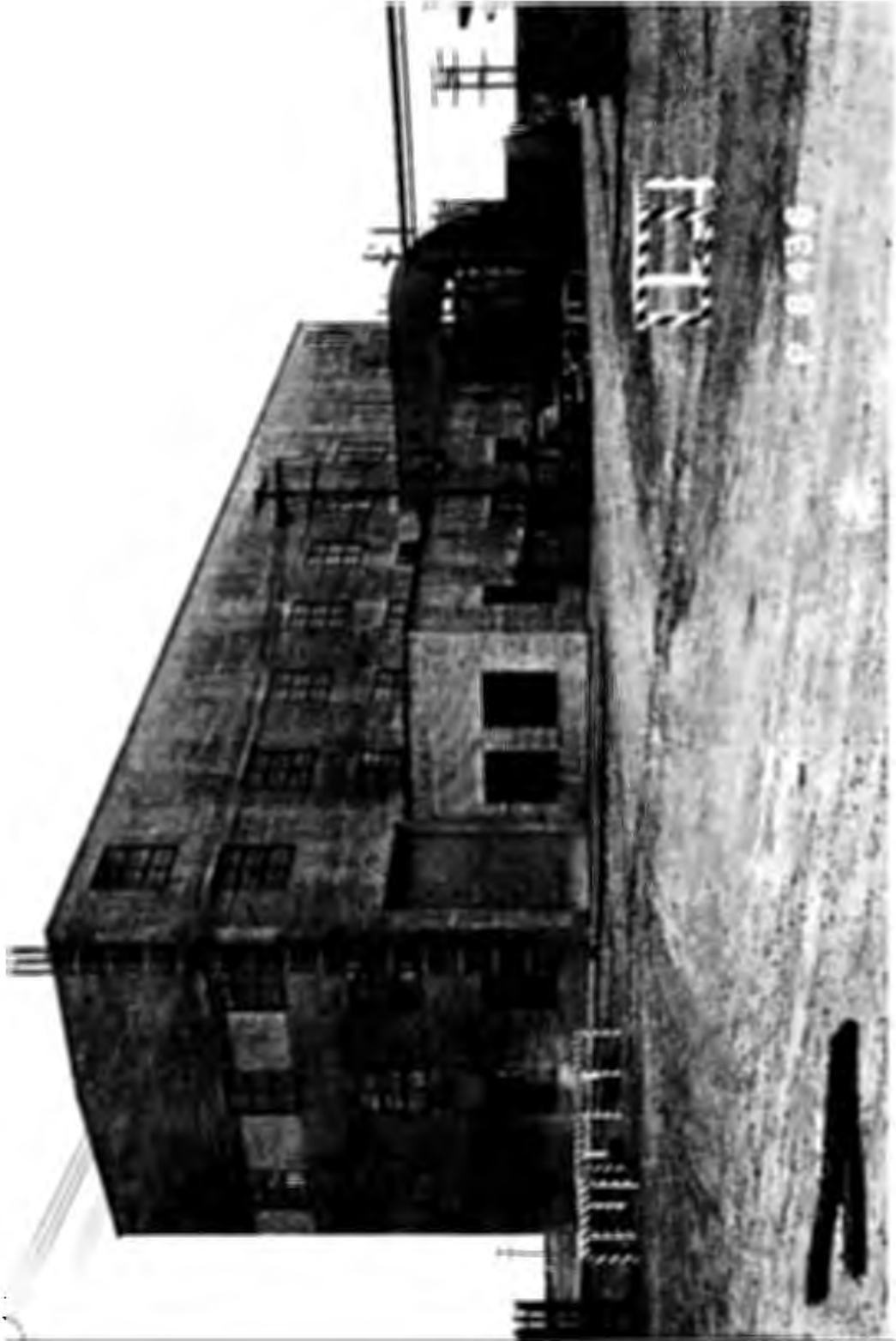
1



APPENDIX A 76

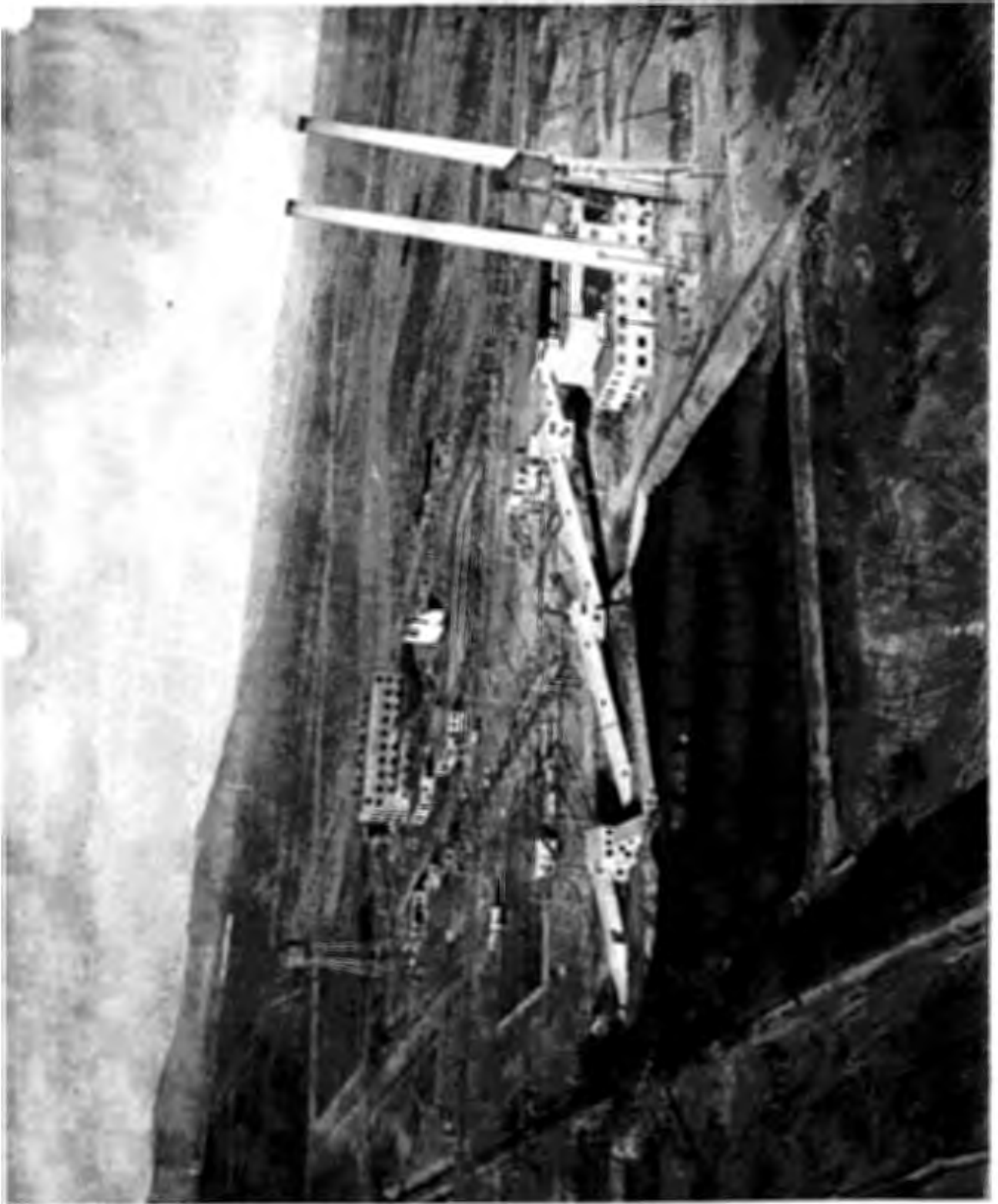
AREA SHOP (272 B BUILDING)

This building houses a Machine Shop, Electrical Shop, Pipe Shop and Carpenter Shop for maintenance of the operating equipment in Building 221.



APPENDIX A 77

POWER PLANT (200 E AREA)

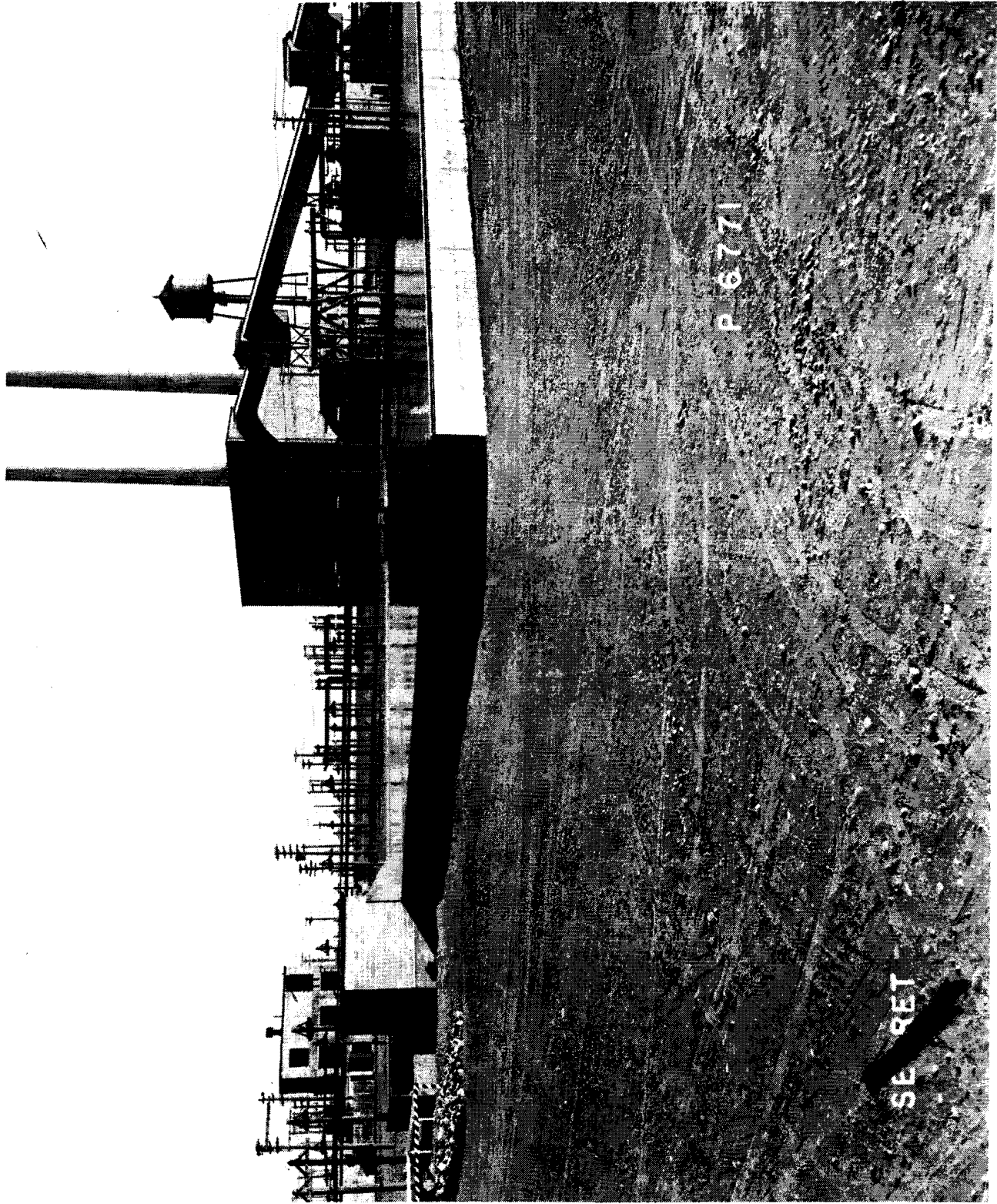


~~SECRET~~

APPENDIX A 78

RESERVOIR AND PUMP HOUSE (282 W)

~~SECRET~~

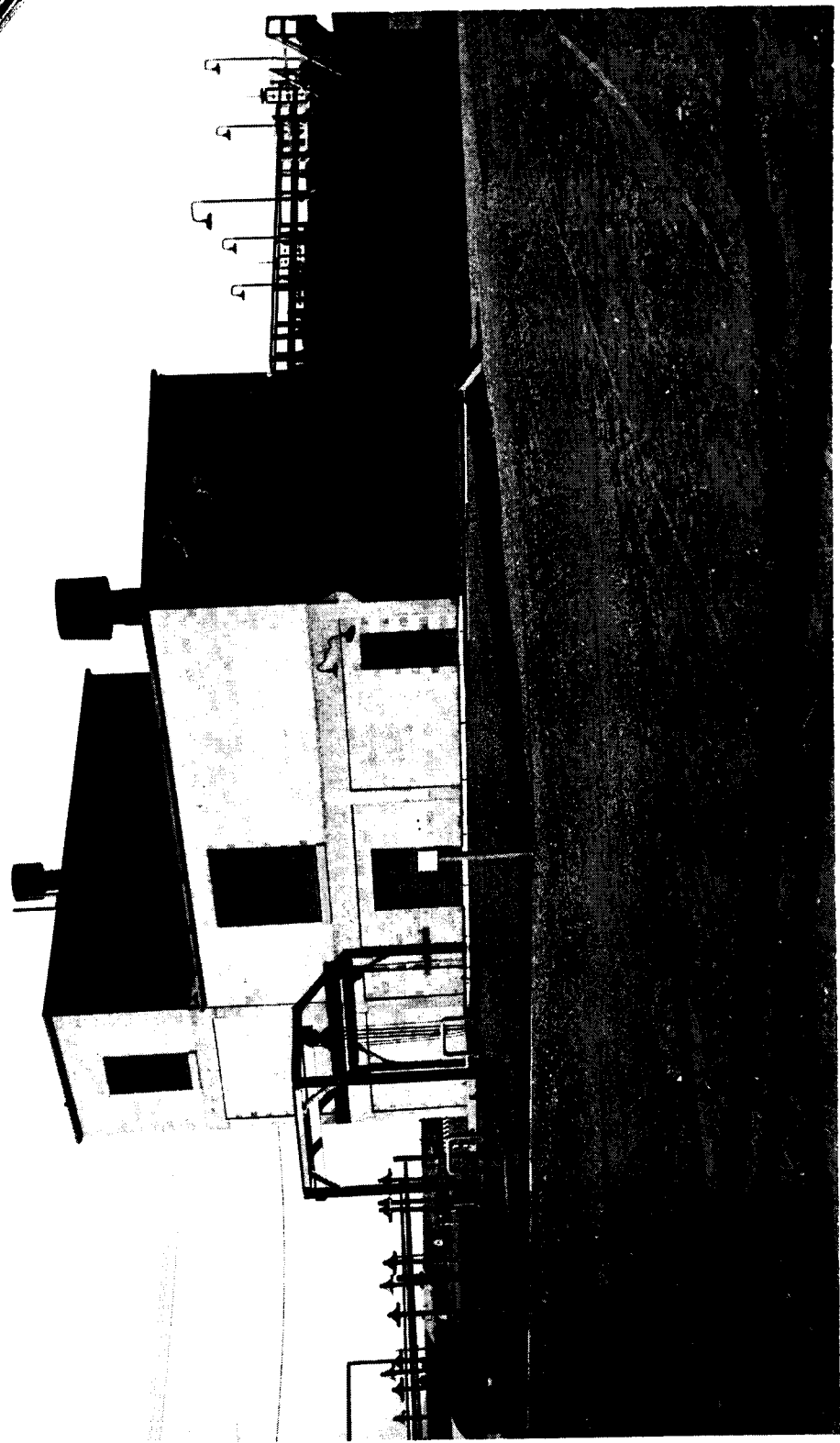


P 6771

SECRET

APPENDIX A 79

FILTER PLANT (283 W)



~~SECRET~~

APPENDIX A 30

HEAT TREATING FURNACE BUILDING (273 E)

A Heat Treating Furnace with necessary facilities for the purpose of heat treating and pickling piping and equipment is housed in this building adjacent to Building 272 E.

~~SECRET~~

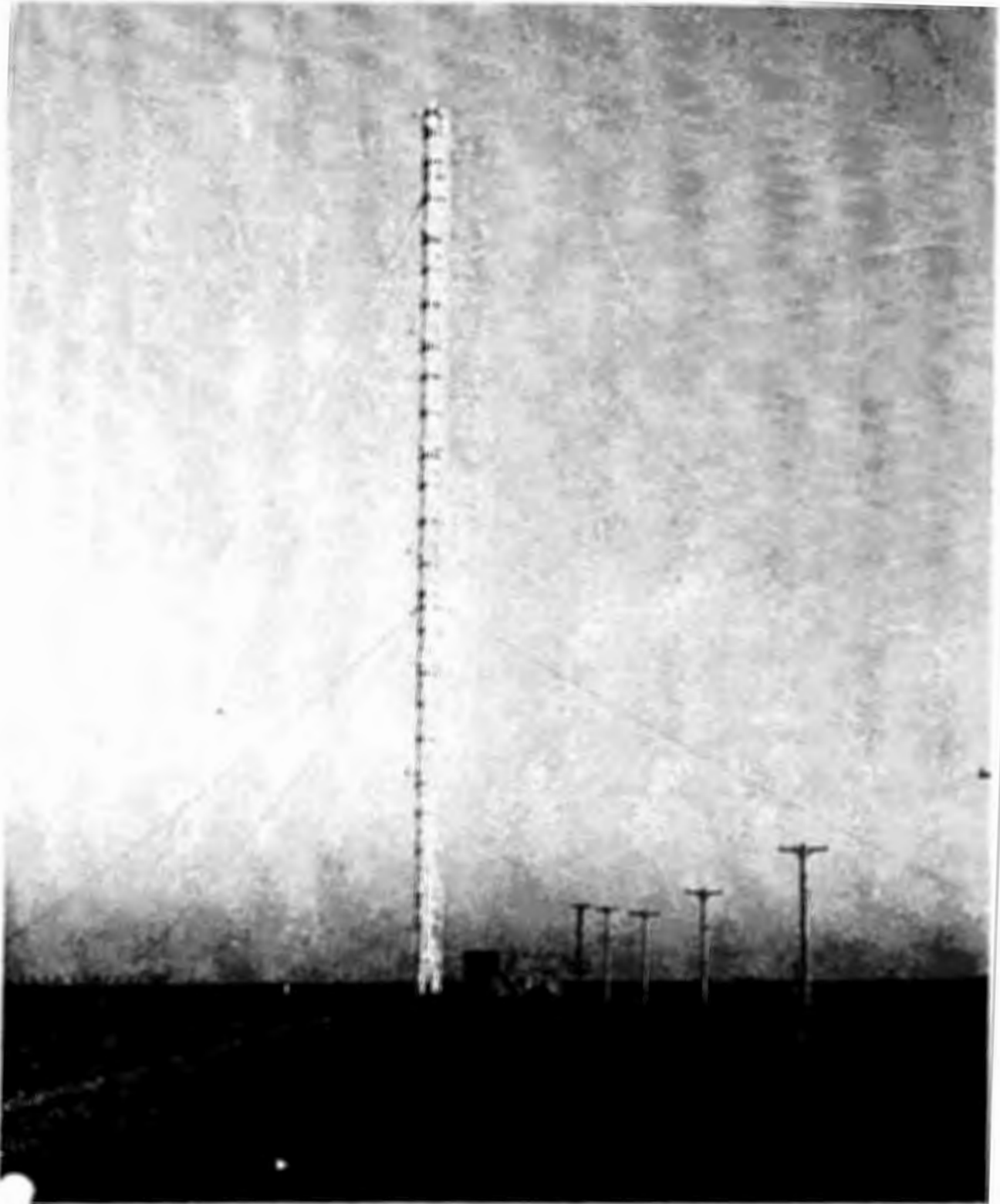


P 8353

APPENDIX A 81

METEOROLOGICAL TOWER

~~XXXXXXXXXX~~

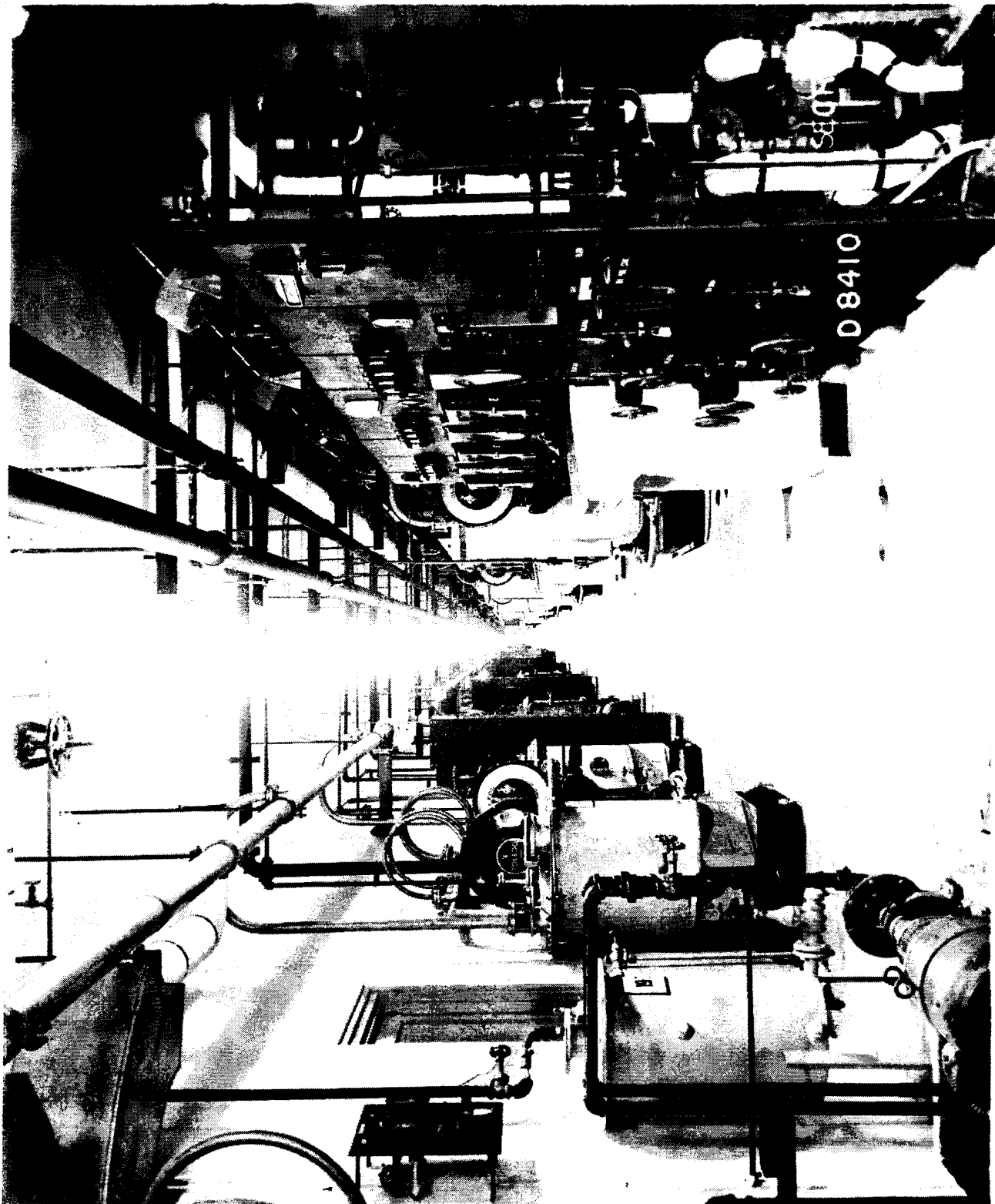


~~XXXXXXXXXX~~

APPENDIX A 32

OPERATING GALLERY (221 BUILDING)

The operating gallery is the control center for cell equipment. At each section is a gauge board from which control and instrument lines run to the cells, via the pipe gallery. Weigh tanks are provided with inlet connections from appropriate chemical headers in the pipe gallery and outlets to the cell vessel connections.



~~UNCLASSIFIED CONTROLLED
NUCLEAR INFORMATION~~

~~SECRET~~

APPENDIX A 83

PIPE GALLERY (221 BUILDING)

All cell piping except process transfer lines is brought up to the pipe gallery, terminating in connections on the wall. From here, connections are made to the weigh tanks and control boards in the operating gallery. Chemical headers, electrical and steam distribution lines are located in this gallery.

~~SECRET~~



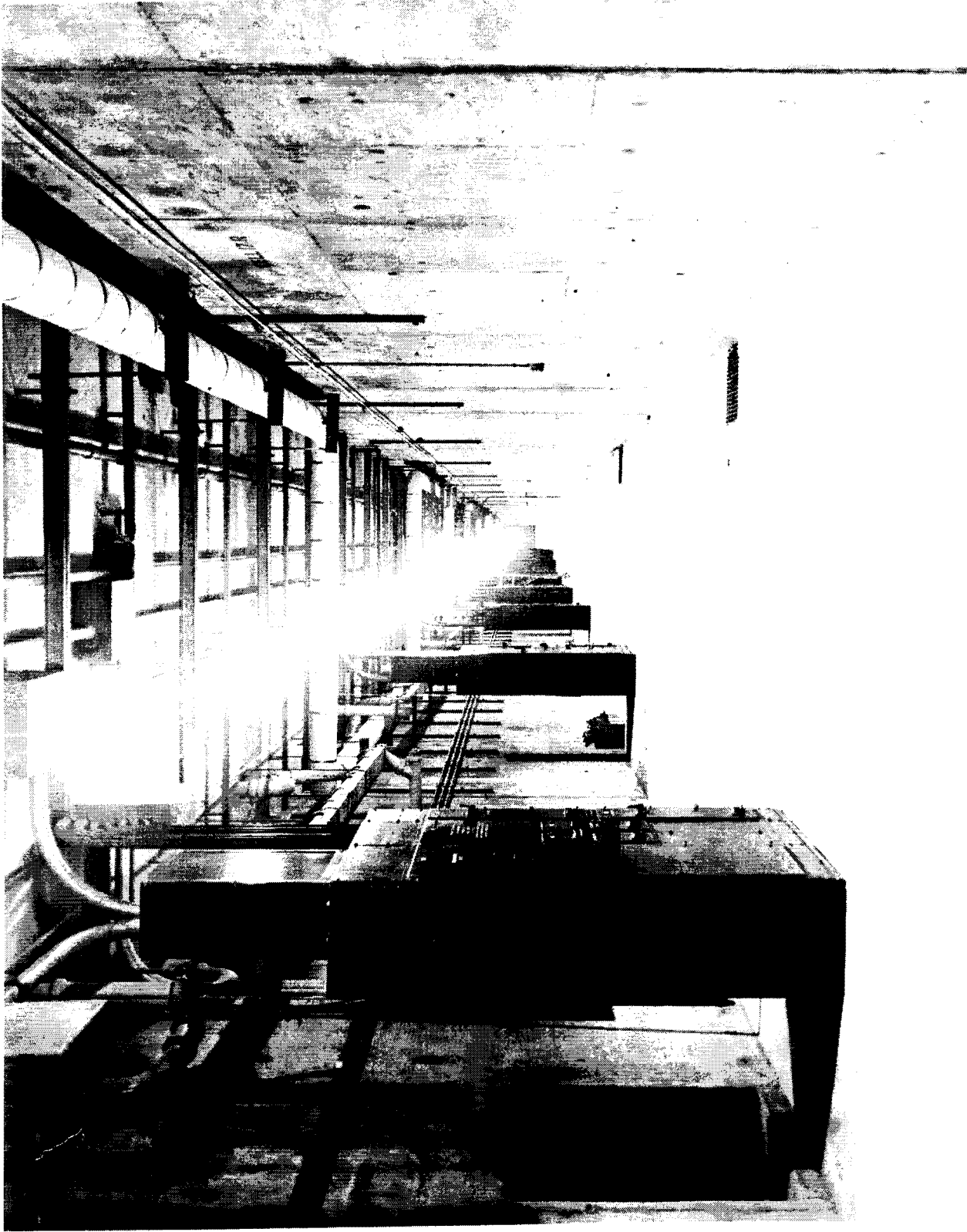
~~SECRET~~

APPENDIX A 34

ELECTRICAL GALLERY (221 BUILDING)

The electrical gallery or basement gallery contains principally electrical lines. The steam main also enters the building through this gallery.

~~SECRET~~



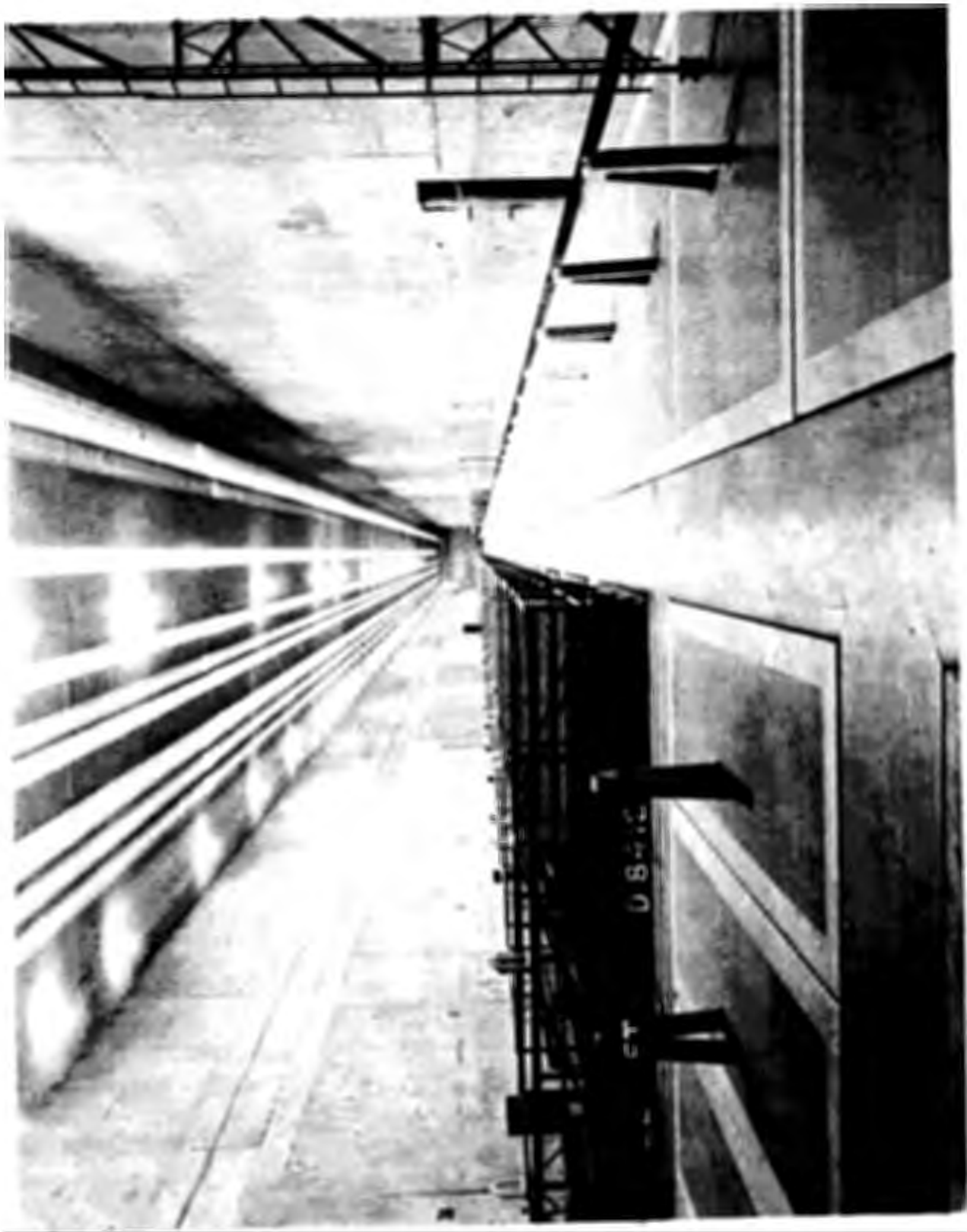
~~SECRET~~

APPENDIX A 85

CELL COVERS (221 BUILDING)

The cell covers are in removable sections and is the only means of access to the cell. The cover sections have stepped interlocking edges so that there are no straight cracks through which radiation can pass. The light streaks running the length of the building are produced by an overhead crane used in servicing the cells.

~~SECRET~~



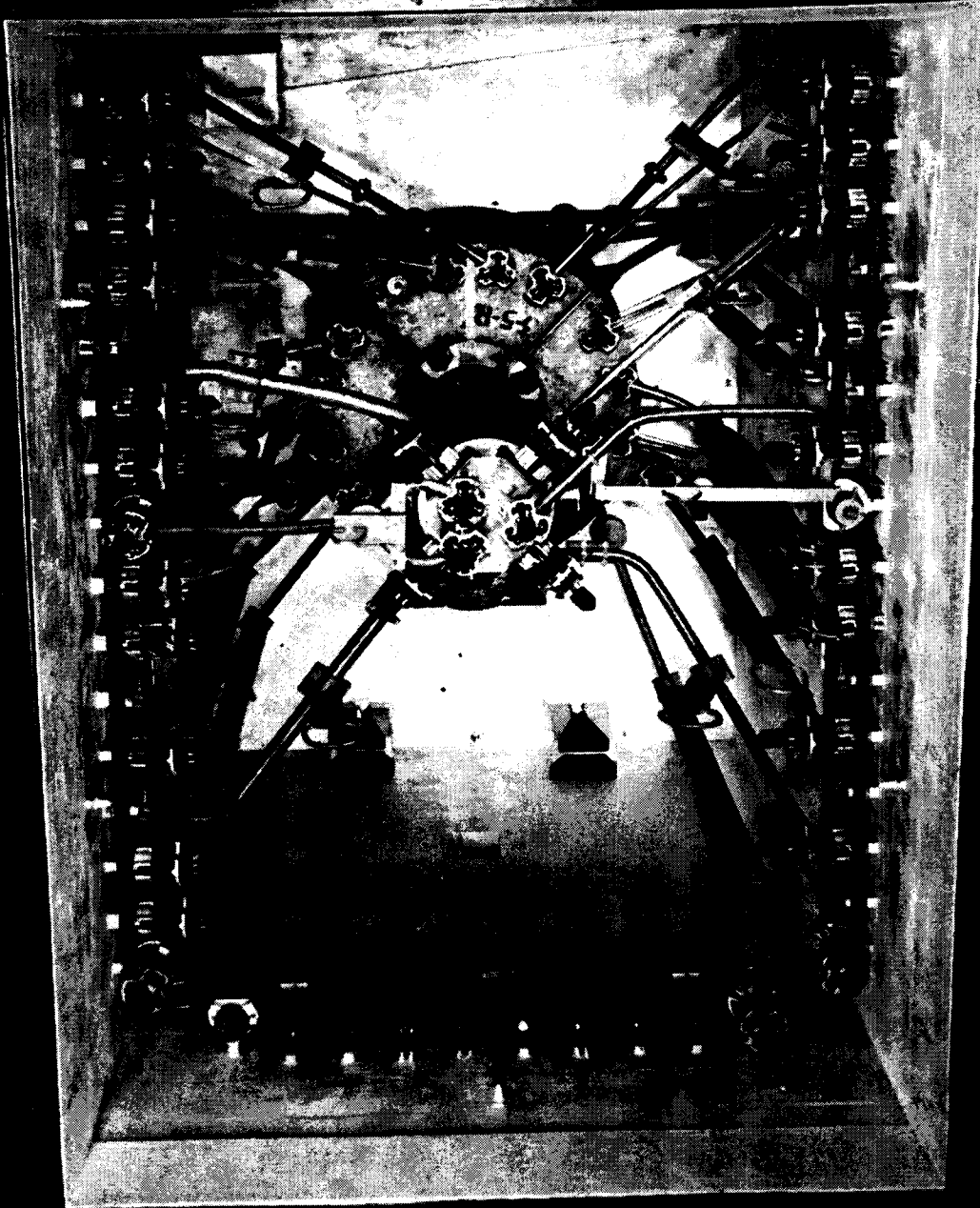
~~SECRET~~

APPENDIX A 86

SEPARATION PLANT DISSOLVER (221 BUILDING)

This is a vertical tank equipped to receive charges of active slugs and conduct operations at the boiling point. There are three dissolvers in 221 Building. The operations of coating removal, metal dissolving and reduction are carried out consecutively in this dissolver.

~~SECRET~~



SECRET

D 5721

~~UNCLASSIFIED CONTROLLED~~
~~NUCLEAR INFORMATION~~

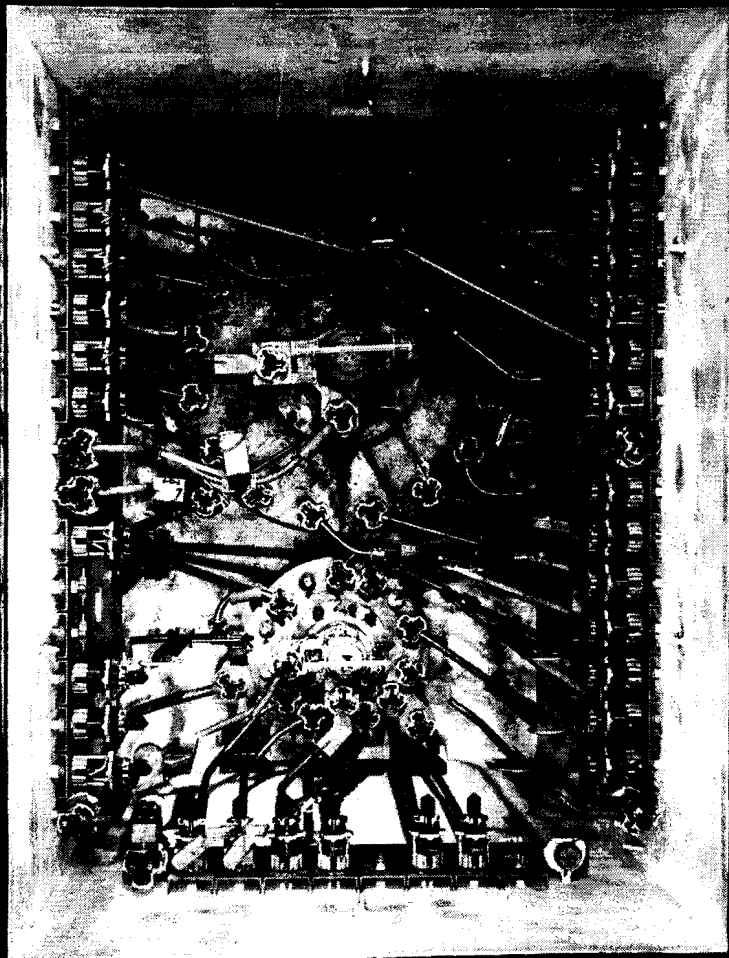
~~SECRET~~

APPENDIX A 87

PRECIPITATOR AND SOLUTION TANK (221 BUILDING)

The precipitator, the upper tank in the photo, is a 9-foot by 9-foot tank. It is equipped with an agitator, a jacket and an overflow line which drains to the cell floor. The solution tank is a small edition of the precipitator equipped with agitator and accessory connections.

~~SECRET~~



SECRET

D 5942

UNCLASSIFIED CONTROLLED
NUCLEAR INFORMATION

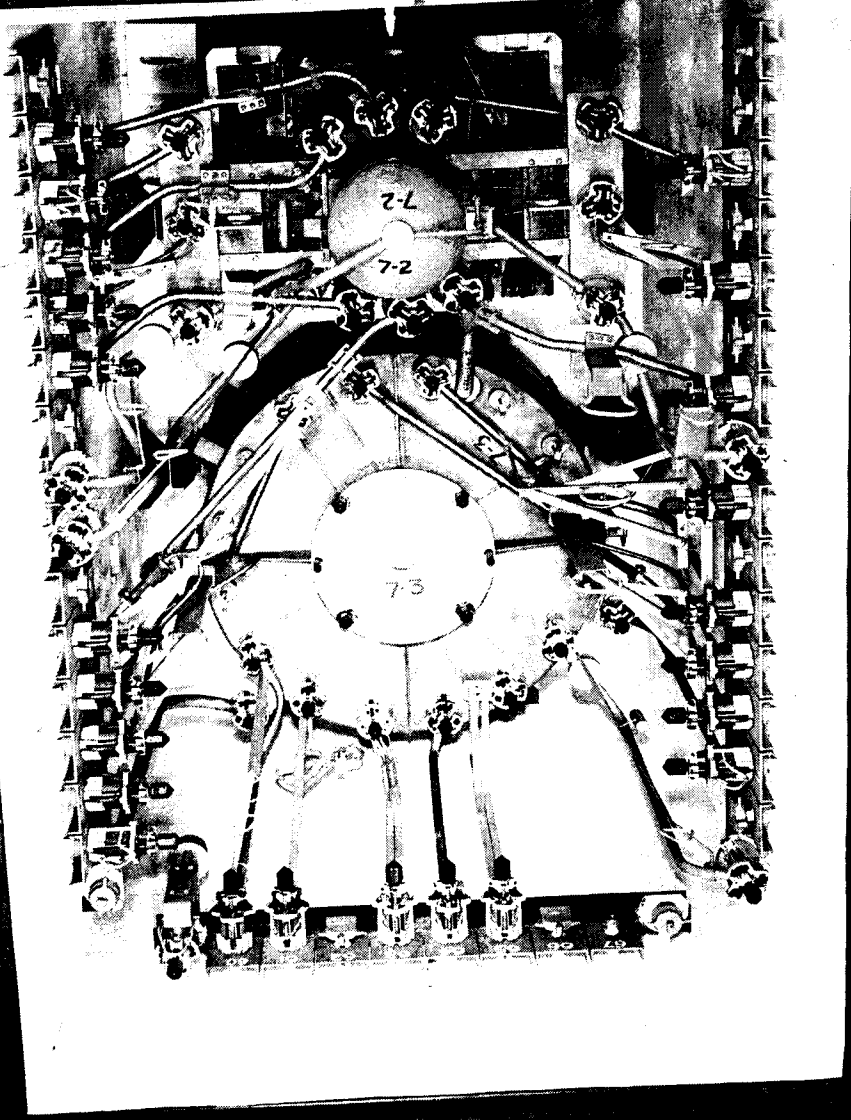
~~SECRET~~

APPENDIX A 88

CENTRIFUGE AND CATCH TANK (221 BUILDING)

The centrifuge, shown in upper section of the photo, is a 40-inch solid bowl machine with an opening near the bottom of the casing through which the bowl effluent flows into the catch tank. The catch tank is identical to the precipitator in design, but has no agitator. The agitator opening is blanked off with a manhole cover.

~~SECRET~~



SECRET D 5951

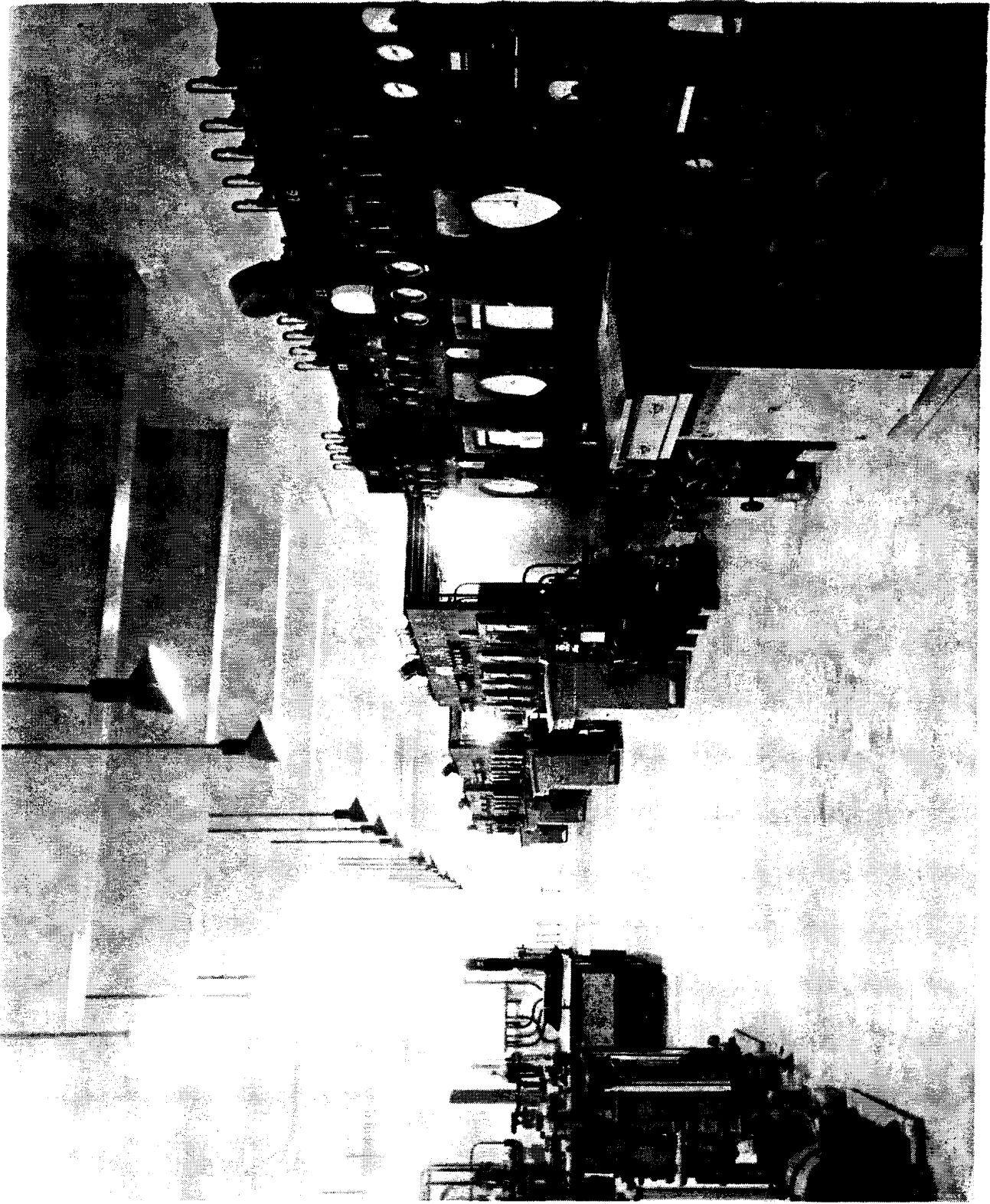
~~UNCLASSIFIED CONTROLLED
NUCLEAR INFORMATION~~

~~SECRET~~

APPENDIX A 89

OPERATION GALLERY (224 BUILDING)

~~SECRET~~

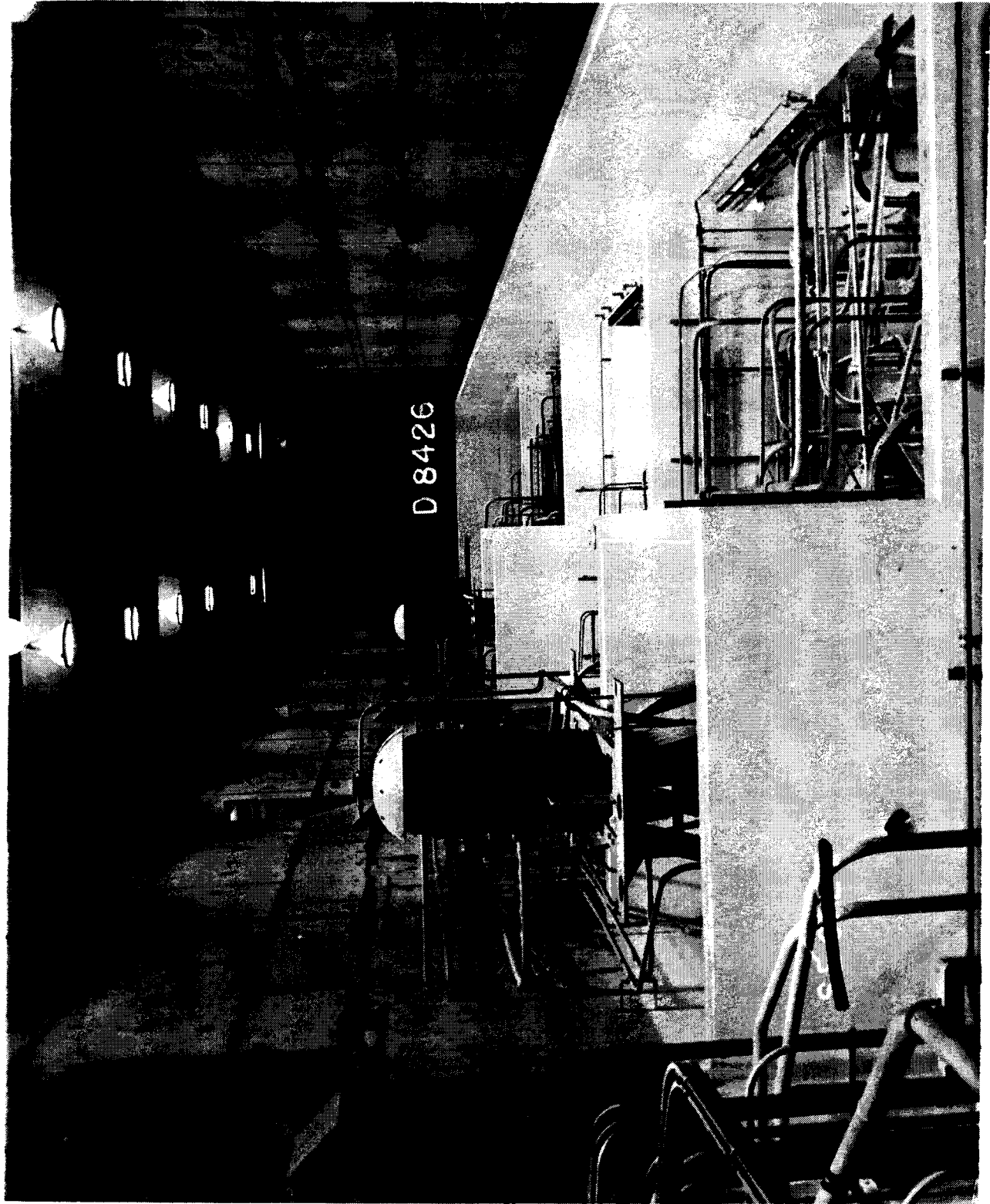


~~SECRET~~

APPENDIX A 90

STANDARD CELLS IN 224 BUILDING

~~SECRET~~



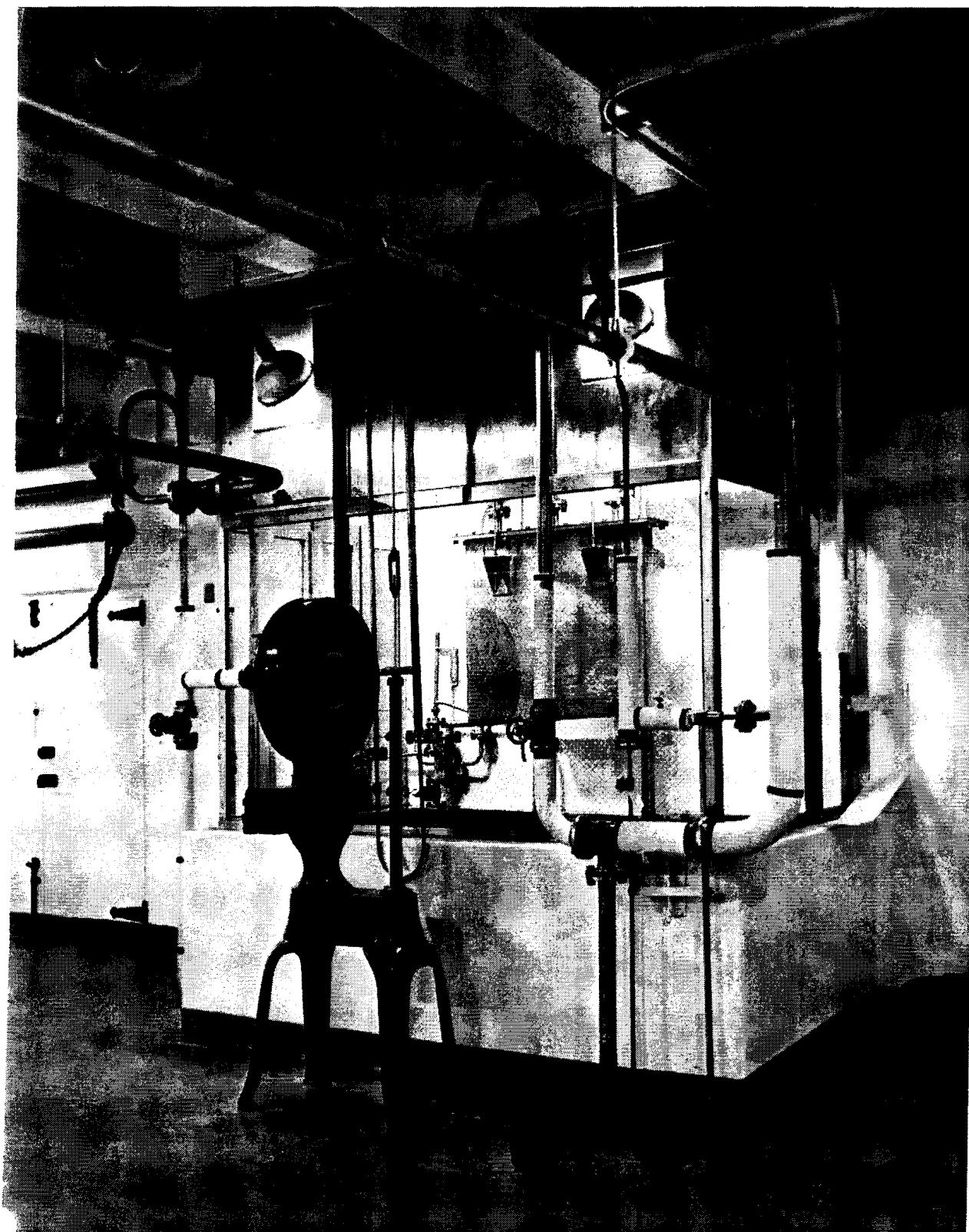
D 8426

~~SECRET~~

APPENDIX A 91

WEIGH TANK AND FILLING ENCLOSURE
FOR CONC. PRODUCT SOL. (224 BUILDING)

~~SECRET~~

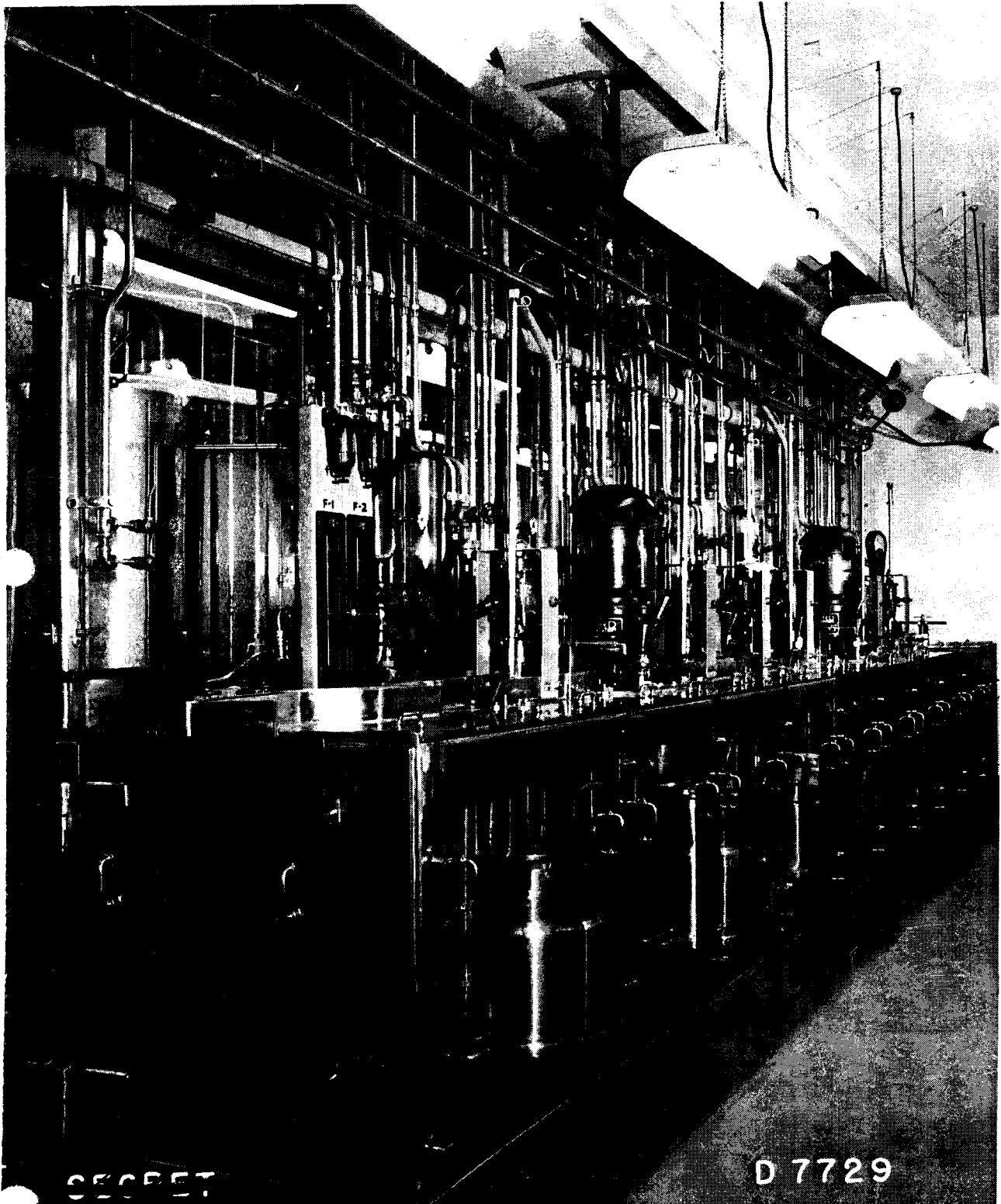


~~SECRET~~

APPENDIX A 92

TYPICAL UNIT IN ISOLATION BUILDING

~~SECRET~~



SECRET

D 7729

~~UNCLASSIFIED CONTROLLED
NUCLEAR INFORMATION~~

~~SECRET~~

APPENDIX A 99

TYPICAL LABORATORY (231 W BUILDING)

~~SECRET~~



SECRET

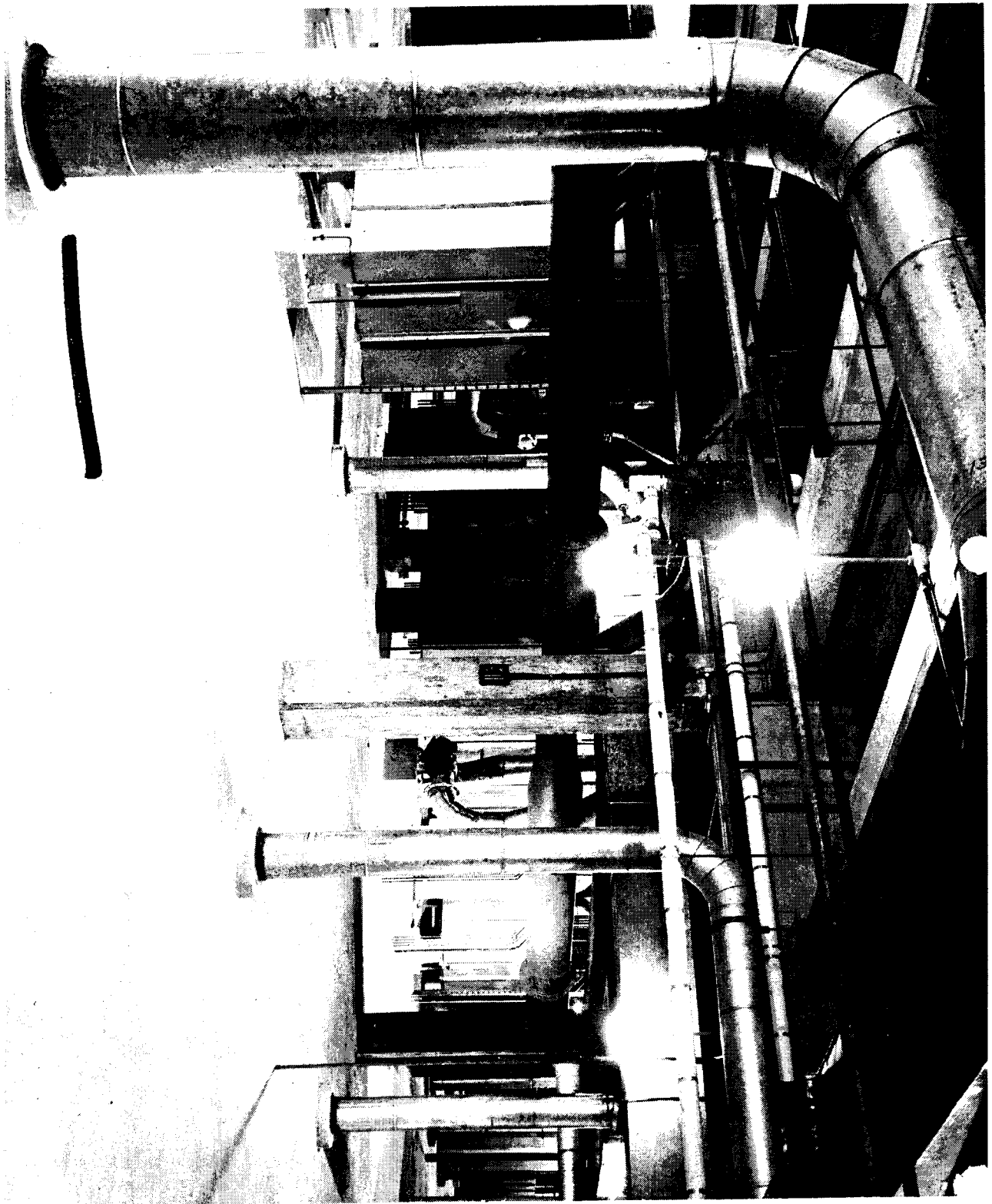
D 7730

~~SECRET~~

APPENDIX A 94

VENTILATION SYSTEM IN 231 BUILDING

~~SECRET~~



~~SECRET~~

APPENDIX A 95

MAGAZINE STORAGE (213 BUILDING)

This building contains two parallel vaults in the easternmost portion of the 200 North Area for the storage of the product.

~~SECRET~~



RICHLAND VILLAGE

Richland Village

APPENDIX A 96

AERIAL VIEW OF RICHLAND VILLAGE (1100 AREA) LOOKING NORTH

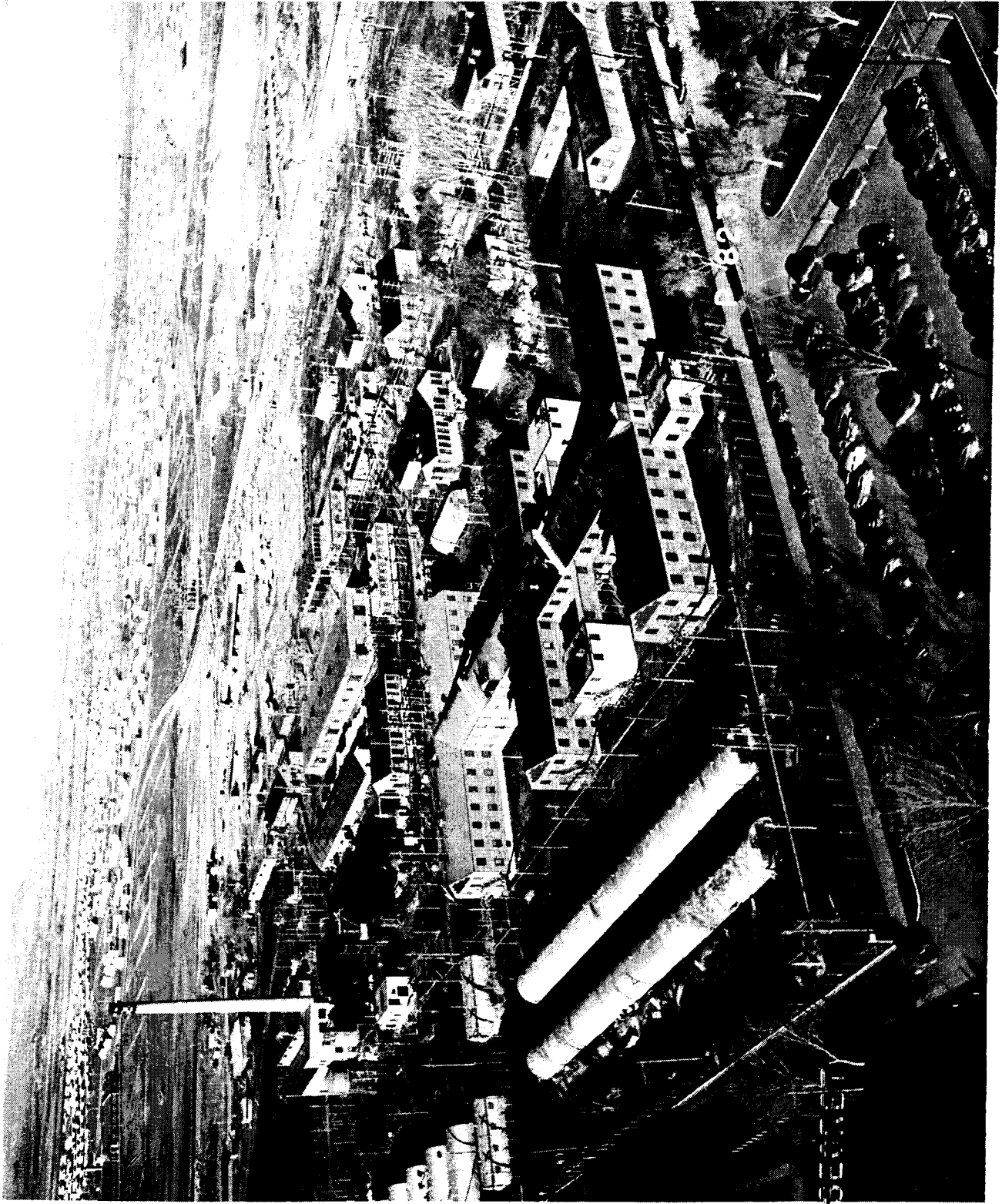


UNCLASSIFIED

APPENDIX A 97

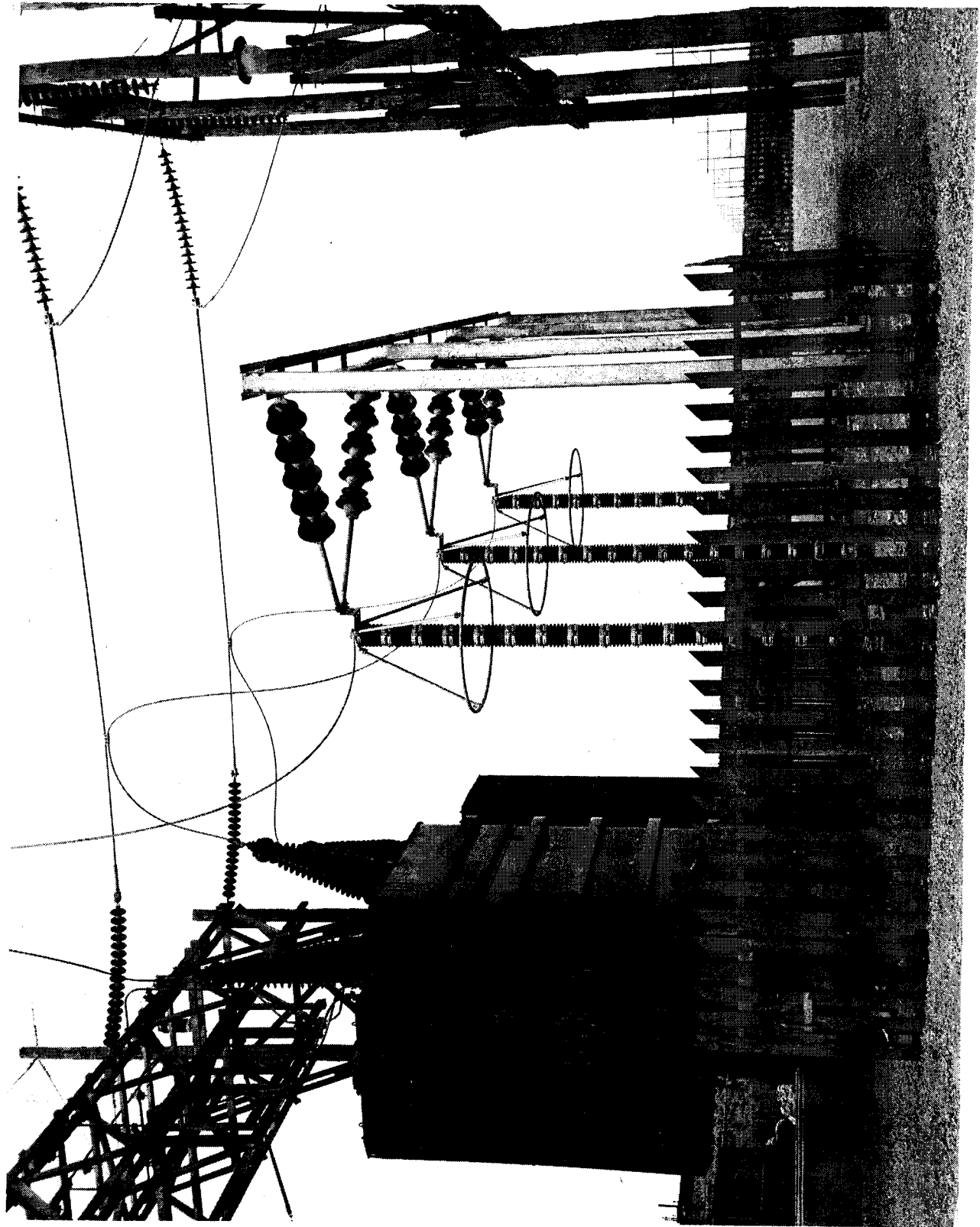
AERIAL VIEW OF ADMINISTRATION AREA

UNCLASSIFIED



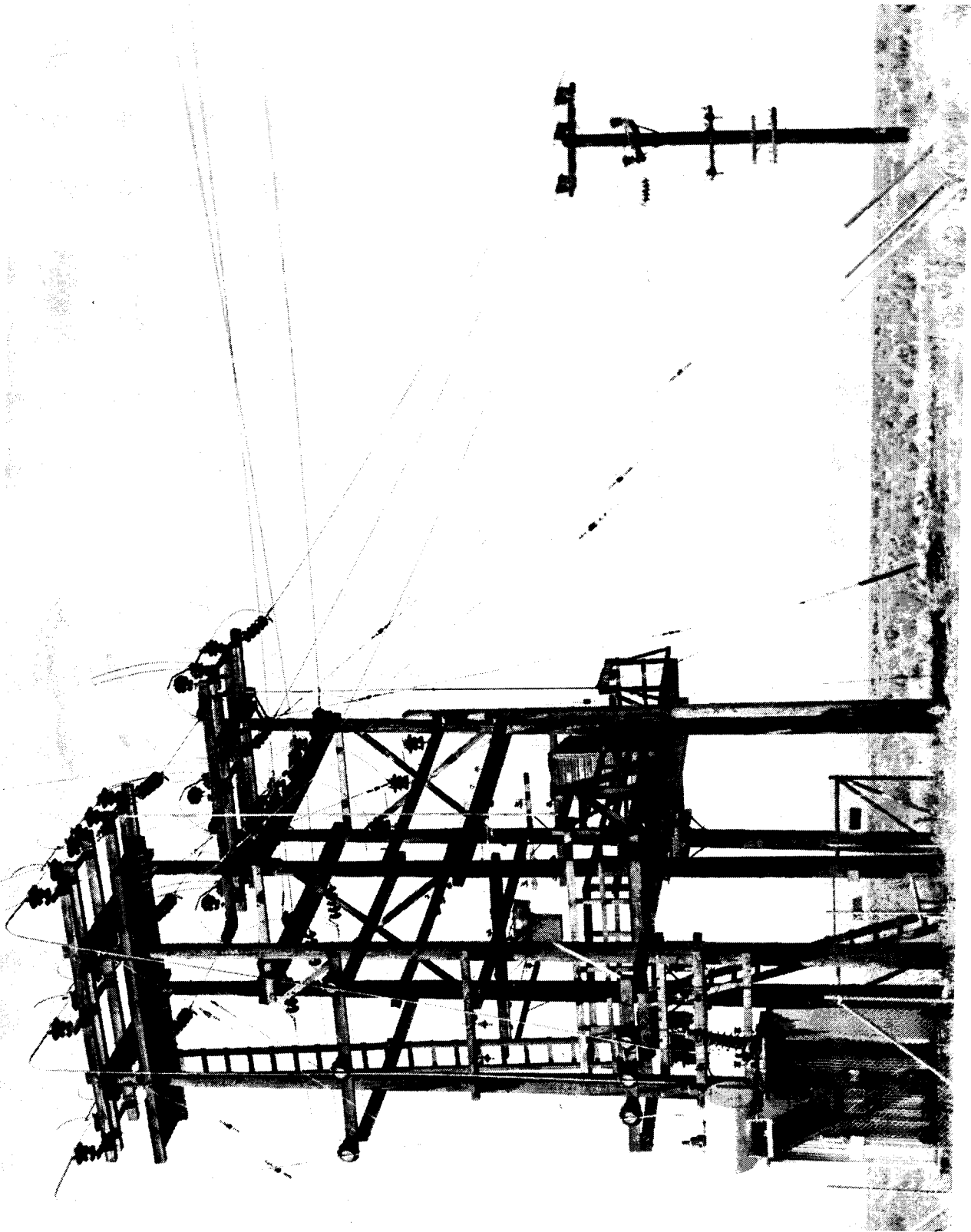
APPENDIX A 98

SUBSTATION



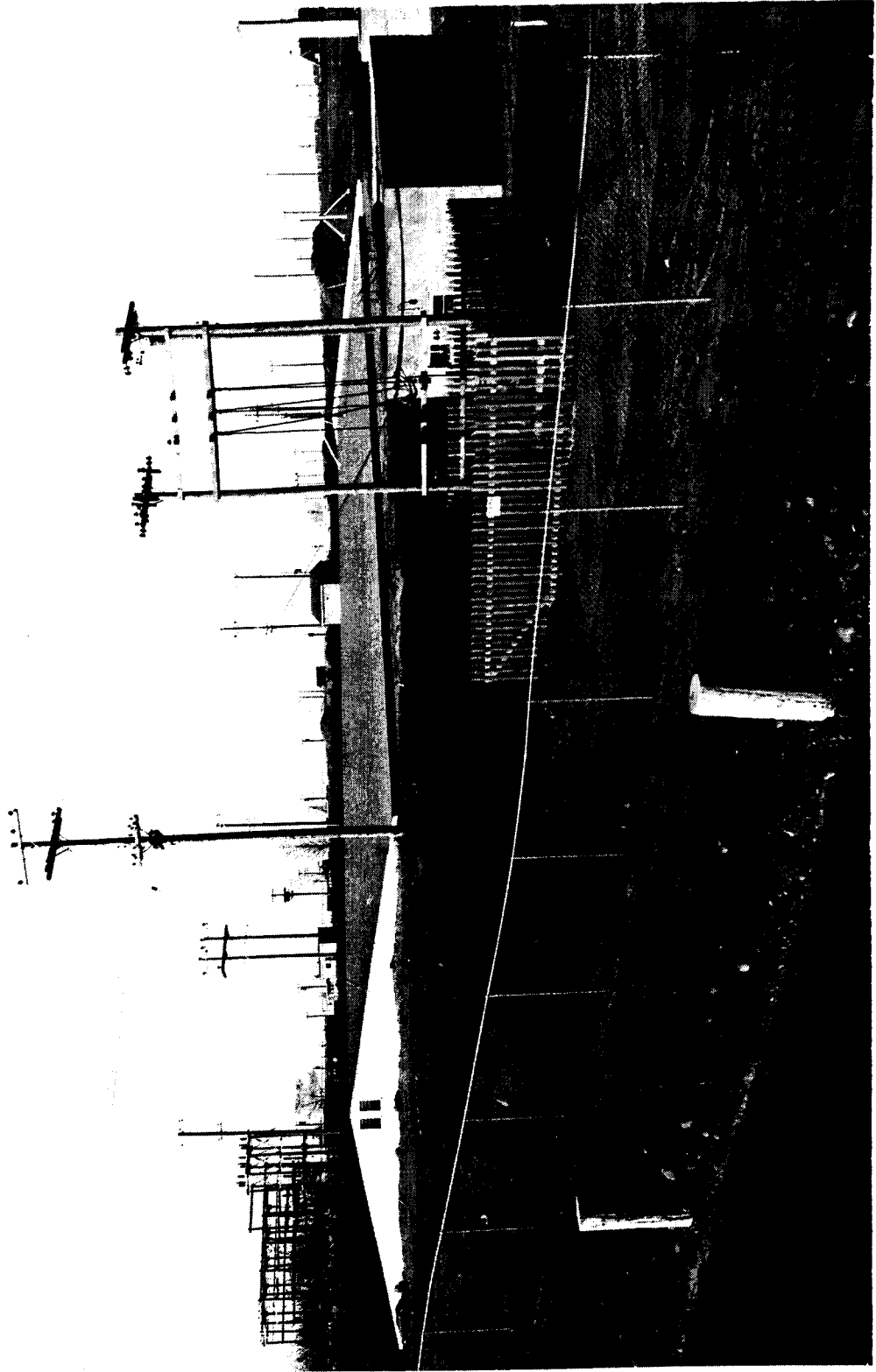
APPENDIX A 99

SUBSTATION



APPENDIX A 100

RESERVOIRS AND PUMP HOUSE



APPENDIX A 101

RESERVOIRS AND PUMP HOUSE



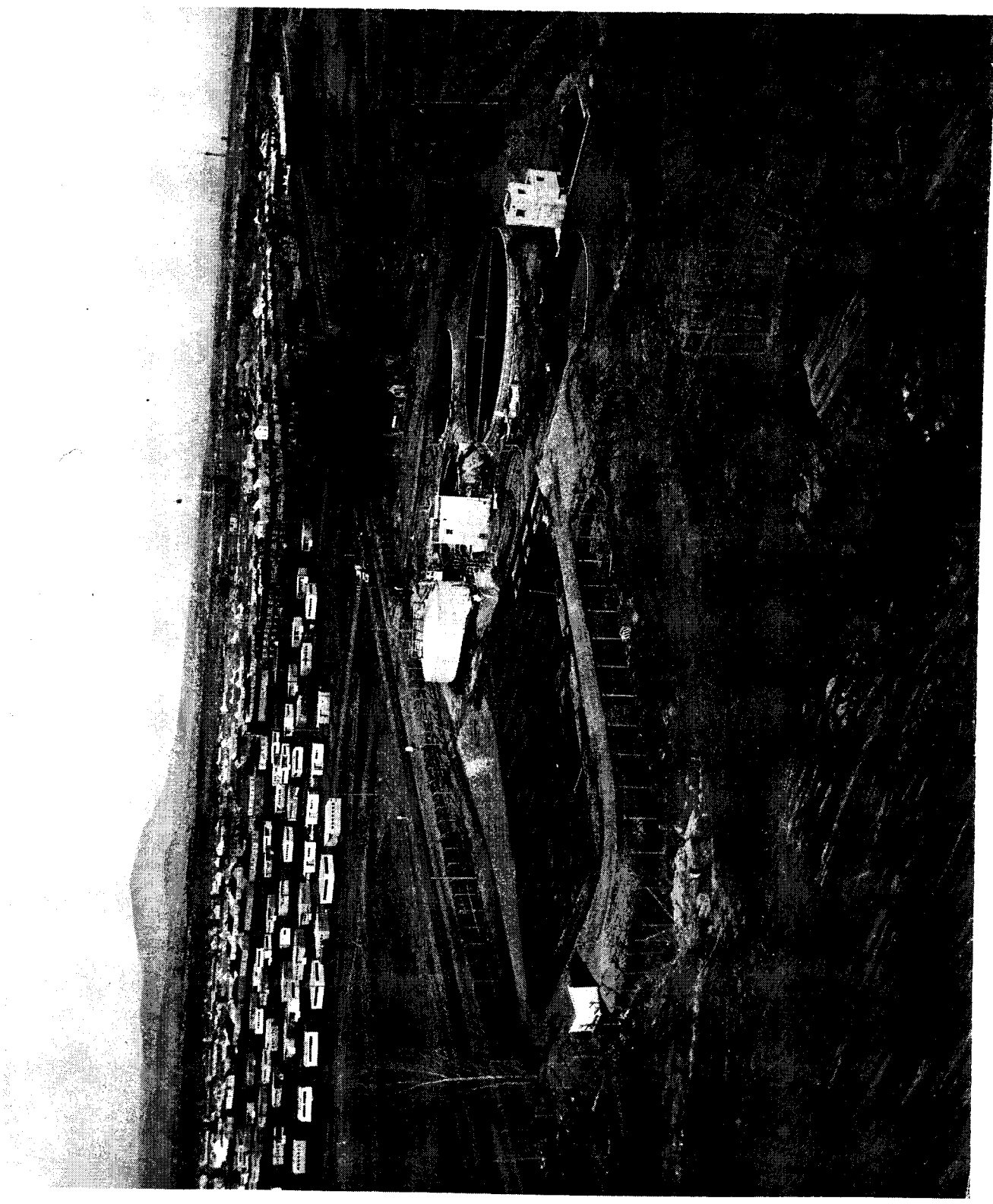
APPENDIX A 102

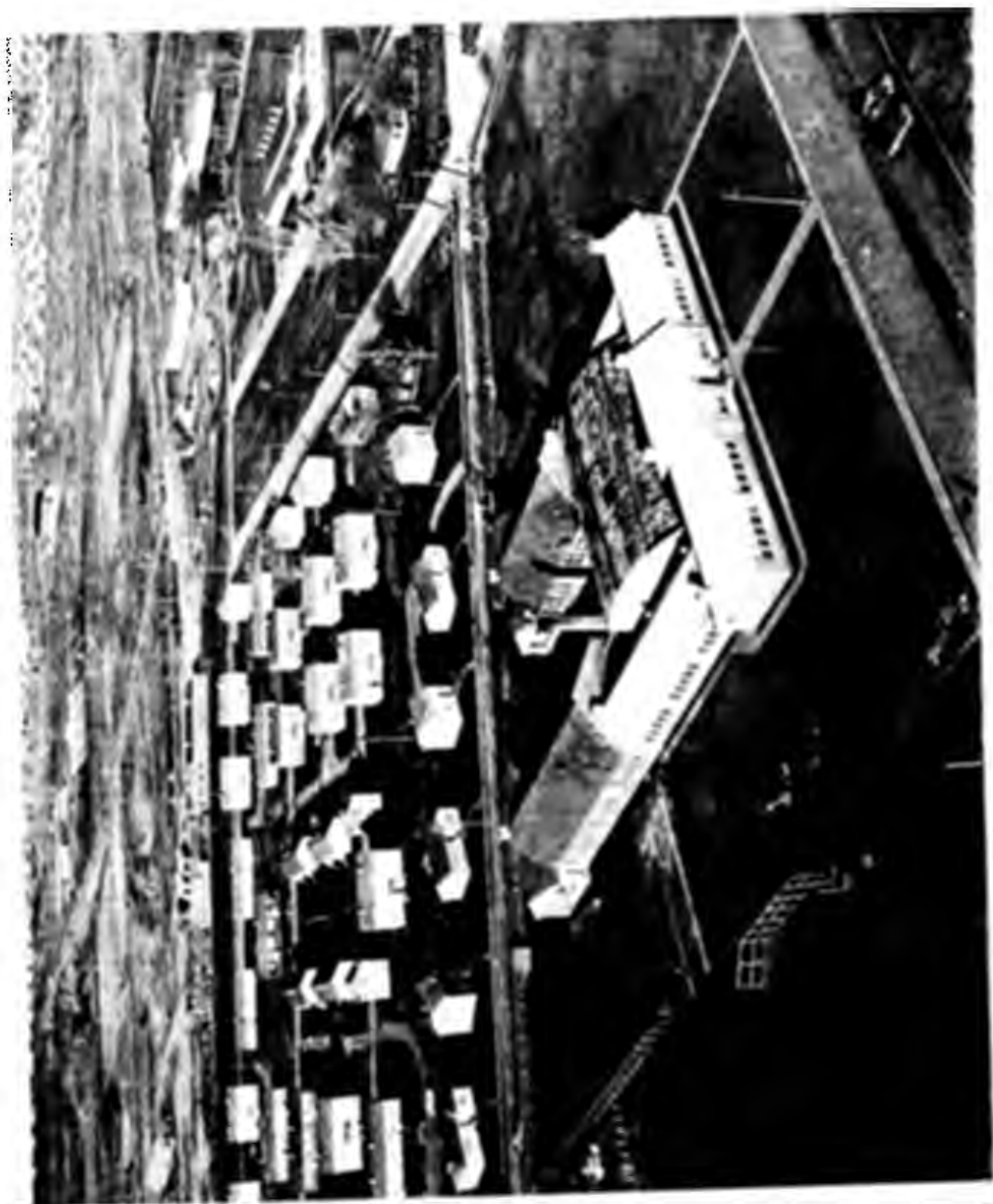
WATER TANK



APPENDIX A 105

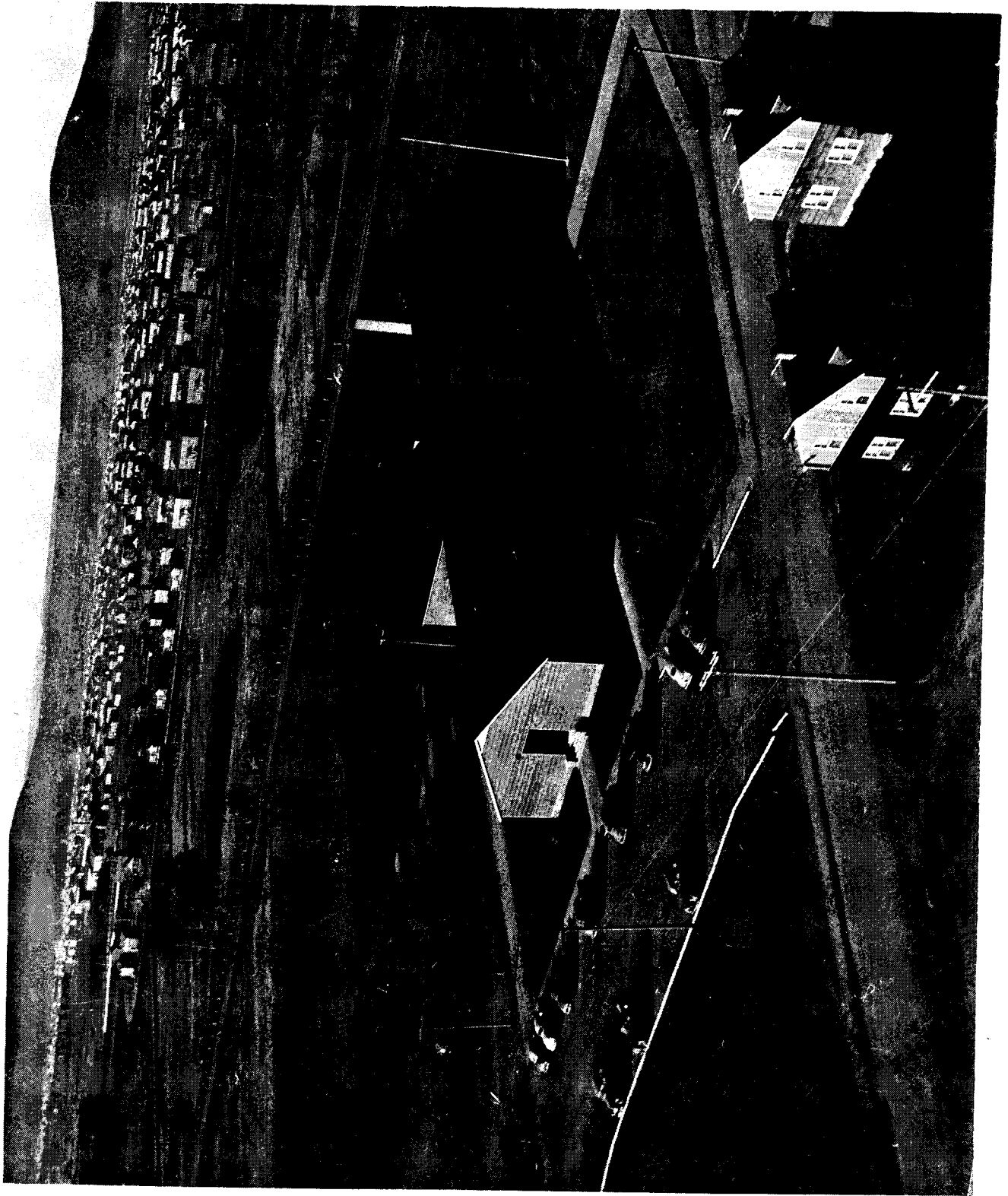
SEWAGE DISPOSAL PLANT





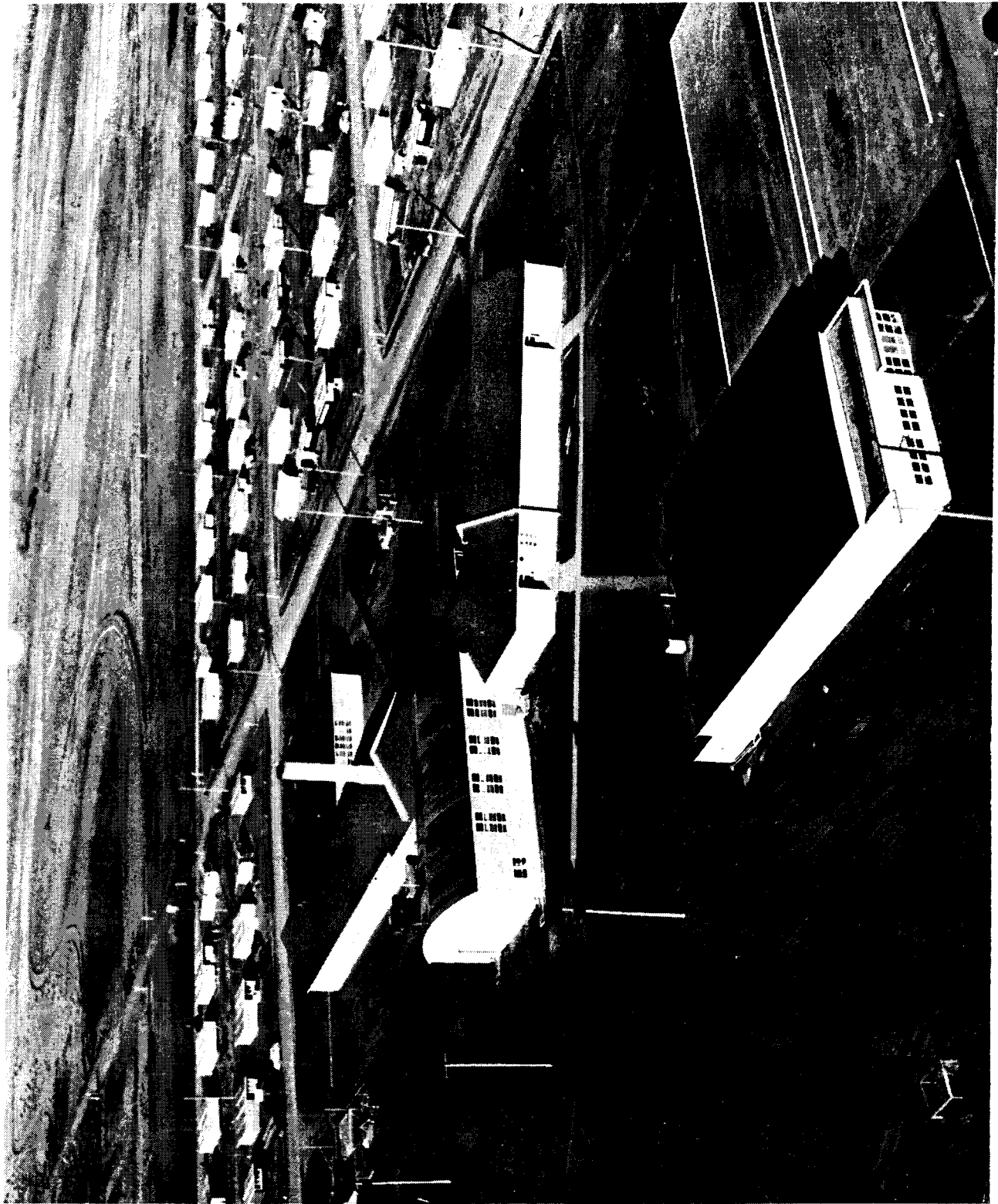
APPENDIX A 108

LEWIS AND CLARK GRADE SCHOOL



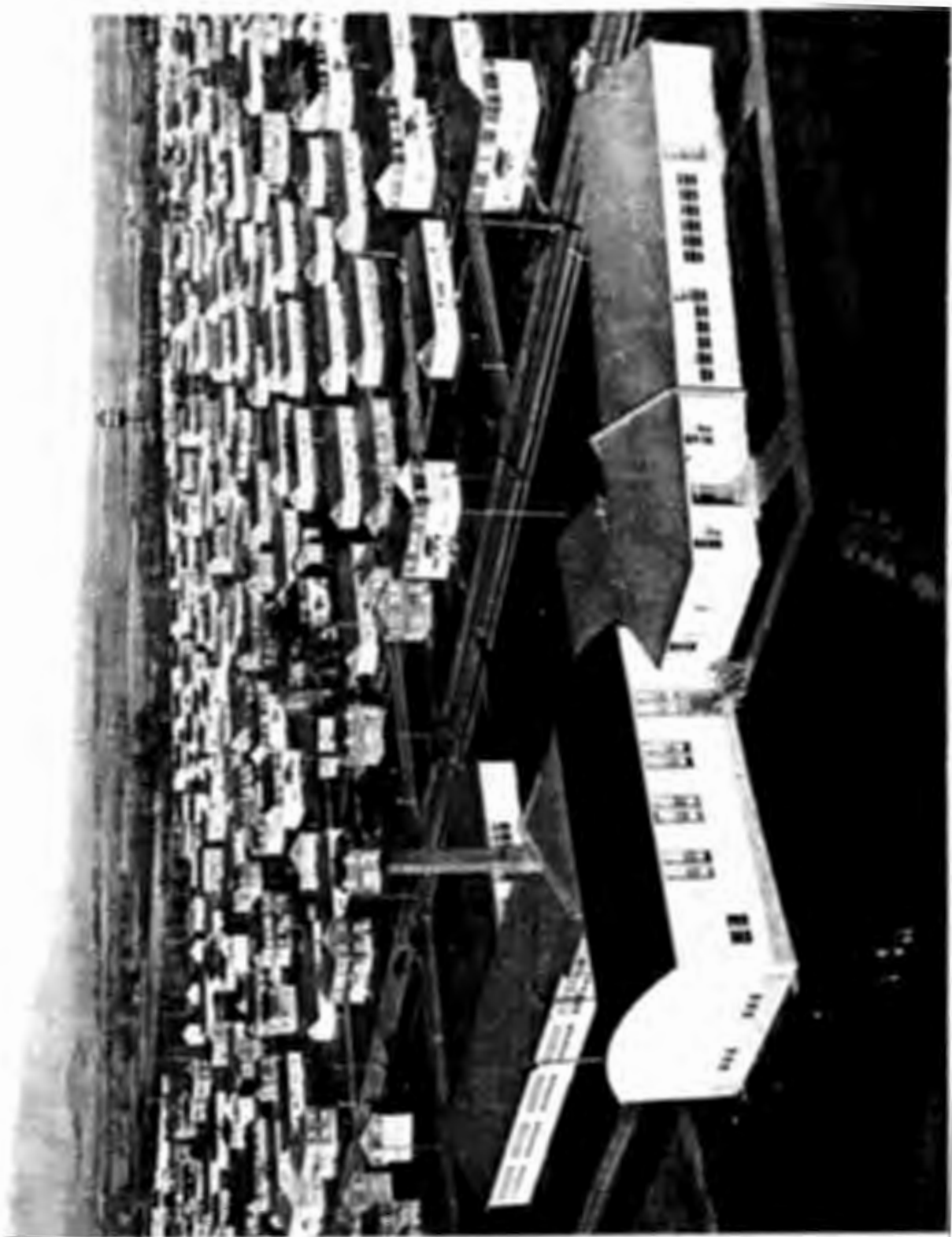
APPENDIX A 109

MARCUS WHELAN GRADE SCHOOL



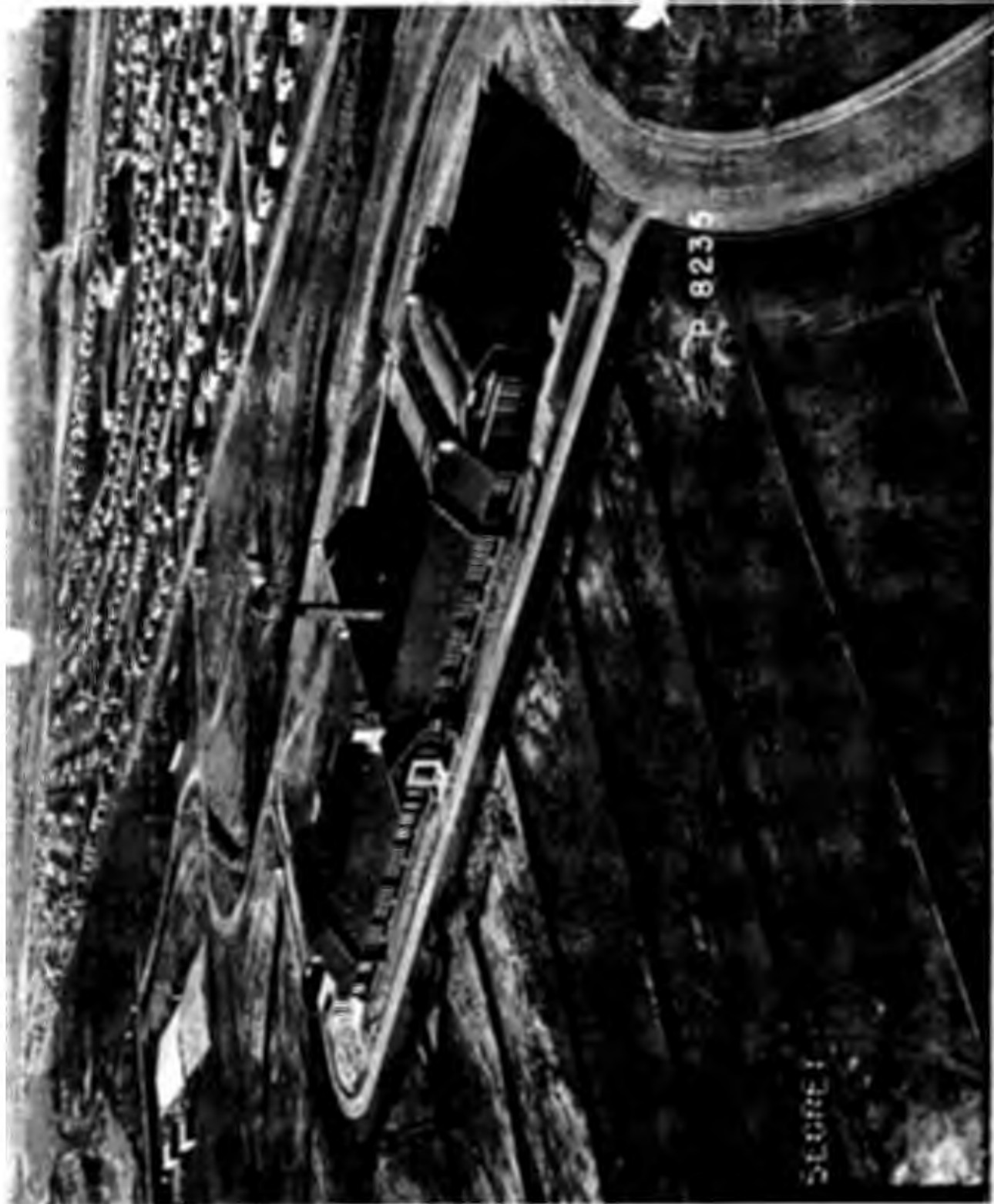
APPENDIX A 110

SACAJAWEA GRADE SCHOOL



APPENDIX A 111

COLUMBIA HIGH SCHOOL

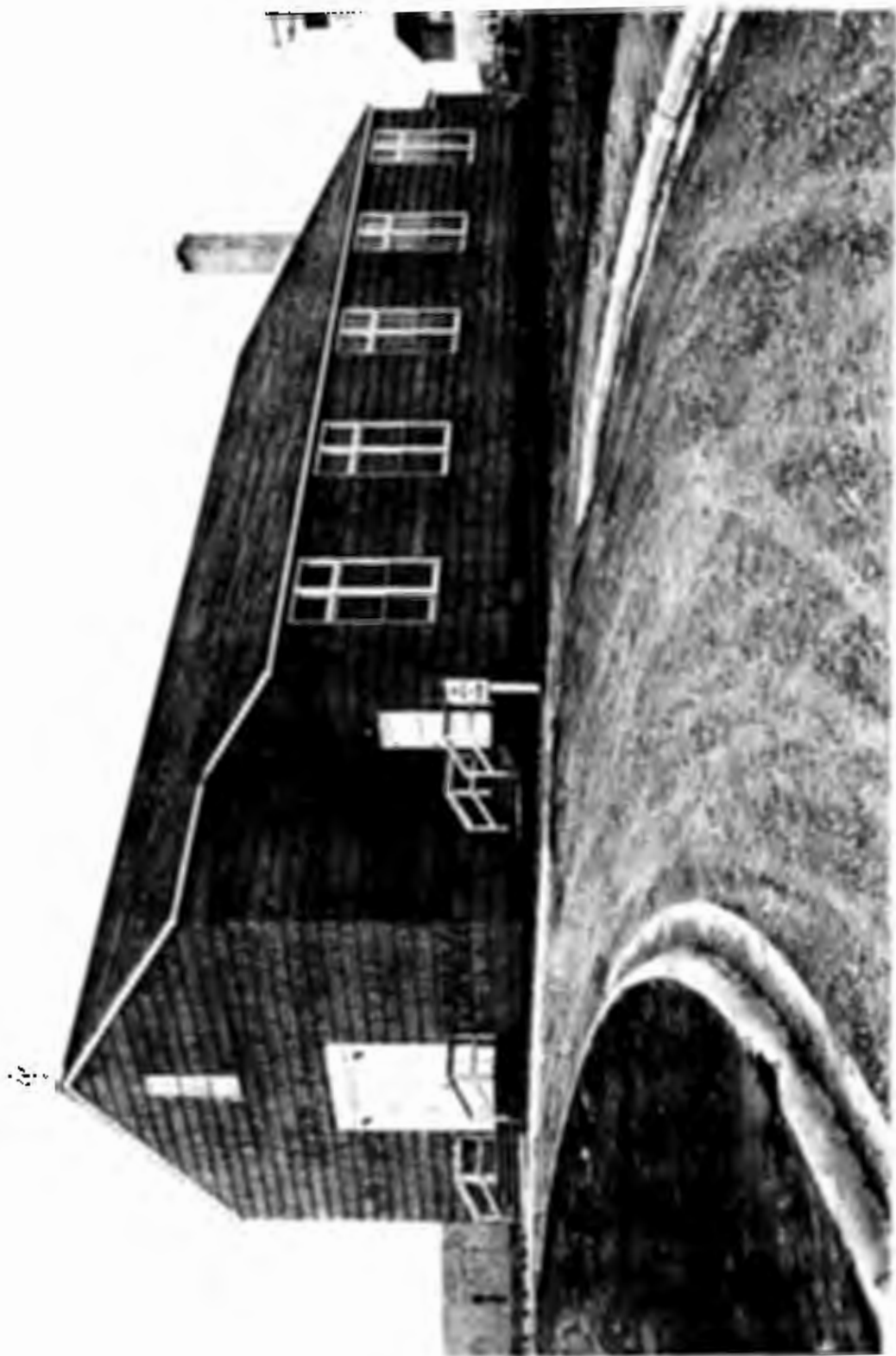


P 8235

SECRET

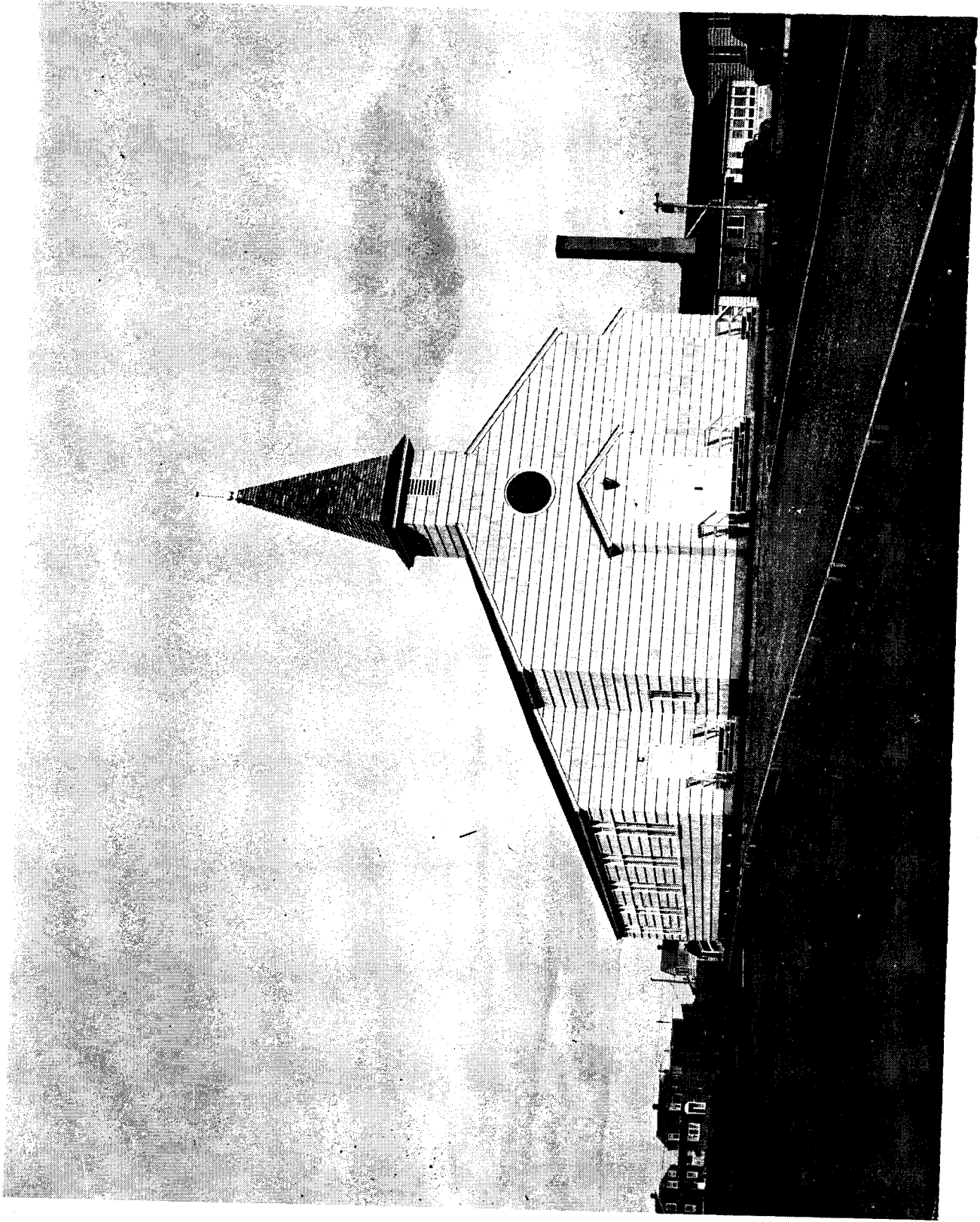
APPENDIX A 112

PROTESTANT CHURCH



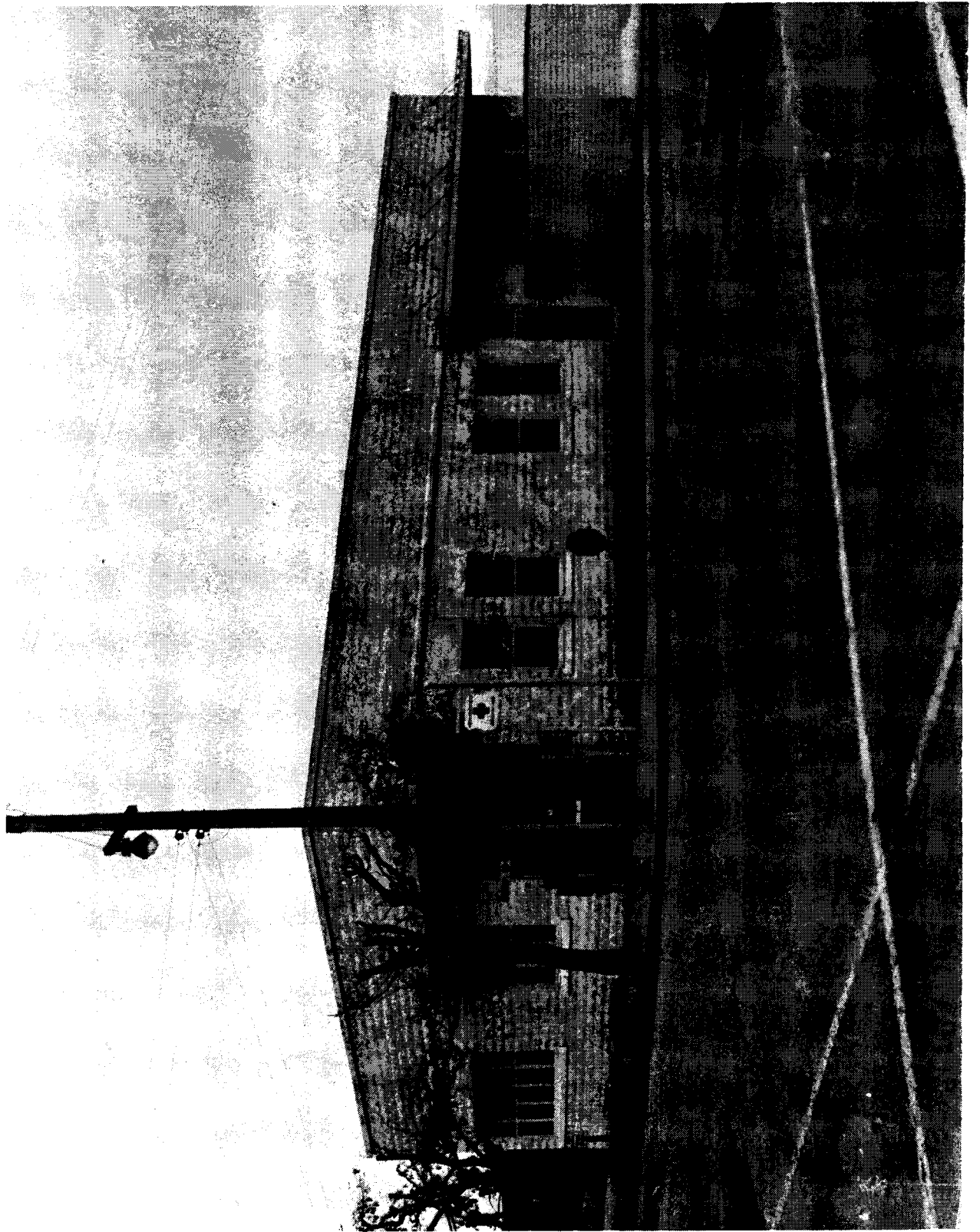
APPENDIX A 113

CATHOLIC CHURCH



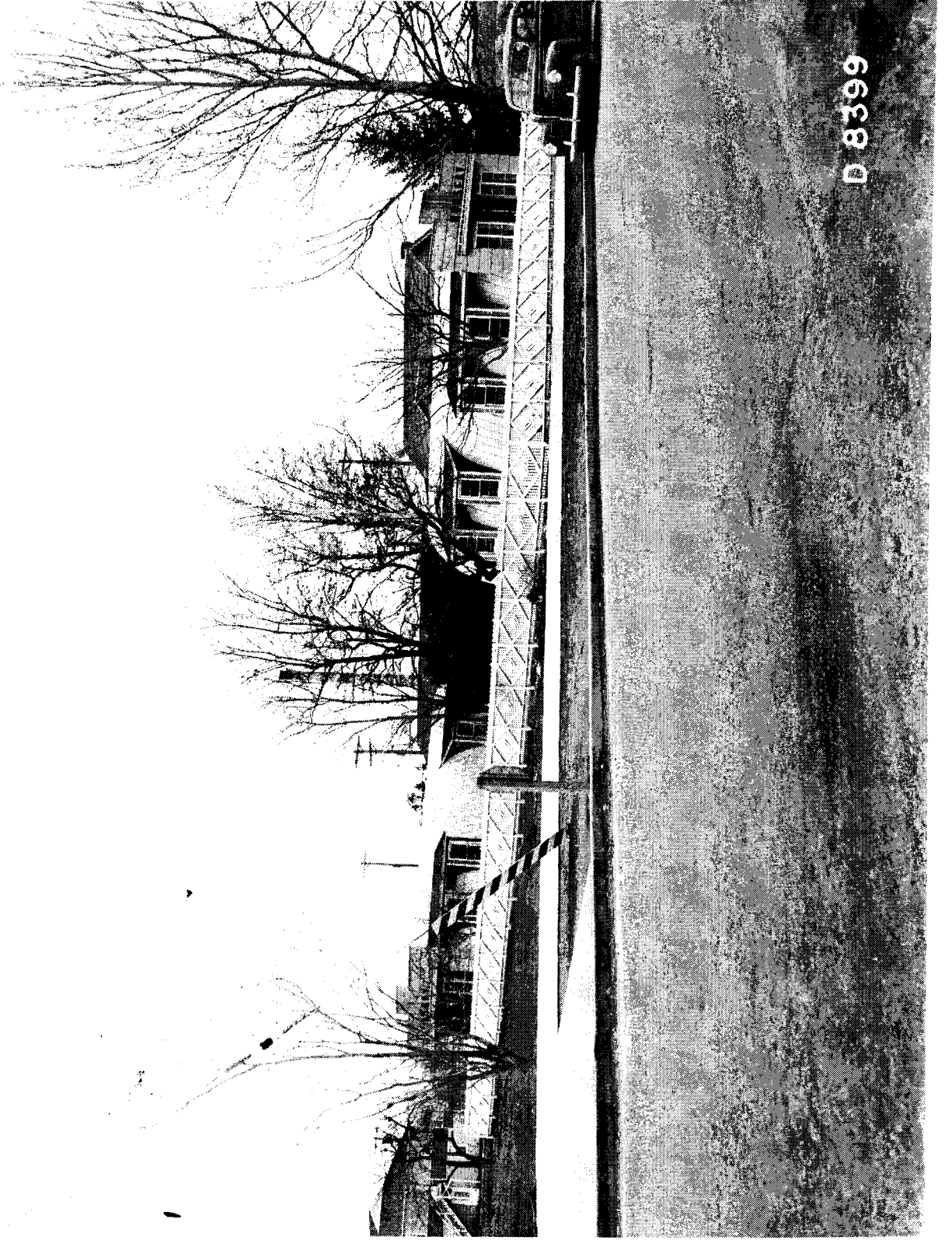
APPENDIX A 114

RED CROSS BUILDING



APPENDIX A 115

NURSERY



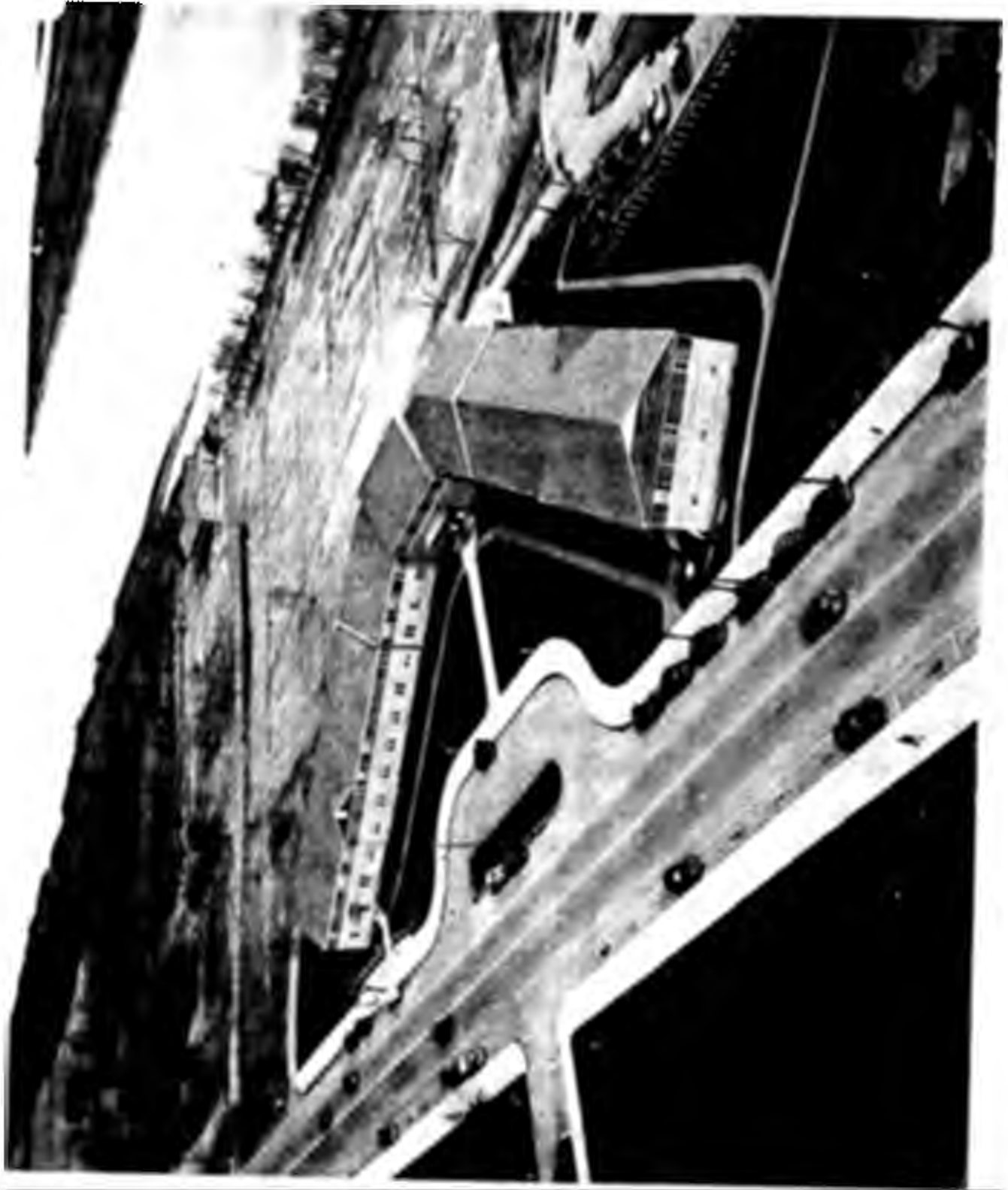
D 8399

APPENDIX A 116

DORMITORY

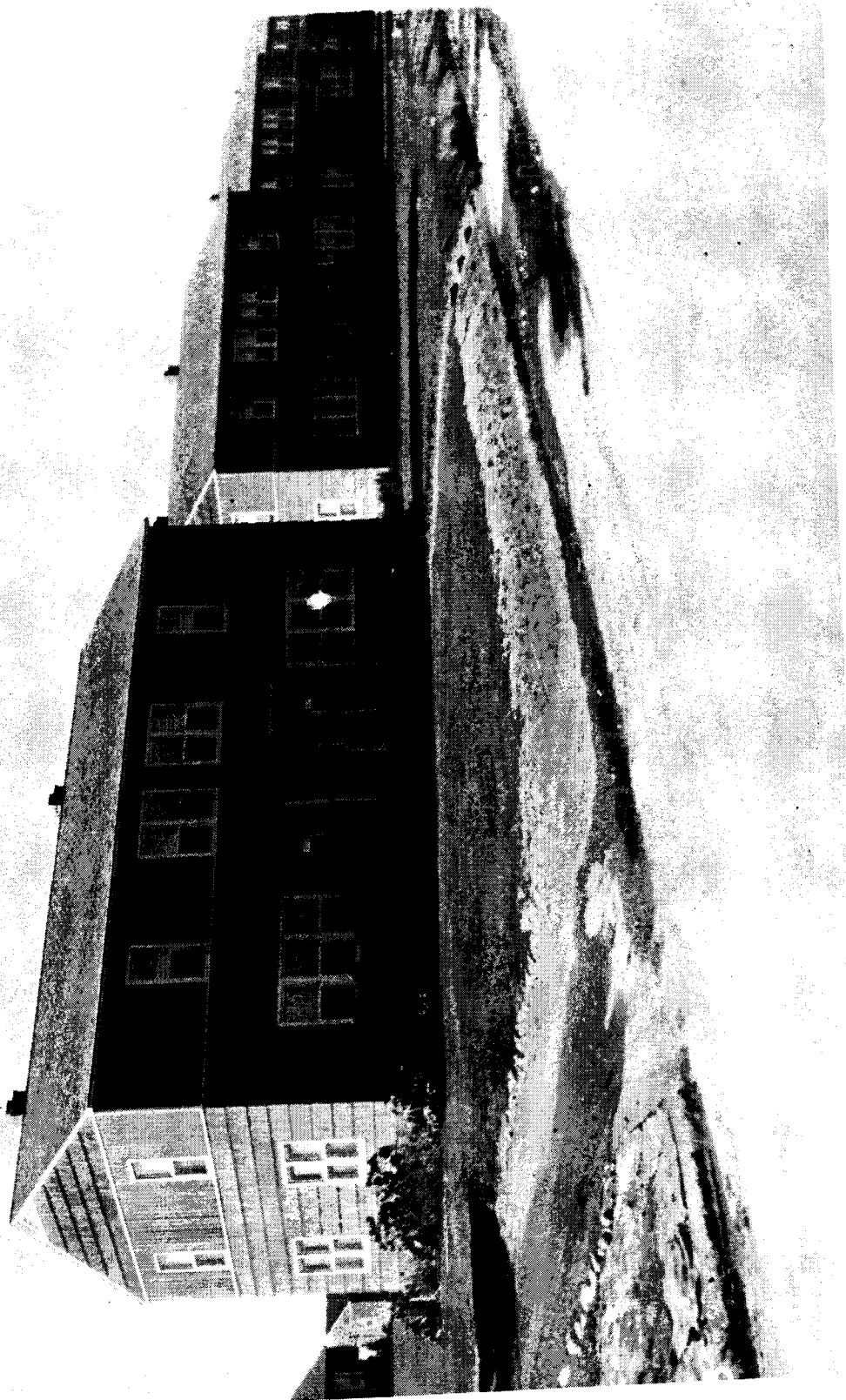
APPENDIX A 117

TRANSIENT QUARTERS



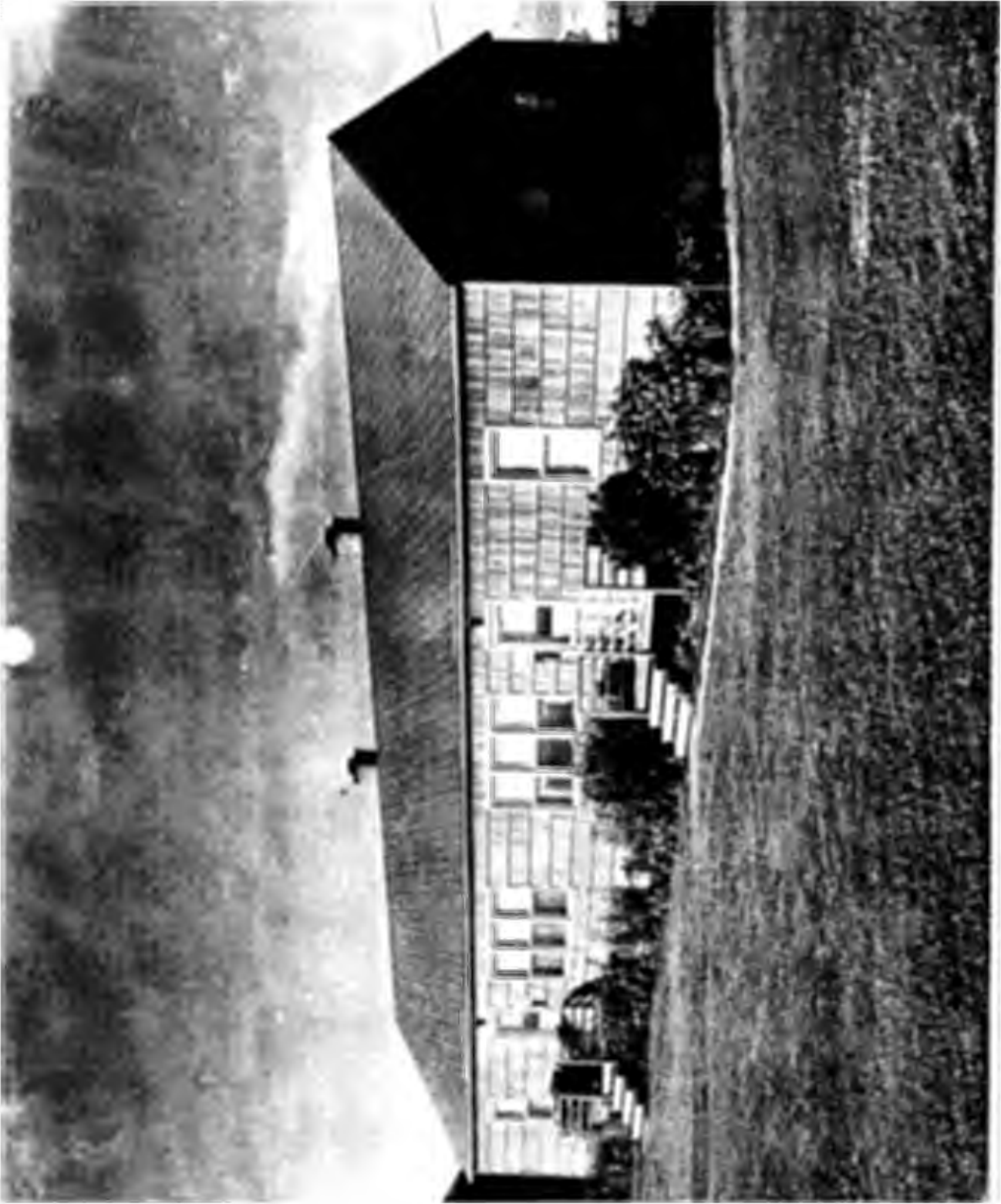
APPENDIX A 115

CONVENTIONAL TYPE A HOUSE



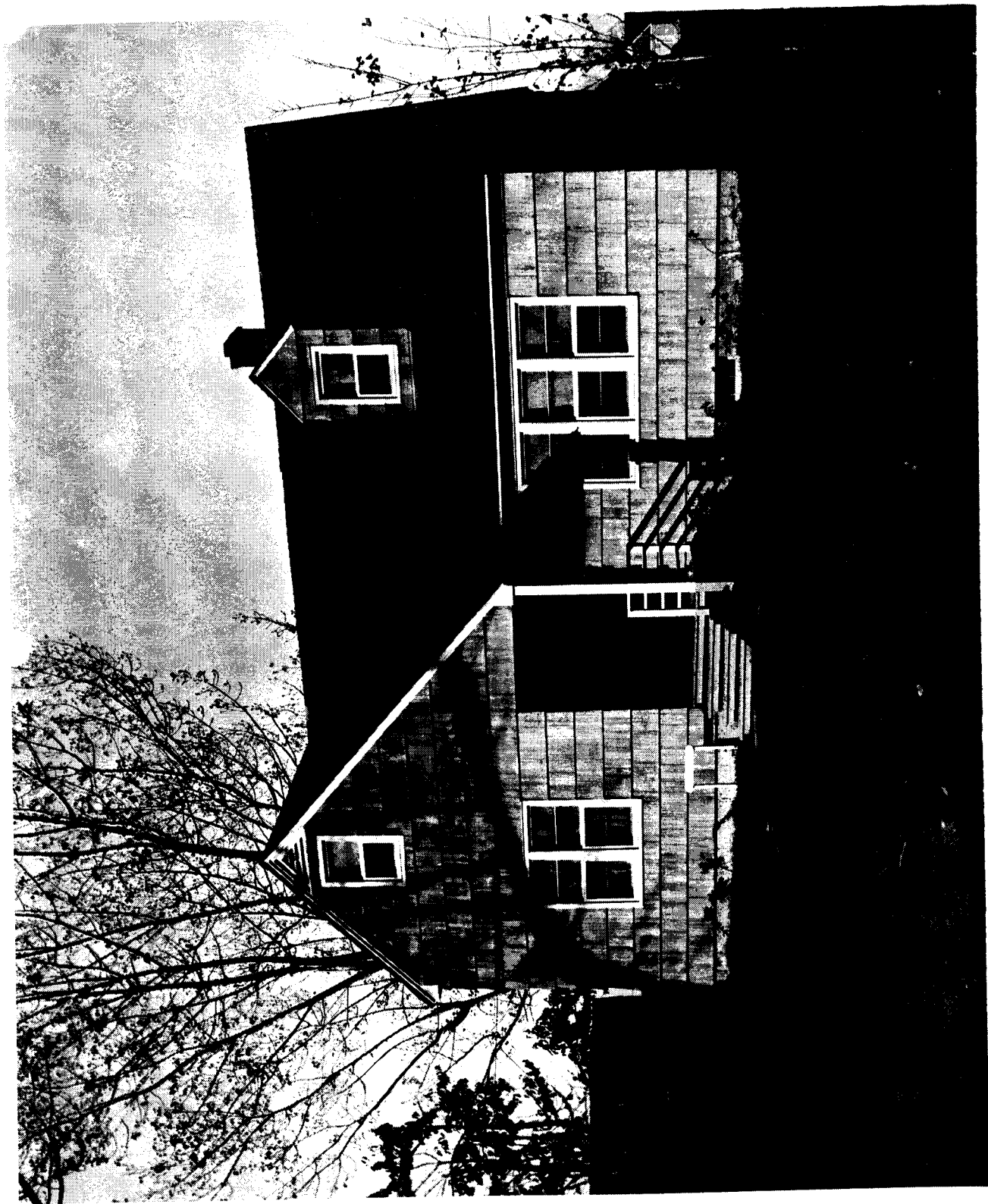
APPENDIX A 119

CONVENTIONAL TYPE B HOUSE



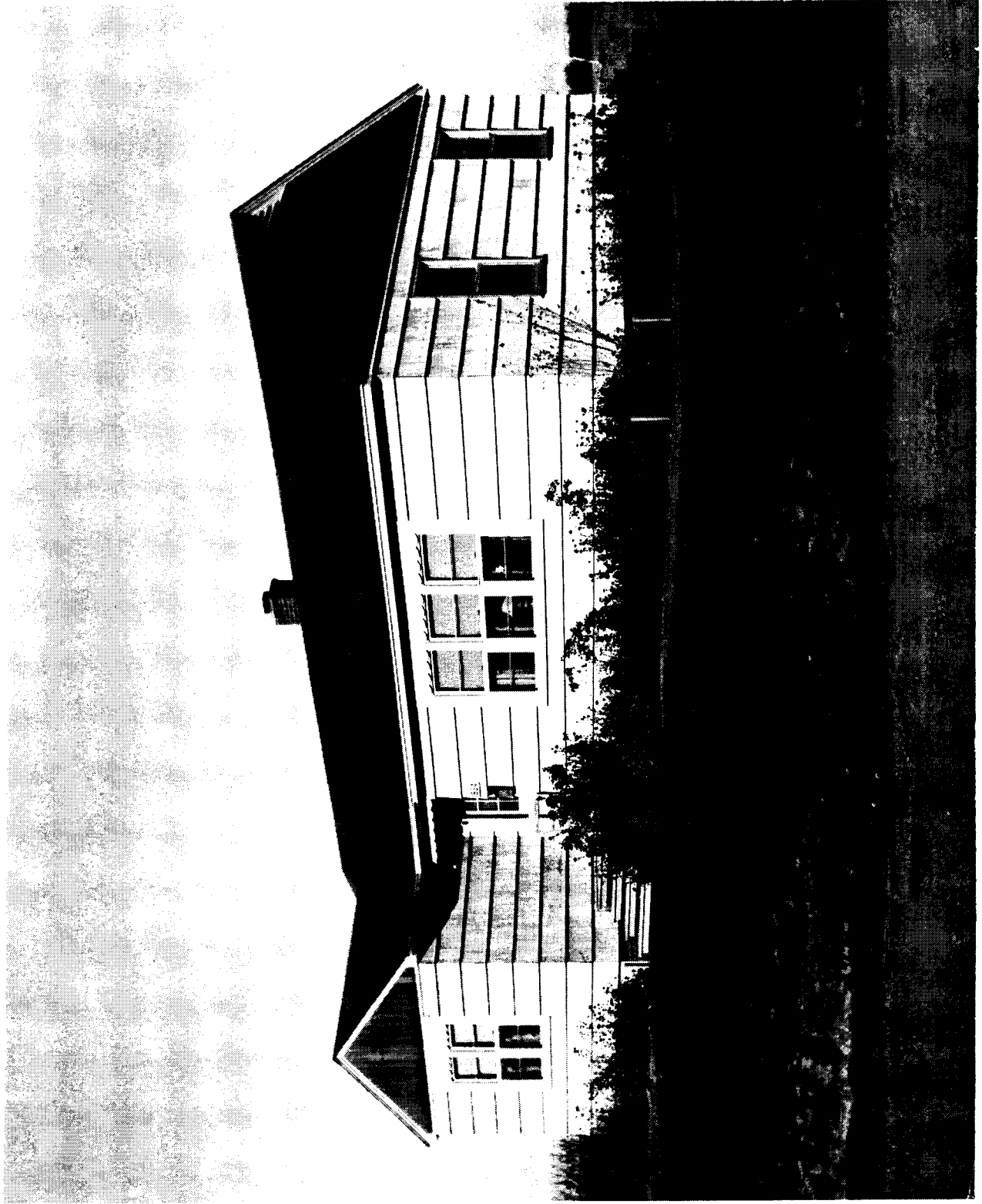
APPENDIX A 120

CONVENTIONAL TYPE D HOUSE



APPENDIX A 121

CONVENTIONAL TYPE E HOUSE



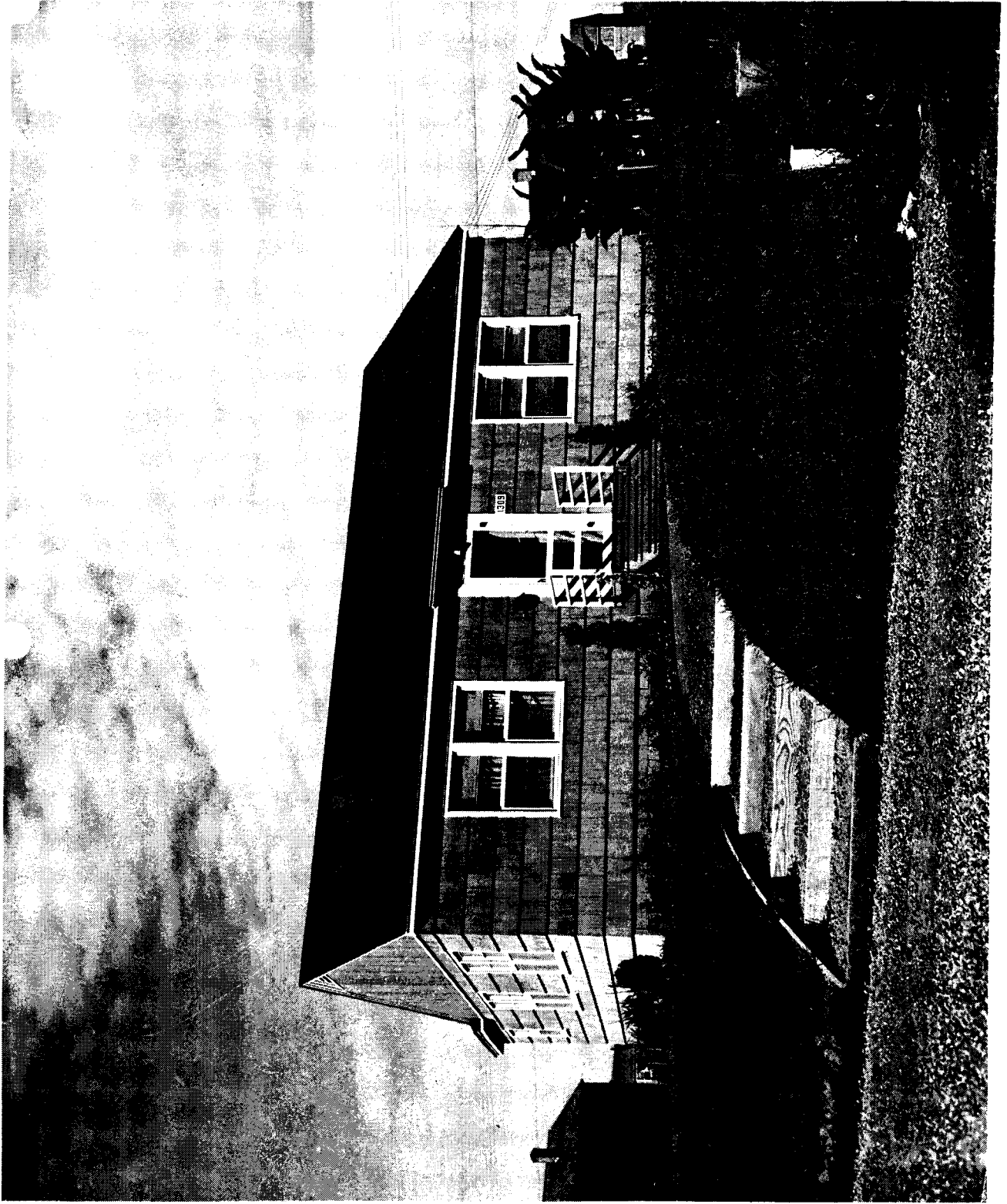
APPENDIX A 122

CONVENTIONAL TYPE F HOUSE



APPENDIX A 123

CONVENTIONAL TYPE H HOUSE



APPENDIX A 124

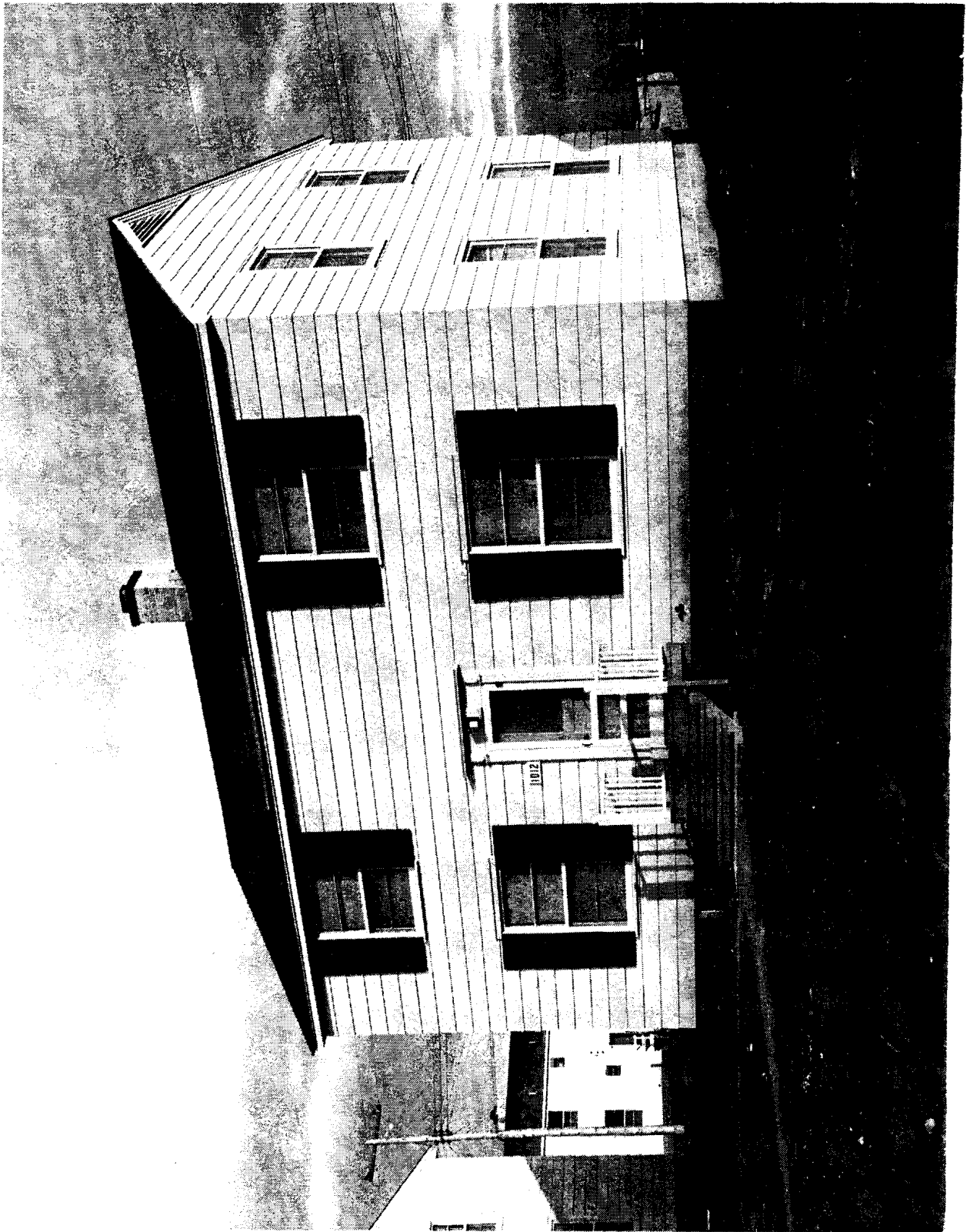
0

CONVENTIONAL TYPE G HOUSE



APPENDIX A 125

CONVENTIONAL TYPE L HOSE



APPENDIX A 126

TYPICAL PREFABRICATED-HOUSE STREET



APPENDIX A 127

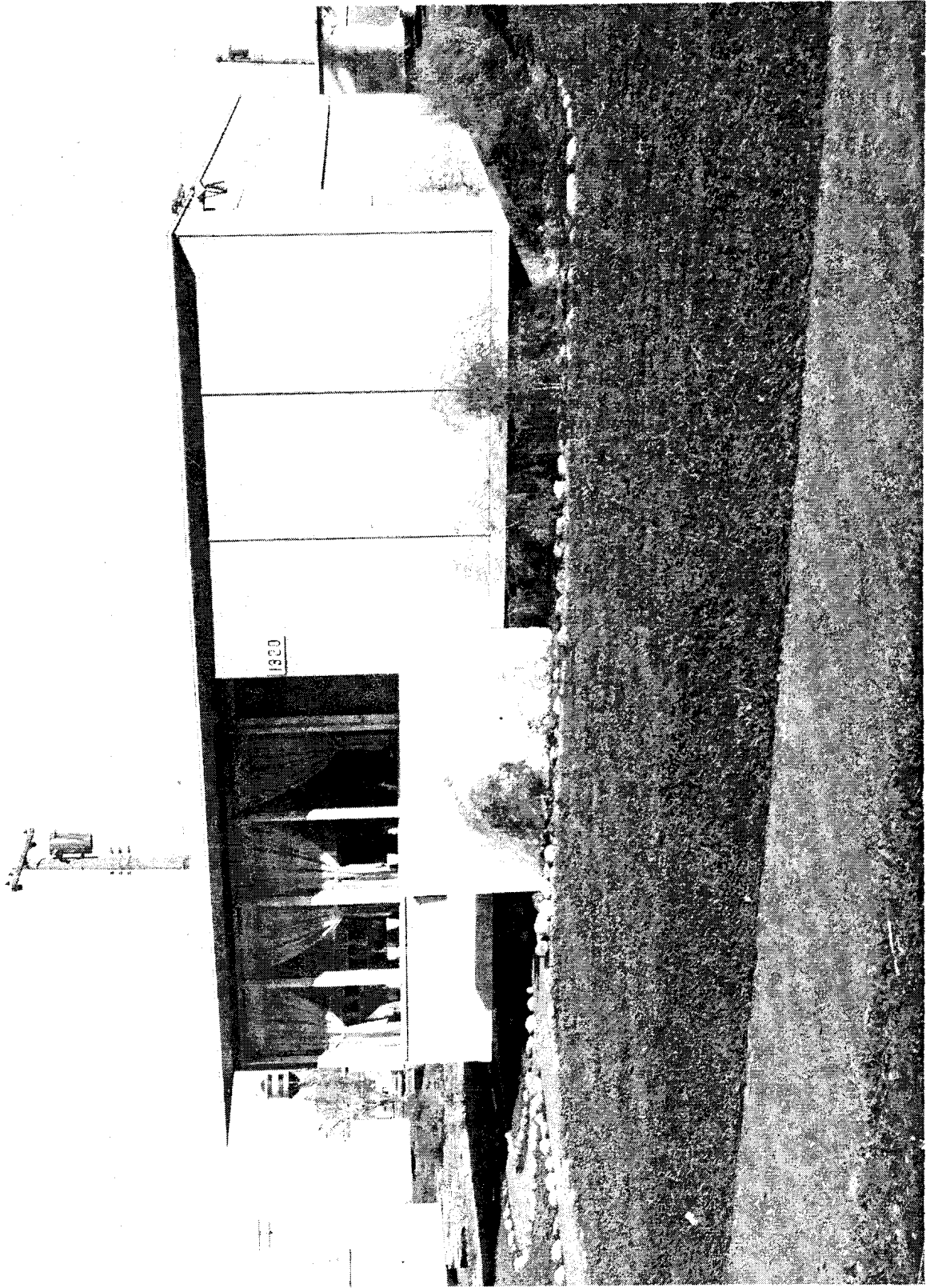
REMANUFACTURED TYPE A HOUSE



SECRET

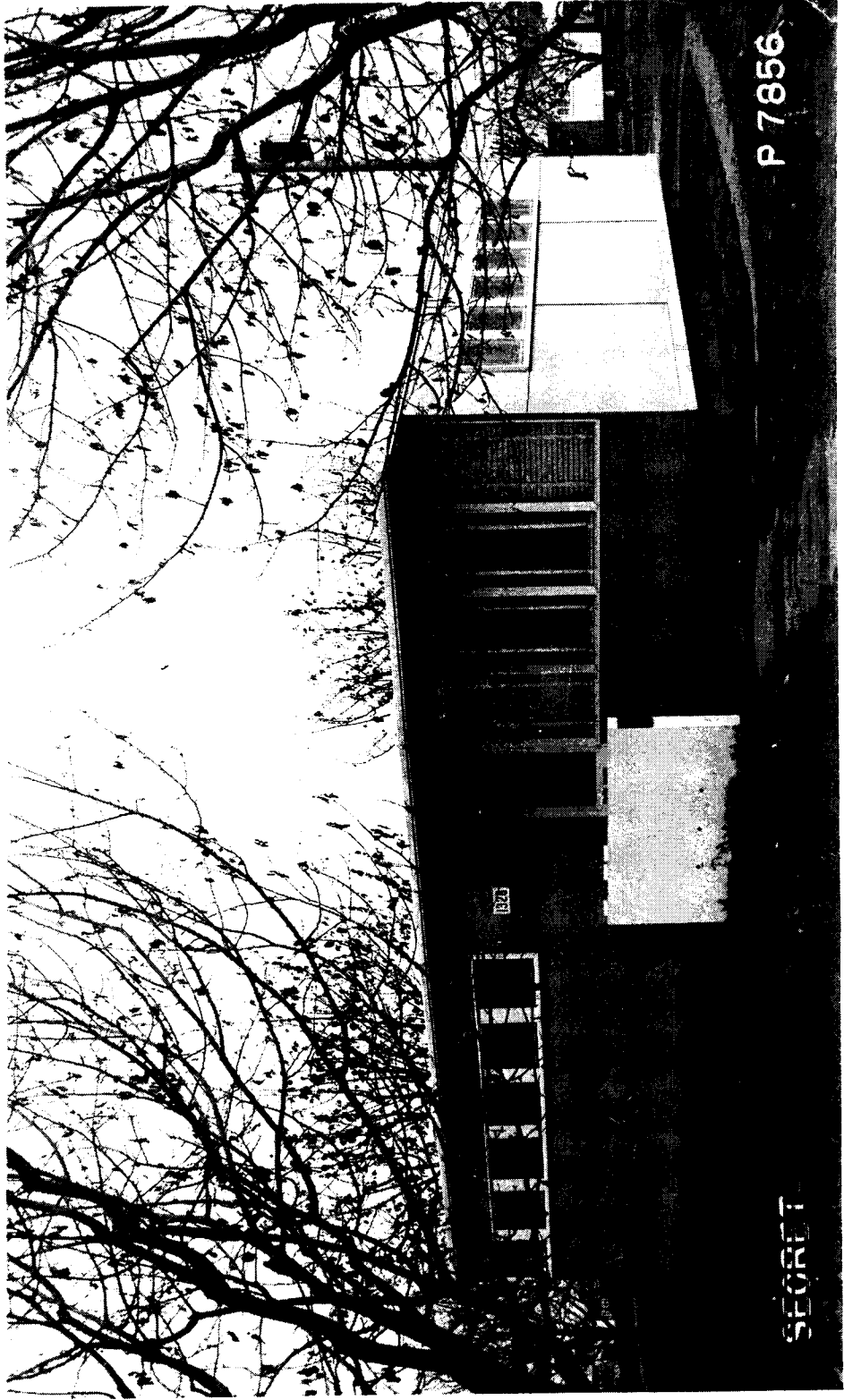
APPENDIX A 128

PREFABRICATED TYPE B HOUSE



APPENDIX A 129

PREFABRICATED TYPE C HOUSE



P 7856

SECRET

APPENDIX A 130

AERIAL VIEW OF COMMERCIAL FACILITIES



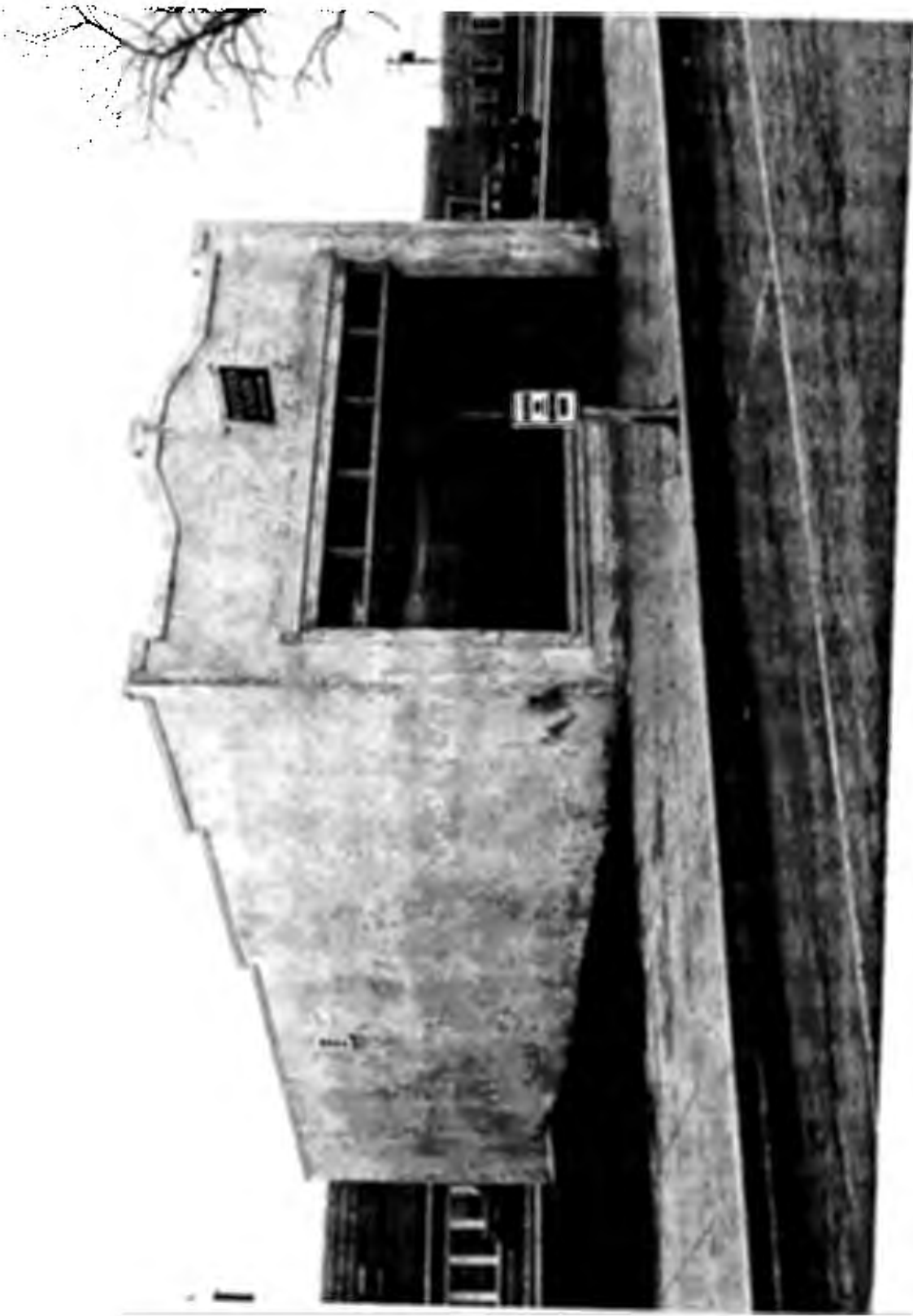
APPENDIX A 151

DRUG STORE



APPENDIX A 132

WESTERN UNION BUILDING



APPENDIX A 133

POST OFFICE



APPENDIX A 134

WOMEN'S APPAREL SHOP

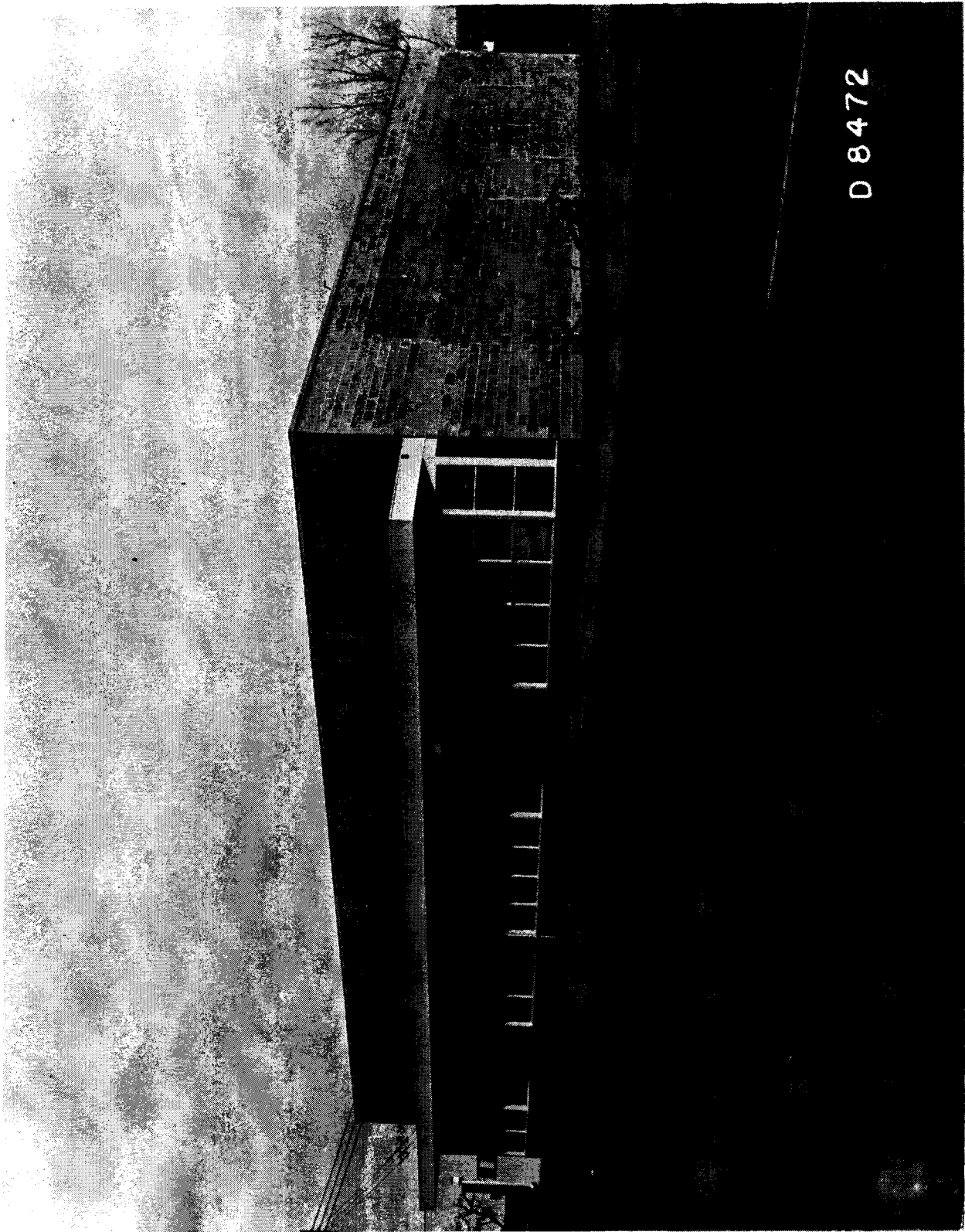


APPENDIX A 135

OPTICAL SHOP



APPENDIX A 136
MEN'S APPAREL SHOP



D 8472

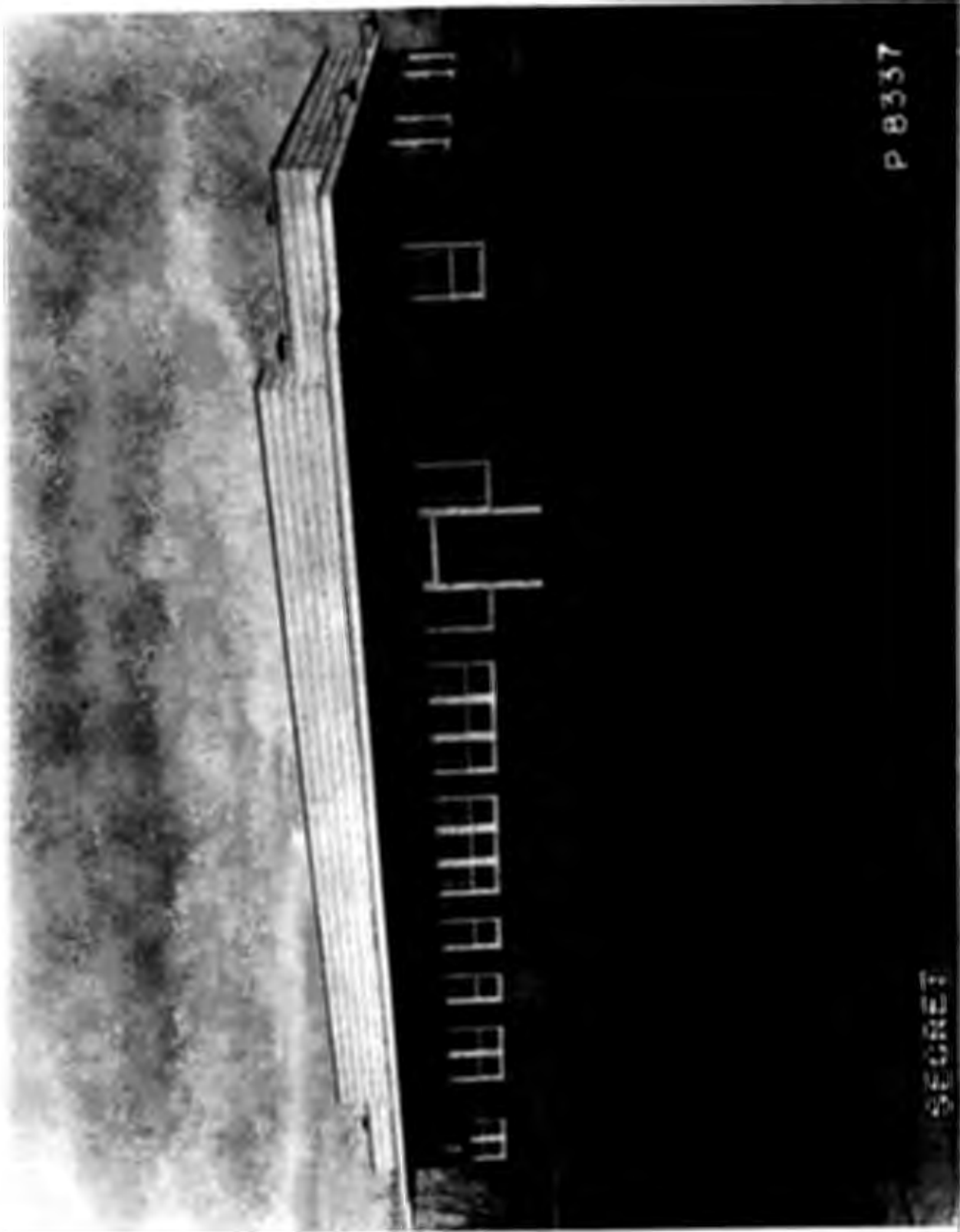
APPENDIX A 137

MILK DEPOT



APPENDIX A 138

BUS DEPOT



P 8337

SECRET

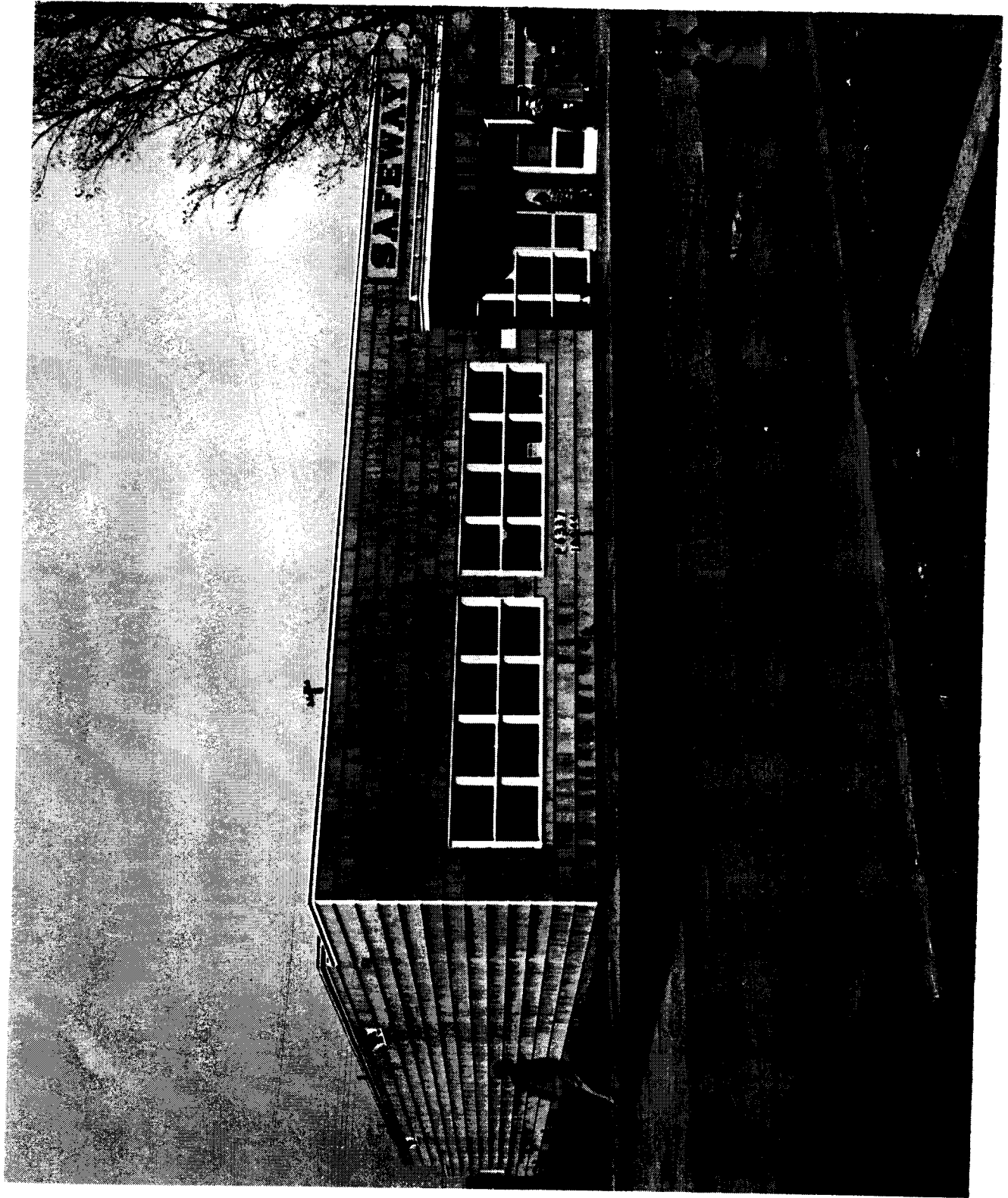
OCI A XIENYIA

QUON SINGAM



APPENDIX A 140

FOOD STORE



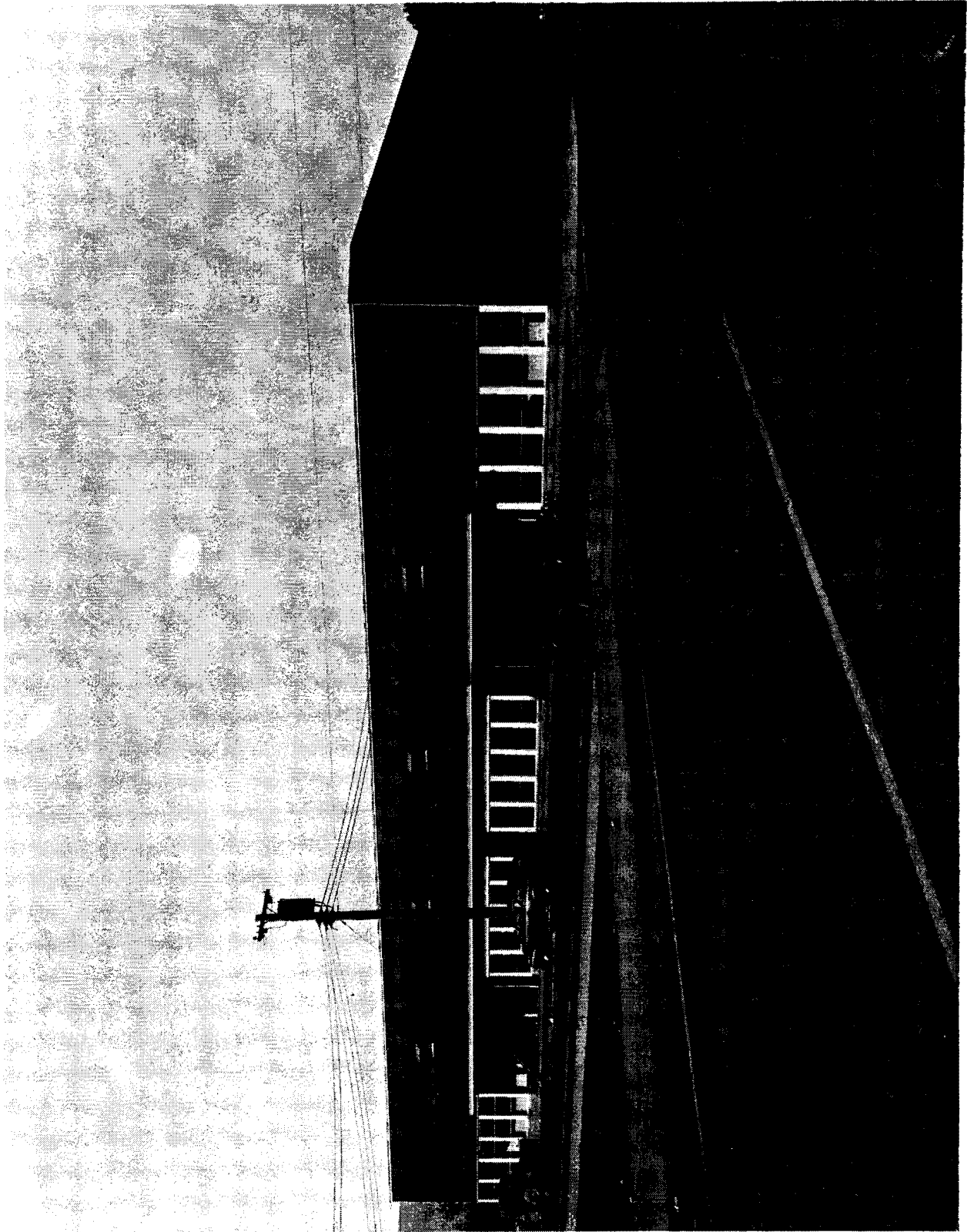
APPENDIX A 141

SERVICE STATION



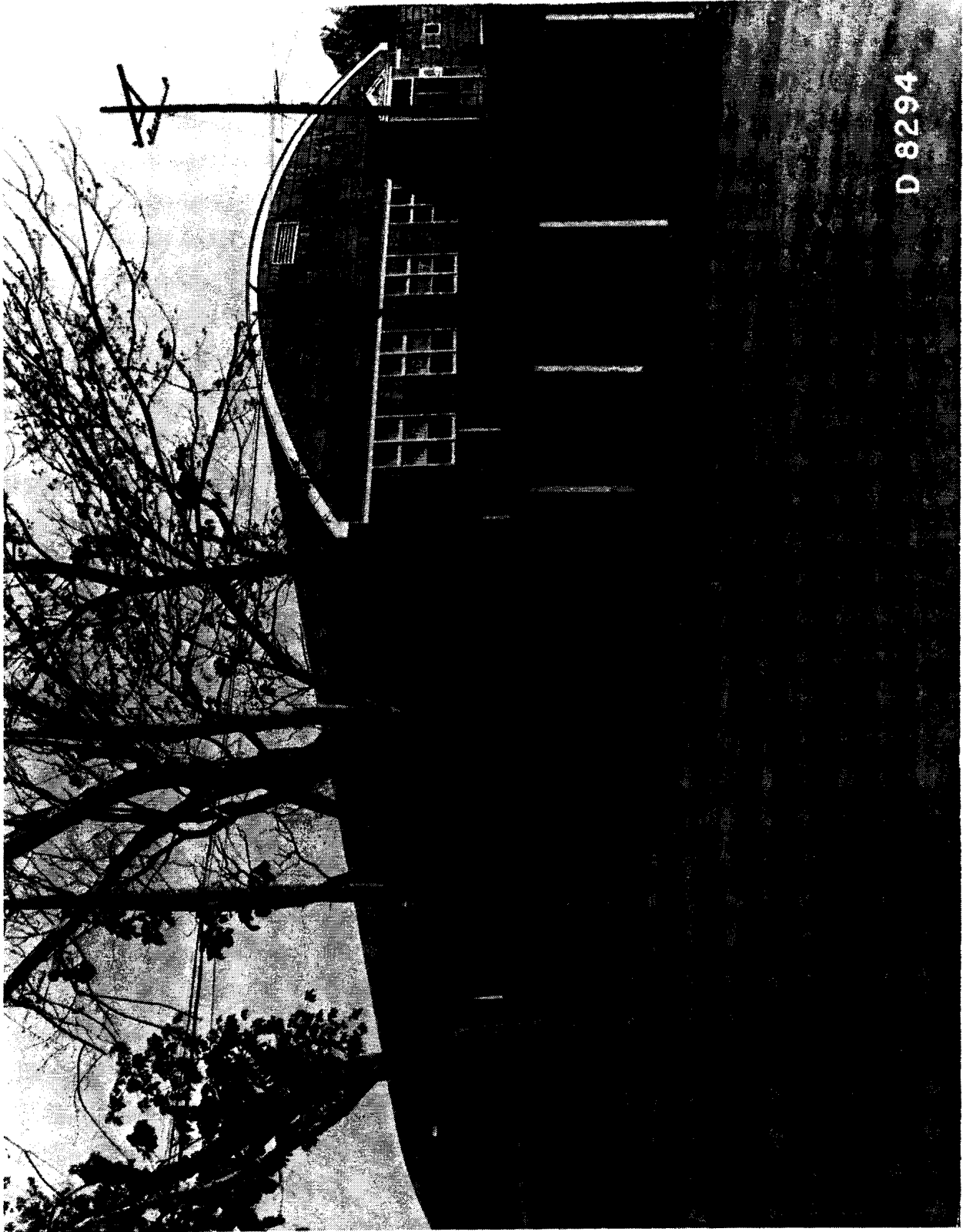
APPENDIX A 142

DEPARTMENT STORE



APPENDIX A 143

CAFETERIA



D 8294

APPENDIX A 144

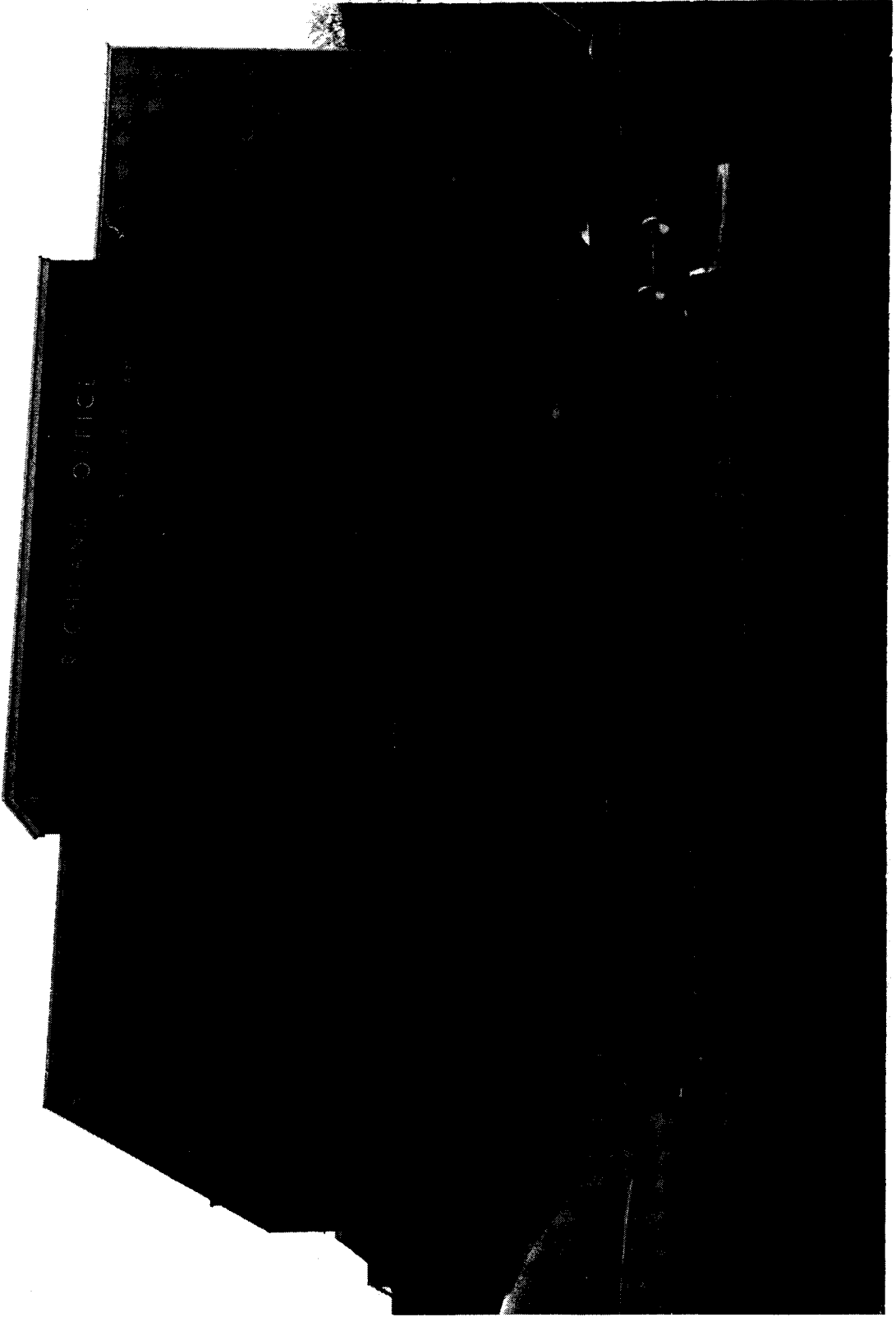
HARDWARE STORE

D 8404



APPENDIX A 145

BANK



RECORDS OFFICE

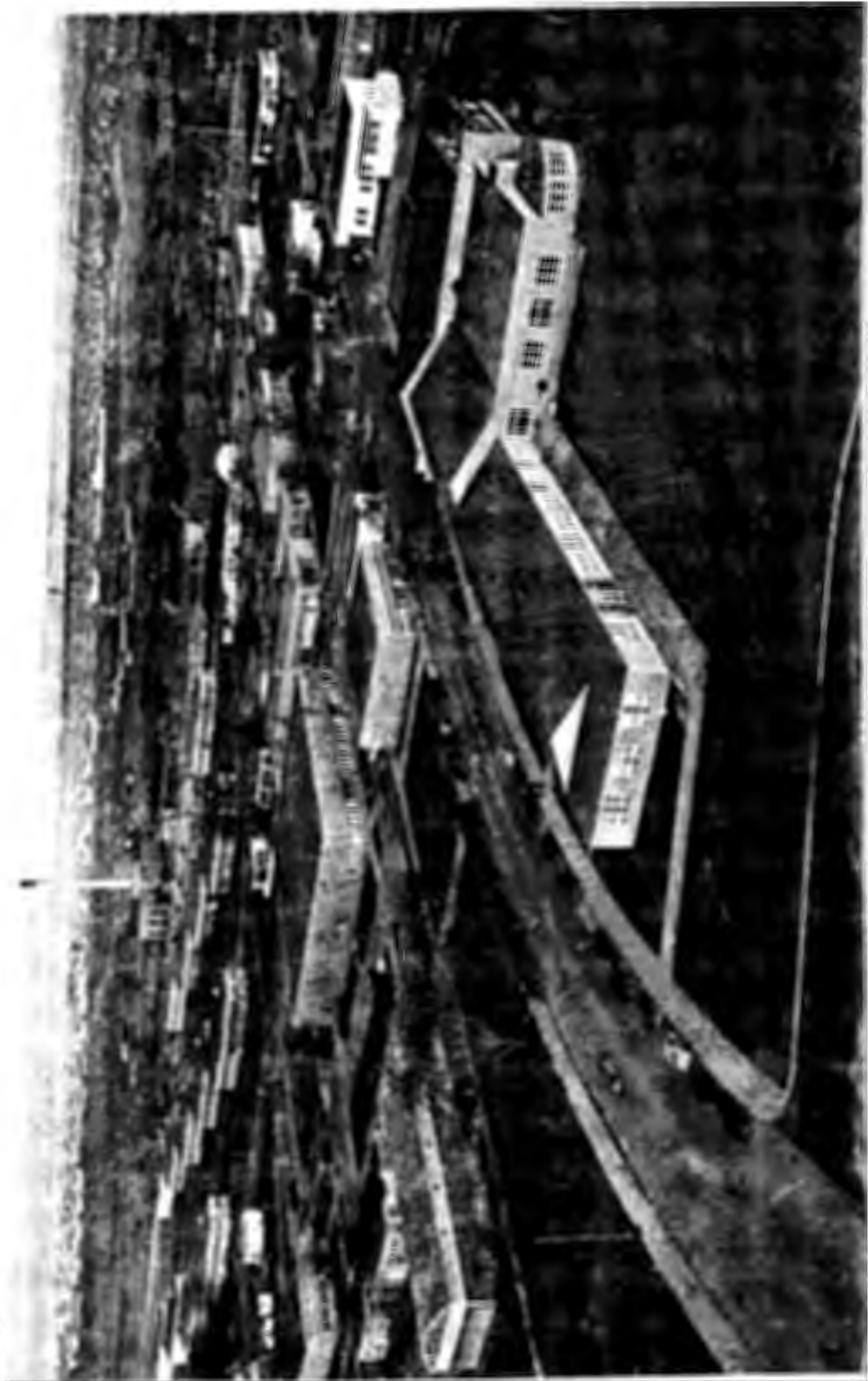
APPENDIX A 146

ELECTRICAL SHOP



APPENDIX A 147

RECREATION BUILDING



APPENDIX A 148

THEATER



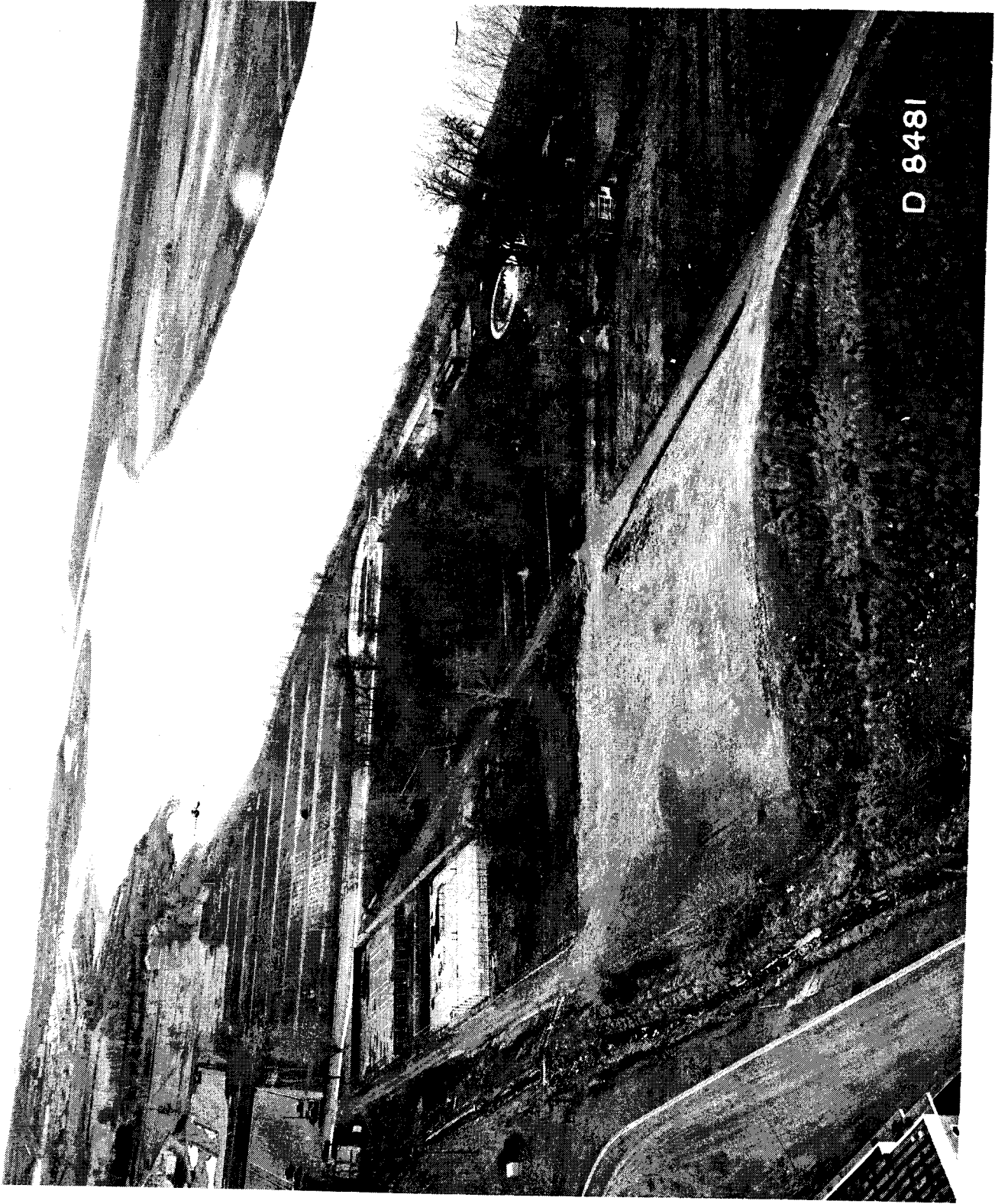
RICHLAND

**THE MASK
OF
DIMITRIOS**

THE MASK

APPENDIX A 149

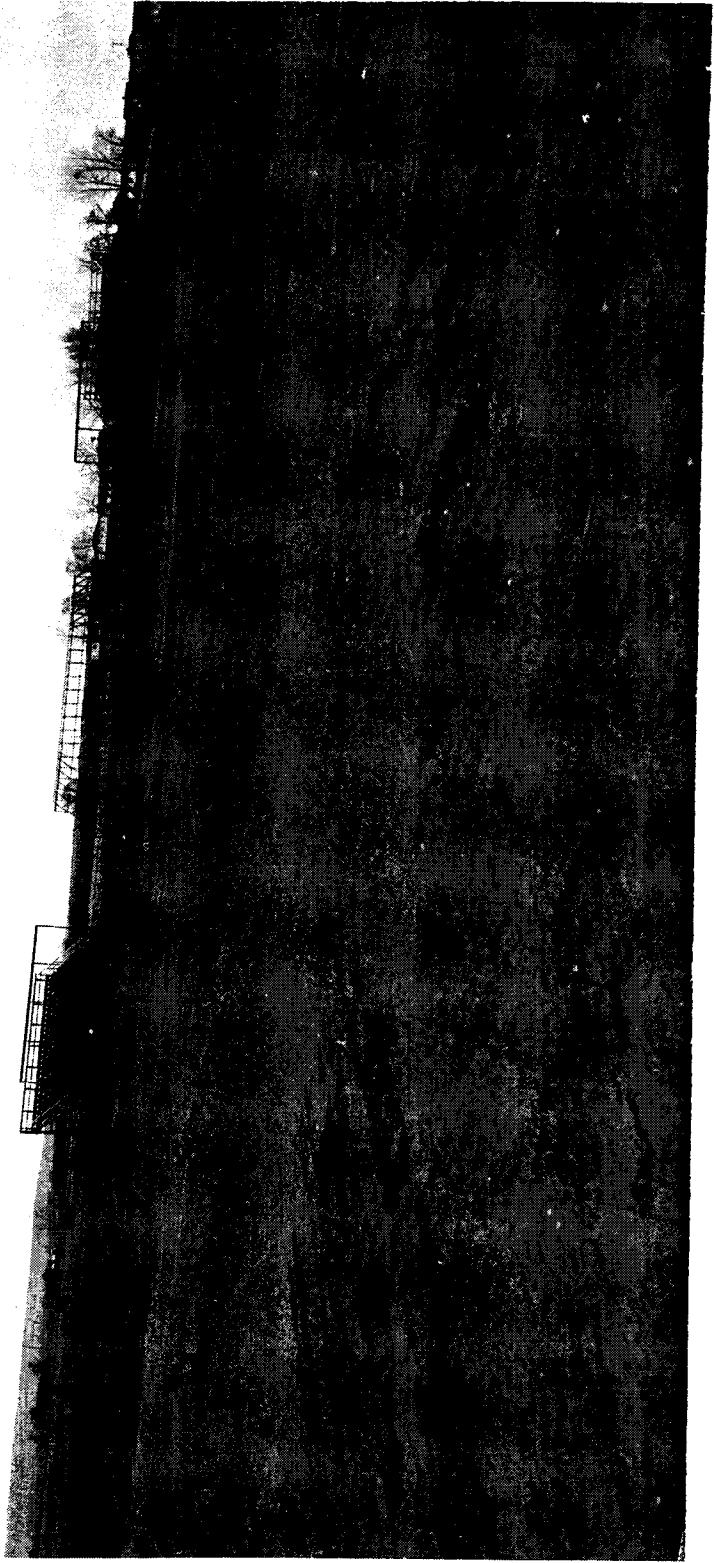
TYPICAL BASEBALL FIELD



D 8481

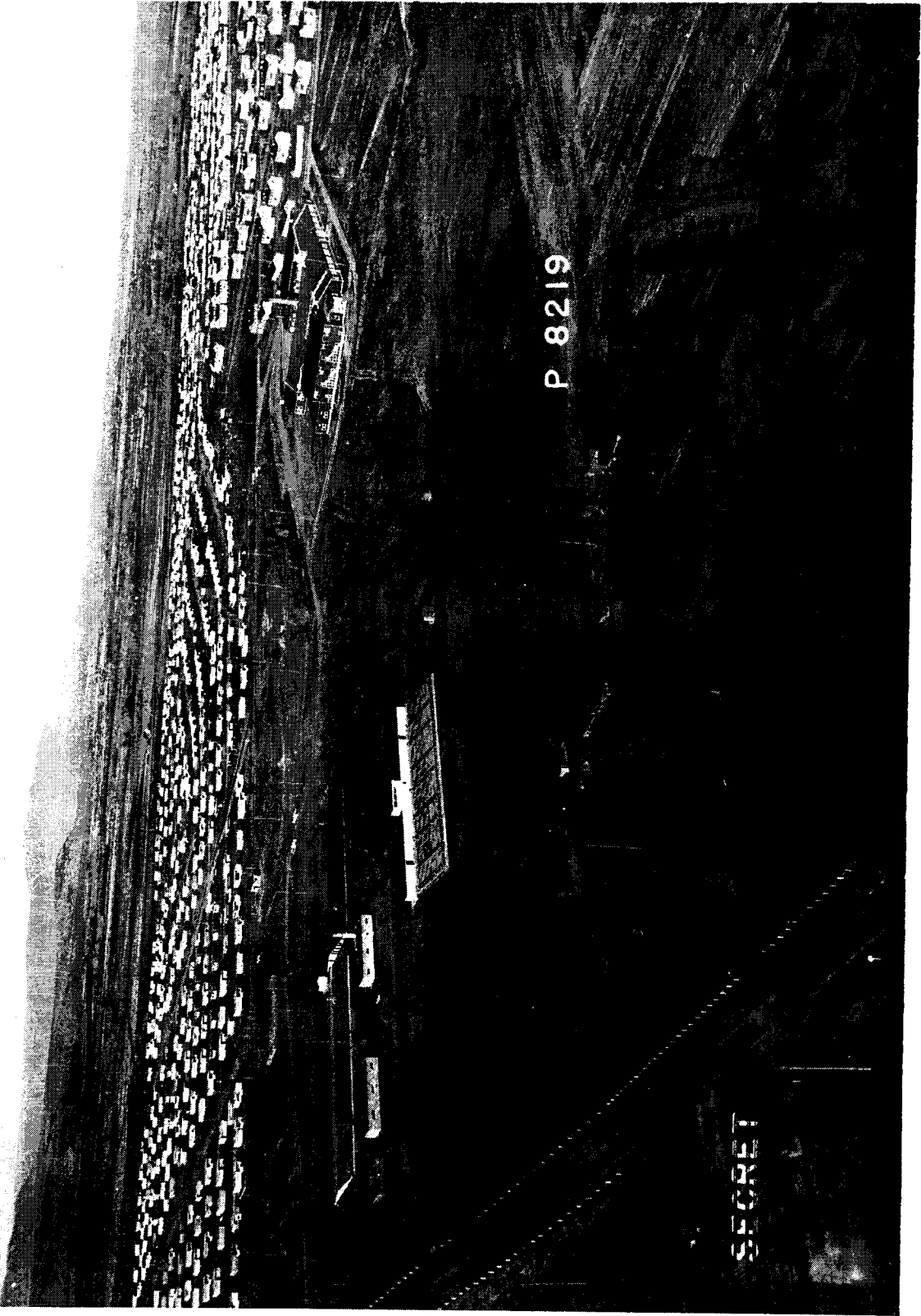
APPENDIX A 150

HIGH SCHOOL FOOTBALL FIELD



APPENDIX A 151

RICHLAND VILLAGE PARK



P 8219

SECRET