~~CONFIDENTIAL~~ RESTRICTED

SPECIAL REPORT

STRATEGIC ENGINEERING STUDY
No. 171

SAISHŪ-TŌ (QUELPART ISLAND)
—and—
TSUSHIMA

TERRAIN INTELLIGENCE

Prepared by
GEOLOGICAL SURVEY, U.S. DEPARTMENT OF THE INTERIOR
Under direction of
CHIEF OF ENGINEERS, U.S. ARMY

MILITARY INTELLIGENCE DIVISION
OFFICE, CHIEF OF ENGINEERS
U. S. ARMY

MARCH, 1945

ARMY MAP SERVICE, U.S. ARMY, WASHINGTON, D.C., 203359
4-45 1945

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STRATEGIC INTELLIGENCE BRANCH
MILITARY INTELLIGENCE DIVISION
OFFICE, CHIEF OF ENGINEERS
U. S. ARMY

MARCH, 1945

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CHIEF, MILITARY INTELLIGENCE DIVISION
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Washington, D.C.

ARMY MAP SERVICE, U.S. ARMY, WASHINGTON, D.C., 203359
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TABLE OF CONTENTS

SAISHU-TO (QUELPART ISLAND) AND TSUSHIMA

INTRODUCTION

This report was prepared by the Geological Survey, United States Department of the Interior, for the Chief of Engineers, U. S. Army during February and March 1945.

The report discusses those terrain features of Saishu-to (Quelpart Island) and Tsushima that are of significance in military operations. Each of the maps and tables is devoted to a special set of problems; together they present a regional picture of the character of the country, the relationship of terrain to movement, problems of road and airfield construction, nature and location of principal construction materials, and water supply. Basic data from which interpretations have been made are summarized in maps and tables on geology and soils. Climate and vegetation are considered only briefly; other intelligence sources should be consulted for detailed information.

METHOD OF COMPILATION AND RELIABILITY OF DATA

The information on Saishu-to is based chiefly on the interpretation of geologic maps, topographic maps, and aerial photographs. The principal geologic source was the 1:100,000 Korean Geological Survey map. The topographic maps used were the 1:50,000 Korean Provisional Land Survey series which are of good quality except for road information. Additional information was obtained from vertical aerial photographs covering the point east of Mosulp'o and a strip across the northwestern part of the island. Poor obliques covering the entire island were also used.

The base map for Saishu-to is A.M.S. L551, Sheet 41, 1:250,000 printed in 1944.

Information on Tsushima was limited mainly to 1:200,000 topographic and geologic maps of the Imperial Geological Survey. No aerial photographs were available at the time this report was prepared.

The base map on Tsushima is A.M.S. L571, Sheet 32, 1:250,000 printed in 1943.

The reliability of data in this report varies considerably with the adequacy of source information and degree of interpretation required. Each sheet is given a reliability rating based on a scale ranging from excellent to poor. In general information about Saishu is rated good, information about Tsushima, fair.

PRINCIPAL SOURCES OF INFORMATION

Saishu-to

Hall, R. Barnett, Quelpart Island and its people: Geog. Rev., vol. 16, pp. 60-72, 1926.

Haraguchi, K., Saishu volcano: Korea Geol. Survey Bull., vol. 10, pt. 1, 1931.

Hurlbut, H. B., The Island of Quelpart: Am. Geog. Soc. Bull., vol. 37, pp. 396-405, 1905.

Pieters, Alex A., A visit to Quelpart: Korea Rev., Seoul, vol. 5,pp. 172-179 and 215-219, 1905.

Lautensach, H. Quelpart and Dagelet. Vergleichande landeskunde zweier koreanischer inseln Wiss Veroffentl Museum landerkunde Leipzig N.F. 3 1935, 196-206.

Trollope, M.N., An account of the ship-wreck of a Dutch vessel on the isle of Quelpart together with a description of the kingdom of Korea: Royal Asiatic Soc., Korea Branch, Trans., vol. 9, pp. 91-148, 1918.

Aerial Photographs:
USAAF 468B6/4MR9/Oct 6, 1944
USAAF 468B6/4MB16/Nov. 11, 1944

Tsushima

Haack, T., Tsushima: Pet. Mitt., vol. 65, p. 130, 1919.

Haushofer, K., Tsushima: Mitt. Geog. Ges. Munchen, 1914.

Kato, T., Contributions to knowledge of Mesozoic igneous rocks developed around the Tsushima Basin, Japan: Geol. Soc. Tokyo Jour. vol. 27, pp. 1-38, 1920.

Tateiwa, I., Cretaceous flora of Tsushima: Japanese Jour. Geology, vol. 11, pp. 185-209, 1934.

Lehmann, F.W.P. Tsuschima, kleine dopfel: Pet. Mitt., vol. 64, p. 268, 1918.

Prepared by U. S. Geological Survey
for Chief of Engineers, U. S. Army

SUMMARY OF TERRAIN SITUATION

SAISHU-TO (QUELPART ISLAND)

I. General
- A. Saishu-To is about 50 miles south of Korea and 175 miles west of Kyushu.
- B. Population about 200,000, distributed in many small villages and towns on the coastal lowland.
- C. Climate temperate humid. Severe snow and frost only in mountains.
- D. Annual rainfall about 55 inches on lowland; summer months are wettest. Droughts rare.

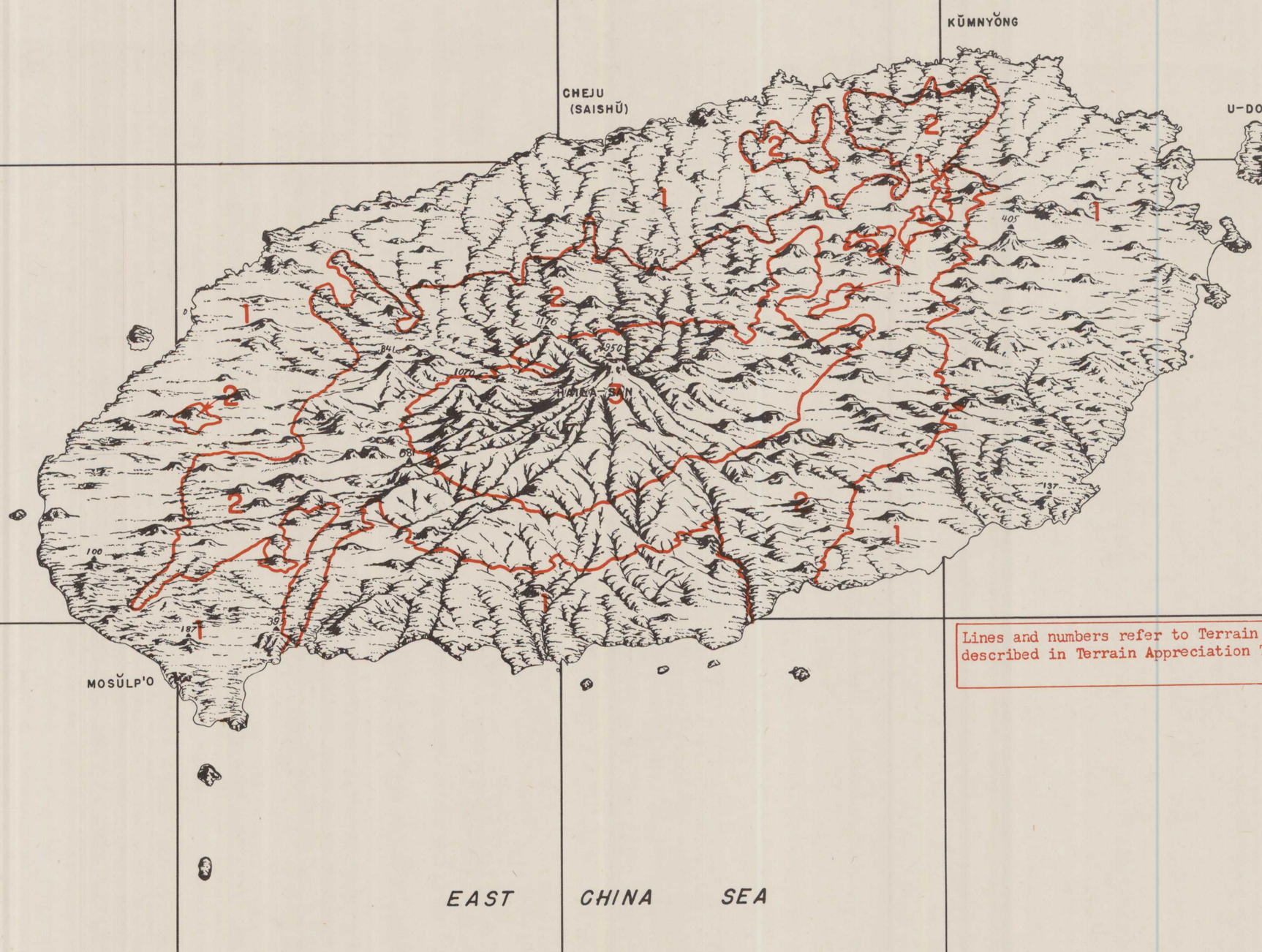
II. Terrain
- A. Volcanic island; land area 720 sq. miles, maximum dimension 45 miles.
- B. Undulating to rolling coastal lowland several miles wide surrounds rugged central peaks.
- C. Coast rough and rocky, many cliffs. A few short beaches.
- D. Scores of steep volcanic ash hills about 200 feet high are scattered over lowland, dominating entire coastal area.
- E. Lowland cultivated to dry crops or in pasture; stone fences surround many small fields. Central mountains heavily forested.

III. Roads
- A. Good road surrounds island, lies near coast.
- B. Many secondary roads and cart tracks cross lowland; no road, few trails cross central mountains.
- C. Secondary roads and trails easily improved on lowland.

IV. Water Supply
- A. Surface water scarce; few small perennial streams occur mostly at south; may disappear in middle courses.
- B. Springs or shallow wells near villages. Developed supply is small and undependable.
- C. Ground water can be developed to supply extensive military needs.

V. Possible Airfield Sites
- A. Three good sites for heavy-bomber fields; two are now occupied by Japanese fields. Several less favorable fields, adequate for fighters.
- B. Construction requirements moderate; much grading may be necessary at some sites.

VI. Construction Materials
- A. Adequate materials abundant.
- B. Gravel scarce or lacking; volcanic cinder and ash abundant.
- C. Trap-rock can be quarried at innumerable places.
- D. Timber abundant in mountains.



Lines and numbers refer to Terrain Units described in Terrain Appreciation Table.

HEIGHTS IN METERS

PREPARED BY U. S. GEOLOGICAL SURVEY FOR CHIEF OF ENGINEERS, U. S. ARMY

Terrain diagram drawn on map base AMS L551 1:250,000, sheet 41. Details added from Korea Provisional Land Survey maps 1:50,000; geological map of Geological Survey of Chosen 1:100,000; views and aerial photographs.

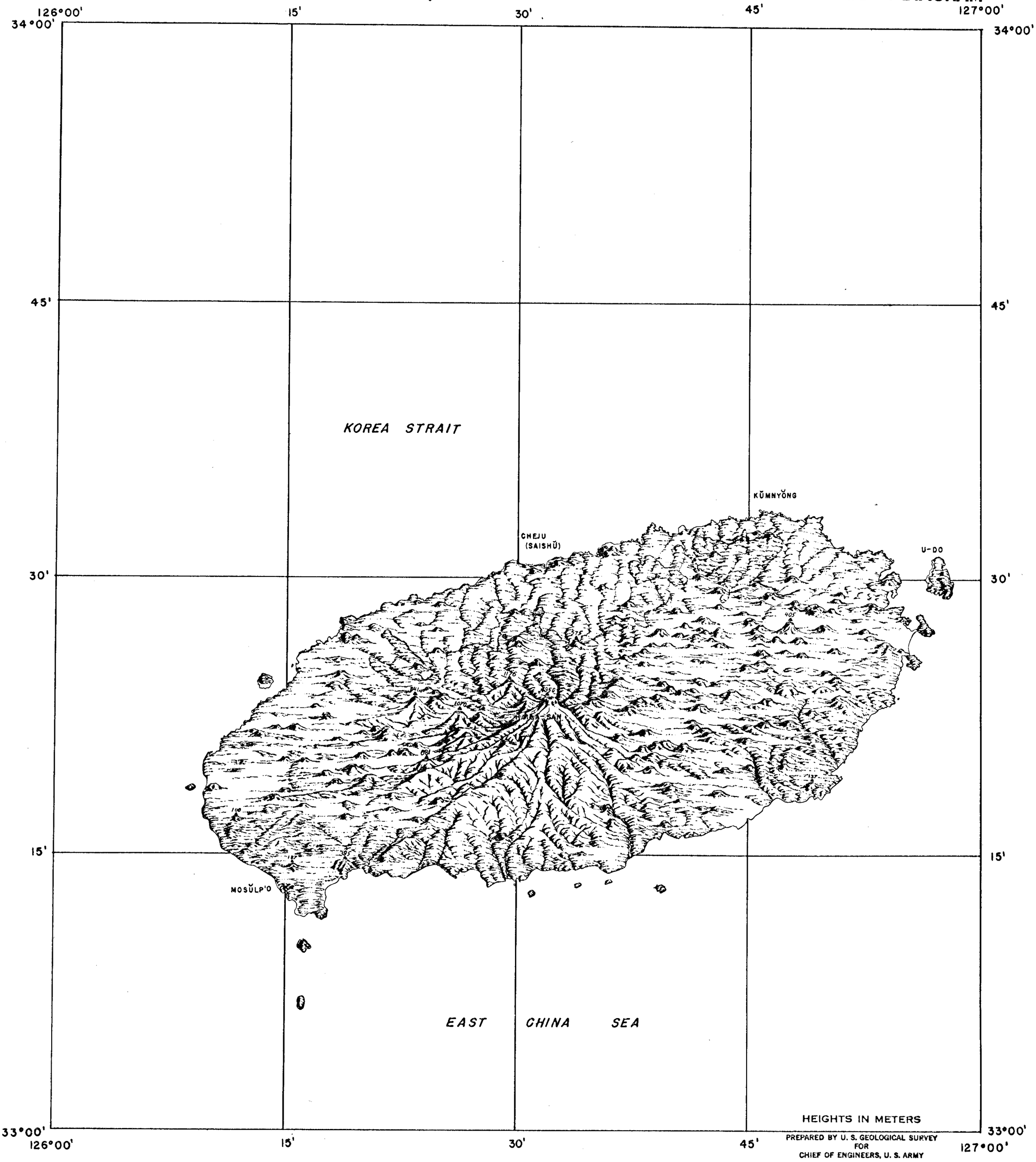
Altitudes in meters above sea level. The appearance of perspective is obtained by shifting all relief features northward by 1/10 inch for each 1,000 feet. Distances on map can therefore be scaled off only between points of equal altitude.

5 0 5 10 MILES

10 0 10 KM.

SAISHU-TO (QUELPART ISLAND)

TERRAIN DIAGRAM



Terrain diagram drawn on map base AMS L551 1:250,000, sheet 41. Details added from Korea Provisional Land Survey maps 1:50,000; geological map of Geological Survey of Chosen 1:100,000; views and aerial photographs.

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5 0 5 10 MILES

10 0 10 KM.

~~CONFIDENTIAL~~

TERRAIN APPRECIATION AND VIEWS: INDEX

KOREA 1:250,000

For use by
War and Navy Department Agencies only
Not for sale or distribution

CHEJU-DO

(SAISHŪ-TŌ)

SAISHU-TO (QUELPART ISLAND)

FIRST EDITION-AMS 1

SHEET 41

CONVERSION GRAPH
Meters / Feet

EXPLANATION

Reliability: Good

1 — COASTAL LOWLAND. Undulating to rolling country. Shallow, rocky stream beds, generally dry. Thickly populated. Intensely cultivated in small fields separated by stone fences 2 to 6 feet high. Fair to good network of roads.

2 — FOOTHILLS. Rolling country, generally grass-covered, locally brushy. Surface usually littered with boulders. Streams small, flow in gullies or ravines; channels rocky or bouldery.

3 — STEEP VOLCANIC SLOPES. Steep upper slopes of Halla-san volcano; generally rugged with many cliffs and gorges. Heavily forested except on higher peaks.

CINDER CONES. Steep-sided hills standing fifty to several hundred feet above surrounding terrain. Most peaks on coastal lowland are wooded in part.

ISOLATED ROCK HILLS. Hills standing fifty to several hundred feet above surrounding terrain. Most hills in part rimmed by rock cliffs.

SEA CLIFF more than 50 feet high.

GORGE more than 50 feet deep. (Not shown in area 3).

BEACH, more than 500 feet shore length. Chiefly sand, but some may be sand and gravel.

NATURAL TUNNEL in volcanic rock.

EXPLANATION

Vertical aerial view.

Oblique aerial view.

Location of ground views not shown.

ROADS EXPLANATION

(Information additional to that shown in red on base map).

Road more than 9 feet wide; probably surfaced.

Road or cart-track more than 6 ft. wide; probably unsurfaced. Generally suitable for single-lane light traffic except in wet weather. Very steep grades in central part of island.

GLOSSARY

-ak	point
-am	rock
-bong	mountain
-chedo	archipelago
-chi	pond
-ch'i	pass
-ch'ŏn	river
-dae	mountain
-dan	point
-do	island, province
-dō	province, village
-dong	village, town
-gak	point
-gan	rock
-gang	river
-gap	point
-gun	county
-guntō	archipelago
-hae	sea
-hang	harbor, point
-hantō	peninsula
-ho	lake
-hō	mountain
-hyŏn	pass
-ji	pond, temple, pass
-kai	sea
-kaikyō	strait
-kaku	point
-kan	point
-kang	river
-ko	lake
-kō	harbor, river, point
-kun	county
-kundo	archipelago
-li	village, town
-lyŏng	pass
-mal	point
-man	bay
-matsu	point
-misaki	point
-ni	village, town
-nyŏng	pass
-pando	peninsula
-p'o	harbor
-pong	mountain
-rei	pass
-rettō	island chain
-ri	village, town
-ryŏng	pass
-sa	temple
-saki	point
-san	mountain
-sen	river
-shima	island
-sho	island
-shotō	archipelago
-sō	island
-su	river
-sui	river
-sudo	channel
-suidō	channel
-tan	point
-to	island
-tō	island
-tong	village, town
-wan	bay
-yŏlto	island chain
-zaki	point
-zan	mountain

LEGEND

Cities over 100,000 Population
Cities 20,000-100,000 Population
Cities 5,000-20,000 Population
Towns 2,000-5,000 Population
Villages 1-2,000 Population
Boundary: (International)
Boundary: Do (Province)
Boundary: Gun (County)
Triangulation Points
Elevations × 254
Walls
Rice
Salt Pans

Railroads: Standard Gauge 4'8½"
Double Track
Single Track (Station)
Under Construction UNDER CONSTRUCTION
Railroads: Narrow Gauge 3'6" or less
Primary Highways
Improved Roads—over 12 ft.
Improved Roads—under 12 ft.
Unimproved Roads, Trails

Aeronautical Information:	Field	Anchorage
Government, Army, Navy	◎	⊛
Municipal or Commercial	○	⊛
Auxiliary or Emergency	+	‡
Unclassified	⊕	

Radio Broadcasting Stations ⊙ RS
Other Radio Stations ⊙ RN

A.M.S. L551

First Edition (A.M.S. 1) 1944

Prepared under the direction of the Chief of Engineers, U. S. Army, by the Army Map Service (AMCV), U. S. Army, Washington, D. C., 1944. Compiled from Korea 1:200,000, Korean Provisional Land Survey, 1921; Korea 1:50,000, Korean Provisional Land Survey, 1918; Japanese H. O. Chart 1208, 1933; U. S. H. O. Chart 3239, 1941; Aeronautical information from U. S. A. A. F., 1943. Korean names transcribed according to the McCune-Reischauer System; Japanese forms of Korean names, shown in parentheses, transcribed according to the Modified Hepburn (Romaji) System; other alternate forms from U. S. H. O. Charts.

PREPARED BY U. S. GEOLOGICAL SURVEY
FOR
CHIEF OF ENGINEERS, U. S. ARMY

Scale 1:250,000

5 0 5 10 Miles
5 0 5 10 15 Kilometers
5000 0 5000 10000 15000 Yards

APPROXIMATE CONTOUR INTERVAL 100 METERS

POLYCONIC PROJECTION

HORIZONTAL CONTROL IS BASED ON DATUM PRIOR TO 1912

TEN THOUSAND YARD WORLD POLYCONIC GRID, BAND IIIN, ZONE "C"
THE LAST THREE DIGITS OF THE GRID NUMBERS ARE OMITTED

NOTE: OFFICERS USING THIS MAP WILL MARK HEREON CORRECTIONS AND ADDITIONS WHICH COME TO THEIR ATTENTION AND MAIL DIRECT TO "THE CHIEF OF ENGINEERS, WASHINGTON, D. C."

HEIGHTS IN METERS

APPROXIMATE MEAN DECLINATION 1943
FOR CENTER OF SHEET
ANNUAL MAGNETIC CHANGE 1' INCREASE

Use diagram only to obtain numerical values. To determine magnetic north line, connect the pivot point "P" on the south edge of the map with the value of the angle between grid and magnetic north, as plotted on the degree scale at the north edge of the map.

INDEX TO PROVINCE BOUNDARIES

INDEX TO ADJOINING SHEETS

ARMY MAP SERVICE, U. S. ARMY, WASHINGTON, D. C. 115865
4-45 1944

CHEJU-DO, KOREA
(SAISHŪ-TŌ)
N3300-E12600/100

~~CONFIDENTIAL~~

SAISHU-TO (QUELPART ISLAND)

TERRAIN APPRECIATION

Reliability: Good

INTRODUCTION

General: Saishu-To (Cheju-Do, Quelpart Island) lies about 50 miles south of the Korean coast. It is approximately 720 square miles in area and roughly elliptical in outline. The population, 198,719 in 1921, is largely concentrated in small villages in the coastal areas. The coast is rocky for the most part; there are no good harbors and few beaches.

Topography: Saishu-To is essentially a complex volcanic cone rising, with a gradually increasing slope, from sea level to Haila-san (Kanra-san), the highest point on the island (1,950 meters altitude). The surface of the island is studded with volcanic cinder cones which dominate the entire area; these range in altitude from fifty to several hundred feet above the surrounding terrain. The coastal lowland is intensely cultivated and is separated by a belt of grass-covered foothills from the rugged, forested upper slopes in the interior. Many streams are dry in their middle courses except during and immediately after heavy rains.

Climate: The climate of Saishu-To ranges from humid subtropical to humid temperate. Annual rainfall at the town of Cheju (Saishu) is about 55 inches, with a pronounced maximum during the summer months when the southeast (sea) monsoon prevails. Rainfall is heavier on the south coast. Mean temperatures at Cheju range from 40° F in January to 79° in August. The southern coast has no snow or frost, but frosts and light snowfall are common during the winter months along the northern coast and heavy snowfall occurs in the high interior. Fogs are common along the coast. Humidity is high throughout the year averaging 74%. Typhoons occasionally strike the island, usually in late fall.

Effects of Terrain on Military Operations: In general, the coastal lowlands and the foothill belt are areas of relatively easy movement because of the extensive network of roads, tracks, and trails. The extreme stoniness of the soil, however, presents a few special problems. Cultivated areas are divided into small fields by stone fences 2 to 6 feet high, which form good defensive barriers and almost block cross-country movement of motorized vehicles. In the grassy foothill areas, stone fences are fewer but the ground is littered with boulders which will hamper movement of mechanized equipment.

The terrain situation is dominated by the hundreds of steep-sided volcanic hills that rise abruptly above the surrounding terrain. These peaks offer excellent gun emplacements and observation posts but, because of lack of cover, would be highly vulnerable to aerial attack.

Natural tunnels (long lava tubes) and caves are numerous in the volcanic rock.

Magnetic compasses will be affected by strong local attraction in the volcanic rocks; in many places the compass will be completely unreliable.

Local concentrations of magnetite can be expected in the beach sands that will seriously interfere with the use of magnetic mine detectors.

Road and Road Construction: The island is circled by a coastal road, most or all of which is probably surfaced and trafficable at all times. A secondary motor road crosses the western part of the island between Cheju and Taejong; short spurs extend out from main towns or connect large towns with the coastal road. The coastal lowland is crossed by numerous country roads and cart tracks, which because of the porous and stony character of the soil are probably passable to single-lane light traffic at most times. Two cart tracks, probably impassable to motorized vehicles, cross higher parts of the interior from north to south.

In the coastal lowland and in the foothill belt, road construction and maintenance is generally easy. The soil is thin, porous, and drains rapidly; grades are low except in the higher parts of the foothills and locally along the coast; clearing is negligible, and abundant supplies of volcanic cinder for fill and surfacing are readily available. Most stream channels in the coastal lowland are broad and dry except after heavy rains; temporary roads require no bridges. Damage from flash floods may be minimized by concreting across the dry stream channels. In the foothills some deep gullies and shallow streams must be crossed. In the high interior part of the island road construction is generally difficult because of steep rocky slopes and forest cover.

Map Unit	Topography and Vegetation	Settlements and Communications	Movement	Ground Conditions[a]	Cover and Concealment	Observation
1 COASTAL LOWLAND	Sloping lowland. Surface undulating to rolling, dotted by many steep-sided volcanic cones; merges gradually with foothills inland. Coast mainly rocky, locally backed by steep, artificially terraced bluffs 20 to 100 feet high. Sea cliffs 5 to 20 feet high are common; locally (particularly along western part of south coast) cliffs are as much as 200 feet high. Beaches rather small, scattered. Except for a few entrenched channels in southern part of area, stream courses are generally shallow, choked with sand and gravel; in places brushy. Most of area intensively cultivated in small fields (average, 5 1/4 acres) to dry crops. Fields separated by stone fences 2 to 6 feet high. Wet rice grown in south, east of Taejong. Scattered groves of trees throughout area.	Area contains about 2/3 of population of island. No isolated farmhouses; all dwellings clustered in villages. Cheju (Saishu) on north coast is the capital and largest town (over 20,000 population in 1921). Houses generally of stone. Remnants of old city walls found within some older towns, such as Saishu, Taejong, Chongui. Area traversed by coastal highway and by dense network of secondary roads, footpaths, and cart tracks, which connect practically all the small villages with each other and with coastal road.	Established Routes: Good network of secondary roads connecting with coastal highway permits rapid movement almost anywhere in area. Cross-country: Stone walls 2 to 6 feet high that separate the small fields almost completely block vehicular movement and seriously restrict foot movement. Some stream channels shallow and dry except during heavy rains. Movement inland from shore commonly difficult because of steep slopes, locally cliffed.	Soil highly permeable, generally stony. Drains quickly after rains. Thickness of soils variable; thinner on spurs than on lowlands. Thickest (and most clayey) soils on northern and northeastern parts of island. Boulders generally cleared to plow depth but below this excavations will be difficult. Soil on northeast and southwest parts of island reported to be less stony than that on north and south.	Good cover and concealment from ground observation afforded by closely spaced stone fences (2 to 6 feet high) between fields, and by brushy beds of dry streams. Deep excavations for shelters difficult to dig out because of thin stony soil; hasty fortifications readily constructed from strewn boulders and rock slabs.	Entire area dominated by volcanic cones; excellent observation and defense positions.
2 FOOTHILLS	Rolling country, merging on one side with coastal lowland and on the other with steep upper slopes of the volcanic complex. Slopes generally 10% to 20%. Rougher and more deeply gullied than coastal lowland. Much of area boulder-strewn, grass-covered, and used for pasturage. Some brush and secondary timber, particularly along stream beds and rough-surfaced spurs. Stream courses commonly entrenched, in places gorge-like; generally choked with rock debris and bordered by brush and scrub timber. Many streams that have dry channels in the coastal plain have short stretches of perennial water in the foothills.	Fairly thickly populated. Villages generally near margin bordering coastal plain or on upper reaches of valleys where water and fuel is available. Numerous secondary roads, cart tracks, and trails extend in from coastal area but few extend through foothills.	Established Routes: Fairly free movement parallel to drainage along secondary roads and cart tracks in from coastal areas; very few roads parallel to contours. Cross-country: Over much of area open, grass-covered terrain permits relatively free movement but large boulders constitute hazard to vehicles. Stone fences common in some places but fields are much larger than those in coastal area. Streams generally dry (except along south coast) but debris-choked, brushy ravines form local barriers. Some areas rough and brush-covered; not passable except on foot.	Thin, stony, well-drained soil; rarely muddy. Hand excavation probably difficult, particularly on crests of spurs. Wet loose rocks and boulders may make trafficability poor in rainy season.	Best cover afforded by numerous sharp, brushy ravines and dry stream channels; by stone buildings in villages; by widely spaced stone fences; and locally on crests of spurs, by rectangular stone grave mounds several feet high. Hasty fortifications most easily constructed from strewn boulders and rock slabs. Excavations generally difficult in thin stony soil. Most of area is open grass country, offering little concealment, except in some tracts covered by low brush and scrub timber, and in brush along stream channels.	As in coastal district the foothills are studded with volcanic cones that dominate area.
3 STEEP VOLCANIC SLOPES	Steep country, mostly above 2,000 feet altitude. Slopes generally greater than 20%. Many cliffs and gorge-like ravines. Higher peaks (Haila-san, 1,950 meters; T'ojok-san, 1,402 meters; Songp'an-ak, 1,215 meters) bare and rocky. Lake in crater of Haila-san (dormant volcano). Heavily wooded; in places forest is park-like, with interspersed grassy tracts.	Unpopulated except for a few small farms on upper reaches of streams. Several cart tracks and trails cross lower parts of area in general north-south direction; one, leading SSE out of Cheju, is reported to have been improved and may be passable to vehicles.	Established Routes: Except for possible road leading SSE out of Cheju, limited to foot movement along trails which are fairly numerous. Cross-country: Generally difficult because of many cliffs and gorges. Locally easy on lower slopes in park-like forest.	Soil, where present, is thin and stony. Many areas of bare rock. Excavations generally difficult. locally impossible.	Excellent cover and concealment from both ground and aerial observation afforded by rugged terrain and thick forest.	From the crest of Haila-san, practically all parts of island can be brought under observation. Other sharp peaks numerous.
CINDER CONES	Isolated, conical or sub-conical, sharp-crested hills, rising abruptly fifty to several hundred feet above the surrounding terrain. Slopes generally 30% to 50%. Some peaks cone-shaped; others breached, with U-shaped outline. Many of the conical peaks have shallow craters. The majority of the hills are either bare or grass-covered; a large numer on the coastal plain are partly wooded, and a few near the coast are cultivated in artificial terraces.	None.	Movement difficult because of steep slopes and because of poor footing on the loose material that makes up the cones.	Hills composed of loose volcanic ash or cinder, locally with thin veneer of soil. Easily excavated by hand but probably will not stand without revetment. Very porous, well-drained.	The U-shaped hills offer some cover along the inner margin of the crestlines; the cone-shaped hills offer little except in shallow craters or where wooded. No concealment except on those that are wooded (mainly those on coastal plain).	Excellent for observation and defense positions but vulnerable to aerial attack.
ISOLATED ROCK HILLS	Isolated hills rising abruptly above surrounding terrain; more or less conical shape. Slopes steep, usually cliffed in part; some hills encircled by steep scarps. Lower slopes usually covered by grass, brush, or woods; upper slopes often bare rock.	None.	Movement on slopes generally difficult because of steep grades, rock cliffs, local patches of woods.	Generally thin, stony, well-drained soil; much bare rock. Hand excavations impossible in many places; difficult elsewhere because of stony soil.	Fair cover in local gullies on lower slopes; poor on bare upper slopes. Little concealment except on wooded or brushy lower slopes.	Hills form excellent observation and defense positions. Those along south coast command all sea approaches to island.

[a] For further information, see Soils sheet.

Prepared by U. S. Geological Survey
for Chief of Engineers, U. S. Army

VIEWS 1-2

SAISHU-TO (QUELPART ISLAND)

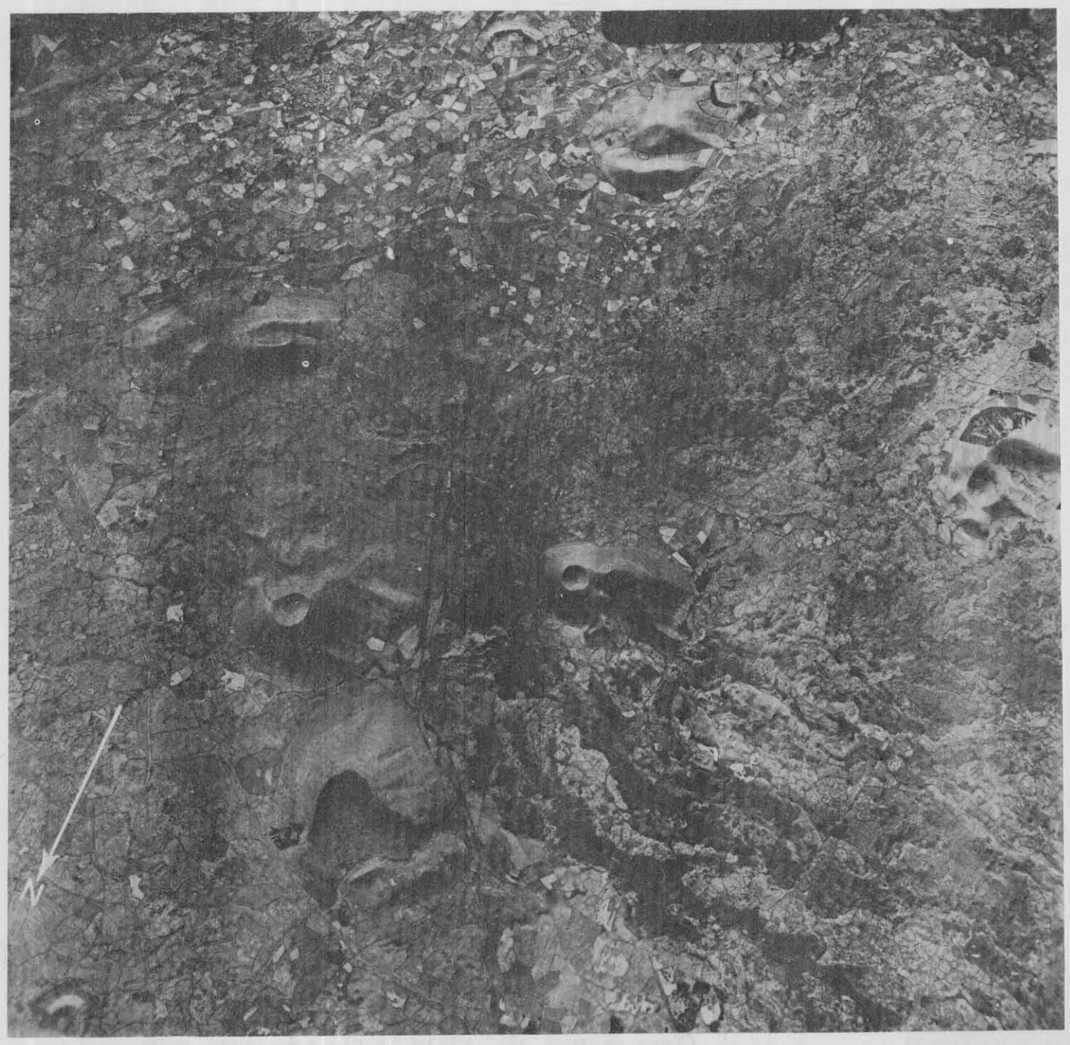
1. Typical section of intensively cultivated coastal lowland on western end of island (Terrain Unit 1). Steep, cliffed coast is typical of most of shore. Nongnam-Bong and Kosan-ak are volcanic ash cones, easily transformed into strong points commanding surrounding lowland. Movement on lowland roads easy, but cross- country movement hampered by stone walls bordering cultivated fields and by scattered patches of rough ground. (USAAF 468BG/4MR9/RV3/Oct. 6, 1944.)

2. Saishu No. 1 airfield, east of Mosulp'o on flat seaward margin of coastal lowland (Terrain Unit 1); most favorable airfield site on the island. Cultivated fields are characteristically about 5 acres, planted to dry crops, surrounded by stone walls 2 to 6 feet high. Main coastal highway connects airdrome with Cheju on north coast.
(USAAF 462B6/4MB16/462-AC-311-3/Nov. 11, 1944)

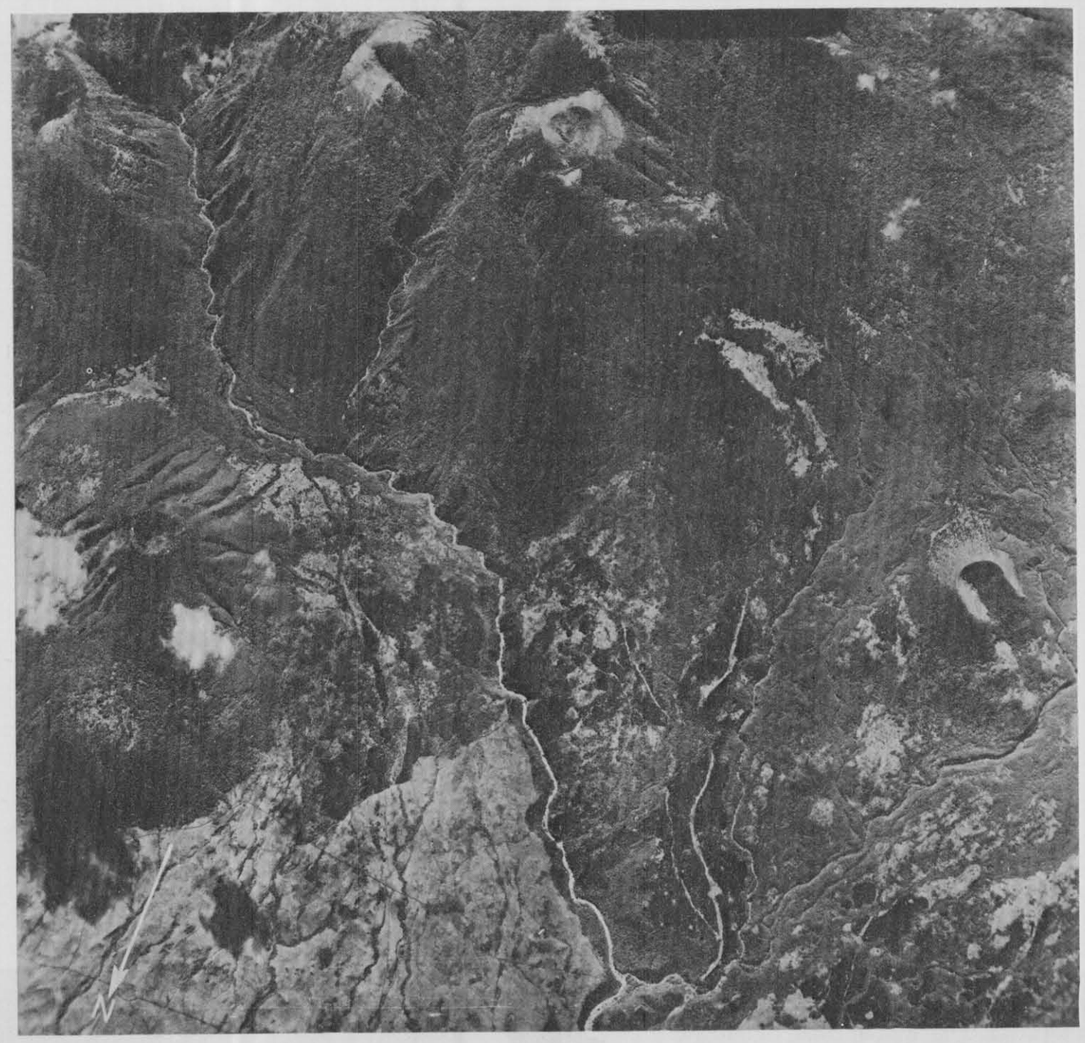
PREPARED BY U. S. GEOLOGICAL SURVEY
FOR
CHIEF OF ENGINEERS, U. S. ARMY

SAISHU-TO (QUELPART ISLAND)

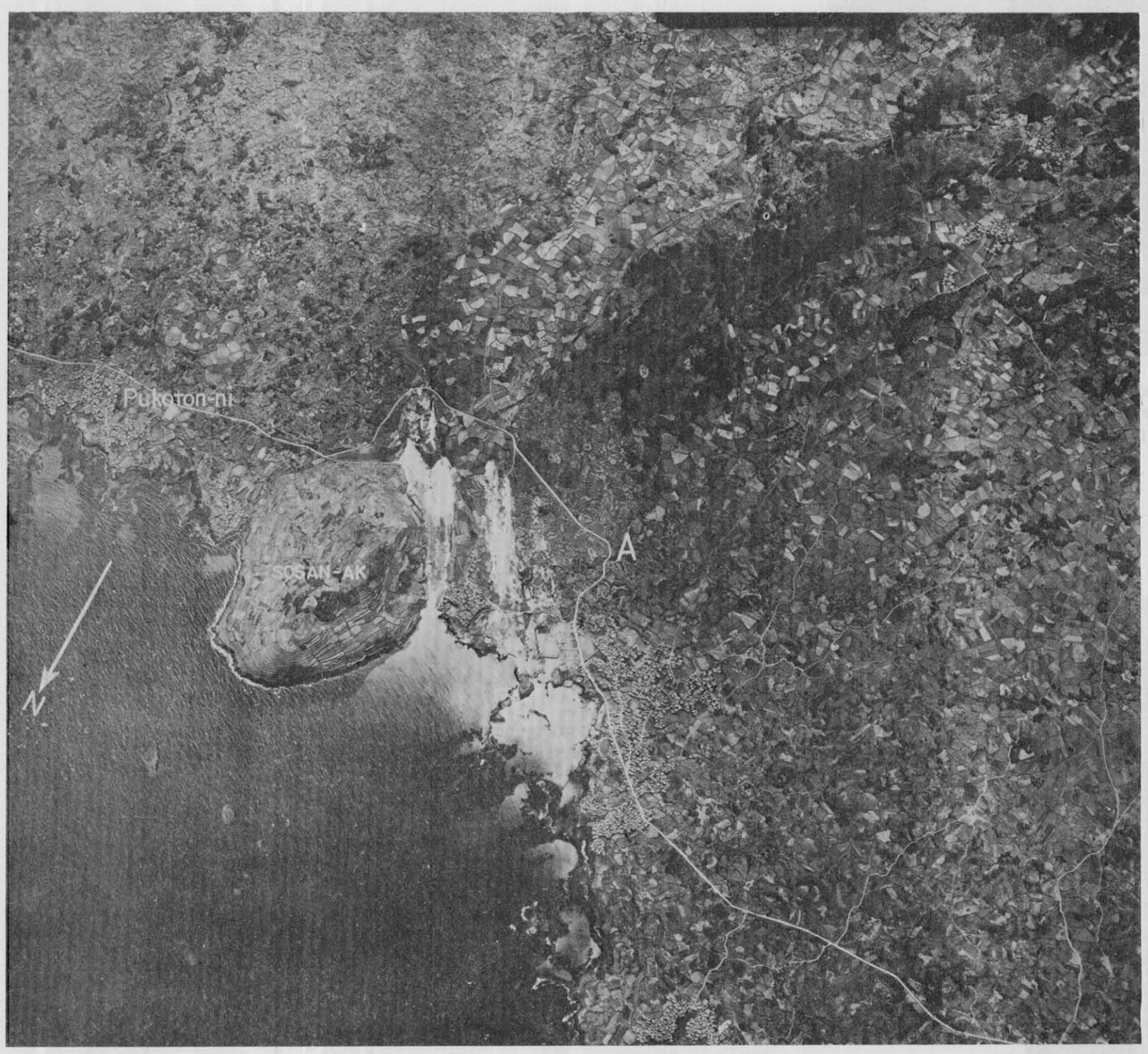
VIEWS 3-6



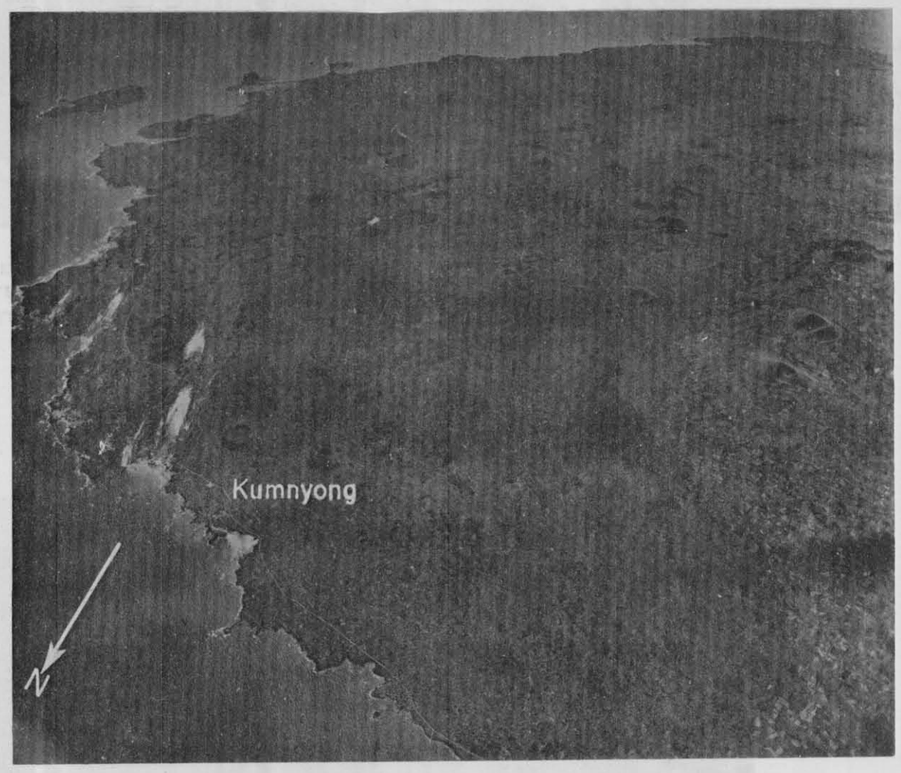
3. Boulder-strewn foothill belt (Terrain Unit 2); grass, brush and timber. Hills with craters are typical volcanic ash cones, very common in foothills and coast belt; offer many commanding positions. Cultivated area at top of View is in Terrain Unit 1. (USAAF 468BG/4MR9/RV7/Oct. 6, 1944.)



4. Steep-sloped rugged terrain typical of mountainous interior (Terrain Unit 3). Slopes densely forested; movement difficult. No roads, few trails. Saucer-shaped features are craters of extinct volcanoes and ash cones. (USAAF 468B6/4MR9/RV11/Oct. 6, 1944.)



5. Coastal lowland and foothill belt along north coast (Terrain Units 1 and 2) Road (A) is surfaced main coastal highway. Rough uncultivated area in upper left corner is typical of foothill belt; surface irregularities impede cross-country movement. Sosan-ak is prominent landmark and like many similar hills dominates surrounding country. White streaks near hill are patches of wind-blown loose sand. (USAAF 468BG/4MR9/Oct. 6, 1944.)



6. Lowland and foothill belt in eastern end of island. Rugged rocky shore is characteristic of the entire coast. Lowland is broken with many shallow depressions and rock and ash mounds which impede movement. Scores of ash cones dominate entire lowland.
(USAAF 468B6/4MR9/RO 10/Oct. 6, 1944.)

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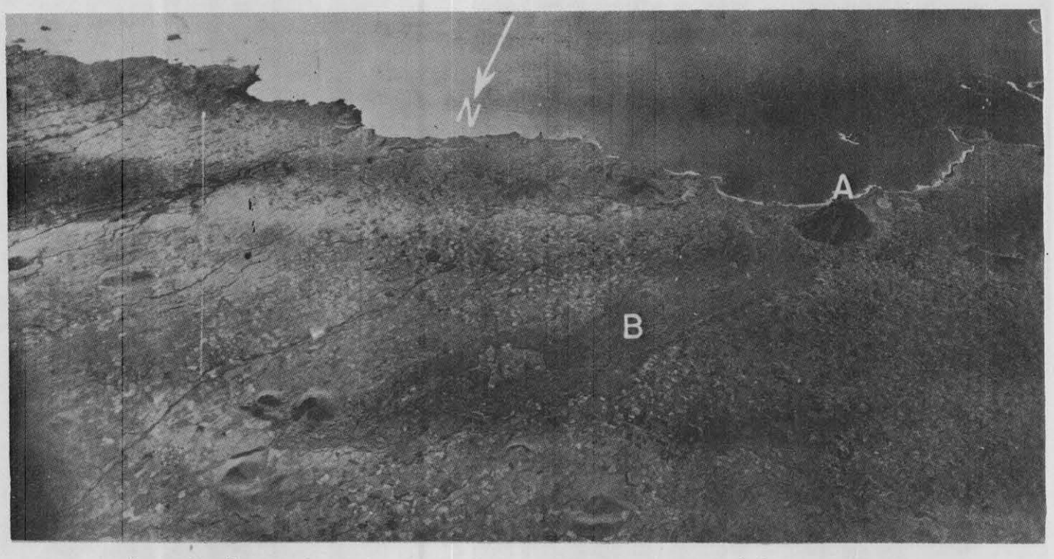
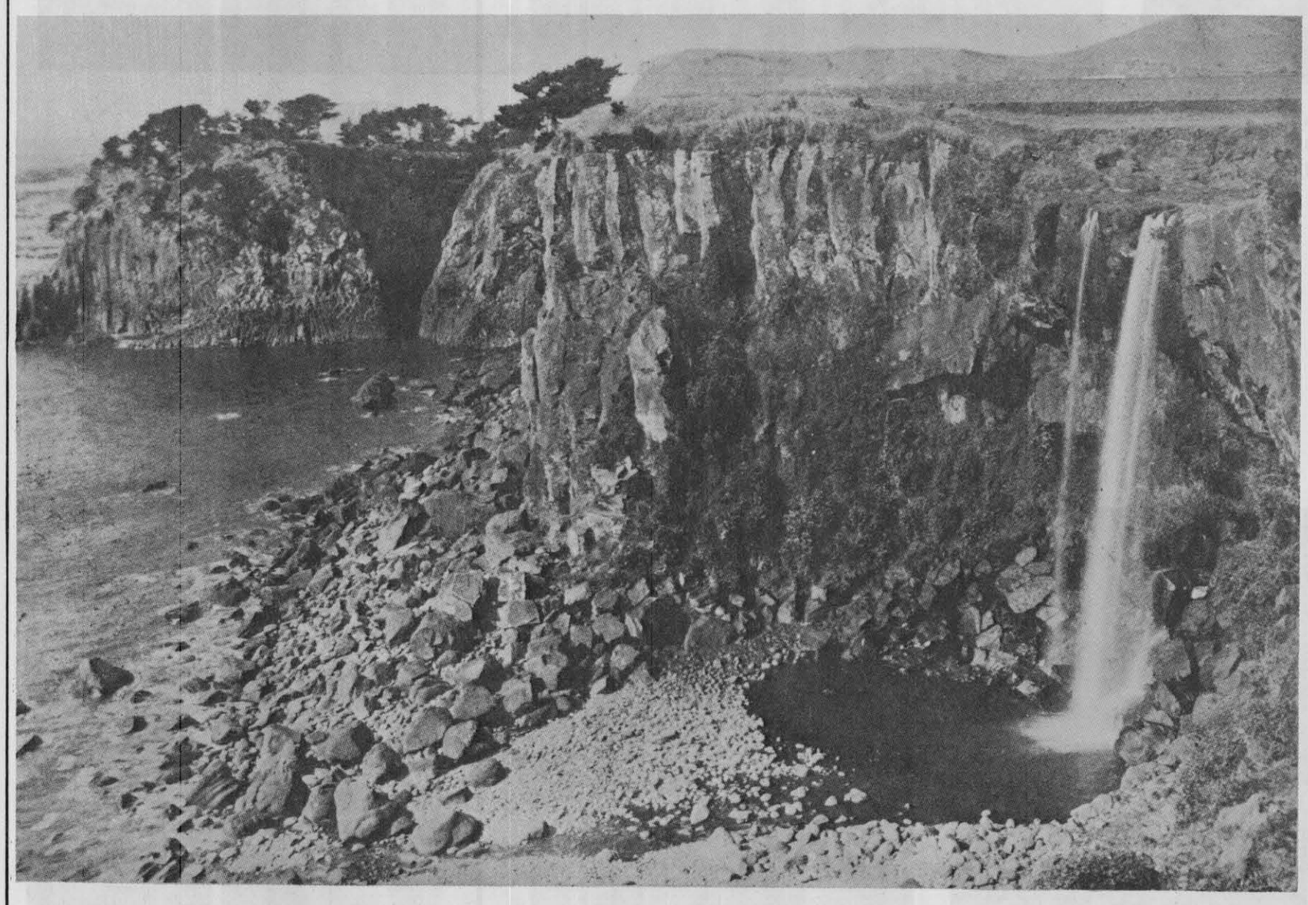
VIEWS 7-11

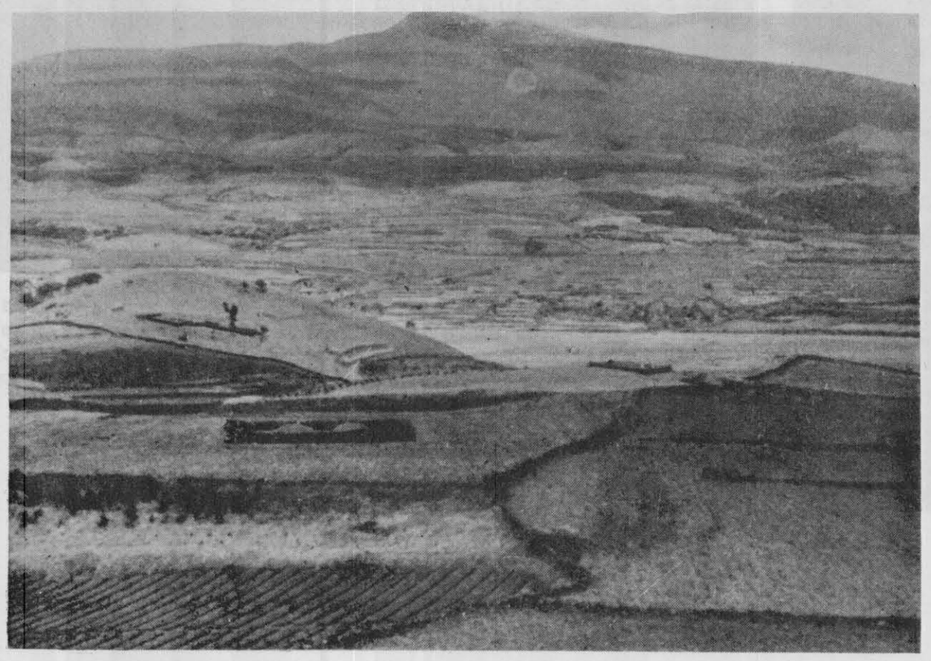
SAISHU-TO (QUELPART ISLAND)



7. South coast east of Mosulp'o. Prominent peak (A) and 2 lower hills to east are bedrock hills; most hills in lowland area are cinder cones. Uncultivated area (B) is typical of rough lava flows which impede cross-country movement. Ragged coast is characteristic. (USAAF 468BG/4MR9/RO4/Oct. 6, 1944.)

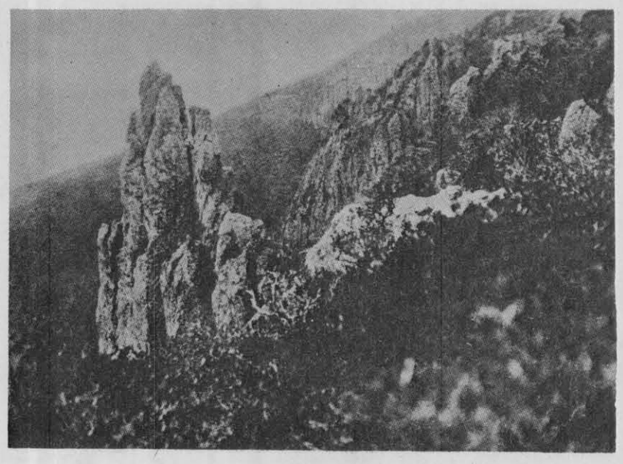


8. Rocky cliffed shoreline typical of higher headlands, commonest along south coast. Bouldery shores are common even where coast is not cliffed. undulating coastal lowland, commonly rough along seaward margin, extends to edge of cliff. (ONI 216-795) (Not located on map).



9. Typical view of southwest part of island, showing undulating lowland in fore- and middleground, foothill belt beyond, and Haila-san in background. Rise in middleground is mount of volcanic ash and cinder, good source of construction material. (Not located on map). (ONI 75558.)

10. View typical of open part of foothill belt (Terrain Area 2). Hills, a few terraced, rise above rough lower ground. Soils generally stony and too thin for fox holes. Numerous boulders in background typical; hamper movement but are good source of construction materials. Few trees or buildings; ground irregularities provide the only cover and concealment. (Not located on map). (Geographical Review, vol.16, p.68, 1926.)



11. View on south side of Haila-san showing rough steep slopes. Except where cliffed, mostly covered with trees and brush. Movement very difficult except along trails. (Not located on map.) (Geol. Sur Chosen, vol. 10, part 1, 1931.)

PREPARED BY U. S. GEOLOGICAL SURVEY
FOR
CHIEF OF ENGINEERS, U. S. ARMY

CONFIDENTIAL

SAISHU-TO (QUELPART ISLAND)

KOREA 1:250,000

For use by
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Not for sale or distribution

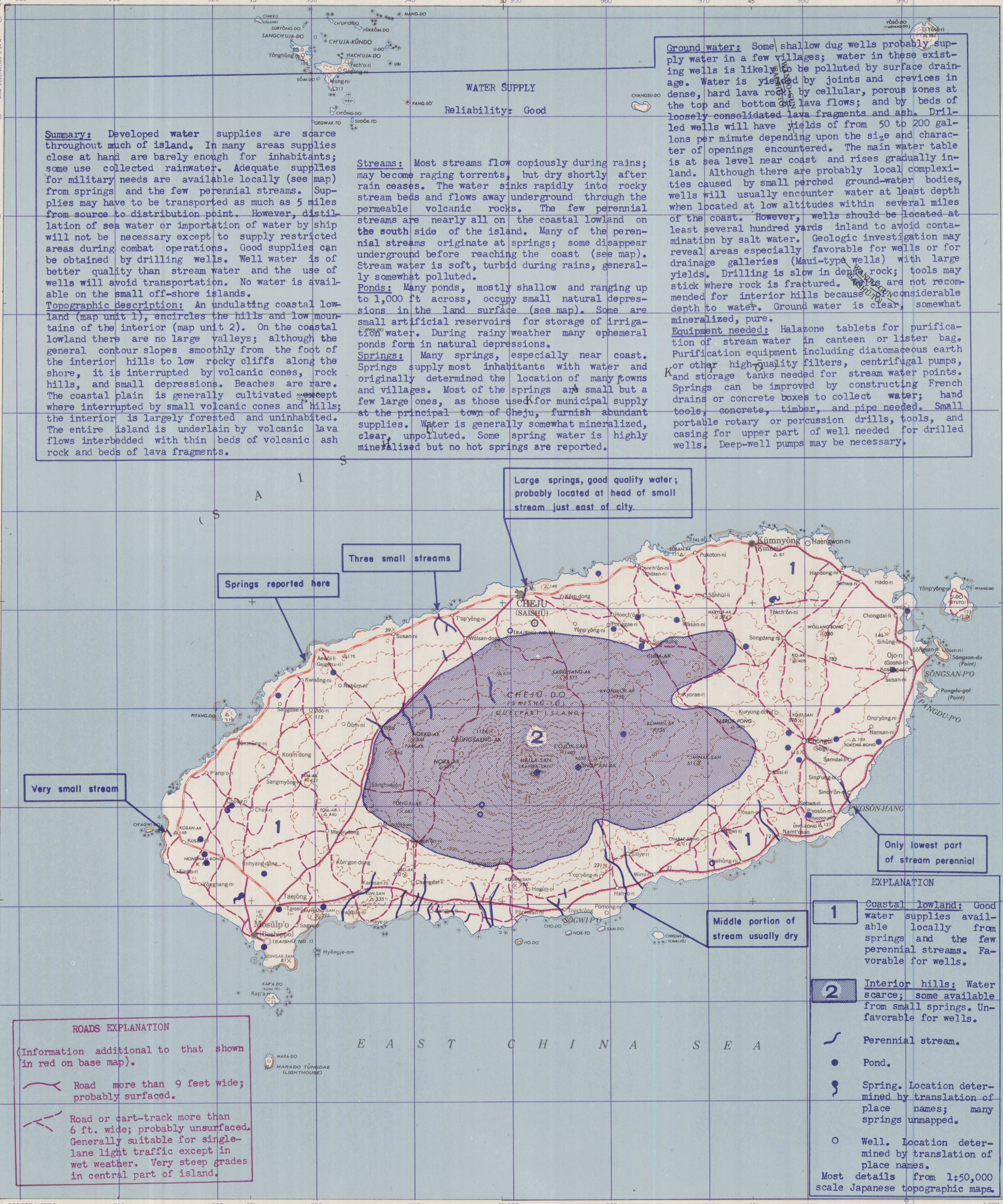
CHEJU-DO

(SAISHŪ-TŌ)

FIRST EDITION-AMS 1

WATER SUPPLY

SHEET 41



WATER SUPPLY
Reliability: Good
Summary: Developed water supplies are scarce throughout much of island. In many areas supplies close at hand are barely enough for inhabitants; some use collected rainwater. Adequate supplies for military needs are available locally (see map) from springs and the few perennial streams. Supplies may have to be transported as much as 5 miles from source to distribution point. However, distillation of sea water or importation of water by ship will not be necessary except to supply restricted areas during combat operations. Good supplies can be obtained by drilling wells. Well water is of better quality than stream water and the use of wells will avoid transportation. No water is available on the small off-shore islands.
Topographic description: An undulating coastal lowland (map unit 1), encircles the hills and low mountains of the interior (map unit 2). On the coastal lowland there are no large valleys; although the general contour slopes smoothly from the foot of the interior hills to low rocky cliffs along the shore, it is interrupted by volcanic cones, rock hills, and small depressions. Beaches are rare. The coastal plain is generally cultivated except where interrupted by small volcanic cones and hills; the interior is largely forested and uninhabited. The entire island is underlain by volcanic lava flows interbedded with thin beds of volcanic ash rock and beds of lava fragments.
Streams: Most streams flow copiously during rains; may become raging torrents, but dry shortly after rain ceases. The water sinks rapidly into rocky stream beds and flows away underground through the permeable volcanic rocks. The few perennial streams are nearly all on the coastal lowland on the south side of the island. Many of the perennial streams originate at springs; some disappear underground before reaching the coast (see map). Stream water is soft, turbid during rains, generally somewhat polluted.
Ponds: Many ponds, mostly shallow and ranging up to 1,000 ft across, occupy small natural depressions in the land surface (see map). Some are small artificial reservoirs for storage of irrigation water. During rainy weather many ephemeral ponds form in natural depressions.
Springs: Many springs, especially near coast. Springs supply most inhabitants with water and originally determined the location of many towns and villages. Most of the springs are small but a few large ones, as those used for municipal supply at the principal town of Cheju, furnish abundant supplies. Water is generally somewhat mineralized, clear, unpolluted. Some spring water is highly mineralized but no hot springs are reported.
Ground water: Some shallow dug wells probably supply water in a few villages; water in these existing wells is likely to be polluted by surface drainage. Water is yielded by joints and crevices in dense, hard lava rock, by cellular, porous zones at the top and bottom of lava flows; and by beds of loosely consolidated lava fragments and ash. Drilled wells will have yields of from 50 to 200 gallons per minute depending upon the size and character of openings encountered. The main water table is at sea level near coast and rises gradually inland. Although there are probably local complexities caused by small perched ground-water bodies, wells will usually encounter water at least depth when located at low altitudes within several miles of the coast. However, wells should be located at least several hundred yards inland to avoid contamination by salt water. Geologic investigation may reveal areas especially favorable for wells or for drainage galleries (Maui-type wells) with large yields. Drilling is slow in dense rock; tools may stick where rock is fractured. Wells are not recommended for interior hills because of considerable depth to water. Ground water is clear, somewhat mineralized, pure.
Equipment needed: Halazone tablets for purification of stream water in canteen or lister bag. Purification equipment including diatomaceous earth or other high-quality filters, centrifugal pumps, and storage tanks needed for stream water points. Springs can be improved by constructing French drains or concrete boxes to collect water; hand tools, concrete, timber, and pipe needed. Small portable rotary or percussion drills, tools, and casing for upper part of well needed for drilled wells. Deep-well pumps may be necessary.
Large springs, good quality water; probably located at head of small stream just east of city.
Three small streams
Springs reported here
Very small stream
Only lowest part of stream perennial
Middle portion of stream usually dry
CHEJU (SAISHŪ)
CHEJU DO (SAISHŪ-TŌ) (QUELPART ISLAND)
HALLA-SAN (KANRA-SAN)
Mosŭlp'o (Boshippo)
SŎGWI-P'O
SŎNGSAN-P'O
P'YOSŎN-HANG
PANGDU-P'O
Kŭmnyŏng (Kinnei)
CH'UJA-KŬNDO
E A S T C H I N A S E A
EXPLANATION
1 Coastal lowland: Good water supplies available locally from springs and the few perennial streams. Favorable for wells.
2 Interior hills: Water scarce; some available from small springs. Unfavorable for wells.
Perennial stream.
Pond.
Spring. Location determined by translation of place names; many springs unmapped.
Well. Location determined by translation of place names.
Most details from 1:50,000 scale Japanese topographic maps.
ROADS EXPLANATION
(Information additional to that shown in red on base map).
Road more than 9 feet wide; probably surfaced.
Road or cart-track more than 6 ft. wide; probably unsurfaced. Generally suitable for single-lane light traffic except in wet weather. Very steep grades in central part of island.

CONVERSION GRAPH (Meters / Feet)

GLOSSARY

-ak	point
-am	rock
-bong	mountain
-chedo	archipelago
-chi	pond
-ch'i	pass
-ch'ŏn	river
-dae	mountain
-dan	point
-do	island, province
-dō	province, village
-dong	village, town
-gak	point
-gan	rock
-gang	river
-gap	point
-gun	county
-guntō	archipelago
-hae	sea
-hang	harbor, point
-hantō	peninsula
-ho	lake
-hō	mountain
-hyŏn	pass
-ji	pond, temple, pass
-kai	sea
-kaikyō	strait
-kaku	point
-kan	point
-kang	river
-ko	lake
-kō	harbor, river, point
-kun	county
-kundo	archipelago
-li	village, town
-lyŏng	pass
-mal	point
-man	bay
-matsu	point
-misaki	point
-ni	village, town
-nyŏng	pass
-pando	peninsula
-p'o	harbor
-pong	mountain
-rei	pass
-rettō	island chain
-ri	village, town
-ryŏng	pass
-sa	temple
-saki	point
-san	mountain
-sen	river
-shima	island
-sho	island
-shotō	archipelago
-sō	island
-su	river
-sui	river
-sudo	channel
-suidō	channel
-tan	point
-to	island
-tō	island
-tong	village, town
-wan	bay
-yŏlto	island chain
-zaki	point
-zan	mountain

A.M.S. L551

First Edition (A.M.S. 1) 1944

Prepared under the direction of the Chief of Engineers, U. S. Army, by the Army Map Service (AMCV), U. S. Army, Washington, D. C., 1944. Compiled from Korea 1:200,000, Korean Provisional Land Survey, 1921; Korea 1:50,000, Korean Provisional Land Survey, 1918; Japanese H. O. Chart 1208, 1933; U. S. H. O. Chart 3239, 1941; Aeronautical information from U. S. A. A. F., 1943. Korean names transcribed according to the McCune-Reischauer System; Japanese forms of Korean names, shown in parentheses, transcribed according to the Modified Hepburn (Romaji) System; other alternate forms from U. S. H. O. Charts.

LEGEND

Cities over 100,000 Population
Cities 20,000-100,000 Population
Cities 5,000-20,000 Population
Towns 2,000-5,000 Population
Villages 1-2,000 Population
Boundary: (International)
Boundary: Do (Province)
Boundary: Gun (County)
Triangulation Points
Elevations × 254
Walls
Rice
Salt Pans

Railroads: Standard Gauge 4'8½"
Double Track
Single Track (Station)
Under Construction
Railroads: Narrow Gauge 3'6" or less
Primary Highways
Improved Roads—over 12 ft.
Improved Roads—under 12 ft.
Unimproved Roads, Trails

Aeronautical Information: Field / Anchorage
Government, Army, Navy
Municipal or Commercial
Auxiliary or Emergency
Unclassified
Radio Broadcasting Stations RS
Other Radio Stations RN

Scale 1:250,000

Miles / Kilometers / Yards

APPROXIMATE CONTOUR INTERVAL 100 METERS

POLYCONIC PROJECTION

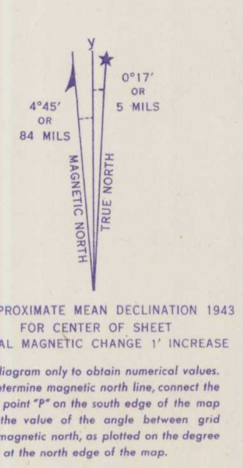
HORIZONTAL CONTROL IS BASED ON DATUM PRIOR TO 1912

TEN THOUSAND YARD WORLD POLYCONIC GRID. BAND IIIN. ZONE "C"
THE LAST THREE DIGITS OF THE GRID NUMBERS ARE OMITTED

NOTE: OFFICERS USING THIS MAP WILL MARK HEREON CORRECTIONS AND ADDITIONS WHICH COME TO THEIR ATTENTION AND MAIL DIRECT TO "THE CHIEF OF ENGINEERS, WASHINGTON, D. C."

HEIGHTS IN METERS

PREPARED BY U. S. GEOLOGICAL SURVEY
FOR
CHIEF OF ENGINEERS, U. S. ARMY

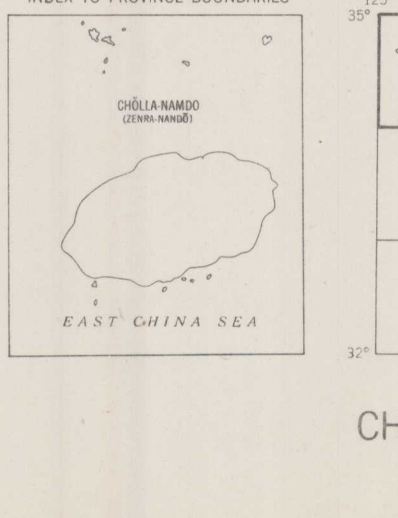


APPROXIMATE MEAN DECLINATION 1943
FOR CENTER OF SHEET
ANNUAL MAGNETIC CHANGE 1' INCREASE

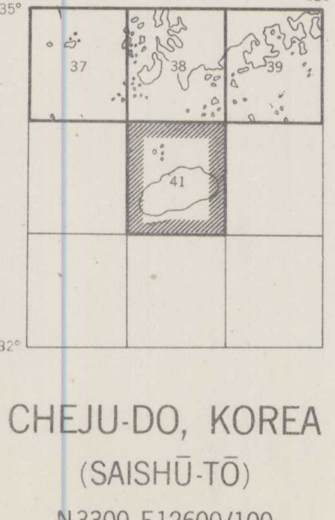
Use diagram only to obtain numerical values. To determine magnetic north line, connect the pivot point "P" on the south edge of the map with the value of the angle between grid and magnetic north, as plotted on the degree scale at the north edge of the map.

ARMY MAP SERVICE, U. S. ARMY, WASHINGTON, D. C., 115865
4-45 1944

INDEX TO PROVINCE BOUNDARIES



INDEX TO ADJOINING SHEETS



CHEJU-DO, KOREA
(SAISHŪ-TŌ)
N3300-E12600/100

CONFIDENTIAL

SUITABILITY FOR AIRFIELDS

KOREA 1:250,000

For use by War and Navy Department Agencies only
Not for sale or distribution

CHEJU-DO

(SAISHŪ-TŌ)

SAISHU-TO (QUELPART ISLAND)

FIRST EDITION-AMS 1

SHEET 41


POSSIBLE AIRFIELD SITES
Reliability: Excellent
Evaluation of Sites:
Of the 12 possible airfield sites, 8 are large enough for heavy bombers; the remaining 4 sites are of suitable size for fighters. Sites in the western half of the island are more suitable than eastern sites. The most favorable are Sites 1 and 6, where the existing fields can readily be expanded. Owing to the good engineering properties of the soil, stabilization of subgrade is less of a problem than grading. On the basis of suitability for rapid air-field construction, 4 sites are rated good, 8 fair.
Location and Accessibility
Most sites are on the gently sloping (up to 4%) sea-ward edge of the coastal plain. All are readily accessible. The main surfaced coastal road connects Sites 1 to 8 with Mosulp'o, Cheju, and Kumnyong. Other sites are connected with this road and nearby towns by improved roads.
Topography and Approaches:
Most sites are on gently rolling cultivated areas with a few shallow depressions and low knobs of volcanic ash or bedrock. Piles of boulders and volcanic ash common on north and south coast sites. Nearby volcanic hills may restrict circling and block some approaches, but in most cases runways can be oriented to avoid or clear them.
Clearing and Grading:
Dry crops and scattered trees easily cleared. Numerous stone buildings, boulders, and stone fences will have to be broken up or hauled away. Large fills needed for hollows, which are up to 10 meters deep. Many bedrock knobs will require blasting or large fills to grade them. Mounds of ash easily levelled. Diversion of a few intermittent streams required; also drainage ditches to divert water from higher ground during heavy summer rains.
Foundation and Drainage:
Coarse volcanic soil (gravelly loam) makes excellent subgrade; compacts and stabilizes easily, has high bearing capacity. Where volcanic soil is too coarse, abundant volcanic ash, or locally sand, are available for stabilizing. Soil may be as much as several feet deep, but bedrock is near surface in many places. Drainage is excellent.
Construction Materials:
Plentiful. Coarse volcanic ash and cinders, suitable for subgrade and fill, abundant in conical hills within a few miles of every site. Sand is available along coast near Sites 3, 4, 6, 8 and 10. Trap rock can be quarried near every site. Stone houses and fences can be broken up for construction materials. Little surface water on island. Unless wells are drilled, water will have to be transported from permanent streams, which may be as far as several miles from site.
Climate:
Annual rainfall averages 55 inches on north coast, more on south. Most of rainfall is concentrated in summer; 5 to 6 inches sometimes fall in one day and cause flash floods. Summer temperatures are about 75°F, winter about 40°F. No snow or frost on south coast; both common on north coast and in interior. Prevailing summer winds are southeast and moderate; winter winds prevailingly northwest and strong.
EXPLANATION
Reliability: Excellent
Good Heavy-Bomber Site: Large flat to gently sloping areas suitable for several 6,000-ft runways with unobstructed approaches. Grading requirements moderate.
Fair Heavy-Bomber Site: Moderately rough, sloping areas suitable for at least one 6,000-ft runway with open approaches. Grading of knobs and rough areas required.
Good Fighter Site: Generally flat area suitable for rapid construction of 4,000-ft runway with clear approaches. Little grading required.
Fair Fighter Site: Moderately rough, sloping areas large enough for at least one 4,000-ft runway with unobstructed approaches. Grading of slopes and rough areas required.
Existing Military Airfield.
ROADS EXPLANATION
(Information additional to that shown in red on base map).
Road more than 9 feet wide; probably surfaced.
Road or cart-track more than 6 ft. wide; probably unsurfaced. Generally suitable for single-lane light traffic except in wet weather. Very steep grades in central part of island.
CHEJU-DO
(SAISHŪ-TŌ)
(QUELPART ISLAND)
CHEJU
(SAISHŪ)
Mosulp'o
Kŭmnyŏng
(Kinnei)
SŎGWI-P'O
SŎNGSAN-P'O
P'YOSŎN-HANG
PANGDU-P'O
HALLA-SAN
(KANRA-SAN)
1950
WANDO-GUN
(SAISHŪ-TŌ)
E A S T C H I N A S E A
CONVERSION GRAPH
GRID DECLINATION 0°34'W
GRID DECLINATION 0°00'

GLOSSARY

-ak	point
-am	rock
-bong	mountain
-chedo	archipelago
-chi	pond
-ch'i	pass
-ch'ŏn	river
-dae	mountain
-dan	point
-do	island, province
-dō	province, village
-dong	village, town
-gak	point
-gan	rock
-gang	river
-gap	point
-gun	county
-guntō	archipelago
-hae	sea
-hang	harbor, point
-hantō	peninsula
-ho	lake
-hō	mountain
-hyŏn	pass
-ji	pond, temple, pass
-kai	sea
-kaikyō	strait
-kaku	point
-kan	point
-kang	river
-ko	lake
-kō	harbor, river, point
-kun	county
-kundo	archipelago
-li	village, town
-lyŏng	pass
-mal	point
-man	bay
-matsu	point
-misaki	point
-ni	village, town
-nyŏng	pass
-pando	peninsula
-p'o	harbor
-pong	mountain
-rei	pass
-rettō	island chain
-ri	village, town
-ryŏng	pass
-sa	temple
-saki	point
-san	mountain
-sen	river
-shima	island
-sho	island
-shotō	archipelago
-sō	island
-su	river
-sui	river
-sudo	channel
-suidō	channel
-tan	point
-to	island
-tō	island
-tong	village, town
-wan	bay
-yŏlto	island chain
-zaki	point
-zan	mountain

A.M.S. L551

First Edition (A.M.S. 1) 1944

Prepared under the direction of the Chief of Engineers, U.S. Army, by the Army Map Service (AMCV), U.S. Army, Washington, D.C., 1944. Compiled from Korea 1:200,000, Korean Provisional Land Survey, 1921; Korea 1:50,000, Korean Provisional Land Survey, 1918; Japanese H.O. Chart 1208, 1933; U.S.H.O. Chart 3239, 1941; Aeronautical information from U.S.A.A.F., 1943. Korean names transcribed according to the McCune-Reischauer System; Japanese forms of Korean names, shown in parentheses, transcribed according to the Modified Hepburn (Romaji) System; other alternate forms from U.S.H.O. Charts.

LEGEND

Cities over 100,000 Population
Cities 20,000-100,000 Population
Cities 5,000-20,000 Population
Towns 2,000-5,000 Population
Villages 1-2,000 Population
Boundary: (International)
Boundary: Do (Province)
Boundary: Gun (County)
Triangulation Points
Elevations × 254
Walls
Rice
Salt Pans
Railroads: Standard Gauge 4'8½"
Double Track
Single Track (Station)
Under Construction UNDER CONSTRUCTION
Railroads: Narrow Gauge 3'6" or less
Primary Highways
Improved Roads—over 12 ft.
Improved Roads—under 12 ft.
Unimproved Roads, Trails
Aeronautical Information: Field / Anchorage
Government, Army, Navy
Municipal or Commercial
Auxiliary or Emergency
Unclassified
Radio Broadcasting Stations ⊙ RS
Other Radio Stations ⊙ RN

Scale 1:250,000

5 0 5 10 Miles
5 0 5 10 15 Kilometers
5000 0 5000 10000 15000 Yards

APPROXIMATE CONTOUR INTERVAL 100 METERS

POLYCONIC PROJECTION

HORIZONTAL CONTROL IS BASED ON DATUM PRIOR TO 1912

TEN THOUSAND YARD WORLD POLYCONIC GRID, BAND IIIN, ZONE "C"
THE LAST THREE DIGITS OF THE GRID NUMBERS ARE OMITTED

NOTE: OFFICERS USING THIS MAP WILL MARK HEREON CORRECTIONS AND ADDITIONS WHICH COME TO THEIR ATTENTION AND MAIL DIRECT TO "THE CHIEF OF ENGINEERS, WASHINGTON, D.C."

HEIGHTS IN METERS

PREPARED BY U. S. GEOLOGICAL SURVEY FOR CHIEF OF ENGINEERS, U. S. ARMY

4°45' OR 84 MILS — 0°17' OR 5 MILS — MAGNETIC NORTH — TRUE NORTH

APPROXIMATE MEAN DECLINATION 1943 FOR CENTER OF SHEET
ANNUAL MAGNETIC CHANGE 1' INCREASE

Use diagram only to obtain numerical values. To determine magnetic north line, connect the pivot point "P" on the south edge of the map with the value of the angle between grid and magnetic north, as plotted on the degree scale at the north edge of the map.

ARMY MAP SERVICE, U. S. ARMY, WASHINGTON, D. C., 115865
4-45 1944

INDEX TO PROVINCE BOUNDARIES

CHŎLLA-NAMDO (ZENRA-NANDŌ)
EAST CHINA SEA

INDEX TO ADJOINING SHEETS

37 38 39 41

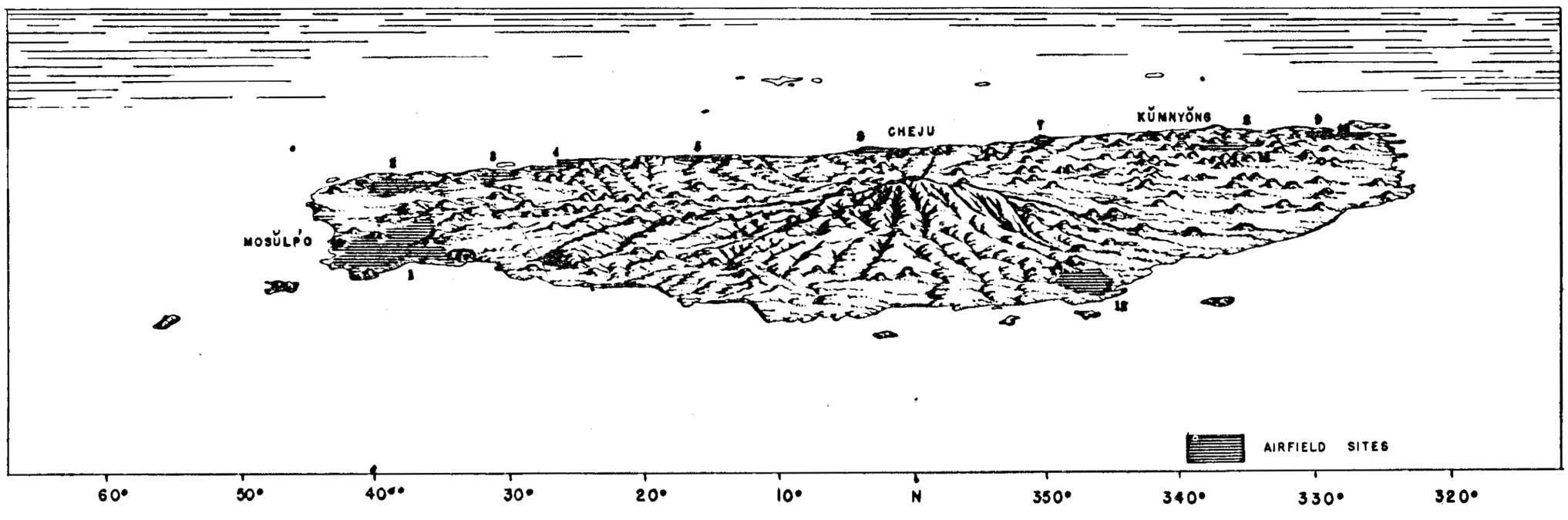
CHEJU-DO, KOREA

(SAISHŪ-TŌ)

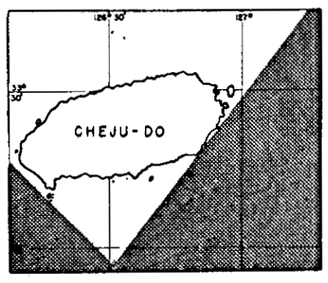
N3300-E12600/100

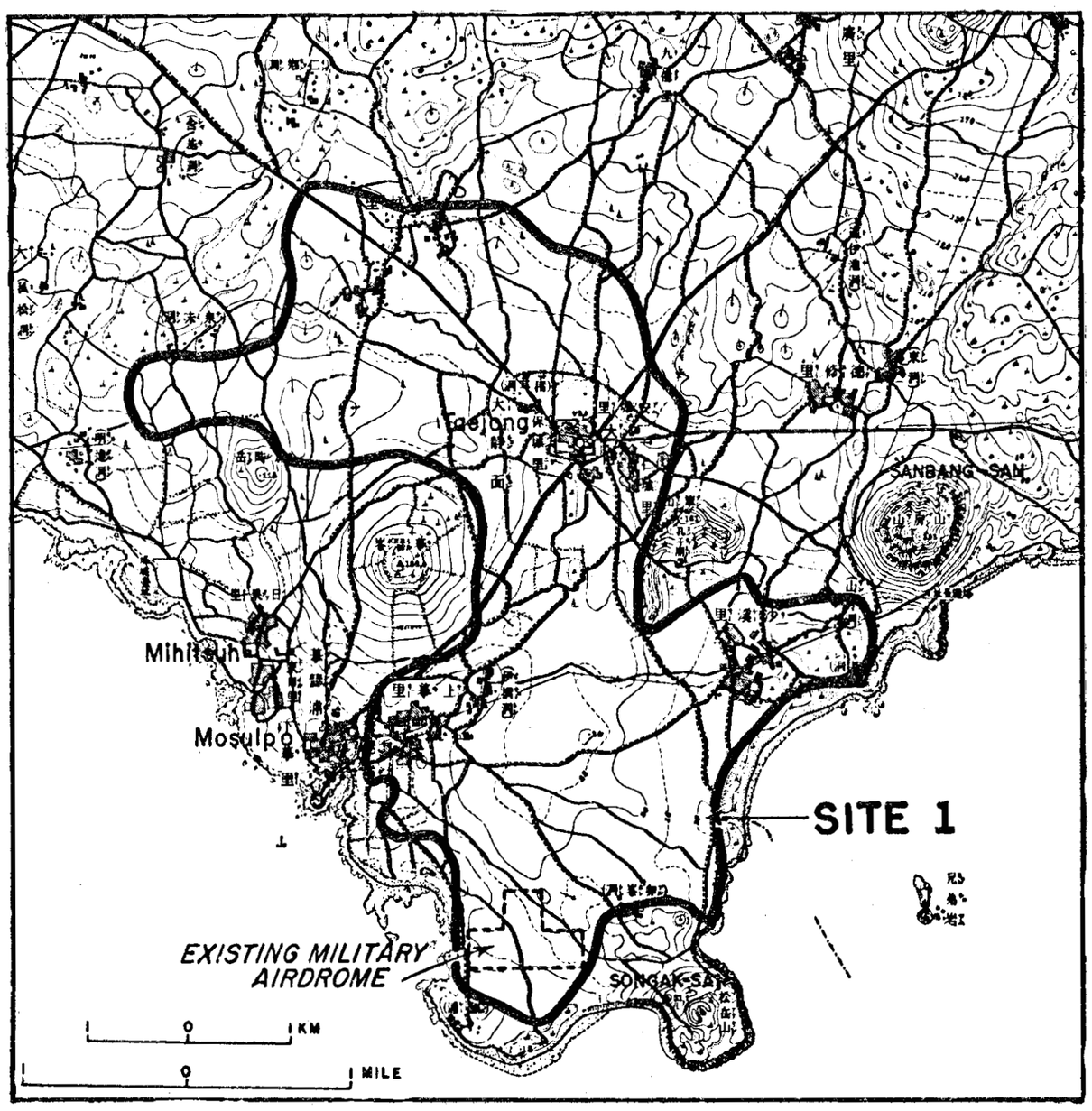
SAISHU-TO (QUELPART ISLAND)

SUITABILITY FOR AIRFIELDS



Perspective view projected from AMS L551 sheet 41 by a machine which gives true perspective and corrects for curvature and refraction of the earth. Details added from Korea Provisional Land Survey maps 1:50,000; geological map of Geological Survey of Chosen 1:100,000; views and aerial photographs. The point of observation is at an altitude of 30,000 feet and is 17 miles from the nearest point on shore as shown on accompanying index map. Vertical scale not exaggerated.





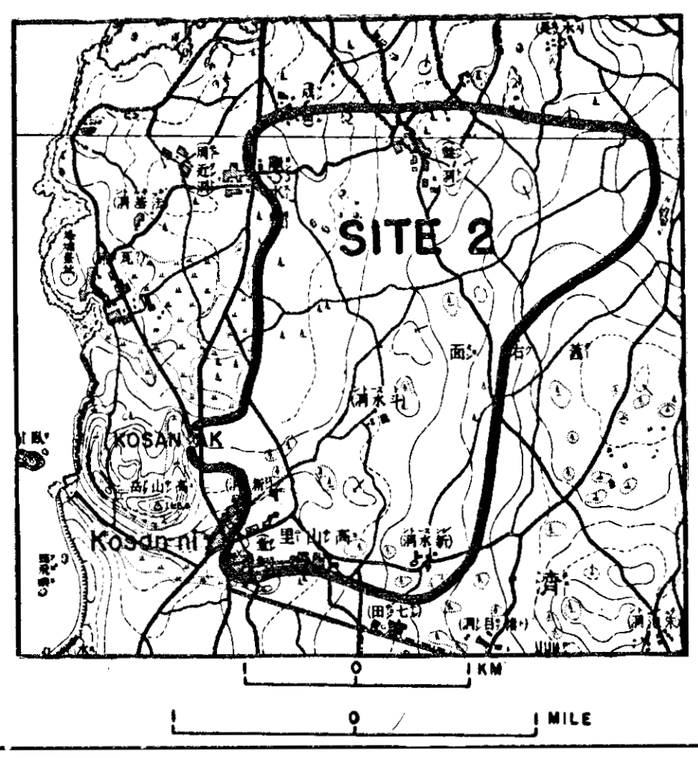
EXPLANATION FOR SITE MAPS

Reliability: Excellent

Source of Maps: Site maps are from the 1:50,000 Korean Provisional Land Survey Series published in 1913 and 1919. Recent aerial photographs indicate that roads have been improved and many alignments changed.

- Road over 3 meters wide.
- Road over 2 meters wide.
- Road over 1 meter wide.
- Trail or path under 1 meter wide.
- Village.
- Individual houses.
- Cliff.
- Piles of boulders.
- Sand.
- Channel of intermittent stream.
- Full contour (20 meters).
- Half contour (10 meters).
- Quarter contour (5 meters).
- Depression.

Altitudes in meters. Contour interval 20 meters.



SITE 1

Suitability: Good

Best site on island. Suitable for two heavy-bomber runways oriented in any direction; hill 395 meters in altitude is obstacle, but runways can be aligned to avoid it. Ample dispersal area. Slope in southern part about 1%; maximum slope on site 2%. Large adjacent volcanic hills will restrict circling, but runways can be aligned to avoid them. Large fills needed for hollows, up to 10 meters deep, in north part; a few knobs to be blasted or levelled. Construction materials abundant in nearby hills; sand on narrow beach just east of site. Perennial stream 2 miles to east. Connected with Cheju by main surfaced coastal road. Existing military airfield with 2 runways in southern part of site.

SITE 2

Suitability: Good

Suitable for heavy-bomber runways oriented W, NW, or N, but smaller and more sloping than Site 1. Ground rough where not cultivated. Several larger hollows and knobs to be levelled; also numerous stone fences to be broken up or hauled away. Hill 148 meters in altitude, adjacent on SW, is good source of volcanic ash and cinder. Stone fences and buildings source of hard rock. Coastal highway to Cheju skirts western edge of site.

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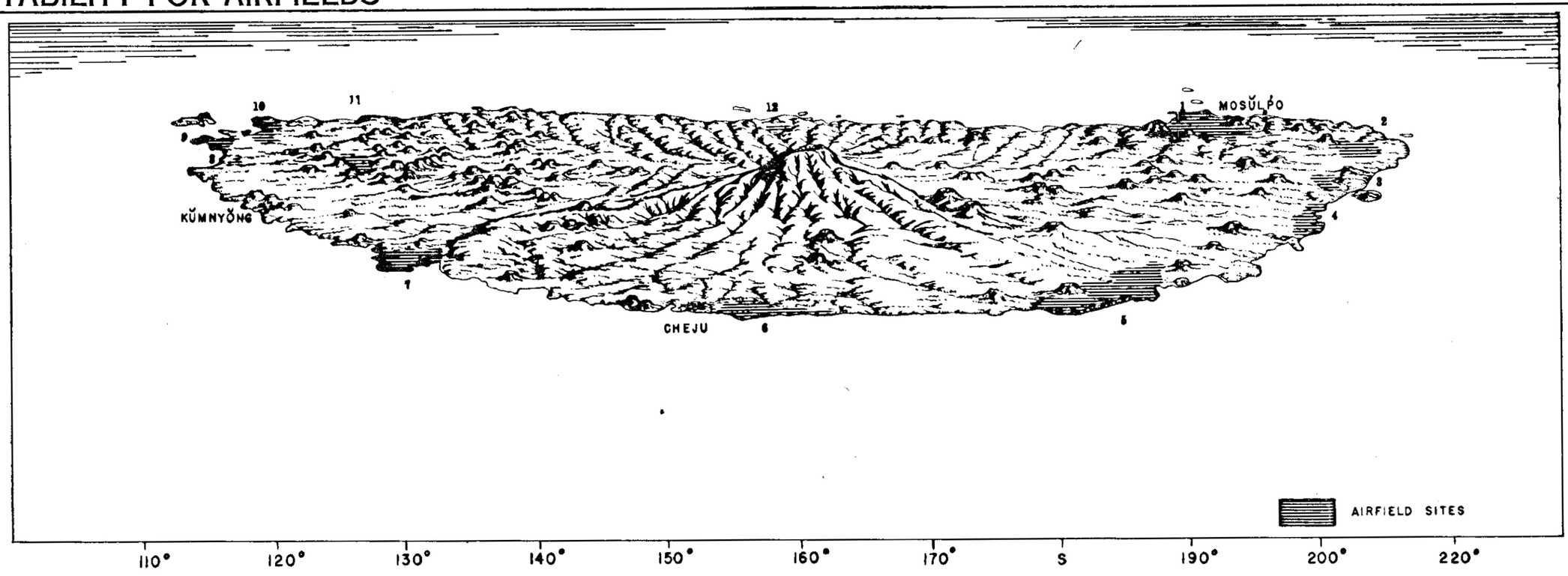
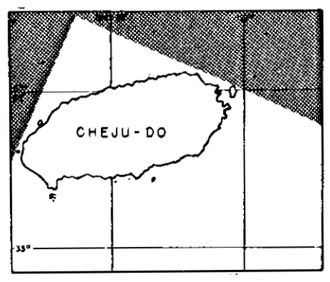
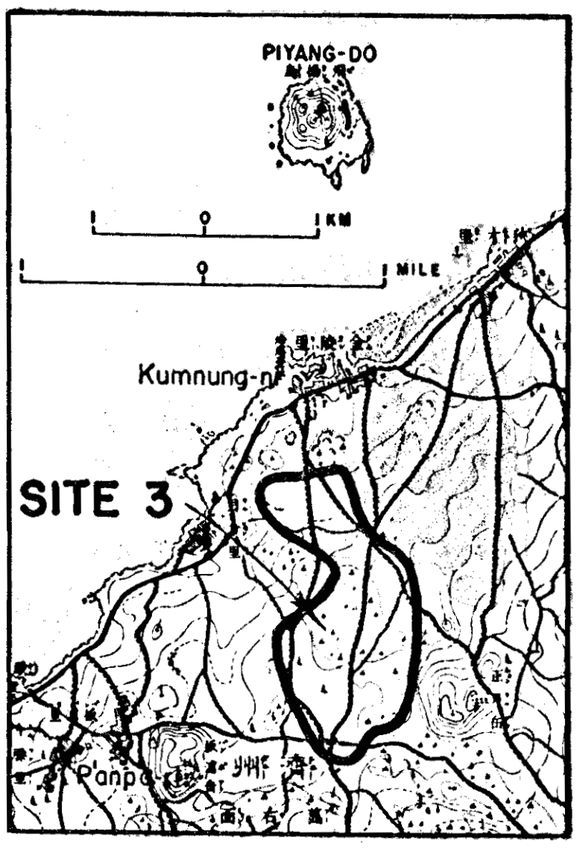
SUITABILITY FOR AIRFIELDS

SAISHU-TO (QUELPART ISLAND)



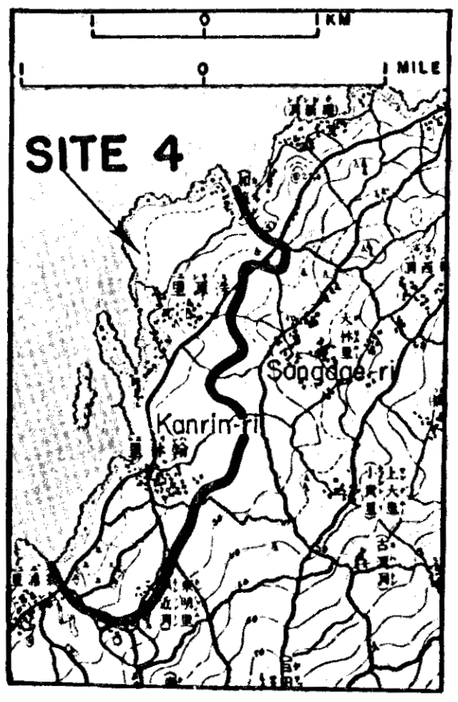
Perspective view projected from AMS L551 sheet 41 by a machine which gives true perspective and corrects for curvature and refraction of the earth. Details added from Korea Provisional Land Survey maps 1:50,000; geological map of Geological Survey of Chosen 1:100,000; views and aerial photographs. The point of observation is at an altitude of 30,000 feet and is 17 miles from the nearest point on shore as shown on accompanying index map. Vertical scale not exaggerated.





SITE 3
Suitability: Fair

Small site suitable for fighter strip oriented N, NE, or NW. Exposed to strong NW winter winds. Middle of site is rough; north end has moderate slope (3%). Northern half tree-covered (information from aerial photographs). Abundant construction materials in hill 111 meters high to E, hill 93 meters high to SW, and large sand deposit to NE. Improved roads from site connect with main coastal highway at Kumnung-ni.



SITE 4
Suitability: Fair

Space for 6,000-ft runways oriented N or NE, and 4,000-ft NW runway. Surface probably rough, particularly near shore. Exposed to salt spray during winter storms. Southern end probably flooded during short heavy summer rains. Clearing may involve demolition of stone buildings in Kanrin-ri. Grading requirements moderate. Cinder and ash in knob 22 meters high a few hundred feet NE of site; sand along shore. Main surfaced coastal highway traverses site from SW to NE.

EXPLANATION FOR SITE MAPS

Reliability: Excellent

Source of Maps: Site maps are from the 1:50,000 Korean Provisional Land Survey Series published in 1913 and 1919. Recent aerial photographs indicate that roads have been improved and many alignments changed.

Road over 3 meters wide.

Road over 2 meters wide.

Road over 1 meter wide.

Trail or path under 1 meter wide.

Village.

Individual houses.

Cliff.

Piles of boulders.

Sand.

Channel of intermittent stream.

Full contour (20 meters).

Half contour (10 meters).

Quarter contour (5 meters).

Depression.

Altitudes in meters. Contour interval 20 meters.

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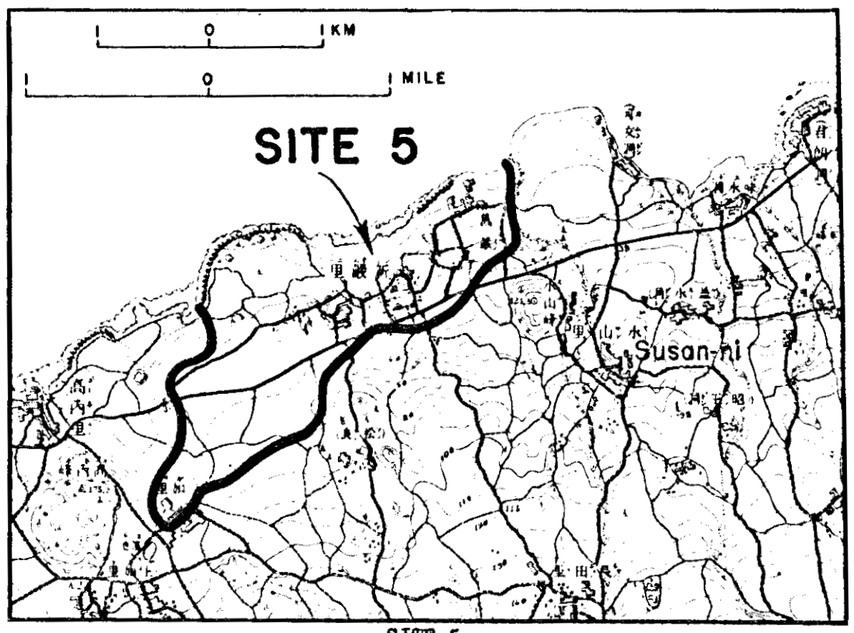
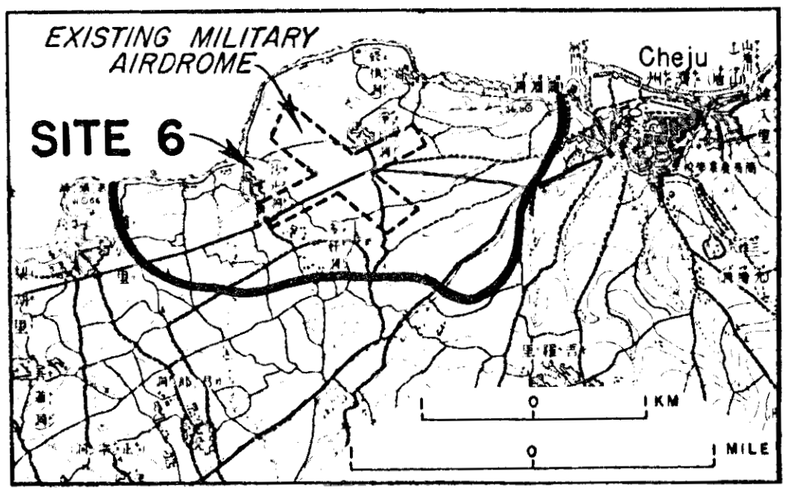
SAISHU-TO (QUELPART ISLAND)

SUITABILITY FOR AIRFIELDS



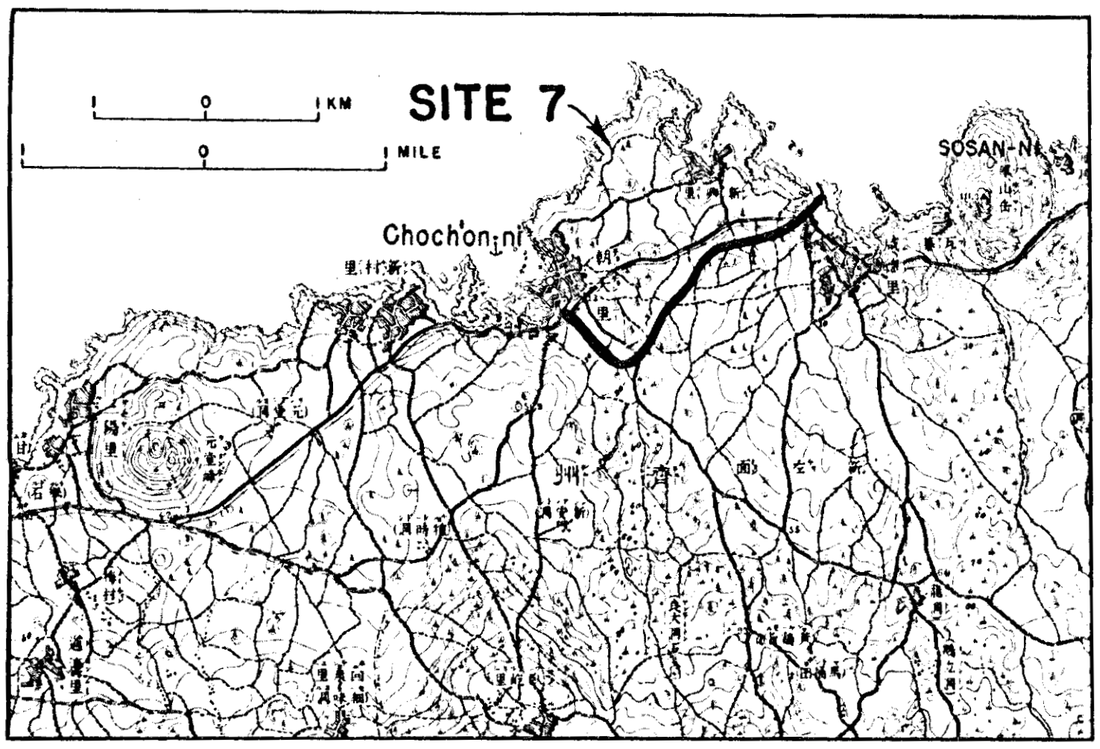
SITE 5
Suitability: Fair

Sufficient space for 6,000-ft runways oriented NE and E. NE runway can be aligned to avoid hill 175 meters high to SW. West end has gentle slope (1%); east end steeper (4%). Soil may be cobbly with boulders on surface. Bedrock exposed, particularly near shore. Clearing and grading involves scattered bedrock knobs, ash mounds, stone buildings of villages, and steeper slopes. Intermittent stream at east edge must be diverted, and its channel filled. Construction materials plentiful in volcanic hills nearby; also sand on beaches. Main surfaced coastal highway runs through site, connecting it with Cheju, 8 miles to NE.



SITE 6
Suitability: Good

Best site on north coast. Situated on generally flat headland within a mile of Cheju. Runways of existing military airdrome can be expanded to 6,000 ft. Required grading will include blasting a few bedrock knobs and filling surface irregularities. Construction materials abundant. Water plentiful in Cheju. Soil probably stony, but easily stabilized. Numerous boulders in uncultivated areas.



SITE 7
Suitability: Fair

Small, moderately rough site adequate for fighter strip oriented NW or NE. Surface irregularities will require considerable grading, but construction materials abundant locally. Area largely forest-covered (information from aerial photographs). May be necessary to demolish buildings in Choch'on-ni and smaller village to NE. Site is midway between Cheju and Kumnyong; main surfaced coastal highway runs through site.

EXPLANATION FOR SITE MAPS

Reliability: Excellent

Source of Maps: Site maps are from the 1:50,000 Korean Provisional Land Survey Series published in 1913 and 1919. Recent aerial photographs indicate that roads have been improved and many alignments changed.

- Road over 3 meters wide.
- Road over 2 meters wide.
- Road over 1 meter wide.
- Trail or path under 1 meter wide
- Village.
- Individual houses.
- Cliff.
- Piles of boulders.
- Sand.
- Channel of intermittent stream.
- Full contour (20 meters).
- Half contour (10 meters).
- Quarter contour (5 meters).
- Depression.

Altitudes in meters. Contour interval 20 meters.

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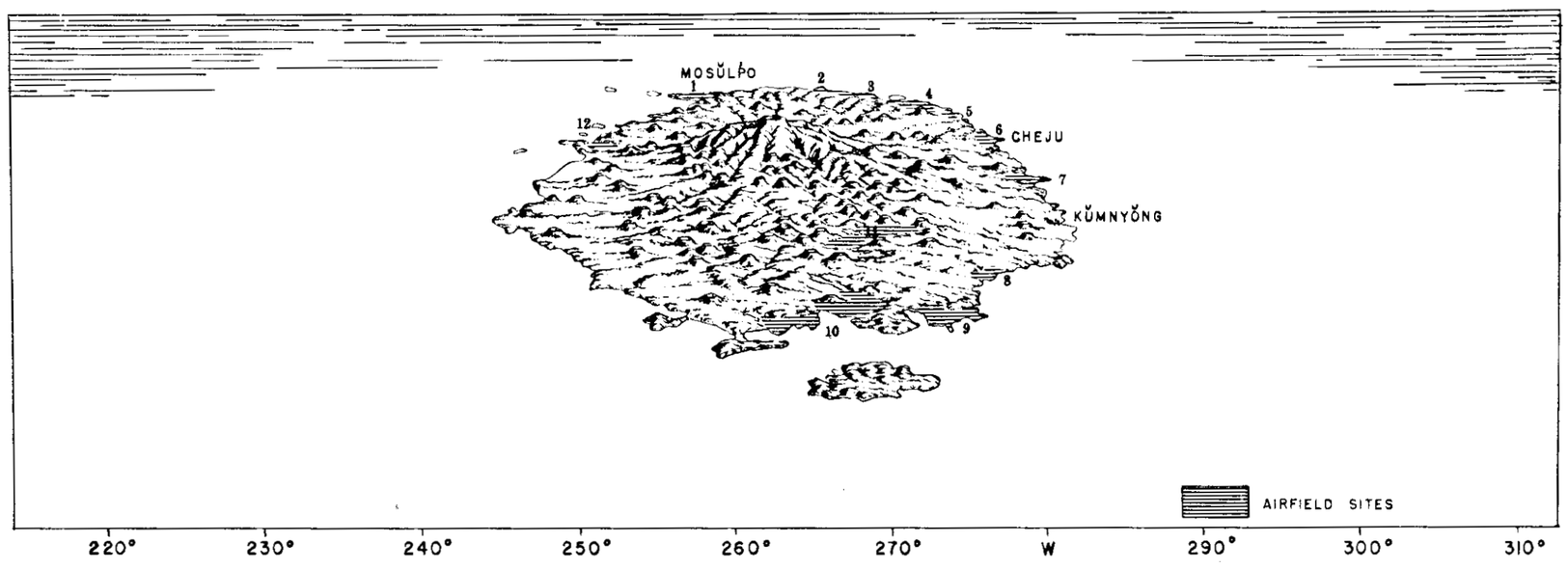
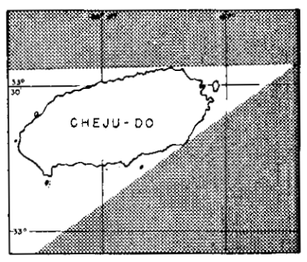
FOR
CHIEF OF ENGINEERS, U. S. ARMY

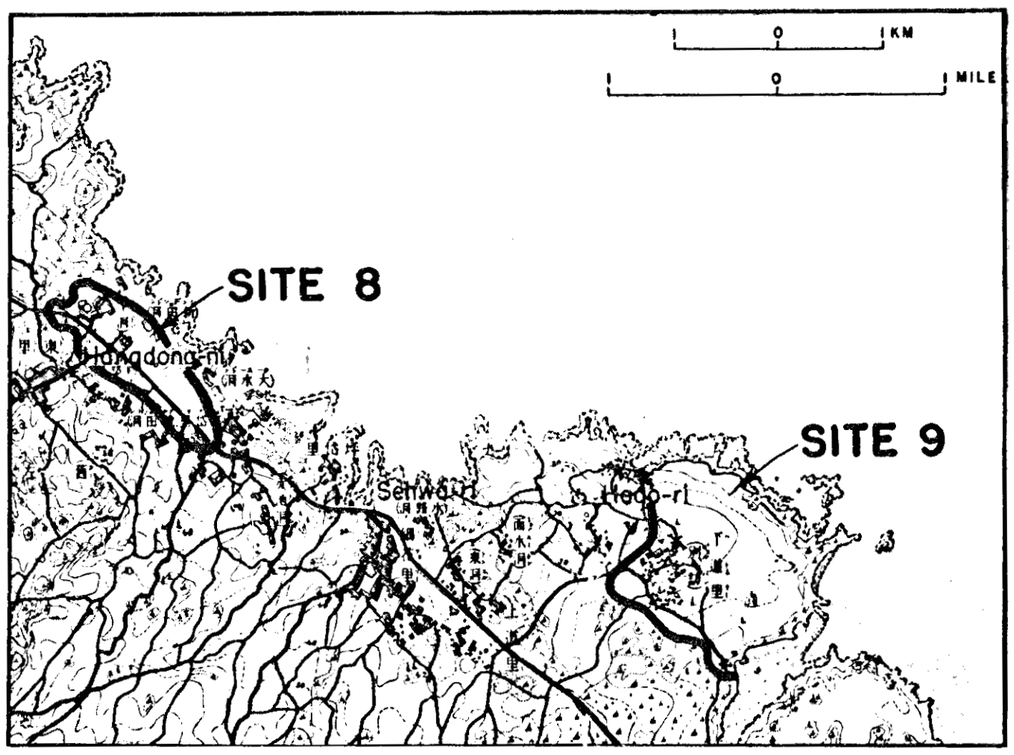
SUITABILITY FOR AIRFIELDS

SAISHU-TO (QUELPART ISLAND)

Perspective view projected from AMS L551 sheet 41 by a machine which gives true perspective and corrects for curvature and refraction of the earth. Details added from Korea Provisional Land Survey maps 1:50,000; geological map of Geological Survey of Chosen 1:100,000; views and aerial photographs. The point of observation is at an altitude of 30,000 feet and is 17 miles from the nearest point on shore as shown on accompanying index map. Vertical scale not exaggerated.







SITE 8

Suitability: Good

Narrow, slightly undulating area suitable for rapid construction of fighter strip with adequate dispersal area. Runway aligned with prevailing NW wind. Little clearing and grading necessary. Cinder and ash available in volcanic cone 3 miles to SW (not shown on site map; see Construction Materials map); sand along beach. Coastal highway runs NW through length of site.

SITE 9

Suitability: Fair

Small, rolling area adequate for 4,000-ft runway oriented W or NW. Slope in places may be prohibitive; seaward margin rough. Grading may involve large fills to modify slope. Necessary to remove village, fell clumps of trees. Cinder and ash available on point to south; sand to west. Readily accessible to coastal highway by network of paths and improved road.

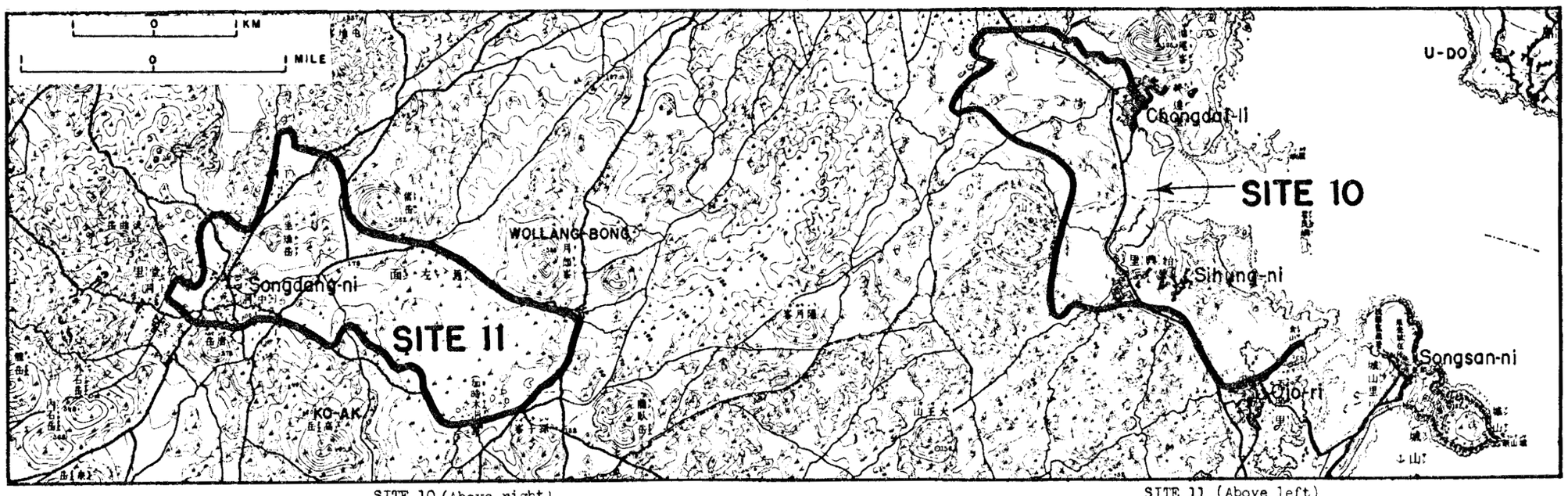
EXPLANATION FOR SITE MAPS

Reliability: Excellent

Source of Maps: Site maps are from the 1:50,000 Korean Provisional Land Survey Series published in 1913 and 1919. Recent aerial photographs indicate that roads have been improved and many alignments changed.

- Road over 3 meters wide.
- Road over 2 meters wide.
- Road over 1 meter wide.
- Trail or path under 1 meter wide.
- Village.
- Individual houses.
- Cliff.
- Piles of boulders.
- Sand.
- Channel of intermittent stream.
- Full contour (20 meters).
- Half contour (10 meters).
- Quarter contour (5 meters).
- Depression.

Altitudes in meters. Contour interval 20 meters.



SITE 10 (Above right)

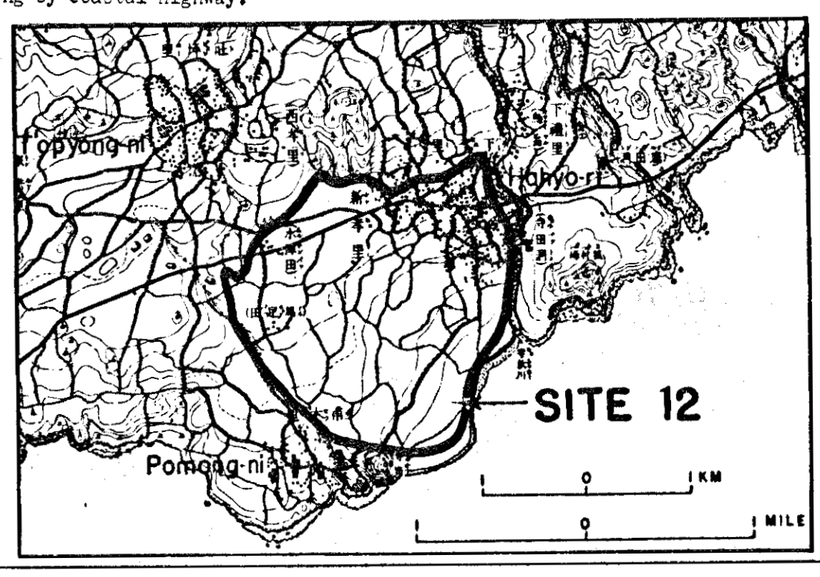
Suitability: Fair

Large, rough site with sufficient room for several heavy-bomber runways. Largest site in eastern part of island. Northern part has more slope (2%) than southern; many knobs and rough areas. Blasting or large fills required. Abundant construction materials in adjacent volcanic hills; sand plentiful along shore. Promontory to SE (Songsan-du) is conspicuous landmark. Connected with Kumnyong by coastal highway.

SITE 11 (Above left)

Suitability: Fair

Moderately large site on inland margin of coastal plain. Large enough for several 6,000-ft runways, but most approaches blocked by surrounding volcanic hills. NW and NE runways can be approached between hills. Surface probably rough; slopes as much as 3% in western part. Abundant cinder and ash in hills around site; no sand close to site. Drainage ditches needed to divert sheet floods after heavy summer rains. Relatively inaccessible site; connected to coastal highway, at Kumnyong and other points, by several narrow roads, probably not surfaced.



SITE 12 a/

Suitability: Fair

Small moderately sloping (2%) heavy-bomber site. Suitable for 6,000-ft runway oriented NW or NE. Moderate fills may be needed. Construction materials available in volcanic cones within 2 miles of site. Perennial stream 1/2 mile east of site. Connected with Site 1 by coastal highway, probably surfaced. Narrow road across island connects site directly with Cheju. Drainage may be a problem.

a/ For better projection view of Site 12, see Diagram, p.19.

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FOR
CHIEF OF ENGINEERS, U. S. ARMY

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SOILS
KOREA 1:250,000

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CHEJU-DO
(SAISHŪ-TŌ)

SAISHU-TO (QUELPART ISLAND)
FIRST EDITION-AMS 1

SHEET 41

CONVERSION GRAPH
Meters: 3,000 — 2,500 — 2,000 — 1,500 — 1,000 — 500 — 0
Feet: 10,000 — 9,000 — 8,000 — 7,000 — 6,000 — 5,000 — 4,000 — 3,000 — 2,000 — 1,000 — 0

30 Miles — 25 — 20 — 15 — 10 — 5 — 0

Trafficability of Soils (Suitability for Cross-country Movement)
Reliability: fair

Map Unit	March — May Moderate rain; moderate humidity; very cloudy; cool.	June — September Heavy rain; high humidity; extremely cloudy; warm; oppressive in July-August.	October — February Moderate rain; moderate to low humidity; cloudy; very cool after November. Snow on high slopes.
1 Well-drained gravelly loam. Movement impeded, in cultivated areas, by moderately shallow ditches, stone fences, small dikes, ridges, and piles of stone. In uncultivated areas movement locally impeded by steep slopes.	Good Fairly firm rapidly drying surface, rarely muddy or dusty.	Fair Somewhat soft surface. Rarely muddy. Dust kept down by frequent rains. Rutting improbable under ordinary traffic.	Fair to Good Fairly firm rapidly drying surface. May be dusty between rains. May rut easily under traffic, when dry.
2 Poorly drained gravelly clay loam. Movement impeded at all times by dikes, ditches, stone fences, and piles of stone.	Poor Surface may be firm enough to support man's weight. Slowly drying soil, easily puddled by traffic in the rain.	Very Poor Puddled muddy surface under several inches of water. Drainage not easily improved. A compact but slippery clayey horizon underlies 6 to 15 inches of mud.	Poor to Fair Surface sufficiently firm to support man's weight; slowly drying soil; may be suited for movement, in places, during rainless periods.
3 Well-drained stony gravelly clay loam. Movement impeded at all times by steep slopes, fairly dense trees, considerable undergrowth, plant detritus, and boulders.	Poor Wet, soft, somewhat loose surface.	Very Poor Wet slippery surface; rarely dry.	Poor Fairly cohesive surface; may be fairly dry between rains.
4 Well-drained stony loam. Movement impeded at all times by steep rugged stony slopes and by fairly dense vegetation.	Very Poor Soft, somewhat slippery surface.	Very Poor Slippery surface; loose soil.	Very Poor Loose, fairly soft surface; may be dry between rains.

GLOSSARY

-ak	point
-am	rock
-bong	mountain
-chedo	archipelago
-chi	pond
-ch'i	pass
-ch'ŏn	river
-dae	mountain
-dan	point
-do	island, province
-dō	province, village
-dong	village, town
-gak	point
-gan	rock
-gang	river
-gap	point
-gun	county
-guntō	archipelago
-hae	sea
-hang	harbor, point
-hantō	peninsula
-ho	lake
-hō	mountain
-hyŏn	pass
-ji	pond, temple, pass
-kai	sea
-kaikyō	strait
-kaku	point
-kan	point
-kang	river
-ko	lake
-kō	harbor, river, point
-kun	county
-kundo	archipelago
-li	village, town
-lyŏng	pass
-mal	point
-man	bay
-matsu	point
-misaki	point
-ni	village, town
-nyŏng	pass
-pando	peninsula
-p'o	harbor
-pong	mountain
-rei	pass
-retto	island chain
-ri	village, town
-ryŏng	pass
-sa	temple
-saki	point
-san	mountain
-sen	river
-shima	island
-sho	island
-shotō	archipelago
-sŏ	island
-su	river
-sui	river
-sudo	channel
-suidō	channel
-tan	point
-to	island
-tō	island
-tong	village, town
-wan	bay
-yŏlto	island chain
-zaki	point
-zan	mountain

ROADS EXPLANATION

(Information additional to that shown in red on base map).

Road more than 9 feet wide; probably surfaced.

Road or cart-track more than 6 ft. wide; probably unsurfaced. Generally suitable for single-lane light traffic except in wet weather. Very steep grades in central part of island.

1 100 000 YARDS

GRID DECLINATION 0°33'W

126°00' 33°00' — 900 000 YARDS — 910 — 920 — 15' — 930 — 940 — 30' 950 — 960 — 970 — 45' — 980 — P 990 — 1 000 — 127°00' 33°00'

1 210 — 1 200 — 1 190 — 45' — 1 180 — 1 170 — 1 160 — 1 150 — 30' — 1 140 — 1 130 — 15' — 1 120 — 1 110 — 1 100 — 1 090

GRID DECLINATION 0°00'

A.M.S. L551

First Edition (A.M.S. 1) 1944

Prepared under the direction of the Chief of Engineers, U. S. Army, by the Army Map Service (AMCV), U. S. Army, Washington, D. C., 1944. Compiled from Korea 1:200,000, Korean Provisional Land Survey, 1921; Korea 1:50,000, Korean Provisional Land Survey, 1918; Japanese H. O. Chart 1208, 1933; U. S. H. O. Chart 3239, 1941; Aeronautical information from U. S. A. A. F., 1943. Korean names transcribed according to the McCune-Reischauer System; Japanese forms of Korean names, shown in parentheses, transcribed according to the Modified Hepburn (Romaji) System; other alternate forms from U. S. H. O. Charts.

LEGEND

Cities over 100,000 Population
Cities 20,000-100,000 Population
Cities 5,000-20,000 Population
Towns 2,000-5,000 Population
Villages 1-2,000 Population
Boundary: (International)
Boundary: Do (Province)
Boundary: Gun (County)
Triangulation Points
Elevations — × 254
Walls
Rice
Salt Pans

Railroads: Standard Gauge 4'8½"
Double Track
Single Track — (Station)
Under Construction — UNDER CONSTRUCTION
Railroads: Narrow Gauge 3'6" or less
Primary Highways
Improved Roads—over 12 ft.
Improved Roads—under 12 ft.
Unimproved Roads, Trails

Aeronautical Information:	Field	Anchorage
Government, Army, Navy	○	⊕
Municipal or Commercial	✿	✿
Auxiliary or Emergency	+	‡
Unclassified	⊕	

Radio Broadcasting Stations ⊙ RS
Other Radio Stations ⊙ RN

Scale 1:250,000

5 0 5 10 Miles
5 0 5 10 15 Kilometers
5000 0 5000 10000 15000 Yards

APPROXIMATE CONTOUR INTERVAL 100 METERS

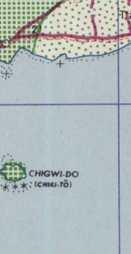
POLYCONIC PROJECTION

HORIZONTAL CONTROL IS BASED ON DATUM PRIOR TO 1912

TEN THOUSAND YARD WORLD POLYCONIC GRID, BAND IIIN, ZONE "C"
THE LAST THREE DIGITS OF THE GRID NUMBERS ARE OMITTED

NOTE: OFFICERS USING THIS MAP WILL MARK HEREON CORRECTIONS AND ADDITIONS WHICH COME TO THEIR ATTENTION AND MAIL DIRECT TO "THE CHIEF OF ENGINEERS, WASHINGTON, D. C."

HEIGHTS IN METERS



APPROXIMATE MEAN DECLINATION 1943
FOR CENTER OF SHEET
ANNUAL MAGNETIC CHANGE 1' INCREASE

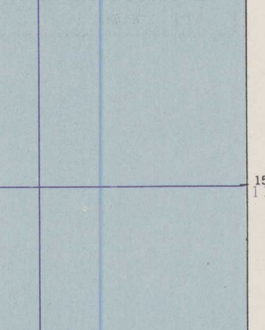
Use diagram only to obtain numerical values. To determine magnetic north line, connect the pivot point "P" on the south edge of the map with the value of the angle between grid and magnetic north, as plotted on the degree scale at the north edge of the map.

PREPARED BY U. S. GEOLOGICAL SURVEY
FOR
CHIEF OF ENGINEERS, U. S. ARMY

ARMY MAP SERVICE, U. S. ARMY, WASHINGTON, D. C., 115865
4-45 1944

INDEX TO PROVINCE BOUNDARIES

INDEX TO ADJOINING SHEETS



CHEJU-DO, KOREA
(SAISHŪ-TŌ)
N3300-E12600/100

~~CONFIDENTIAL~~

SAISHU-TO (QUELPART ISLAND)

SOILS

Reliability: Fair

Map Unit	Topography and Vegetation	Engineering Properties
1 Well-drained brown or gray gravelly loam: Moderately compact; underlain, at a few feet depth by hard or soft volcanic rock or, in places, by loose coarse-textured volcanic deposits. Volcanic ash mixed with surface soil. Small areas of thin windblown sand and few narrow beaches included. (See Geology map.)	Very gently rising undulating coastal lowland, containing numerous cones, up to 300 feet high, of volcanic ash and cinders. Much of the area is under crops other than rice. Grass and scattered trees in uncultivated sections. In cultivated areas moderately shallow ditches, small dikes, stone fences and piles of loose stone.	Good soil for engineering purposes: Suited for compaction and mechanical stabilization; high bearing strength at optimum compaction; good subgrade or base course. Grading can be improved by addition of medium-textured aggregate from volcanic ash and cinder cones. Excellent drainage. Low moisture retention. Low shrinkage, expansion, and elasticity. Low plasticity index. Medium to low dry strength.
2 Poorly drained dark-gray gravelly clay loam: Compact; underlain, at 2 or 3 feet depth, by loose coarse-textured volcanic deposits. Volcanic ash mixed with surface soil.	Fairly level, diked, irrigated rice fields; numerous dikes, ditches, canals, stone fences, and piles of loose stone.	Poor soil for engineering purposes: Poor drainage and poor grading. Clay fraction has good binding properties. When dry, the surface is hard, compressible, and rebounds but little on removal of load. Would be comparable to Map Unit 1 if adequate drainage could be maintained.
3 Well-drained brown stony gravelly clay loam: Moderately firm, weakly granular; underlain, at 1/2 to 3 feet depth, by volcanic rock, either hard and solid or soft and containing cavities. Unweathered rock exposed on ridges.	Gentle to moderately steep mountain slopes, cut by small ravines containing much shattered rock. Fairly dense forest with considerable undergrowth and much plant detritus on the forest floor.	Not considered for engineering purposes, because of the dense vegetation, stoniness, and shallow depth.
4 Well-drained stony loam: Loose; underlain, commonly at several inches' depth, by iron-rich volcanic rock, in places hard and solid, in places soft and containing cavities. Boulders and large masses of unweathered rock are common.	Steep rugged stony mountain slopes covered by fairly dense vegetation (small trees, some brush, and grass).	Not considered for engineering purposes, because of extreme stoniness, inaccessibility, and very shallow depth.

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FOR
CHIEF OF ENGINEERS, U. S. ARMY

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SAISHU-TO (QUELPART ISLAND)

KOREA 1:250,000

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Not for sale or distribution

CHEJU-DO

(SAISHŪ-TŌ)

SOURCES OF CONSTRUCTION MATERIALS

FIRST EDITION-AMS 1

SHEET 41

Reliability: Good

INTRODUCTION

Construction materials are generally abundant on Saishu-to. Most bedrock is excellent for quarrying; possible quarry sites are numerous along the coast. Closely spaced stone walls, generally 2 to 6 ft high, between fields on the coastal plain form an immediately available source, in moderate amounts, of building stone. Widespread deposits of volcanic ash and cinder afford many excellent, readily accessible sources of fill and subgrade material which can be obtained without blasting. Poor-quality sand is available along north coast from numerous wind-blown deposits.

The high interior part of the island is covered with forests of oak, pine, larch, and maple, which are excellent for light or heavy construction; lower slopes fairly accessible.

Map Unit	Description	Value as Construction Material	Availability
1 Predominantly Hard Volcanic Rock	Compact, fine-grained rock. Color gray, purple, green, or black.	Hard, brittle rock, easily quarried. Excellent for riprap, crushed rock, fill, or concrete aggregate.	Numerous fair quarry sites, not readily accessible, in cliffs and bluffs along coast. Excellent accessible site at Sanbang-San; good accessible site at Kun-San; these probably have large amounts of loose talus that can be loaded directly without blasting. Probably many sites for small quarries in east around Chongui; few elsewhere on coastal plain.
2 Predominantly Weak Volcanic Rock	Dark-colored rock, generally weak and porous.	Easily quarried; fair for riprap or fill but generally less satisfactory as building stone than hard volcanic rock. Porous rock should not be used for concrete aggregate because it may contain zeolites (white, soft minerals); these retard setting and cause early disintegration of the concrete.	Most suitable quarry sites are in inaccessible interior of island.
3 Volcanic Ash and Cinder	Loose, porous volcanic material forms many steep-sided cones and mantles adjacent areas. Size of fragments ranges from fine dust to blocks weighing several pounds; material becomes finer away from cones.	Excellent for fill or subgrade if compacted in lifts of not more than 8 inches. Not satisfactory for concrete aggregate because of extremely porous nature.	Available in unlimited quantities from many easily accessible localities. Can be loaded directly with power shovels; no blasting necessary.
4 Sand	Wind-blown deposits and beach sands. Wind-blown deposits largely well-sorted (poorly graded) shell sand. Beach sands are mixture of shell fragments and volcanic sand; probably gravelly along some beaches.	Wind-blown deposits in north generally too poorly graded for use as base-course material without mixture; not satisfactory in concrete mix because of composition. Beach sands should make good base course material.	Wind-blown deposits available in large quantities from several readily accessible localities along north coast.

Good quarry site

ROADS EXPLANATION

(Information additional to that shown in red on base map).

Road more than 9 feet wide; probably surfaced.

Road or cart-track more than 6 ft. wide; probably unsurfaced. Generally suitable for single-lane light traffic except in wet weather. Very steep grades in central part of island.

GLOSSARY

-ak	point
-am	rock
-bong	mountain
-chedo	archipelago
-chi	pond
-ch'i	pass
-ch'ŏn	river
-dae	mountain
-dan	point
-do	island, province
-dō	province, village
-dong	village, town
-gak	point
-gan	rock
-gang	river
-gap	point
-gun	county
-guntō	archipelago
-hae	sea
-hang	harbor, point
-hantō	peninsula
-ho	lake
-hō	mountain
-hyŏn	pass
-ji	pond, temple, pass
-kai	sea
-kaikyō	strait
-kaku	point
-kan	point
-kang	river
-ko	lake
-kō	harbor, river, point
-kun	county
-kundo	archipelago
-li	village, town
-lyŏng	pass
-mal	point
-man	bay
-matsu	point
-misaki	point
-ni	village, town
-nyŏng	pass
-pando	peninsula
-p'o	harbor
-pong	mountain
-rei	pass
-rettō	island chain
-ri	village, town
-ryŏng	pass
-sa	temple
-saki	point
-san	mountain
-sen	river
-shima	island
-sho	island
-shotō	archipelago
-sŏ	island
-su	river
-sui	river
-sudo	channel
-suidō	channel
-tan	point
-to	island
-tō	island
-tong	village, town
-wan	bay
-yŏlto	island chain
-zaki	point
-zan	mountain

LEGEND

- Cities over 100,000 Population
- Cities 20,000-100,000 Population
- Cities 5,000-20,000 Population
- Towns 2,000-5,000 Population
- Villages 1-2,000 Population
- Boundary: (International)
- Boundary: Do (Province)
- Boundary: Gun (County)
- Triangulation Points
- Elevations × 254
- Walls
- Rice
- Salt Pans
- Railroads: Standard Gauge 4'8½"
  - Double Track
  - Single Track (Station)
  - Under Construction UNDER CONSTRUCTION
- Railroads: Narrow Gauge 3'6" or less
- Primary Highways
- Improved Roads—over 12 ft.
- Improved Roads—under 12 ft.
- Unimproved Roads, Trails

Aeronautical Information:	Field	Anchorage
Government, Army, Navy	◎	⊕
Municipal or Commercial	○	⊛
Auxiliary or Emergency	+	‡
Unclassified	⊕	

- Radio Broadcasting Stations ⊙ RS
- Other Radio Stations ⊙ RN

A.M.S. L551

First Edition (A.M.S. 1) 1944

Prepared under the direction of the Chief of Engineers, U. S. Army, by the Army Map Service (AMCV), U. S. Army, Washington, D. C., 1944. Compiled from Korea 1:200,000, Korean Provisional Land Survey, 1921; Korea 1:50,000, Korean Provisional Land Survey, 1918; Japanese H.O. Chart 1208, 1933; U.S.H.O. Chart 3239, 1941; Aeronautical information from U.S.A.A.F., 1943. Korean names transcribed according to the McCune-Reischauer System; Japanese forms of Korean names, shown in parentheses, transcribed according to the Modified Hepburn (Romaji) System; other alternate forms from U.S.H.O. Charts.

Scale 1:250,000

5 0 5 10 Miles
5 0 5 10 15 Kilometers
5000 0 5000 10000 15000 Yards

APPROXIMATE CONTOUR INTERVAL 100 METERS

POLYCONIC PROJECTION

HORIZONTAL CONTROL IS BASED ON DATUM PRIOR TO 1912

TEN THOUSAND YARD WORLD POLYCONIC GRID, BAND IIIN, ZONE "C"
THE LAST THREE DIGITS OF THE GRID NUMBERS ARE OMITTED

NOTE: OFFICERS USING THIS MAP WILL MARK HEREON CORRECTIONS AND ADDITIONS WHICH COME TO THEIR ATTENTION AND MAIL DIRECT TO "THE CHIEF OF ENGINEERS, WASHINGTON, D.C."

HEIGHTS IN METERS

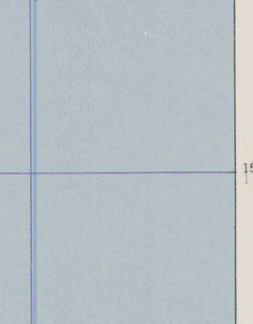
4°45' OR 84 MILS — 0°17' OR 5 MILS — TRUE NORTH — MAGNETIC NORTH

APPROXIMATE MEAN DECLINATION 1943
FOR CENTER OF SHEET
ANNUAL MAGNETIC CHANGE 1' INCREASE

Use diagram only to obtain numerical values. To determine magnetic north line, connect the pivot point "P" on the south edge of the map with the value of the angle between grid and magnetic north, as plotted on the degree scale of the north edge of the map.

INDEX TO PROVINCE BOUNDARIES

INDEX TO ADJOINING SHEETS



PREPARED BY U. S. GEOLOGICAL SURVEY
FOR
CHIEF OF ENGINEERS, U. S. ARMY

ARMY MAP SERVICE, U. S. ARMY, WASHINGTON, D. C., 115865
4-45 1944

CHEJU-DO, KOREA

(SAISHŪ-TŌ)

N3300-E12600/100

~~CONFIDENTIAL~~

SAISHU-TO (QUELPART ISLAND)

KOREA 1:250,000

For use by
War and Navy Department Agencies only
Not for sale or distribution

CHEJU-DO

(SAISHŪ-TŌ)

FIRST EDITION-AMS 1

GEOLOGY
SHEET 41

CONVERSION GRAPH
Meters / Feet

INTRODUCTION
Reliability: good

Cheju-Do (Saishu-To, Quelpart Island) is a complex volcanic cone rising with gradually steepening slope to an altitude of 1950 meters (about 6,400 feet) in the center of the island. The island is elliptical in shape and has an area of about 720 square miles. Numerous volcanic ash and cinder cones stand 50 to 300 feet above the surrounding terrain. Basalt flows underlie by far the greatest part of the island; other volcanic rocks include trachyte, trachy-andesite, and volcanic ash and cinder. The volcanics range in age from late Tertiary to Recent; the last period of active vulcanism is reported to have occurred about 1,000 A. D. when basalt was erupted at Kun-San, near the south coast. Sedimentary deposits are very scarce, consisting of one occurrence on the south coast near Tojich'ong of fossiliferous Pleistocene sand (not shown on map) interbedded with volcanics, and of small deposits of sand along the coast and along streams.

The trachytic rocks appear to be the oldest rocks exposed on the island. These are overlain by numerous basalt flows, with the formation of the cinder cones being the last phase of vulcanism except for the recent flow at Kun-San.

Map Unit	Extent	Description	Topographic Expression
1 Trachyte and trachy-andesite	Probably in part remnants of older flows and in part plugs (eroded volcanic necks). Underlie numerous isolated areas in west half of island; largest individual area approximately 10 square miles.	Generally fine-grained, compact rock; ranges in color from gray to green and purple.	Varied; in north and in parts of south forms subdued, rolling plain: along south coast, forms several bold rocky hills such as Sangang-San, northeast of Mosulp'o; peak of Haila-San composed of trachyte.
2 Older Basalt Flows	Cover much of outer parts of island, locally extend inland toward Haila-San. Total thickness not known; individual flows appear to be 20 to 100 feet thick.	Dominant rock type is a dense, black, non-porphyritic basalt; locally the rock is porphyritic with phenocrysts of olivine, plagioclase, and augite. Columnar structure common.	Forms rolling, subdued landscape for the most part; bare outcrops rare except in east around Chongui and along coast where flows form many cliffs and low bluffs.
3 Younger Basalt Flows	Cover much of interior of island. Centering on Haila-San, they extend as broad tongues toward outer parts of island, reaching coast at three places in south. Number and thickness of individual flows not known; total thickness probably several hundred feet.	Predominant type is a black, weak, vasicular rock with small plagioclase phenocrysts; a few flows, including recent flow at Kun-San, 5 miles east of Taejong, are dense rocks similar to the "older basalts".	Commonly form more rugged topography than older basalts because of generally higher elevation, younger age, and softer, more easily gullied character.
4 Volcanic Ash and Cinder	Cones stud surface of the island, and loose ash mantles areas up to several square miles.	Loose, cindery material of basaltic composition. Size of fragments varies from bombs of several pounds to fine dust; material generally finer away from the cones.	Forms steep-sided cinder cones, with adjacent areas of older rocks mantled by finer material.
5 Sand	Narrow beaches along coast, and thin wind-blown deposits extending inland from northern coast.	Largely well-sorted shell sand in the wind-blown deposits. Beach sands probably poorly-sorted mixture of dark volcanic sand and shell fragments, with local concentrations of magnetite; in part gravelly.	Beaches and (in north) mantles on coastal lowland.

ROADS EXPLANATION

(Information additional to that shown in red on base map).

Road more than 9 feet wide; probably surfaced.

Road or cart-track more than 6 ft. wide; probably unsurfaced. Generally suitable for single-lane light traffic except in wet weather. Very steep grades in central part of island.

GLOSSARY

-ak	rock
-am	rock
-bong	mountain
-chedo	archipelago
-chi	pond
-ch'i	pass
-ch'ŏn	river
-dae	mountain
-dan	point
-do	island, province
-dō	province, village
-dong	village, town
-gak	point
-gan	rock
-gang	river
-gap	point
-gun	county
-guntō	archipelago
-hae	sea
-hang	harbor, point
-hantō	peninsula
-ho	lake
-hō	mountain
-hyŏn	pass
-ji	pond, temple, pass
-kai	sea
-kaikyō	strait
-kaku	point
-kan	point
-kang	river
-ko	lake
-kō	harbor, river, point
-kun	county
-kundo	archipelago
-li	village, town
-lyŏng	pass
-mal	point
-man	bay
-matsu	point
-misaki	point
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-nyŏng	pass
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-p'o	harbor
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-rei	pass
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-ri	village, town
-ryŏng	pass
-sa	temple
-saki	point
-san	mountain
-sen	river
-shima	island
-sho	island
-shotō	archipelago
-sō	island
-su	river
-sui	river
-sudo	channel
-suidō	channel
-tan	point
-to	island
-tō	island
-tong	village, town
-wan	bay
-yŏlto	island chain
-zaki	point
-zan	mountain

A.M.S. L551

First Edition (A.M.S. 1) 1944

Prepared under the direction of the Chief of Engineers, U. S. Army, by the Army Map Service (AMCV), U. S. Army, Washington, D.C., 1944. Compiled from Korea 1:200,000, Korean Provisional Land Survey, 1921; Korea 1:50,000, Korean Provisional Land Survey, 1918; Japanese H.O. Chart 1208, 1933; U.S.H.O. Chart 3239, 1941; Aeronautical information from U.S.A.A.F., 1943. Korean names transcribed according to the McCune-Reischauer System; Japanese forms of Korean names, shown in parentheses, transcribed according to the Modified Hepburn (Romaji) System; other alternate forms from U.S.H.O. Charts.

LEGEND

Cities over 100,000 Population
Cities 20,000-100,000 Population
Cities 5,000-20,000 Population
Towns 2,000-5,000 Population
Villages 1-2,000 Population
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Boundary: Do (Province)
Boundary: Gun (County)
Triangulation Points
Elevations × 254
Walls
Rice
Salt Pans

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Double Track
Single Track (Station)
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Railroads: Narrow Gauge 3'6" or less
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Municipal or Commercial	○	⊕
Auxiliary or Emergency	+	⊕
Unclassified	⊕	

Radio Broadcasting Stations ⊙ RS
Other Radio Stations ⊙ RN

Scale 1:250,000

5 0 5 10 Miles
5 0 5 10 15 Kilometers
5000 0 5000 10000 15000 Yards

APPROXIMATE CONTOUR INTERVAL 100 METERS

POLYCONIC PROJECTION

HORIZONTAL CONTROL IS BASED ON DATUM PRIOR TO 1912

TEN THOUSAND YARD WORLD POLYCONIC GRID, BAND IIIN, ZONE "C"
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HEIGHTS IN METERS

4°45' OR 84 MILS — 0°17' OR 5 MILS — MAGNETIC NORTH — TRUE NORTH

APPROXIMATE MEAN DECLINATION 1943
FOR CENTER OF SHEET
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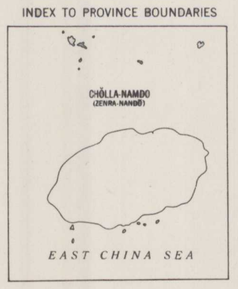
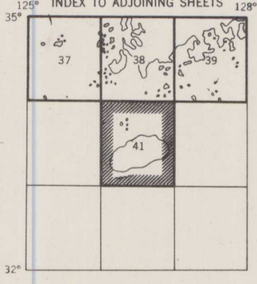
INDEX TO PROVINCE BOUNDARIES



INDEX TO ADJOINING SHEETS



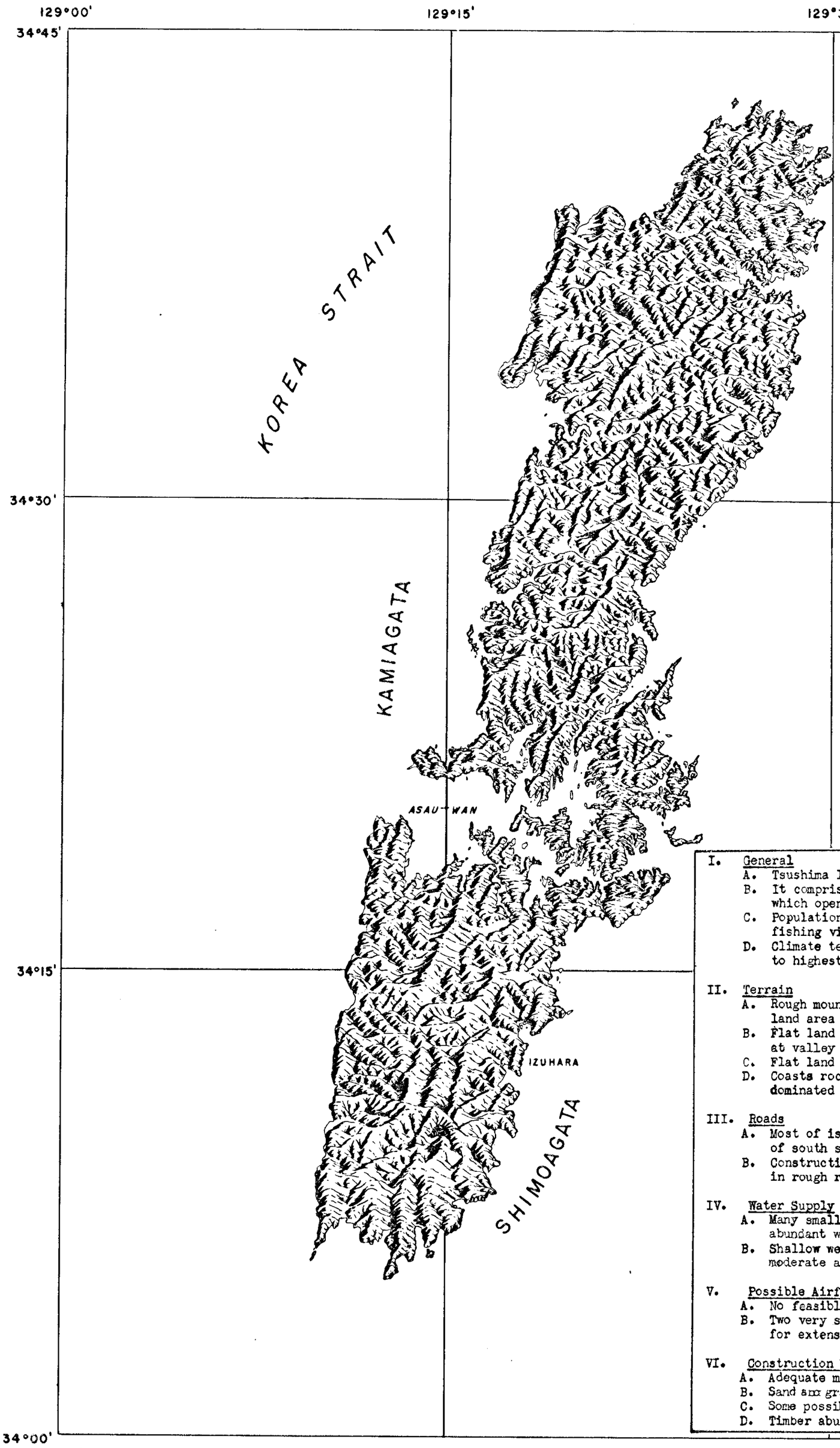
CHEJU-DO, KOREA
(SAISHŪ-TŌ)
N3300-E12600/100

PREPARED BY U. S. GEOLOGICAL SURVEY
FOR
CHIEF OF ENGINEERS, U. S. ARMY

ARMY MAP SERVICE, U. S. ARMY, WASHINGTON, D. C., 115865
4-48 1944

TSUSHIMA

SUMMARY OF TERRAIN SITUATION



I. General
- A. Tsushima lies midway between Korea and southern Japan.
- B. It comprises two main islands separated by a narrow strait which opens west to island-studded bay.
- C. Population about 60,000, centered chiefly in small coastal fishing villages.
- D. Climate temperate humid. Severe frost and snow restricted to highest points.

II. Terrain
- A. Rough mountainous islands with total length of about 45 miles; land area about 250 sq. miles.
- B. Flat land restricted to narrow stream valleys, more extensive at valley mouths; most of island difficult of accessability.
- C. Flat land largely planted to irrigated rice.
- D. Coasts rocky and steep. Many short bayhead beaches, dominated by headlands and bordering hills.

III. Roads
- A. Most of island not served by roads; best road skirts part of south shore of bay.
- B. Construction of more than local access roads difficult in rough rocky terrain.

IV. Water Supply
- A. Many small perennial streams and small springs provide abundant water.
- B. Shallow wells dug in larger valleys will provide a moderate amount of water.

V. Possible Airfield Sites
- A. No feasible sites for either fighters or bombers.
- B. Two very short runways reported on island; not suitable for extension.

VI. Construction Materials
- A. Adequate materials abundant in southern section.
- B. Sand and gravel located near streams and on small beaches.
- C. Some possible quarry sites.
- D. Timber abundant.

PREPARED BY U. S. GEOLOGICAL SURVEY
FOR
CHIEF OF ENGINEERS, U. S. ARMY

5 0 5 10 MILES

10 0 10 KM.

Terrain diagram drawn on map base Imperial Geological Survey of Japan Topographic Maps 1:200,000, zone 8, column II and zone 7, column II. Details added from Imperial Geological Survey of Japan Geologic Maps 1:200,000; U. S. and Japanese H. O. Charts; and photographs; and AMS L571 sheet 32.

The appearance of perspective is obtained by shifting all relief features northward by 1/10 inch for each 1,000 feet. Distances on map can therefore be scaled off only between points of equal altitude.

TSUSHIMA
CENTRAL JAPAN 1:250,000

For use by
War and Navy Department Agencies only
Not for sale or distribution

TSUSHIMA

TERRAIN APPRECIATION
SHEET 32

FIRST EDITION - AMS 1

EXPLANATION

Reliability: Fair

Valley bottoms. Include narrow strips of flat land along streams and gently sloping lower slopes. Generally cultivated.

Rugged mountains; most slopes more than 25%. Heavily forested.

Sea cliffs.

Beach. Some sand, some gravel.

Best cross-country routes. Narrow steep trails which permit only foot movement.

CONVERSION GRAPH
Meters / Feet

TERRAIN APPRECIATION

Reliability: Fair

INTRODUCTION

Tsushima consists of two large islands, Kamiagata in the north and Shimoagata in the south, with a total area of about 250 square miles. The islands are separated by an irregular, island-dotted strait which in the east narrows to a width of a few hundred yards and in the west opens out to a broad bay (Asau-wan). The total population is less than 60,000; fishing is the chief occupation. There is a small zinc mine about one mile southeast of Komota on the west coast of Shimoagata. The island has many natural harbors; limited facilities are reported at Izuhara, Takeshiki, and Osaki. There is a seaplane base on Asau-wan.

Tsushima is generally unfavorable for military operations. There are few roads; movement along coast is prevented by closely spaced cliffed headlands, cross-country movement by steep slopes and heavy forest cover. Most beaches are narrow and dominated by adjacent headlands. There are no good airfield sites, though small landing fields have been reported at Minato and Sasuna along northwest coast.

TERRAIN DESCRIPTION

Topography: Generally rugged, with many closely spaced, narrow ridges. Intervening valleys mostly steep-sided; most are V-shaped, although many, particularly near the coast, have narrow strips of flat land along streams. Highest reported altitude is 2,106 feet.

Coast: Rugged and irregular; cliffed headlands alternate with short stretches of sand or gravel bay-head beach along much of the coast, particularly in south; elsewhere coast is marked by stretches up to several miles long of low rocky bluffs. Longest beach is on north coast, where sand beach extends for nearly 2 miles northeast of Minato; most beaches less than 500 feet long.

Vegetation and Land Use: Narrow flats along lower courses of streams cultivated, chiefly to rice. Slopes, particularly in Shimoagata, covered with dense evergreen forest consisting largely of live oak. Some headlands on coast are grass-covered.

Roads: Very few roads. Only surfaced road extends from Izuhara on east coast north to Takeshiki, with a short spur extending east from Kechi; total length less than 10 miles. Secondary unsurfaced road from Izuhara southwest across island to Tsutsu on south coast.

OPERATIONAL FACTORS

Movement: Generally difficult. Vehicular movement practically confined to short stretches of road in eastern part of Shimoagata and to short, narrow strips along lower courses of some streams; elsewhere obstructed by steep slopes and heavy forest cover. Foot movement also difficult; impeded by steep slopes, brushy forest. Ground slippery when wet; most streams narrow but swift, difficult to cross. Best routes for crossing island indicated on the map; they have narrow, steep trails suitable only for foot movement.

Ground Conditions: Soil on slopes generally thin, clayey, fairly well-drained, slippery when wet; hand excavations fairly easy. Many areas of shaly rock, unstable when wet and subject to landslides; poor for foundations. Flat valley bottoms underlain by sandy alluvium, easily excavated but require revetment.

Cover and Concealment: Rugged topography and thick forests provide excellent cover and concealment everywhere except in narrow, cultivated valley bottoms.

Observation: Many observation posts possible on ridges and hills, but treetop stations probably necessary; area of view generally small. Most beaches dominated by headlands or hills close to coast.

GLOSSARY

-bana	point
-dake	mountain
-daki	waterfall
-fuji	mountain
-gawa	river
-gun	county
-guntō	archipelago
-hama	beach
-hana	point
-iwa	rock
-jima	island
-kai	bay, gulf, sea
-kaikyō	strait
-kawa	river
-ken	prefecture
-ko	lake
-kō	harbor
-mine	mountain
-misaki	cape
-mori	forest, mountain
-nada	sea
-numa	lake, pond
-rettō	island chain
-saki	cape
-sammyaku	mountain range
-san	mountain
-sawa	swamp, stream
-se	shoals, rapids
-seto	strait
-shima	island
-shotō	island group
-suidō	channel
-take	mountain
-taki	waterfall
-tō	island
-tōge	mountain pass
-umi	bay, gulf
-ura	inlet, beach
-wan	bay
-yama	mountain
-zaki	cape
-zan	mountain
-zawa	swamp, stream

KAMIAGATA

SHIMOAGATA

OKINO-SHIMA

TSUSHIMA

Scale 1:250,000

A. M. S. L571

First Edition 1943

Prepared under the direction of the Chief of Engineers, U. S. Army, by the Army Map Service (LU), U. S. Army, Washington, D. C., 1943. Compiled from Japan 1:50,000, Japanese Imperial Land Survey, (1933-34). Japan 1:200,000, Japanese Imperial Land Survey, Tsushima, (1921). All place names transcribed according to the Modified Hepburn (Romaji) System.

LEGEND

Cities over 100,000 Population
" 20,000-100,000 "
" 5,000-20,000 "
Towns 1,000-5,000 "
Villages 1-1,000 "

Width
Primary Highways 24 ft. or more
Improved Roads 18 ft. to 24 ft.
Unimproved Roads 6 ft. to 18 ft.
Trails under 6 ft.
Boundary: Ken (Prefecture)
Boundary: Gun (County)
Lighthouses
Rice
Radio Broadcasting Stations RSO
Other Radio Stations RNO

Railroads: Standard Gauge 3'6"
Double Track
Single Track
Railroads: Narrow Gauge 2'6" or less
Single or Double Track
Topographic Control Points
Triangulation Points
Elevations × 250

Aeronautical Information
Field / Anchorage
Government, Army, Navy
Municipal or Commercial
Auxiliary or Emergency
Unclassified

APPROXIMATE MEAN DECLINATION 1943
FOR CENTER OF SHEET
ANNUAL MAGNETIC CHANGE 1' INCREASE

Use diagram only to obtain numerical values. To determine magnetic north line, connect the pivot point "P" on the south edge of the map with the value of the angle between GRID NORTH and MAGNETIC NORTH, as plotted on the degree scale at the north edge of the map.

5 0 5 10 Miles
5 0 5 10 15 Kilometers
5000 0 5000 10000 15000 Yards

POLYCONIC PROJECTION

TEN THOUSAND YARD WORLD POLYCONIC GRID, BAND IIIN, ZONE "C"
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HEIGHTS IN METERS

PREPARED BY U. S. GEOLOGICAL SURVEY
FOR
CHIEF OF ENGINEERS, U. S. ARMY

INDEX TO PREFECTURE BOUNDARIES

SEA OF JAPAN
CHOSEN-KAIKYŌ
MASAN-KEN
TSUSHIMA-KAIKYŌ

INDEX TO ADJOINING SHEETS

ARMY MAP SERVICE, U. S. ARMY, WASHINGTON, D. C., 115737
1943

TSUSHIMA, CENTRAL JAPAN
N3400-E12900/100

TSUSHIMA
CENTRAL JAPAN 1:250,000

WATER SUPPLY
SHEET 32

TSUSHIMA

FIRST EDITION-AMS 1

EXPLANATION

Reliability: Fair

1 — Alluvium. Small alluvial deposits in narrow, flat stream valleys. Good water supplies obtainable from streams, springs, and shallow wells.

2 — Sedimentary rocks. Hills underlain by sandstone, shale, and volcanic ash rock (tuff). Steep valley sides and sharp ridges. Good water supplies obtainable from larger streams and a few springs.

3 — Granitic rocks. Mostly rugged hilltops. Few streams; a few small springs.

WATER SUPPLY

Reliability: fair

Summary

Water supplies adequate for military needs. Many streams are perennial and provide good supplies. Some small seepage springs useful. Wells in alluvial lowlands provide moderate supplies of ground water; elsewhere, wells unsatisfactory. No water on small neighboring islands.

Topography

Long, hilly to mountainous island with very irregular coast line. Thoroughly dissected into ridges and steep valley sides. Small alluvial lowlands near mouths of streams are the only level land and are sites of most settlements. Coasts rugged and rocky except for a few small pebbly beaches. Bedrock chiefly shale interbedded with some sandstone and volcanic ash rock (tuff); beds generally dip to SE. Hard granitic rocks occur locally, underlying mountains and rugged hills; more common in southern part of island.

Streams

Many perennial streams. Discharge varies considerably according to precipitation; small streams flow only during or shortly after rains. Heavy rains may produce short, violent floods. Stream water soft, turbid, may be polluted. Small storage reservoirs would be useful on streams with small flow during low water. Streams probably furnish water supplies for most of the inhabitants.

Springs

No large springs, but many small seepage springs. Most likely to occur on sides of valleys where sandstone overlies shale. Water clear, unpolluted, may be somewhat mineralized.

Ground Water

No existing wells reported. Sandstone beds yield some water where rock is uncemented; shale, ash rock, and granitic rocks yield no water except from the few joints and fissures. On the small alluvial lowlands, shallow dug or driven wells in alluvium will have moderate yields of 20 to 50 gallons per minute. Wells should be placed near center of valley to penetrate maximum thickness of saturated alluvium. Elsewhere wells not recommended because of low water-yielding capacity of rock.

Equipment Needed

For stream water, necessary purification equipment includes diatomaceous earth or other high quality filters, centrifugal pumps, storage tanks, and pipe for gravity supply. Materials and tools for construction of diversion and small storage dams. Tanks can usually be placed on hillside, eliminating necessity for elevated platforms. For spring improvement, hand tools, concrete, timber, and pipe. Springs can be improved by constructing buried and tightly covered concrete chambers to collect water. Hand tools, windlass, timber cribbing, centrifugal or pitcher pumps needed for shallow dug wells in alluvium.

GLOSSARY

-bana	point
-dake	mountain
-daki	waterfall
-fuji	mountain
-gawa	river
-gun	county
-guntō	archipelago
-hama	beach
-hana	point
-iwa	rock
-jima	island
-kai	bay, gulf, sea
-kaikyō	strait
-kawa	river
-ken	prefecture
-ko	lake
-kō	harbor
-mine	mountain
-misaki	cape
-mori	forest, mountain
-nada	sea
-numa	lake, pond
-rettō	island chain
-saki	cape
-sammyaku	mountain range
-san	mountain
-sawa	swamp, stream
-se	shoals, rapids
-seto	strait
-shima	island
-shotō	island group
-suidō	channel
-take	mountain
-taki	waterfall
-tō	island
-tōge	mountain pass
-umi	bay, gulf
-ura	inlet, beach
-wan	bay
-yama	mountain
-zaki	cape
-zan	mountain
-zawa	swamp, stream

CONVERSION GRAPH
Meters / Feet

30 Miles
20
25
15
10
5
0
5

GRID DECLINATION 1°09'E
GRID DECLINATION 1°43'E
GRID DECLINATION 1°07'E
GRID DECLINATION 1°41'E

1 220 000 Yards

A. M. S. L571

First Edition 1943

Prepared under the direction of the Chief of Engineers, U. S. Army, by the Army Map Service (LU), U. S. Army, Washington, D. C., 1943. Compiled from Japan 1:50,000, Japanese Imperial Land Survey, (1933-34). Japan 1:200,000, Japanese Imperial Land Survey, Tsushima, (1921). All place names transcribed according to the Modified Hepburn (Romaji) System.

LEGEND

Cities over 100,000 Population
" 20,000-100,000 "
" 5,000-20,000 "
Towns 1,000-5,000 "
Villages 1-1,000 "

Width
Primary Highways 24 ft. or more
Improved Roads 18 ft. to 24 ft.
Unimproved Roads 6 ft. to 18 ft.
Trails under 6 ft.
Boundary: Ken (Prefecture)
Boundary: Gun (County)
Lighthouses
Rice
Radio Broadcasting Stations RSO
Other Radio Stations RNO

Railroads: Standard Gauge 3'6"
Double Track
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Single or Double Track
Topographic Control Points
Triangulation Points
Elevations 250

Aeronautical Information

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7°15' OR 129 MILS — 1°25' OR 25 MILS — MAGNETIC NORTH

APPROXIMATE MEAN DECLINATION 1943
FOR CENTER OF SHEET
ANNUAL MAGNETIC CHANGE 1' INCREASE

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Scale 1:250,000

5 0 5 10 Miles
5 0 5 10 15 Kilometers
5000 0 5000 10000 15000 Yards

POLYCONIC PROJECTION

TEN THOUSAND YARD WORLD POLYCONIC GRID, BAND IIIN, ZONE "C"
THE LAST THREE DIGITS OF THE GRID NUMBERS ARE OMITTED

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PREPARED BY U. S. GEOLOGICAL SURVEY
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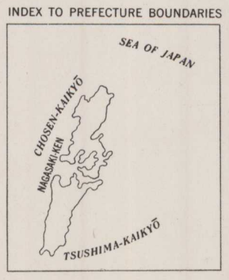

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4-45 1943

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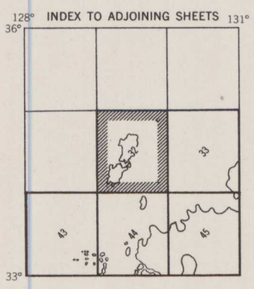

TSUSHIMA, CENTRAL JAPAN
N3400-E12900/100

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TSUSHIMA

FIRST EDITION - AMS 1

SOILS
SHEET 32

Commonly Well-drained Alluvial Soils.	Map Unit	Suitability for Engineering Purposes
	1 Sand, gravelly sand, and sandy gravel of narrow beaches: Underlain, at several feet depth, by shattered or solid rock.	Good: Suited for stabilization; will compact best when excessively wet. Can be used as a borrow material to improve quality of other soils.
	2 Gravelly clayey silt: Underlain, at a few feet depth, by coarse sorted alluvium.	Fair to poor: Sum of silt and clay may exceed 1/5 of the soil mass. Maintenance of drainage important during rainy season. Suited for compaction and stabilization, when sand is added.
	3 Stony gravelly loam: Underlain, at 1 to 2 feet depth, by shattered or solid rock or by coarse alluvium.	Fair: Excessive amount of stone and dense vegetation in places interfere with excavation; drainage may need to be provided during rainy season. Can be stabilized readily after the ground is cleared.
Mountains.	4 Stony sandy clay: Underlain, at varying depth, by unweathered rock, commonly of moderate hardness.	Poor to fair: Commonly poorly graded fairly plastic soil. Suited for compaction and stabilization but requires very careful moisture control during compaction. Much leveling is commonly needed. Boulders and dense vegetation make excavation difficult in many places.
Well-drained Soils of	5 Shallow stony loam: Underlain, at a few inches depth, by unweathered rock commonly of moderate hardness. Much bare rock exposed.	Not considered for engineering purposes, because of shallow depth, stoniness, and relative inaccessibility.

Reliability: fair

Soil Trafficability (Suitability for Cross-country Movement)

Reliability: fair

Map Unit	October–March Moderate rain; moderate humidity; cloudy; cool Dec.–March; very cool Feb.	April and May Increasing rain; increasing humidity; very cloudy in May; moderately warm.	June–September Heavy rain; fairly high humidity; very cloudy June – Aug. warm; very warm in August.
1 Commonly firm sand, gravelly sand, and sandy gravel: Small narrow bare marine beaches. Good beach ESE of Sao-saki.	Fair to good	Fair to good	Fair to good
2 Gravelly clayey silt: Fairly level parts of stream valley of very small extent.	Fair	Fair	Poor Subject to floods; drainage probably poor in many places.
3 Stony gravelly loam: V-shaped narrow stream valleys and some coastal slopes. Movement may be impeded by boulders and vegetation.	Fair to poor Probably fairly loose surface; may be dry between rains.	Fair to poor Subject to floods, surface may dry rapidly between rains.	Fair to poor Wet soil probably not very slippery. Subject to floods.
4 Stony sandy clay: Fairly steep wooded slopes. Movement impeded by large rocks and dense vegetation.	Fair in small clear areas Surface firm when dry.	Fair to poor Surface may require 1 or 2 days to dry after a moderately heavy rain.	Poor to impassable Also very poor footing because of wet slippery soil; muddy under traffic.
5 Shallow stony loam: Mountains and extremely steep slopes. Many rock outcrops. Movement impeded by rugged topography and vegetation.	Impassable to vehicles; footing may be fair on mountain trails.	Impassable to vehicles; footing increasingly poor on trails as the rainy season approaches.	Impassable to vehicles; footing very poor on trails; slippery soil, despite good drainage.

CONVERSION GRAPH

Meters: 3,000 2,500 2,000 1,500 1,000 500 0
Feet: 10,000 9,000 8,000 7,000 6,000 5,000 4,000 3,000 2,000 1,000 0

30 Miles 25 20 15 10 5 0 5

1 220 000 Yards

GLOSSARY

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-daki	waterfall
-fuji	mountain
-gawa	river
-gun	county
-guntō	archipelago
-hama	beach
-hana	point
-iwa	rock
-jima	island
-kai	bay, gulf, sea
-kaikyō	strait
-kawa	river
-ken	prefecture
-ko	lake
-kō	harbor
-mine	mountain
-misaki	cape
-mori	forest, mountain
-nada	sea
-numa	lake, pond
-rettō	island chain
-saki	cape
-sammyaku	mountain range
-san	mountain
-sawa	swamp, stream
-se	shoals, rapids
-seto	strait
-shima	island
-shotō	island group
-suidō	channel
-take	mountain
-taki	waterfall
-tō	island
-tōge	mountain pass
-umi	bay, gulf
-ura	inlet, beach
-wan	bay
-yama	mountain
-zaki	cape
-zan	mountain
-zawa	swamp, stream

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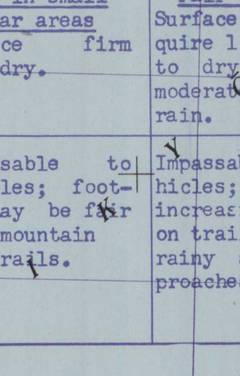

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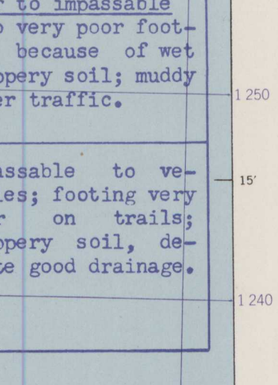

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TSUSHIMA

SOURCES OF CONSTRUCTION MATERIALS
SHEET 32

FIRST EDITION-AMS 1

CONVERSION GRAPH
Meters / Feet

30 Miles

SEA OF JAPAN

KAMIAGATA

SHIMOAGATA

TSUSHIMA

Mitsu-shima
Uni-shimo
Ebi-shima
Kunoshita-saki
Oni-saki
Shirahama-saki
Saba-saki
Onitsura
Toyo
Izumi-wan
Izumi
Kawachi
Nishitsuya
Hitakatsu
Nishitomari-wan
Sao-saki
Sasuna-kō
Sasuna
Tsuwahara
Jōdono-saki
Shinaki-shima
Tsuwa-ura
Shūshi-wan
Goneo
Usu-saki
Tanohama
Ina-saki
Kin-zaki
Shakushi-se
Nita-wan
Shishiiki-kō
Shishiiki
Ashima
Hitoi
Oshika
Miura
Shitoke
Hori-saki
Mine-wan
Kasa
Yoshida
Kamabuta-se
Nagasaki-hana
Yokoura
Karasu-saki
Kaiguchi
Karasu
Kaitsuna
Nobu
Yoshiga-ura
Aka-shima
OKINO-SHIMA
Ō-GUCHI (Channel)
ASAU-WAN
Gō-saki
Hirufeura
Kamiyoze
Kuro-shima
Miura-wan
Origuchi-saki
Imasaki
Kusuba
Ō-furukoshi
Ōta-saki
Tsunakake-saki
Ōno-saki
Neo-shima
Kamoda
Ōkaji-saki
Tsurumo-saki
Yara-saki
Kamitsuki
Kuroshima
Ō-saki
Tsutsuga
Agami
Tatsuno-saki
Kiwa
Tsutsu
Kaneo
Tsutsu-saki
Naiin-shima
TSUTSU-WAN
Kō-saki

CONSTRUCTION MATERIALS
Reliability: Fair

Hard rock for construction is scarce on Kamiagata, abundant on Shimoagata. Easily accessible only in the developed areas on the east side of Shimoagata, around Izuhara. Most of the bedrock on the islands is not suitable for construction purposes. Sand and gravel are limited to small beaches and along lower courses of larger streams. The hills are heavily forested; oak for heavy or light construction is everywhere available.

1 — ABUNDANT HARD ROCK: Hard, granular, brittle rocks. Excellent for all construction purposes. Quarrying requires considerable drilling and blasting. Readily accessible only on east coast of Shimoagata; at least one quarry known to be located near Izuhara.

2 — LITTLE HARD ROCK: Interbedded sandstone and soft, layered rock (shale). Sandstone locally may be suitable for riprap and fill but is generally weathered and friable, not satisfactory as construction material. Shale probably not usable for any purpose.

3 — SAND AND GRAVEL: Limited quantities available from stream beds and small beaches. Sand generally interlayered with gravel; satisfactory for fill and subgrades. Most sand probably of poor quality, not suitable for concrete mix.

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-iwa	rock
-jima	island
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-ko	lake
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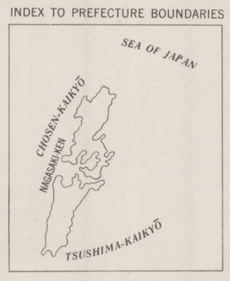

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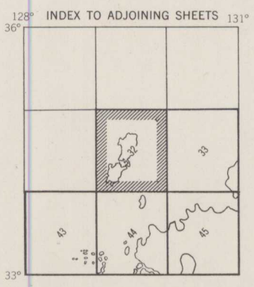

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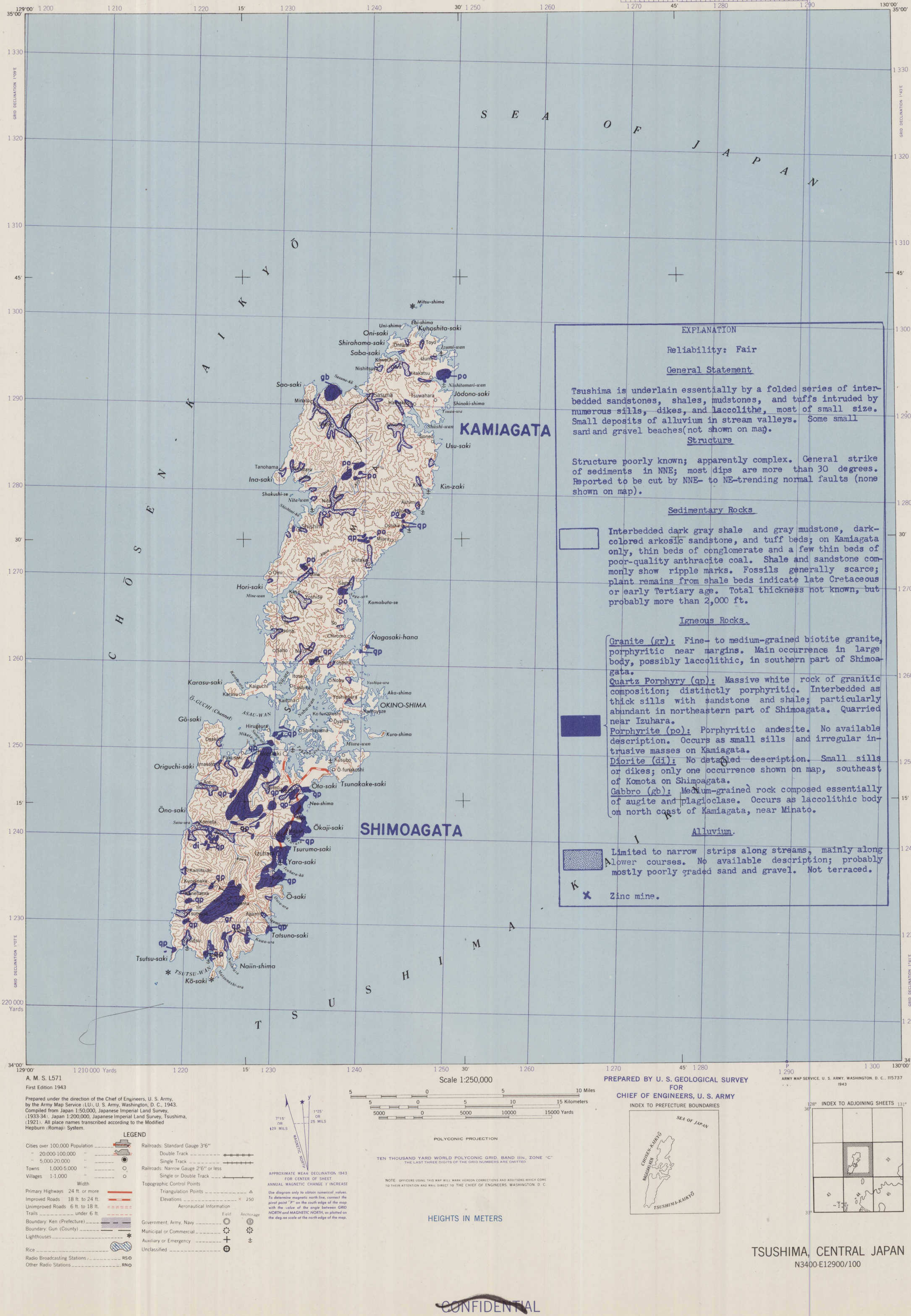
GEOLOGY
SHEET 32

TSUSHIMA

FIRST EDITION - AMS 1



CONVERSION GRAPH

Meters	Feet
3,000	10,000
	9,000
2,500	8,000
	7,000
2,000	6,000
1,500	5,000
1,000	4,000
	3,000
500	2,000
	1,000
0	0

30 Miles · 25 · 20 · 15 · 10 · 5 · 0 · 5

GRID DECLINATION 1°09'E

GRID DECLINATION 1°43'E

GRID DECLINATION 1°07'E

GRID DECLINATION 1°41'E

EXPLANATION

Reliability: Fair

General Statement

Tsushima is underlain essentially by a folded series of interbedded sandstones, shales, mudstones, and tuffs intruded by numerous sills, dikes, and laccolithe, most of small size. Small deposits of alluvium in stream valleys. Some small sand and gravel beaches (not shown on map).

Structure

Structure poorly known; apparently complex. General strike of sediments in NNE; most dips are more than 30 degrees. Reported to be cut by NNE- to NE-trending normal faults (none shown on map).

Sedimentary Rocks

Interbedded dark gray shale and gray mudstone, dark-colored arkosic sandstone, and tuff beds; on Kamiagata only, thin beds of conglomerate and a few thin beds of poor-quality anthracite coal. Shale and sandstone commonly show ripple marks. Fossils generally scarce; plant remains from shale beds indicate late Cretaceous or early Tertiary age. Total thickness not known, but probably more than 2,000 ft.

Igneous Rocks.

Granite (gr): Fine- to medium-grained biotite granite, porphyritic near margins. Main occurrence in large body, possibly laccolithic, in southern part of Shimoagata.

Quartz Porphyry (qp): Massive white rock of granitic composition; distinctly porphyritic. Interbedded as thick sills with sandstone and shale; particularly abundant in northeastern part of Shimoagata. Quarried near Izuhara.

Porphyrite (po): Porphyritic andesite. No available description. Occurs as small sills and irregular intrusive masses on Kamiagata.

Diorite (di): No detailed description. Small sills or dikes; only one occurrence shown on map, southeast of Komota on Shimoagata.

Gabbro (gb): Medium-grained rock composed essentially of augite and plagioclase. Occurs as laccolithic body on north coast of Kamiagata, near Minato.

Alluvium.

Limited to narrow strips along streams, mainly along lower courses. No available description; probably mostly poorly graded sand and gravel. Not terraced.

Zinc mine.

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