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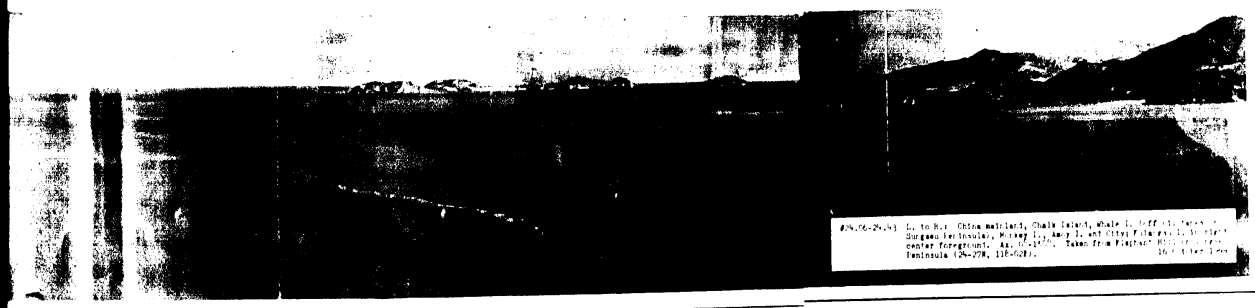
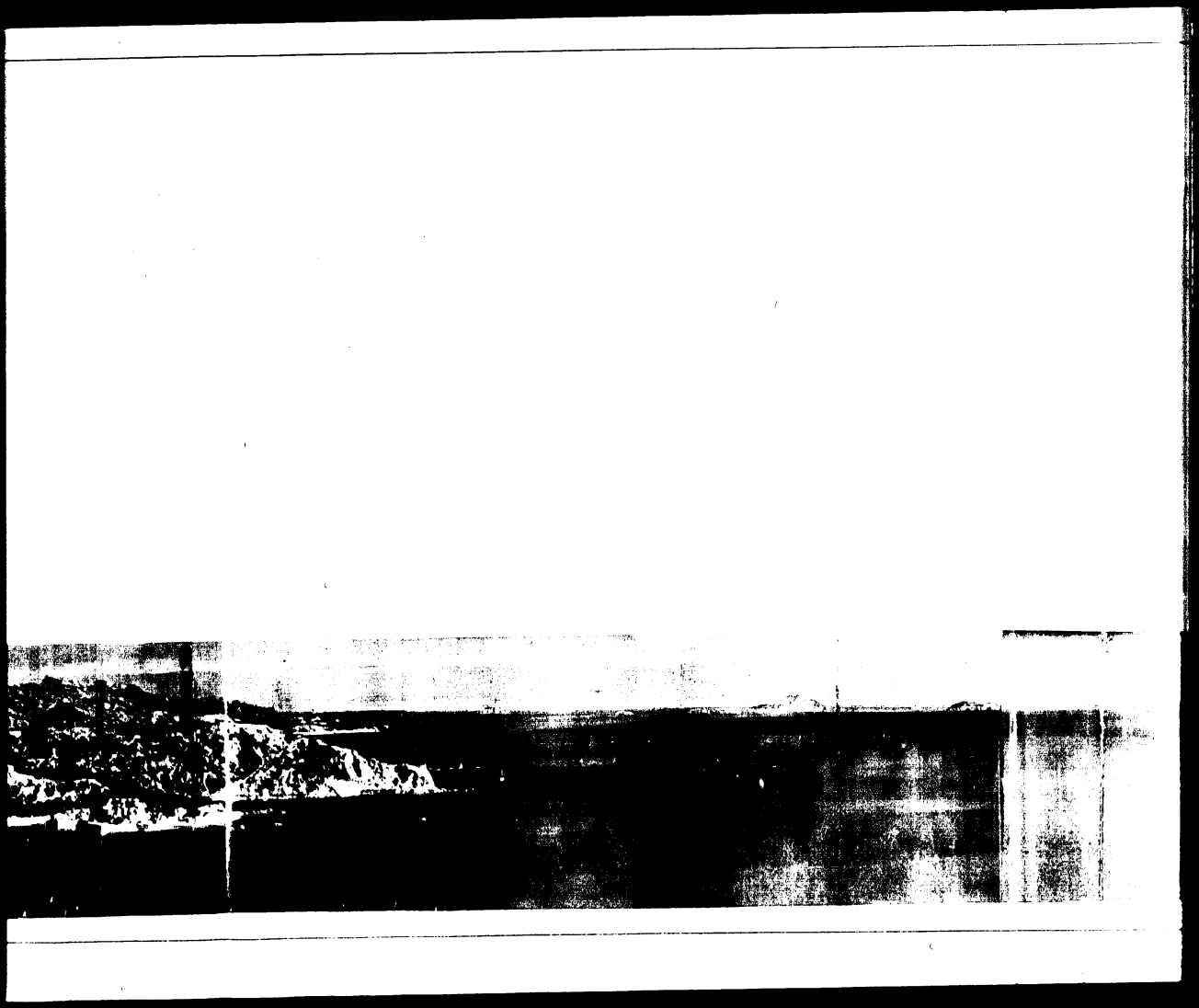
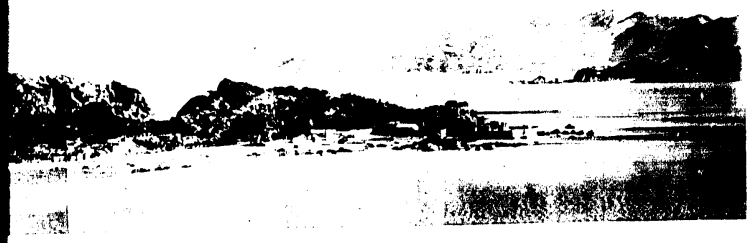
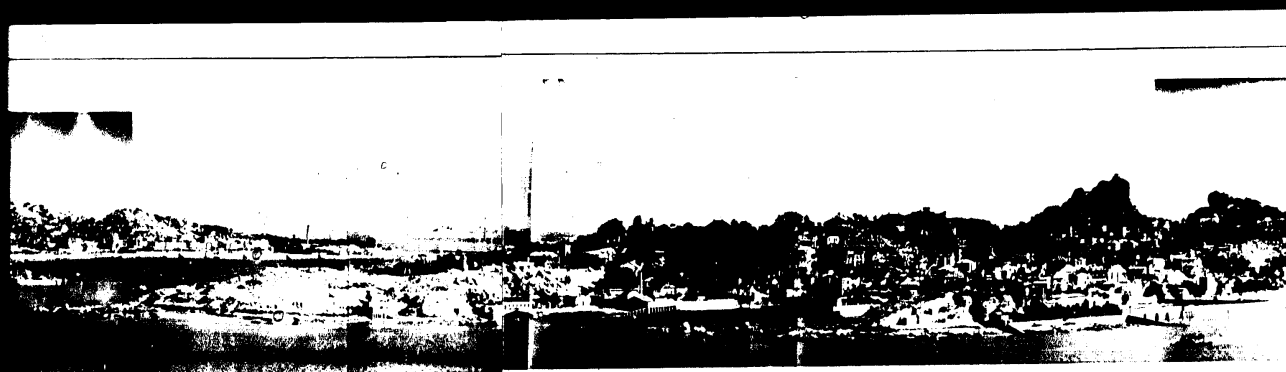


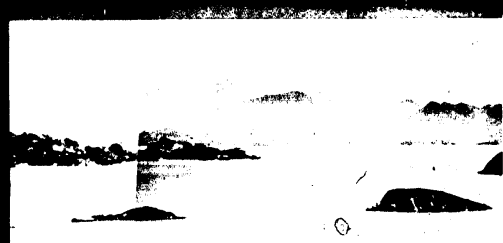
#24.06-24.43 L. to R.: China mainland, Chalk Island, Whale I. (off [illegible] Surgeon Peninsula), Monkey I., Amoy I. and City; Kulangsu I. in right center foreground. Ax. [illegible]. Taken from Elephant Hill [illegible] Peninsula (24-27N, 118-62E). 16 October [illegible]



#23.80-24.01 Amoy City, Amoy Inner Harbor, and Kulangsu I. from Whale I. (24-28N, 118-03E); Az. 82°-102°. 15 October 1944







#2[illegible] Army City, lower Harbor and Kalangsu I. in background; Chalk Islands center right foreground; and Whale I. extreme right. Az. 13[illegible]-18[illegible]. From China mainland 124-30N, 118-02E. 16 October 1944

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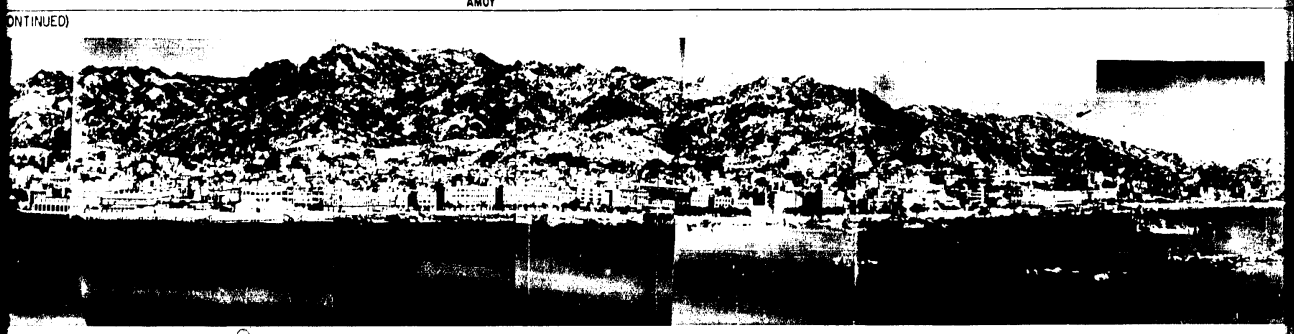

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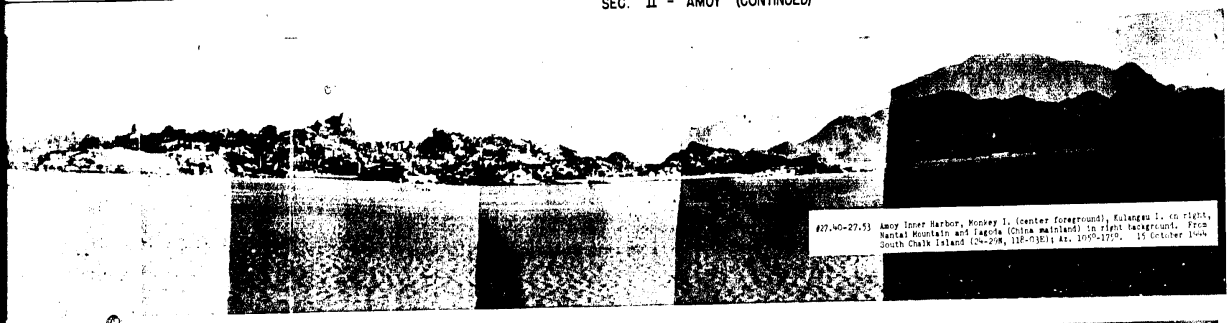
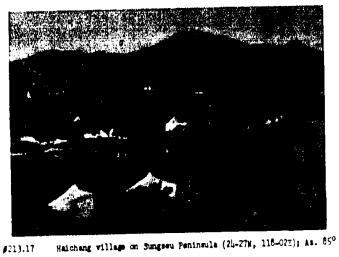
SEC. II - AMOY (CONTINUED)

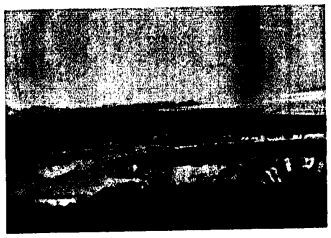


#27.40-27.53 Amoy Inner Harbor, Monkey I. (center foreground), Kulangsu I. (on right, Nantal Mountain and Pagoda (China mainland) in right background. From South Chalk Island (24-29N, 118-03E); Az. 105°-175°. 15 October 1944



#213.17 Haichang village on Sungseu Peninsula (24-27N, 118-02E); Az. 85°

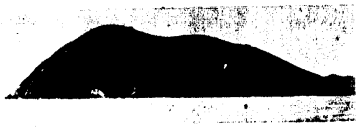
#211.35 China Coast from Eang Be Eang Creek to Suabe (Tipan Point) 24-27N, 118-03E; Az. 95°.



#213.18 View of Amoy Outer Harbor from Haitsang village on Sungseu Peninsula (24-27N, 118-01E); Az. 120°.

#212.24 - 212.25 Entrance to Amoy Outer Harbor from 3 miles offshore in a moving junk. Wu Seu I. on extreme left; Tai Tan I. left center; Steven I. on right; Amoy I. in background. Az. 130° - 360°.

#213.62 and #213.64 Hou Tse Shan on Amoy Island - Hoshan Air Field (24-30N, 118-03E); Az. 80°.



#213.18 Whale Island from junk offshore 100 yards; Az. 225°.

#213.40 and #213.42 Kan Pu village on China Mainland opposite Hoshan Field (24-30N, 118-02E); Az. 270°.

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Pictures Not Shown on Layout Plan

PAN-PAMAS

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146.	Partially destroyed bridge - Chuan-Ch'ao.	2[illegible]
147.	Partially destroyed bridge - Chuan-Ch'ao.	2[illegible]
148.	Partially destroyed bridge - Chuan-Ch'ao.	2[illegible]
149.	Partially destroyed bridge - Chuan-Ch'ao.	2[illegible]
150.	Partially destroyed bridge - Chuan-Ch'ao.	2[illegible]
*223-230	Fast from Quemoy Harbor, from off the coast of Quemoy; Az. [illegible]	[illegible]
231-236	Little Quemoy; Az. [illegible]	[illegible]
236-238	Off coast Little Quemoy I.; Az. 35.	[illegible]
239	Bu Sew Island - China Coast and Amoy in background - from 1 mi. offshore; Az. [illegible]	[illegible]
240-258	Bu Sew Island and China Coast; Az. [illegible]	[illegible]

NOTES ON INDEX NOS. 106 - 258 and 519 - [illegible]

(1) All the above photos were taken from a moving launch at a distance of from 1 to 2 miles from the shoreline, unless noted otherwise.

(2) All sizes the listed are approximate.

(3) Many single photos were taken of the same subject, but may have slightly varying viewpoints.

SEC. II - AMOY (CONTINUED)

7. Construction Effort and Time Element.

(a) The Amoy Area offers no unusual construction problems, as it has favorable terrain and soil conditions.

(b) With the exception of administration, housing and warehouse facilities now on Amoy and Kulangsu, all facilities pertinent to a major fleet base will have to be constructed. All airfields with their administrative and housing requirements will have to be built. In order to supply nine airfields including Air Force personnel, sustain 5000 tons daily to interior China, and supply an estimated 100,000 defense and staging troops, it is necessary to construct a 3,600' dock at Sungsu, a 5,400' dock at Ohtau and a 3,000' dock at Wei-t'ou. In addition, dolphins for tankers and pipe lines should be constructed at Sungsu and Wei-t'ou. All roads with a good percentage of the bridges in the area have been destroyed; practically all of these will have to be restored. This includes 175 miles of roads within AREA "J"; the rehabilitation of supply roads including necessary construction troops to the interior beyond the limits of AREA "J" are covered under Section II-H-3.

(c) It is estimated that 33 construction battalions or their equivalent will be required to construct necessary facilities including naval base, docks, airfields, roads, bivouac areas and do necessary dredging--in a period of 120 days. A subdivision of work is listed below:

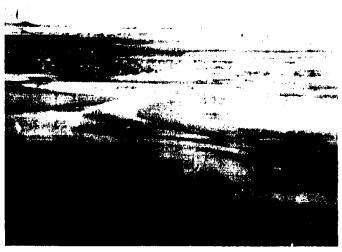
	Battalions
(1) Shi; docks and interior supply facilities	9
(2) Naval base installations	6
(3) Nine airfields, including Amoy Island	9
(4) Perimeter, internal supply roads and bivouac areas	6
(5) Dredging	1
(6) Stevedore	3
Total	33

#2625 Asiatic Petroleum Company oil installations on Sungsu Peninsula.

8. Resources, Facilities and Labor.

(a) Throughout the entire area, sand and stone can be had in abundance, while some unsized gravel, brick and lime can be obtained in limited quantities. Cement and timber will have to be brought in as none is available in the area. The only timber available is that deep in the mountains, 100 miles from the coast and difficult to bring out. All construction materials with the exception of aggregate, sand and limited quantities of brick and lime will have to be brought in. Agricultural resources are poor; little food for supplemental rations can be obtained as the main crops are sweet potatoes and peanuts. Ample water supply can be obtained from wells and streams, but purification units are needed as no water is safe for drinking purposes. The mainland telephone and telegraph lines and the few power plants are inadequate to meet any new demands.

(b) Local labor is available; some are skilled in the cutting of stone, etc., for footings and base, but for the most part should be considered as unskilled. For a rating on Labor see Supplementary Data (III-E).



#2487-(2,487) Chumbi Beach at I.N.

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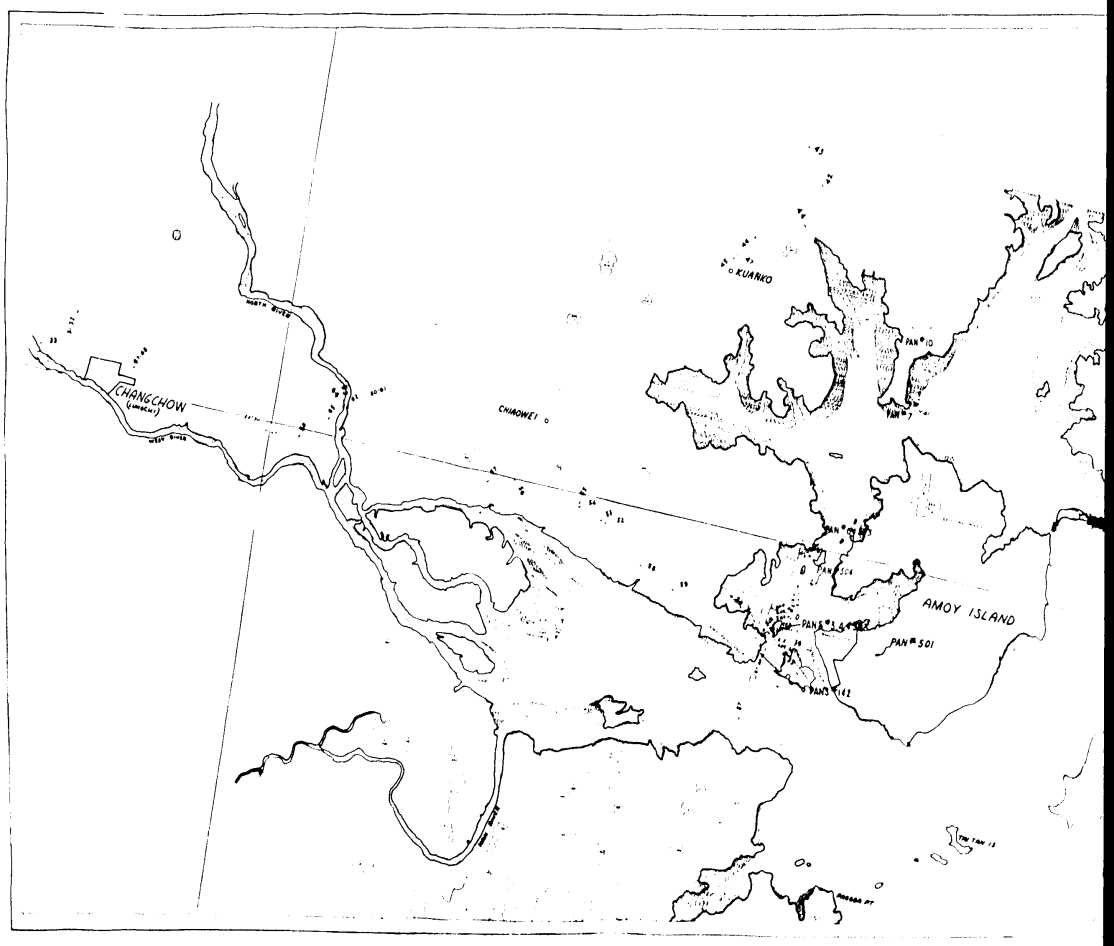

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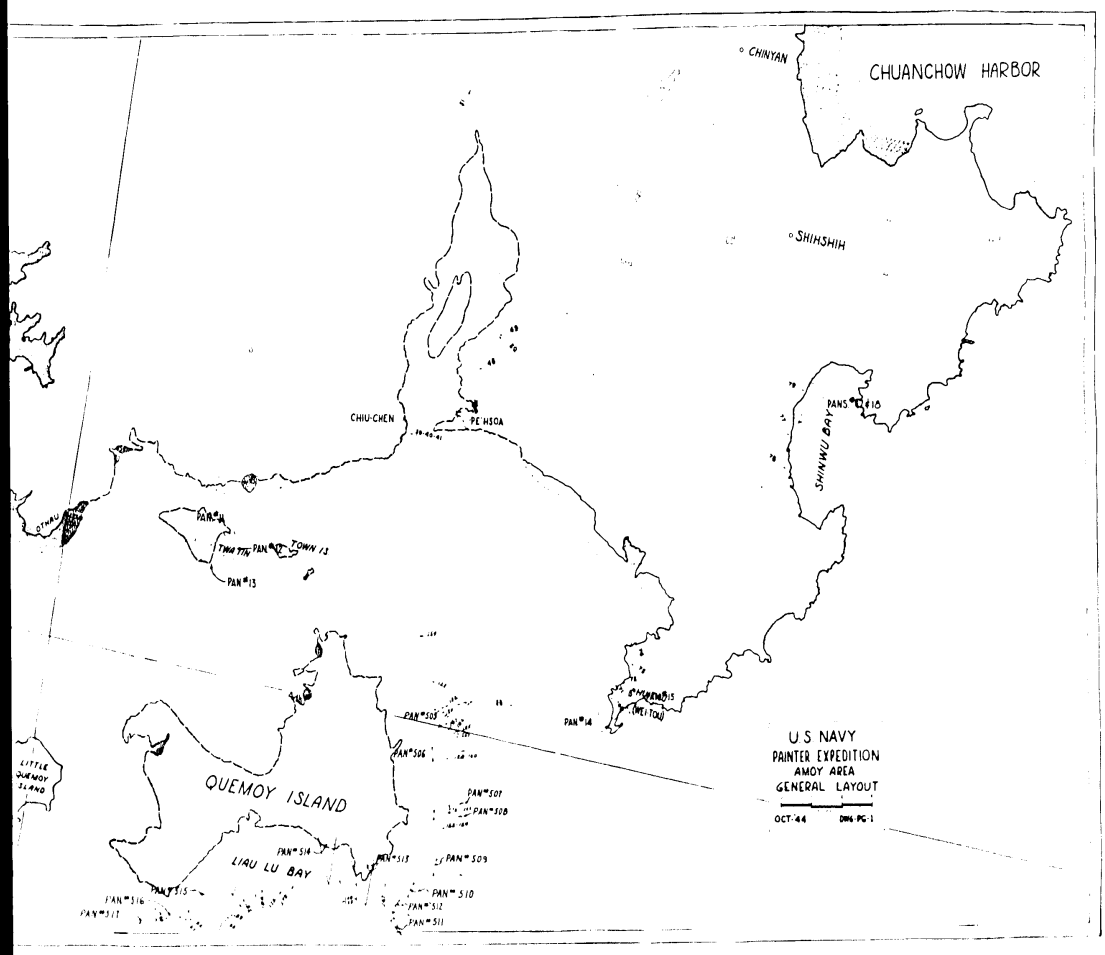
Approved For Release 2003/04/23 : CIA-RDP78T05439A000200180013-9



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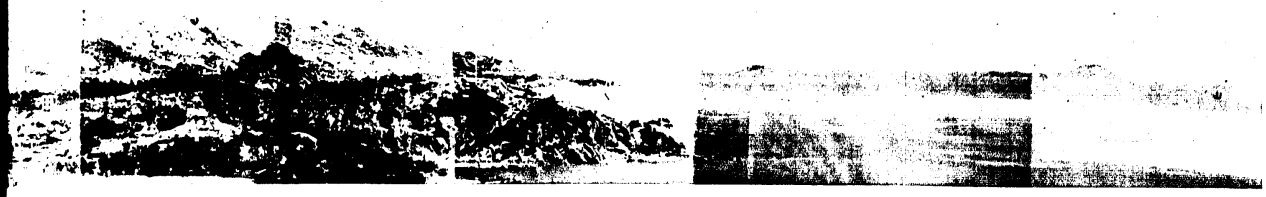
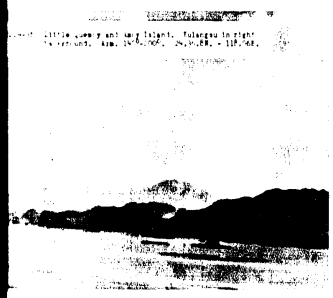
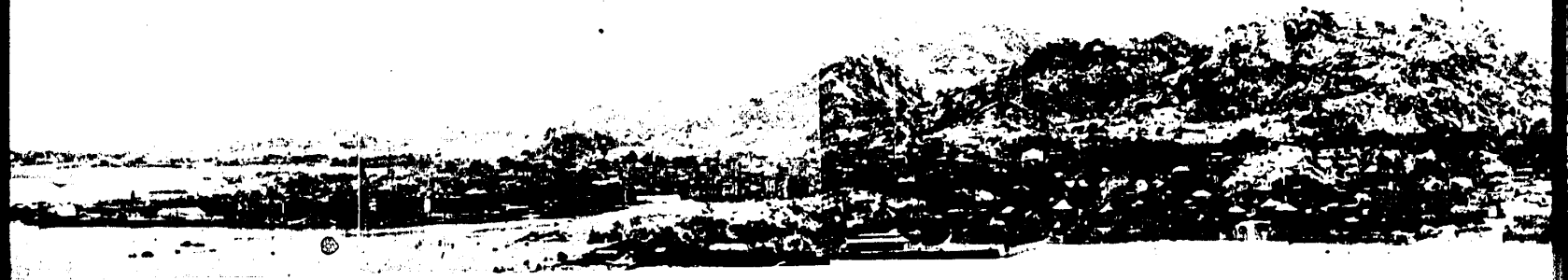
Approved For Release 2003/04/23 : CIA-RDP78T05439A000300180013-9

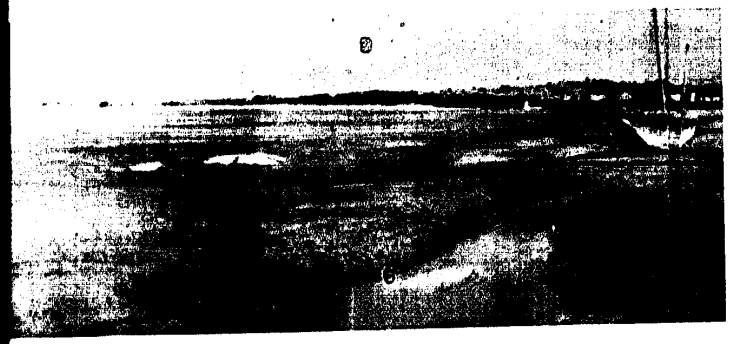
#2198-2219 Whale Is, Amoy and Fulangsu.
Azm. 32°-118° 24.27 N. - 118.02 E.

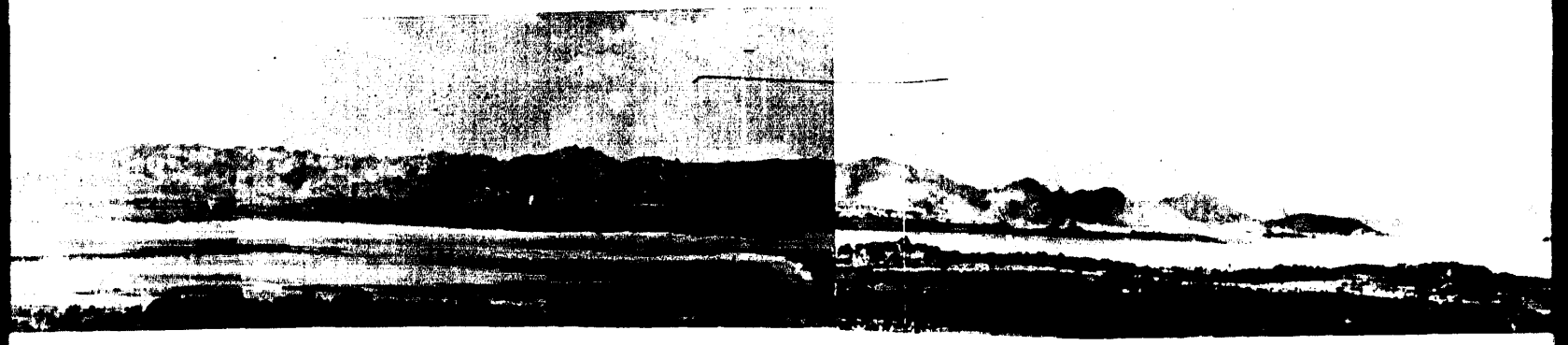


Little Quemoy and Amoy Island. Fulangsu in right
background. Azm. 14°-206°. 24.30.8N. - 118.06E.

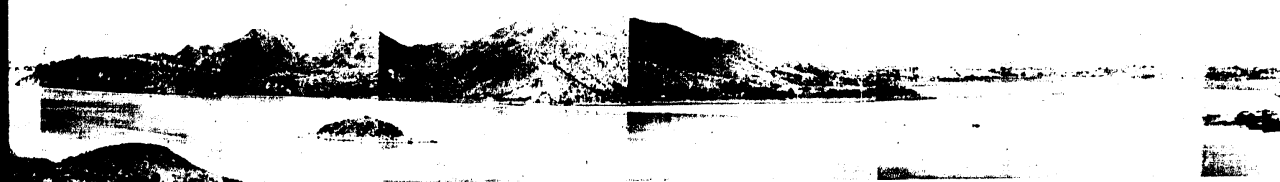




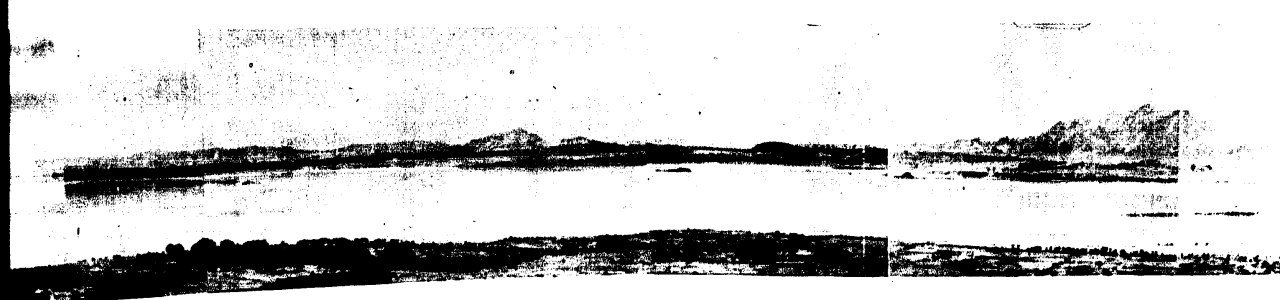




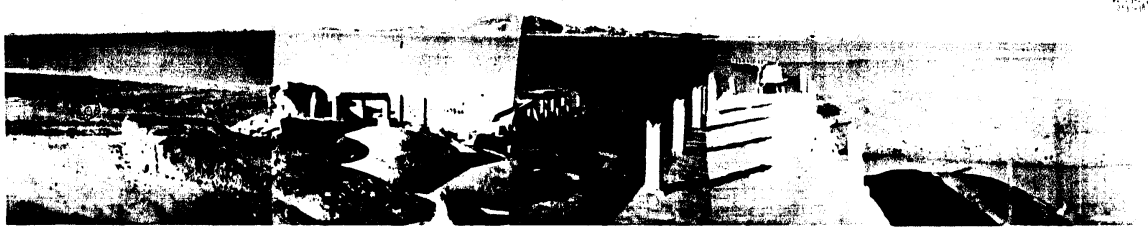
SEC. II - AMOY (CONTINUED)

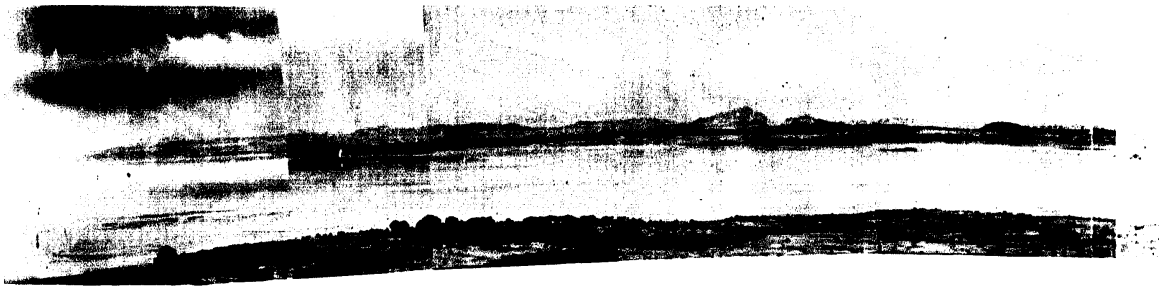


#2723-2', 2532-38 Old Wharf and Beach at Othau. Azm. 260°-340°. 24.32 N. - 118.19.2 E.



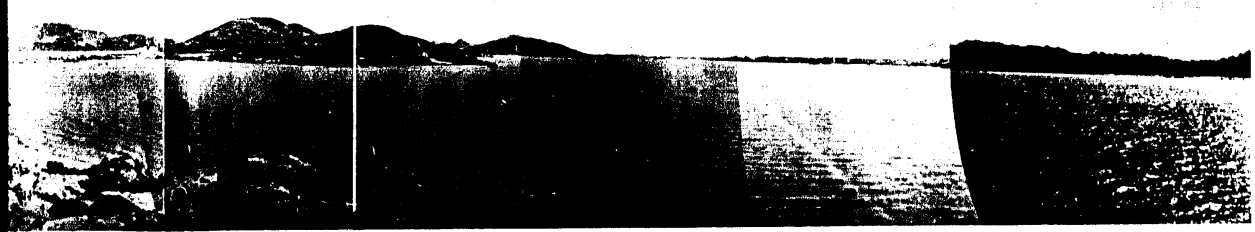
SEC. II - AMOY (CONTINUED)



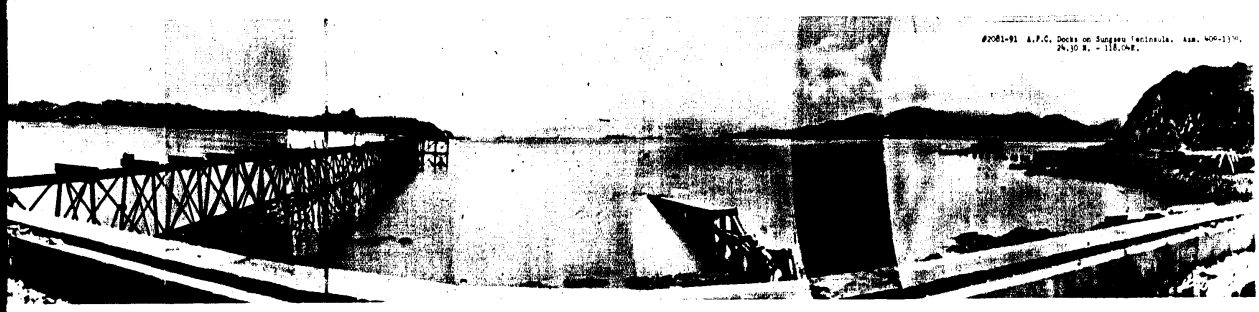


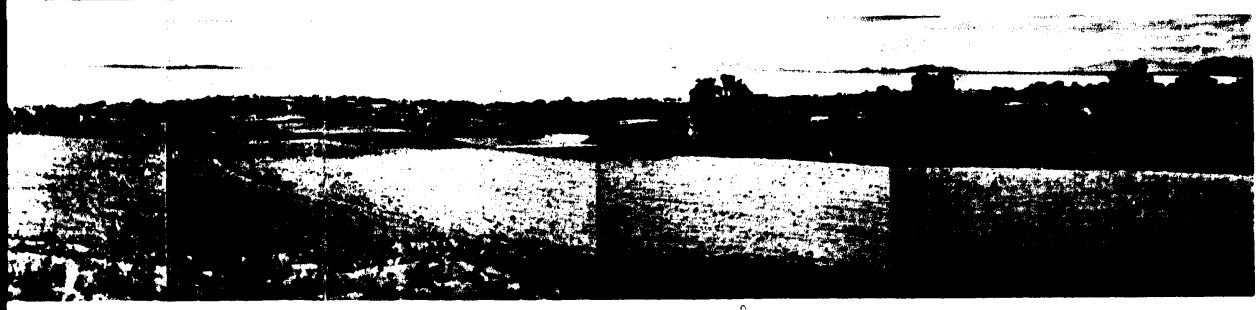
SEC. II - AMOY (CONTINUED)

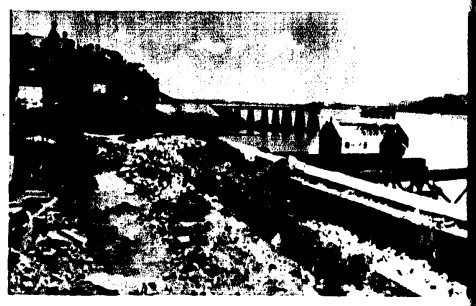
#2568 & 2579-84 Section of A.P.C. Dock on Sungseu Peninsula and Whale Island. Azm. 320°- 40°. 24.30N - 118.04E.

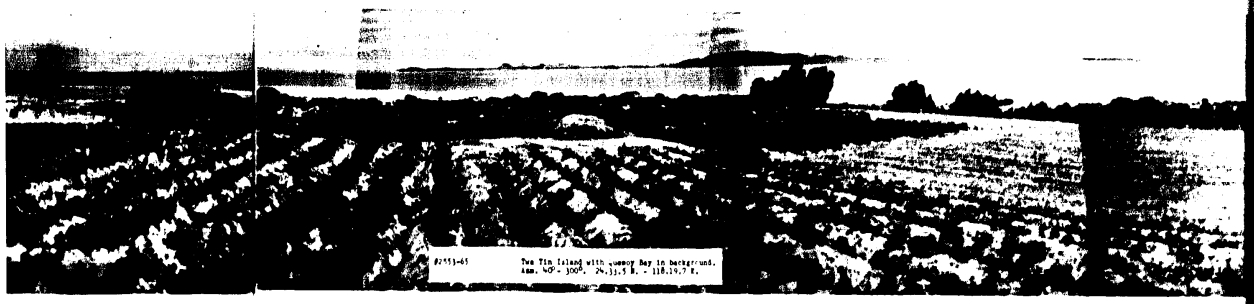


#2081-91 A.P.C. Docks on Sungseu Peninsula. Azm. 40°-130°. 24.30 N. - 118.04E.









#2553-65 Two Tin Island with Quemoy Bay in background. Azm. 40°- 300°. 24.33.5 N. - 118.19.7 E.

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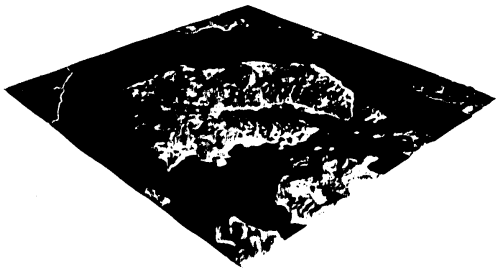
4. Amoy Model. From the North.

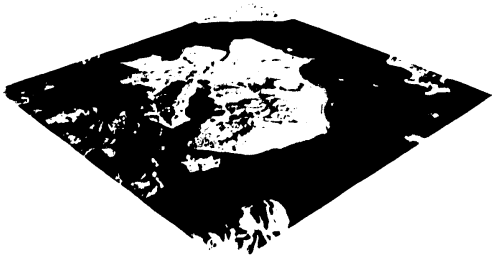
1. Amoy Model. From the South.

2. Amoy Model. From the East.

3. Amoy Model. From the West.

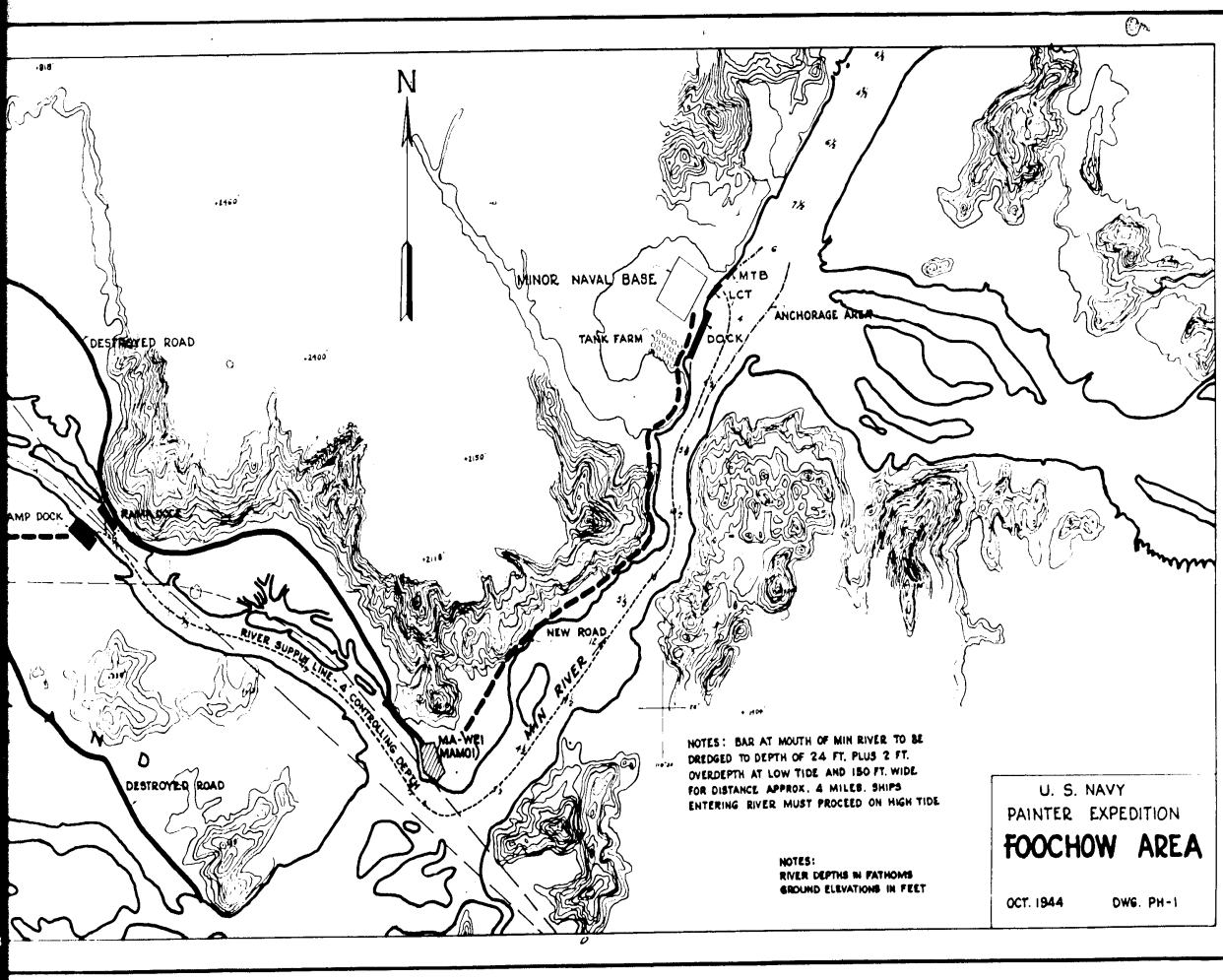


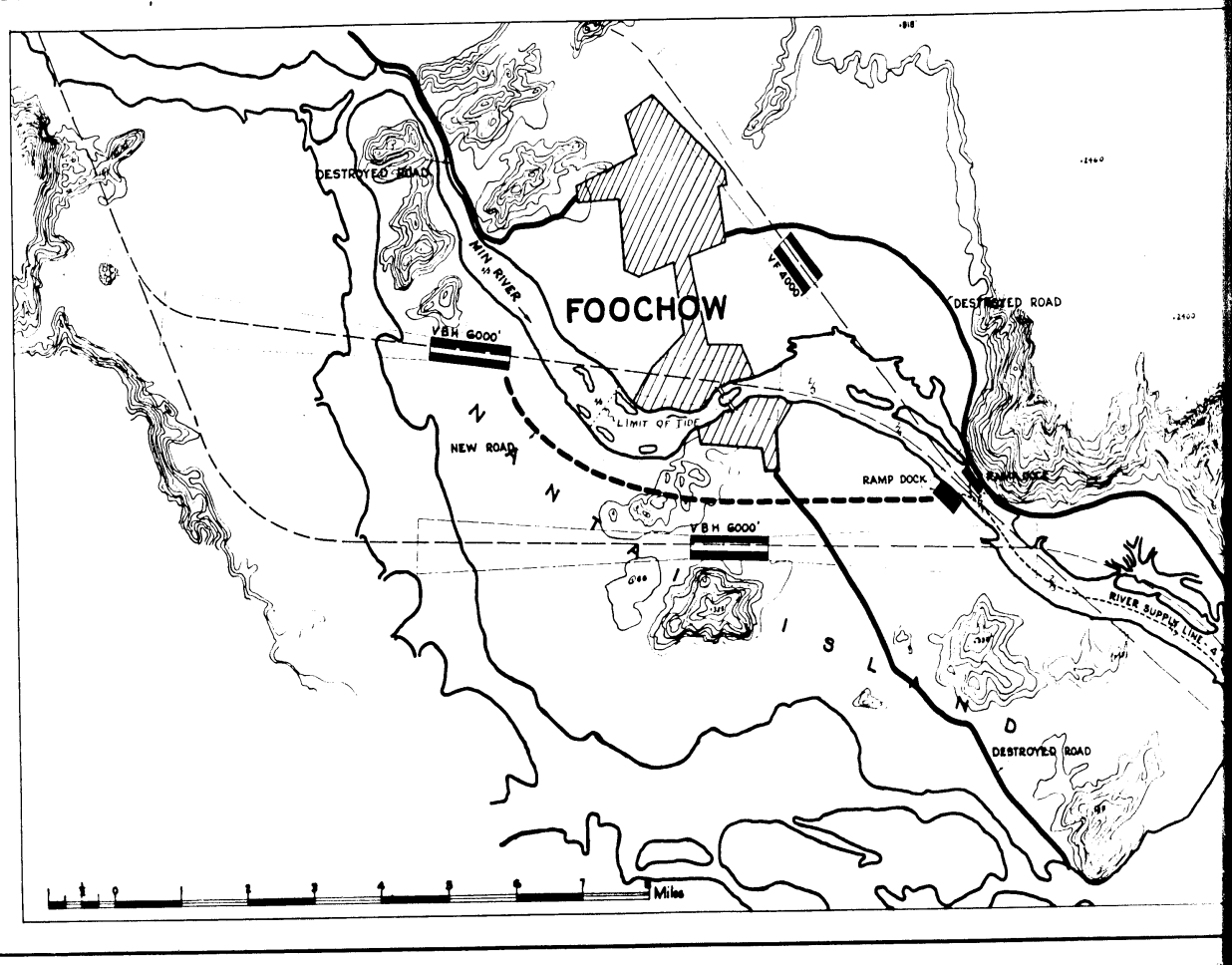
6. Amoy Model. From the Northwest.



5. Amoy Model. From the Southwest.

Approved For Release 2005/04/25 : CIA-RDP78T05439A000300180013-9





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H. OTHER AREAS

1. Foochow.

General

Foochow, a city of 400,000 population, is located on the Min River approximately 33 miles from the China Sea. The area adjacent is generally flat with a few hills, and is surrounded by mountains. It offers favorable terrain and a waterway route suitable for constructing, operating and supplying air bases and a minor naval base accommodating small naval craft including PT boats and medium-sized cargo ships. This area could be used in connection with and support of proposed installations at Samsa Inlet, which is approximately 90 nautical miles to the north.

(a) Anchorage.

(1) Anchorage of 24 feet located approximately 20 miles downstream from Foochow provides ship anchorage, from which supplies could be distributed to each of the area activities. Vessels navigating to and from the anchorage must have pilots and should move on high tide because of shifting sands and silting at the mouth of the river. (Reported 14' over bar at L.W.) Some dredging in small areas at the river mouth will be required to produce a more satisfactory and permanent approach from the sea. Supplies and equipment imported from other bases can be transferred to lighter craft and transported to the proposed air bases during early stages of occupation and until such time as an overland route can be provided.

(2) The river from Ma-wei to the west end of Nantai Island, by way of Foochow, is limited to the use of shallow draft boats drawing up to 4' of water. Moderate dredging of the several bars within this stretch will deepen the channel to 10', permit the operation of larger craft and facilitate movement of supplies.

(b) Fleet Base.

This area is not suitable for the operation of a major fleet base.

(c) Air Bases.

(1) Certain parts of the terrain on Nantai Island are suitable for construction of two VBH airbases, each with two parallel runways. Approach zones and glide angles meet standard requirements and construction could be accomplished within a short time. Although the sites are of sandy, loamy material, covered with rice paddies, there is an abundance of granite, gravel and sand in nearby hills for use in surfacing the runways and taxiways. Kapok was, fuel and other critical materials can be dispersed in the adjacent hilly ground. Adequate space is available for construction of administration, operation and housing facilities. The distance from these sites to Samsa Inlet is approximately 66 air miles.

(2) A suitable VF airfield site is located just south and east of Foochow. At this location the Chinese formerly constructed and operated a fighter field of two short runways which have since been destroyed and covered with rice paddies. Two parallel runways could be constructed from available granite and river gravel.

(d) Supply and Base for Interior China Operations.

The area is not suited to the development of a supply base for supply operations to interior China. (See Section II, AREA "D" and Section II-H-3).

(e) Beaches and Landing Areas.

(1) Being a river port, beaches for the most part are non-existent. The river has formed a delta and bar which meanders to some degree but is fixed by Woga, Sharp Peak and Wufu Islands. The North Channel is the customary ship entrance, the South Channel being very silted and constantly shifting. Mei-wa, a village approximately one mile west of Sand Peak Pt. and north of Sand Peak mountain, is apparently suitable for a landing. The Japs landed here on September 27, 1944 in their latest attack on Foochow. Photos will show the area to the east of Sand Peak Pt. as shoal and unsuitable for landing craft. The beach west of Hiuto (8 miles south of Sand Peak Pt.) appears ideal for a landing on a rather extensive scale. No good roads exist from here inland, but foot troops could move across the country.

(2) The Japanese also landed at Lien Chiang, about 15 miles by destroyed road from Kwantao (2½ miles west of Woga Creek). Inasmuch as they occupied Sharp Peak Island beforehand, their landings were carried out without too much difficulty, although the Chinese garrisons ashore put up minor resistance.

7. From Pagoda Anchorage looking north. Destroyed piers at Lawei. 31.30.

(3) Within the river itself, landings at jetties and small docks all along the river are available. In Foochow itself, pontoons and landing stages are available. (See Photo.)

(f) Ease of Military Occupation and Defense.

(1) Occupation: Due to the report of enemy artillery on the islands in the mouth of the Min River, it appears desirable to land north and south of the river until this artillery can be silenced. Beaches south at Hiuto and north at Lien Chiang appear the most feasible landing areas. The enemy strength in the area as of 28 Oct. is reported to be 10,000 Japs and 7,100 puppets. These are probably dispersed over quite a wide area from Foochow to Lien Chiang.

(2) Defense: Once the enemy is cleared out of the area, the danger of an inland attack would be minimized as the only large concentrations of enemy troops (aside from water reinforcement from Formosa) are in the northern area and in Central China. A coastal land route is non-existent, and in order to move troops from inland the Japanese would have to capture the inland highway system and proceed down the Min River. The road from Chien-ou to Foochow is destroyed.

(g) Construction Effort and Time Element.

(1) Construction involves the following facilities, none of which present any unusual construction problems:

a. Construction of two (2) VBH and one (1) VF airbases with all necessary appurtenances.

b. Restoration of approximately 30 miles of destroyed road and 30 miles of new roads.

c. Construction of a minor naval base including docks, tank farm, storage, etc.

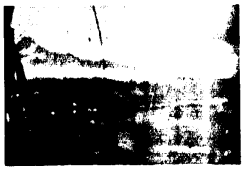
d. Dredging approximately 400,000 cubic yards of material.

(2) It is estimated that 8 construction battalions will require 120 days to complete the facilities listed above.

(h) Resources, Facilities and Labor.

There is an unlimited supply of hard granite rock, decomposed granite, river gravel and sand. Brick and lime in limited quantities can be produced in the several villages. Cement, timber, and electric power are not available. All skilled labor, equipment, supplies, accessories and materials (except rock, gravel and sand) must be imported. A large supply of common labor is available from Foochow and its environs.

8. From Pagoda Anchorage looking east - Stockpiled oil drums, fuel tanks and go-downs. 31.32-31.35



9. Min River below Foochow looking east above Pagoda Anchorage. 34.33

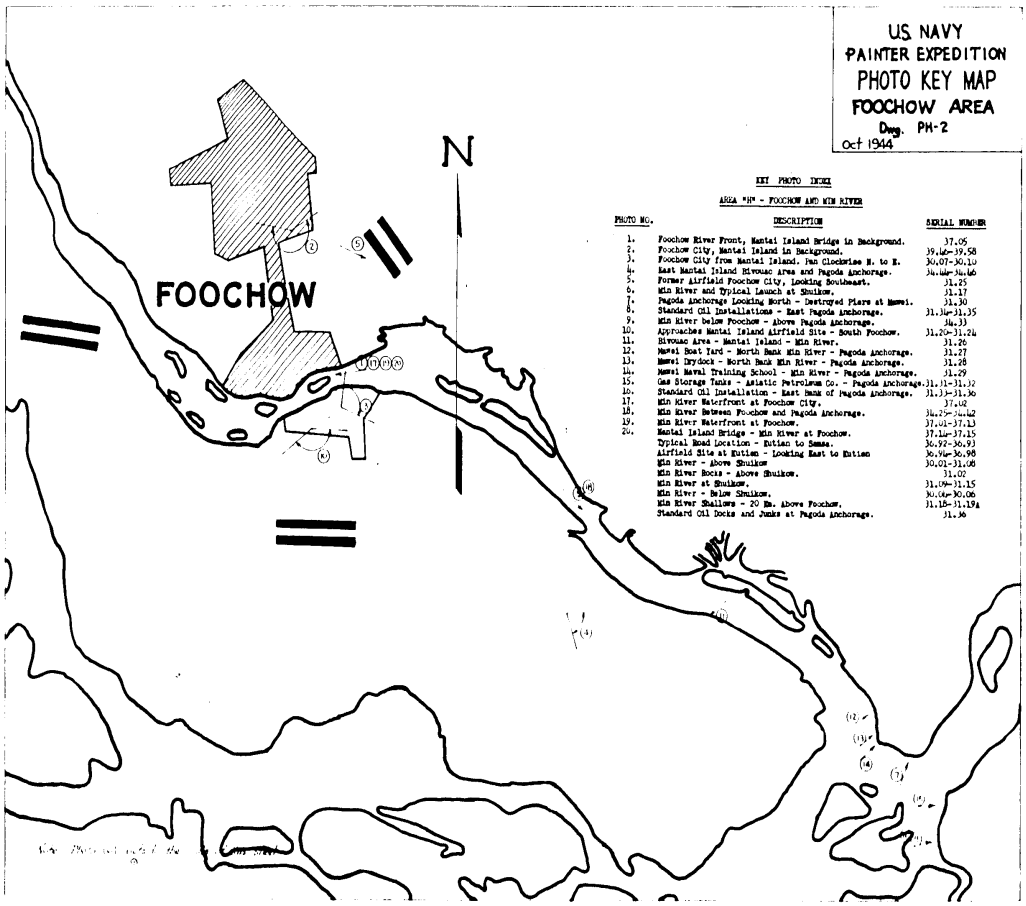
ity from Nantai Island -
kwise 10-100 #30.07-30.10

SEC. II - FOOCHOW (CONTINUED)

2. Foochow City, Min River & Nantai Island in background. Pan clockwise E. to W. #39.46-39.58

4. East end of Nantai Island Bivouac Area and Pagoda anchorage - pan clockwise N/E to S/E. #34.44-34.46

Foochow City from Nantai Island - Pan clockwise 10-100 #10.07-10.10



KEY PHOTO INDEX

AREA "H" - FOOCHOW AND MIN RIVER

PHOTO NO.	DESCRIPTION	SERIAL NUMBER
1.	Foochow River Front, Mantai Island Bridge in Background.	37.05
2.	Foochow City, Mantai Island in Background.	39.46-39.58
3.	Foochow City from Mantai Island. Pan Clockwise N. to E.	30.07-30.10
4.	East Mantai Island Bivouac Area and Pagoda Anchorage.	34.44-34.46
5.	Former Airfield Foochow City, Looking Southeast.	31.25
6.	Min River and Typical Launch at Shuikow.	31.17
7.	Pagoda Anchorage Looking North - Destroyed Piers at Mawel.	31.30
8.	Standard Oil Installations - East Pagoda Anchorage.	31.34-31.35
9.	Min River below Foochow - Above Pagoda Anchorage.	34.33
10.	Approaches Mantai Island Airfield Site - South Foochow.	31.20-31.24
11.	Bivouac Area - Mantai Island - Min River.	31.26
12.	Mawel Boat Yard - North Bank Min River - Pagoda Anchorage.	31.27
13.	Mawel Drydock - North Bank Min River - Pagoda Anchorage.	31.28
14.	Mawel Naval Training School - Min River - Pagoda Anchorage.	31.29
15.	Gas Storage Tanks - Asiatic Petroleum Co. - Pagoda Anchorage.	31.31-31.32
16.	Standard Oil Installation - East Bank of Pagoda Anchorage.	31.33-31.36
17.	Min River Waterfront at Foochow City.	37.02
18.	Min River Between Foochow and Pagoda Anchorage.	34.29-34.42
19.	Min River Waterfront at Foochow.	37.01-37.13
20.	Mantai Island Bridge - Min River at Foochow.	37.14-37.15
	Typical Road Location - Eutien to Sensa.	30.92-30.93
	Airfield Site at Eutien - Looking East to Eutien	30.94-30.98
	Min River - Above Shuikow	30.01-31.08
	Min River Rocks - Above Shuikow.	31.02
	Min River at Shuikow.	31.09-31.15
	Min River - Below Shuikow.	30.04-30.06
	Min River Shallows - 20 Km. Above Foochow.	31.18-31.19A
	Standard Oil Docks and Junks at Pagoda Anchorage.	31.36

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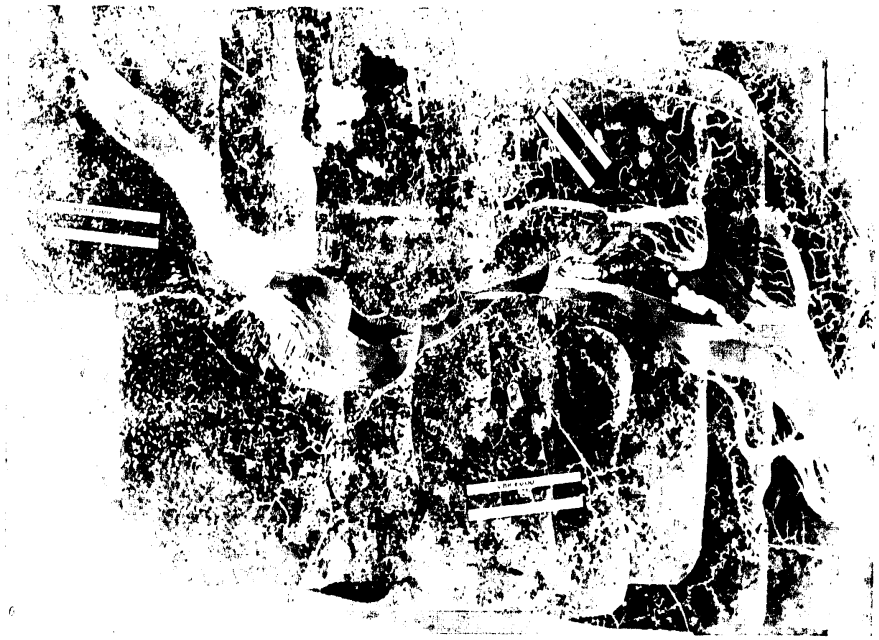
SEC. II - FOOCHOW (CONTINUED)



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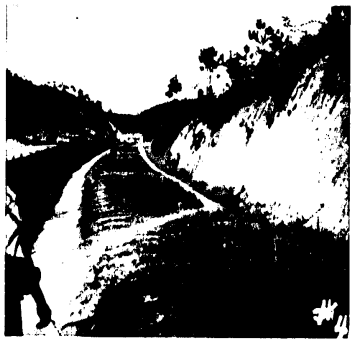
SEC. II - H-2. RAILWAY REHABILITATION (CHEKIANG-KIANGSI RR.)

2. Railroad Rehabilitation (Chekiang-Kiangsi R.R.)

(a) The only railroad in the region is the Chekiang-Kiangsi Railroad, located in the northerly portion of the area surveyed. (See Drawings No. PH-3 and PH-4.) This road was originally constructed as a single-track standard-gauge modern railway connecting Hang-hsien (Hangchow-30°-15'N, 120°-10'E) with Ch'ang-sha (28°-12'N, 112°-58'E), a distance of 612 miles; connecting Hangchow with Shanghai, a distance of 124 miles; and connecting Hangchow with Yin-hsien (Ningpo), a distance of approximately 100 miles. The Hangchow - Tsao-e section of the Hangchow-Ningpo line, approximately one-half the distance, was never fully completed.

(b) The railway was constructed to good standards with 1% maximum grades and a minimum radius of 650 feet, the sharp curves occuring in the first 30 miles west of Hangchow. The grading, drainage and bridges are of high quality, and for the part examined between Ch'u-hsien and Shang-jao, in a remarkably good state of preservation.

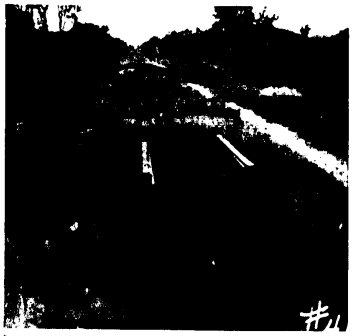
(c) The railway was destroyed by the Chinese some years ago, but certain sections have been rehabilitated and placed in operation. Intelligence reports indicate that the Japanese have the section in operation from Shanghai to Hangchow and from Hangchow to Chin-hua (Kinhwa - 29°-06'N, 119°-42'E) (plus a branch to Wu-I). It is reported that the combination railway-highway bridge across the Ch'ien-t'ang River at Hangchow has been rehabilitated by the Japanese and was in operation when observed on 10 October 1944. The section from Lung-yu to Chiang-shan is "destroyed", while the section from Chiang-shan to a point 18 miles west of Shang-jao (total 71 miles) is operated as a standard-gauge line by the Chinese. (See Photographs.) It is reported that the remaining line to the west is destroyed.



#41.03 "Destroyed" section of Railway. Ch'u-hsien - Chiang-shan Section.

#41.14 Stranded Locomotive at Ch'u-hsien

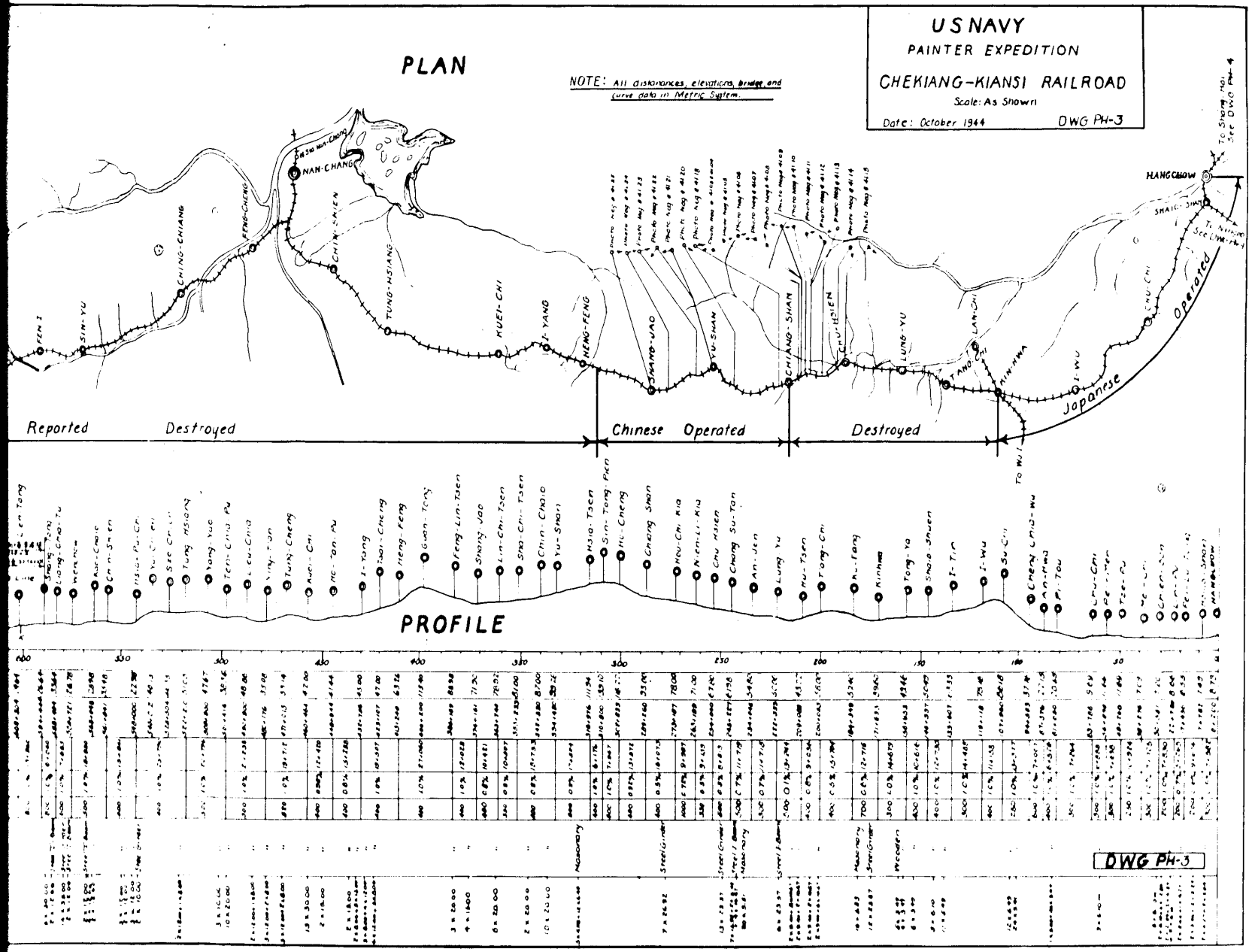
#41.04 Typical destruction in a cut. Ch'u-hsien - Chiang-shan Section.



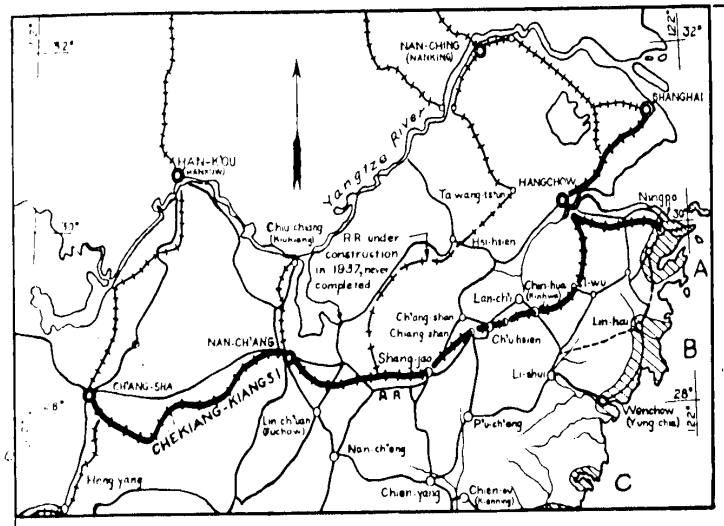
#41.05 Typical Destruction in Fill. Ch'u-hsien - Chiang-shan Section.

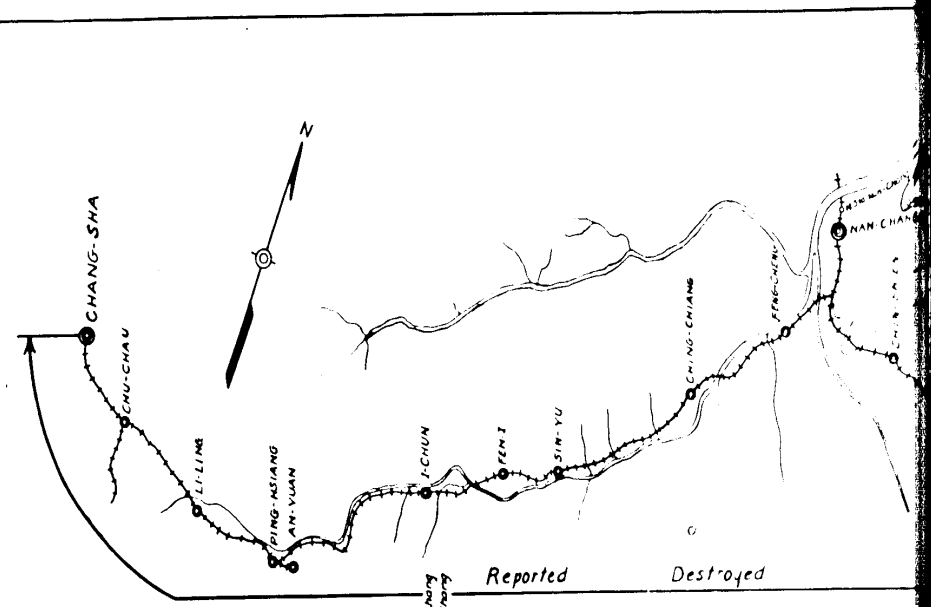
#41.06 "Destroyed" section of Railway. Ch'u-hsien - Chiang-shan Section.

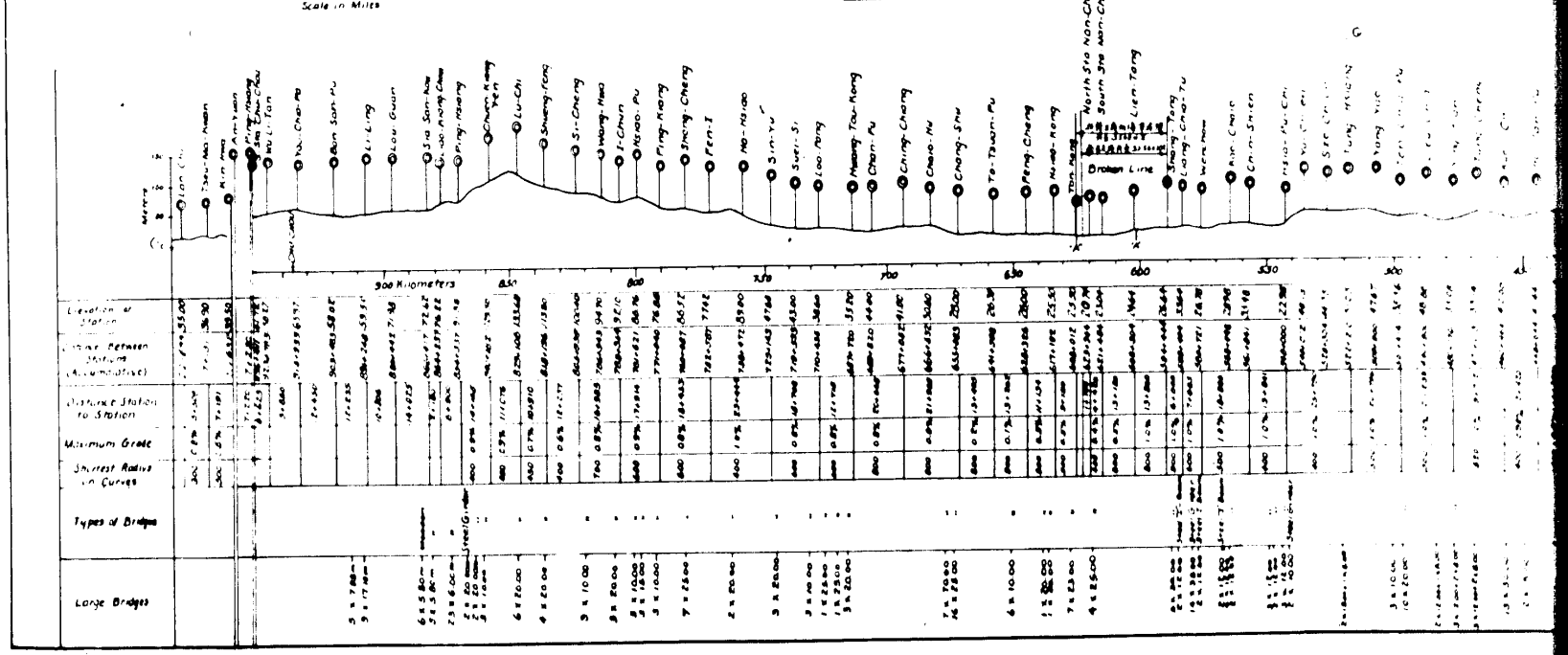
#41.12 Close-up View of destroyed RR Bridge. Ch'u-hsien - Chiang-shan Section. Less bridge shown in page [illegible] #41.[illegible]



U S NAVY
PAINTER EXPEDITION
CHEKIANG-KIANSI RAILROAD
Scale: As Shown
Date: October 1944
DWG PH-3
PLAN
NOTE: All distances, elevations, bridge and curve data in Metric System.
NAN-CHANG
HANGCHOW
Reported
Destroyed
Chinese Operated
Destroyed
Japanese Operated
PROFILE
DWG PH-3


NAN-CHING (NANKING)
SHANGHAI
HAN-KYOU
Yangtze River
Ta wang tsun
HANGCHOW
Ningpo
Chu chang (Kiukiang)
RR under construction in 1937, never completed
Hsi-hsien
Chan-hua
Lan-ch'i
Ch'ang shan
Chiang shan
Ch'u hsien
Lin-hau
NAN-CH'ANG
Shang-jao
Li-shui
CHANG-SHA
CHEKIANG-KIANGSI
Lin ch'uan (Fuchow)
Pi'u-ch'eng
Wenchow (Yung chia)
Nan-ch'eng
Hsing yang
Chien-yang
Chien-ou (Kienning)
A
B
C
KEY MAP
Scale in Miles


N
CHANG-SHA
CHU-CHAU
LI-LING
PING-HSIANG
AN-YUAN
I-CHUN
FEN-I
SIN-YU
CHING-CHIANG
FENG-CHENG
NAN-CHANG
Reported Destroyed


Broken Line
900 Kilometers
850
800
750
700
650
600
550
500
Elevation at Station
Distance Between Stations (Accumulative)
Distance Station to Station
Maximum Grade
Shortest Radius in Curves
Types of Bridges
Large Bridges

SEC II RAILWAY REHABILITATION (CONTINUED)

(d) The destroyed sections could be rehabilitated rapidly by experienced railway engineer troops, the "destruction" consisting of pits dug in the grade at intervals, and in the demolition of some steel bridge spans. Abutments are intact, generally. On the portion operated by the Chinese (Chiang-shan to Shang-jao), the condition of the grading is excellent, but ties, rails and ballast are poor and some bridges have been destroyed. Sidings are inadequate for length and no round houses, classification and freight yards have been provided in this operated section. Inadequate shop facilities are located at Shang-jao. Topography is favorable and such facilities could be provided easily. Present motive power and rolling stock is inadequate for operation.

(e) Rehabilitation would consist of filling the pits, rebuilding destroyed spans in timber, laying ties and rails, reballasting, constructing sidings, yards, shops, round houses, fueling stations, water supplies, signals, communications systems, freight buildings and other operating facilities. Rails, ties, telegraph poles, lumber, shop machinery, operating equipment, motive power and rolling stock would have to be imported from outside China.

(f) It is estimated that the rehabilitated line with the addition of motive power and rolling stock could handle 10,000 tons of freight each way per day.

(g) It is estimated that 10 battalions of specially trained and equipped railroad engineer troops plus available Chinese labor would require 180 days to rehabilitate the railway (and the parallel highway) from I-wu to Ch'eng-ma (540 miles) to a condition which will make it capable of handling 10,000 tons per day each way.

(h) It is estimated that between 475,000 and 540,000 tons of ocean shipping will be required to rehabilitate and equip the railway for operation, including locomotives, rolling stock, rail and accessories, ties, telegraph poles, shop machinery, power plants, cement, steel, lumber and piling. This tonnage does not include construction equipment and supplies for the construction forces.

(i) In the event that ARRA "A" (Wiarod Sound) is developed and Hang-hsien (Hangchow) is held by the enemy at the time of rehabilitation, it will be necessary to move this tonnage from seaport to I-wu and Chin-hua overland by highway, approximately 150 miles and 250 miles respectively. (See Drawing No. F-2). The construction of these highways is covered in the detailed description of ARRA "A".

(j) Estimates of the forces required to clear the railway and highway routes of enemy units from Shao-hsing (30°-01'N, 120°-17'E) to Ch'u-hsien (29°-00'N, 118°-56'E) is covered in Supplementary Data, (III-F). The Japanese also are in control of portions of the railway road bed east of Ch'eng-ma to (29°-17'N, 116°-10'E).

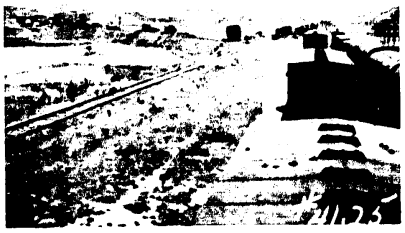
NOTES:

(1) O.S.S. Report (R. and A. #2379) dated 10 August 1944 states that an air photo taken June 1944 shows the Hang-hsien (Hangchow) - Yin-hsien (Ningpo) railroad entirely dismantled, the rail removed, no activity and the roadbed being used as a motor road.

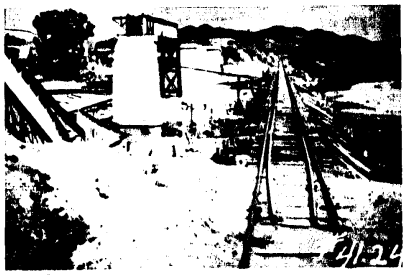
(2) The report also states that air photos show the following railway facilities at Chin-hua: Railroad yards 6 tracks wide and 3,000 feet long, one 75-foot turntable, one 3-stall round house, a turning Y and a freight house.

(3) Chinese intelligence reports that a railway was under construction in 1937 between Kuei-chi (26°-17'N, 117°-06'E) and Ta-Wang-Ta'un (30°-42'N, 119°-02'E) where it connected with the Nanking-Wuhu Railroad. The line followed a route via Fou-liang, Ch'i-men, Hsi-hsien and was never completed, although some sections had been graded and bridges constructed. The rail for the new line was removed and utilized on the Hunan-Kwelchow Railroad.

#1.11 Destroyed Railway Bridge. Ch'u-hsien - Chiang-shan Section.

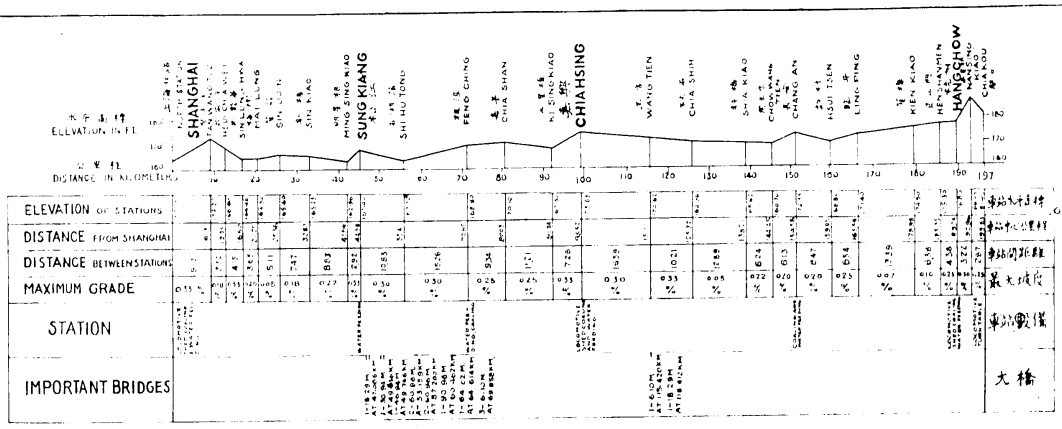


#1.85 Railway Yard at Shang-jao.

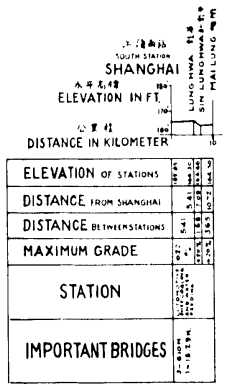


#1.84 View of destroyed bridge and by-pass, Chiang-shan - Shang-jao, Chinese-operated Section.

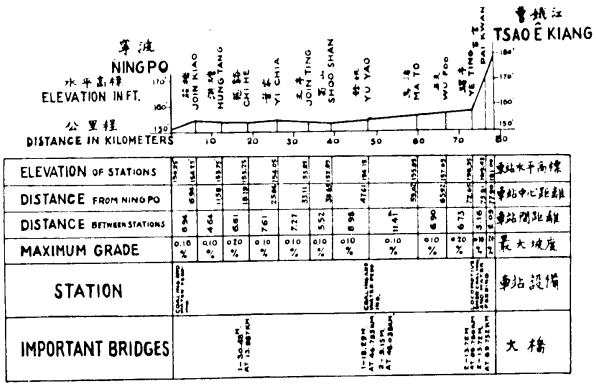
#1.83 Chinese-operated Section of Railway. Chiang-shan - Shang-jao Section.



滬杭段 SHANGHAI HANGCHOW R.R.



SOUTH STATION BRANCH LINE
OF SHANGHAI HANGCHOW R.R



YUNG-TSAO SECTION
OF HANGCHOW NINGPO R.R.

LEGEND

- RAIL ROAD
- RAIL ROAD STATION
- ROAD
- PROVINCIAL BOUNDARY
- LAKE

SCALE

U.S.NAVY
PAINTER EXPEDITION
CHEKIANG KIANGSI RAILROAD

SCALE AS SHOWN

DATE 11-1-44 DWG PH-4

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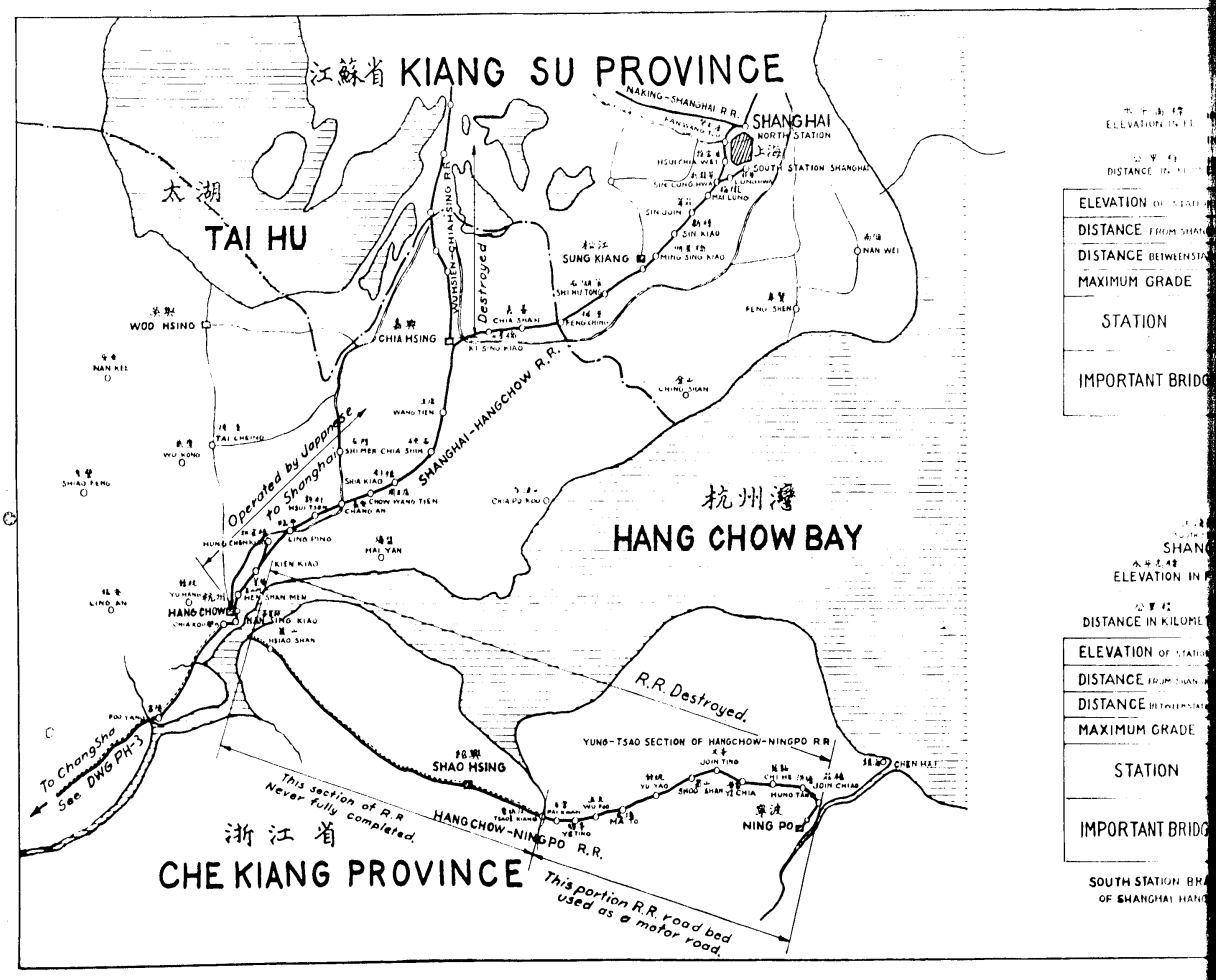

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SEC. II - H-3. HIGHWAY TRANSPORTATION

3. Highway Transportation.

(a) A highway system exists and is operating in East China today. Generally, the principal highway routes run north and south, with connecting east-west roads being located at intervals where topography is favorable. The principal routes are shown on Drawing No. PH-6.

(b) The present usable roads are graded 20 feet wide generally, and are capable of handling 500 tons per day if bridges are strengthened and minor repairs made. It is estimated that such repair work on the principal routes can be done with Chinese forces within 30 days which, in the initial phase of a military operation, would facilitate the early movement of construction equipment and essential military supplies. Generally, the restoration of destroyed roads to original width would present no problem to engineer troops with equipment.

(c) Personal reconnaissance indicates the feasibility of improving several routes to two-lane standard capable of handling 2,000 tons per day. Certain of these routes have been surveyed with a view toward their improvement and utilization for transporting supplies consigned to Chinese and Allied military forces from seaports to such interior areas as are suitable for training and staging troops. Four routes have been selected for consideration (see Drawing No. PH-6). In the selection of the routes and order of priority, attention was given to the adaptability of the seaport for quick development to handle cargo vessels and the directness of route to suitable interior areas. In the operation of the routes U.S. trucks should be made available.

(d) The connecting routes in the Amoy Area (24°-[illegible]'N, 110°-[illegible]'E) are treated under AREA "G"; and the routes connecting Mimrod Sound (29°-35'N, 121°-45'E) with the Chekiang-Kiangsi Railroad are treated under AREA "A". Necessary rehabilitation of the highway parallel to the Chekiang-Kiangsi Railroad would be done in conjunction with the reconstruction of the railway.

ESTIMATE

RESTORATION AND WIDENING EXISTING
HIGHWAYS TO TWO LANE STANDARDS
IN FOUR MONTHS TIME
CAPABLE OF HANDLING 2000 TONS EACH WAY PER DAY

Route	Length In Miles	Number of Troop (1,000 man) Battalions Required	-or-	Approximate* Number of Chinese Coolies Required
1	322	9		100,000
2	595	19		275,000
3	320	9		100,000
4	240	10		200,000
TOTALS	1,477	47**		675,000

*Assuming that U.S. trucks, stone crushing plants, sawmills, manufactured materials, and equipment operators will be made available to the Chinese. This figure should be supplemented by 5,000 U.S. construction troops to operate machinery.

**lb of above battalions also included in estimates for AREAS "D" and "G"

(e) A detailed description of proposed routes follows:

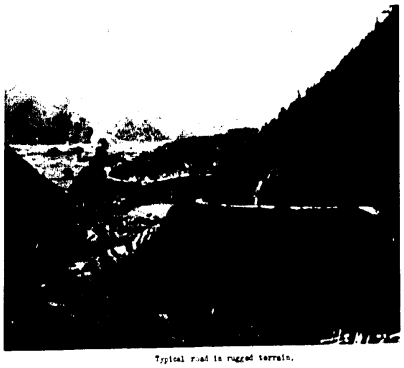
ROUTE 1: Lung-chi (Changchow 24°-32'N, 117°-33'E) to Kan-hsien (Kanchow 25°-50'N, 114°-54'E) .....Total, 322 miles.

General: Route 1 is the most direct supply route from the Amoy Area to suitable troop staging, training areas, and airfield sites located in the vicinity of the Kan-hsien territory. Supply can also flow over existing operative roads south toward Canton; to Ch'u-chiang (Kukong, 28°-38'N, 115°-52'E), where a junction is made with the Canton - Ch'ang-sha Railroad, and to points west; and north to Chi-an (Kian, 27°-04'N, 115°-00'E) and up to Nan-ch'eng (27°-34'N, 116°-40'E). Chinese junks and sampans operate on the Kan River principally northward toward Nan-ch'eng. Of the total distance of 322 miles, 52 miles have been "destroyed".

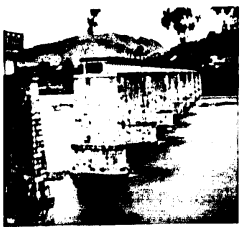
(1) Description: The route is located in easy country with easy curves and grades for 63 miles of the 66 mile distance from Lung-chi to Lung-yen, the remaining distance being in rugged terrain with sharp curves and heavy grades. Some realignment will be required to reduce grades and curvature to acceptable standards. From Lung-yen to P'eng-kou, 70 miles, the route is in easy country for 34 miles. The remainder is in rugged terrain and will require some realignment to reduce grades to 15% and curvature to acceptable standards. Of the 166 miles from P'eng-kou to Kan-hsien, 116 miles is in relatively easy country. The remaining distance, 48 miles, is in rugged terrain and requires some realignment to reduce grades to 15% and curvature to acceptable standards. (See photographs.)

(2) Airfield Sites Adjacent to Route: Between Lung-chi and Kan-hsien, sites suitable for fighter aircraft exist at Lung-yen and Chang-ting (Ting-chow), while 10 miles east of Chang-ting an undeveloped VHR site is available. At Lung-yen the field is unpaved; sub-surface drainage and operational buildings would have to be provided. At Chang-ting the field is operative on an emergency basis. Kan-hsien (Kanchow) is the hub of a cluster of four existing airfields.

#1.51 Typical road in valley near Lung-yen Fukien Province.

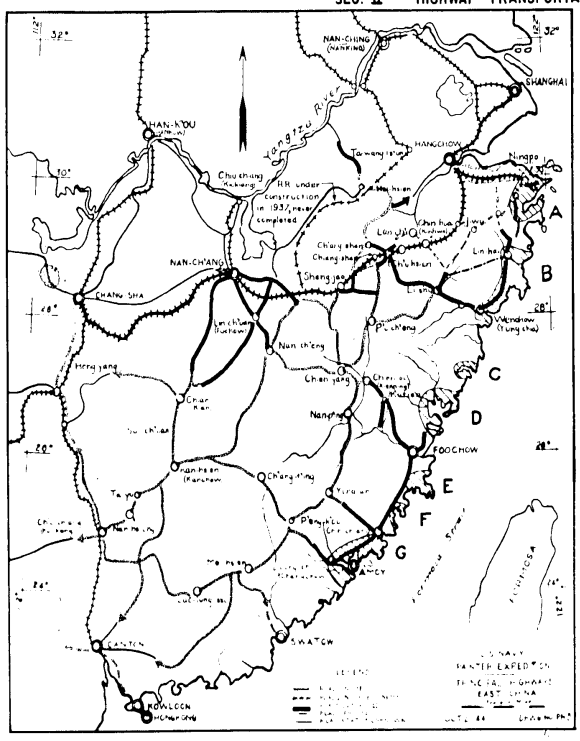


Typical road in rugged terrain.



#0.11 Chien ou Bridge Fukien Province.

SEC. II - HIGHWAY TRANSPORTATION (CONTINUED)



(3) Resources, Facilities, Labor, etc.: Some of the heaviest forests of pine timber in East China are located in the section between Lung-chi and Lung-yen in the mountains, and it is estimated that portable saw mills could produce sufficient lumber to rebuild the bridges for 500 miles of road. Adequate deposits of sand and gravel are available in the streams adjacent to the route, and suitable rock for crushing is available to supplement the gravel supply. All gravel and stone must be crushed. Long piling, cement, and steel will have to be imported. In the Lung-yen area deposits of low grade coal are mined and a type of cement is produced from the soft limestone found in the mountains. Present production is low. There is no industrial development in the area in an American sense, but there are some small hand industries, limited quantities of brick are produced, and small munitions plants are operated. The area is served by a telephone and telegraph system operated by the Provincial and Central Governments respectively, but the service is poor. There are no large radio stations, water supplies, sewerage systems; and the power plants are inadequate for the present demand. Ample potential water supplies are available in nearby streams. Food production is sufficient for the present population only. Chinese sampans operate on the rivers at Lung-chi and Kan-hsien. Chinese coolies are available for construction work. The hospitals in the area are staffed by Chinese, but are barely capable of serving present needs. There are some mission buildings and abandoned temples available, and Chinese school buildings could be utilized for hospitals in an emergency.

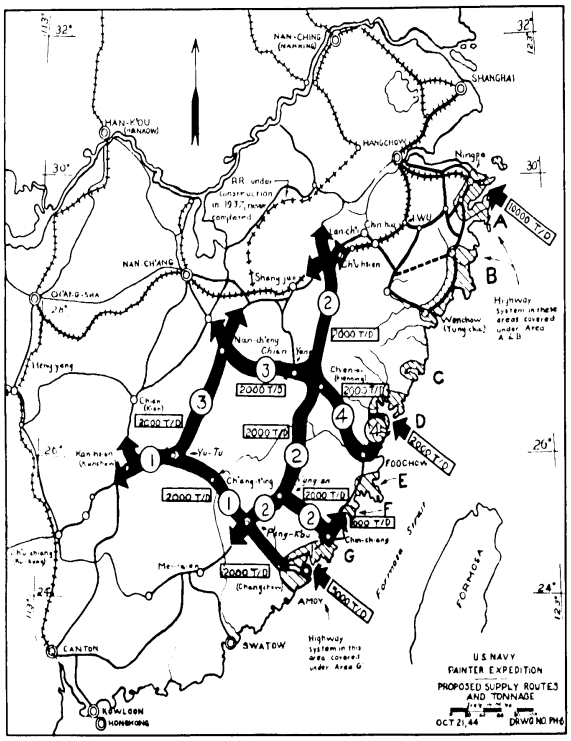
ROUTE 8: Chin-chiang (Chuanchow, 14 -52'N, 118 -36'E)
to
Yung-an (25°-56'N, 117°-22'E); and
P'eng-k'ou (25°-34'N, 116°-43'E) to
Chu-hsien (29°-00'N, 118°-21'E).....
Total, 598 miles.

General: The route connects the coast at Chin-chiang and Amoy with the interior by utilizing the only north-south highway between the coast and the Kan-hsien - Nan-ch'eng valley. It runs parallel and approximately 100 miles from the coast, and furnishes a supply route north to the railway at Chiang-shan and Chu-hsien. The entire highway including the railroad terminus is now in Chinese hands. The value of developing a route like this in opening a supply line to the interior for the coast capable of accommodating an appreciable amount of traffic, and to support operations around the inland way to the west of Area "A", rather than for the exploitation of the terrain for troop staging and airfield development, does not justify [illegible] the distance, 120 miles has been "beaten" [illegible]

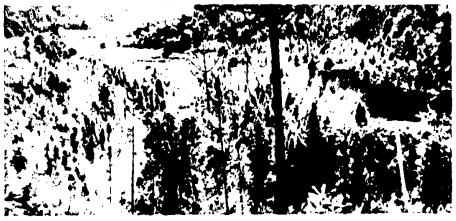
Pl.17-A6 Typical mountain scene near Lung-yen, Fukien Province.

Pl.17 Rugged terrain near Lung-yen, Fukien Province.

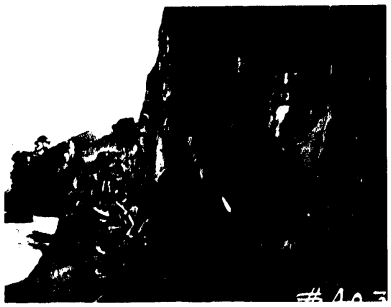
SEC. II - HIGHWAY TRANSPORTATION (CONTINUED)



#40,35 Road in rugged terrain north of Pu-ch'eng, Chekiang Province.



#40,54-55 Typical road in rugged terrain, Ku-t'ien Section, Fukien Province.



#40,32 Highway along river, Tung-an - Nan-p'ing, Fukien Province.

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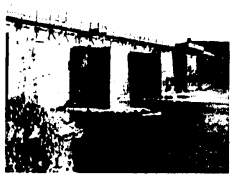
SEC. II - HIGHWAY TRANSPORTATION (CONTINUED)

(1) Description: Of the total 595 miles, 140 miles are through rugged country and some realignment will be required to improve curvature and reduce grades to 18% maximum. From Chin-Chiang westward to Yung-an, a distance of 172 miles, the route is in easy country for 37 miles, the remaining 135 miles being in rugged terrain. Some realignment will be required to reduce curvature to desired standards. From Yung-an to Nan-p'ing, 91 miles, the road generally follows a side hill along the river with good alignment and grades generally. One low mountain section 11 miles long is encountered and 30 miles of the side hill section is heavy. At Nan-p'ing a high level bailey bridge will be required to replace an inadequate ferry. From Nan-p'ing to Chien-ou, 44 miles, the route continues in side hill construction along the Chien River, generally with good alignment and grades. For 22 miles the side hill work is fairly heavy. From Chien-ou to Chien-yang, 20 miles of the 20 mile length is classified as easy construction. There are no long grades in this section. At Chien-yang it will be necessary to replace an inadequate ferry with a timber bridge. Of the 76 miles from Chien-yang to Pu-ch'eng, 60 miles is generally easy while the remainder is through rugged terrain with sharp curvature, requiring some realignment. The route intersects the Chekiang-Kiangsi Railroad at Chiang-shan. The section to Chiu-hsien, 21 miles, traverses a broad flat valley, on the east side of the river, and paralleling the railway for 17 miles. Although this section has been "destroyed", it can be readily restored with troop labor. A timber bridge will be required across the river at Chiang-shan. No ferry or bridge is available at this time.

(2) Airfield Sites Adjacent to Route: Except in the Chiang-shan - Chiu-hsien valley where 42 sites are available, the terrain along the road precludes the development of other than fighter fields. Such sites are available at Yung-an, Chien-yang, one to miles north of Chien-yang and one at Pu-ch'eng, with several more in approaching Chiang-shan. There is an existing field at Chien-ou (1[illegible]-[illegible]'N, 11[illegible]-[illegible]'E). The existing field at Chiu-hsien, developed to [illegible] standards, has been destroyed but could be repaired by Chinese labor in [illegible] days time and can be readily extended to [illegible] standards.

#40,59 Road in valley near Chien-yang, Fukien Province.

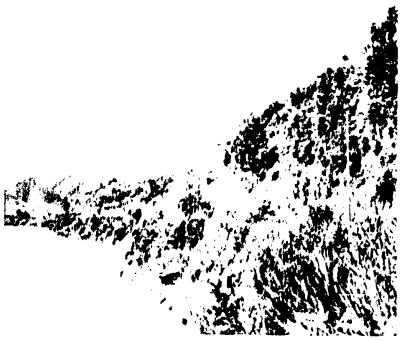


#[illegible] Bridge at Chien-yang, Fukien Province.

(3) Resources, Facilities, Labor, etc.: Adequate deposits of sand and gravel are available in the streams adjacent to the route; suitable rock for crushing is available to supplement the gravel; and it is estimated that sufficient timber can be cut with portable mills from available stands to furnish [illegible] of the amount required for bridging, provided portable mills are made available. Long piling, cement, and steel will have to be imported. Brick in limited quantities is available generally; pine oil plants are located at Sha-hsien, Nan-p'ing, and Chien-ou, each with a capacity of 5,000 gallons per month and some electrical supplies and shop facilities are available at Nan-p'ing, but otherwise there is little industrial development along the route. Small munitions plants are operated in the area. Although the larger towns have power plants, these are inadequate to care for present Chinese needs. No warehouse space is available. Although the streams adjacent to the route provide ample potential supplies, there are no developed water supplies along this route, except a bamboo pipe system at Nan-p'ing. There are no sewerage systems in the area. The Provincial and Central Governments operate an inadequate telegraph and telephone system. There are no large radio stations. The Chinese military forces and the American Information Service at Yung-an operate moderate-powered code stations. Chinese coolies are available for labor. The Chinese operate sampans from Yung-an northward as far as Pu-ch'eng and westward to Shao-wu, and steamers operate on the Min River from Nan-p'ing to Fuochow. Sampans, and during high water, junks, operate from Chiu-hsien westward to Lake Po-Yang and thence to the Yangtze. In the north adjacent to the Chiang-shan area some surplus food products are available, but otherwise there is no surplus food produced along the route. Limited Chinese hospital facilities are located at Chin-Chiang, Yung-an and Pu-ch'eng. At Nan-p'ing a total capacity of 44 beds is available at the various Chinese-staffed hospitals located there. Chinese school buildings, old temples, and mission buildings could be utilized for hospitals in an emergency.

#[illegible] Road between [illegible] and Nan-p'ing, Fukien Province.

#[illegible] Road in valley Pu-ch'eng - Chiang-shan Section, Chekiang Province.



#[illegible] Road between Yung-an and Nan-p'ing, Fukien Province.

SEC. II - HIGHWAY TRANSPORTATION (CONTINUED)

ROUTE 3: Chien-yang (27°-11'N, 118°-21'E) to Nan-ch'eng (27°-24'N, 116°-24'E), to Ku-t'ien (27°-23'N, 115°-19'E) .....total, 210 miles.

General: The development of this route [illegible] to flow from the coast via Route 2 [illegible] and thence westward to Nan-ch'eng and from there northward as the valley toward Kan-hsien. This [illegible] is suitable for stealing and training troops. Supplies can also flow from Nan-ch'eng north to the [illegible] railroad and northwest toward Nan-ch'ang. Supplies can also flow down the river by Chinese sampan from Nan-ch'eng to Lake P'o-yang and thence to the Yangtze. [illegible] 7 miles, provides a western outlet for any [illegible] supply development system from the San-tu-ao [illegible] means. [illegible] part of this route has been destroyed.

(1) Description: The section from Chien-yang to Ku-t'ien, a distance of 110 miles, follows a natural break in the mountain ranges, and although the terrain is more rugged than the Ku-t'u - Nan-ch'eng section, there are no long heavy mountain grades and relatively few sharp curves. There are [illegible] ferries in this section, one at Ma-sha and one at Ku-t'ien. Both of these ferries can be eliminated by the construction of timber bridges. The valleys are relatively small and the area does not lend itself to extensive military operations. The section from Nan-ch'eng to Ku-t'ien, a distance of 170 miles, traverses an area favorable for the training and stealing of troops. As compared with the more difficult mountainous territory lying to the eastward, the topography is quite favorable, consisting of rolling hills and wide valleys with the [illegible] ranges relatively far apart. The highway follows [illegible] one of the best roads in East China. The asphalt surface is 14 feet, approximately shows it as a [illegible] road. The road is 18 feet wide, is surfaced with gravel, and the alignment and grades are [illegible] passable in all weather.

(2) Airfield Sites Adjacent to Road: Although the section between Chien-yang and Nan-ch'eng is [illegible] airfield development, a few fighter field sites are available. An existing all-weather fighter field is located at Nan-ch'eng; a dry-weather fighter field is located at Nan-feng (27°-12'N, [illegible]); and an existing turf fighter field is located at Lung-t'an (27°-44'N, 116°-11'E) capable of development [illegible].

(3) Resources, Facilities, Labor, etc.: Supplies of sand and gravel are available in the streams adjacent to the road, and some quarry rock is located [illegible] Nan-ch'eng section. All stone and [illegible] construction material [illegible]. Chinese coolie labor is available. [illegible] area is served by a telephone and telegraph system [illegible] Provincial and Central Governments re[illegible] service is not reliable. There are no [illegible] stations, water supplies, sewerage systems, [illegible] and power plants are inadequate to care [illegible] demand. Ample potential water supplies are available in the area adjacent to the route. Food [illegible] are sufficient only for the present population. [illegible] operate on the rivers at Chien-yang and [illegible]. There are some buildings available for [illegible] hospital use, particularly at Chien-yang [illegible] and at Nan-ch'eng. The latter [illegible] by the Japanese during the occupation. [illegible] buildings could be utilized for hospital [illegible].

ROUTE 4: San-tu-ao (26°-21'N, 118°-40'E), to Poochow to Chien-ou (27°-19'N, 118°-19'E) .....total, 144 miles.

General: This route connects the seacoast with Route 1 at Chien-ou and would provide an additional east-west artery for transporting supplies inland. Of the routes under consideration, it provides the shortest route from the seacoast to Nan-ch'eng and to the Cheking-Kiangsi railroad. In addition to acting as an artery for the flow of supplies to interior China, the route provides for the circulation of supplies and military personnel and equipment between San-tu-ao and Poochow and to the Min River, which is navigable by native power craft to Nan-p'ing. The entire distance of the existing highway has been or is in the process of being "destroyed".

(1) Description: Of the 64 miles from San-tu-ao to Poochow, 22 miles of new construction will be required from San-tu-ao to Lo-yuan, 11 miles of which is through rugged terrain. For the remaining distance to Poochow the route follows a partially completed highway through relatively easy country with one small range to cross before reaching Poochow. The Poochow area is covered under Section II-H-1. From Poochow westward to Ku-t'ien, a distance of 64 miles, the route follows the Min River Valley through easy country for 19 miles. Upon leaving the river the route enters rugged country for 26 miles with heavy grades and sharp curves, and some realignment will be necessary to improve curvature. The remaining 19 miles is through relatively easy country. Of the 71 miles to Chien-ou, 45 miles is in rugged country. Some realignment will be required to reduce curvature to required standards.

(2) Airfield Sites Adjacent to Route: Prospective fighter airfield sites are available at Ku-t'ien, 3 miles west of Ku-t'ien and 41 miles west of Ku-t'ien. An existing fighter field is located at Chien-ou. The terrain is unsuited to airfield development.

(3) Resources, Facilities, Labor, etc.: Deposits of sand and gravel are available in the streams adjacent to the road as well as suitable rock for crushing. All gravel must be crushed. Ample stands of pine in a quantity sufficient to reconstruct the bridges on the route are available. Portable mills will be required. Long piling, cement, and steel will have to be imported. (The resources for the Poochow area are treated under Section II-H-1). Other than at Poochow there is little industrial development along the route. A pine oil plant having a capacity of 1,000 gallons per month is located at Chien-ou and a limited quantity of brick is produced in kilns located 6 miles north of Chien-ou on the highway. Small sanitions plants are operated in the area. A coal mine is located 3 miles east of Chien-ou on Route 4. Other than at Poochow, there is no developed water supply, sewerage systems, and the power plants are inadequate for the present load. Ample undeveloped streams are available for water supply. At Ku-t'ien and at Chien-ou warehouse space is available in abandoned temples and other vacant buildings. Telephone and telegraph service of poor quality is provided by the Provincial and Central Governments and the Chinese military operate low-powered code radio. Chinese coolies are available. Chinese sampans operate at Chien-ou and launches are operated on the Min River. There is no surplus food along the route. The summer climate in the vicinity of Ku-t'ien and in the mountains to the westward is more pleasant, with lower temperatures and humidity than elsewhere in the territory surveyed; and would lend itself to the establishment of a rehabilitation and hospital center. There are several missions, schools and temples which could be converted to this use. Limited Chinese hospital facilities are available at Ku-t'ien and Chien-ou.

SEC. II - H-4. BEACHES AND DEFENSES FROM KAN-PU TO WOOSUNG

4. Beaches and Defenses from Kan-pu to Woosung.

General: The coastline from Kan-pu (27°-44'N, 120°-53'E) to Whangpo (32°-20'N, 121°-32'E), is powerful, unfavorable to landing operations. From Kan-pu to Hangchow Bay, around Yangtze Cape and also at the Bay, the coastline is flanked by broad mud flats.

(a) From Kan-pu to Yangtze Cape, these mud flats are from one to two miles wide at low water. At high tide there is a narrow strip of sand mixed with some sand between the water line and the solid ground; the width of this muddy beach is from a few feet to a hundred yards. The waters off shore are deep at a very slight gradient of approximately one foot to the mile for the first mile or two offshore. The depths at high water are very shallow as evidenced by the extensive mud flats at low water. Mud and silt are gradually filling the bay, and the soundings shown on existing charts cannot be relied upon in waters close to the shore.

(b) Approach to the shores in this area is dangerous because of strong tidal currents which prevail throughout the year. These tides attain a velocity of from 5 to 6 knots at spring tides and from 3 to 4 knots at neaps.

(c) The coast from Yangtze Cape to [illegible] Bay is likewise flanked by mud flats which, at a point just north of Yangtze Cape, extend about 3 miles out at low tide. These mud flats gradually narrow as the mouth of the Whangpo River is approached.

(d) Approach to the shore along the mouth of the Yangtze is made difficult by strong tidal currents which attain velocities up to six knots. Circular or clockwise currents are also found in the approaches to the Yangtze.

(e) The best beach for a landing along the coast from Kan-pu to Wusung is that near Sheipu (20°-26'N, 121°-08'E)--extending westward just beyond to Kan-pu. The roadstead off Sheipu is protected from eastward by a small group of islets. At low tide there is a narrow sandy beach, but at high tide the water comes right up to a seawall which has been built along the shore in this area. Shallow draft landing craft could come right up to the seawall to unload at high tide. From the shore inland there are rice paddies but fairly good roads extend westward to Hangchow, northwestward to Chihsing and eastward along the coast to Shanghai.

(f) It was in this general area that the Japanese landed in 1937. However, it must be emphasized that any future landing in this area should be much more difficult than that made by the Japanese. The Japanese, using small landing craft, made a surprise against negligible ground and air opposition. On 5 November 1944 it was reported that there were at least three Japanese divisions in the Shanghai-Nanking area and eight first class airfields within 50 miles of the landing area. A Japanese defense line protecting Shanghai is being constructed along a line at all important approaches. It is reported that it was that the coastal highway from Shanghai through Sheipu to Chihsing is being fortified. This defense line consists of [illegible] and pill boxes, and is [illegible]. Strong Japanese reaction to a landing in this area can be expected. (See drawing No. [illegible]).

(g) Landing in Hangchow Bay in the shape of Bang Kow Bay could be effected at high water in smaller draft landing craft. Landings would be difficult because of strong tidal currents and wide mud flats. Strong Japanese reaction can be expected. There is no evidence that the Japanese have [illegible] any beach obstacles.

NOTE: This report is not based on personal reconnaissance, but has been prepared from intelligence information which is believed reliable.

SECTION III. SUPPLEMENTARY DATA

SEC. III - A. EXCERPTS FROM ORIGINAL DIRECTIVE

A. EXCERPTS FROM ORIGINAL DIRECTIVE

FOR AND EXCHEQUER
HEADQUARTERS
U. S. ARMY FORCES
CHINA, BURMA AND INDIA

TOP SECRET

FXLshlb
AFO 879
21 July 1944

AG 373.2

SUBJECT: Ground Reconnaissance of Southeastern China.

TO : Commodore Milton E. Miles, Commander, U.S. Naval Group, AFO 879.

1. a. The Theater Commander has been directed by the Joint Chiefs of Staff to furnish information on ports and harbors between Amoy and Shanghai concerning:

(1) Accommodations for the U.S. Fleet units.
(2) Port facilities.
(3) Suitable bases (sites for bases) along coast for operations into or from China.

b. Preliminary study indicates that the following localities will satisfy requirements for bases and accomodations for fleet units:

(1) Amoy.
(2) Mirred Sound.
(3) Foochow-Santu Bay area or Foochow-Haitan Strait area.
(4) Wenchow.

2. In accordance with the directive from the Joint Chiefs of Staff, a detachment consisting of Army and Navy personnel, Captain William J. Leitner, U.S. Navy, commanding (see Annex "A") will conduct the necessary ground reconnaissance, secure information, make engineering estimates and submit same to Forward Echelon, Headquarters CBI as early as practicable with target date for completion of project as November 1, 1944.

3. a. Information is desired initially on localities named in paragraph 1b. Secondly, on localities which from further study and ground reconnaissance, suitable sites for bases and accomodations for fleet units are indicated.

b. The following items will be covered:

(1) Ports and Harbors. See Annex "B".
(2) Airfields. See Annex "C".
(3) Landing Beaches. See Annex "D".
(4) Roads and Railroads. See Annex "E".
(5) Inland Waterways. See Annex "F".
(6) Disposition and Estimated Combat Efficiency of Friendly Troops. See Annex "G".
(7) Resources. See Annex "H".
(8) Hospitals and General Sanitary and Health Conditions. See Annex "I".
(9) Utilities. See Annex "J".
(10) Military Considerations touching on Ease of Troop Country Maneuverability for Foot Troops, Cavalry, Motor Unit, etc.
(11) Effect of Tides and Tsuns in Certain Areas on Operations.

4. Engineer Requirements:

a. Engineer estimates are required on the following items:

(1) Ports and Harbor Facilities.
(2) Airfields.
(3) Roads.
(4) Waterways.
(5) Bivouac Areas.
(6) Water Supply.
(7) Railroads.

b. Estimates to include:

(1) Quantities involved in construction and/or reconstruction.
(2) Bill of materials.
(a) Local available.
(b) Required to be shipped in.
(3) Equipment required.
(4) Labor required.
(a) Troop units.
(b) Possible local labor believed available to supplement.
(5) Time required for construction and/or reconstruction.
(6) Surveys, profiles and layouts where necessary.
(7) Estimated capacity of facility after construction and/or reconstruction as above.

For the Commanding General:

/s/ T. G. Hearn
T. G. HEARN
Major General, U. S. C.
Chief of Staff

10 Incls.
Annex "A" - "J" as above.

cc to Commanding General, Headquarters USAF CBI, AFO 885.
cc to Commanding General, 14th Air Force, AFO 627.

SEC. III - B. WEATHER REPORT

B. WEATHER REPORT.

1. The weather survey covers a coastal area from the China-Indo border to Shanghai with a depth of 120 miles inland. This was subdivided into three Zones. Zone One from the China-Indo border to Chilang Point (22°-33½N, 115°-114½E); Zone Two from Chilang Point to the Fukien-Chekiang boundary (27°-10½N, 120°-25½E); and Zone Three as Chekiang Province.

2. The most accurate portion of this survey concerns rainfall. The average rainfall and Rainy Days per Month for Zone One were derived from figures covering rainfall statistics for a period of forty years. The number of recording stations was ten. For Zone Two, Swatow, Amoy, and Foochow stations furnished reliable records. Records for interior Fukien Province were not the best, covering only seven to ten years. The rainfall statistics from Wenchow, Hangchow, Anchi (29°-46½N, 118°-11½E), and Pei-yu-shan (28°54½N,122°-15½E) covered Zone Three.

3. Wind data for the Zone was limited. The most useful source was H. O. 124; however, this covered coastal waters. The Southwest and Northeast monsoons and the intermediate period of Spring and Autumn are the major wind influence in the respective areas. Wind roses were constructed from this data.

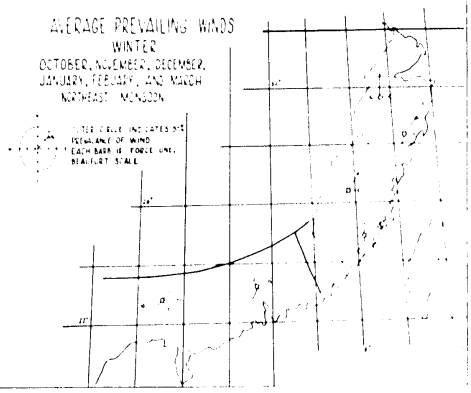
4. Fog statistics were graphed for Amoy, Fukien Province, and for Hongkong, Canton, and Shanghai for the three Zones.

5. Statistics on thunderstorms were as limited as statistics for fog data. The same procedure was carried out on the graph.

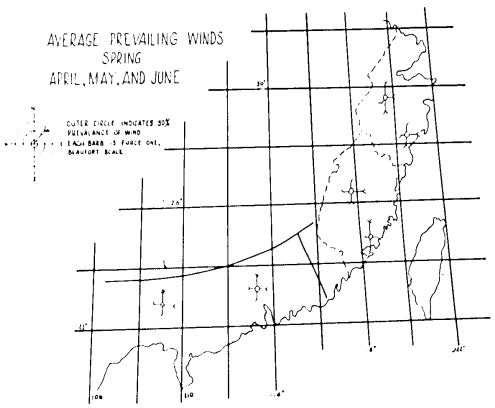
6. The graphs of average Rainfall and Average Rainy Days per Month were compiled from "The Chinese Rainfall" published by National Research Institute of Meteorology, H. O. 219, Climatology Asiatic Station; and Climate and Weather of Southeastern Asia, Vol. V, No. 3, published by U. S. Weather Bureau.

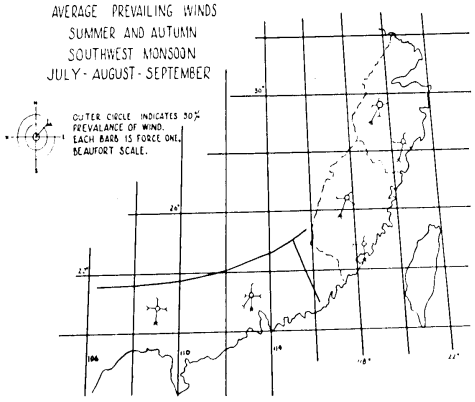
7. The Wind roses were constructed from data surveyed in the following publications: Dynamical Effect of Eastern Chinese Coastal Winds, by John Lee; Asiatic Fleet Bulletin No. 3-39, covering weather in the Western Pacific Ocean; and Central East Asia, a confidential report by the U. S. Weather Bureau. In addition to the above, general data was obtained from a report of observations in Fukien Province by the Chinese Weather Bureau.

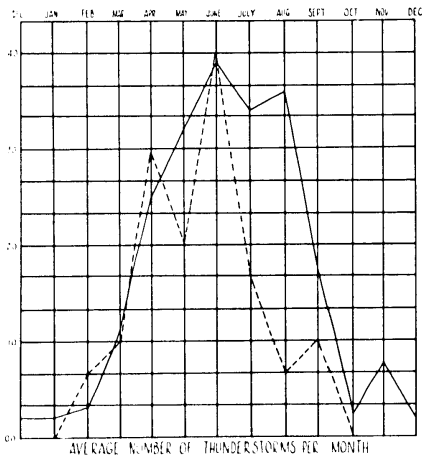
8. Fog and Thunderstorm data was compiled from appendices of the above publications.



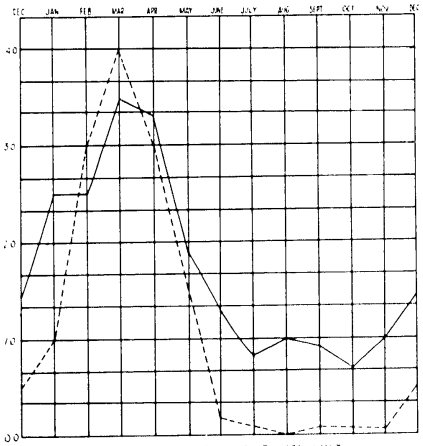
SEC. III WEATHER REPORT (CONTINUED)





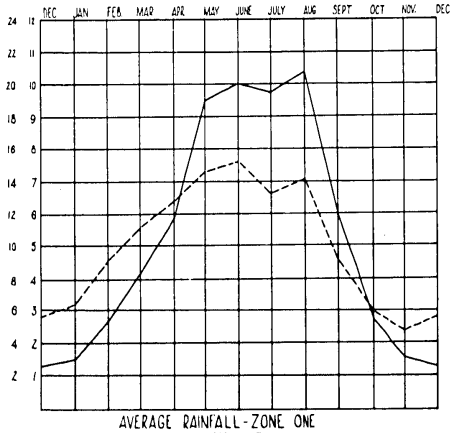


AVERAGE NUMBER OF THUNDERSTORMS PER MONTH
---- AMOY
—— ZONES ONE, TWO, AND THREE

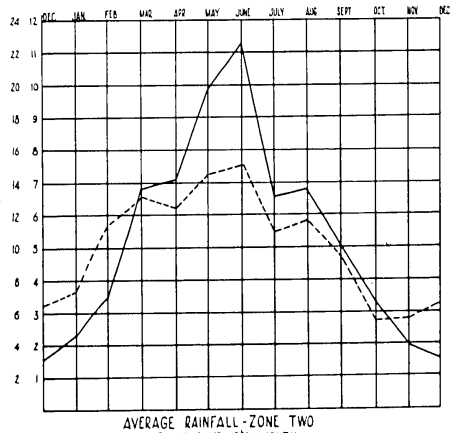


AVERAGE NUMBER OF DAYS WITH FOG PER MONTH
---- AMOY
—— COSTAL STATIONS, ZONES 1, 2, AND 3

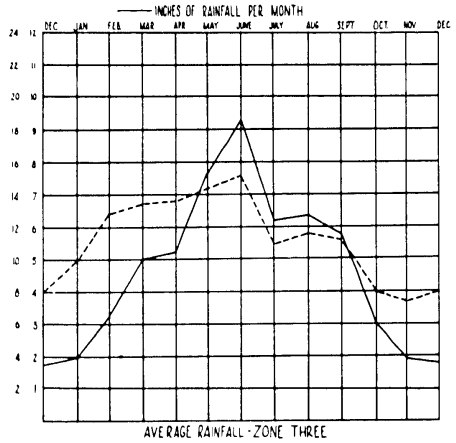
SEC. III - WEATHER REPORT (CONTINUED)



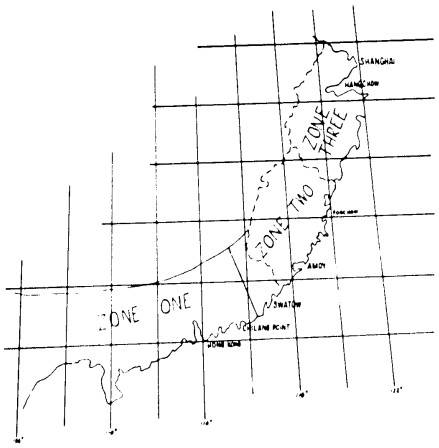
AVERAGE RAINFALL - ZONE ONE
------ RAINY DAYS PER MONTH
—— INCHES OF RAINFALL PER MONTH



AVERAGE RAINFALL - ZONE TWO
------ RAINY DAYS PER MONTH
—— INCHES OF RAINFALL PER MONTH



AVERAGE RAINFALL - ZONE THREE
------ RAINY DAYS PER MONTH
—— INCHES OF RAINFALL PER MONTH



SEC. III - C. HEALTH AND SANITATION

2. HEALTH AND SANITATION.

General.

(a) The contents of this report are supplemental to other information concerning matters of public health, sanitation, and medicine in the provinces of the southeastern coastal area of China, and primarily concerned with Chekiang and Fukien. As such there is considerable overlapping of the information contained in this report and that presented in other sections. The information presented has been obtained from many sources: Reports of individuals attached to Commander, U.S. Naval Group, China; Medical officers on duty in isolated areas in Chekiang and Fukien Provinces; Missionary doctors; the American Red Cross; Official and unofficial Chinese sources; and personal trips through a part of the area. The many sources of the material presented renders it most difficult in many instances to determine the adequacy and the reliability of the information concerned.

(b) A prevailing opinion of inhabitants of the area indicates that the Japanese were considerably hampered in their operations in this area in 1937 by communicable diseases. Little is definitely known in detail about health conditions in the enemy controlled areas, but it is believed that conditions have changed little since the enemy occupation. Because of the coastal blockade maintained by the Japanese, little in the way of medical supplies and equipment has been obtainable during these years. As a result, through deterioration and wear, supplies at the present time are either meager or nonexistent.

1. Environmental Factors Of Importance.

(a) Transportation

It is important to consider certain environmental factors in the planning for sanitation, disease prevention measures, and rendering medical aid to sick and wounded troops operating in the area. Inland from the coastal strip the terrain is rough and roads bad. There is no efficiently connecting highway system, and such roads that do exist are likely to be in poor condition. Such conditions have been found to lessen the effective life of motor vehicles drastically. Frequently travel inland is possible only on foot. These facts render definite limitations to the transportation of medical supplies and equipment.

(b) Insects

Throughout the area mosquitoes, flies, fleas, mites, ticks, lice, leeches, and other insects are numerous. These occur so frequently that, besides being vectors of many of the prevalent diseases in the area, they constitute an appreciable source of discomfort and loss of morale. Rats and mice can be found in almost every house.

(c) Water Supply

While there is abundant water in the area, no source can be considered safe for ingestion without purification. None but the largest cities in the area have modern public water and sewage systems and these cannot be considered safe until proven so. Currently practiced methods of disposal of garbage and sewage and the universal use of human feces for fertilizer renders most likely the extensive contamination of the water of any stream encountered.

(d) Housing Problems

Housing problems in the area are magnified by the scarcity of building materials. Practically all houses are infested with insects and rats, and few are fit for habitation without disinfection and cleansing.

2. Diseases Of Special Significance As Dangerous To Military Operations.

(a) Malaria

(1) Of all the diseases occurring in the area, two of these; namely, Malaria and Dysentery, are of special importance. These two diseases represent the most likely cause of disability involving large numbers of men to such an extent that their operating efficiency might be seriously lowered.

(2) There are no figures available from which the incidence of Malaria can be estimated accurately, and such obtainable figures are representative of so small a portion of the population of Fukien and Chekiang provinces that considered by themselves could be considerably misleading. The high incidence of malaria south of the Yangtze is well known, and according to a report prepared by H. Z. King, Director of National Health Administration it is the most important cause of ill health in unoccupied China. Figures collected from hospitals in the area are in no way indicative of the true incidence of the disease, because these institutions serve a very small section of the people and many of the people do not apply for treatment because of poverty or ignorance. However, figures from the various hospitals, where available, do indicate the relative prevalence of the disease. Statistics of the National Health Administration for the year 1941 indicate that 4,464 cases occurred in Chekiang province, and 15,102 cases occurred in Fukien province. This reported incidence of the disease is the highest figure given for any of the reportable communicable diseases. The problem is even more serious in Kiangsi and Kwantung provinces where over 54,000 and 73,000 cases were reported from these two provinces respectively in the same year. Since that time dwindling medical supplies have considerably retarded efforts at control. From forward units of the U.S. Naval Group located in the provinces under consideration reports have been received which indicate that the majority of their Chinese trainees have been suffering from malaria during the summer months. Among the naval personnel in the area Malaria has been the chief cause of illness with the single exception of dysentery. The collected statistics from a few hospitals located in these provinces show the same trend. This evidence leads to the inescapable fact of the widespread frequent and serious occurrence of Malaria in this coastal area.

(3) Cases of Malaria occur throughout the entire year in the area but are most frequent during the hot summer months. The three common species of Plasmodia occur in the area. The most frequent of these encountered is the Plasmodium vivax with Plasmodium falciparum almost as frequently found. Plasmodium Malariae is said to be the cause of 3 to 4 percent of the clinical Malaria observed. Here again figures are not accurate because of lack of facilities for proper laboratory diagnosis in many instances. In American personnel in the area Plasmodium vivax infections have been the most common, and in them the disease has shown a marked tendency to relapse.

(4) While nationally administered public health organizations exist in the unoccupied portions of these provinces, the lack of supplies and equipment has rendered the control work done by these organizations in the case of Malaria almost negligible.

(b) Dysentery and Other Enteric Diseases

(1) As serious as is the malaria problem, of equal or more importance is the problem of dysentery in Fukien and Chekiang provinces. Of all the communicable diseases in China, dysentery is probably the chief cause of disability in the adult population. It represents a chief cause of death in infants. So common is the disease in the native Chinese people that its importance is not appreciated by them. Among the U.S. Naval personnel located in these provinces it has been the chief cause of illness and has caused more lost man days than any other disease. Although the mortality rate is low, it produces severe prostration in afflicted personnel. Statistical evidence of its frequency represented by available material is of no value since so small a section of the population is represented by these figures. Few if any of the U.S. Naval personnel traveling through the area, taking as many precautions as possible to avoid it, escape the infection. Appended statistics from hospitals in the area show its relative frequency in those institutions. Experience with populations of small villages confirms the impression of its great frequency and seriousness. Recent reports received by the American Red Cross indicates that in the absence of adequate medical supplies dysentery is occurring with more than the usual frequency during the summer months in both Chekiang and Fukien. A report from a U.S. Naval officer covering the period of September shows that over 50 percent of newly arrived men at a base in Fukien province were so ill that they required bed rest for two or more days.

(2) There are many factors responsible for the widespread occurence of this disease. Chief among these are the primitive and unsanitary methods of disposal of sewage and garbage, the universal use of human feces for fertilizer, virtual absence of protection against filth carrying flies, the lack of appreciation of the concept of bacteriologic cleanliness, the indiscriminate use of stream banks for latrines, lack of facilities for the treatment of the disease when it occurs, and the large number of carriers. Under such conditions all food and drink is unsuitable for consumption unless properly sterilized by cooking or boiling. In many instances the water contains so much organic material that chemical sterilization is ineffective. Where native help is employed in the handling of food, rigorous control is necessary. Any relaxation of vigilance in the matters of sanitation is likely to be followed by a disabling outbreak of dysentery.

(3) Bacillary dysentery is by far the most common type, lack of laboratory facilities has prevented the determination of the causative organisms responsible. Where microscopic examinations of the dysenteric stool is possible Endameba Histolytica has been found in approximately 20 percent of the cases.

(4) Non-dysenteric diarrheas are extremely common.

(5) Of other enteric diseases typhoid fever is quite common in both Fukien and Chekiang provinces. Reports from a forward unit in Chekiang province received during the summer indicated a rather high incidence in Chinese in the area. No U.S. Naval personnel have had typhoid fever, but rigid prophylaxis cannot be over emphasized.

(6) Cases of these enteric diseases are present throughout the year but are commonest during the hot months of June, July, and August.

3. Diseases of Potentially Great Importance in Military Operations.

(a) Plague

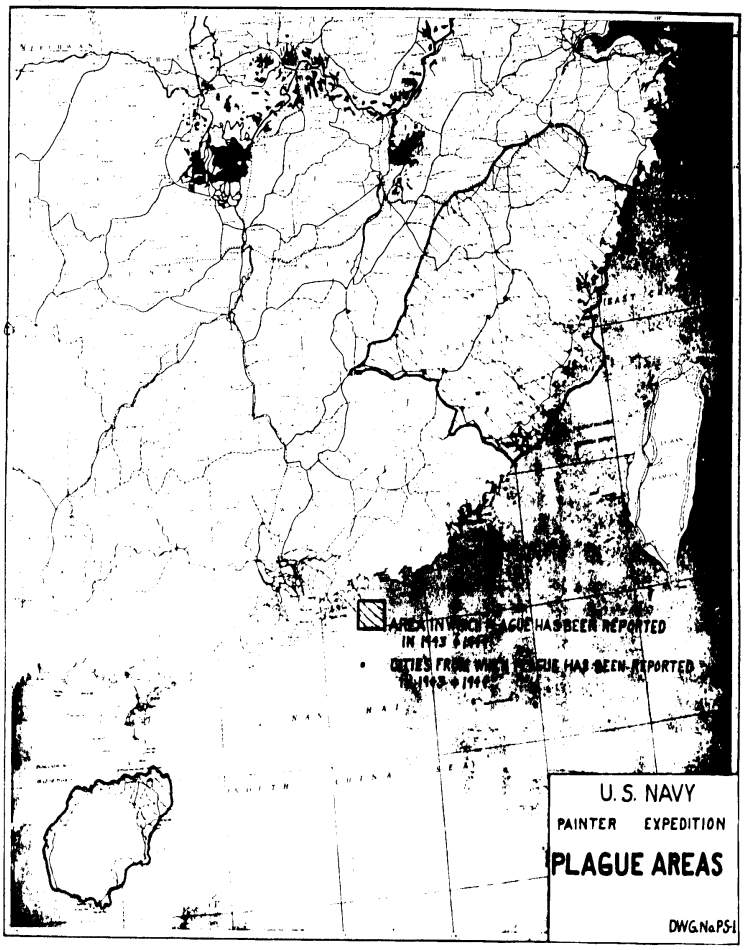
(1) In Fukien province plague has been present continuously since its introduction in 1894. Since that time some 11 cities or districts have been infected. In 1940 there occurred 7[illegible] cases with 355 deaths in 21 districts. In 1942 and 1943 it was reported as present in 18 or more districts. And in 1944 it has assumed epidemic proportions in many areas within this province. (See Drawing No. FS-1).

(2) In Kwantung province plague has remained fairly well localized in the Lanchang district and on Pai-nan Island. Up to the present war Canton City had not been involved in any outbreaks of plague, and since the war it presumably remains free of the disease. There is no information concerning the plague situation in other sections of this province occupied by the enemy.

(3) Chekiang province is reported to have been free of plague until 1940, when an outbreak occurred at Yin-hsien (Ningpo), allegedly the result of Japanese attempts at the use of bacteria in warfare. At about the same time a smaller outbreak occurred at Chu-hsien. The story originated at Chu-hsien that shortly before the appearance of the disease at that city Japanese planes had dropped rice and wheat grain and that this grain had contained plague infected fleas. Other similar reports have been received. The Yin-hsien outbreak claimed 99 victims in 31 days and the Chu-hsien outbreak resulted in 21 deaths in 24 days. The Yin-hsien outbreak was controlled early and at the present time appears to be free of the disease.

(4) In the Chu-hsien area plague has become endemic in the rhodents of the district, and in 1941 during the period from March to July 157 human cases with 115 deaths occurred. Scanty and unofficial information about this district at the present indicates that plague is present in the district although possibly not in Chu-hsien city itself. In recent years the disease has spread to the area near the Fukien border. In April 1944, at the port of Fang-shih (Benchow) a considerable outbreak occurred. Up to August [illegible] cases with 111 deaths had been reported (National Health Administration). Reports obtained by the American Red Cross covering the period of August to the time of the occupation of the city by the Japanese indicated that the situation continued to be quite serious. Three hundred thirty six additional cases had been reported from the Fang-shih area. Li-shui, which has in the present year become involved, continues to remain active. Six additional cases were reported from Li-shui in October. The problem in Chekiang province is very serious since there has been a complete breakdown of medical supplies for some months.

(5) In general, it can be said that plague is present throughout the entire coastal strip extending from Amoy to [illegible]. Amoy City remains free of the disease although Chinkiang and Tsing-tao continue to be involved and active. The disease has spread upstream from Foochow to Nan-ping by river traffic. From Nan-ping it has spread to Chien-yang and thence by way of Chu-cheng into Kiangsi province. Eastward the disease has spread to Shao-wu and then Ching-an in Kiangsi province. During the months of September and October of 1944, plague has been the principal disease in the latter city. [illegible] reports indicate the presence of plague at Fan-hsien and Shih-[illegible] north of Foochow. Plague has been reported in Lo-yuan, Fang-ting, and as far north as Yin-hsien. The latter city is quiescent at present. This presents a somewhat tenuous picture of the plague situation in this area. It is to be noted that the pest has spread along the main routes of water and overland travel, and that the detailed information concerns the cities and main centers of population. The situation in the smaller villages is difficult to evaluate under the present conditions, but is said to be serious. It is difficult to obtain information concerning the smaller villages because the native population frequently will not give strangers information about the presence of the disease in the villages. The condition in the smaller villages is an ever changing one. Appended reports will be useful in visualizing the spread of plague in Fukien province.



(6) Clinical types of plague other than the bubonic are rare. The reported mortality rate for the disease in recent months has varied from 50 to 90 percent. In general the serious outbreaks begin in the early spring and reach their peaks in the hot summer months and extend on into the early autumn. Some plague cases occur throughout the entire year.

(b) Cholera

Cholera has been endemic for years along the coastal areas of China. It usually spreads inwards along the main waterways during the spring and summer months. Since the start of the war in 1937 it has spread inland. In 1940 large numbers of cases occurred in Fukien, Chekiang and Kwangtung Provinces. Each year since that time cases have occurred along the main routes of travel in varying numbers. There are no recent reports of serious outbreaks of Cholera in these provinces in the recent months. The same features of sanitation that make dysentery an ever-present and serious disease make Cholera always potentially dangerous. Cases occur throughout the entire year, but are more frequent in the spring and summer months.

(c) Typhus

Under war conditions serious outbreaks of typhus fever have occurred among Chinese troops and refugees. Clear cut differentiation of the types occurring has been impossible since most of the diagnoses are made on the basis of clinical evidence. Laboratory facilities for the adequate differentiation of the various Rikettesial diseases are not available. The reported incidence of the disease is low, but unofficial information suggests that it may occur more commonly than is suspected. At any rate there is no lack of mites, lice and fleas to act as transmitters of the disease. United States Naval personnel stationed in forward areas but at considerable distance away from the coast have been infected. The peak incidence is reached during the winter months.

(d) Relapsing Fever

(1) Of serious concern during recent years has been relapsing fever. Both Fukien and Chekiang have reported large numbers of cases occurring there in recent months. Reports from the Information Service of the American Embassy that relapsing fever has been unusually common along the coastal areas under consideration throughout the year 19[illegible]. The disease is louse borne, and it is a virtual impossibility to remain in the eastern part of China for any long period of time without becoming lousy. Consequently the infection is one that is potentially menacing. Naval personnel situated inland from the coast in forward areas have contracted the disease.

(2) Cases occur throughout the entire year with the peak of incidence coming in the winter months.

4. Other Diseases of Interest.

(a) All of the common infectious diseases occur frequently in these provinces. Of special interest is cerebro-spinal fever which is quite common in both Fukien and Chekiang Provinces. During the winter months it frequently assumes epidemic proportions. United States Naval personnel stationed in these provinces have contracted this disease.

(b) Another disease which has not been uncommon in Naval personnel in the area is Acute Infective Jaundice. Several recent cases have been reported from a unit located in Chekiang Province.

(c) Trachoma is extremely common throughout China and Americans appear to be quite susceptible to the infection. Common modes of spread observed have been from the use of common wash basins and the ubiquitous post prandial hot cloth.

(d) Small pox occurs throughout China. During the year 1941 the highest reported incidence of the disease was in Chekiang and Fukien Provinces. Recent reports from hospitals in the area show its presence there during the current year.

(e) Syphilis, Gonorrhea, Chancroid, and Lymphogranuloma venereum are extremely common and contacts are easy. More than usual precautions must be taken to keep these venereal diseases at a low rate.

SEC. III - HEALTH AND SANITATION (CONTINUED)

5. Parasitic Diseases Other Than Malaria And Amebiasis.

(a) Many parasitic diseases occur in these two provinces of Shantung and Anhwei, other than Amebiasis and Malaria; Schistosomiasis, Ascariasis, Fasciolopsiasis, Paragonimiasis, Teniasis, Ancylostomiasis, Trichuriasis, Filariasis, and Leishmaniasis, all occur in these provinces. Hookworm disease is very common in the natives. Schistosomiasis deserves some consideration, not because it is likely to prove a disease of major importance, but because individuals forced to work or fight in streams, irrigation ditches, and rice paddies will be exposed. The infection is due to the Schistosoma japonicum. Occurring widely throughout the lower Yangtze valley, it is especially common in the lakes area. Throughout Shantung province and to a lesser extent in Anhwei the parasite is present. Several cases have been observed in Chinese servants employed by naval groups in these provinces.

(b) Various skin diseases are common. In Chinese troops Scabies is of serious concern because of its high incidence. Chinese troops have been observed to be involved to the extent of 80 to 90 percent in some instances. Various fungus diseases are common on and about the feet. These frequently become secondarily infected and lead to a serious condition known variously as Hongkong foot, Bengal-foot, etc.

(c) This material may be generalized by saying that practically every known parasitic disease occurs in Shantung and Anhwei provinces. Of these diseases, malaria and dysentery deserve the most consideration of the diseases of major importance and because of their [illegible] of interfering with the attainment of objectives. Plague, typhus, typhoid, and relapsing fever are endemic in the area and at [illegible] conditions. Yellow fever has been unusually [illegible] along the entire coastal area. Plague [illegible] at the present time because it is [illegible] with immunization along the coastal strip from Amoy [illegible].

[illegible] Medical Supplies And Equipment.

(a) In any estimate of supplies and equipment necessary [illegible] and prevention of disease, consideration must be given [illegible] that such material is practically unobtainable in this area, [illegible] throughout China. Conditions are such that extremely [illegible] should be made for such preventive work, and also [illegible] for all mechanical equipment employed would be [illegible].

(b) All medical supplies and equipment will have to be [illegible]. A [illegible] portability of supplies that will be [illegible] in the interior is especially desirable, [illegible] the only means of transportation is a coolie's back.

[illegible] Facilities.

[illegible] a very small group of the total population [illegible] in the larger population [illegible] little information as to what private hospitals [illegible] at the present time. Impressions [illegible] are that hospital facilities are [illegible] the Amoy list indicates [illegible] and other hospitals now [illegible] provinces, since the recent occupation [illegible] hospitals, many of the hospital [illegible] equipment and supplies and equipment carried [illegible] in spite of their condition since the occupation. [illegible] supplies, which might be useful for storage [illegible] supplied by the fact that building [illegible] provision for [illegible] stages of operations.

[illegible] Information.

[illegible] information [illegible] interest in the interior of [illegible] the fact that serious enteric [illegible] from carriers and uncontrolled sanitation. [illegible] at the time of writing. All water to be [illegible] should be treated as a suspicious [illegible] healing is [illegible].

(2) So rife is disease in the area under consideration that all preventive measures should be doubled. This applies to personnel as well as to materiel. For all mechanical equipment 100 percent replacements should be allowed. Rapid deterioration and the absence of local supplies dictates this.

(3) All personnel should be immunized against all communicable diseases possible. Booster injections should be given every six months or oftener when in areas known to be seriously infected. This applies especially to cholera, typhoid, plague, and small pox.

(4) It is recommended that the clothing of all personnel who must work or fight in the area be suitably impregnated with either DDT or Dimethylphthalate emulsion. Portable impregnation equipment should be provided for each regiment operating in the field. Similarly delousing equipment should be provided.

(5) Where permanent establishments are to be built it is strongly urged that the sites be located one or two miles away from native settlements when possible, and that all construction be as rat and insect proof as possible. All bedding, nets, and buildings should be treated with DDT.

(b) Specific Recommendations

(1) Water

Water should be sterilized by boiling when practicable. If mechanical purification is anticipated 100 percent replacements for all mechanical equipment involved should be provided. Either mechanical, chemical, or heating methods are employed to render water fit for consumption, careful supervision of the process is necessary.

(2) Food

Food is scarce. There are few large scale sources of supply adequate to provide for large bodies of troops. Sanitary control of all local sources of food should be maintained as far as possible and all local food should be considered as unfit for consumption until thoroughly cooked. Where native help is employed in handling food careful supervision is required.

(3) Malaria

At least one trained malaria control unit should be provided for each regiment operating in the field, and at least one such unit at each permanent establishment. Serious consideration should be given to the employment of suppressive treatment so that personnel will be adequately protected by the time that operations are begun.

(4) Dysentery

Observance of the principles of sanitation should prevent widespread dissemination of the disease. For groups operating inland, the necessary food and water should be carried with them. Anti fly measures should be vigorously carried. Careful supervision of the disposal of waste and garbage should be exercised, and fly proof latrines are essential. Where native labor is employed in the field, or fixed, care should be exercised in the selection and supervision of this personnel since the carrier problem is an important one. Sight seeing and cleanliness should be encouraged and demanded.

(5) Plague

The danger of contracting the disease seems to be a permanent in stationary groups. As permanent establishments, buildings should be as rat proof as practicable, and situated away from native settlements. Control of rats and insects should be required. For groups operating in the field or in infected villages, suitable equipment should be provided. Where it is necessary to stay, bivouac sites should be located away from the infected locality and where prolonged halts are made, any shelter should be provided away from infected habitations. Soldiers should never be placed on requests of local villagers in the interests as to the presence or absence of plague in the town. The obtaining of supplies from infected areas should be avoided, since hides, cloth, bedding, etc., frequently contain infected fleas. Anti flea perfectly harmless in themselves may further infected fleas in the habitations. Under any circumstances such supplies should be disinfected beforehand. The wearing of impregnated clothing and liberal use of repellents and powders should be useful.

(6) Cholera

A careful supervision of sanitation and protection of the food and water as previously outlined should prove adequate.

(7) Typhus

In addition to immunization, the use of impregnated clothing and the use of repellents, powders, etc., delousing equipment, both stationary and portable, should be provided. Periodic delousing in the field should be practiced, and always when personnel are returned to permanent establishments.

(8) Relapsing Fever

The same general measures recommended for the control of typhus should suffice to control this disease.

(9) Infectious Diseases

No specific recommendations are made except to reemphasize the extreme prevalence of venereal disease. More than usual precautions should be employed.

(10) Parasitic Diseases

Where personnel are required to work or fight in water in areas heavily infected with Schistosoma, protective clothing should be provided if practicable. Water used for bathing should be rendered safe before use. Swimming in streams should be prohibited until proven to be safe. Control of insect vectors and proper attention to sanitation should control the other parasitic diseases encountered.

3 YEAR MEDICAL RECORD
OF
ALDEN SEAMS HOSPITAL
NAN-PING
1941 - 1943

DISEASES	NO. OF PATIENTS 1941	NO. OF PATIENTS 1942	NO. OF PATIENTS 1943
ALKALINE POISONING		1	
ANEMIA	9	8	4
APOPLEXY	2		
ARTHRITIS	7	22	17
ASCARIDES INFECTION	22	24	30
ASCITES	1		
ASTHMA	9	8	6
BARBITAL POISONING	1		
BEHI-BERI		1	1
BLACKWATER FEVER	1		
BRONCHITIS	49	57	[illegible]
BRONCHO-PLEURE	13	4	[illegible]
CATARRHAL FEVER	1		
CHOLERA	10	[illegible]	
CHOLECYSTITIS	2		
CIRRHOSIS OF LIVER		2	
COMMON COLD	22	27	5
COLITIS	1		2
CONSTIPATION		1	1
CONVULSIONS		3	
CYSTITIS		3	4
DENGUE FEVER	3		
DIABETES		1	
DIARRHEA	25	[illegible]	[illegible]
DIPTHERIA	2	3	[illegible]
DYSENTERY	94	[illegible]	[illegible]
EDEMA	2		
ELEPHANTIASIS	1	1	[illegible]
ENCEPHALITIS			[illegible]
ENTERITIS	9	7	[illegible]
EPILEPSY			
FASCIOLOPSIASIS	1		
FATIGUE	1		
FURUNCULA	4	4	[illegible]
GASTRIC DILATATION			1
GASTRITIS	6	3	[illegible]
GASTRO-ENTERITIS	1	2	
HEMATEMESIS		2	
HEART FAILURE			1
HEAT EXHAUSTION	1		
HEPATOMEGALY PHASE I	1		
HYDROPHILIA		1	
HYDROPHOBIA			1
HYPERACIDITY	1		
HYPERTENSION	1	4	
HYPERTROPHY OF STOMACH		1	
INSOMNIA			1
INTOXICATION	8	[illegible]	1
INFANTILE PARALYSIS		1	
INTERSTITIAL PNEUMONIA			1
INTERSTITIAL NEPHRITIS	2		
JAUNDICE		1	[illegible]

SEC. III -. HEALTH AND SANITATION (CONTINUED)

3 YEAR MEDICAL RECORD
OF
ALDEN SPEARE HOSPITAL
NAN-P'ING
1941 - 1943

DISEASE	NO. OF PATIENTS 1943	NO. OF PATIENTS 1942	NO. OF PATIENTS 1941
[illegible]			
[illegible]	4	3	2
[illegible]		1	
[illegible]			1
[illegible]			1
[illegible] ANEMIA		1	
MALARIA	320	415	217
[illegible]	4	6	3
[illegible]	1		
[illegible]	6	3	
[illegible]	9	3	6
[illegible]	3	2	2
[illegible]	1	1	2
[illegible]	1		
[illegible]	19	27	37
[illegible]		1	1
[illegible]		1	
[illegible]	3	5	1
[illegible]	1	1	4
[illegible]		1	
[illegible]	8	4	2
[illegible]	5	24	18
[illegible]	2	1	
[illegible]	9	11	4
[illegible]	1		
[illegible]			4
[illegible]	103	82	73
[illegible]		2	
[illegible]			1
[illegible]		1	
[illegible]	1		
[illegible]	1	1	
[illegible]	1		1
[illegible]	34	25	29
[illegible]	1	3	2
[illegible]	1		1
[illegible]	1	1	
[illegible]		1	32
[illegible]	1		
[illegible]	4	1	5
[illegible]	25	12	5
[illegible]			1
[illegible]	227	113	161
[illegible]	11	10	2
[illegible]			
[illegible]	6	4	144
[illegible]		11	
[illegible]	4	3	
[illegible]	7	5	2
[illegible]	1		

[illegible] IN FUKIEN PROVINCE
[illegible] ONLY
[illegible]

[illegible]	[illegible]	DEATHS
[illegible]	25	0
[illegible]	[illegible]	0
[illegible]	[illegible]	7
[illegible]	[illegible]	4
[illegible]	[illegible]	1
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	3
[illegible]	[illegible]	5
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	4
[illegible]	[illegible]	0
[illegible]	[illegible]	[illegible]

INFECTIOUS DISEASES ONLY
YEAR 1943 & 1941 - JANUARY TO JULY

2. NAN-P'ING - ALDEN SPEARE HOSPITAL

	1943		1941 (JANUARY TO JULY)	
DISEASE	NO. CASES	DEATHS	NO. CASES	DEATHS
1. BLACKWATER FEVER	1	0	0	0
2. CHOLERA	12	2	0	0
3. TETANUS	3	0	0	0
4. DIPTHERIA	2	0	1	0
5. DYSENTERY(AMEBIC)	102	9	66	12
6. MALARIA	332	12	107	3
7. MEASLES	6	1	0	0
8. MENINGITIS	12	3	6	1
9. PARATYPHOID	8	0	9	0
10. PNEUMONIA	116	13	66	12
11. RELAPSING FEVER	35	2	107	4
12. TYPHOID	73	13	65	12
13. WHOOPING COUGH	2	0	0	0
14. TYPHUS	1	0	0	0

PLAGUE CASES NOT LISTED. ALL SUCH CASES TREATED AT ISOLATION HOSPITAL

STATISTICS COLLECTED FROM HOSPITALS IN FUKIEN PROVINCE

INFECTIOUS DISEASES ONLY

JANUARY TO JUNE 1941

NAN-P'ING - PROVINCIAL HOSPITAL

DISEASE	NO. CASES
1. MALARIA	43
2. DYSENTERY, BACILLARY	13
3. DYSENTERY, AMEBIC	4
4. PNEUMONIA, LOBAR	25
5. MENINGITIS, EPIDEMIC	14
6. PARATYPHOID	8
7. TYPHOID	14
8. MEASLES	1
9. RELAPSING FEVER	12
10. BLACKWATER FEVER	3
11. PUERPERAL SEPSIS	12
12. RABIES	2
13. CHOLERA	1
14. DIPTHERIA	2

SPREADING OF PLAGUE IN FUKIEN PROVINCE IN THE PAST FEW YEARS

YEAR	NO. CASES	NO. DEATHS
1939	554	434
1940	252	178
1941	56	44
1942	408	172
1943	5158	4082

SPREADING OF PLAGUE IN FUKIEN PROVINCE IN THE YEAR 1943.

DISTRICT	NO. CASES	NO. DEATHS
1. FOOCHOW	908	859
2. SHOUCHUNG	73	55
3. LO-TIAN	390	351
4. HIANGI	33	13
5. MINCHUNG	4	2
6. NAN-P'ING	166	120
7. CHIEN-OU	85	4
8. CHIEN-YANG	65	55
9. PU-CH'ENG	58	47
10. SHANHIEN	59	56
11. AN-CH'I	42	28
12. TUNGCHI	19	16
13. LIENCHIANG	51	51
14. SHAO-WU	73	45
15. CHIENHO	46	21
16. WING-TE	18	1
17. NAN-CH'ANG	45	13
18. EN-TIEN	157	155
19. CHANLO	125	108
20. LUNG-CHI	23	23
21. TSING KIANG	409	397
22. TUNGTING	148	122
23. MINGCHING	136	128
24. HAILE	223	184
25. FUCHING	426	295
26. TUNG-AN	56	37
27. PU-T'IEN	699	538
28. HAICHEN	68	15
29. PINGTANG	80	34
30. WTIAN	104	101
31. HSIENTU	258	208
TOTALS	5158	4082

FATALITY RATE:- AVERAGE 75.2%

HOSPITALS LOCATED IN CHEKIANG & FUKIEN PROVINCES

CHEKIANG PROVINCE

NAME	LOCATION	CAPACITY NO. BEDS	EQUIPMENT
1. ENGLISH PRESBYTERIAN HOSPITAL.	TUNG-CHIA(WENCHOW)	142	DEFICIENT
2. JEAN GABRIEL CATHOLIC HOSPITAL.	TUNG-CHIA(WENCHOW)	226	FAIR
	TOTAL -	368	

RECENT REPORT AMERICAN RED CROSS: NOTHING KNOWN ABOUT THE HOSPITALS IN THIS PROVINCE.

FUKIEN PROVINCE

NAME	LOCATION	CAPACITY NO. BEDS
1. CHRIST'S HOSPITAL, C.M.S.	FOOCHOW	159
2. UNION METHODIST HOSP.	FOOCHOW	152
3. TA TENG INDEPENDENT HOSP.	FOOCHOW	106
4. ALDEN SPEARE MEMORIAL METHODIST HOSPITAL.	NAN-P'ING	150
5. FUKIEN PROVINCIAL HOSP.	NAN-P'ING	250
6. ISOLATION HOSPITAL	NAN-P'ING	46

NOTE: SOME SMALL PRIVATE HOSPITALS WITH DOUBTFUL FACILITIES ARE MENTIONED IN NAN-P'ING.

7. LUCY F. HARRISON METHODIST HOSPITAL.	FU-TING	70
8. ST. LUKES HOSP., C.M.S.	PU-T'IEN	114
9. UNION, L.M., R.C.A.	CHANGHOW	60
10. ENGLISH PRESBT. HOSP.	CHANGHOW	224
11. WILET MEMORIAL METHODIST.	AN-T'IEN	80
12. KIEKOU, C.M.S.	CHIEN-OU	58
13. SAIPU HOSP., C.M.S.	HSIA-P'U	140
14. HIRUTEN HOSP., C.M.S.	WING-TE	75
15. LIENKIANG HOSP., C.M.S.	LIENKIANG	40
16. CHRIST'S DOCTRINE HOSP.	LO-TIAN	70
17. NATHAN SITES METH. HOSP.	MINTSING	85
18. PROVINCIAL HOSPITAL & MEDICAL SCHOOL	SHANSIEN	75 (?)
	TOTAL -	1878

CONFIDENTIAL

SEC. III - D. ENEMY TROOP DISPOSITIONS, INSTALLATIONS AND AIRFIELDS

D. ENEMY TROOP DISPOSITIONS, INSTALLATIONS, AND AIRFIELDS.

General.

Enemy strength in coastal areas is at present not great, but recent movements indicate an intention to reinforce or occupy all critical areas. The present disposition (20 October 1944) of enemy troops and coastal defenses taken from available Naval intelligence and Chinese sources is shown on Drawing No. PS-2. The location of enemy airfields, as shown on Drawing No. PS-2 and as given in the succeeding table, is taken from all available Army, Navy, and Chinese sources.

1. An estimate of the Japanese ability to reinforce any of the various Coastal areas considered in this report after invasion has begun has been made by O-2, C.B.I. Theater and is included in its entirety. Drawing No. PS-3 has been made to show the areas mentioned in this estimate. The figures on enemy dispositions mentioned are somewhat different from those shown on Drawing No. PS-2.

Copy Of Report Prepared By O-2 - C.B.I. Theater, 28 Oct. 1944. *

Following the occupation of Eastern China by Japan, Shanghai and Hongkong - Canton areas were strongly fortified. The coastline between Shanghai and Hongkong, however, remained essentially unguarded except for small garrisons at the ports of Swatow and Amoy. In May of this year the garrisons at Amoy and Swatow were further depleted to strengthen Japanese Forces in the Canton Area.

Concurrent with Allied successes in the Pacific and Admiral Nimitz' statement of the China Coast being his objective, the Japanese openly announced their intention of fortifying the entire China coast. Their objective appears to be to occupy all strategic ports and islands off the China Coast.

This program started with a drive east from Kiangsi with the capture of Wenchow Harbor on 9/9/44. This was followed by landings in the islands of the coast of Chekiang to wit:

The Chungaing Island in the mouth of the Yangtse River, Islands of the Chusan group, off Ningpo Bay on 20/9/44.

8,000 at Ting Hai
5,000 on Chou-shan

The Islands covering the entrance to Loching Bay

500 on Pachen
100 on another island opposite Li ching.

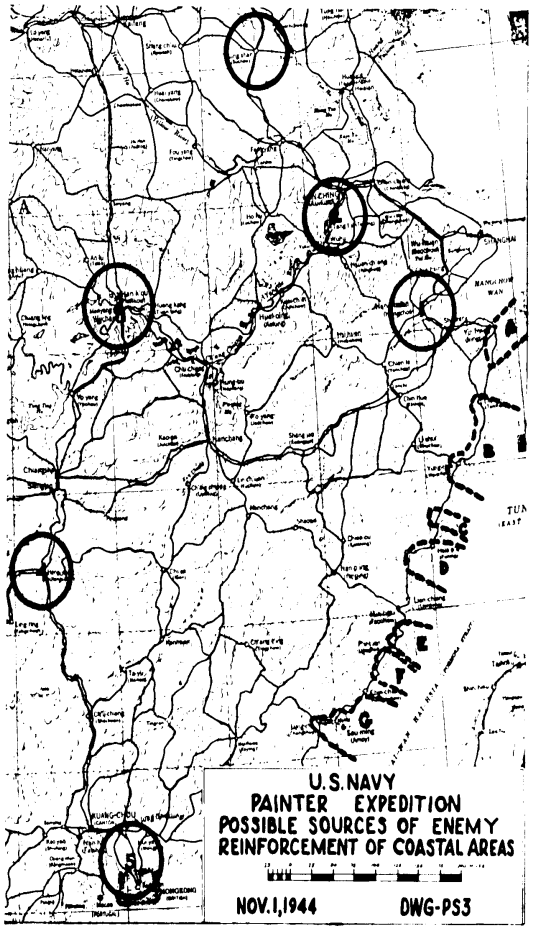
Wenchow Island in the mouth of the Chiang River east of Wenchow (14/9/44).

Occupation of Islands in Mirs and Hice Bays early in October.

On the 27th of September, Japanese forces landed in the vicinity of Hsia-chiang and driving southwest occupied the Foochow Bay area by the 5th of October. In conjunction with the occupation of these new areas the Garrison Forces at Quemoy Island off Amoy, Amoy and Swatow were strengthened and the construction of additional coastal defenses commenced. This construction work appears to be in the hands of Naval Units, as has been the Japanese custom in the past. However, in all probability, once the positions are completed, they will be manned or reinforced by Army Units. Army Units identified in the occupied points to date are: in the Wenchow area elements of the 70th Division; in the Foochow area the 5th IMB; in Amoy area elements of the 22nd IMB and in Swatow elements of the 19th IMB. Present estimated total strength of Army and Navy Units in areas are: Wenchow 10,000; Foochow 10,000; Amoy - Quemoy area 20,000; Swatow Area 15,000.

Aside from these localized forces, the East Coast of China is essentially unguarded inasmuch as not even puppet troops are to be found in Southern Chekiang or Northern Fukien Provinces, these areas being controlled largely by Communist troops who are strongly anti-Japanese.

* NOTE:- Certain names of Chinese Towns have been corrected to conform to the Wade-Giles System.



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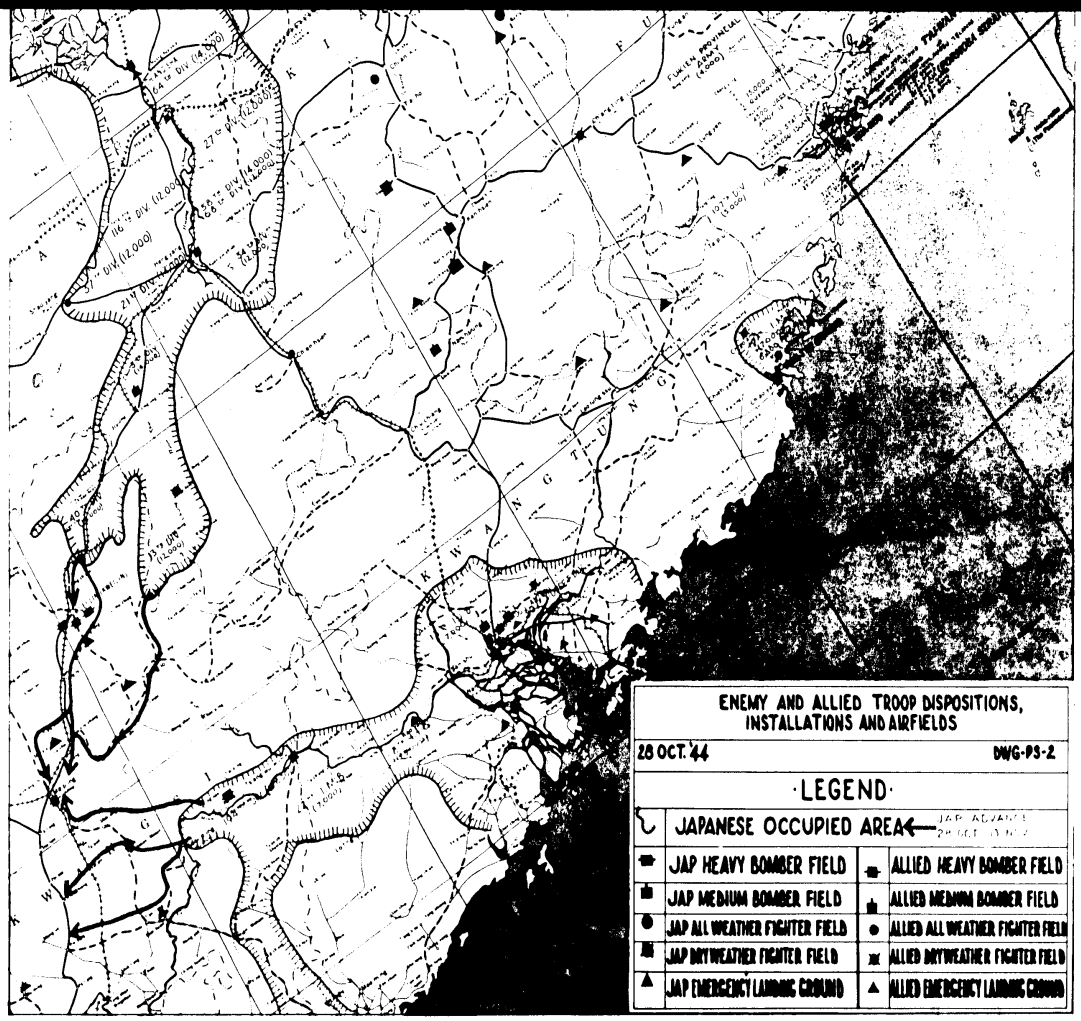

ENEMY AND ALLIED TROOP DISPOSITIONS, INSTALLATIONS AND AIRFIELDS
28 OCT. '44
DWG-PS-2
·LEGEND·
JAPANESE OCCUPIED AREA
JAP HEAVY BOMBER FIELD
ALLIED HEAVY BOMBER FIELD
JAP MEDIUM BOMBER FIELD
ALLIED MEDIUM BOMBER FIELD
JAP ALL WEATHER FIGHTER FIELD
ALLIED ALL WEATHER FIGHTER FIELD
JAP DRYWEATHER FIGHTER FIELD
ALLIED DRYWEATHER FIGHTER FIELD
JAP EMERGENCY LANDING GROUND
ALLIED EMERGENCY LANDING GROUND

SEC. III - ENEMY TROOP DISPOSITIONS, INSTALLATIONS AND AIRFIELDS (CONTINUED)

While it is very probable that in the due course of time the Japanese will make additional landings along the coast and increase the garrisons and defenses of areas already occupied at the present time Japanese forces are limited to the four points mentioned and concentrations at these points are not sufficiently large to allow for defense of more than the immediate area leaving the balance of the coast line essentially undefended. The area between Wenchow in the North and Amoy in the South is essentially devoid of roads for some distance back from the coast line. This allows for practically no communication between the various points except by water. Further occupation and reinforcement of points along the coast would of a necessity have to be conducted by water in the same manner as Foochow has been occupied. This lack of a land road network necessitates that each garrisoned area be essentially self sustaining and prohibits to a great extent the use of forces concentrated at one point in the defense of another point unless they can be water borne. As mentioned above, Japanese forces now concentrated at the four points mentioned are insufficient to more than defend the area they occupy. If a landing were made at any other point along the coast line this landing would have to be met by forces brought in from outside areas. There are five main areas from which troops could be obtained with which to counter a landing by our forces. These are:

1. Hangchow Area.
2. Nanking-Wuhu Area.
3. Hankow Area.
4. Hong-yang Area.
5. Hongkong - Canton Area.

From Area 1, 2, 3, 4, and 5*, a choice of water route or land route exists. To reach a point along the coast by water would be extremely hazardous in face of the presence of an enemy force lying off the coast of China; therefore, a combination of water and land routes would probably be utilized. A discussion of the various routes available and time required to reach various points along the coast follows.

TO REINFORCE "A"

I. FROM HANGCHOW AREA.

1. There is a good motor road following the north coast. However, at TSAO-AO there is a ferry. There is no available rail line.

2. The single rail line to I-WU, thence by good motor road northeast via CHEN-P-HSIEN, PA-MAO, AND NINGPO.

a. Without interference 1 and 2 enemy reinforcements could begin to reach "A" from HANGCHOW within eight days.

b. If the HANGCHOW rail line to I-WU and the TSAO-AO ferry were bombed at enemy reinforcements could begin to reach "A" within 10 days, in the face of moderate air harrassment.

II. FROM NAN-CHING - WU-HU AREA.

1. By good rail line and motor road system via SHANGHAI and HANGCHOW to connect with I.

2. By motor road through I-HSING, and to be reconstructed motor road via WU-HU to HANGCHOW to connect with I.

a. Without interference enemy reinforcements could begin to reach "A" within 15 days via 1. Route 2 should be considered secondary, as the roads are partially destroyed and the area partially hostile, friendly guerrillas. By this route enemy reinforcements could begin to reach "A" within 20 days.

b. By the destruction of the HANGCHOW bridge, which is now operable, the ferry of NANKING - HANGCHOW rail line, and destruction of TSAO-AO ferry, enemy reinforcements would probably not begin to reach "A" within 40 days against moderate air harrassment.

III. FROM HANGCHOW AREA*

1. By rail to NANKING and then via SHANGHAI and HANGCHOW to connect with I.

2. By raw, by road from this distance would not likely be feasible. Moreover, the small number of troops available in this area [illegible] this area would also likely be utilized to strengthen coastal areas north of HANKAU.

a. Without interference by rail take four days to arrive. Add four days to II.

* Indicated by circle on drawing No. [illegible].

b. If railway bridge over Yellow River were knocked out, add an additional 7 days.

AREA B: FROM SUCHOW AREA.

1. Add 7 days to A.

IV. FROM HANKOW AREA.

1. By water via NANKING, if enemy possesses river shipping, add three days to II and III.

2. By motor road via HAN-CH'ANG - HAN-CH'ENG - P'U-CH'ENG - LI-SHUI - TUNG-T'ANG - TUNG-TANG - PA-MAO, or HANCHANG - HAN-CH'ENG - KUEI-CH'I - SHANG-RAO - CH'U-HSIEN - LAN-CH'I - TUNG-TANG - PA-MAO would in either case require possibly 120 days. Very little of this route is now in enemy hands, much of the roads would require reconstruction, that now usable would be at least partially destroyed by guerrilla action, and there would probably be air harrassment over most of the route. There are numerous bridges, and gorges, which could be destroyed, or blocked, by air action. Therefore 120 days is probably a conservative estimate for enemy reinforcements to begin to reach "A".

V. FROM HENG-YANG AREA.

1. By road through CHI-AN - LIN-CH'UAN - HAN-CH'ENG - P'U-CH'ENG - LI-SHUI - TUNG-TANG - PA-MAO.

2. By road and rail via CH'ANG-SHA, HANKOW.

3. By LEI-YANG - CH'U-CHIANG - HAN-HSIEN - HAN-CH'ENG - FOCHENG - LI-SHUI - TUNG-TANG - PA-MAO, or LEI-YANG - CH'U-CHIANG - HAN-HSIEN - TUNG-AN - HAN-P'ING - PU-CHENG - LI-SHUI - TUNG-TANG - PA-MAO.

a. With moderate air harrassment, difficulty of road construction, necessity of anti-guerrilla tactics, route 1 would possibly require 145 days for enemy reinforcements to begin to reach "A".

b. By route 2 add 7 days to IV for enemy reinforcements to begin reaching "A".

c. By route 3 possibly 160 days would be required for enemy reinforcements to begin to reach "A", due to excellent opportunity for guerrilla and air action to block the route from LEI-YANG to CH'U-CHIANG, plus usual guerrilla and air harrassment over remainder of this route.

VI. FROM CANTON AREA.

1. By CH'U-CHIANG - HAN-HSIEN - TUNG-AN - HAN-P'ING - P'U-CH'ENG - LI-SHUI - TUNG-TANG - PA-MAO possibly 150 days would be required. The principle difference between this route and V-3 is the nearness of enemy territory to CH'U-CHIANG, obviating the need for such a stiff march as required from LEI-YANG to CH'U-CHIANG in V-3.

TO REINFORCE "B"

I. FROM HANGCHOW AREA.

1. Add 7 days to "A".

II. FROM NANKING AREA.

1. Add 7 days to "A".

III. FROM WU-HU AREA.

1. Add 7 days to "A".

IV. FROM HANKOW AREA.

1. By water, add 7 days to "A".

2. By road, the same as "A".

V. FROM HENG-YANG AREA.

1. Subtract 5 days from "A".

VI. FROM CANTON AREA.

1. Subtract 5 days from "A".

TO REINFORCE "C" AND "D"

It is unlikely that enemy reinforcements would arrive at "C" and "D" except from the HENG-YANG, HANKOW, CANTON areas, especially in view of their tactical requirements at "A" and "B" and the large concentration of available enemy troops in the HENG-YANG area.

I. FROM HANKOW AREA.

By road via TA-YEH - JO-CH'I - HAN-CH'ANG - CHIEN-TANG - CHIEN-CI - HAN-P'ING and down river valley to FOOCHOW, thence northeastward over trails. This route would require possibly 100 days at best for enemy reinforcements to begin to reach "C" and "D" as part of the route requires reconstruction and from the WU CHANG valley there are no roads to "C" and "D" other than peasant trails through rough, mountainous terrain.

II. FROM HENG-YANG AREA.

1. By road via CHI-AN - HAN-HSIEN - TUNG-AN - HAN-P'ING, thence down river valley and northeastward over trails. This route probably require 125 days for enemy reinforcements to begin to reach "C" and "D" as the greater part of it is through unoccupied territory, which in conjunction with guerrilla and air harrassment would cause very slow rate of march.

2. Via LEI-YANG - CH'U-CHIANG - HAN-HSIEN - TUNG-AN - HAN-P'ING, thence down river valley and northeastward over trails. This route would possibly require 145 days for enemy reinforcements to begin to reach "C" and "D" due to the added difficulty over preceding route of the LEI-YANG - CH'U-CHIANG gorges.

III. FROM CANTON AREA.

1. Via CH'U-CHIANG - HAN-HSIEN and on as in II above would possibly require 120 days for enemy reinforcements to begin to reach "C" and "D". The possible route via SHEKLUNG - LAO-LUNG-SSU - MEI-HSIEN is improbable due to destroyed roads. Advance would be subject to strong guerrilla attack as this area is focal point of HSANGTUNG "mods".

TO REINFORCE "E - F - G"

The same situation as to enemy reserves applies for "E-F-G" as does for "C-D", i.e., HANKOW, HENG-YANG and CANTON areas will probably be drawn upon. The immediate hinterland of this area is extremely rough, mountainous, terrain with roads destroyed leaving only peasant trails as possible routes open to the enemy for reinforcements. The same routes leading to "C" and "D" lead to the hinterlands of "E-F-G".

I. FROM HANKOW AREA.

1. Add 14 days to "C-D".

II. FROM HENG-YANG AREA.

1. The same as for "C-D".

III. FROM CANTON AREA.

1. Subtract 20 days from "C-D".

With the present distribution of Japanese troops in China, troops for a counter attack against an allied landing on the East Coast would be available in the various areas as follows.

Area 1. Hangchow Area: In the Hangchow - Ningpo area are to be found the balance of the 70th Division, approximately [illegible] and elements of the 60th Division. Hangchow as the 60th Division appears to have taken over defense of areas around and to the rear of Shanghai, formerly occupied by the 60th Division, it is doubtful whether more than one regiment or around [illegible] would be available. In addition to these, there are approximately [illegible] Japanese troops in the vicinity of Ningpo and an additional [illegible] Japanese troops in Hangchow area which would be available. [illegible] the Japanese have shown a great reluctance to use Japanese troops in local Against Chinese troops, preferring to use them for guard duty in rear areas or in policing communication lines. It is [illegible] however, that in the event of an allied landing, especially in areas A, B, and C the Japanese would make use of these Japanese troops in repelling the arrival of Japanese regulars from other areas. There would be available then approximately [illegible] Japanese troops and [illegible] Japanese troops in the Hangchow area. Mobilization of these forces would require from [illegible] to 7 days following which the time required to reach the area of action would be as indicated in the section on routes.

Area 2. Nanking - Wuhu area: In this area the 61st Division with an estimated strength of [illegible] is available. The regiment is located at Nanking, one at Wuhu and the third at Pei. Approximately 7 - 10 days would be required to mobilize and move these elements. If this division at either Wuhu or Nanking. There are considerable Japanese troops in this area but it is very doubtful if these troops would be utilized for other than rear guard duty in the area evacuated by the 61st Division.

SEC. III - ENEMY TROOP DISPOSITIONS, INSTALLATIONS AND AIRFIELDS (CONTINUED)

Area 3. Suchow Area: In this area are to be found the 63rd and 65th DIVISIONS and the 4th Cavalry Brigade. The 63rd holds a section of the Kiangsu coast and could not be moved without exposing a vulnerable stretch of coastline. The 65th Division and the 4th KB however would be available, and together furnish a force of around 18,000 men. Elements of the 4th KB could be mobilized within 7 to 10 days inasmuch as it is concentrated in the Haifeng area. Mobilization of the 65th Division would require 10 to 15 days as its elements are scattered and cover a wide area. Elements of the 4th KB could mobilize and be transported to Suchow arriving there in time to move southward with the 65th Division. Further movement to points along the coast lies as shown in the section on routes.

Area 4. Hankow Area: Formerly one of the largest concentrations of Japanese Troops in China was found in this area; however, the area has been denuded in order to prosecute the offensive in Hunan - Kwangsi area and at the present time only one division, the 39th, and one IMD, the 1st, and three IIBs have been positively identified in this area. Of these only the 39th Division and the 1st IMD would be suitable for combat purposes. These two units total approximately 28,000 men.

There have been persistant rumors of additional troops being brought into Wuhan area but no units have been identified. Identification of a new 34th Army Headquarters in Hankow would lead one to suspect that these rumors are correct; however, in the absence of positive identification availability of these units cannot be determined and the sum total of available troops must be held to the 28,000 mentioned above.

Transportation from this area would be by boat down the Yangtse River either to Shanghai area and then south thru Hangchow or down the Yangtse as far as Chiu-chiang and from there overland to the desired destination.

Mobilization and concentration of the 39th Division and 1st IMD at Hankow would require 10 days or more as both units are scattered due to removal of other units from the area. It would also leave inadequately guarded the main granary for Japanese troops in China and it is doubtful whether either of these units would be called on to assist in the defense of the east coast. If additional units are available in the Wuhan area, they would be available; however, it is impossible to make an estimate of the number of troops available until the units have been identified.

Area 5. Hsing-yang Area: Eleven divisions, one IMD and elements of two IIBs have been moved into the central Hunan area. Of these, approximately one-half have been committed to the push into Kwangsi. Remaining in Hsing-yang and vicinity are the 27th, 34th, 64th, 71st, and 110th Divisions, the 17th IMD, and the 4th and elements of the 5th IIB. Of these units, all five divisions would be available totaling approximately 90,000 troops. Mobilization of these troops could be accomplished in 7 to 10 days inasmuch as they are located in a combat zone. Transport of these forces to coastal areas would be difficult and require a great deal of time as indicated in the section on routes; however, the largest single available group in China is located in this area.

Area 6. Canton - Hongkong Area: In this area are to be found two divisions, two IIBs, elements of three IMDs and the Hongkong Garrison. There are strong indications that at least one additional division has been brought into the area but this has not been confirmed to date. Of the above mentioned units, approximately 75% have been committed to a drive along the West River. The balance is needed for defense of Hongkong - Canton area so that unless additional troops are available, not more than 10 - 20,000 troops would be available in this area. Mobilization could be completed within 7 to 10 days. Transport of troops from this area to points along the East Coast could best be done by water, barring interference by allied forces. If this route is denied them, the overland route as discussed in section on routes would have to be followed.

Following is a summary of troops available in the various areas together with an estimate of time required to mobilize and reach the various points along the coast. In all cases, the minimum time, barring strong opposition or damage to routes (such as the bombing and destruction of main bridges), required to reach the specified point has been used.

	Troops	AREA A	AREA B	AREA C	AREA D	AREA E	AREA F	AREA G
Area 1 Hangchow	32,000J 35,000P	13	20	Not likely to be used in these areas.				
Area 2 Nanking	20,000	20	27	*	*	*	*	*
Area 3 Suchow	18,000	24	31	*	*	*	*	*
Area 4 Hankow	28,000	33	33	110	110	124	124	124
Area 5 Hsing-yang	90,000	33	40	132	132	132	132	132
Area 6 Canton	20,000	-	-	114	114	114	114	114

* NOTE:- Japanese Puppet

A study of the above figures indicates the difficulty of transporting troops from the various area of China to the coastal area. Due to this difficulty of transport and the lack of a road network in the coastal areas, unless the Japanese establish adequate self-sustaining garrisons at all possible landing places along the East China Coast they will experience great difficulty in preventing a landing, or in making a counter attack once a landing has been effected.

A report recently received by the Chinese G-2 from their agents in the coastal area to the effect that the Japanese are planning on building a series of 11 airfields along the China coast may indicate an intention on the part of the Japanese to utilize land-based aircraft as a defense against a possible invasion attempt. Reports indicate that the Japanese are improving and enlarging the air fields in the vicinity of Swatow and Amoy and that construction has already commenced in the vicinity of Foochow and Wenchow.

One other source of troops must be considered. This is Manchuria. Divisions in this area have been greatly weakened in recent months by being drained of their experienced troops for formation of new units. Depending on the Japanese fear of a threat from Russia and their willingness to deplete their strength in this area still further, one to five divisions, or from twenty to one hundred thousand or more troops, would be available from this area. Overland transport of these troops to Hankow area would require four to eight weeks depending on the number of troops transported. However, with the use of water transport, and barring interference from our naval and air units, they could be brought into the area within a period of from two to six weeks depending on whether one or five divisions comprised the force. Overland movement of these forces could easily be hampered by destruction of the railway bridges at Tsinan, Pukow and Nanking. Reinforcements from Manchuria could come overland and be utilized in an offensive in Areas A and B but terrain difficulties would make it very unlikely that they could be used in areas C to G unless transported by boat to a point near their destination. This would be very difficult to accomplish if allied fleet units were in the area.

/s/ Joseph K. Dickey
JOSEPH K. DICKEY
Colonel, G.S.C.
Asst. Chief of Staff, G-2

AIRFIELDS IN SOUTHEAST CHINA

Japanese Airfields, as of 10 Oct. 1944

NAME	TYPE	LOCATION	RUNWAYS (Feet)	REMARKS
Amoy Island (Kaiti)	MAD	24-33/118-07	(1) 4200x45 NE/SW (2) 3500x200 NW/SE	Runway (1) hard surfaced, probably concrete. A/C revetments. Dummy A/C on field.
Amoy Island	SB	24-26/118-05		
Canton (Kuper Island)	SB	23-07/113-17	E/W of S. coast of island.	Two Seaplane ramps. Double bay hangar with slipway.
Canton (Hamilton)	LIB	23-09/113-16		
Canton (Tien Ho)	MAD	23-08/113-19	4500x320 N/S 3100x200 E/W	Runways concrete, camouflaged. Apparently being extended.
Canton (Tien Ho Satellite)	MLD	23-10/113-23	1000x500 NW/SE	
Canton (Shamsua)	MLD	23-07/113-25		Runway being surfaced.
Canton (White Cloud)	MAD	23-11/113-16	4400x200 NE/SW 3720x320 NW/SE	Runways concrete. First class military airfield.
Canton (White Cloud Satellite)	MAD	23-14/113-15	4400 NNE/SSW	Runway hard surfaced. Being enlarged.
Chiang-sha	LIB	28-12/113-00	1000x900	
Chiang-sha	MLD	28-13/113-00	4400x220	New strip. Rolled earth runways.
Chi'ao-an	FLD	23-43/116-35	4500x2700	Satellite field of Swatow. Grass runway.
Chia-hsing (Kashing)	ELD	30-43/120-43	Field: 2500x2500	Overgrown with grass.
Chiang-men (Kongmoon)	MLD	22-36/113-06		
Ch'eng Pu	ELD	31-10/121-07		
Chin-hua (Kinhwa)	FAD	29-09/119-43	3750x150 NE/SW	Runway concrete.
Chiu-chiang (Kiukiang)	MLD	29-47/115-57	4400x360 ENE/WSW 3500x190 NNW/SSW	Dummy planes reported.
Chiu-chiang (Kiukiang Satellite)	MLD	29-49/115-56	3200x600 NW/SE	Runway hard packed dirt.
Chou-shan Island (Tinghai)	SB	30-01/122-05		One seaplane ramp.
Chou-shan Island (Tinghai)	FAD	30-01/122-26	3600x250 NW/SE	Combination landing ground and seaplane base under construction by Japanese. Reported under development into a large base.
Chu-chi	ELD	29-44/120-13	5400x100	
Chung shan	MLD	22-22/113-36	Field: 5240x2795	Sandy soil.
Fu-mai-chai	ELD	22-42/113-39	Field: 4200x400	
Hangchow	MAD	30-17/120-13	4700x200 NE/SW	Runway paved and camouflaged.

SEC. III - ENEMY TROOP DISPOSITIONS, INSTALLATIONS AND AIRFIELDS (CONTINUED)

JAPANESE AIRFIELDS

NAME	TYPE	LOCATION	RUNWAYS (Feet)	REMARKS
Hang-chow (Kiaoshe)	ELG	30-21/120-16	1200	Runway surfaced with crushed stone.
Hang-chow (Hengkiapu)	ELG	30-22/120-22	1200	Runway surfaced with crushed stone.
Hankow	MAD	30-36/114-15	5250x190 NNE/SSW 4000x175 NNE/SSW 4200x185 NNE/SSW 4500x180 ESE/SSW 3500x185 NW/SE 3900x185 N/S 5500x160 WNW/ESE	First class airfield. Runways hard surfaced.
Hankow	MAD	30-36/114-09	6000x200 ENE/WSW	Hard surfaced, probably compacted clay and river gravel.
Hankow	FLG	30-47/114-12	Field: 3100x500 NNE/SSW	
Heng-yang	MAD	26-57/112-31	4921x164 N/S 4921x 98 N/S	Reconstructed and being used by Japanese.
Ho-fei	ELG	31-54/117-19	Field: 2000x2000	Grass.
Hong Kong (Kai-Tak)	FAD	22-20/114-12	3600x330 NW/SE 1930x165 WNW/ESE	Concrete runways. Camouflaged.
Hong Kong	SB	22-19/114-12		Connected with Kai-Tak A/F by two 55' seaplane ramps.
Hsiao-kan (Siao-kan)	FAD	30-55/114-52	3820x250 NE/SW	Runway hard surfaced.
Hsien-ning (Sienning)	ELG	29-57/114-15	3500x190	
Hsin-yang (Sinyang)	FLG	32-05/114-05	3400x125 NW/SE 2300x165 NE/SW	Sod.
Hsiu-ning	MAD	30-31/117-44	4950x180 NE/SW	Unpaved but hard-packed.
Hsiu-ning	MAD	30-31/117-46	5000x160 ENE/WSW	
Huaihin	ELG	22-32/114-44	2400x210	
Hua-yao	ELG	23-03/112-28	Field: 2700x1600	Sandy, flat.
Iao-ch'i	FAD	29-12/119-29	3250x170 E/W	Runway hard surfaced, probably concrete.
Ichang	MAD	29-17/111-34	4921x328 N/S	
I-hsing	MAD	29-32/113-11	5400x250	Hard surfaced. Still under construction.
I-ning	ELG	22-46/114-16	Field: 3000x2100 E/W	
Macao	ELG	22-10/113-34		Portuguese controlled.
Makok	SB	21-27/117-42		
Nan-ch'ang	FAD	28-36/115-53	3400x160 NE/SW	Runway hard surfaced.
Nan-ch'ang	FLG	28-38/115-53	3000 NNE/SSW	
Nanking (Hsiaohsingkuan)	MAD	32-03/118-46	5400x300	
Nanking	MAD	32-00/118-46	[illegible]x175 N/S [illegible]x175 N/S 4600x220 WNW/ESE	Runways concrete. First class field.
Nanking	FAD	32-02/118-49	2000x300 NW/SE	Runways appear paved.
Nan-t'ung	FLG	32-05/120-57	Field: 3750x1500	Sandy subsoil.
Pang-fou	FLG	32-55/117-22	Field: 3900x2700	Hard clay.
P'u-ch'i	FLG	29-43/113-54	3000x225 NNW/SSE	
Quemoy (Chin-men)	ELG	24-26/118-20	3200x100 NW/SE	
San-tsao	MAD	22-00/113-24	4150x210 N/S 2730x160 NE/SW	First Class field. Runways hard surfaced.
Shanghai (Hungjao)	MAD	31-11/121-22	5850x330 N/S	Runway hard surfaced.
Shanghai (Kiangwan)	MAD	31-20/121-31	5000x525 N/S 4500x525 E/W 3700x525 NW/SE	Concrete runways. Earth revetments.
Shanghai (Lunghua)	FAD	31-10/121-29	3000 NW/SE 3110 NE/SW	Runways hard cinder surface. Earth revetments.
Shanghai (Lunghua)	SB			Adjoins Lunghua FAD.
Shanghai (Point I.)	FLG	31-17/121-24		Probably an aircraft repair depot.
Shanghai (Tachang)	MAD	31-18/121-24	5400x220 N/S 5400x220 E/W 5200x250 NW/SE	Concrete runways. Military A/D; used also for civil A/C.
Shanghai (Woosung)	MAD	31-25/121-28	3850x350 E/W 3450x350 N/S	Concrete runways.
Shao-yang (Paoching)	FAD	27-06/111-28	3930x165 NW/SE	Runway macadam.
Shi-hui-yao	FLG	30-14/115-08	2760x150 NW/SE	Compacted earth
Swatow	FAD	23-22/116-41	3720x125 NE/SW 3000x240 NW/SE	NE/SW runway concrete. NW/SE runway grass.
Taoyuan	MAD	23-25/116-32	6500x165 NE/SW	Runway clay on rock.
Tao-t'ien	FLG	23-33/111-32	Field: 3900x1000	
T'eng-hsien	FLG	23-23/111-39	3900x320 EW	Sod.
Tseng-ch'eng	FLG	23-20/113-31	Field: 3000x700	
Tseng-shan-shih	FLG	30-38/114-28	3000x160	
Wan-ha	FLG	22-30/113-55	2500x160	
Wu-ch'ang	MAD	30-31/114-20	5400x175 N/S 5400x175 E/W	Concrete runways.
Wu-ch'ang	MAD	30-34/114-23	5000x150 N/S	
Wu-hsien	ELG	31-18/120-32	Field: 1500x1000 N/S	Grass, cinder covered.
Wu-chin	ELG	31-47/119-54	2700 NW/SE	
Wu-hu	ELG	31-22/118-23	3000x150 E/W	
Wu-i	ELG	20-55/119-50		
Yin-hsien (Ningpo)	FAD	29-49/121-28	3400x140 NW/SE 2400x140 NE/SW	Reported to have concrete runways.
Yueh-yang	FAD	29-29/113-07	3800x150 NNE/SSW 3630x 70 NNE/SSW	Runway paved. Runway paved and earth-fill.

GLOSSARY

ELG - Emergency Landing Ground
FLG - Dry weather Fighter Field
FAD - All weather Fighter Field
MLG - Dry weather Medium Bomber Field
MAD - All weather Medium Bomber Field
HAD - All weather Heavy Bomber Field
SB - Seaplane Base

SEC. III – E. DISPOSITION OF FRIENDLY FORCES AND ALLIED AIRFIELDS

E. DISPOSITION OF FRIENDLY FORCES AND ALLIED AIRFIELDS

General

The disposition of Chinese forces shown on Drawing No. PS-2 has been taken from all available sources but is not believed to be complete. The following data on Allied Fields, shown on Drawing No. PS-2, has been taken from all available Army, Navy, and Chinese sources and is believed to be correct:

AIRFIELDS IN SOUTHEAST CHINA

Allied Airfields, as of 10 Oct. 1944

NAME	TYPE	LOCATION	RUNWAYS (feet)	REMARKS
Ch'ang-t'ing	FLO	25-51/116-20	4290x165 N/S	Sandy earth runway.
Chen-hsien	KLO	25-48/112-39	4920x328 N/S	Clay.
Chi-an	FAD	27-10/115-06	3936x160 NNE/SSW	Runway stone bound with clay.
Chien-ou	FLO	27-09/118-17	3900x160 NNW/SSE	Runway stone bound with sand and clay.
Ch'u-hsien	HAD	28-57/118-52	5905x492	Destroyed but can be readily repaired.
Ho-p'ing	KLO	24-23/115-06		
Hsin-ch'eng	MAD	25-31/114-33	4250x195	Runway paved. Originally intended for V.L.R. but work now suspended.
Hsin-feng	KLO	25-25/114-52	Field: 4950x1320 NW/SE	Medium bomber staging field planned.
Kan-hsien (Kanchow)	MAD	25-50/115-53	4600x164	Runway stone bound with clay.
Kuang-ch'ang (new)	FAD	26-50/116-12	Field: 3280x1476	Runway stone bound with clay. Capable of development into an MAD.
Kuang-ch'ang (old)	KLO	26-46/116-12	Field: 3280x1476	Turf surface, flooded from April-July.
Kwei-hsien	KLO	23-02/109-39	Field: 4200x1500	Hard clay.
Kwei-lin (Hurtang)	HAD	25-16/110-09	6561x246 NNE/SSW	Runway stone bound with clay.
Kwei-lin (Li Chia Chen)	HAD	25-14/110-12	5774x164 N/S	Runway stone bound with clay.
Kwei-lin (Iangtang)	HAD	25-17/110-04	6600x450 NE/SW 4900x265 N/S	Runway gravel on stone. NOTE: Except for one fighter strip, all Kwei-lin airfields have been destroyed.
Liang-feng	KLO	25-07/110-08	Field: 2625x645	
Li-shui	FAD	28-27/119-57	4500x150 NE/SW	Repaired and used by Japanese during their occupation of Li-shui in Aug-Sept., 1944.
Lu-chai	KLO	24-32/109-38	2624x328	
Lung-chi	KLO	24-29/117-40	1800x600 N/S	Grass over sandy soil.
Lung-yen	KLO	25-11/117-02	3280x984 N/S	Grass surface.
Ma-ping (Linchow)	MAD	24-17/109-16	6000x246 N/S	Runway stone bound with clay.
Ma-hsien	KLO	24-18/116-13	Field: 1200x600	
Man-ch'eng	FAD	27-33/116-41	3900x164 N/S	Runway paved.
Man-feng	KLO	27-11/116-23	Field: 3000x3000	Turf surface.
Man-hsiung	FAD	25-11/114-09	3900x164	All weather runway.
P'ing-lo	KLO	24-36/110-28		
P'u-ch'eng	KLO	27-58/118-27	Field: 2800x1100	
Sui-ch'uan	MAD	26-25/114-33	6000x196 N/S	Runway stone bound with clay.
Ta-yu	KLO	25-15/114-25	Field: 4950x1320	Turf surface. Medium bomber staging field planned.
Wu-hsuan	KLO	23-36/109-39	2625x351	
Wu-ming	KLO	23-12/108-15		
Yu-shan	MAD	28-43/118-24	4920x165 NNE/SSW	Runway stone bound with clay.

SEC. III – F. ESTIMATES ON FORCES REQUIRED TO CLEAR THE CHEKIANG – KIANGSI R.R.

F. ESTIMATES ON FORCES REQUIRED TO CLEAR THE CHEKIANG-KIANGSI RAILROAD.

Information not received at time of printing.

SEC. III - H. TYPICAL FIELD DATA AND BEACH AND TIDAL INFORMATION

H. TYPICAL FIELD DATA, BEACH AND TIDAL INFORMATION.

1. Typical Field Data.

(a) The reproductions shown illustrate the type of field sheets furnished all Parties. Similar forms were used for Airfields, Harbors, Landing Beaches, Waterways, Bridges, Ferries, Railways, and Supplemental Information (Health, Resources, Utilities, and Communications).

2. Beaches.

(a) Many beaches adjacent to villages have small stone jetties or ramps constructed by the Chinese which may be safely used. In many instances where there is deep water just offshore, the banks are steep-to and such areas should be avoided.

(b) From Fu-ch'ing south and in the Amoy area there are a number of boulders and rocks just off many of the beaches. These rocks may be covered at high tide, and caution should be exercised in approaching an unknown beach. Beach studies from aerial photographs cannot be considered reliable, but may indicate the best landing areas. The best Amoy area beaches on the mainland are at Wei-t'ou (Buiten - 24°-32'N, 118°-33'E), Chiu-chen (24°-07'N, 117°-57'E) and Chan (24°-34'N, 118°-13'E) Points.

(c) In the Mizzed Area, the beaches along the Pai She Shan Channel (29°-53'N, 121°-56'E) and Wei Shan Channel (29°-18'N, 122°-04'E) are steep and, although mud, may be used at all tides. Mat should be utilized for unloading heavy equipment. Good beaches appear available on Chou-shan (Chusan) Island.

3. Tidal Information.

(a) The charts show typical tide curves based on predicted Amoy Inner Harbor tides. These were checked by actual readings at Wei-t'ou Point and the differences were minor. It is to be noted that mean Spring H.W. and mean Neaps H.W. do not differ greatly. The H.H.W. Spring in September was 17.3' and the L.H.W. Neaps was 14.8'. The mean H.W. difference appears to be only 1' between Neaps and Springs. Allowing 11.0' above L.T.W., landing craft have approximately 5 hours and 30 minutes to use the beaches. This makes almost all the natural beaches usable for limited hours.

FUKIEN PROVINCE — PAINTER EXPEDITION

Chien-yang - Chien-ou Section

1. Route from Chien-yang — Latitude 27-20 N. 118-03 E.
Length of Section: 32.2 Miles.
Approximate population: City of Chien-yang: 16,000; Chien-yang District: 101,000
2. Alternate hills
Alternate hills and Rice
3. None
4. Silty Clay
5. Right of Pavement: Average 10 ft. — Average 8 ft.
Base course: Type stone (depth) — Average thickness 6"
Top of Pavement: Type (depth) — Average 6"-8"
Surface course: Type (depth, etc.) — None
Condition (dry, wet, etc.) — Average load 20 MPH
6. Minimum Rad. 5 feet
7. Maximum grade 10% — All short grades under 1,000 ft. — 10% once — Frequency 8% ten times
8. Maximum curvature 40° R.
9. Minimum grade — Frequency 5 times
10. Minimum Rad. 30 (Including Culverts) — No major bridges except at Chien-yang.) — Location See list
11. Ferries None — Location
12. Supplemental Information: Widening, drainage, new bridges and resurfacing with crushed gravel.
13. None.
14. Surfacing material (All gravel must be crushed.) At intervals along road, leaving not over 5 mi. apart.
Use Sandstone — In River
Use — Bridge Parallel to road.
Use — In River
Use — On road parallel to road.
Local coolie out — Use "Chan" wood — Size 4"x4"x18'-Piling Max 16'
None. — Location
None. — Location
None. No bricks suitable for heavy construction. — Location
15. None.
16. Total excavation 470,000 Cu.Yds. (12% Rock). Gravel surfacing 14,000 cu.yds. Two (1000 man) Troop Battalions will require 70 days to complete to 2-lane highway.
17. Date of Survey: Personal inspection — Date 8/12/44.
18. Reviewed: Charles M. Noble.

NOTE: This road does not cross Ch'ung Ch'i (Creek).

FUKIEN PROVINCE

Chien-yang - Chien-ou Section

Total Length: 32.2 Miles

One Way Operation: 18.8 Miles

SUMMARY OF REQUIREMENTS

1. Excavation
(a) Highway
(1) Earth 245,000 C.Y. — Total excavation Earth & Rock:
(2) Rock 215,000 C.Y. — 670,000 C.Y. (32% Rock)
(b) Bridges, etc
(1) Earth 5,000 C.Y. — Average excavation per mile
(2) Rock 5,000 C.Y. — 20,000 C.Y.
2. Culvert Pipe
(a) 24" Pipe 2,400 lin. ft.
(b) 36" Pipe 1,200 lin. ft.
3. Dry Rubble Masonry 400 C.Y.
4. Rip Rap 400 C.Y.
5. Wood Piling
(a) 16 ft. to 20 ft. 8,400 lin. ft.
6. Bridge Timber 710 MBM (Thousand Ft. Board Measure) (Including 171.0 MBM to repair Chien-yang Bridge at Chien-ou)
7. Concrete 400 C.Y.
8. Gravel Surfacing 14,000 C.Y.

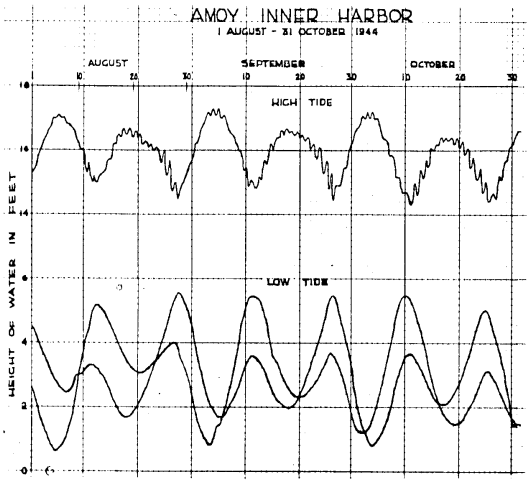
ESTIMATE OF TIME REQUIRED

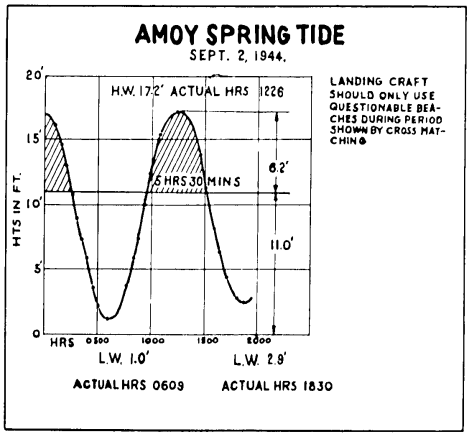
(a) Native labor: Requires 10,000 coolies for 117 days.

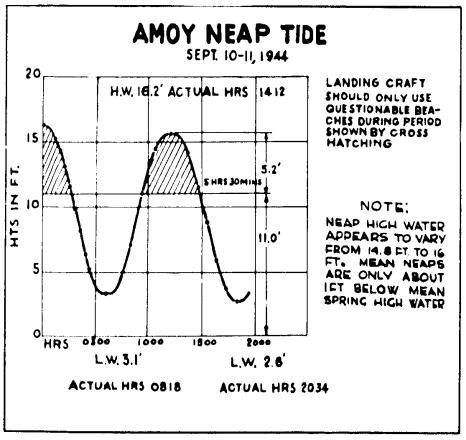
(b) Troop labor with heavy equipment:
Total Man-Days Required: 710,000
Time Required One Battalion: 470,000 ÷ 4,000 = 117 days
+ 25% contingency = 29 days
Total = 117 days

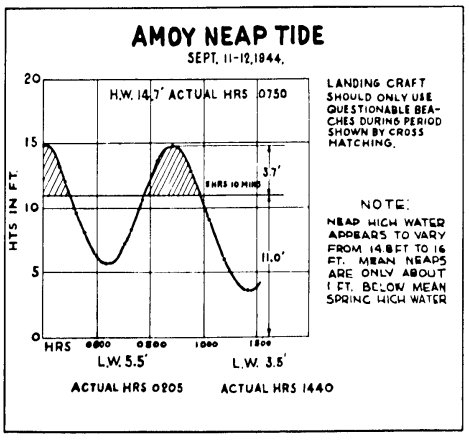
CONFIDENTIAL

SEC. III - FIELD DATA, BEACHES & TIDES (CONTINUED)

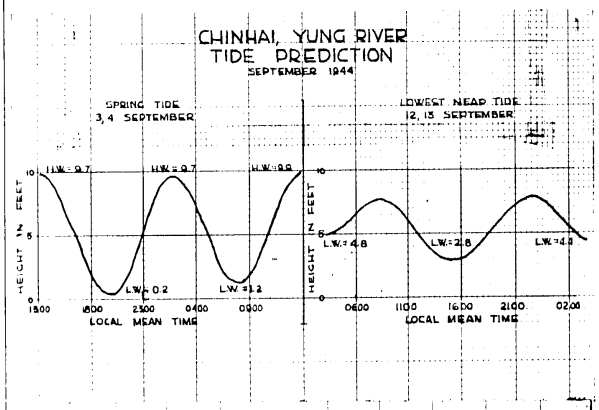


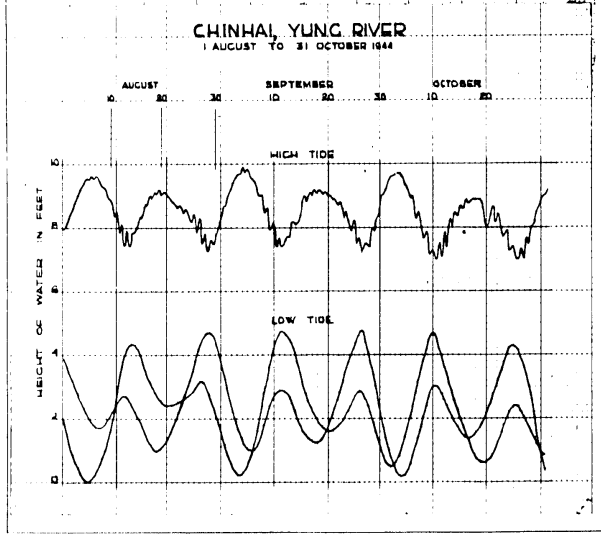






SEC. III - FIELD DATA BEACHES & TIDES (CONTINUED)





TIDE RECORD
(Observed and Computed Values)

Taken at SHIN TIN, 8 miles SW of AMOY

August 21 - 24, 1944

Date	High Tide Time	High Tide Ht.(Ft.)	Low Tide Time	Low Tide Ht.(Ft.)
21	(1348	16.4)	(0747	3.1)
	1350	20.0	—	—
	(0220	16.5)	(2002	2.2)
	0220	20.3	2002	5.5
22	(1412	16.2)	(0818	3.1)
	1412	19.7	0818	7.0
	(0236	16.3)	(2034	2.6)
	0215	20.8	2034	6.1
23	(1434	16.1)	(0847	3.2)
	1445	20.7	0835	8.1
	(0253	16.2)	(2102	3.0)
	0300	20.7	2110	6.3
24	(1500	16.0)	(0920	3.3)
	1530	20.9	0920	8.0
	(0316	16.1)	(2134	3.5)
	0325	20.9	2134	8.3

Readings in () are computed; others actual observations.

Times shown are local mean.

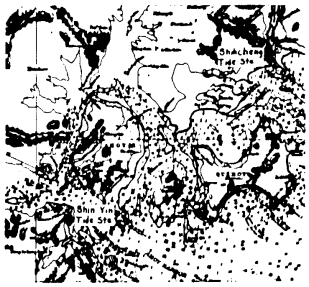
TIDE RECORD
Observed Values

Taken at Shih-cheng

September 1 - 7, 1944

Date	High Tide Time	High Tide Ht.(Ft.)	Low Tide Time	Low Tide Ht.(Ft.)
1	1053	17.9	0510	2.2
	0010	19.5	1732	0.1
2	1142	19.2	0551	-0.1
	0043	20.6	1812	0.2
3	1229	20.4	0632	-0.3
	0120	20.9	1855	2.0
4	1312	20.7	0710	-0.1
	0150	21.7	1930	1.3
5	1315	21.5	0750	0.3
	0224	21.4	2015	1.1
6	1436	20.6	0830	2.1
	0259	20.1	2054	1.6
7	1524	19.9	0912	2.6
	0240	19.5	2135	2.2

Times shown are local mean.



KEY MAP SHOWING LOCATIONS OF TIDE STATIONS IN AMOY AREA

SEC. III – I. ENGINEERING ASSUMPTIONS & ESTIMATES

I. ENGINEERING ASSUMPTIONS AND ESTIMATES.

General

(a) In estimating the amount of construction troops required, it has been assumed that advance base type construction will be used, and that any existing suitable structures in the area will be utilized. Such buildings, notably in the Amoy area, would be usable, after necessary repairs, for warehousing, hospitals and offices.

1. Wharves.

(a) In estimating the amount of wharfage required, it has been assumed that a ship can be unloaded at the rate of 500 tons per day, and that 600 feet of dock space per ship would be required for berthing. A standard 90 foot timber pile dock section has been used, and where these are shown parallel to the shore a 25 foot timber bridge section or rock causeway connection to the beach for each 600 foot section of dock is included. In water over 5 fathoms, pontoon sections should be used. In the Amoy inner harbor there are some pontoon docks which might be used in the early stages of an operation but in the eventual development of the base these should be replaced either with new pontoons or piled wharfs. In other areas there are no existing deep water docks. In estimating the amount of dock space necessary for receiving bombs and ammunition for airbases, five tons per plane per day is used. No wharfage is assumed for tankers beyond pile cluster dolphins for mooring and a pile supported cat walk to the shore to carry the pipe lines.

(b) The causeways as shown for some of the docks (e.g., Shitau Point in Area #3* (5000' approximately)) will be long in order to reach the 5-fathom curve. To meet this construction requirement, large rock handling equipment is being recommended. (See Paragraph 6.(a)).

2. Storage.

(a) Warehousing is provided for a five day back log of supplies to interior China, at the rate of 40 cubic feet per ton. It is further assumed that 60 per cent of the floor space provided would be utilized for actual storage, to a height of 10 feet. The basis for estimating shipping and storage facilities for garrison and bivouac troops is 33 lbs. per man day with a total storage capacity of 20 days supply.

3. Airfields.

(a) Construction of V.L.R. and W.B.M. airfields in accordance with U.S.A.F. Specifications is provided for in the estimate. No complete site surveys were possible because of the limited time and personnel, but earth moving at the recommended sites will not be excessive. Soil in the Amoy area is sandy and emergency fields could be put in quickly with Marston Mat surfacing, later gravel surfaced and sealed with asphalt. In all areas good rock is available in abundance and it is assumed that it would be crushed and used for surfacing material on most airfields and roads. Also included in the airfield estimate are gasoline storage facilities for a twenty day supply, bomb dumps, and necessary facilities for the administration, operation, and supply of a combat air base, including the housing of personnel.

4. Roads.

(a) The road system, including bridges, on the coast and extending inland an average depth of 75 miles has been to a large extent destroyed by the Chinese. The interior roads are generally narrow with inadequate bridges and with steep grades and sharp curves in the mountain sections. (See transportation study.)

(b) The road estimates provide for repairing and widening the roadway to 20 feet with 2 foot ditches, and providing crushed rock surfaces 18 feet wide. Some realignment will be required in mountainous sections to reduce grades to a maximum of 15% and to widen curves where necessary. A few heavy sections have been planned for one way traffic over short distances.

(c) Most of the existing bridges are inadequate for heavy traffic, and estimates provide for replacing these with suitable structures. For estimating purposes, a twenty foot wide timber pile bridge section has been used as a standard.

5. Camps.

(a) The estimate provides for construction of frame mess halls, heads, showers, and storerooms for camps but does not provide for housing which it is assumed would be in tents. For health, these have to be screened and decked as materials and labor become available.

6. Special Equipment.

(a) Due to the magnitude of the development planned and because of the urgency of meeting construction schedules, the following special equipment not included in the usual allowance lists of construction troops will be required, equipment to be assigned to an Advance Base Construction Depot (ABCD) for assignment as required:

ITEM	NO.
60 Ton Rock Crushers.	1/runway, plus 1/60 miles of road.
250 Ton/hr. Rock Crushers.	1 per Major Base.
10-16 Yard Dump Trucks.	100 per Major Base.
4 Yard Shovels.	4 per Major Base.
Rock drilling equipment (including compressors, hose, jack hammers, etc.).	100% over basic allowance for all road and airfield battalions.
Wagon Drills.	20 per Major Base.
Dynamite.	1000 Tons.
Asphalt mixing and spreading equipment.	As required.
Marston Mat - 3,000,000 square feet.	7,500 Tons.
Asphalt impregnated paper or burlap mat for airfields.	2,000 Tons.
Pontoon Assembly Depot.	1 per Major Base.
Oxygen and Acetyline Plants.	1 Stationary Plant for each Major Base.
Complete Machine Shop with equipment of sufficient size for the repair of large construction parts.	1 for each Major Base.
Harbor Tugs.	5
Floating Cranes (75 Ton).	2
Floating Cranes (20 Ton Whirleys) for Dock Construction.	6
Suction Dredges with discharge pipe (Minimum 1,000 cubic yards per hour).	2
Truck Cranes (approx. 5 Ton Capacity).	10
Bailey Bridge or U. S. equivalent.	5,000 lineal feet.
Pile Driving Rigs complete - 75-80' leads, large steam or air hammers.	As required.
Air Driven Dock Building Equipment including compressors, hose, drills, saws, hammers, etc.	1 allowance per Dock Battalion.
Shallow Water Diving Gear.	2 Units per Dock Battalion.
70' to 80' creosoted piling.	As required for docks.
Steel Sheet Piling - 25' lengths, including tie bars and structural steel.	1,000 Tons.

(b) Much of the usual earth moving equipment included in the Navy Construction Battalion allowance list will be inadequate on the type of work which will be encountered. It is recommended that all battalions assigned to road work or airfields be equipped with 2 - 2½ yard shovels and 3 - 1½ yard shovels in lieu of the usual lighter equipment. Some lighter machines will be required to operate as cranes, trenchers, etc., but they would not be suitable for mass excavation. It is further recommended that 75% of the carryalls supplied to airfield battalions be of 12-16 yard capacity; the other 25% to be 8 yard. All tractors for road building and airfield battalions should be Class 1.

7. Troop Labor.

(a) The exact number of Engineering Battalions recommended for construction of facilities at each base is outlined under the detailed report of the respective areas. Where dock or other special building units are required it would be desirable to organize the personnel and equipment to meet the special requirements.

J. - HIGHWAY TRANSPORTATION ASSUMPTIONS

J. HIGHWAY TRANSPORTATION ASSUMPTIONS

General

In analysing the highway system from the standpoint of traffic capacity and the physical characteristics required to make it capable of carrying a required tonnage, standards and assumptions were adopted. Estimates of traffic capacity and of the construction effort required to condition the highways to carry a desired daily tonnage are based on these assumptions. They are as follows:

1. Highway Standards.

(a) Width

(1) Single lane: Graded width 18 feet exclusive of ditches. Ditches 2 ft. wide. Surfacing 9 ft. Bridges 15 ft.
(2) Two lane: Graded width 26 ft. exclusive of ditches. Ditches 2 ft. wide. Surfacing 18 ft. Bridges 20 ft.
(3) Additional lanes were assumed in multiples of 9 ft. for graded width and surfacing, and 10 ft. for bridges.

(b) Alignment

(1) Minimum radius, 150' unless widened. Absolute minimum 100' radius on inside curve.

(c) Grades

(1) Maximum long grades: 10%.
(2) Maximum short grade: 20%.
(3) Desirable short grade: 15%.

(d) Overhead clearance of 11 ft.; desirable: 14 ft.

(e) Bridge strength: H 10.

(f) Materials of Construction.

(1) Surfacing: Crushed gravel or stone, 6" thick on new subgrade and assuming that new metal would be added as a continuing maintenance operation; 3" thick over existing good quality gravel surfacing.

(2) Bridges:

a. Spans: Wooden construction throughout (stringers, planking, abutments and piers).
b. Small culverts: Pipe, maximum size 36" concrete pipe manufactured along the work using portable forms).

2. Traffic Assumptions.

(a) Limit of haul per division: 250 miles.

(b) Loading per truck: 4 tons.

(c) Average distance covered: 10 miles per hour.

(d) Type of surfacing constructed and maintained which would carry traffic without rutting.

(e) Capacity:

(1) One lane with 25% of distance where passing can occur: 500 tons per day.
(2) Two lane, with single lane (one way) sections limited to 5% of distance: 1500 tons per day.
(3) Two lane, with single lane (one way) sections limited to 25% of distance: 1000 tons per day.
(4) Two lane with 90% free passing: 2000 tons per day.

(f) Truck requirements per 200 mile division (2000 tons day.

(1) Time required for round trip:
Running time 40 hours
Eating and servicing 6 hours
Loading and unloading 2 hours
Total - 48 hours or 2 days
(2) Capacity each truck per day, assuming truck returns empty; one truck with 4 tons requires 2 days for round trip; thus each truck has a capacity of 2 effective tons per day.
(3) Trucks required for 2000 tons per day:
2000 ÷ 2 = 1000 trucks, net
200 20% spares and being overhauled.
Total - 1200

SEC. III - K. RESOURCES AND LABOR

K. RESOURCES AND LABOR.

1. RESOURCES.

(a) As has been pointed out in the discussions of the various areas under consideration, there are very few natural resources in the coastal regions which could be counted upon for material support in any extensive development. Sand and rock are the only notable exceptions, and these are to be found in abundance in most areas. In general, the hard rock found in Fukien Province is granite, although sandstone and limestone are also prevalent; and a good grade of sand can be taken from any of the beach areas. In the back areas sand/gravel can be found in abundance of sand and gravel is found in the streams. In Chekiang Province, limestone and sandstone are prevalent and would be suitable for all road and airfield work, concrete, etc. Chekiang Province does not have the sandy beaches to be found further South, but sand and gravel pits can be opened up in most of the larger stream beds.

(b) It is believed that brick and tile in quantities (red in South, blue in North) would become available from local sources as soon as a demand was created. Numerous kilns are evident.

(c) Timber was found along the coast in any of the areas investigated, but in some of the mountainous sections to the west there is a small amount of short leaf pine. This timber is for the most part small (average 12" to 15" at the butt) and difficult to get out, but in some instances limited lumbering operations might be carried out near the roads. (See Section II - H - 3).

(d) Wells and streams will afford an ample supply of water in all areas. Purification will be required.

(e) All rations must be shipped in as there is no food surplus above the needs of the local inhabitants in any areas.

(f) No industrial development in the American sense exists in the territory and all manufactured products and construction materials must be imported.

(g) Except in a few of the larger coastal cities, there are no utilities in the territory such as gas, water, and sewerage systems. A few of the larger towns have small sized power plants which are unable to meet present needs and the communication systems consist of government operated telegraph and telephone lines, which could not be relied upon for military and construction operations.

2. LABOR.

(a) Chinese labor would be available in all areas at an estimate rate of 10% of the local population within a radius of 30 miles, or, in the case of road work, within a belt extending 30 miles on each side of the road. Since the whole coastal area has a high population density this would amount to a considerable figure. In general, the only skilled workmen to be found in the area will be carpenters and masons. The approximate classification is shown below:

Classification	Percent of Total
Carpenters	7%
Masons	13%
Unskilled	80%

If Chinese truck drivers and mechanics are desired, it will be necessary to bring them from the large inland cities, particularly Nanking and Kweilin, as there are few with experience to be found along the coast.

(b) A study of U. S. troop labor using heavy equipment as compared with coolie labor using only hand tools indicates that a ratio of about 1 to 130 prevails in heavy dirt moving operations such as roads or airfield construction. However, since all roads would have to be surfaced with crushed rock, this ratio could be cut to about 1 to 60 if rock crushers and trucks were furnished and the crushed stone were delivered to the required location and stock piled. This ratio could be further lowered to about 1 to 50 by furnishing power rollers to Chinese road gangs eliminating 900 man days per mile-which is an average figure for rolling with coolie drawn equipment.

(c) The skilled Chinese laborers compare with Americans at the ratio of about 2 to 1. Their methods of construction are considerably different from standard American methods, but the quality of their work is good. A number of carpenter gangs would be needed to work with coolie road gangs on bridge construction, and here as with the road crews, some trucks for hauling materials would eliminate much coolie hauling and expedite the job. Chinese brick and stone masons are good, and compare quite favorably with American workmen.

(d) Ample coolie labor could be secured for stevedoring requirements in any of the coastal areas, but winch and crane operators would have to be drawn from the construction troops.

SEC. III - L. PHOTO INDEX

L. PHOTO INDEX

General

Approximately 2,000 printable pictures were taken by members of the Expedition in the coastal area between August 2 and November 1, 1944. All of the pictures in this Report except aerial mosaics were taken during this time. The photo key map attached to each Area, "A" through "H" and "H-1" gives the location where each picture in the Area was taken, as well as the description, the negative serial number, and usually the azimuth. This covers all pictures except those taken of interior roads and railroads by Party #4; these are covered below in Paragraph 2.

1. Brief of Film Rolls (or Packs) Taken:

Party #1 Area
(Including "A" and "B")

Camera		Roll No.	Serial No.
Fairchild K-20	(1)	1	10.01 - 10.37
	(2)	2	10.90 - 11.31
	(4)	3	11.32 - 11.69
	(6)	4	11.70 - 12.18
	(5)	5	12.19 - 12.48
Eastman Retina I	(1)	1	14.85 - 15.06
Eastman Medalist	(1)	1.1	10.38 - 10.45
	(2)	1.2	10.46 - 10.52
	(3)	1.3	10.70 - 11.76
Speed Graphic	(1)	5	12.49 - 12.60
	(2)	6	12.61 - 12.71
		7	12.72 - 12.78
	(3)	8	12.79 - 12.88
	(4)	9	12.89 - 13.00
	(5)	10	13.01 - 13.11
	(6)	11	13.12 - 13.19
Folmer Graflex	(1)	1	10.54 - 10.64
	(2)	2	10.66 - 10.77
		3	10.84 - 10.89

Party #2 Area
(Including "C")

Fairchild K-15	(1)	4	21.98 - 22.19
	(2)	6	22.51 - 22.73
	(3)	7	22.24 - 22.38
	(4)	8	23.05 - 23.21
	(7)	9	23.22 - 23.50
	(1)	10	23.51 - 23.78
	(3)	11	23.80 - 24.03
	(4)	12	24.02 - 24.33
	(5)	13	24.31 - 24.60
	(6)	14	27.40 - 27.53
	(8)	15	27.54 - 27.72
Fairchild K-20	(1)	2.2	20.48 - 20.71
	(2)	2.3	20.72 - 21.05
	(3)	2.4	29.21 - 29.73
	(1)	9	2.470 - 2.514
	(2)	10	2.517 - 2.565
	(3)	11	2.568 - 2.624
	(4)	12	210.01 - 210.28
	(5)	13	210.29 - 210.59
	(6)	14	210.60 - 210.67
	(12)	15	210.68 - 211.17
	(7)	16	211.18 - 211.54
	(8)	17	211.55 - 212.02
	(9)	18	212.03 - 212.49
Eastman Kodak 35	(1)	1	213.01 - 213.33
	(2)	2	213.31 - 213.60
	(3)	3	213.61 - 213.75
Eastman Retina I	(1)	3	2.801 - 2.836
		4	2.837 - 2.872

Party #2 (Cont'd.)

Area		Roll No.	Serial No.
Eastman Medalist	(1)	1	[illegible]
	(2)	2	[illegible]
	(3)	3	[illegible]
	(4)	4	[illegible]
	(5)	5	[illegible]
	(6)	6	[illegible]
	(7)	7	[illegible]
	(8)	8	[illegible]
	(9)	9	[illegible]
	(10)	10	[illegible]
	(11)	11	[illegible]
	(12)	12	2.783 - [illegible]
	(13)	13	[illegible]
	(14)	14	[illegible]
	(15)	15	2.7[illegible] - 2.771
	(16)	16	2.771 - 2.773
	(17)	17	2.773 - 2.775
	(18)	18	2.775 - 2.777
	(19)	19	2.733 - 2.739

Party #1 Area
(Including "A", "B", "C", "D" & "H-1")

Fairchild K-20	(19)	3.1	[illegible]
	(20)	3.2	[illegible]
	(21)	3.3	[illegible]
	(22)	6	[illegible]
	(23)	7	[illegible]
	(27)	8	[illegible]
Leica III (35mm)	(1)	1	[illegible]
	(2)	2	[illegible]
	(3)	3	[illegible]
	(4)	4	[illegible]
	(5)	5	[illegible]
	(6)	6	[illegible]
	(7)	7	[illegible]
	(8)	8	[illegible]
	(9)	9	[illegible]
	(10)	10	[illegible]
	(11)	11	[illegible]
	(12)	12	[illegible]
	(13)	13	[illegible]
	(14)	14	[illegible]
	(15)	15	[illegible]
	(16)	16	[illegible]
	(17)	17	[illegible]
Eastman Retina I	(1)	2	3.7[illegible] - 3.736

Party #4 Area
(Interior Roads and Railroads

Eastman Medalist	(1)	1.1	[illegible]
	(2)	1.2	[illegible]
	(3)	1.3	[illegible]
	(4)	1.4	[illegible]
	(5)	1.5	[illegible]
	(6)	1.6	[illegible]
	(7)	1.7	[illegible]
	(8)	1.8	[illegible]
	(9)	1.9	[illegible]
	(10)	1.10	[illegible]
	(11)	1.11	[illegible]
	(12)	1.12	[illegible]
	(13)	1.13	[illegible]
	(14)	1.14	[illegible]
	(15)	1.15	[illegible]
	(16)	1.16	[illegible]
	(17)	1.17	[illegible]
	(18)	1.18	[illegible]
	(19)	1.19	[illegible]
	(20)	1.20	[illegible]

NOTE: Decimal point in Negative Serial Number has no significance.

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SEC. III PHOTO INDEX (CONTINUED)

2. Description of photos taken by Party #4 (Interior Roads and Railroads):

CAMERA: Eastman Medalist

Roll	Serial #	Azimuth (Degrees)	Subject and Location	Mi. south of Chien-yang
			Fukien Province	
			Chien-yang - Chien-ou Section	
4.1	40.02	269	Typical Bridge	
	40.03	229	Another view of typical bridge (above)	
	40.04	93	Typical Bridge	
	40.05	33	Typical Bridge	
	40.06	352	Chien-ou airfield approach at north end	
	40.07	172	Pan Chien-ou airfield approach at south end	
	40.08	195		
4.2	40.09	285	Chien-ou airfield, 600 meters south of north end of runway, taken from east edge of runway	
	40.10	105	Same as above	
	40.11	231	Bridge over Chien River at Chien-ou	
	40.12	233	Same as above	
	40.13	244	Same as above	
	40.14	249	Same as above	
	40.15	275	View of road, west side of Chien River, taken from bridge.	
4.5	40.16	320	View from bridge at Chien-ou, looking toward Chien-yang showing road	
4.6	40.43	331	View of road	26
	40.44	95	View of road	14
	40.45	329	View of road	14
	40.46	229	Showing easy valley and pole construction	5
	40.47	05	Bridge at Chien-yang from south end	
	40.48	170	Bridge at Chien-yang from north end	

			Fukien Province	Mi. north of
			Tung-an - Nan-ping Section	Tung-an
4.3	40.19	05	View from north end of possible airfield site at Tung-an	
	40.20	145	View from south end of possible airfield site at Tung-an	
	40.21	35	Bridge over river at Tung-an	
	40.22	215	Tung-an from north side of city.	
	40.23	250	View of road	2.
	40.24	145	View of road	4.
4.4	40.25	198	View of road	4.
	40.26	245	View of cliff at bridge	6.5
	40.27	192	View of road	21.5
	40.28	75	Looking down 8% grade	22.5
	40.29	210	View of road and bridge	24.
	40.30	40	View of road	27.5
	40.31	245	View of road	31.5
	40.32	85	View of road	33.5
4.5	40.33	85	along road	4.
	40.35	232	View of road	53.
4.3	40.36	65	Boat landing at Nan-ping on Min River	
	40.37	152	On west side of Min River at Nan-ping across from ferry landing	
	40.38		Ferry landing on west side of Min River at Nan-ping	

			Fukien Province	Mi. north of
			Nan-ping - Chien-ou Section	Nan-ping
4.6	40.37	20	Typical valley	11.
	40.38	185	View of bridge	21.
	40.39	40	View of road	21.5

Roll	Serial #	Az.(degrees)	Subject and Location	Mi. n.e.
			Fukien Province	
			Chien-ou - Ku-tien Section	Mi. east of Chien-ou
4.7	40.49	140	Bridge over Chien River at Chien-ou	
	40.50	140	Same as above	
	40.52	245	View of road	2.5
	40.53	270	View of road	3.5
	40.54		Pan - 97 Road development - descending mountain	[illegible]
	40.55			
	40.55	270	Road curve and cut	[illegible]
4.8	40.57	07	Road across	[illegible]
	40.58	205	Road in rugged terrain	[illegible]
	40.59	98	Terrain and road on hillside in distance	[illegible]
	40.60	305	Valley and village, looking toward Chienou	[illegible]
	40.61	295	Typical deep side hill cut	[illegible]
	40.62	305	Gullies destroying road	[illegible]
	40.63	313	S-curve in road and road destruction	[illegible]
	40.64	335	Typical destruction of mountain road	[illegible]
4.9	40.65		Pan - 95 View of mountain road	[illegible]
	40.66			
	40.67	45	Road destruction	[illegible]
	40.68			
	40.69		Pan - 212 Hairpin curve and cut; radius: 15' inside of curve	[illegible]
	40.72	243	Terrain and road	[illegible]
4.10	40.74	325	Road excavation	[illegible]
	40.76	233	Terrain and road	[illegible]
	40.77	297	Valley at Ku-tien looking S. from top of hill approx. 250' high and located at N. edge of city. Distance from camera to end of houses to left is 1.5 miles; by-pass road to Ka-kou in foreground.	
	40.78	150	Looking S. across Ku-tien valley, located 1 mile, and along azimuth of 233°, from previous photo.	
	40.80	276	View of Min River near Ka-kou, looking upstream.	

			Fukien Province	Mi. north of
			Chien-yang - Pu-cheng Section	Chien-yang
4.11	40.81	02	Typical road and topography	[illegible]
	40.82	310	Road and terrain	[illegible]
	40.83	195	Possible A/F site--taken along centerline looking S.	[illegible]
	40.84	15	Possible A/F site--taken along centerline looking N.	[illegible]
	40.85	66	Road climbing side of mountain, looking toward Pu-cheng	[illegible]
	40.86	60	Same as above	[illegible]
	40.87	23	View of terrain	[illegible]

			Fukien-Chekiang Provinces	Mi. north of
			Pu-cheng - Chiang-shan Section	Pu-cheng
4.12	40.89	16	Possible A/F site at Pu-cheng from S. end--looking toward Chiang-shan	[illegible]
	40.90	26	At N. end of possible A/F site at Pu-cheng--looking north	[illegible]
	40.91	210	At N. end of possible A/F site at Pu-cheng--looking south	[illegible]
	40.92	21	Possible A/F site - S. end of valley looking S.	[illegible]
	40.93	3	Possible A/F site - S. end of valley looking N.	[illegible]
	40.94	56	Road and terrain	[illegible]
	40.95	06	Typical terrain	[illegible]
	40.96	31	Typical site hill cut	[illegible]
4.13	40.97	31	Deep rock cut and general terrain	[illegible]
	40.98	5	Cut and valley	[illegible]
	40.99	175	A/F site, looking S. showing mountains taken normal to road	[illegible]
	41.00	355	A/F site, looking N., terrain clear of obstructions taken normal to road	[illegible]
	41.01	215	A/F site, looking S., from N. end of site	[illegible]
	41.02	30	A/F site, looking N., from S. end of site	[illegible]

SEC. III PHOTO INDEX (CONTINUED)

[illegible]	Date*	Length (Approx)	Subject and Location	Approx. Mi. north of Chiang-shan
			Chekiang Province	
			Chiang-shan - Chu-hsien Section	
[illegible]	[illegible]	[illegible]	View of Railroad bed, opposite Chiang-shan	4.0
	[illegible]	[illegible]	Typical Railroad destruction	3.8
[illegible]	[illegible]	[illegible]	Typical Railroad bed	4.1
	[illegible]	[illegible]	Typical RR destruction in fill	5.0
	[illegible]	[illegible]	View of river	5.0
	[illegible]		View of river showing "channel" during low water period	5.0
	[illegible]	[illegible]	Same as above, 200 yds. downstream	
	[illegible]	[illegible]	Typical road destruction	6.0
	[illegible]		Covered Railroad bridge - looking toward Chu-hsien	8.3
	[illegible]	[illegible]	Close-up of same wrecked RR bridge, from N. bank of river looking S.	8.3
[illegible]	[illegible]	[illegible]	Typical sampan, river at Lu-hsiang	13.0
	[illegible]	[illegible]	Looking upstream, showing "spoil" and terrain	17.0
	[illegible]	[illegible]	Typical locomotive and car at Chu-hsien Railroad "station"	
	[illegible]	[illegible]	Road destruction and flat terrain	17.0
			Chekiang Province	
			Chiang-shan - Chang-hsin Section (Railroad)	Km from Hangchow
[illegible]	[illegible]	[illegible]	Typical RR track and terrain	297.9
[illegible]	[illegible]	[illegible]	Typical RR track and roadbed, showing "bulge" rails	319.7
	[illegible]	[illegible]	Locomotives and cars at Li-shan Station	
	[illegible]	[illegible]	Locomotives and cars - [illegible] west face	
	[illegible]	[illegible]	Typical railroad bed condition - looking toward Chang-shan	324.0
	[illegible]	[illegible]	Double-by-pass along destroyed trestle	326.5
	[illegible]	[illegible]	View of [illegible] yard and repair shops at Chang-hsin RR station	
			Fukien Province	
			Chang-hsin - Chang-ping Section	
[illegible]	[illegible]	[illegible]	View showing bridge [illegible] section	
	[illegible]	[illegible]	Typical terrain, mountain section	
			Fukien Province	
			Chang-ping - Lung-yen Section	Mi. south of Tung-an
[illegible]	[illegible]	[illegible]	View from road	24.5
	[illegible]	[illegible]	Road and terrain	21.5
	[illegible]	[illegible]	Road and terrain	18.5
	[illegible]	[illegible]	Road and terrain	18.5
	[illegible]	[illegible]	Road and terrain	15.5
	[illegible]	[illegible]	Road and terrain	57.[illegible]
[illegible]	[illegible]	[illegible]	Road in mountain valley	11.0
	[illegible]	[illegible]	Road and terrain	132.5
	[illegible]	[illegible]	Lung-yen A F from S. end of site	
	[illegible]	[illegible]	Lung-yen A F from S. end of site	
	[illegible]	[illegible]	Lung-yen A F from N. end of site	
	[illegible]	[illegible]	Lung-yen A F from N. end of site	
			Fukien Province	
			Lung-yen - Yan-lian Section	Mi. east of Lung-yen
[illegible]	[illegible]	[illegible]	Road and terrain	26.[illegible]
	[illegible]	[illegible]	Heavy "shao wood" forests	27.8
	[illegible]	[illegible]	Terrain, road and excellent short leaf pine forest	29.3
	[illegible]	[illegible]	Road and terrain	24.8
	[illegible]	[illegible]	Road along creek	10.2
	[illegible]	[illegible]	Road in valley	4.9

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C O N F I D E N T I A L V E R S I O N

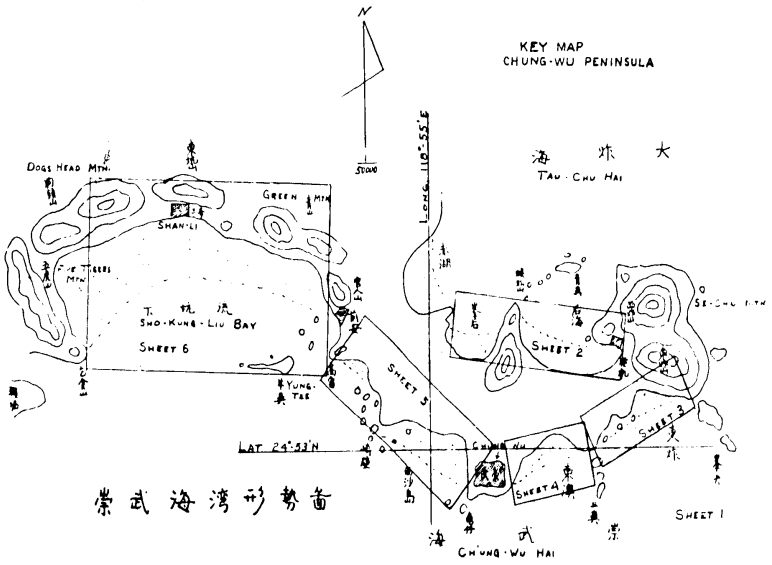
Amoy to Shanghai

APPENDIX "A"

APPENDIX A BEACH STUDY - CH'UNG-WU PENINSULA

Appendix A covers a beach survey of Ch'ung-wu Peninsula (Lat. 24°-53' N, Long. 110°-55' E.) made by a Chinese engineer between Oct. 12 and Oct. 24, 1944. The data is presented in its entirety as received. Since the first [illegible] was not available after completion of the survey, travel time was made in Calcutta.

Nov. 20, 1944



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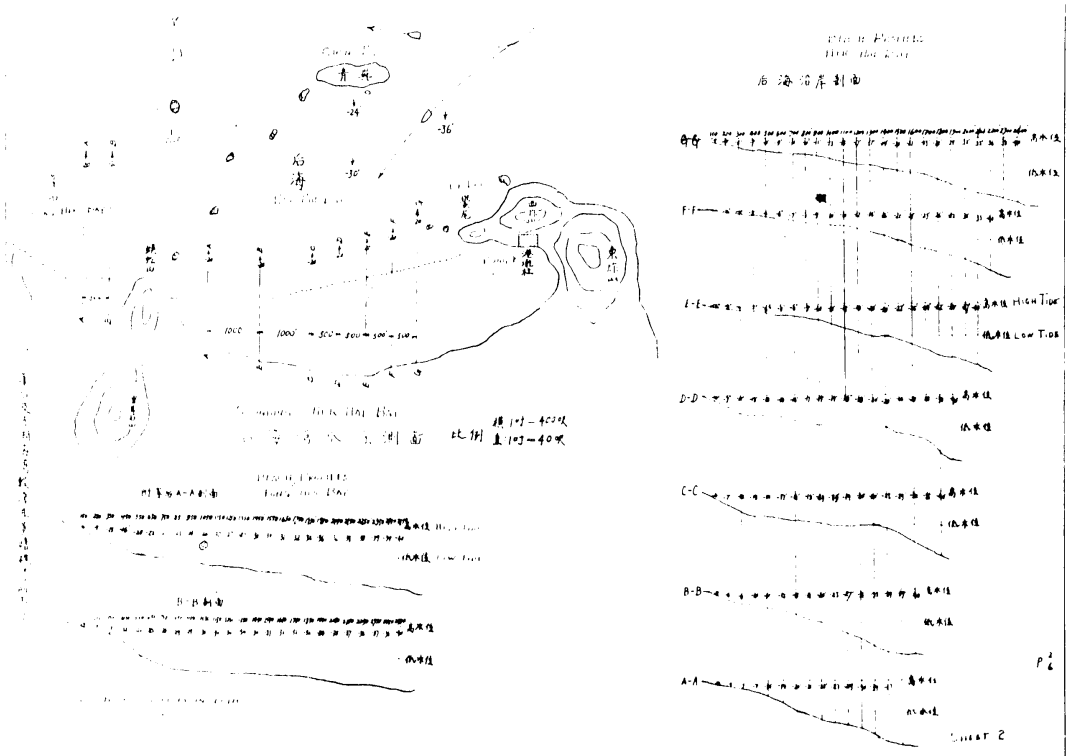
APPENDIX A BEACH STUDY - CH'UNG-WU PENINSULA (CONTINUED)



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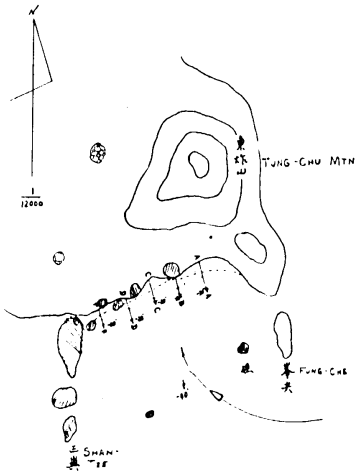
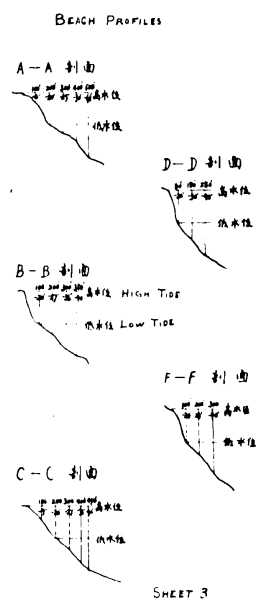
APPENDIX A BEACH STUDY-CH'UNG-WU PENINSULA (CONTINUED)



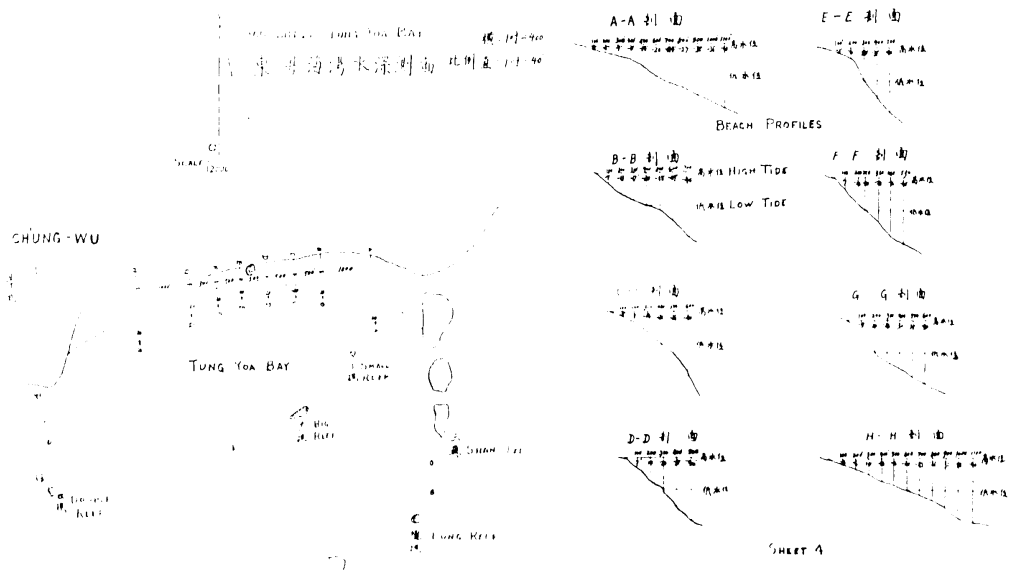
SOUNDINGS TUNG-CHU BAY

東坑灣水深測畫 比例 橫:1吋=400呎 直:1吋=40呎



SHEET 3

APPENDIX A BEACH STUDY - CH'UNG-WU PENINSULA (CONTINUED)



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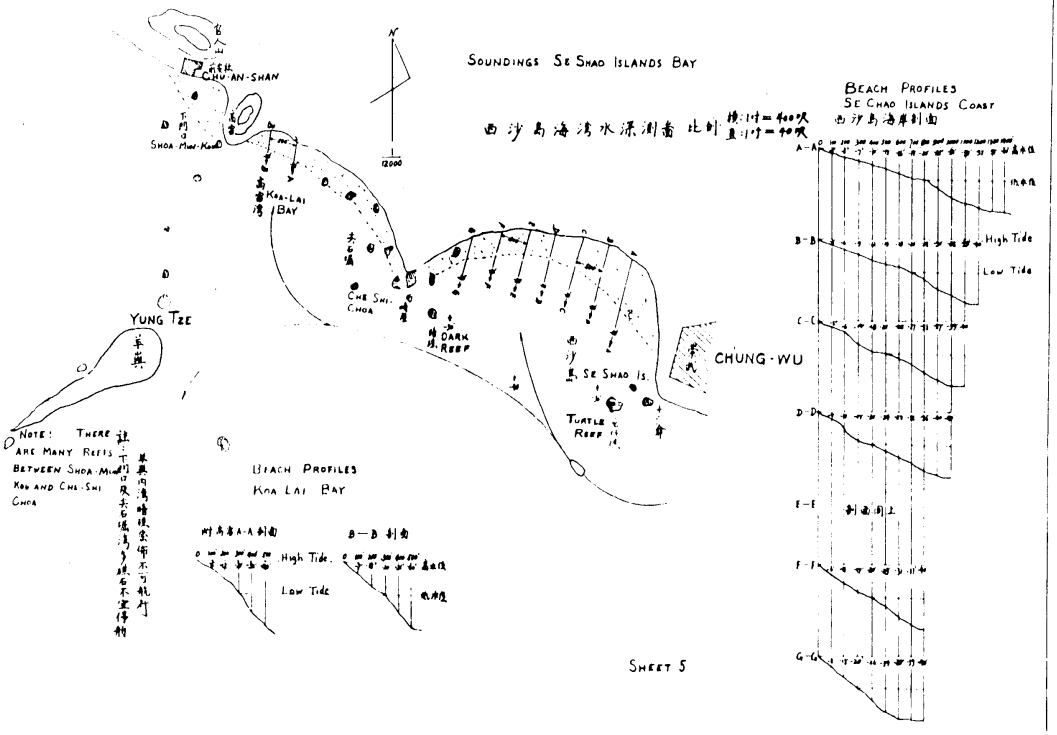
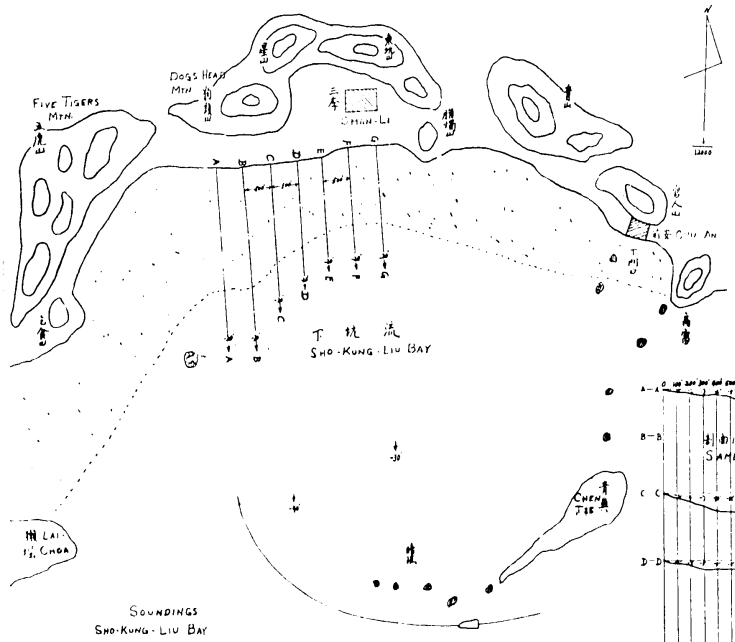
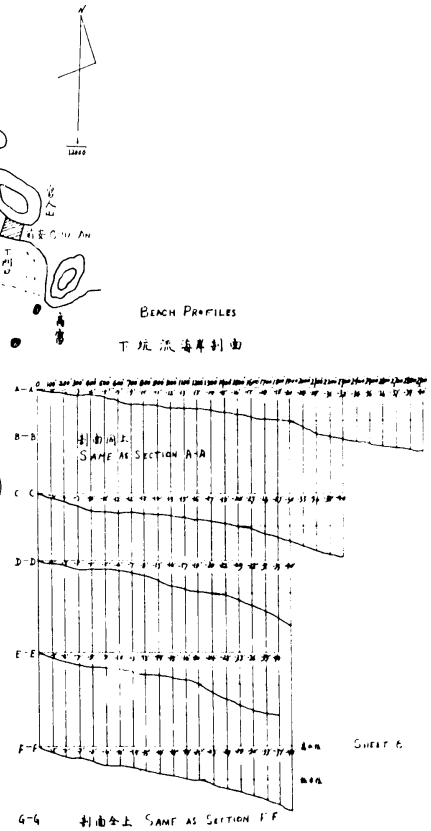
APPENDIX A BEACH STUDY - CH'UNG-WU PENINSULA (CONTINUED)



SHEET 5

APPENDIX A BEACH STUDY - CH'UNG-WU PENINSULA (CONTINUED)





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