

SUPPORTING SYSTEMS REPORT

MASTER PLAN

FUTURE DEVELOPMENT PLAN

AKIZUKI AMMUNITION DEPOT HIROSHIMA PREFECTURE, JAPAN

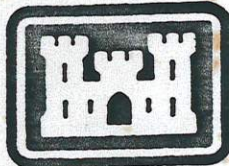
FINAL

DEC. 20, 1988

CONTRACT DOCUMENTS

DECEMBER 1988

Prepared for:



US Army Corps
of Engineers
Japan Engineer District

Prepared by,

ONUMA AND ONUMA ASSOCIATES, INC.

ARCHITECTS ENGINEERS PLANNERS 4-32-4 NISHI-SHINJUKU SHINJUKU-KU TOKYO, JAPAN

TABLE OF CONTENTS

	<u>PAGE</u>
SECTION 1 - INTRODUCTION	
1.1 Purpose of Report	1
1.2 Supplementary Future Development Plans	2
1.3 Organization of Report	3
SECTION 2 - SYSTEMS STUDIES	
2.1 General Road Study	4
2.2 General Water Study	7
2.3 General Storm Drainage Study	10
2.4 General Sanitary Sewer Study	12
2.5 General Electrical Study	14
2.6 General Heating Study	16
2.7 General Telephone Study	17

SECTION 1

INTRODUCTION

1.1 PURPOSE OF REPORT

This Supporting Systems Report is one of several documents that together constitute the updated Master Plan for Akizuki Ammunition Depot, a U.S. Army installation in Hiroshima Prefecture, Japan.

The companion planning documents are:

- a) A report entitled "Analysis of Existing Facilities/Environmental Assessment Report," dated January 1984.
- b) "Building Information Schedule," dated January 1984.
- c) "Basic Information Maps," 8 maps dated January 1984.
- d) A report entitled "Analytical/Environmental Assessment Report," dated March 1987.
- e) "Tabulation of Existing and Required Facilities," dated March 1987.
- f) "Future Development Plans," 3 plans dated May 1987 (corrected).
- g) Supplementary Future Development Plans, 8 plans dated with this report.

Of unique concern to this study are summary accountings of existing supporting systems, their relation to proposed future projects and requirements for alterations and expansions to meet future demands. In particular, this report is to provide assistance in understanding the Supplementary Future Development Plans (item g above, described in the following section).

1.2 SUPPLEMENTARY FUTURE DEVELOPMENT PLANS

The studies of this Supporting Systems Report for Akizuki Ammunition Depot are to provide assistance in understanding the Supplementary Future Development Plans listed below:

- a) Detailed Site Plan
- b) General Road Plan
- c) General Water Plan
- d) General Storm Drainage and Sanitary Sewer Plan
- e) General Electrical Plan
- f) General Heating Plan
- g) General Telephone System Plan
- h) General Tree Cover and Recreation Plan

These plans are concerned with showing existing conditions and future components and necessary changes of supporting systems associated with future requirements.

In the case of utilities systems the plans are not concerned with detailed lateral connections but rather new primary components or main lines and significant reroutals. This is due to the conceptual nature of the future plans and that the exact locations of the components of concern are subject to some variation.

1.3 . ORGANIZATION OF REPORT

The Supporting Systems Report contains a series of studies on supporting utilities and other systems at Akizuki Ammunition Depot as listed below:

<u>STUDY</u>	<u>SECTION</u>
General Road Study	2.1
General Water Study	2.2
General Storm Drainage Study	2.3
General Sanitary Sewer Study	2.4
General Electrical Study	2.5
General Heating Study	2.6
General Telephone Study	2.7

SECTION 2

SYSTEMS STUDIES

2.1 GENERAL ROAD STUDY

2.1.1 General

Roads and streets are under the 850 Army construction category code series.

Design of roads shall be in accordance with appropriate Government of Japan and U.S. Army criteria as applicable. The following list identifies the manuals of concern:

- a) GOJ FIP "Design Criteria for Civil Engineering under the Facilities Improvement Projects," August 1983.
- b) TM 5-822-1, "Traffic-Study Requirements," July 1965.
- c) TM 5-822-2, "General Provisions and Geometric Design for Roads," April 1977.
- d) TM 5-822-3, "Parking for Nonorganizational Vehicles," July 1965.
- e) TM 5-822-5, "Flexible Pavements for Roads," May 1980.
- f) TM 5-822-8, "Bituminous Pavements, Standard Practice," December 1971.

2.1.2 . Existing Conditions

Akizuki Ammunition Depot has 300 square yards (SY) (approx. 0.1 linear mile) of portland cement concrete (PCC) roads, 22,529 SY (2.0 linear miles) of asphalt concrete (AC) paved roads, and 7,034 SY (1.4 linear miles) of unpaved/gravel roads. Additionally, there are 5,253 SY of AC paved parking and 7,860 SY of unpaved parking and 199 SY of AC paved walkways.

Most facilities on the installation are easily accessible by vehicles. Many roads, however, are worn and undersized.

2.1.4. Design Considerations

The primary artery running through the central part of the installation is a flat terrain construction. Some of the supplementary secondary roadways, though, are on rolling terrain and a few of the tertiary access roads qualify as mountainous construction.

For design purposes, the traffic composition at most locations on the base is Category III -- traffic including small trucks and a few heavy trucks in addition to passenger cars (reference TM 5-822-5).

The Design Index, Varying from 1 through 10 (reference TM 5-822-5), is based on road Category and Class and is used in conjunction with the existing subgrade CBR to determine required asphalt pavement thickness.

Various factors are involved in determining geometric design requirements as shown in Tables 1 and 2 of TM 5-822-2.

2.2 GENERAL WATER

2.2.1 General

Water works are under the 840 Army construction category code series.

Design of water supply treatment, storage and distribution systems shall be based on the appropriate Army Technical Manuals and Government of Japan criteria as applicable. Fire protection concerns as pertaining to water systems shall be in accordance with Department of Defense, GOJ and Army Standards. The following list identifies the manuals of concern:

- a) MIL-HDBK-1008, "Fire Protection for Facilities -- Engineering, Design, and Construction," April 1985.
- b) GOJ FIP, "Design Criteria for Civil Engineering under the Facilities Improvement Projects," GOJ, August 1983.
- c) TM 5-813-1, "Water Supply -- Sources and General Considerations," March 1979.
- d) TM 5-813-3, "Water Supply -- Water Treatment," January 1978.
- e) TM 5-813-4, "Water Supply -- Water Storage," July 1965.
- f) TM 5-813-5, "Water Supply -- Water Distribution Systems," August 1965.
- g) TM 5-813-6, "Water Supply -- Water Supply for Fire Protection," October 1965.

2.2.2 Existing Conditions

Potable and fire fighting water distribution systems are separate at Akizuki Ammunition Depot.

2.2.3 Future Developments

2.2.4 . Design Considerations

Water Supply Requirements

References: MIL-HDBK-1008 & TM 5-813-1

REQ'D DAILY DEMAND = DESIGN POPULATION X PER CAPITA DOMESTIC ALLOWANCE
+ FIRE DEMAND

DESIGN POPULATION = (RESIDENTS + 33% OF NONRESIDENTS) x CAPACITY
= (0 + 0.33 x 204) x 1.50 = 102 PN

PER CAPITA DOMESTIC ALLOWANCE = 150 GPD

FIRE DEMAND - SPECIAL OCCUPANCIES EXIST HOWEVER CONSIDER EXTRA HAZARD
REQUIREMENTS:

a. W/O SPRINKLER = 2,500 GPM x 150 MIN = 375,000 GAL

b. W/SPRINKLER = (0.35 GPM/SF x 3,000 SF + 750 GPM) x 105 MIN
= 270,000 GAL

c. YARD STORAGE = 2,000 GPM x 180 MIN = 360,000 GAL

REQ'D DAILY DEMAND = 102 x 150 GPD + 375,000 GAL = 390,000 GAL

DAILY DOMESTIC DEMAND = 102 x 150 GPD = 15,300 GAL

EXIST WELL PRODUCTION = 3,300 GAL/DAY

EXIST POTABLE STORAGE = 500 GAL + 300 GAL = 800 GAL

FIRE DEMAND = 375,000 GALS (See a. ABOVE)

EXIST NONPOT STORAGE = 132,000 GAL + 170,000 GAL = 302,000 GAL

2.3 - GENERAL STORM DRAINAGE STUDY

2.3.1 General

Storm drainage facilities are under the 871 Army construction category code series.

Design of storm water drainage systems shall be primarily based on Army Technical Manual No. 5-820-4 and Government of Japan criteria with considerations being given to Army airfield drainage manuals where applicable and to structural design concerns as found in TM 5-814-1. The following list identifies the manuals of concern:

- a) TM 5-820-4, "Drainage for Areas Other Than Airfields," October 1983.
- b) GOJ FIP, "Design Criteria for Civil Engineering under the Facilities Improvement Projects," August 1983.
- c) TM 5-820-1, "Surface Drainage Facilities for Airfields and Heliports," April 1977.
- d) TM 5-820-2, "Drainage and Erosion Control -- Subsurface Drainage Facilities for Airfield Pavements," March 1979.
- e) TM 5-820-3, "Drainage and Erosion Control -- Structures for Airfields and Heliports," January 1978.
- f) TM 5-814-1, "Sanitary Engineering -- Sanitary and Industrial Waste Sewers," August 1966.

2.3.2. Existing Conditions

Akizuki Ammunition Depot relies mostly on concrete and stone lined trenches to channel storm drainage to the ocean. For the most part these trenches are open, however, some are subsurface and the total network covers 32,178 linear feet. Actual circular concrete drainage pipes are limited to only 23 linear feet.

Surface runoff over some of the steep terrain and embankments often causes erosion problems for which corrective action is required.

2.4 - GENERAL SANITARY SEWER STUDY

2.4.1 General

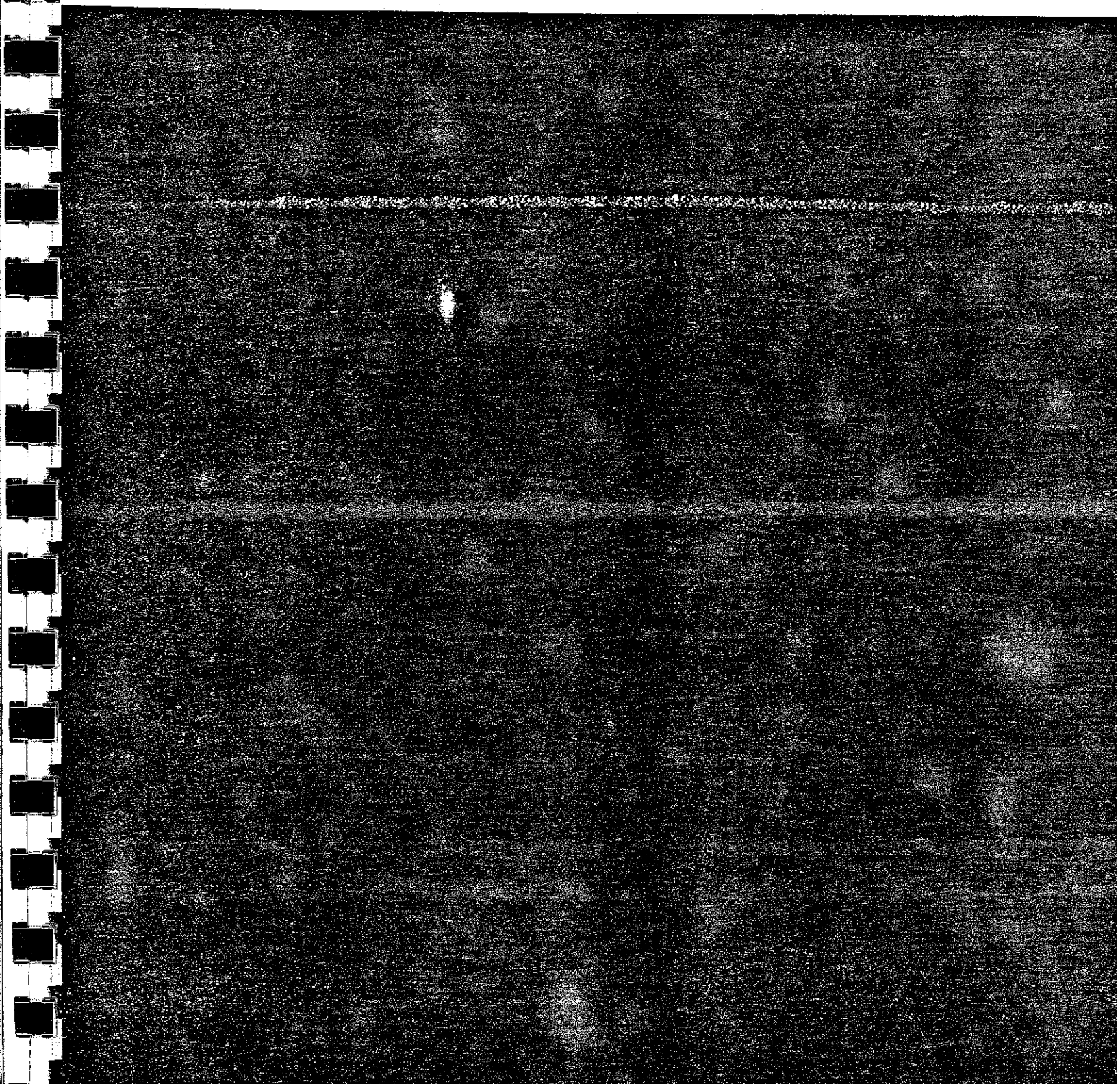
Sanitary sewer facilities are under the 830 Army construction category code series.

Design of sanitary sewage systems shall be in accordance with appropriate Army and Government of Japan criteria as applicable. The following list identifies the manuals of concern:

- a) TM 5-814-1, "Sanitary Engineering -- Sanitary and Industrial Waste Sewers," August 1966.
- b) GOJ FIP, "Design Criteria for civil Engineering under the Facilities Improvement Projects," August 1983.
- c) TM 5-814-2, "Sanitary Engineering -- Sewage and Industrial-Waste Pumping stations," August 1965.
- d) TM 5-814-3, "Sanitary Engineering -- Domestic Wastewater Treatment," November 1978.
- e) AR 200-1, "Environmental Quality -- Environmental Protection and Enhancement," July 1982.
- f) Appropriate GOJ EPA regulations and local standards.

2.4.2 - Existing Conditions

There are 16 septic tanks at Akizuki Ammunition Depot providing treatment of domestic sewage prior to discharge. Effluent is discharged directly to nearby drainage channels or directly to the ocean. Septic tank discharges are monitored semi-annually and are in compliance with local discharge laws.



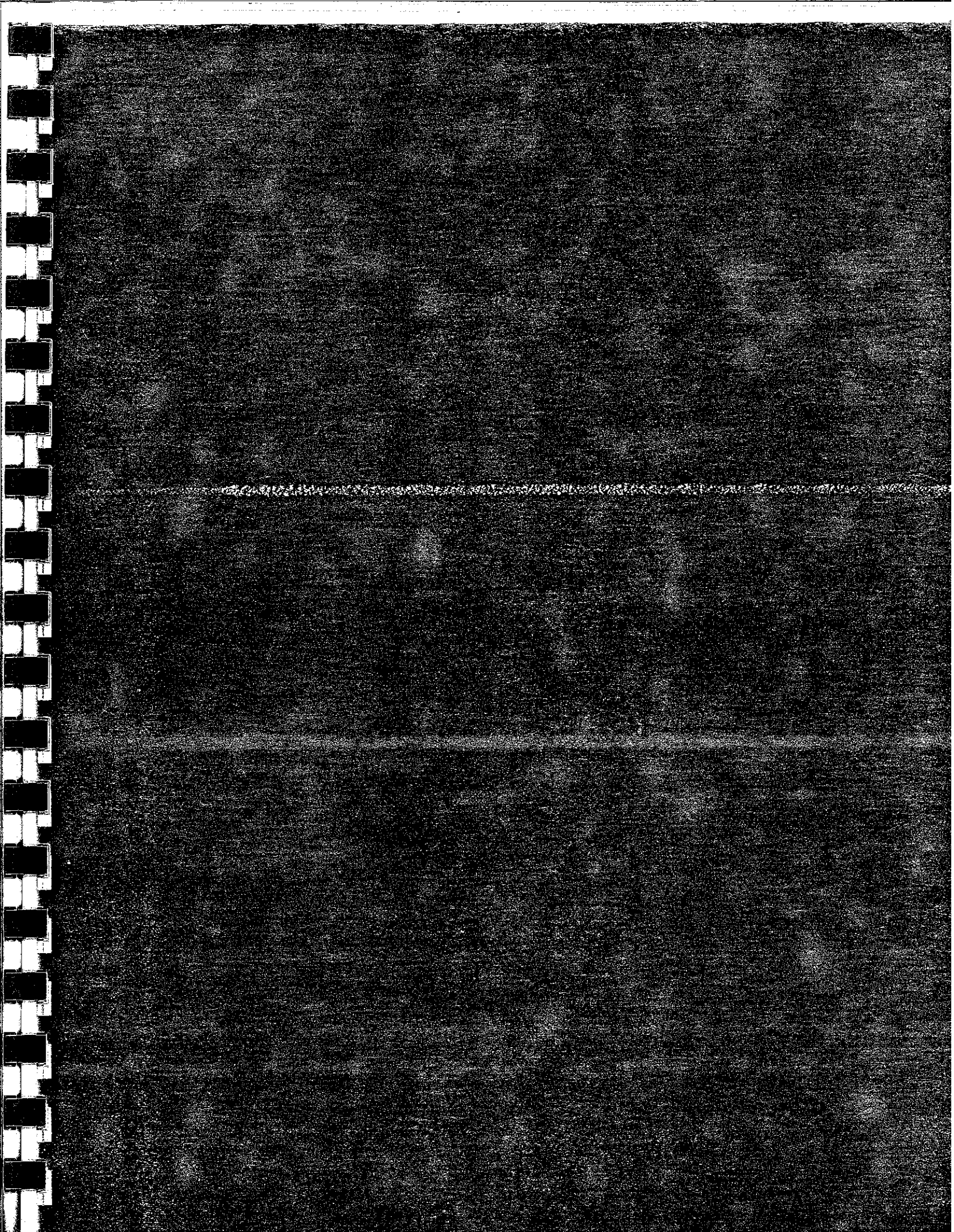
2.5 - GENERAL ELECTRICAL STUDY

2.5.1 General

Electrical facilities are under the 810 Army construction category code series.

Design of electrical systems shall be in accordance with appropriate Army criteria. The following list identifies some of the manuals of concern:

- a) TM 5-811-1, "Electric Power Supply and Distribution," September 1984.
- b) TM 5-811-6, "Electric Power Plant Design," January 1984.
- c) TM 5-765, "Electric Power Transmission and Distribution," June 1970.



2.6 - GENERAL HEATING STUDY

2.6.1 General

Heating facilities are under the 820 Army construction category code series.

Design of steam, hot water and fuel oil heating systems and domestic hot water systems shall be in accordance with appropriate Army criteria. The following list identifies some of the manuals of concern:

- a) TM 5-810-2, "High Temperature Water Heating Systems," March 1977.
- b) TM 5-810-6, "Nonindustrial Gas Piping Systems," March 1984.
- c) TM 5-650, "Central Boiler Plants," August 1962.

2.6.2 Existing Conditions

Akizuki Ammunition Depot has two boiler plants for steam heating supply. They are located in buildings S-332 and S-353 and both are packaged smoke tube type boilers. The boiler in S-332 supplies steam heating and/or domestic hot water to seven buildings in the administration area and the boiler in S-353 supplies only steam heating to four buildings in the southeastern part of the base. Additionally, there is a small boiler of the same type for hot water heating in bldg. S-236. Other heating systems consist of forced warm air furnaces in bldgs. S-246, S-308, S-307, and T-386. All of the above systems are oil fired.

2.7 - GENERAL TELEPHONE STUDY

2.7.1 General

Communication facilities are under the 130 Army construction category code series.

Design of communication facilities shall be in accordance with appropriate Government of Japan and U.S. Army criteria as applicable.

