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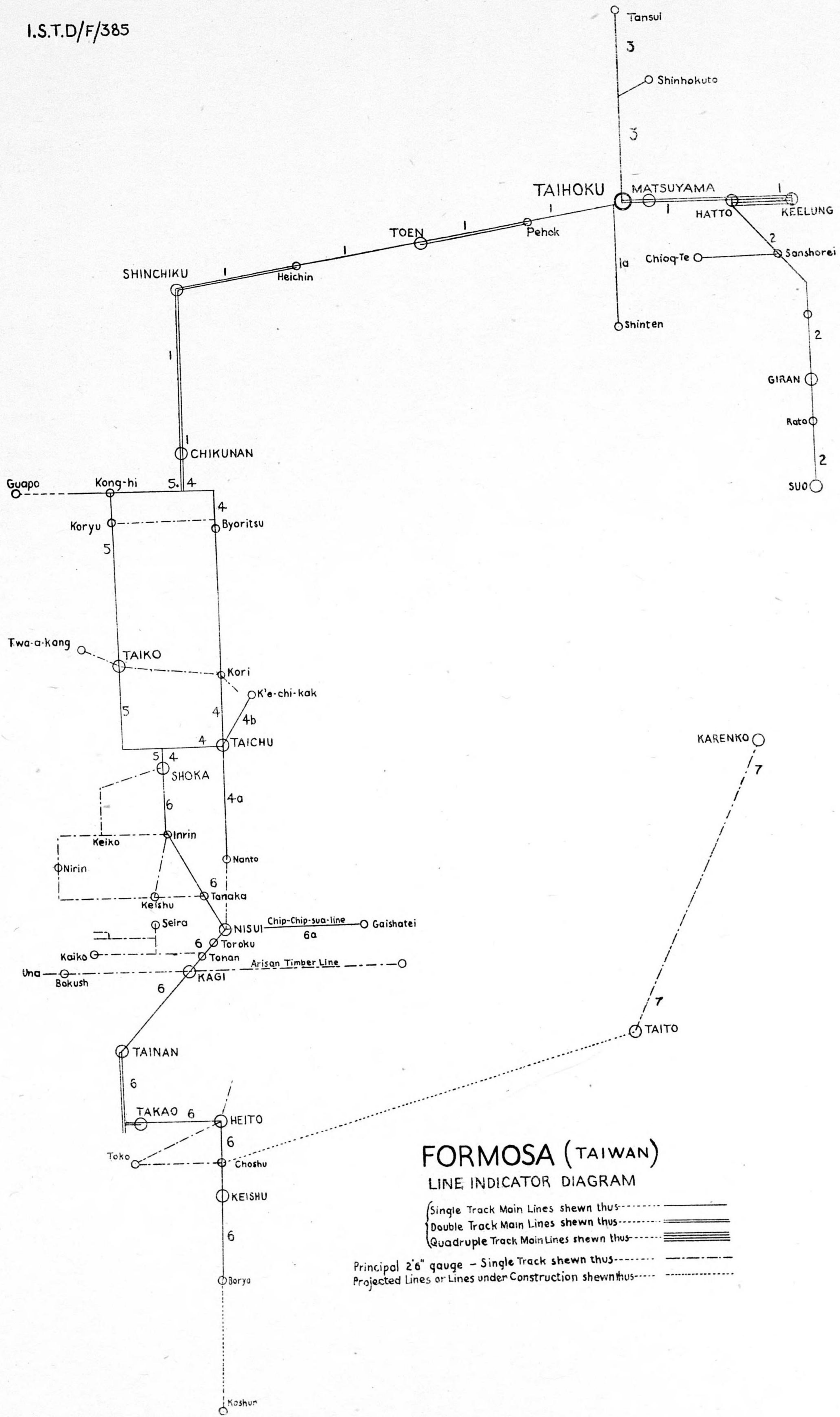
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PLANS

in pocket at back



(A) RAILWAYS

(1) MAP OF SYSTEM

See *Fig. 1* and *Plans 13-19*.

(2) GENERAL DESCRIPTION

At the time of the Japanese annexation of Formosa in 1895 the only railway ran from Kirun via Taihoku to Shinchiku, and it was not until well into the present century that the main-line system operated by the Government was developed, construction being mainly carried out by British engineers. The railways as a whole are therefore modern, well constructed and equipped. The railways fall into three categories:

- (i) The Government lines, which provide the main through passenger and freight services.
- (ii) The privately owned lines operated by industrial concerns, acting as feeders to the main lines, and in many cases forming the only rail service between the interior and the port.
- (iii) Push-car lines, privately owned, which play an important part in transportation, by providing cheap, though slow, means of transport both for passengers and merchandise.

The government railways comprise two main lines serving the east and west coasts, the latter having short branch lines converging upon it.

The west coast main 3 ft. 6 in. gauge line runs from Kirun, important port in the north-east of the island, to Taihoku the capital, and thence west to Shinchiku, turning south to run parallel with the coast to Takao, where originally it terminated but now extends as a branch line to Heito and Boryo. In 1941 work commenced on a further extension to Koshun in the southern tip of the island, and plans have been considered to provide a branch line from Choshu to link up with the east coast. The track is double from Kirun to the capital, and, with the exception of certain stretches, from the capital to Chikunan junction, where the line diverges into two single-track lines to Shoka, one crossing the mountains to provide the main route for fast passenger and freight trains, whilst the other, which is longer, follows the coast and is used mainly for slow freight services. Both lines are rendered particularly vulnerable by several long bridges over rivers which become swollen during the rainy season, and damage to the bridges during such times is not uncommon. The inland route has, in addition, numerous tunnels, the blockage of which during the earthquake of 1935 caused the line to be closed for about two years. Landslides also are frequent on the inland route, but although local authorities have favoured closing the line altogether, for military considerations the line has been maintained as the chief route. The most important branches are from Suo to Hatto junction, providing a service to the north-east coal-mining area; from the port of Tansui to Taihoku; and from Nisui inland to Gwaishatei, giving access to Lake Jitsugetsutan and the aborigine district around Musha. The system is equipped and serviced up to normal Japanese standards.

The east coast line runs from Karenko to Taito and the only branch line is with a privately owned line from Busegan to Pok-Pok. The gauge is 2 ft. 6 in., but there have been proposals to broaden to 3 ft. 6 in., the normal Japanese gauge, and connect it up with the west coast line at Suo to the north and Choshu to the south. The line follows the valley lying between the coastal range and the Formosan (central) range, crossing and recrossing several rivers for its whole length. Gradients are heavy and restrict speed to 20 miles per hour, whilst rolling-stock is almost of the same capacity as Japanese standard stock, but

antiquated. Traction is steam for general purposes, but petrol-driven coaches (*photograph C1*) have been introduced for use on passenger services.

The trunk lines are separated by the central mountain range, which makes inter-connexion difficult.

The privately owned lines, which for the main part are 2 ft. 6 in. gauge, are run by the various sugar corporations and timber concerns, primarily to facilitate transport of equipment and produce to the ports or principal stations. Of the total of 18 lines in operation, however, 9 are licensed to operate as public carriers, both for goods and passengers, using for the latter service self-propelled petrol-driven coaches as well as steam-hauled rolling-stock. These 'private' lines occur mostly in the west, particularly in the central region between Taichu and Kagi. The most notable is the Arisan line, which is actually operated by a Government department, the Bureau of Forestry, from Kagi to the mountainous interior, and has in construction entailed considerable engineering work in negotiating the heavy gradients experienced in the mountain region (*photograph C2*).

The push-car lines are hand operated, being pushed or poled along by coolies, male or female, one normally being employed on level ground, and two on steeper gradients. The lines are frequent throughout the island and serve most towns of importance. As they penetrate into regions not served by motor roads or railways they are of some importance, although by reason of their light capacity not suitable for heavy movement of stores (*photograph C3*).

(3) ORGANIZATION AND PERSONNEL

(a) OWNERSHIP

The main through trunk lines are owned by the Government, whilst the 2 ft. 6 in. gauge lines are, with the exception of the east coast line and certain minor branches, owned by industrial concerns. The push-car lines are run by private companies.

(b) TRAFFIC DIVISIONS

The government railways form a separate self-contained division of the Japanese State railways with headquarters for the west coast system at Taihoku, and for the Karenko to Taito line at Karenko. The private lines and tramways are operated independently, but are controlled by a separate department in the Government Railway Bureau's headquarters in Taihoku.

(c) PERSONNEL

The management and organization of the railways in Formosa follows the practice adopted in Japan proper. There are nine departments controlled by a General Manager, viz. General Affairs, Finance, Traffic, Operating, Civil Engineers, Mechanical Engineers, New Works, Private Railways, and Road Transport.

The staff on the government railways are well trained and conscientious in the execution of their duties. All personnel in responsible positions are Japanese, well-selected, and specially cared for. In normal times the staff consisted of the General Manager, with 10 secretaries who were heads of departments, 13 engineers, 142 assistant engineers, 276 chief clerks, 3600 clerical staff, and 6200 operating staff.

The private railways employed 800 Japanese and 2700 Formosans.

No details are available of the numbers for each department.

(4) MILEAGE AND GAUGES**(a) ROUTE AND TRACK LENGTHS****Table 1: Government railways (1939)**

Gauge	Route length		Double track		Sidings		Track length	
	Km.	Miles	Km.	Miles	Km.	Miles	Km.	Miles
3 ft. 6 in.	584	366	128	79½	397	248	1020	694
2 ft. 6 in.	296	184	...	...	Not known	296	296	184
TOTAL	880	550	128	79½	397	248	1316	878

Table 2: Private railways (1939)

Gauge	Route length		Double track		Sidings		Track length	
	Km.	Miles	Km.	Miles	Km.	Miles	Km.	Miles
3 ft. 6 in.	53	33	Nil	Nil	Not known	53	33	33
2 ft. 6 in.	1194	742	Nil	Nil	1268	795	2762	1537
TOTAL	1247	775	Nil	Nil	1268	795	2815	1570

Push-car lines

Track length (1937)	Km.	Miles
	1038	650

(b) LOADING GAUGES

No information is available for the privately owned lines.

The loading gauge on the 3 ft. 6 in. gauge lines compares very favourably with the standard European 4 ft. 8½ in. gauge.

Maximum height of the gauge is 13 ft. 3 in.

Maximum width of the gauge is 9 ft. 10 in.

Maximum width of passenger vehicles is 9 ft. 2¼ in.

Vehicles on the 2 ft. 6 in. east coast line are almost of the same dimensions as those on 3 ft. 6 in. gauge lines, but no details are available.

(5) PERMANENT WAY

The west coast lines have been laid to the standards adopted in Japan proper, and, unless where specifically mentioned as relating to Formosa, details given for 3 ft. 6 in. gauge lines in the following paragraphs relate to Japan generally. Many experiments have been carried out by the Japanese in an effort to improve the already high standard in construction and maintenance of permanent way, and with their recent reconstruction of the west coast line there is no reason to suspect that this important trunk system is not of as high a standard as that which obtains in Japan.

(a) TYPE, LENGTH, AND WEIGHT OF RAILS

Rails are of the flat-bottomed type (Vignole section) for all lines irrespective of gauge.

Originally the west coast line was laid with 30 kg./m. (60 lb. per yd.) in lengths of 10 m. (33 ft.), but these have been found uneconomical in maintenance and the Japanese have adopted the general policy of replacing them with 37 kg./m. (75 lb. per yd.) rails in length of 25 m. (82 ft.). Where 30-kg./m. rails are still employed, i.e. on the less important lines, lengths have been increased to 20 m. (65 ft. 6 in.), to provide more even riding.

The 2 ft. 6 in. gauge lines are laid with 25/40 lb. per yard rails, and push-car lines with 10/12 lb. per yard rails, although no details are available of the lengths employed in each case.

Rails are laid with a cast of 1/20, after the British practice.

(b) TYPE OF RAIL FASTENING

The Japanese practice is to use dog spikes with flat, double-shouldered bearing plates for securing 30 and 37 kg./m. rails to sleepers, and notched fish plates for rail joints, with stakes driven in to the formation at the side of the joint sleepers to prevent their displacement.

(c) TYPE AND SPACING OF SLEEPERS

Sleepers are wooden, cut from local ironwood and laid 2410-2570 to the mile. The standard dimensions

adopted by the Japanese government railways for sleepers are 20 × 14 × 213 cm. (8 in. × 5½ in. × 7 ft. 0 in.). Intermediate spacing was until recent years 71 cm. with close spacing at rail joints of 38 and 58 cm. The Japanese have, however, found that maintenance costs are reduced if spacing at rail joint is maintained at 38 cm., and spacing of adjacent sleepers 45-55-65 cm. and the remainder 80 cm.

(d) NATURE OF BALLAST

Crushed stone from local sources is employed on all Government lines, screened to 15-65 cm. (5.8 in.-29.16 in.); stone is also most probably used on private lines.

Depth of ballast below bottom of sleepers is 20 cm. (8 in.), and the width from the end of the sleeper to the shoulder of the ballast section is 23 m. (9 in.), giving a top width of the ballast section of 9 ft. 6 in.

Solid roadbeds are often used in tunnels.

(e) STANDARD OF MAINTENANCE

The standard of maintenance on all Government lines is high, but little information is available of private lines, although as these bodies are controlled by the government there is little doubt that where such lines are operated for public service the standard is high.

(f) LOCATION OF STORES FOR PERMANENT WAY

No information is available as to the actual location of permanent-way stores, except at Matsuyama (Route 1), where the central workshops are established. It could also reasonably be assumed that stocks of materials for the private lines would be held at important centres such as Kagi (Route 6) and Nisui (Route 6), although no confirmation is available.

(g) MAXIMUM PERMISSIBLE AXLE-LOADS

No information was available at the time of writing this report on the axle-loads permissible on individual lines but, so far as the Government lines are concerned, it is assumed that the normal Japanese standard is maintained, i.e. 16 metric tons (3 ft. 6 in. gauge) for lines laid with 37-kg./m. rails, but for those still laid with 30-kg./m. rails the axle-loading will probably be in the region of 12-13 metric tons. For particular classes of vehicles, the following details relate:

Passenger locomotives	16.7 metric tons
Passenger coaches	11.2 metric tons
Goods passenger wagons	13.3 metric tons

(h) MINIMUM RADIUS OF CURVES

Sharp curves exist on all lines.

The minimum curvature allowed by the Japanese regulations on main lines is 400-m. radius and on ordinary lines 300 m. Guard rails are employed on all curves of 300-m. radius.

Widening of the gauge is practised on curves less than 800 m. in radius, the formula employed being:

$$\left(\frac{6000}{\text{radius (in. m.)}} - 5 \right) = \text{Widening allowed in mm.}$$

The maximum widening allowed is 30 mm. (1.18 in.).

(i) MAXIMUM GRADIENTS

The Japanese government railways normally restrict gradients to 1 in 100, but gradients of 1 in 80 are reported to exist, and undoubtedly heavier grades will be experienced on the 2 ft. 6 in. lines, particularly on the Arisan line which runs into the mountains.

(6) SIGNALLING AND SAFETY PRECAUTIONS**(a) GENERAL METHODS EMPLOYED**

No information is available as to the methods employed on the private lines, which are all single track, but those operating for public services will no doubt conform with Government regulations.

The government railways retain the English method of signalling and train staff regulations apply to single-track lines.

(b) LINESIDE SIGNALS

Semaphore signals of a similar type to those employed on British railways are used on main lines, but no details are available.

Various types of lineside warning signals are used at level crossings (*photograph C4*).

(c) INTERLOCKING

'Lock and block' applies on certain sections, but no other details are available.

(d) TELEGRAPH AND TELEPHONE

The State lines, including the Arisan line, are equipped with both telegraphic and telephonic communication, but it is not known to what extent these facilities apply to private lines.

(7) ELECTRIFICATION

Unconfirmed reports indicate that several lines are electrified, the only named route being that from Tansui to Taihoku (*Route 3*). As the Japanese have considerably developed the use of electricity, both thermal and hydro-electric, in the Taihoku area it is quite a reasonable possibility.

No private lines are reported to be electrified.

(8) LOCOMOTIVES

(a) NUMBERS AND TYPES

The number of locomotives on the government lines in 1938 was 232, and on the private lines, in 1934, 251. All locomotives employed are coal-fired, but no details are available of the actual types in operation, although common types of locomotives operating on Japanese railways in 1936 (*photographs C5-11*) and the type employed on the Arisan railway (*photograph C12*) are illustrated.

(b) ADEQUACY FOR REQUIREMENTS

Normally the locomotive power is adequate for requirements: 70 to 80 per cent are reported to have been usually in operation with about 8 per cent in the shops for repair and maintenance, whilst 12 to 14 per cent were held in reserve.

(c) LOCOMOTIVE DEPOTS AND REPAIR SHOPS

The following locomotive depots are known to exist on the government lines:

Route 1. Kirun, Matsuyama, Taihoku, Toen, Shinchiku, Chikunan.

Route 2. Giran, Suo.

Route 4. Taichu, Shoka.

Route 5. Taiko.

Route 6. Kagi, Tainan, Takao, Heito, Keishu, Horyo.

Route 7. Kirun, Tamazato, Taito.

No information is known of locomotive facilities for the private 2 ft. 6 in. lines, but sheds are believed to exist at Shinchiku and Kagi.

It is not possible to give details of capacities, efficiency, and the number of locomotives available at each depot, but from air photographs the sheds and layout appear to conform with European standards and will probably be adequate for normal requirements.

The principal repair shop was originally at Taihoku, but has been removed to Matsuyama about 3 miles east of the capital. The new works are extensive, covering 44 acres, and are equipped to deal with all repairs to locomotives and rolling-stock as well as construction work in connexion with signalling apparatus and permanent way. The following particulars indicate the repairs the workshops can handle in one month:

- 10 locomotives
- 10 passenger coaches
- 58 wagons
- 2 motor engines

Reports indicate that Takao at the western end of the main trunk line is also equipped to deal with heavy repairs, whilst most locomotive sheds can deal with running repairs.

(d) SOURCES OF FUEL

The coal used on Formosan locomotives is from local sources and is of a low-grade, bituminous nature: 90 per cent of it is mined in Taihoku province, whilst the next important field is in the Shinchiku area. Reserves are estimated to be 400 million tons.

The heating power of the coal varies from 7480 to 6160 calories and the sulphur content is of 1.2 to 4.45 per cent.

Annual consumption is in the region of 150,000 tons, representing roughly 10 per cent of the total yearly output.

Petrol used in railcars operated on Government and private railways is probably obtained from local sources, viz. the areas around Shinchiku and Byoritsu, although local fields only produce roughly 10 per cent of Formosan total requirements.

(e) WATER SUPPLY

With the numerous rivers and waterways there is no shortage of water from natural sources, although river water contains a considerable amount of suspended matter, and is of an alkaline nature.

The main supply for most towns and cities is taken from the mountains, stored in well-constructed reservoirs and piped to consumers. It is reported to be fairly free from contamination but is still hard.

No information is obtainable as to what methods are adopted, if any, to soften water for railway purposes, but unless such precautions are taken, frequent washing-out will be necessary.

(9) ROLLING-STOCK

(a) NUMBERS AND TYPES

In 1931 official figures of rolling-stock available were as follows:

	Government railways	Private railways
Passenger coaches ...	499	244
Goods wagons ...	3964	15,768

Reports indicate now, however, that the Government railways stock consists of the following:

Passenger coaches ...	600
Goods wagons ...	8000
Refrigerator wagons ...	60
Self-propelled railcars (passenger and goods):	
steam ...	6
petrol-driven ...	24

In 1935 the east coast line was reported to be using 200 freight wagons with a further 100 on order for 1936. The capacity of these wagons is rather less than those employed on the main 3 ft. 6 in. gauge line, but it is still large for the gauge, being in the region of 10 tons. Passenger coaches on the east coast line are practically of the same dimensions as normal 3 ft. 6 in. gauge stock.

Modern passenger vehicles (*photographs C13 and 14*) on the 3 ft. 6 in. gauge line are of all steel construction and have the following dimensions:

length 45 ft.; width 9 ft. 2 in.; height 12 ft. 4 in.

Seating capacities of first-, second-, and third-class carriages are 30, 48, and 76 respectively. Stock is of the open Japanese type, some having two long seats running the length of the coach. Third-class sleeping-cars carry 39 passengers, whilst second- and first-class cars are composite, with accommodation for 22 and 6 respectively. Sleeping-cars are of the American type, but the third-class sleepers have bunks arranged in tiers of 3.

Most goods wagons are 2-axled, chiefly open, although box wagons are used, and have an average capacity of 10-12 metric tons. The latest types of wagons, however, have a much greater capacity, and the following particulars refer to most common types.

hours by night. These have no sleeping- or dining-cars. High-speed petrol-driven railcars, running singly or in pairs, are tending to replace steam trains for passenger services on the east coast.

Goods trains run throughout the day and night at almost the same frequency as passenger trains, but in the case of both passenger and goods, trains are of comparatively low capacity, passing loops on the single lines restricting goods trains to a maximum of 30 wagons, or 750 tons behind the tender.

Table 7 gives particulars of normal train services in Formosa.

The following information refers to the maximum authorized speed of trains over curves on Japanese railways:

Radius of curves (metres)	Speed (m.p.h.)
1970	52.8
1640	49.7
1310	43.5
980	37.3
660	31.1
330	18.6

Table 7: Normal train services on Formosan State railways

Line	Miles	Double or single line	Trains per day each way	
			Passenger	Freight
<i>West line</i>				
Kirun-Taihoku ...	17	D	23	4-12
Taihoku-Shinchiku ...	49	D and S	14	4-10
Shinchiku-Chikunan ...	12	S	16	4-12
Chikunan-Shoka Junction		Now doubled		
(Coast) ...	56	S	9	4-8
Chikunan-Shoka (Inland)	56	S	8	1-4
Shoka Junction-Kagi ...	50	S	12	4-8
Kagi-Tainan ...	38	S	7	2-4
Tainan-Takao ...	29	D	17	2-8
Hatto Junction-Suo ...	60	S	7	1
<i>East line</i>				
Karenko-Taito ...	117	S	6	1

(c) SYSTEM OF TRAIN CONTROL

No information available.

(d) SPECIAL FEATURES OF OPERATION

Government lines

(i) For the main part track is single, and trains are worked under staff and ticket regulations.

(ii) The distances between stations are fairly short and facilitate a frequent service.

(iii) Passing loops on single lines restrict train capacities to about 30 wagons.

(iv) Marshalling yards are not necessary as the two separate coastal systems consist of single trunk lines with a few short branches, and sorting facilities, even at the largest stations, rarely amount to as much as 12 sidings.

(v) Locomotive sheds are at frequent intervals and favour short hauls. Capacities of sheds are generous compared with normal train services.

(vi) Gradients are heavy and curvatures sharp, with consequent restriction on train speeds.

(vii) In spite of the narrow gauge, rolling-stock is of high capacity compared with European rolling-stock of 4 ft. 8½ in. gauge.

(viii) The inland section of the west coast line (Route 4) is subject to landslides and blockage of tunnels, whilst during the rainy season, when rivers are in full flood, damage to the very long bridges, which apply to both the inland and coastal routes, is not uncommon.

(e) NATURE AND ADEQUACY OF TERMINAL FACILITIES

All the main stations are well built and planned, with concrete-paved yards giving good, hard standing and access for road transport. Stations are, bearing in mind the lightness of the traffic, well provided with siding facilities and spacious storage sheds. No details are available of cranes or side- and end-loading ramps; the only case where an end-loading ramp is reported to exist is at Suo (Route 7).

On the private lines, track is single throughout, and whilst no information is available as to the method

of working, it is assumed that staff and ticket regulations apply.

Although the gauge is for the main part only 2 ft. 6 in., the lines are capable of handling a fair amount of traffic, both passenger and goods, whilst rolling-stock is of high capacity for the gauge.

Extensive siding facilities exist for sorting and holding traffic at factories and stations served by the private lines, and there are adequate inter-change facilities with the main 3 ft. 6 in. gauge lines at principal railway centres. (Plans 29A and 31A.)

(11) CAPACITY

(a) CAPACITY OF TRAINS PER DAY EACH WAY

The maximum length of trains of government lines is restricted by passing loops to 30 wagons and a net load per train of 240 tons military stores.

Generally speaking, the maximum track capacity for the whole system is 48 trains each way per 24 hours on double lines, and 18 trains each way per 24 hours for single lines.

Capacities for each individual route is given in the 'General description' before itineraries, but it must be emphasized that the estimates given for the various lines must not be regarded as simultaneous. Further, the attainment of these capacities depends on the following conditions:

- (i) Sufficient rolling-stock, including locomotives, must be available.
- (ii) Terminal facilities must be adequate to cope with the traffic.
- (iii) There must be no interference by the enemy.
- (iv) Absence of any exceptional operating difficulties.

(b) METHODS OF INCREASING CAPACITY

(i) Provision of longer passing loops on single lines.

(ii) Conversion from single to double track.

(iii) Installation of modern signalling and central traffic control.

(iv) Reduction in the length of block sections, although, generally speaking, sections are already short.

(v) Adjustment of terminal facilities and the number of rolling-stock.

(vi) Improvement of track and bridges to allow for heavier axle-loads and permit operation of heavier locomotives. On main lines, however, track already provides for the optimum axle-loading for the gauge, i.e. 16 metric tons.

(vii) Quicker turn-round at terminals of wagons and locomotives, so that greater use can be made of existing rolling-stock.

(12) VULNERABILITY OF SYSTEM

Most lines, and in particular the west coast system, are rendered highly vulnerable by numerous bridges, several of great length, necessitated in crossing wide river valleys, which are subject to flood in the rainy season. Bridges are usually constructed of metal girder spans on concrete or masonry piers.

Tunnels are frequent on the inland route (Route 4), and, as these are often of great length, they can, by blockage, cause dislocation to traffic for considerable periods.

The principal junctions are at Hatto, Shinchiku, and Shoka, the simultaneous destruction of which would completely sever communication on the west coast system.

Particular vulnerable points are indicated in the itineraries of lines by an asterisk.

(13) NEW WORKS

(a) LINES UNDER CONSTRUCTION FROM BORYO TO KOSHUN

A single-track extension of the west coast route was reported to be under construction in 1941.

(b) OTHER CONSTRUCTIONAL WORKS IN HAND
No information.

(c) LINES PROJECTED
Conversion of the Karenko-Taito line (*Route 7*) to 3 ft. 6 in. gauge and extension north to Suo (*Route 2*) and south-west to Choshu (*Route 6*).

(d) LINES DISMANTLED^{*}
No information.

(14) ITINERARIES OF LINES

Only the main government lines are described in detail, those on the west coast system (*Routes 1-6*) being numbered progressively from east to west.

Owing to their importance, brief notes have been written on the private lines, giving route lengths, gauges, and principal bridges and tunnels.

As the push-car lines are not of any great importance they have not been described, but where they provide a mutual service with the main Government lines to principal towns, reference has been made to them in the itineraries.

The physical features of lines described have been taken from 1/250,000 A.M.S., L 592, 1943, and also 1/50,000 Japanese original maps.

Technical information and statistical data have been taken from *Survey of the Island of Formosa (Taiwan) Jan. 1944*; *Short Report on Formosa Transportation Facilities*, W.D. Dec. 1943; *The Railway Gazette* 1941; *Bulletin of the International Railway Congress Association*; and air photographs.

The following abbreviations have been used:

DE.	Dead-end.
DES.	Dead-end sidings, prefixed by number of DES. and followed by length of sidings in feet.
DT.	Double track.
ER.	End-loading ramp.
ES. ()	Engine shed (capacity in locos. in brackets). Round-house or rectangular in words, if known.
I.	Interchange with line of different gauge.
J.	Junction, facing or trailing in words.
LS.	Loop siding, prefixed by number of LS. and followed by length of sidings in feet.
MY.	Marshalling yard.
PL.	Passing loop.
Rps.	Locomotive and/or wagon repair shops.
ST.	Single track.
SY.	Shunting yard.
Tbl. ()	Turntable (length in feet in brackets).
W.	Watering facilities.

(15) TRAIN FERRIES

No train ferries or steamship services are operated by the government railways; but a steamship service, not railway owned or operated, runs between Kirun and Moji (Japan proper), with connecting rail services at each end.

Transshipment between rail and ship in Formosa takes place at:

Kirun: 600 yards of railway sidings on quayside with cranage facilities.

Takao: quayside spurs with cranes.

Tainan: by barge canal via Anpin.

Tamsin: short spurs to oil and lumber jetties.

Karenko: by lighter.

Taito: by lighter.

Suo: light railway spur to quayside and lighter.

ROUTE 1

KIRUN (KEELUNG)—TAIHOKU—SHINCHIKU—CHIKUNAN

(Plans 15-17, 24, 31A, 32)

General description

The line takes a general direction west from Kirun to the capital of Taihoku, whence it turns south-west to the important town of Shinchiku, before following the coastline to Chikunan, junction for the inland and coastal routes (*Routes 4 and 5*) to Shoka.

From Kirun to Toen, 57.5 km. (35½ miles), the contours are rugged, but advantage is taken of river valleys to avoid heavy gradients, although this has resulted in rather sharp curves, particularly between Kirun and the capital, where the line follows the Keelung river.

Originally single track, the line is double for most of its length, and latest reports indicate that it might be double track throughout, whilst the portions between Kirun and Hatto, junction for Route 2 serving the mining area, is quadruple track.

The parallel road and rail bridge at 2.9 km. would, if destroyed, almost completely isolate Kirun. Also tunnels occur between Hatto and Taihoku, but the most vulnerable aspect of the line is after leaving Taihoku, when several long bridges are encountered, the chief being those over the Shinten and Tam-tsui rivers soon after leaving the capital.

Read as contiguous with Routes 4 or 5, and 6, the line provides means for a through service to the important provincial administrative centre of Takao.

General details

- (1) *Gauge*: 3 ft. 6 in.
- (2) *Length*: 125.7 km. (78 miles).
- (3) *Track*:
 Kirun-Hatto (3.2 km., 2 miles), 4 track.
 Hatto-Taihoku (25.4 km., 15¾ miles), double.
 Taihoku-Pehok (10.7 km., 6½ miles), single.
 Pehok-Toen (18.2 km., 11¼ miles), double.
 Toen-Heichin (14.9 km., 9¼ miles), single.
 Heichin-Chikunan (53.3 km., 33 miles), double.

- (4) *Maximum permissible axle-load*: No details available.
- (5) *Maximum gradient*: No details, but most severe will be probably between Kirun and Toen.
- (6) *Minimum radius of curves*: No details.
- (7) *Traction*: Steam.
- (8) *Maximum distance between stations*: Kozan-Chikunan: 11.2 km. (7 miles).
- (9) *Engine sheds*:
 Kirun (Keelung), 0 km.
 Matsuyama, 22.2 km.
 Taihoku, 28.6 km.
 Toen, 57.5 km.
 Shinchiku, 106.7 km.
 Chikunan, 125.7 km.
- (10) *Marshalling or shunting yards*
 Kirun, 0 km.
 Taihoku, 28.6 km.
 Shinchiku, 106.7 km.
 Chikunan, 125.7 km.
- (11) *Watering facilities*: As in (9) above.
- (12) *Vulnerable points* (Marked with asterisk in text)
 - (a) Locomotive and marshalling facilities. (*See (9) and (10) above.*)
 - (b) Junctions at Hatto (3.0 km.), Taihoku (28.0 and 31.4 km.), and Chikunan (125.7 km.)
 - (c) Bridges, in particular those at 2.9, 32.8 (over Shinten river), 37.1, 38.7, 99.9, 102.0, 103.2, and 103.6 km.
 - (d) Tunnels at 2.0, 6.5, 8.7, and 121.1 km.
 - (e) Connexions to docks at Kirun.
- (13) *Capacity*
 On double-line sections, 48 trains each way per day.
 On single-line sections, 24 trains each way per day.
 Overall capacity of line, if single-line sections not doubled, 30-35 trains each way per day.
 Net weight of military stores per train, 200/250 tons.

Distance from KIRUN		Stations	Engineering works	Details and facilities
miles	km.			
*0	0	KIRUN (KEELUNG)	...	Terminus. ES. Tbl. W. SY. and 12 sidings. (Connexions to docks.) J also for ST. DE. line to Sian-Tang, c. 2½ miles. I. with push-car line to Kau-kieng-kio, c. 8 miles.
*1¼	2.0	...	Tunnel	½ mile.
*1¾	2.9	...	Bridge over Keelung river	c. 210 ft. long, 40 ft. high. Line curves SE.
*1¾	3.0	...	...	J (trailing). Cr. ST. line to Suo (<i>Route 2</i>).
2	3.2	HATTO	...	Passenger station. 3 platforms (2 main being 600 ft. long), 11 through tracks. Line runs along south bank of river to Matsuyama.
3¼	5.2	SHICHITO	...	Line crosses main road twice.
*4	6.5	...	Tunnel	150 ft. Line curves NW.
5¼	8.5	...	...	Line crosses main road to Taihoku.
*5½	8.7	...	Tunnel	c. 300 ft. Line curves SW. and runs parallel with road to Taihoku.
6¼	10.0	KEELUNG-HO	...	Line crosses main road.

RAILWAYS

Distance from KIRUN		Stations	Engineering works	Details and facilities
miles	km.			
7	11.3	SHIODOME	...	...
7 $\frac{3}{4}$	12.6	...	Bridge over small river	...
*9	14.5	...	Tunnel	c. 450 ft.
9 $\frac{1}{4}$	15.2	...	...	Line turns west to Taihoku.
9 $\frac{3}{4}$	15.9	...	Bridge over small river	...
10 $\frac{1}{4}$	16.7	NANKO	...	...
12 $\frac{3}{4}$	20.7	...	Bridge over small river	...
13 $\frac{1}{2}$	22.0	...	Bridge over small river	...
*13 $\frac{3}{4}$	22.2	MATSUYAMA	...	ES. Tbl. W. Rps. (locos and rolling-stock; capacity 10 locos, 10 coaches, and 58 wagons per month).
14	22.7	...	Bridge over stream	...
15 $\frac{1}{4}$	24.5	...	...	Line crosses minor road.
16	25.6	...	...	Line crosses minor road.
16 $\frac{1}{4}$	26.2	...	...	Line crosses main road.
16 $\frac{1}{4}$	26.4	...	Bridge over river	...
*17 $\frac{1}{4}$	28.0	...	...	J (trailing) right. ST. line to Tansui (Route 3). J (facing) right. ST. line to riverside docks.
*17 $\frac{3}{4}$	28.6	TAIHOKU	...	Passenger station. 2 platforms (1 island), connected by footbridge to separate platform for Tansui line, c. 4 tracks for main line. Loco depot. South of passenger station. ES. $\frac{1}{2}$ roundhouse, capacity c. 40 locos with workshops attached. Tbl. W. Shunt yard. North of passenger station, c. 8 LS. Goods yard. North of SY. c. 14 DES. serving 4 large sheds, also a subsidiary yard south of SY. with several DES. serving sheds, and with access for road vehicles. Connexion to docks. Line continues ST.
18	29.1	...	...	Line curves south.
19 $\frac{1}{4}$	30.9	...	...	Line curves west.
*19 $\frac{1}{2}$	31.4	Station	...	J for ST. line from Shinten (Route 1a). Also, I. with push-car line to Chiang-ho and Itahashi.
19 $\frac{1}{2}$	31.6	...	...	J (trailing). Cr. ST. line from Shinten. Line curves SW.
19 $\frac{3}{4}$	31.9	...	Bridge over light railway	...
20	32.4	...	Bridge over stream	Line curves west
*20 $\frac{1}{4}$	32.8	...	Bridge over Shinten river	1280 ft. Steel cantilever type. Line resumes SW.
22 $\frac{1}{2}$	36.4	ITAHASHI	...	I. with push-car line to Taihoku, Chiang-ho and Sankvo. Also south to Gua-ma-tso-tsan. 24 in. gauge.

Distance from KIRUN		Stations	Engineering works	Details and facilities
miles	km.			
23	37.0	...	...	Line turns west.
*23	37.1	...	Bridge over river	c. 1200 ft.
*24	38.7	...	Bridge over river	c. 900 ft.
24 $\frac{1}{4}$	39.3	...	...	Line crosses road: then resumes direction SW. as DT.
25 $\frac{1}{4}$	40.6	...	Bridge over stream	...
25 $\frac{1}{4}$	40.8	PEHOK	...	...
27 $\frac{1}{2}$	44.5	SANSHIKYAKU	...	...
30 $\frac{1}{2}$	49.2	OKASEKI	...	I. with push-car line to Sankyo and Tsohap, 18 in. gauge.
31 $\frac{1}{4}$	50.5	...	...	Line crosses road, then turns NW. to Toen.
32	51.7	...	...	Line crosses road.
34 $\frac{3}{4}$	56.0	...	...	Line turns WSW.
35	56.4	...	...	Line crosses road.
*35 $\frac{3}{4}$	57.5	TOEN	...	ES. W. I. with push-car line north to Tiek-ui; north to Lamk'ame; south to Kak-pan-sua; and NE. to Taien. End of DT. Beginning of ST. Line crosses road.
37 $\frac{1}{2}$	60.3	...	Bridge over stream	...
38 $\frac{3}{4}$	62.5	...	Bridge over stream	...
39	62.8	KANSHIKYAKU	...	Line turns SW.
41 $\frac{1}{4}$	66.5	...	Bridge over stream	...
41 $\frac{1}{2}$	66.9	CHUREKI	...	I. with push-car lines SE. to Pueq-te, south to Tsap-it-hun, north to Go-ts'u and NW. to Kannon. 18-24 in. gauge.
41 $\frac{3}{4}$	67.2	...	...	Line crosses road.
42 $\frac{1}{4}$	68.0	...	...	Line crosses road.
42 $\frac{3}{4}$	68.8	...	Bridge over stream	...
43	69.6	...	...	Line turns WSW.
44 $\frac{1}{4}$	71.2	...	...	Line crosses road.
44 $\frac{1}{2}$	71.4	...	...	Line turns SW.
45	72.4	HEICHIN	...	Line resumes DT.
45 $\frac{3}{4}$	73.5	...	...	Line turns WSW.
46	74.2	...	Bridge over stream	...
46 $\frac{3}{4}$	75.3	...	Bridge over stream	...
47 $\frac{1}{4}$	76.2	...	Bridge over stream	...

Distance from KIRUN		Stations	Engineering works	Details and facilities
miles	km.			
47 $\frac{1}{2}$	76.5	YOBAI	...	Originally line ran ST. from Yobai in a direction SW. by south and parallel with the main road through the town of Koko, but from recent maps it appears that the line is now DT. and to avoid the sharp curves, which previously existed between Koko and Komo, deviates north-westwards. Line crosses road, and takes direction WNW.
47 $\frac{3}{4}$	77.0	...	Bridge over stream	...
50 $\frac{1}{2}$	81.3	...	Bridge over stream	...
52	83.6	...	...	Line turns SSW.
52 $\frac{1}{2}$	84.6	HAKUKOKO	...	...
53 $\frac{1}{2}$	86.3	...	...	Line turns SW.
54 $\frac{1}{4}$	87.5	...	Bridge over stream	...
55 $\frac{1}{4}$	89.1	...	Bridge over stream	...
56 $\frac{1}{4}$	90.6	KOKO	...	c. 2 $\frac{1}{4}$ miles NW. of town of Koko.
56 $\frac{1}{2}$	91.0	...	Bridge over stream	...
57 $\frac{3}{4}$	93.0	...	Bridge over stream	...
58	93.4	...	...	Line crosses main road.
59 $\frac{1}{4}$	95.5	...	? Causeway over small lake	...
60	96.8	BANG-K'O-LAU	...	...
60 $\frac{1}{4}$	97.1	...	...	Line turns SE.
60 $\frac{1}{4}$	97.2	...	? Causeway over small lake	...
*62	99.9	...	Bridge over river Hong-sua-k'e and road	c. 900 ft. Line curves gradually SW.
62 $\frac{1}{2}$	100.7	...	Bridge over stream	...
62 $\frac{3}{4}$	101.1	...	? Culvert	Line crosses stream
63	101.5	KOMO	...	...
*63 $\frac{1}{4}$	102.0	...	Bridges over arm of river T'au-chieng-k'e	c. 1800 ft.
63 $\frac{3}{4}$	102.7	...	Bridge over stream	...
*64	103.2	...	Bridge over river T'au-chieng-k'e	c. 1240 ft. (2 parallel ST. bridges).
*64 $\frac{1}{4}$	103.6	...	Bridge over river	c. 580 ft. (2 parallel ST. bridges).
64 $\frac{3}{4}$	104.2	...	Bridge over stream	...
64 $\frac{3}{4}$	104.3	...	Bridge over stream	...
65	104.5	...	Bridge over river	c. 120 ft.
65	104.7	...	Bridge over stream	...
65 $\frac{1}{4}$	105.0	...	Bridge over stream	...
65 $\frac{1}{2}$	105.6	...	Bridge over stream	...

Distance from KIRUN		Stations	Engineering works	Details and facilities
miles	km.			
66	106.1	...	Bridge over push-car track, road, and stream	Line crosses road.
*66 $\frac{1}{4}$	106.7	SHINCHIKU	...	<p>Passenger station. 2 platforms (1 single-faced, 1 island), c. 1200 ft. long, both partly covered. 3 tracks.</p> <p>Shunt yard. Alongside passenger station. c. 8 LS., each c. 1600 ft. long with small group of c. 4 DES. at north end, c. 400 ft. long.</p> <p>Loco depot. South end of SY. ES. $\frac{1}{2}$ roundhouse, capacity c. 24, with workshops attached. Tbl. c. 65 ft. W. Coal stage at north end of shed.</p> <p>Goods yard. North of SY. 4 DES. c. 1600 ft. long serving 2 goods sheds (800 ft. \times 80ft. and 1320 ft. \times 40 ft.)</p> <p>Connexion north of station and west of line to industrial establishment, also I. with 2 ft. 6 in. gauge light railways to Po-lo-bun (to the north), E-sua (to the east) and Io-liau (to the west); and push-car line to Siang-pe (to the SE.). (Plan 31A.)</p>
66 $\frac{1}{2}$	107.2	...	Bridge over stream	...
66 $\frac{3}{4}$	107.3	...	...	Line crosses road.
67	107.7	...	...	Line turns west.
67 $\frac{1}{4}$	108.1	...	Bridge over river Keg-nga-k'e	4 spans with total length of c. 200 ft.
67 $\frac{1}{2}$	108.4	...	? Culvert over stream	...
67 $\frac{3}{4}$	108.8	...	...	Line turns SW.
68	109.3	...	? Culvert over stream	...
68 $\frac{1}{2}$	110.3	...	? Culvert over confluence of streams	...
69 $\frac{1}{4}$	111.4	...	Bridge over stream	...
69 $\frac{3}{4}$	112.2	...	Bridge over stream	...
69 $\frac{3}{4}$	112.4	...	...	Line turns south, parallel with coastal road
71	114.5	KOZAN	...	...
71 $\frac{1}{2}$	115.3	...	Bridge over stream	...
72	116.0	...	? Bridge	Line crosses main road, to Koryu. Line proceeds on embankment for 1 mile.
73 $\frac{1}{4}$	118.0	...	Bridge over river	...
73 $\frac{3}{4}$	118.9	...	...	Main road turns SE. from line.
				Line crosses minor road.
				Curve to right, radius c. 2198 ft., length c. 2625 ft.
*75 $\frac{1}{4}$	121.1	...	Short tunnel	c. 225 ft.
75 $\frac{1}{4}$	121.2	...	...	Line turns SW.
				Line crosses narrow road.
76	122.5	...	Bridge over stream	Embankment
76 $\frac{3}{4}$	123.7	...	...	Line turns SSW.

Distance from KIRUN		Stations	Engineering works	Details and facilities
miles	km.			
77 $\frac{1}{4}$	124.6	...	Bridge over stream	...
77 $\frac{1}{2}$	125.0	...	Bridge over push-car track	...
*78	125.7	CHIKUNAN	...	ES. Tbl. W. SY. Line continues south to Shoka by 2 ST. lines, one via Taichu (Route 4), and the other via Taiko (Route 5).

ROUTE 1a
TAIHOKU—SHINTEN
(Plans 16, 17, 32)

General description

The single-track line runs south from the capital, branching off from the main line to Shinchiku (Route 1) at 2.8 km., and follows the valley of the Shinten river to the terminus at Shinten.

No details are available of gradients, but it is anticipated that these will be easy, the country being of a flat nature.

General details

- (1) Gauge: 3 ft. 6 in.
 (2) Length: 13.3 km. (8 $\frac{1}{4}$ miles).
 (3) Track: Single.
 (4) Maximum permissible axle-load: No details available.
 (5) Maximum gradient: No details available, but line runs through comparatively flat country.

- (6) Minimum radius of curves: No details available.
 (7) Traction: Steam.
 (8) Maximum distance between stations: Station (2.8 km.)—Station (5.1 km.): 2.3 km. (1 $\frac{1}{2}$ miles).
 (9) Engine sheds: Taihoku.
 (10) Marshalling and shunting yards: Taihoku.
 (11) Watering facilities: Taihoku.
 (12) Vulnerable points (Marked with asterisk in text)
 (a) Marshalling and locomotive facilities at Taihoku.
 (b) Junction at 2.8 km.
 (c) Bridges, particularly those at 3.9, 10.2, and 11.3 km.
 (13) Capacity
 12 trains each way per day.
 Net weight of military stores per train, 200/250 tons.

Distance from TAIHOKU		Stations	Engineering works	Details and facilities
miles	km.			
*0	0	TAIHOKU	...	Passenger station. 2 platforms (1 island) for main line, also 1 platform for Tansui line. ES. $\frac{1}{2}$ roundhouse, capacity c. 40 locos. Tbl. W. Shunt yard. c. 8 LS. Goods yard. c. 14 DES. serving 4 large sheds, also several DES. with access for road vehicles and sheds in subsidiary yard south of SY.
*1 $\frac{3}{4}$	2.8	Station	...	J (facing) left with ST. line to Shinchiku (Route 1).
1 $\frac{3}{4}$	3.0	...	...	Line runs east.
2 $\frac{1}{4}$	3.5	...	...	Line curves SE.
*2 $\frac{1}{2}$	3.9	...	Bridge over river	...
2 $\frac{3}{4}$	4.3	...	...	Line curves ESE.
3 $\frac{1}{4}$	5.1	Station	...	...
3 $\frac{1}{4}$	5.3	...	...	Line crosses secondary road.
3 $\frac{1}{2}$	5.6	...	...	Line turns SE.
4	6.4	...	...	Line turns ESE.
4 $\frac{1}{4}$	7.0	SUIGENCHI	...	...
4 $\frac{1}{2}$	7.2	...	Bridge or culvert over stream	...

Distance from TAIHOKU		Stations	Engineering works	Details and facilities
miles	km.			
4½	7.4	...	...	Line turns SE.
4¾	7.6	KOKAN	...	...
5	8.0	...	Bridge or culvert over stream	...
5	8.3	...	...	Line curves south.
5¼	8.5	...	...	Line turns SE.
5½	8.8	Station	...	...
5½	9.0	...	...	Line begins long curve towards south.
6	9.6	...	...	Line turns SW.
6	9.8	KEIBI	...	I. with push-car line to Chioq-tia.
6¼	10.0	...	...	Line turns south.
*6¼	10.2	...	Bridge over river Kieng-bue-k'e	c. 300 ft.
6½	10.4	...	...	Line crosses secondary road.
7	11.2	...	...	Line curves SE.
*7	11.3	...	Bridge over stream	...
7	11.4	...	...	Line turns south.
7¼	11.6	DAIHERIRIN	...	...
7¼	11.9	...	...	Line turns SW.
8¼	13.3	SHINTEN	...	...

ROUTE 2

HATTO—GIRAN—SUO

(Plans 16, 17, 25A)

General description

This single-track branch line connects the east coast and the north-east mining area with the port of Kirun and the main line to Taihoku and the west coast (Route 1).

From Hatto the line runs eastwards along the valley of the Keelung river almost to its source, when, immediately after the junction with the coal mine branch from Sanshorei to Chioq-te (Route 2a), it turns south and cuts through the hills to join the valley of another river, which it follows to the coast to Otei, and again turns south and passes through a tunnel to Chioq-sia-a, whence it follows the coastal road to serve the towns of Shokei, Giran, Rato, and finally Suo.

The main bridge is over the Dakusai river between Giran and Rato (c. 2250 ft.), but the presence of tunnels increases the vulnerability of the line.

Plans have been under consideration for extending the line to join the present 2 ft. 6 in. gauge line at Karenko, which it is proposed to broaden to 3 ft. 6 in., but no information is available as to whether the work has been started. The proposed extension would be a costly and tedious business, and the scheme would take several years to complete.

Gradients and curvature will have a restrictive effect on speeds and train capacity.

General details

(1) Gauge: 3 ft. 6 in.

- (2) Length: 92.7 km. (57½ miles).
- (3) Track: Single.
- (4) Maximum permissible axle-load: No details available.
- (5) Maximum gradient: No details available; but hilly country, with tunnels, as far as Tairi. Thence line runs between hills and coast to Gaio. Low-lying country from Gaio to Suo.
- (6) Minimum radius of curves: No details available.
- (7) Traction: Steam.
- (8) Maximum distance between stations: Otei-Tairi: 7.6 km. (4¾ miles).
- (9) Engine sheds
Kirun (Route 1), 0 km.
Giran, 70.1 km.
Suo, 92.4 km.
- (10) Marshalling and shunting yards: Kirun (Route 1). No other details.
- (11) Watering facilities: As in (9) above.
- (12) Vulnerable points (Marked with asterisk in text)
 - (a) Locomotive and marshalling facilities. (See (9) and (10) above.)
 - (b) Junction at Hatto with Route 1.
 - (c) Bridges, in particular at 48.6 km. and over the Dakusai river at 74.3 km.
 - (d) Tunnels at 6.0, 9.6, 11.0, 16.1, 24.2, 33.0 km.
 - (e) Siding connexion to pier at Suo.
- (13) Capacity
12 trains each way per day.
Net weight of military stores per train, 200 tons.

Distance from HATTO		Stations	Engineering works	Details and facilities
miles	km.			
* 0	0	HATTO	...	3 passenger platforms, 2 being 600 ft. long, with 11 tracks through station. (Kirun-Taihoku-Shinchiku-Chikunan.) J with Route 1.
$\frac{1}{4}$	0.4	...	...	Line turns SE. and leaves Route 1.
$\frac{1}{2}$	1.1	...	Bridge over river	...
$\frac{3}{4}$	1.4	...	...	Line turns east.
1	1.5	DANDAN	...	...
$1\frac{1}{4}$	2.0	...	Bridge over river	...
$1\frac{1}{2}$	2.6	...	...	Line gradually curves NE. and east.
$2\frac{1}{4}$	3.8	SHIKYAKUTEI	...	...
$2\frac{1}{2}$	4.1	...	...	Line turns NE.
3	5.0	...	...	Line gradually curves SE.
* $3\frac{3}{4}$	6.0	...	Tunnel	c. 1500 ft. Tunnel curves SE. and NE.
4	6.5	...	...	Line follows wide curve NE. and east.
$5\frac{1}{2}$	9.0	ZUIHO	...	...
$5\frac{3}{4}$	9.3	...	Overbridge	Line crossed by push-car line from Kirun.
*6	9.6	...	Tunnel	c. 900 ft.
$6\frac{3}{4}$	10.9	...	...	Line crosses secondary road.
* $6\frac{3}{4}$	11.0	...	Tunnel under river bed	c. 900 ft. Line keeps close to river, making wide curve south.
$8\frac{1}{4}$	13.2	KODO	...	Line turns south, still following river.
$9\frac{3}{4}$	15.6	SANSHOREI	...	...
$9\frac{3}{4}$	15.9	...	...	J (facing) right, with 3 ft. 6 in. gauge coal-mine line from Chioq-te (Route 2a).
*10	16.1	...	Tunnel	c. 6000 ft. Tunnel curves gradually east.
$11\frac{3}{4}$	18.9	...	...	Line crosses secondary road.
$11\frac{3}{4}$	19.1	...	Bridge over river	...
12	19.3	...	...	J (trailing) right, with line to Sokei. Line turns north to Butanko.
12	19.5	BUTANKO	...	Dead-end station. Trains reverse to continue route south.
$12\frac{3}{4}$	20.5	...	Bridge over stream	Line crosses secondary road.
13	21.1	...	...	Line turns east.
$13\frac{1}{4}$	21.4	...	Bridge over stream	...
$13\frac{3}{4}$	22.1	...	...	Line turns south.
$14\frac{1}{4}$	23.0	CHOSOKEI	...	Line gradually curves SE.
$14\frac{3}{4}$	23.9	...	...	Line crosses secondary road.
*15	24.2	...	Tunnel	c. 900 ft.

Distance from HATTO		Stations	Engineering works	Details and facilities
miles	km.			
16 $\frac{1}{4}$	26.1	...	...	Line crosses secondary road, and curves NE.-SE. Curve radius c. 900 ft.
16 $\frac{1}{2}$	26.7	...	...	Line recrosses secondary road.
16 $\frac{3}{4}$	27.2	KORYOSHO	...	...
17	27.7	...	...	Line crosses secondary road.
17 $\frac{1}{2}$	28.4	...	Bridge over river	...
19 $\frac{1}{4}$	31.0	OTEI	...	Line closely follows river bed.
19 $\frac{1}{2}$	31.5	...	Bridge over river	...
20	32.3	...	...	Line turns south.
20 $\frac{1}{4}$	32.8	...	...	Line turns SE.
*20 $\frac{1}{2}$	33.0	...	Tunnel	Line turns south. c. 6600 ft. Tunnel runs due south under foothills, which, at the southern end, slope steeply to the coast.
21 $\frac{3}{4}$	35.2	...	...	Line emerges from tunnel, turns SW. and follows coastline as far as Gaio (51.7 km.).
22	35.4	...	...	Embankment begins.
22 $\frac{1}{2}$	36.2	...	Bridge over stream	...
23	37.0	...	...	Embankment ends.
23	37.3	...	Bridge over stream	Embankment begins.
23 $\frac{1}{4}$	37.4	...	...	Embankment ends.
23 $\frac{1}{2}$	38.0	...	Bridge over stream	...
24	38.6	TAIRI	...	...
24	38.8	...	...	Line crosses main road.
24	38.9	...	Bridge over stream	...
24 $\frac{1}{4}$	39.0	...	...	Embankment begins.
24 $\frac{1}{2}$	39.3	...	...	Embankment ends.
25 $\frac{1}{4}$	40.6	...	Bridge over stream	...
25 $\frac{1}{2}$	40.8	...	Bridge over stream	...
25 $\frac{3}{4}$	41.3	...	...	Embankment begins.
25 $\frac{3}{4}$	41.5	...	...	Embankment ends.
25 $\frac{3}{4}$	41.7	...	...	Line crosses main road.
26	42.1	...	...	Line turns west.
26 $\frac{1}{2}$	42.8	...	Bridge over river Tua-k'e-ts'ui	...
26 $\frac{1}{2}$	42.9	...	...	Line crosses main road.
27	43.4	...	...	Elevation marker, 9.29 m.
27	43.5	TAIKEI	...	...

RAILWAYS

Distance from HATTO		Stations	Engineering works	Details and facilities
miles	km.			
27 $\frac{1}{4}$	43.8	...	...	Embankment begins.
27 $\frac{1}{4}$	44.0	...	...	Embankment ends.
27 $\frac{1}{2}$	44.2	...	Bridge over dry valley	...
27 $\frac{1}{2}$	44.5	...	Bridge over dry valley	...
27 $\frac{3}{4}$	44.6	...	...	Embankment begins
27 $\frac{3}{4}$	44.9	...	...	Embankment ends
28	45.0	...	Bridge over stream	...
28 $\frac{1}{4}$	45.6	...	...	Embankment begins
				Elevation marker, 7.86 m.
28 $\frac{1}{2}$	45.9	...	...	Embankment ends.
29 $\frac{1}{4}$	47.2	...	...	Line crosses main road.
29 $\frac{1}{2}$	47.4	...	...	Line recrosses main road.
29 $\frac{1}{2}$	47.5	...	...	Elevation marker, 10.93 m.
29 $\frac{3}{4}$	48.1	KIZAN	...	...
*30 $\frac{1}{4}$	48.6	...	Bridge over river	c. 3000 ft. Line takes wide curve SE.-south.
30 $\frac{1}{2}$	49.4	...	...	Elevation marker, 5.32 m.
31 $\frac{3}{4}$	51.3	...	...	Elevation marker, 5.75 m.
31 $\frac{3}{4}$	51.5	...	Bridge over stream	...
32	51.7	GAIO	...	From Gaio line turns inland, and begins to run in straight sections instead of curves.
32 $\frac{1}{2}$	52.4	...	...	Embankment begins.
32 $\frac{1}{2}$	52.5	...	Bridge over stream	...
32 $\frac{3}{4}$	52.6	...	...	Embankment ends.
33 $\frac{1}{4}$	53.5	...	...	Elevation marker, 6.55 m. Line turns SW. from SSW.
33 $\frac{1}{2}$	54.2	...	...	Embankment begins.
33 $\frac{1}{2}$	54.3	...	Bridge over stream	...
33 $\frac{3}{4}$	54.4	...	...	Embankment ends.
33 $\frac{3}{4}$	54.7	...	...	Line turns SSW.
34	54.9	...	...	Embankment begins.
34 $\frac{1}{4}$	55.2	...	Bridge over stream	Embankment ends.
34 $\frac{1}{2}$	55.5	Toi	...	...
34 $\frac{3}{4}$	56.0	...	...	Embankment begins
34 $\frac{3}{4}$	56.1	...	Bridge over river	...
34 $\frac{3}{4}$	56.2	...	Bridge over dry valley	...
35 $\frac{1}{4}$	56.9	...	Bridge over stream	...
35 $\frac{1}{2}$	57.1	...	...	Embankment ends.

Distance from HATTO		Stations	Engineering works	Details and facilities
miles	km.			
36	58.0	...	...	Embankment begins.
36½	58.8	...	...	Line turns west.
36½	58.9	...	Bridge over stream	...
37¼	59.9	...	...	Embankment ends.
37½	60.6	...	...	Line turns SW.
38	61.3	...	Bridge over stream	...
38½	61.8	SHOKEI	...	...
38½	61.9	...	...	Embankment begins.
38½	62.0	...	Bridge over stream	...
38¾	62.4	...	...	Embankment ends. Line turns SSW.
39¼	63.1	...	...	Embankment begins.
40	64.6	...	Bridge over tributary of river T'au-ui-ts'ui	...
40½	65.3	...	Bridge over stream	...
41¼	66.3	...	...	Embankment ends.
41¼	66.4	SHIKETSU	...	...
41¼	66.6	...	Bridge over stream	...
41½	66.9	...	Bridge over river	...
41¾	67.4	...	...	Embankment begins. Line turns south.
42¼	67.9	...	Bridge over stream	...
42¾	68.8	...	...	Line turns SSW.
42¾	69.0	...	Bridge over stream	Embankment ends.
42¾	69.1	...	Bridge over river Giran-kei	c. 600 ft.
43	69.3	...	...	Embankment begins.
43	69.6	...	...	Line crosses secondary road.
*43½	70.1	GIRAN	...	ES. Tbl. W. Embankment ends. Line takes wide curve SSW.-SE.
44¼	71.2	...	...	Embankment begins.
44½	71.7	...	Bridge over stream	...
44¾	72.0	...	Bridge over stream	...
46	74.1	...	...	Line turns SSE. from SE.
*46	74.3	...	Bridge over river Dakusui-kei	Embankment ends. c. 2250 ft.
46½	75.0	...	...	Embankment begins.
46¾	75.4	...	...	Embankment ends.
47	75.7	NIKETSU	...	...
47	75.9	...	...	Line crosses secondary road. Embankment begins.

Distance from HATTO		Stations	Engineering works	Details and facilities
miles	km.			
47 $\frac{1}{4}$	76.2	...	...	Line turns south.
47 $\frac{1}{2}$	76.5	...	Bridge over stream	...
47 $\frac{1}{2}$	76.7	...	...	Elevation marker, 2.0 m.
48	77.5	...	Bridge over stream	...
48 $\frac{1}{4}$	77.8	...	Bridge over stream	...
48 $\frac{1}{2}$	78.3	...	...	Embankment ends.
48 $\frac{1}{2}$	78.4	...	Bridge over stream	...
48 $\frac{3}{4}$	78.7	RATO	...	...
48 $\frac{3}{4}$	78.9	...	...	Embankment begins.
49	79.0	...	...	Line turns SE.
49	79.1	...	Bridge over river	...
49 $\frac{1}{2}$	79.7	...	Bridge over stream	...
50	80.4	...	Bridge over stream	...
50	80.6	...	...	Line turns further SE.
50 $\frac{1}{4}$	80.8	...	Bridge over stream	...
50 $\frac{3}{4}$	81.6	...	Bridge over stream	...
50 $\frac{3}{4}$	81.8	...	...	Elevation marker, 2.5 m.
51 $\frac{1}{4}$	82.7	...	Bridge over stream	...
51 $\frac{3}{4}$	83.4	...	Bridge over river	Line turns further SE.
52	83.7	TOZAN	...	...
52 $\frac{1}{2}$	84.5	...	...	Elevation marker, 5.75 m. Line crosses secondary road.
53	85.5	...	...	Embankment ends.
53 $\frac{1}{4}$	85.7	...	...	Embankment begins. Line turns SSE.
53 $\frac{1}{2}$	86.2	...	Bridge over stream	Line gradually curves east.
53 $\frac{3}{4}$	86.6	...	...	Line crosses secondary road.
53 $\frac{3}{4}$	86.7	...	Bridge over river	...
54	87.0	...	...	Line completes curve.
54 $\frac{1}{2}$	87.8	BU-LAU-K'E	...	Embankment ends. Line takes wide curve south.
54 $\frac{3}{4}$	88.1	...	Bridge over stream	Line crosses secondary road.
54 $\frac{3}{4}$	88.2	...	...	Line runs south, in valley between foothills.
55	88.5	...	...	Elevation marker, 16.8 m.
55 $\frac{1}{2}$	89.4	...	...	Line crosses secondary road.
55 $\frac{3}{4}$	89.7	...	...	Line recrosses road.
55 $\frac{3}{4}$	89.9	...	...	Line recrosses road, and curves SSW.

Distance from HATTO		Stations	Engineering works	Details and facilities
miles	km.			
56	90.3	...	...	Line turns SE. and crosses road.
56 $\frac{1}{4}$	90.7	...	...	Embankment begins. Line turns east.
56 $\frac{1}{2}$	90.8	...	...	Elevation marker, 16.7 m.
56 $\frac{3}{4}$	91.4	...	Bridge over stream	...
57	91.9	...	Bridge over stream	...
57 $\frac{1}{4}$	92.1	...	...	Embankment ends.
*57 $\frac{1}{2}$	92.4	SUO	...	End loading ramp. ES. Tbl. W. I. with push-car line from Se-bo-sua. Line continues east of station for c. $\frac{1}{4}$ mile to serve pier.
*57 $\frac{3}{4}$	92.7	...	Bridge over river Ts'un-t'au-k'e	...

ROUTE 2a

CHIOQ-TE—SANSHOREI (Coal Mine Line)

(Plan 16)

General description

This line serves a coal mine, and is therefore probably privately owned. There is one station (Tsap-hun-liau) *en route*. The line runs through the valley of the Keelung river, which it crosses just beyond Tsap-hun-liau, and as the country constantly rises, heavy gradients will no doubt be experienced. The line is a succession of curves and bends. It has one tunnel, just before Sanshorei.

- (5) *Maximum gradient*: No details available.
- (6) *Minimum radius of curves*: No details available.
- (7) *Traction*: Steam.
- (8) *Maximum distance between stations*: Chioq-te-Tsap-hun-liau: 6.5 km. (4 miles).
- (9) *Engine sheds*
- (10) *Marshalling or shunting yards*
- (11) *Watering facilities*
- (12) *Vulnerable points* (Marked with asterisk in text)
 - (a) Bridge at 7.2 km.
 - (b) Tunnel at 11 km.
 - (c) Junction with Route 2 at Sanshorei.
- (13) *Capacity*
8 trains each way per day.
Net weight of military stores per train, 200 tons.

General details

- (1) *Gauge*: 3 ft. 6 in.
- (2) *Length*: 12 km. (7 $\frac{1}{2}$ miles).
- (3) *Track*: Single.
- (4) *Maximum permissible axle-load*: No details available.

Distance from CHIOQ-TE		Stations	Engineering works	Details and facilities
miles	km.			
0	0	CHIOQ-TE	...	Line extends west for c. 1 mile beyond Chioq-te to coal mine. From Chioq-te line runs NE. to Sanshorei (Route 2), following the winding course of a river valley.
$\frac{1}{4}$	0.5	...	...	Line turns north.
$\frac{3}{4}$	1.4	...	...	Line curves south.
1 $\frac{1}{4}$	1.9	...	...	Line turns NE.
2 $\frac{1}{4}$	3.5	...	...	Line curves north.
2 $\frac{3}{4}$	4.5	...	...	Line turns east and NE.
4	6.5	TSAP-HUN-LIAU	...	...
*4 $\frac{1}{2}$	7.2	...	Bridge over river	...
4 $\frac{3}{4}$	7.5	...	...	Line turns north.

Distance from		Stations	Engineering works	Details and facilities
miles	km.			
5	8.2	...	...	Line curves east.
5½	8.8	...	...	Line turns NE.
*6¾	11.0	...	Tunnel	c. ¼ mile.
7	11.5	...	...	Line turns north.
*7½	12.0	SANSHOREI	...	J with Route 2 (Hatto-Suo).

ROUTE 3
TANSUI—TAIHOKU
(Plans 16, 23, 32)

General description

This single-track line runs south from the northern port of Tansui, along the right bank of the Tansui river parallel with the main road to Kanto, where it curves east away from the river to the town of Hokuto, where it again turns southwards to rejoin the river at Shirin.

After leaving Shirin the line runs parallel to the river and crosses the Keelung river, tributary of the Tansui, before entering the suburbs of Taihoku.

The line frequently crosses the main road by level crossings.

Reports indicate that the line may be electrified, but this is not confirmed.

General details

- (1) Gauge: 3 ft. 6 in.
- (2) Length: 22.1 km. (13¾ miles).
- (3) Track: Single.
- (4) Maximum permissible axle-load: No details available.
- (5) Maximum gradient: No details available, but line

runs through low-lying country, following coast or skirting foothills.

- (6) Minimum radius of curves: No details available.
- (7) Traction: Steam; possibly electrified.
- (8) Maximum distance between stations: Tansui-Kanto: 7.3 km. (4½ miles).
- (9) Engine sheds: Taihoku, 22.1 km.
- (10) Marshalling and shunting yards: Taihoku, 22.1 km.
- (11) Watering facilities: Taihoku. No other details.
- (12) Vulnerable points (Marked with asterisk in text)
 - (a) Marshalling and locomotive facilities at Taihoku.
 - (b) Junction at Taihoku.
 - (c) Bridges, particularly that over the Keelung river at 18.0 km.
 - (d) Tunnel at 6.4 km.
 - (e) Sidings to oil and timber jetties at Tansui.
- (13) Capacity
 - 12 trains per day each way (steam working).
 - Net weight of military stores per train, 200/250 tons.

Distance from		Stations	Engineering works	Details and facilities
miles	km.			
*	0	TANSUI	...	I. with push-car line running north to Se-ki-liong. Siding connexions to oil and timber jetties. Line runs south parallel to main road and along right bank of Tansui river to Kanto.
—	0.2	...	Bridge over river	...
¼	0.3	...	...	Line crosses secondary road.
¼	0.6	...	...	Embankment begins.
½	0.7	...	...	Embankment ends.
½	0.9	...	...	Line turns SSE. from SE.
½	1.0	...	Bridge over stream	...
¾	1.3	...	...	Line crosses main road and gradually curves SE.
1	1.5	...	...	Line crosses main road, which follows a series of loops, crossing and recrossing the line.
1	1.8	...	...	Line crosses main road and begins wide curve southwards.

Distance from TANSUI		Stations	Engineering works	Details and facilities
miles	km.			
1 $\frac{1}{4}$	2.1	...	...	Line crosses main road and runs south for straight stretch of c. 1 $\frac{1}{4}$ miles.
1 $\frac{1}{4}$	2.2	...	Bridge over river	...
1 $\frac{3}{4}$	2.7	...	...	Line crosses main road.
2	3.1	...	...	Line crosses main road.
2 $\frac{1}{4}$	3.5	...	...	...
2 $\frac{1}{2}$	4.0	...	Bridge over stream	...
3	4.8	...	...	Line curves gradually SW. Elevation marker, 3.0 m.
3 $\frac{1}{4}$	5.1	...	...	Line gradually curves SSE.
3 $\frac{1}{4}$	5.3	...	...	Line crosses main road, and runs SSE. for c. $\frac{1}{2}$ mile.
3 $\frac{1}{4}$	5.4	...	...	Line crosses main road.
3 $\frac{3}{4}$	6.1	...	...	Line curves NE.: radius c. 984 ft.
*4	6.4	...	Tunnel	c. 328 ft. Tunnel runs under foothills, on flattened portion of curve.
4	6.6	...	...	Line crosses main road.
4 $\frac{1}{4}$	6.8	...	...	Line begins straight section NE. of c. 1 mile.
4 $\frac{1}{2}$	7.3	KANTO	...	...
5	8.1	...	...	Embankment begins on south side of line only.
5 $\frac{1}{4}$	8.5	...	...	Line leaves river and begins wide sweep NE. and SE. to Hokuto.
5 $\frac{1}{2}$	9.0	...	...	Embankment ends.
5 $\frac{3}{4}$	9.3	...	Bridge over stream	Embankment begins.
6	9.8	...	Bridge over stream	...
6 $\frac{1}{4}$	10.0	...	Bridge over stream	Embankment ends.
6 $\frac{1}{2}$	10.3	...	Bridge over stream	...
6 $\frac{1}{2}$	10.5	...	...	J (trailing) left. ST. with short line to Shinhokuto.
6 $\frac{3}{4}$	10.8	HOKUTO	...	Embankment begins.
6 $\frac{3}{4}$	11.1	...	...	Line curves SSE.
7	11.3	...	...	Line crosses main road.
7 $\frac{1}{4}$	11.8	...	Bridge over tributary of Tansui-ho river	...
7 $\frac{1}{2}$	12.0	...	...	Line curves ESE.
7 $\frac{1}{2}$	12.2	...	...	Line runs ESE. for straight stretch c. $\frac{1}{2}$ mile.
8	12.8	...	...	Embankment ends.
8	13.1	...	...	Line turns SE., and begins straight stretch of c. 1 mile.

Distance from TANSUI		Stations	Engineering works	Details and facilities
miles	km.			
8 $\frac{3}{4}$	14.1	KIRIGAN	...	...
9	14.7	...	Bridge over river	...
9 $\frac{1}{4}$	14.9	...	...	Line curves SSE.—SE.
9 $\frac{1}{4}$	15.1	...	...	End of curve.
9 $\frac{1}{2}$	15.5	...	Bridge over river	...
9 $\frac{3}{4}$	15.8	...	...	Embankment begins
10	16.3	SHIRIN	...	...
10 $\frac{1}{4}$	16.5	...	...	Line follows circular loop round town.
10 $\frac{1}{2}$	16.9	...	...	Embankment ends.
10 $\frac{1}{2}$	17.0	...	...	Line crosses main road and curves SW.—south. Embankment begins on west side of line only.
10 $\frac{3}{4}$	17.4	...	...	Line runs alongside road for <i>c.</i> $\frac{1}{4}$ mile and begins straight stretch SW. of <i>c.</i> $\frac{3}{4}$ mile.
11	17.7	...	...	Embankment begins.
11	17.9	MIYANOSHITA	...	Embankment ends.
*11 $\frac{1}{4}$	18.0	...	Bridge over Keelung river	<i>c.</i> 600 ft.
11 $\frac{1}{4}$	18.2	...	...	Embankment begins.
11 $\frac{1}{2}$	18.4	...	...	Embankment ends.
11 $\frac{1}{2}$	18.6	...	...	Line turns SSW.
11 $\frac{3}{4}$	18.8	E'PI-T'AU	...	...
11 $\frac{3}{4}$	19.0	...	...	Embankment begins.
12 $\frac{1}{4}$	19.7	...	Bridge over stream	...
12 $\frac{1}{4}$	19.9	...	...	Line curves SSE.
12 $\frac{1}{2}$	20.3	...	...	Embankment ends.
12 $\frac{3}{4}$	20.6	...	...	Line turns south for straight stretch of <i>c.</i> $\frac{1}{2}$ mile.
12 $\frac{3}{4}$	20.7	TSU-TS'U'LUN	...	...
12 $\frac{3}{4}$	20.8	...	...	Embankment begins.
13	21.2	...	...	Embankment ends.
*13 $\frac{3}{4}$	22.1	TAIHOKU	...	<i>Passenger station.</i> 1 platform for Tansui line; 2 platforms (1 island) for main line. <i>Loco depot.</i> South of passenger station. ES. $\frac{1}{2}$ roundhouse, capacity <i>c.</i> 40 with workshop attached. Tbl. W. <i>Shunt yard.</i> North of passenger station, <i>c.</i> 4 LS. <i>Goods yard.</i> North of SY. <i>c.</i> 14 DES. serving 4 large sheds. South of SY. a group of DES. serving sheds and also provided with access for road vehicles. Connexion to docks.

ROUTE 4

CHIKUNAN—BYORITSU—TOYOHARA—TAICHU—SHOKA

(Plans 15, 30A)

General description

Connecting with Route 1 (Kirun-Taihoku-Chikunan), the line runs south to the junction with the coastal line to Shoka (Route 5), taking the more direct route via Taichu through the mountainous hinterland.

It follows the main road to Sansa through the valleys of the Au-lieng-ke and Obai-ke, turning inland between Sansa and Kori and again between Kori and Hogen to avoid the wide deltas of the Taian and Taiko rivers.

At Hogen the line again reaches the coastal plain, which it follows to the important town of Taichu, where it turns south-west to join the coastal line at 83.2 km.

A link with the coast is effected at Kori by means of the 2 ft. 6 in. gauge power-tram line from Twa-a-kang, which proceeds inland to Kan-a-e and Tsui-telia sugar-cane nursery.

At Taichu a connexion with the 3 ft. 6 in. gauge Tei Koku sugar refinery line provides a service to Nanto, some 28 km. (18 miles) to the south, and also to the line from Tanshi, 8 km. (5 miles) to the north, which joins the sugar refinery line near Tuape.

The line is the route taken by express trains from Taihoku to the south, but is rendered particularly vulnerable by the presence of several long tunnels, one of which, at Byoritsu, caused a complete dislocation for almost 2 years when it became blocked as a result of the earthquake in 1935.

(1) Gauge: 3 ft. 6 in.

(2) Length: 91.2 km. (56½ miles).

(3) Track

Chikunan-J at 2.5 km. (1½ miles), double. J at 2.5 km.-J at Shoka, 80.7 km. (50

miles), single. J at Shoka, 80.7 km. -Shoka, 8.0 km. (5 miles), double.

(4) *Maximum permissible axle-load*: No details available, but track runs through low-lying country until south of Dora, when it runs through hills. Level country again from Hogen to Shoka.

(5) *Maximum gradient*: No details available.

(6) *Minimum radius of curves*: No details available.

(7) *Traction*: Steam.

(8) *Maximum distance between stations*: Sansa-Ch'it-Te'-Ts'u: 17.2 km. (10½ miles).

(9) *Engine sheds*
Chikunan, 0 km.
Taichu, 71.7 km.
Shoka, 91.2 km.

(10) *Marshalling or shunting yards*
Chikunan, 0 km.
Shoka, 91.2 km.

(11) *Watering facilities*: As in (9) above. No other details available.

(12) *Vulnerable points* (Marked with asterisk in text)
(a) Locomotive and marshalling facilities. (See (9) and (10) above.)

(b) Junctions at Chikunan (2.5 km.) and at Shoka (83.2 km.).

(c) Bridges and tunnels. The most important bridges are at 2.0 km. (c. 1050 ft.), 11.2, 11.9, 46.6, 48.8, 50.5 km. (2500 ft.), 57.3 km. (1000 ft.) and 84.3 km. (c. 2300 ft.) and tunnels at 7.7, 18.5, 23.1, 42.9, 43.8, 47.3, 48.5, 49.0, 53.0, and 56.5 km.

(13) *Capacity*

12 trains per day each way.

Net weight of military stores per train 200/250 tons.

Distance from CHIKUNAN		Stations	Engineering works	Details and facilities
miles	km.			
*0	0	CHIKUNAN	...	ES. Roundhouse. W. Rps. attached. SY. Line assumes a southerly direction and runs DT. in to J (2.5 km.).
¼	0.4	...	Bridge over stream	...
½	1.1	...	Bridge over stream	...
*1¼	2.0	...	Bridge over river Tiong-kong-k'e	1050 ft.
*1½	2.5	...	...	J (facing) right, with ST. coast line to Shoka (Route 5). End of DT., beginning of ST.
1¾	2.8	...	...	Line crosses main coastal road.
2¾	4.3	...	Bridge over river Nanko	...
				Line crosses secondary road to Hogen, and crosses SW. to run through hilly country to Hokusei.
3½	5.6	...	...	...
3¾	5.9	...	...	Line crosses road to Hogen.
3¾	6.2	...	...	Line crosses road to Hogen.
*4¾	7.7	...	Tunnel	c. 600 ft.
5	8.0	...	...	Line curves sharply SSW. and crosses road.

RAILWAYS

Distance from CHIKUNAN		Stations	Engineering works	Details and facilities
miles	km			
5 $\frac{1}{4}$	9.4	...	Bridge over road to Hogen	Line runs on falling gradient to Byoritsu.
6 $\frac{3}{4}$	10.9	...	Bridge over stream	...
*7	11.2	...	Bridge	c. 750 ft. Line curves south.
7 $\frac{1}{4}$	11.6	HOKUSEI	...	...
7 $\frac{1}{4}$	11.7	...	Bridge over stream	...
*7 $\frac{1}{4}$	11.9	...	Bridge over river Koryu	c. 750 ft.
8	12.9	...	...	Line crosses road, still travelling south.
10	16.2	BYORITSU	...	...
10 $\frac{1}{2}$	16.8	...	...	Line turns SW., on a rising gradient through hilly country.
11	17.6	...	Bridge over road	...
*11 $\frac{1}{2}$	18.5	...	Tunnel	c. 1350 ft.
11 $\frac{1}{2}$	18.7	...	...	Line turns SSW.
12 $\frac{1}{2}$	20.2	...	Bridge over tributary of river Koryu	Line turns SE.
12 $\frac{3}{4}$	20.6	...	Bridge over tributary of river Koryu	...
				Line turns south.
13	21.0	...	Bridge over tributary of river Koryu	Line turns SW.
13 $\frac{1}{4}$	21.3	...	Bridge over tributary of river Koryu	...
13 $\frac{1}{2}$	21.8	...	...	Line crosses road.
14	22.8	Go-o	...	Line turns south.
*14 $\frac{1}{4}$	23.1	...	Tunnel	c. 600 ft.
16	25.7	...	...	Line crosses road.
16	25.9	...	...	Line crosses road.
16 $\frac{3}{4}$	27.1	TSAN-IO	...	Station for Dora. Line runs along river valley.
19	30.6	...	...	Line crosses road.
19 $\frac{1}{4}$	31.1	...	...	Line turns SW.
19 $\frac{1}{2}$	31.3	...	Bridge over road to Sansa	...
19 $\frac{1}{2}$	31.4	...	Bridge over river	c. 300 ft.
19 $\frac{1}{2}$	31.7	...	...	Line turns south. Curve radius c. 984 ft.
20 $\frac{1}{4}$	32.8	...	? Culvert	Line crosses stream.
21	33.9	...	...	Embankment for c. $\frac{1}{2}$ mile.
21	34.1	...	Bridge over stream	...
21 $\frac{1}{4}$	34.3	...	...	Line crosses road.
21 $\frac{1}{2}$	34.8	SANSA	...	...

Distance from CHIKUNAN		Stations	Engineering works	Details and facilities
miles	km.			
21 $\frac{3}{4}$	35.0	...	...	J (trailing) left with short DE. spur c. 2296 ft.
22	35.5	...	...	Line curves SW.
24 $\frac{3}{4}$	40.0	...	...	Line crosses road and curves south.
25	40.4	...	...	Line enters hilly country and gradually rises.
25	40.5	...	...	Line crosses road.
25 $\frac{1}{2}$	41.4	...	...	Line curves SE.
26	41.9	...	...	Line runs east.
26 $\frac{1}{4}$	42.5	...	...	Line curves SE.
*26 $\frac{1}{2}$	42.9	...	Tunnel	c. 750 ft.
*27 $\frac{1}{4}$	43.8	...	Tunnel	c. 2100 ft. Line curves SW.; radius c. 984 ft.
28	45.2	...	...	Line curves south.
28 $\frac{1}{2}$	45.9	...	...	Line curves SW.; radius c. 984 ft.
*29	46.6	...	Bridge over river	At least 600 ft.
*29 $\frac{1}{4}$	47.3	...	Tunnel *Tunnel	c. 2100 ft. c. 900 ft.
*30	48.5	...	Tunnel	c. 750 ft.
*30 $\frac{1}{4}$	48.8	...	Bridge over river	c. 600 ft.
*30 $\frac{1}{2}$	49.0	...	Tunnel	c. 450 ft.
*31 $\frac{1}{4}$	50.5	...	Bridge over river Taian	c. 2500 ft. Line curves west.
32 $\frac{1}{4}$	52.0	CH'IT-TE'TS'U	...	...
32 $\frac{1}{2}$	52.5	...	...	Line turns SW., and descends gradually to plain.
*33	53.0	...	Tunnel	c. 1800 ft.
33 $\frac{1}{2}$	54.0	...	...	Line turns south.
33 $\frac{3}{4}$	54.5	KORI (TOYOHARA)	...	I. with 2 ft. 6 in. gauge sugar refinery line from Twa-a-kang and Taiko, c. 13 $\frac{3}{4}$ miles.
34 $\frac{1}{2}$	55.8	...	...	Line turns SW.
*35	56.5	...	Tunnel	c. 3000 ft. Line turns south.
*35 $\frac{1}{2}$	57.3	...	Bridge over river Taiko	c. 1000 ft.
35 $\frac{3}{4}$	57.6	...	...	Line turns SW.
37 $\frac{1}{2}$	60.3	HOKEN	...	I. with sugar-cane line, 2 ft. 6 in. gauge, from T'an-k'o-sua.
37 $\frac{3}{4}$	60.9	...	...	Line crosses road.
40 $\frac{1}{2}$	65.3	TANSHI	...	...
45	72.6	...	...	Line curves SW. I. with push-car line to T'au-pi-k'e.
*46 $\frac{1}{4}$	74.7	TAICHU	...	ES. J with Teikoku sugar refinery line to Nanto (Route 4a) and ST. line to K'e-chi-kak (Route 4b).

Distance from		Stations	Engineering works	Details and facilities
miles	km.			
CHIKUNAN				
45 $\frac{3}{4}$	73.9	...	...	Line crosses main road to Shoka.
48 $\frac{1}{2}$	78.0	...	...	Line turns west.
48 $\frac{3}{4}$	78.5	...	...	Line crosses secondary road.
48 $\frac{3}{4}$	78.8	UZITSU	...	...
49	79.2	...	? Bridge over river	...
51 $\frac{1}{4}$	83.2	ODEN	...	...
*51 $\frac{3}{4}$	83.2	...	...	Line curves south. J (trailing) with coastal line Chikunan-Taiko-Shoka (Route 5).
52	83.8	...	...	Line crosses main road.
*52 $\frac{1}{4}$	84.3	...	Bridge over river Taito	c. 2300 ft.
53	85.3	...	...	Line crosses main road and turns SW.
55	88.8	...	...	Line crosses secondary road.
*56 $\frac{1}{2}$	91.2	SHOKA	...	3 platforms. ES. W. Small SY. I. with power-tram line to E-ki-k'au; and 2 ft. 6 in. gauge line to Tieng-ts'u; also push-car line to Tieng-k'e-lau. Line continues south to Tainan as Route 6.

ROUTE 4a

TAICHU—TUA-PE—NANTO (TEIKO KU Sugar Refinery Line)

(Plans 14, 15, 30A)

General description

This line, the Teiko sugar refinery line, was originally 2 ft. 6 in. gauge, but is now probably 3 ft. 6 in. gauge. The line leaves the main line (Route 4) at Taichu and runs south-east and south-west to Bu-hong, where it joins the main road running south from Taichu. It keeps close to the road, crossing and recrossing it, as far as Soton, and runs parallel with the road from Soton to Nanto. It touches the foothills at one point only (K'e-k'au, south of Bu-hong). Otherwise the line runs through fairly low-lying country, with easy gradients and curves. It crosses several rivers, the most important being the O-k'e river below Bu-hong (suspension bridge, about 1050 feet).

At Taichu there is a connexion with the 3 ft. 6 in. gauge line to K'e-chikak and at Nanto interchange facilities exist with the 2 ft. 6 in. gauge Meiji sugar refinery line running south to Nama and Nisui.

General details

(1) Gauge: 3 ft. 6 in.; possibly 2 ft. 6 in.

(2) Length: 29.9 km. (18 $\frac{1}{2}$ miles).

(3) Track: Single.

(4) Maximum permissible axle-load: No details available.

(5) Maximum gradient: No details available.

(6) Minimum radius of curves: No details available.

(7) Traction: Steam.

(8) Maximum distance between stations: Taichu-Tua-pe: 3.4 km. (2 miles).

(9) Engine sheds: Taichu.

(10) Marshalling or shunting yards: Probably at Taichu.

(11) Watering facilities: Taichu.

(12) Vulnerable points (Marked with asterisk in text)

(a) Locomotive facilities at Taichu.

(b) Junction at Taichu with main line.

(c) Bridges, particularly those at 1.5, 1.8, 17.6, and 25.3 km.

(13) Capacity

12 trains per day each way.

Net weight of military stores per train, 150/200 tons.

Distance from		Stations	Engineering works	Details and facilities
miles	km.			
TAICHU				
*0	0	TAICHU	...	ES. W. J for ST. main line Chikunan-Shoka (Route 4) and ST. branch line to K'e-chi-kek (Route 4a). Line runs NE. from Taichu.
$\frac{1}{4}$	0.3	...	...	Line curves SE.

Distance from TAICHU		Stations	Engineering works	Details and facilities
miles	km.			
*1	1.5	...	Bridge over 2 rivers	c. 450 ft.
*	1.8	...	Bridge over river and valley	c. 450 ft.
1 $\frac{1}{4}$	2.1	...	...	J (facing) left, with line running north to K'e-chi-kek, c. 6 miles. Also J (facing) right, with dead-end line running SW. c. 5 $\frac{1}{2}$ miles.
1 $\frac{1}{2}$	2.4	...	Bridge over valley	c. 300 ft.
1 $\frac{1}{2}$	2.5	...	Bridge over river	...
2	3.4	TUA-PE	...	Line curves south.
2 $\frac{1}{2}$	3.9	...	Bridge over valley	...
2 $\frac{1}{2}$	4.2	...	Bridge over valley	...
2 $\frac{3}{4}$	4.3	...	Bridge over valley	...
	4.4	...	Bridge over valley	...
3	4.9	...	Bridge over valley	...
	5.0	...	Bridge over valley	...
3 $\frac{1}{4}$	5.2	...	Bridge over valley	Line curves south.
3 $\frac{1}{2}$	5.7	Station	...	Branch line runs SE. to Tiek-a-k'e, c. 1 $\frac{1}{2}$ miles, then turns SW. and rejoins line.
4 $\frac{1}{2}$	6.9	...	...	Line curves SW.
	7.2	Station	...	...
5	8.1	...	...	Line turns south.
	8.2	TO-SIA	...	Embankment begins.
5 $\frac{1}{4}$	8.6	...	Bridge over river and valley	c. 300 ft.
5 $\frac{1}{2}$	8.9	...	Bridge over valley	c. 300 ft.
	9.0	...	...	Embankment ends, and line curves SW.
5 $\frac{3}{4}$	9.4	Station	...	I. with dead-end narrow-gauge line running east, c. 2 $\frac{1}{2}$ miles.
6 $\frac{1}{4}$	10.8	...	...	Line crosses main road from Taichu.
	11.0	BU-HONG	...	I. with narrow-gauge line from Tiek-a-k'e. Line turns south.
7 $\frac{1}{2}$	12.0	...	...	Line recrosses main road.
	12.3	...	Bridge over river	c. 300 ft.
8 $\frac{1}{4}$	13.3	...	...	Line recrosses main road.
8 $\frac{1}{2}$	13.9	K'E-K'AU	...	...
10 $\frac{1}{4}$	16.3	BAN-TAU-LAK	...	...
	16.6	...	...	Line recrosses road.
10 $\frac{3}{4}$	17.3	...	...	Embankment begins
*	17.6	...	Bridge over river O-k'e (tributary of Taito-kei)	c. 1050 ft.
11	18.1	...	...	Embankment ends.

Distance from TAICHU		Stations	Engineering works	Details and facilities
miles	km.			
	18.3	...	...	Line curves west.
11½	18.7	...	...	Line curves south.
12	19.5	Station	...	Line turns SW.
	20.0	...	...	Line turns south.
13	21.2	SOTON	...	Line runs alongside road.
14	22.7	Station	...	...
14½	23.5	...	...	Line turns SW.
15½	24.9	Station	...	Line turns south.
*15¾	25.3	...	Bridge over river	c. 450 ft.
	25.5	...	...	Embankment begins.
16	26.0	...	...	Line turns SE.
16¼	26.4	...	...	Embankment ends.
16½	26.5	Station	..	...
16¾	27.1	...	...	Line crosses road.
17	27.6	Station	...	...
18	29.3	...	...	Line curves SE.
18¼	29.5	...	...	Line turns south.
18½	29.9	NANTO	...	I. with Meiji, sugar refinery line running south to Nama. Push-car line runs SE. to Shushu.

ROUTE 4b

K'E-CHI-KAK—TAICHU

(Plans 15, 30A)

General description

This line connects at Taichu with the Teiko sugar refinery line (Route 4a), and, like the latter, was originally 2 ft. 6 in. gauge, but is now probably 3 ft. 6 in. It runs due south from K'e-chi-kak (c. ¾ mile north-east of Tanshi, Route 4) to Taichu, passing through flat country and crossing some rivers.

General details

- (1) Gauge: 3 ft. 6 in., possibly 2 ft. 6 in.
- (2) Length: 11.4 km. (7 miles).
- (3) Track: Single.
- (4) Maximum permissible axle-load: No details available.
- (5) Maximum gradient: No details available, but no severe gradients to be expected.

- (6) Minimum radius of curves: No details available.
- (7) Traction: Steam.
- (8) Maximum distance between stations: Station (? Huan-a-lo)—Taichu: 4 km. (2½ miles).
- (9) Engine sheds: Taichu.
- (10) Marshalling or shunting yards: Probably at Taichu.
- (11) Watering facilities: Taichu.
- (12) Vulnerable points (Marked with asterisk in text)
 - (a) Locomotive facilities at Taichu.
 - (b) Junction at Taichu.
 - (c) Bridges at 9.6 and 9.8 km.
- (13) Capacity
 - 12 trains per day each way.
 - Net weight of military stores per train, 150 tons.

Distance from K'E-CHI-KAK		Stations	Engineering works	Details and facilities
miles	km.			
0	0	K'e-chi-kak	.....	c. 1 mile east of Tanshi (Route 4).
½	1.1	Station	...	Line runs south in straight stretch, c. ¾ mile.
1½	2.4	...	... ..	Line turns SE.

Distance from K'E-CHI-KAK		Stations	Engineering works	Details and facilities
miles	km.			
2 $\frac{1}{4}$	3.6	...	...	*Line turns south.
2 $\frac{1}{2}$	4.0	...	...	Line crosses push-car line and road.
	4.1	Station	...	...
2 $\frac{3}{4}$	4.3	...	Bridge over stream	...
3	5.0	...	...	Line curves SW.
3 $\frac{1}{2}$	5.5	Station	...	...
	5.8	...	...	I. with 2 ft. 6 in. line from Tanshi. Line turns south.
4 $\frac{1}{2}$	6.9	...	Bridge over river	...
	7.4	Station (? HUAN-A-LO)	...	...
5 $\frac{1}{2}$	8.8	...	...	Line crosses push-car line and road.
5 $\frac{3}{4}$	9.3	...	...	Embankment begins. Line curves east.
	9.5	...	...	I. with DE. 21 ft. 6 in. line running SW., c. 5 $\frac{1}{2}$ miles.
*6	9.6	...	Bridge over river and valley	c. 450 ft.
*	9.8	...	Bridge over 2 rivers	c. 450 ft.
*7	11.4	TAICHU	...	ES. W. J for main line, Chikunan-Shoka (Route 4).

ROUTE 5

CHIKUNAN—TAILO—SHOKA

(Plan 15)

General description

The line follows the common route with the inland route to the junction at 2.5 km., where it turns west along the left bank of the Au-lieng-ke to Kong-hi, junction for the dead-end line to the small coastal town of Guapo. From Kong-hi the line turns south to Koryu, where interchange facilities exist with a short light railway to Hokusei, on Route 4, and thence the line runs parallel and close to the coast to Enri, where it turns inland, and, after crossing the river at 50.7 km. by a bridge about 5000 feet long, reaches the important town of Taiko.

Taiko is served also by a 2 ft. 6 in. sugar refinery line running from the small coastal town of Twa-a-kang to Kori (Route 4).

From Taiko the line continues southwards, crossing the Taiko river at 58.7 km. by a bridge about 3750 feet long, and turns inland at Taito (79.1 km.), to rejoin the inland route at 84.8 km., before crossing the Taito river bridge, about 1950 feet long, and turning southwards again to Shoka.

From Shoka, the main line continues as Route 6.

The line is used mainly for slow goods services, express trains using the more direct inland route.

General details

- (1) Gauge: 3 ft. 6 in.
- (2) Length: 91.2 km. (56 $\frac{1}{2}$ miles).
- (3) Track
Chikunan-J at 2.5 km. (1 $\frac{1}{2}$ miles), double.
J. at 2.5 km.-J at 85.3 km. (53 miles), single.

- (4) Maximum permissible axle-load: No details available.
- (5) Maximum gradient: No details available, but line follows coast or skirts foothills, so no severe gradients to be expected.
- (6) Minimum radius of curves: No details available.
- (7) Traction: Steam.
- (8) Maximum distance between stations: Koshiryo-Hakushaton: 8.1 km. (5 miles).
- (9) Engine sheds
Chikunan, 0 km.
Taiko, 54.9 km.
Shoka, 91.2 km.
- (10) Marshalling or shunting yards
Chikunan, 0 km.
Shoka, 91.2 km.
- (11) Watering facilities: As in (9) above.
- (12) Vulnerable points (Marked with asterisk in text)
 - (a) Marshalling and locomotive facilities. (See (9) and (10) above.)
 - (b) Junctions at 2.5, 9.3, 84.8 and 85.3 km.
 - (c) Bridges, particularly those at 2.0, 15.8, 20.4, 44.2 km., 50.7 km. over river Taian (c. 5000 ft. long), 58.7 km. over Taiko river (c. 3750 ft. long), and at 85.6 km. over Taito river (c. 1950 ft. long).
 - (d) Tunnels at 22.9, 23.3, 23.6, and 56.1 km.
- (13) Capacity
20 trains per day each way.
Net weight of military stores per train, 200/250 tons.

Distance from CHIKUNAN		Station	Engineering works	Details and facilities
miles	km.			
* 0	0	Chikunan	...	ES. Roundhouse. Rps. attached Tbl. W. SY. I. with push-car line west to Chuko and east to Lam-tsng.
$\frac{1}{4}$	0.4	...	Bridge over river	...
$\frac{1}{4}$	0.5	...	...	Embankment begins.
$\frac{1}{2}$	1.1	...	Bridge over stream	Line turns SSE. from south. Embankment ends. DT. ceases and line is henceforward ST.
* $1\frac{1}{4}$	2.0	...	Bridge over river Tiong-kang-k'e	c. 1050 ft.
* $1\frac{1}{2}$	2.5	...	...	Line curves SW. J (facing) left, with ST. inland route to Shoka (Route 4).
2	3.1	...	...	Embankment begins.
2	3.2	...	Bridge over tributary of river Nanko-kei	c. 787 ft.
$2\frac{1}{4}$	3.7	...	Bridge over river Nanko-kei	Embankment ends. c. 375 ft.
$2\frac{3}{4}$	4.6	TAMBUNKO	...	...
3	4.8	...	...	Embankment begins.
$3\frac{1}{4}$	5.4	...	...	Line curves NW. and runs between foothills and the Tiong-kang-k'e estuary, with a gradually rising gradient.
$3\frac{1}{2}$	5.6	...	Bridge over stream	...
$3\frac{3}{4}$	6.2	...	Bridge over stream	...
4	6.5	...	...	Trig. point, 63.1 m.
$4\frac{1}{4}$	6.8	...	...	Embankment ends.
$4\frac{1}{4}$	7.0	...	Bridge over tributary of river Tiong-kang- k'e	c. 300 ft.
5	8.1	...	...	Line turns sharply.
$5\frac{1}{4}$	8.6	...	Bridge over river	c. 328 ft. SW. dropping contour-line of 10 m.
$5\frac{1}{2}$	8.9	...	Bridge over river	c. 328 ft.
* $5\frac{3}{4}$	9.3	KONG-HI	...	J (facing) right. ST. DE. line for c. $1\frac{3}{4}$ miles towards Gua-po.
6	9.5	...	...	Line turns SSW. Straight stretch c. $\frac{1}{2}$ mile.
$6\frac{1}{2}$	10.5	...	...	Line turns southwards. Straight stretch c. 2 miles.
$6\frac{3}{4}$	10.8	...	...	Line rises to 20 m. contour-line.
$7\frac{1}{4}$	11.7	K'O-LIENG-K'A	...	...
8	12.8	...	...	Line drops to sea-level.
$8\frac{1}{4}$	13.3	...	...	Line again rises to 20 m. contour-line.
$8\frac{1}{4}$	13.5	...	...	Line turns south. Straight stretch of c. $\frac{3}{4}$ mile.

Distance from CHIKUNAN		Station	Engineering works	Details and facilities
miles	km.			
*8½	13.7	...	Bridge over stream	c. 450 ft.
8½	13.8	...	...	Line descends to 10 m. contour-line.
9	14.5	...	...	Line drops to sea-level, and curves SW. Embankment begins.
9	14.7	...	Bridge over minor road to Gua-po, and tributary of river Au-lieng-k'e	Embankment ends.
9¼	15.2	KORYU	...	I. with light railway line to Hokusei.
9½	15.5	...	...	Line turns south and runs alongside main road.
9¾	15.6	...	...	Embankment begins.
*9¾	15.8	...	Bridge over river Au-lieng-k'e	Embankment ends. c. 1050 ft.
10	16.3	...	...	Line turns SW.
10¼	16.5	...	Bridge over tributary of river Au-lieng-k'e	...
10½	16.6	...	...	Line turns west and leaves road.
10½	17.0	...	...	Line follows curving course along fringe of foothills to Koshiryo. Line runs alongside secondary road from Byoritsu.
10¾	17.5	...	Bridge over Byoritsu road	...
11	17.7	...	...	I. with push-car line to Byoritsu.
11	17.7	...	...	Embankment begins.
11¼	18.0	...	...	Line curves NW.
11½	18.4	...	...	Line crosses Byoritsu road, and curves west.
11½	18.6	...	...	Embankment ends.
11¾	19.0	KOSHIRYO	...	...
12	19.4	...	...	Line turns SW. Embankment begins.
12¼	19.9	...	...	Embankment ends.
12½	20.1	...	...	Embankment begins.
12½	20.3	...	...	Embankment ends.
*12½	20.4	...	Bridge over river O-bai-k'e	c. 900 ft. Embankment begins.
12¾	20.9	...	...	Line gradually curves west.
13	21.2	...	...	Embankment ends.
13¼	21.3	...	...	Line crosses 10 m. contour-line, and begins long, gradual curve south.
13¾	22.4	...	...	Embankment begins.
14	22.7	...	Bridge over cutting	...
14	22.8	...	...	Line again curves south. Embankment ends.

Distance from CHIKUNAN		Station	Engineering works	Details and facilities
miles	km.			
*14 $\frac{1}{4}$	22.9	...	Tunnel	c. 900 ft. Tunnel follows gradual curve under foothills.
14 $\frac{1}{4}$	23.2	...	...	Line emerges from tunnel and crosses level ground.
*14 $\frac{1}{2}$	23.3	...	Tunnel	c. 600 ft. Tunnel follows slight curve under foothills.
14 $\frac{1}{2}$	23.5	...	...	Embankment.
*14 $\frac{3}{4}$	23.6	...	Tunnel	c. 300 ft.
14 $\frac{3}{4}$	23.7	...	...	Line again turns south, with straight stretch of c. $\frac{1}{2}$ mile.
15	24.3	...	...	Line turns south, and begins straight stretch of c. $\frac{3}{4}$ mile.
15 $\frac{1}{4}$	24.6	...	...	Line drops from 10 m. contour-line to sea-level.
15 $\frac{1}{4}$	24.7	...	Bridge over river	...
15 $\frac{1}{4}$	24.8	...	...	Line rises to 10 m. contour-line.
15 $\frac{3}{4}$	25.4	...	...	Line drops to sea-level.
16	25.7	...	...	Line curves due south.
16	26.0	...	Bridge over river	...
16 $\frac{1}{4}$	26.3	...	...	Line curves gradually SSW. and begins straight stretch of 1 $\frac{1}{2}$ miles.
16 $\frac{3}{4}$	27.1	HAKUSHATON	...	...
16 $\frac{3}{4}$	27.3	...	...	Embankment begins.
17 $\frac{1}{4}$	28.0	...	Bridge over river	...
17 $\frac{1}{2}$	28.4	...	Bridge over dry valley	...
17 $\frac{3}{4}$	28.9	...	Bridge over dry valley	...
18	29.2	...	...	Line turns south, and begins straight stretch of c. 4 miles.
18 $\frac{1}{4}$	29.4	...	...	Embankment begins.
18 $\frac{1}{2}$	29.8	...	...	Embankment ends.
18 $\frac{1}{2}$	29.9	...	Bridge over dry valley	...
18 $\frac{3}{4}$	30.2	SHIMPO	...	...
19	30.5	...	...	Line runs parallel to main coastal road.
19 $\frac{1}{2}$	31.5	...	Bridge over dry valley	...
19 $\frac{3}{4}$	32.1	...	Bridge over dry valley	...
20	32.5	...	...	Line curves slightly due south.
20 $\frac{1}{4}$	32.8	...	...	Line gradually curves SSW. and begins straight stretch c. $\frac{3}{4}$ mile.
21	34.1	...	...	Line turns SW. and begins straight stretch of c. 1 $\frac{1}{2}$ miles.
22	35.6	...	...	Coastal road leaves line and turns inland.
22 $\frac{1}{4}$	36.0	TSUSHO	...	I. with push-car line to Dora.

Distance from CHIKUNAN		Station	Engineering works	Details and facilities
miles	km.			
22½	36.5	...	... Bridge over river	Line turns south.
22¾	36.9	...	...	Embankment begins. Line gradually curves SW.
23¼	37.5	...	...	Embankment ends. Line curves SSW. and begins straight stretch of c. ¾ mile.
23¾	38.2	...	Bridge over river	...
24	38.8	...	...	Line turns south and begins straight stretch of c. 1 mile.
25	40.4	...	...	Embankment begins.
25½	40.7	...	...	Line curves SW. with straight stretch of c. ¼ mile.
25¾	40.8	...	Bridge over river	...
25½	41.0	...	...	Embankment ends.
26	42.0	...	...	Line turns SSW.
26¼	42.3	ENRI	...	...
26½	42.9	...	...	End of coastal road. Line curves gradually SE. and begins straight stretch of c. 3 miles.
26¾	43.2	...	Bridge over stream	...
27¼	43.9	...	...	Embankment begins.
*27½	44.2	...	Bridge over river and (?) sugar refinery line	c. 900 ft.
27¾	44.7	...	Bridge over stream	...
28¼	45.4	...	Bridge over stream	...
28½	45.9	...	Bridge over stream	...
28¾	46.4	...	...	Embankment ends.
29¾	48.1	...	...	Line begins wide gradual curve SW. beginning straight stretch of c. 2 miles.
30½	49.0	...	...	Embankment begins.
30½	49.1	...	Bridge over river	...
30¾	49.5	...	...	Embankment ends.
30¾	49.7	...	Bridge over stream	...
31	50.0	NICHINAN	...	...
31¼	50.3	...	...	Embankment begins.
*31½	50.7	...	Bridge over river Taian-k'e	c. 5000 ft.
31¾	51.4	...	Bridge over stream	...
32	51.6	...	Bridge over stream	...
32	51.8	...	...	Line turns slightly SSW.
32¼	52.2	...	Bridge over river	...
32½	52.4	...	...	Embankment ends.
32¾	52.8	...	...	Line curves back to south-westerly direction.

Distance from CHIKUNAN		Stations	Engineering works	Details and facilities
miles	km.			
33 $\frac{1}{4}$	53.5	...	...	Embankment begins.
33 $\frac{1}{4}$	53.7	...	...	Embankment ends.
33 $\frac{1}{2}$	53.9	...	...	Embankment begins.
33 $\frac{1}{2}$	54.1	...	...	Embankment ends.
33 $\frac{1}{2}$	54.2	...	Bridge over dry valley	...
33 $\frac{3}{4}$	54.5	...	...	Embankment begins.
34	54.8	...	...	Embankment ends.
34	54.9	...	...	Line crosses secondary road.
*34	54.9	TAIKO	...	ES. W. I. with 2 ft. 6 in. gauge Gueq-bai sugar-refinery line to Kori; also with power tram line to Twa-a-kang (on coast).
34 $\frac{1}{4}$	55.3	...	...	Embankment begins.
34 $\frac{1}{2}$	55.5	...	...	Sugar refinery line crosses line.
34 $\frac{3}{4}$	56.1	...	Tunnel (?)	Embankment ends. c. 300 ft.
34 $\frac{3}{4}$	56.2	...	...	Embankment begins.
35	56.4	...	...	Embankment ends.
35	56.5	...	...	Embankment begins.
35	56.6	...	Bridge over (?) dry valley	...
35 $\frac{3}{4}$	57.5	...	...	Line turns further SE. and begins straight section of c. $\frac{3}{4}$ mile.
35 $\frac{3}{4}$	57.7	...	...	Embankment ends.
36	58.2	...	Bridge over stream	...
36	58.3	...	...	Line begins straight stretch of c. 2 miles.
*36 $\frac{1}{4}$	58.7	...	Bridge over arms of river Taiko-kei	Embankment ends. c. 3750 ft. (<i>photograph 18</i>).
37 $\frac{1}{4}$	59.9	...	Bridge over stream	Embankment begins.
37 $\frac{3}{4}$	60.9	Tsui-Tsui	...	...
38	61.0	...	...	Embankment begins.
38	61.2	...	Bridge over stream	Embankment ends.
38	61.3	...	...	Embankment begins. Line begins gradual curve SSW.
38 $\frac{1}{2}$	62.0	...	...	Embankment ends. Line begins straight stretch of c. 1 $\frac{1}{2}$ miles, with embankment on west side only. On east side line flanked by foothills.
40	64.6	...	...	Line curves gradually west.
40 $\frac{1}{4}$	64.7	...	...	Resumption of double embankment.

<i>Distance from</i>		<i>Stations</i>	<i>Engineering works</i>	<i>Details and facilities</i>
<i>CHIKUNAN</i>	<i>miles km.</i>			
40½	65.2	...	Bridge over river and coastal road	c. 300 ft.
40½	65.3	...	Bridge over stream, secondary road, and narrow-gauge line to E-gu-po	Line begins wide gradual curve southwards.
40¾	65.8	...	Bridge over stream	Line begins straight stretch of c. 6½ miles.
41	66.1	...	Bridge over stream	...
41	66.2	KIYOMIZU	...	I. with narrow-gauge line NW. to E-gu-po.
41½	66.9	...	Bridge over stream	...
42	67.7	...	Bridge over stream	...
42¼	67.9	...	...	Embankment ends.
42½	68.6	...	Bridge over stream	...
42¾	68.8	...	Bridge over stream	...
42¾	69.0	...	...	Line crossed by narrow-gauge line to Gosei.
43	69.5	SHAROKU	...	I. with narrow-gauge line to Gosei; also with narrow-gauge line running south to Taito.
43½	70.1	...	...	Line crosses secondary road.
44	70.9	...	Bridge over stream	...
44¼	71.2	...	Bridge over stream	...
44½	71.7	...	...	Line takes slight turn farther south.
44¾	72.0	...	Bridge over stream	Embankment begins.
44¾	72.1	...	...	Embankment ends. Embankment on west side of line only.
45½	73.1	...	Bridge over stream	Embankment ends.
45½	73.3	...	Bridge over stream	...
45¾	73.5	...	Bridge over stream	...
45¾	73.6	...	...	Embankment begins.
46	74.1	LIENG-BAK-TSE	...	...
47¼	76.1	...	...	Line curves gradually SSE.
47½	76.6	...	Bridge over stream	Line begins straight stretch of c. 2¼ miles.
48½	78.4	...	...	Embankment begins.
49	79.1	TAITO	...	...
49¼	79.5	...	...	Line crosses secondary road.
49¼	79.6	...	Bridge over stream	...
49½	79.8	...	Bridge over stream	Embankment begins.
49¾	80.2	...	...	Embankment ends. Line turns SE. and begins straight stretch c. 1½ miles.
50¼	80.8	...	Bridge over stream	...

RAILWAYS

Distance from CHIKUNAN		Stations	Engineering works	Details and facilities
miles	km.			
50½	81.5	...	Bridge over stream	Line ascends gradually to higher ground.
50¾	81.7	...	Bridge over dry valley	...
51	82.1	...	...	Embankment begins. Main coastal road curves close to line.
51	82.2	...	Bridge over stream	...
51¼	82.5	...	...	Embankment ends.
51½	82.8	...	...	Line turns ESE. and begins straight section of c. 1 mile.
51½	83.0	...	Bridge over stream	...
51½	83.1	...	...	Embankment begins.
52	83.7	...	...	Embankment ends.
52	83.9	(?) ONG-TS'AN	...	...
52½	84.6	...	...	Line begins wide gradual curve southwards.
52½	84.7	...	...	Line crosses main road from Taiko. Elevation marker, 27.3 m.
			Bridge over stream	...
*52¾	84.8	...	...	Triangular <i>J</i> with inland line from Chikunan (<i>Route 4</i>).
*53	85.3	...	...	End of southward curve. <i>J</i> (trailing) left, with ST. inland line from Chikunan (<i>Route 4</i>). Line crosses main road. Beginning of DT.
53	85.5	...	...	Embankment begins.
*53¼	85.6	...	Bridges over river Taito-kei	c. 1950 ft. 2 iron girder ST. bridges, with (?) push-car lines either side. Road bridge runs parallel with railway bridges.
53¼	85.9	...	...	Line begins long, gradual curve SW.
53½	86.0	...	...	Embankment ends.
53¾	86.4	...	Bridge over stream	...
53¾	86.5	...	...	Line ends curve, and begins straight stretch SW. of c. 2 miles.
53¾	86.7	...	...	Line crosses main road.
54	86.9	...	...	Embankment begins.
54	87.0	...	Bridge over stream	...
54¼	87.3	...	Bridge over stream	...
54¼	87.6	...	Bridge over stream	...
55	88.6	...	Bridge over stream	...
55¼	89.2	...	Bridge over stream	Embankment ends.
55½	89.3	...	Bridge over stream	...
55¾	89.7	...	...	Line turns SSW.
*56½	91.2	SHOKA	...	3 platforms. ES. W. SY. Line continues south to Tainan as Route 6.

ROUTE 6

SHOKA—NISUI—KAGI-TAINAN—TAKAO—HORYO (BORYO)

(Plans 13, 14, 15, 20A, 27A, 28A, 29A)

General description

Linking up with Routes 4 and 5 at Shoka, this line provides means for a through service from Kirun and the capital, Taihoku, in the north, to Horyo in the south-west of the island. An extension of the line from Horyo to Koshun was under construction in 1941, but no information is available as to how much of it has been completed. In addition, plans have been prepared for the construction of a cross-country connexion to the town of Taito on the east coast and to the present 2 ft. 6 in. gauge line to Karenko, which it is also proposed to widen to 3 ft. 6 in. gauge and extend to Suo in the north-east.

The route runs through the coastal plain for its whole length so that gradients will not be severe. Sharp curves exist from Takao to Keishun, but from thence to Horyo the line has been improved to embrace Toko, and many curves have been eliminated. The section Takao-Horyo is still, however, treated as a branch line as distinct from the section Shoka-Takao, which is laid as main line.

As the watershed is to the west many rivers are encountered, several of which are of exceptional length to provide for flooding during the rainy season.

The line is laid as single track throughout, apart from the stretch between Tainan and Takao, which is double, but doubling for the whole line has been under consideration since 1936.

General details

- (1) Gauge: 3 ft. 6 in.
- (2) Length
251.9 km. (156½ miles) via the direct Keishu-na-pi-kato route.
257.2 km. (159¾ miles) via old route.
- (3) Track
Shoka-Tainan (142.5 km., 88½ miles), single.
Tainan-Takao (46.5 km., 29 miles), double.
Takao-Koshun via Na-pi (105.9 km., 65¾ miles), single.
Takao-Koshun via old route (111.2 km., 69 miles), single.
- (4) Maximum permissible axle-load: No details available.
- (5) Maximum gradient: No details available, but not expected to be severe until after leaving Horyo (Boryo).
- (6) Minimum radius of curves: No details available.

- (7) Traction: Steam.
- (8) Maximum distance between stations

SECTION

Shoka-Tainan, 9.6 km. (6 miles) (single track).
Tainan-Takao, 7.6 km. (4¾ miles) (double track).
Takao-Horyo, 7.0 km. (4¼ miles) (single track).

- (9) Engine sheds
Shoka, 0 km.
Kagi, 81.0 km.
Tainan, 142.5 km.
Takao, 189.0 km.
Heito, 215.2 km.
Keishu, 236.0 km.
Horyo, 251.9 km.
- (10) Marshalling facilities
Kagi, 81.0 km.
Tainan, 142.5 km.
Takao, 189.0 km.
Heito, 215.2 km.
- (11) Watering facilities: As in (9) above.
- (12) Vulnerable points (Marked with asterisk in text)
 - (a) Locomotive and marshalling facilities. (See (9) and (10) above.)
 - (b) Junctions at Shoka, Takao (187.4 km.) and station (239.2 km.).
 - (c) Bridges, the longest being as follows:—

Distance km.	Place	River	Approximate length in feet
35.7	Nisui	Tak-tsui-k'e	3000
45.8	Rinnan	Ho-bue-k'e	1350
55.4	Tonan	Chioq-gu-k'e	900
76.3	Tamio	Gu-tiau-k'e	600
91.1	Mizukami	Pueq-chio-k'e	750
119.9	Banshiden	Sobun-kei	1119 (photograph 19)
133.1	Shinshi	K'o-kuai-k'e	630
187.7	Takao	Takao	320 180 420
207.9	Kyokyo Kudo	Shimo-tansui	5007 (photograph 20)
219.6	Sai-se	Ai-liau-k'e	3000
242.1	Napi	Na-pi	1360
241.0	Kato	Na-pi	610 (alternative route)

- (d) Port facilities at Takao.
- (13) Capacity
Shoka-Takao: DT. sections, 48 trains each way per day, and ST. sections, 20 trains each way per day, of 200/250 tons net weight military stores.
Takao-Koshun: 12 trains per day each way, of 200 tons net weight military stores.

Distance from SHOKA	Stations	Engineering works	Details and facilities
miles *0	0 SHOKA	...	J. ES. W. 3 platforms. Line runs ST. to Tainan.
¼	0.5	...	Line turns south, radius c. 984 ft.
½	0.9	...	Line crosses minor road.
2½	3.9	...	Line turns SSE.
2¾	4.5	(?) Bridge over tributary of river Lo-a-ts'u-k'e	...
4	6.5 KATAN	...	...
4½	7.3	(?) Bridge over tributary of river Lo-a-ts'u-k'e	Line recrosses minor road, and turns SE., radius c. 300 m.

Distance from SHOKA		Stations	Engineering works	Details and facilities
miles	km.			
5½	8.7	...	(?) Bridge over tributary of river Lo-a-ts'u-k'e	...
6¼	10.2	...	...	Line curves SSE. Straight stretch for c. 2 miles.
6½	10.5	...	Bridge over stream	...
6¾	10.9	...	Bridge over stream	Line crosses minor road.
7	11.3	...	...	Line crosses secondary road.
8¼	13.5	...	...	Line curves south. Straight section for c. 2 miles.
8¾	14.0	...	...	Line crosses minor road.
9	14.8	INRIN	...	I. with sugar refinery line to Rokko; with circular power-tram (2 ft. 6 in. gauge) route, running Inrin-Keiko-Nirin-Inrin; and with push-car line to Lam-nga.
9¼	15.1	...	...	Line crosses secondary road.
10½	17.0	...	...	Line crosses minor road.
10¾	17.5	...	...	Line curves SE.
11½	18.4	...	...	Line crosses road, and turns south. Straight section for c. 4 miles.
11¾	18.8	...	...	Line crosses minor road.
11¾	18.9	...	...	Line crosses minor road.
13½	22.0	SHATO	...	...
15½	25.1	...	...	Line crosses secondary road and turns SSE. Embankment begins, along straight section c. 2¼ miles.
15¾	25.4	...	Bridge over river	...
16¼	26.2	TANAKA	...	...
17½	28.3	...	...	Embankment ends.
17¾	28.6	...	...	Line crosses secondary road.
17¾	28.7	...	...	Embankment resumed.
18¼	29.4	...	...	Embankment ends.
18½	29.9	...	...	Line recrosses secondary road.
18¾	30.4	...	...	Line recrosses secondary road.
19¼	31.3	...	...	Line turns SE.
19½	31.3	...	...	Line recrosses secondary road.
19½	31.7	...	Bridge over river	...
19¾	32.0	NISUI	...	I. with push-car line to Nama (connecting at Nama with Meiji sugar refinery line (2 ft. 6 in. gauge)); also with mountain railway, Chip-chip-sua to Gwaishatei (Route 6a).
20½	33.3	...	...	Line turns SSE. Crosses secondary road.
21½	34.8	...	...	J (facing) left, ST. mountain railway to Gwaishatei.. (Route 6a).
21¾	35.1	...	...	Line curves south. Embankment begins.

Distance from SHOKA		Stations	Engineering works	Details and facilities
miles	km.			
*22	35.7	...	Bridge over Tak-tsui-k'e and Siera-kei	c. 3000 ft. Concrete girder type.
22½	36.2	...	...	Line curves SW.
23¼	37.7	...	...	Line turns SSW.
24¾	39.9	RINNAN	...	...
24¾	40.0	...	...	Embankment begins.
25¼	40.7	...	...	Embankment ends. Line turns SW.
25¾	41.7	...	...	Line turns SSW. Straight section for c. 3 miles.
27¾	44.6	...	...	Embankment begins.
*28½	45.8	...	Bridge over tributary of Ho-bue-k'e river	Embankment ends. Bridge c. 1350 ft. Embankment begins.
28¾	46.4	...	...	Embankment ends.
29	46.7	...	...	Line curves west.
29	46.8	...	Bridge over tributary of Ho-bue-k'e river	...
29¼	47.1	...	...	Line completes westerly curve. Straight section for c. ¾ mile.
30½	49.2	TOROKU	...	I. with push-car line to Seira; and 2 ft. 6 in. gauge line to K'am-t'au-ts'u.
31	49.9	...	Bridge over tributary of Ho-bue-k'e river	c. 328 ft.
31½	50.8	...	...	Line curves WSW.
31¾	51.2	...	...	Embankment ends.
31¾	51.4	...	...	Embankment begins.
32	51.6	...	Bridge over Pak-se river (another tributary of Ho-bue-k'e)	...
32¼	52.1	...	...	Embankment ends.
32½	52.4	...	Bridge over stream	...
33½	54.3	...	Bridge over stream	...
34	55.0	...	...	Line curves SW.
*34¼	55.4	...	Bridge over river Chioq-gu-k'e and over secondary road	c. 500 ft.
34½	55.7	...	...	Embankment begins.
34¾	56.0	...	...	Embankment ends.
35¾	57.4	TONAN	...	I. with Dai Nippon sugar refinery line (2 ft. 6 in. gauge), which branches to Seira and to Kobi, Wokko and Shinko, connecting at Shinko with Nitaka sugar refinery line (2 ft. 6 in. gauge) to Tairin and with Toyo sugar refinery line to Kagi.
36	58.2	...	...	Embankment begins. Line curves south. Straight section c. 3 miles.

Distance from SHOKA		Stations	Engineering works	Details and facilities
miles	km.			
36 $\frac{1}{4}$	58.7	...	Bridge over river Tua-o-k'au-k'e	c. 300 ft.
37 $\frac{1}{4}$	60.1	...	...	Embankment ends.
38 $\frac{1}{2}$	62.2	...	Bridge over tributary of Pak-kong-k'e river and river To-kong- sua-k'e	c. 450 ft.
38 $\frac{3}{4}$	62.4	...	...	Nitaka sugar refinery line crosses main line.
39	63.0	...	Bridge over stream	Line curves SSW.
40 $\frac{1}{4}$	64.8	...	Bridge over tributary of river To-kong-sua-k'e	...
40 $\frac{1}{2}$	65.3	...	...	Line crosses secondary road.
40 $\frac{3}{4}$	65.7	TAIRIN	...	I. with branch line connecting with Nitaka sugar refinery line.
41	66.1	...	...	Connexion with Nitaka sugar refinery line crosses main line.
41 $\frac{1}{4}$	66.7	...	Bridge over river Sa-t'iap-k'e	c. 300 ft.
41 $\frac{1}{2}$	66.8	...	...	Embankment begins.
41 $\frac{3}{4}$	66.9	...	...	Embankment ends.
42	67.6	...	...	Line crosses main road from Seira.
42	67.8	...	...	Embankment begins. Line gradually curves south.
42 $\frac{1}{2}$	68.6	...	...	Embankment ends. Straight stretch c. 1 $\frac{1}{2}$ miles.
44 $\frac{1}{4}$	71.1	...	...	Line crosses secondary road.
44 $\frac{1}{2}$	71.4	TAMIO	...	I. with push-car line to Hokko.
44 $\frac{3}{4}$	71.6	...	...	Embankment begins.
45 $\frac{1}{4}$	72.7	...	Bridge over tributary of river Pak-kong-k'e	...
45 $\frac{1}{2}$	72.8	...	...	Embankment ends. Line gradually curves SE.
45 $\frac{3}{4}$	73.3	...	...	End of curve. Straight stretch c. 2 $\frac{1}{4}$ miles.
45 $\frac{3}{4}$	73.8	...	...	Embankment begins.
46	74.2	...	Bridge over stream	Embankment ends.
46 $\frac{3}{4}$	75.2	...	...	Line crosses minor road.
47	75.8	...	...	Embankment begins. Line runs close to main road from Seira.
*47 $\frac{1}{4}$	76.3	...	Bridge over river Gu-tiau-k'e	Line crosses to east side of main road at Gu-tiau-k'e bridge (c. 600 ft.), taking wide curve and recrossing main road at c. $\frac{3}{4}$ mile north of Kagi.
47 $\frac{3}{4}$		...	...	Embankment ends.
47 $\frac{3}{4}$	77.0	...	...	Line turns south.
48	77.3	...	Bridge over sugar re- finery line (2 ft. 6 in. gauge) from Lam-tse	...

Distance from SHOKA		Stations	Engineering works	Details and facilities
miles	km.			
48 $\frac{3}{4}$	78.8	...	Bridge over river Tai-tau-k'e	...
49 $\frac{1}{2}$	79.8	...	...	Line crosses main road.
*50 $\frac{1}{4}$	81.0	KAGI	...	<p>Passenger station. 2 platforms (1 island and 1 single-faced): 3 through platform roads.</p> <p>Goods yard. West of line c. 6 DES. (500 ft. long) with tranship sheds.</p> <p>Shunt yard. South of goods yard. 8 LS. (420 ft.-500 ft.).</p> <p>c. 10 LS. (1870 ft.).</p> <p>Loco depot. South of SY. ES. $\frac{1}{4}$ round-house, workshops attached. Tbl. (c. 70 ft.).</p> <p>2 coal stacks 340 ft. \times 45 ft. (Jan. 1944).</p> <p>I. with Arisan 2 ft. 6 in. gauge railway east of line and Toyo and Meiji 2 ft. 6 in. gauge sugar refinery lines west of line, with 2 groups of LS., ES., and station for light railway west of goods yard (Plan 29a).</p>
50 $\frac{3}{4}$	81.6	...	...	Line crosses minor road.
50 $\frac{3}{4}$	81.7	...	...	Embankment begins. Straight stretch c. 3 $\frac{3}{4}$ miles.
50 $\frac{3}{4}$	81.8	...	Bridge over stream	...
52	83.6	...	Bridge over stream	...
52 $\frac{1}{2}$	84.7	...	...	Embankment ends.
54 $\frac{3}{4}$	88.1	...	...	Line turns SSW.
55 $\frac{3}{4}$	89.7	...	Bridge over sugar refinery line (?) connecting with 2 ft. 6 in. gauge line from Lam-tse	...
56	90.2	MIZUKAMI	...	Line turns south.
56 $\frac{1}{4}$	90.6	...	...	Embankment begins.
*56 $\frac{1}{2}$	91.1	...	Bridge over river Pueq-chio-k'e and over sugar refinery line (?) connecting with Lam-tse line	c. 750 ft. Embankment ends.
56 $\frac{3}{4}$	91.3	...	...	Embankment begins.
56 $\frac{3}{4}$	91.4	...	...	Embankments ends.
56 $\frac{3}{4}$	91.5	...	...	Line takes wide curve SW.
57	92.0	...	Bridge over stream	...
57 $\frac{1}{4}$	92.4	...	...	Line turns SSW. and runs alongside main road to Koheki. Beginning of long, straight stretch to Shinei, c. 6 $\frac{3}{4}$ miles.
58 $\frac{1}{2}$	94.0	...	Bridge over stream	...
59 $\frac{1}{2}$	95.9	...	...	Line crosses main road.
59 $\frac{3}{4}$	96.2	KOHEKI	...	I. with push-car line to Kuan-a-nia.
59 $\frac{3}{4}$	96.4	...	...	Embankment begins.
60 $\frac{1}{2}$	97.5	...	Bridge over tributary of Pueq-chio-k'e	...

Distance from SHOKA		Stations	Engineering works	Details and facilities
miles	km.			
61	98.2	...	...	Embankment ends.
61½	99.2	...	Bridge over sugar refinery line (?) connecting with Lam-tse line	... Embankment begins.
62	99.7	...	Bridge over tributary of Pueq-chio-k'e	...
62	100.0	...	...	Embankment ends.
62¼	100.3	...	Bridge over tributary of Pueq-chio-k'e	...
62¾	101.1	..	Bridge over tributary of Pueq-chio-k'e	...
64¼	103.4	...	...	Line crosses main road.
64½	104.0	SHINEI	...	I. with 2 ft. 6 in. gauge power-tram, connecting at riverside with lam-tsui-kang sugar refinery line. Also with (?) line to Ch'iu-na sugar refinery.
65	104.5	...	...	Line curves SE.
65¼	105.0	...	Bridge over tributary of river Kip-tsui-k'e	...
65½	105.5	...	...	Embankment begins. Line turns south, beginning a straight stretch c. 2½ miles.
65½	105.6	...	Bridge over sugar refinery line	c. 300 ft.
66¼	106.7	...	...	Embankment ends.
66¾	107.6	...	...	Embankment begins.
67¼	108.4	...	...	Embankment ends.
67½	108.8	...	...	Embankment begins.
67¾	108.9	...	Bridge over tributary of river Kip-tsui-k'e	c. 300 ft. Embankment ends.
68	109.3	...	Bridge over sugar refinery line	c. 300 ft. Line turns slightly SW. and continues in a straight stretch for c. 3½ miles.
68½	110.3	...	...	Embankment begins.
68¾	110.6	...	Bridge over stream	...
69	111.1	...	...	Embankment ends.
69¼	111.3	RINHOEI	...	...
69¼	111.7	...	...	Embankment begins.
69½	111.9	...	...	Line is crossed by push-car line into the hills.
69¾	112.2	...	Bridge over small lake	...
70	112.8	...	...	Embankment ends.
70	112.9	...	Bridge over stream	... Embankment begins.
70½	113.4	...	Bridge over stream	Embankment ends.
71½	115.3	...	...	Line turns south, and follows straight stretch for c. 2 miles.

Distance from SHOKA		Stations	Engineering works	Details and facilities
miles	km.			
71 $\frac{3}{4}$	115.5	...	Bridge over lake	c. 300 ft.
72	115.9	...	Bridge over river	...
72 $\frac{1}{4}$	116.4	...	...	Line crosses main road, which turns away inland.
72 $\frac{1}{2}$	116.8	BANSHIDEN	...	I. with 2 ft. 6 in. gauge Meiji sugar refinery line to Kari and Dzi-tieng-kang (?). Also with (?) push-car line into the hills.
73	117.5	...	...	Embankment begins. Line rises to higher ground. Trig. point, 42.8 m.
74	119.0	...	...	Embankment ends.
74	119.2	...	...	Embankment begins.
74 $\frac{1}{4}$	119.5	...	...	Embankment ends.
74 $\frac{1}{2}$	119.6	...	...	Line drops to sea-level, and curves SW.
*74 $\frac{3}{4}$	119.9	...	Bridge over Sobun-kei (or Tdan-bun-k'e river)	Total length 1119 ft., 9 spans, lattice girder and deck on masonry piers (<i>photograph C19</i>). Embankment begins.
74 $\frac{3}{4}$	120.4	...	...	Embankment ends.
75	120.7	...	...	Line turns slightly more SW.
75 $\frac{1}{4}$	121.0	...	Bridge over (?) small lake	...
75 $\frac{1}{2}$	121.5	...	...	Trig. point, 17.3 m.
76 $\frac{1}{4}$	122.6	...	...	Line turns south. Beginning of straight section c. 4 $\frac{3}{4}$ miles.
76 $\frac{1}{2}$	123.0	...	Bridge over (?) push-car line	...
76 $\frac{3}{4}$	123.2	...	Bridge over stream	...
76 $\frac{3}{4}$	123.6	KENKA	...	I. with push-car line into hills.
77	123.9	...	...	Embankment begins.
78 $\frac{3}{4}$	126.8	...	Bridge over stream	...
79 $\frac{1}{4}$	127.7	...	...	Trig. point, 10.7 m.
79 $\frac{1}{2}$	128.1	...	Bridge over trail	...
80 $\frac{1}{2}$	129.7	...	...	Elevation marker, 9.0 m.
80 $\frac{3}{4}$	130.0	...	...	Embankment ends.
81 $\frac{1}{4}$	130.6	...	...	Embankment begins. Line curves SW., and begins straight stretch c. 4 miles.
81 $\frac{3}{4}$	131.5	SHINSHI	...	PL. 1600 ft. I. with push-car lines running NE. and SW.
82	132.0	...	...	Line crosses main road and runs parallel with it for c. 2 $\frac{1}{2}$ miles.
82 $\frac{1}{4}$	132.6	...	Bridge over tributary of river Iam-tsui-k'e	c. 110 ft.
*82 $\frac{3}{4}$	133.1	...	Bridge over river K'o-kuai-k'e	c. 630 ft. c. 9 spans.

Distance from SHOKA		Stations	Engineering works	Details and facilities
miles	km.			
83 $\frac{3}{4}$	134.8	...	Bridge over stream	c. 50 ft.
84 $\frac{1}{2}$	136.0	...	5 minor bridges	c. 50 ft. each. Embankment ends. Main road turns away towards coast.
84 $\frac{3}{4}$	136.3	CHIAU-CHIENG	...	PL. c. 1700 ft. I. with narrow-gauge light railway running west from south end of station.
85	136.7	...	Bridge over (?) sugar refinery line	...
85	137.0	...	...	Line turns SW. and begins straight section c. 1 $\frac{3}{4}$ miles.
85 $\frac{3}{4}$	138.0	...	Bridge	...
86	138.6	...	...	Embankment begins.
86 $\frac{1}{4}$	138.8	...	...	Embankment ends.
86 $\frac{3}{4}$	139.8	...	...	Embankment begins.
87	140.0	...	...	Line turns SSW. with gradually rising gradient and begins straight stretch of c. 1 $\frac{1}{4}$ miles.
87	140.3	...	Bridge over river Iam-tsui-k'e	c. 300 ft. Line descends again to sea-level.
87 $\frac{1}{2}$	140.9	...	...	Embankment ends.
88	141.9	...	...	Line turns south and begins straight stretch of c. 1 mile.
88 $\frac{1}{4}$	142.1	...	...	Embankment begins.
88 $\frac{1}{2}$	142.3	...	...	Embankment ends.
*88 $\frac{1}{2}$	142.5	TAINAN	...	ES. Tbl. Roundhouse at north end of station yard. Workshops at south end of station yard. W. 7 LS. c. 1050-1500 ft. 3 tracks c. 2000 ft. through passenger station. I. with push-car lines to Kari, Van-lai (south of Tainan), Shinka and Kai-tieng (east to hills) (<i>Plan 28a</i>).
89	143.2	...	...	Line turns SSW. and begins straight stretch of c. 1 $\frac{1}{4}$ miles.
89	143.5	...	...	Line crosses push-car line.
89 $\frac{1}{4}$	143.9	...	Bridge over stream	...
89 $\frac{3}{4}$	144.5	...	...	Embankment begins.
89 $\frac{3}{4}$	144.7	...	...	Embankment ends.
90 $\frac{1}{4}$	145.3	...	...	Line curves south.
91	146.4	...	...	Line approaches main road, and gradually curves SSE.
91 $\frac{3}{4}$	147.5	...	...	Line curves SE. and ascends slight gradient (20 m.).
92 $\frac{1}{4}$	148.7	...	...	Embankment begins.
92 $\frac{3}{4}$	149.3	...	...	Embankment ends and line descends to sea-level.

Distance from SHOKA		Stations	Engineering works	Details and facilities
miles	km.			
93	149.7	...	Bridge over river Sa-ia-kieng-k'e	...
93 $\frac{1}{4}$	150.1	SHAROKEN	...	I. with (?) power-tram (2 ft. 6 in. gauge) lines inland.
93 $\frac{1}{4}$	150.2	...	...	Embankment begins.
93 $\frac{1}{4}$	150.3	...	Bridge over (?) power-tram line	...
93 $\frac{1}{2}$	150.7	...	...	Line curves farther SE.
93 $\frac{3}{4}$	150.8	...	Bridge over stream	...
94 $\frac{1}{4}$	152.6	...	Bridge over river Kang-bue-kau	...
95	152.9	...	...	Line curves SSE.
95	153.1	...	...	Embankment ends.
95	153.2	...	Bridge over stream	...
95 $\frac{1}{4}$	153.6	...	Bridge over stream	...
95 $\frac{3}{4}$	154.1	CHUSHU	...	...
96	154.4	...	...	Line turns south and begins straight stretch to Taiko of c. 1 $\frac{1}{4}$ miles.
96	154.6	...	...	Push-car line crosses line, and runs alongside track to Rochiku.
96 $\frac{1}{4}$	155.0	...	Bridge over river Dzi-tsan-hang-k'e	c. 820 ft.
97	156.0	...	...	Push-car line crosses line.
97 $\frac{1}{4}$	156.6	TAIKO	...	...
97 $\frac{1}{2}$	156.9	...	...	Line curves SE. and begins straight stretch of c. 1 mile.
98 $\frac{1}{2}$	158.5	...	...	Line again turns SE.
99 $\frac{1}{4}$	159.8	ROCHIKU	...	...
99 $\frac{1}{2}$	160.0	...	...	Line crosses main road.
99 $\frac{3}{4}$	160.5	...	...	Line turns SSE. and begins straight stretch of c. $\frac{3}{4}$ mile.
100 $\frac{1}{2}$	161.7	...	...	Line turns SE. (From this point to Takao, data taken from <i>A.M.S. Maps, Series L592, 1/250,000, Sheet 13.</i>)
*102	164.3	...	Bridge over river	...
102 $\frac{3}{4}$	165.4	...	...	Line crosses main road.
103 $\frac{1}{2}$	166.8	...	...	Push-car line crosses line. Line curves south.
104 $\frac{1}{2}$	168.1	OKAYAMA	...	I. with 2 ft. 6 in. gauge line to airfield.
104 $\frac{3}{4}$	168.6	...	...	Line turns SE., and begins straight stretch of c. 4 miles.
*105	168.9	...	Bridge over river Tiek-a-kang-k'e	c. 60 ft.
*105 $\frac{3}{4}$	170.4	...	Bridge over tributary of river Tian-po-k'e	c. 110 ft.

Distance from SHOKA		Stations	Engineering works	Details and facilities
miles	km.			
*106 $\frac{1}{2}$	171.4	...	Bridge over river Tian-po-k'e	c. 120 ft.
107 $\frac{1}{4}$	172.7	KYOSHITO	...	I. with 2 ft. 6 in. gauge line serving airfield and industrial plant.
108 $\frac{1}{4}$	174.3	...	...	Line crosses main road.
109 $\frac{1}{4}$	175.8	...	...	Line turns SSW.
*109 $\frac{1}{4}$	176.1	NANSHI	Bridge over river Au-kieng-ts'ut	...
*109 $\frac{3}{4}$	176.8	...	Bridge over tributary of river Au-kieng-ts'ut	Line crosses main road, and turns SSE.
111	178.6	...	...	Line turns SW. and begins straight stretch of c. 4 $\frac{1}{4}$ miles (called the 'Tsong-kuan-sua').
113 $\frac{3}{4}$	183.1	KYUJO	...	...
115 $\frac{1}{4}$	185.5	LUI-UI (TOKIEN)	...	Group of c. 4 LS. c. 1000 ft. along east of line. J (facing) right, with short DE. line to Takao-zan. Line turns south.
116 $\frac{1}{4}$	187.1	...	Bridge over arm of Takao river	c. 40 ft.
*116 $\frac{1}{2}$	187.4	...	...	J (triangular) right, with DT. line to harbour station and Rps. The eastern curve of the triangle entails crossing the Takao river by a bridge of c. 180 ft.
*		TAKAO harbour station	...	c. 1 $\frac{1}{2}$ miles from J. 2 platforms c. 800 ft. Shunt yard. East of station c. 10 sidings, c. 1600 ft.; connexion to industrial plant west of station. Loco depot. East of SY. ES. $\frac{1}{2}$ roundhouse. Tbl. (c. 48 ft.). W. Dock sidings. East of ES. 8 DES. (c. 800 ft.) with connexion at east end serving industrial plant in harbour area, and via a bridge over the Takao river (c. 420 ft.), to works in east part of town. 8 LS. (c. 800 ft.) adjacent to DES. with connexions at east end to wharves 1 and 2 (Plan 20a). Line curves north: radius c. 1410 ft.
116 $\frac{1}{2}$	187.7	...	Bridge over Takao river	c. 1050 ft.
*117 $\frac{1}{2}$	189.0	TAKAO	...	Loco depot. ES. small roundhouse. Tbl. (60 ft.). W. A further ES. adjacent to docks sidings. Sorting sidings. c. 8 DES. c. 1300 ft. adjoining loco depot. Goods yard. South of sorting sidings and south of line, c. 6 DES. (4 serving shed) c. 480 ft. Goods shed c. 80 ft. x 160 ft. with side-loading platforms for road vehicles. Passenger station. West of goods yard, 2 platforms c. 1300 ft. covered for 700 ft. 4 through tracks. Sorting sidings. South of passenger station, comprising c. 6 LS. c. 1600 ft. (Plan 20a).
			Road overbridge	...

Distance from SHOKA		Stations	Engineering works	Details and facilities
miles	km.			
118	190.0	...	...	J (facing) right with branch serving industrial works east of town. From air photographs taken in Nov. 1943 it appears that this branch has been taken up. End of DT., beginning of ST.
118 $\frac{1}{4}$	190.3	...	...	Line turns east and begins straight stretch of c. 4 miles
121 $\frac{3}{4}$	196.0	HOSAN	...	I. with 2 ft. 6 in. gauge power-tram line south to Shoko (2 ft. 6 in. gauge) and power-tram line SW. to mouth of river (also 2 ft. 6 in. gauge).
122 $\frac{1}{4}$	196.7	...	...	Line turns NE. I. with Sin Hieng sugar refinery line (2 ft. 6 in. gauge).
122 $\frac{1}{2}$	197.3	...	...	Line follows curve of river.
123 $\frac{1}{2}$	198.7	...	Bridge over river	...
124 $\frac{1}{4}$	199.9	KOSHO	...	...
125 $\frac{3}{4}$	202.4	...	...	Line curves north, radius c. 1640 ft.
127 $\frac{3}{4}$	205.6	...	Bridge over river	...
128 $\frac{1}{2}$	206.8	KYUKYOKUDO	...	...
128 $\frac{3}{4}$	207.4	...	...	I. with 2 ft. 6 in. gauge power-tram line to Kisan. Line curves east, radius c. 984 ft.
*129 $\frac{1}{4}$	207.9	...	Bridge over Shimo-Tansui river	Total length 5007 ft., lattice girder through bridge with overhead bracings and masonry piers (<i>photograph C20</i>).
130 $\frac{1}{4}$	209.8	...	...	Line turns NE. and begins straight stretch of c. 2 miles.
131 $\frac{1}{2}$	211.9	ROKUKAISEKI	...	...
132 $\frac{1}{2}$	213.1	...	Bridge over tributary of river Tau-chieng-k'e	...
133 $\frac{1}{4}$	214.4	...	...	Line turns east.
*133 $\frac{3}{4}$	215.2	HEITO	...	ES. small rectangular. Tbl. (c. 45 ft.). W. c. 4 LS. adjacent to loco shed, c. 450 ft.; c. 6 LS. 1050-1350 ft. I. with 2 ft. 6 in. gauge Taiwan sugar refinery power-tram line, running south to Toko, and north to Kuai-chiu. Also I. with push-car line to Naiho. Line curves SE. (<i>Plan 27a.</i>)
134	215.9	...	Bridge over river	...
134 $\frac{1}{4}$	216.1	...	...	Line crossed by power-tram line. Line ends curve, and begins straight stretch SE. for c. 5 $\frac{1}{2}$ miles.
*134 $\frac{3}{4}$	216.9	...	Bridge over river	...
136 $\frac{1}{4}$	219.2	...	Bridge over tributary of river Ai-liau-k'e	...
*136 $\frac{1}{2}$	219.6	...	Bridge over river Ai-liau-k'e	c. 3000 ft.
137	220.6	SAI-SE	...	...
139 $\frac{1}{4}$	224.2	...	...	Line turns south and begins straight stretch of c. 4 miles.

RAILWAYS

Distance from SHOKA		Stations	Engineering works	Details and facilities
miles	km.			
140	225.2	TAKEDA	...	...
140 $\frac{1}{4}$	225.8	...	Bridge over tributary of river Ai-liau-k'e	...
141 $\frac{1}{2}$	227.8	...	Bridge over river	...
142 $\frac{1}{4}$	228.8	...	...	Line crosses secondary road.
142 $\frac{1}{2}$	229.3	CHOSHU	...	I. with 2 ft. 6 in. gauge line to Toko running SW. to join Taiwan sugar refinery line from Heito; also with push-car line going north to Naiho.
142 $\frac{1}{2}$	229.3	...	...	Line crosses secondary road.
142 $\frac{3}{4}$	229.6	...	Bridge over river	...
143	230.2	...	...	Line curves SW. and runs alongside road for c. 1 $\frac{3}{4}$ miles. ('Tio-chiu-sua'.)
145 $\frac{1}{2}$	234.2	...	...	Line turns south and leaves road.
146 $\frac{1}{4}$	235.5	...	Bridge over tributary of river Ai-liau-k'e	...
*146 $\frac{3}{4}$	236.0	KEISHU	...	Turning triangle. ES. W. J (facing) left with old route to Kato.
147	236.5	...	Bridge over railway	Line passes over turn-round.
147	236.6	...	Bridge over stream	...
147	236.7	...	Bridge over stream	...
147	236.8	...	Bridge over stream	...
147 $\frac{1}{4}$	237.0	...	Bridge over stream	...
147 $\frac{1}{4}$	237.2	...	Bridge over stream	...
147 $\frac{1}{2}$	237.4	...	Bridge over stream	...
147 $\frac{1}{2}$	237.6	...	Bridge over stream	...
147 $\frac{3}{4}$	237.8	...	Bridge over stream	...
148	238.1	...	Bridge over railway	Line crosses ? light railway.
148	238.4	...	Bridge over river	c. 450 ft.
*148 $\frac{1}{2}$	239.2	Station (for Kato seaplane base)	...	4-5 LS. in goods yard. J for DE. line to Toko, c. 4 $\frac{1}{4}$ miles.
			Bridge over stream	Line bears east.
149 $\frac{3}{4}$	241.0	NAPI	...	PL.
*150 $\frac{1}{2}$	242.1	...	Bridge over river	c. 1360 ft.
151	243.0	...	Bridge over river	...
151 $\frac{3}{4}$	244.2	KATO	...	I. with push-car line, Toko—Suiteiryō.
154 $\frac{1}{4}$	248.2	...	Bridge over river	Water-purification plant in town.
154 $\frac{1}{2}$	248.6	HUAN-A-LUN	...	...
156	257.3	...	...	Line crosses secondary road.
*156 $\frac{1}{2}$	257.9	HORYO (BORYO)	...	ES. W. Tbl. An extension of the line to Koshun was under construction in 1942, the route following that of the coastal road.
183 $\frac{1}{4}$	294.9	KOSHUN (KUSYAM)	...	...

Distance from SHOKA miles km.	Stations	Engineering works	Details and facilities
Alternative route between Keishu and Koshun			
146 $\frac{3}{4}$ 236.1	KEISHU	...	Turning triangle. ES. W.
146 $\frac{3}{4}$ 236.3	...	...	Line crosses secondary road.
147 $\frac{1}{4}$ 237.0	...	...	Line begins wide curve SE.
147 $\frac{1}{2}$ 237.3	...	...	Line crossed by push-car line from Toko.
148 238.1	...	Bridge over river	...
149 $\frac{3}{4}$ 240.9	...	...	Line begins gradual curve SSE.
149 $\frac{3}{4}$ 241.0	...	Bridge over river Na-pi-k'e	610 ft.
151 $\frac{1}{4}$ 243.7	...	...	Line begins gradual curve south to SSE.
152 $\frac{1}{2}$ 245.5	KATO	...	I. with push-car line, Toko—Suiteiryō.
152 $\frac{3}{4}$ 249.5	...	Bridge over river	...
157 $\frac{3}{4}$ 253.9	HUAN-A-LUN	...	...
159 $\frac{1}{2}$ 256.6	...	...	Line crosses secondary road.
159 $\frac{3}{4}$ 257.2	HORYO (BORYO)	...	ES. Tbl. W. An extension of the line to Koshun was under construction in 1942, the route following the coastal road for its whole length.
186 $\frac{1}{2}$ 300.2	KOSHUN (KUSYAM)	...	...

ROUTE 6a

NISUI—NAMA—CHIP-CHIP-TUA-SUA (GAISHATEI) (CHIP-CHIP-SUA Line)
(Plan 14)

General description

This line was built by the Formosa Water Company, and taken over by government railways in 1927. It was originally 2 ft. 6 in. gauge but is now probably 3 ft. 6 in. The line runs east and north, following the valleys of the rivers Seira-kei and Tsui-li-k'e. At Nama it begins to climb into the foothills, dropping into the valley again at Shushu. At Tsui-li-k'e it turns north and climbs steeply to Chip-chip-tua-sua.

At Misui, J for Route 6 (Shoka-Tainan-Takao-Boryo), interchange facilities exist with the Meiji sugar refinery line to Nama and Nanto.

The line crosses several rivers, but has no outstandingly wide bridges. At 17.4 km. (10 $\frac{3}{4}$ miles) it runs through a tunnel (about 1050 feet) and thenceforward there are several tunnels as the gradients increase.

General details

- (1) Gauge: 3 ft. 6 in.
- (2) Length: 31.9 km. (19 $\frac{3}{4}$ miles).

- (3) Track: Single.
- (4) Maximum permissible axle-load: No details available.
- (5) Maximum gradient: No details available, but severe gradients can be expected after Tsui-li-k'e at 26.9 km. (16 $\frac{3}{4}$ miles).
- (6) Minimum radius of curves: No details available.
- (7) Traction: Steam.
- (8) Maximum distance between stations: Station at 2.9 km.—Nama: 7.9 km. (4 $\frac{3}{4}$ miles).
- (9) Engine sheds
- (10) Marshalling or shunting yards
- (11) Watering facilities
- (12) Vulnerable points (Marked with asterisk in text)
 - (a) Junction with main line at Misui (1.3 km.).
 - (b) Bridges, the longest being c. 200 feet.
 - (c) Tunnels at 17.4, 22.6, 27.4, 28.3, 28.9, 29.5, 31.1, and 31.6 km.
- (13) Capacity
 - 12 trains per day each way.
 - Net weight of military stores per train, 150/200 tons.

Distance from NISUI miles km.	Stations	Engineering works	Details and facilities
*0 0	NISUI	...	J for main line, Shoka-Tainan-Takao-Horyo (Route 6). I. with Meiji Sugar refinery line.

RAILWAYS

Distance from NISUI		Stations	Engineering works	Details and facilities
miles * $\frac{3}{4}$	km.			
	1.3	...	...	J with ST. main line from Shoka (Route 6). Line curves east, following valley of river Seira.
1	1.5	...	...	Line crosses secondary road to Nama.
1 $\frac{3}{4}$	2.7	...	...	Line turns further east.
	2.9	Station	...	...
2 $\frac{1}{4}$	3.7	...	...	Line recrosses Nama road and turns NE.
2 $\frac{1}{2}$	3.9	...	Bridge over stream	...
2 $\frac{1}{2}$	4.0	...	...	Line turns east.
2 $\frac{3}{4}$	4.5	...	...	Line recrosses Nama road and turns NE. for straight stretch c. 3 miles.
4	6.6	...	Bridge over river	...
4 $\frac{1}{4}$	6.8	...	...	Line crosses road.
6	9.5	...	...	Embankment begins.
	9.8	...	Bridge over river	...
6 $\frac{1}{4}$	9.9	...	...	Line gradually curves east.
6 $\frac{1}{2}$	10.4	...	Bridge over river	...
	10.5	...	...	Line crosses road. Embankment ends.
6 $\frac{3}{4}$	10.8	NAMA	...	At Nama line continues eastwards and climbs into foothills, through which it follows a winding course to Chip-chip- tua-sua (Gaishatei).
7 $\frac{1}{4}$	11.1	...	Bridge over river	Line curves SE.
	11.7	...	...	Line curves NE. and east, crossing and recrossing road.
8 $\frac{3}{4}$	14.3	...	Bridge over river	...
9 $\frac{1}{4}$	14.9	...	Bridge over river	...
9 $\frac{1}{2}$	15.4	...	Bridge over river	...
9 $\frac{3}{4}$	15.6	Station	...	Line turns SE.
10 $\frac{1}{2}$	16.9	...	...	Line curves south.
*10 $\frac{3}{4}$	17.4	...	Tunnel	c. 1050 ft. Tunnel runs under spur of foothills, where line makes wide SE.- NE. curve.
11 $\frac{1}{4}$	18.2	...	...	Line curves east.
11 $\frac{1}{2}$	18.4	...	Bridge over river	...
12 $\frac{1}{4}$	19.7	SHUSHU	...	...
13	21.1	...	...	Line turns SE.
14	22.5	...	...	Line turns east.
*14	22.6	...	Tunnel	c. $\frac{3}{4}$ mile. Tunnel runs straight.
15 $\frac{1}{4}$	24.5	...	Bridge over valley	...
15 $\frac{1}{2}$	24.9	...	Bridge over valley	...
15 $\frac{3}{4}$	25.4	...	Bridge over valley	...

Distance from NISUI		Stations	Engineering works	Details and facilities
miles	km.			
16 $\frac{3}{4}$	26.9	TSUI-LI-K'E	...	At this point line curves almost due north and follows a more closely winding course through steeper hills to Chip-chip-tua-sua (valley of river Tsui-li-k'e).
*17	27.4	...	Tunnel	c. 180 ft.
	27.7	...	Bridge over valley	...
17 $\frac{1}{4}$	28.0	...	...	Line curves east.
*17 $\frac{1}{2}$	28.3	...	Tunnel	c. 300 ft. Line curves north.
*17 $\frac{3}{4}$	28.9	...	Tunnel	c. 150 ft.
18	29.1	GUA-CH'IA-TIA	...	Beginning of push-car line, which runs north of lake Jitsugetsu.
*18 $\frac{1}{4}$	29.5	...	Tunnel	c. 300 ft. Line curves west.
18 $\frac{3}{4}$	30.4	...	...	Line curves NE.
*19 $\frac{1}{4}$	31.1	...	Tunnel	c. 180 ft.
	31.5	...	Bridge over valley	...
*19 $\frac{1}{2}$	31.6	...	Tunnel	c. 300 ft.
	31.9	CHIP-CHIP-TUA-SUA (GAISHATEI)	...	(Photograph C21.)

ROUTE 7

KARENKO—TAITO

(Plans 18, 19, 26)

General description

The line proceeds west from Karenko and after the junction at Pok-pok with the sugar refinery line from Busegan-sia turns south-west to Hatsune, where it crosses the river Bak-kua-k'e and continues south-west through a long valley lying between the coastal and central mountain range. This valley forms the course of three main rivers, the Hua-lien-ke, Shykoran-kei, and Sin-bu-lo-k'e, which are fed throughout by a series of streams and rivers from both ranges, involving the construction of several long bridges, the greatest of which are those over the Chyakan-k'e at 26.3 km., the Chioq-kong-k'e at 85.4 km., the Sin-bu-lo-k'e at 115.7 km., and the Lok-liau-k'e at 137.4 km.

In order to avoid deltas at the confluence of the main rivers the line deviates inland occasionally, necessitating crossing the foothills which intrude into the valley, and heavy gradients are likely to be encountered, particularly between the tunnel at 71.0 km. and Tamazato at 82.9 km.

Rolling-stock employed on the line is of high capacity for the gauge and this, together with the heavy gradients, restricts speed to about 20 miles per hour.

Permanent way is laid to a high standard and rails are heavier than is usually adopted for the gauge, giving a high permissible axle-loading.

Plans are under consideration to widen the gauge to Japanese normal standard (3 ft. 6 in.) and link the line up with the Hatto-suo line in the north (Route 2), and with the west coast route at Choshu (Route 6), although no information has been received that the work, which because of the nature of the country would be costly and take some considerable time to carry out, has been taken in hand.

Traction is normally steam, but of recent years

high-speed gasoline cars have replaced steam trains for passenger services.

General details

- (1) Gauge: 2 ft. 6 in.
- (2) Length: 169.7 km. (105 $\frac{1}{2}$ miles).
- (3) Track: Single.
- (4) Maximum permissible axle-load: No details available.
- (5) Maximum gradient: No details available.
- (6) Minimum radius of curves: No details available.
- (7) Traction: Steam.
- (8) Maximum distance between stations: Basshi-Mizuho: 9.2 km. (5 $\frac{3}{4}$ miles).
- (9) Engine sheds:
Karenko, 0 km.
Tamazato, 82.9 km.
Taito, 164.2 km.
- (10) Marshalling or shunting yards
Karenko, 0 km.
Taito, 164.2 km.
- (11) Watering facilities
Karenko, 0 km.
Tamazato, 82.9 km.
Taito, 164.2 km.
- (12) Vulnerable points (Marked with asterisk in text)
 - (a) Locomotive and marshalling facilities at Karenko and Taito.
 - (b) Bridges, particularly those over the Chyakan-k'e (26.3 km.), Chioq-kong-k'e (85.4 km.), Sin-bo-lo-k'e (115.7 km.), and Lok-liau-k'e (137.4 km.).
 - (c) Tunnel at 71.0 km.
- (13) Capacity
12 trains per day each way.
Net weight of military stores per train, 150/200 tons.

RAILWAYS

Distance from		Stations	Engineering works	Details and facilities
miles	km.			
*0	0	KARENKO	...	ES. Tbl. W. Small SY. J with narrow-gauge line south to Kaigan, c. $\frac{3}{4}$ mile, and thence north to Bi-lun, c. 2 miles. Line takes wide curve NW. and west.
$\frac{1}{2}$	0.9	...	...	Embankment begins.
1	1.6	...	...	Embankment ends.
$1\frac{1}{4}$	1.9	...	...	Line turns SW. and begins straight stretch, c. 4 miles.
$1\frac{1}{4}$	2.2	...	...	J (trailing) right, with sugar refinery line to Busegan-sia. Line crosses secondary road.
$1\frac{1}{2}$	2.3	POK-POK (? TORAN)	...	J with 2 ft. 6 in. gauge sugar refinery line from Busegan-sia.
$1\frac{1}{2}$	2.5	...	Bridge over river	...
3	4.7	YOSHINO	...	...
$3\frac{1}{4}$	5.1	...	...	Line crosses secondary road.
4	6.5	...	Bridge or culvert over stream	...
$4\frac{1}{4}$	6.9	...	Bridge or culvert over stream	...
5	8.2	HATSUNE	...	...
$5\frac{1}{4}$	8.5	...	...	Elevation marker, 81.6 m. Embankment begins.
$5\frac{1}{2}$	8.7	...	...	Line turns SSW. and begins straight stretch of c. $3\frac{3}{4}$ miles.
$5\frac{1}{2}$	8.8	...	Bridge over stream	...
* $5\frac{1}{2}$	9.0	...	Bridge over river Bak-kua-k'e	c. 660 ft.
*6	9.7	...	Bridge over river Bak-kua-k'e	c. 750 ft.
$6\frac{1}{4}$	10.2	...	...	Embankment ends.
$7\frac{1}{2}$	12.3	KADA	...	...
$8\frac{3}{4}$	14.1	...	Bridge over embankment and sugar refinery line	...
$9\frac{1}{4}$	14.9	...	...	Line turns SW. and begins straight stretch of c. $\frac{3}{4}$ mile.
* $9\frac{3}{4}$	15.7	...	Bridge over river Lau-k'e	c. 450 ft.
$9\frac{3}{4}$	15.9	...	...	Embankment begins.
10	16.2	...	...	Line crosses secondary road.
$10\frac{1}{4}$	16.7	...	...	Embankment ends.
$10\frac{1}{4}$	16.7	...	Bridge over river	...
$10\frac{1}{2}$	17.1	KOTOBUKI	...	J with Iam-tsui-kang sugar refinery line.
$10\frac{3}{4}$	17.5	...	Bridge or culvert over stream	...

Distance from KARENKO		Stations	Engineering works	Details and facilities
miles	km.			
12 $\frac{1}{4}$	19.8	TOYODA (? SUA-E-TOYODA)	...	Station lies at intersection of main and secondary roads; and runs alongside main road to Keiko.
13 $\frac{1}{2}$	22.0	...	Bridge or culvert over stream	...
14 $\frac{3}{4}$	23.9	KEIKO	...	...
15 $\frac{1}{4}$	24.4	...	...	Line begins wide curve westwards.
15 $\frac{3}{4}$	25.5	...	...	Elevation marker, 150.57 m. Line begins wide curve SW.
16	26.0	...	Bridge over river	...
16 $\frac{1}{4}$	26.1	...	...	Embankment begins.
*16 $\frac{1}{4}$	26.3	...	Bridge over river Chyakan-k'e	c. 1500 ft.
16 $\frac{3}{4}$	27.0	...	...	Line gradually curves SE.
17	27.5	...	...	Embankment ends.
17	27.7	HIRABAYASHI	...	J with sugar refinery lines.
18	29.1	...	...	Line gradually curves south.
18	29.2	...	...	Embankment begins.
18 $\frac{1}{4}$	29.6	...	Bridge over river Ch'ieng tsui-k'e	c. 300 ft.
18 $\frac{1}{2}$	29.8	...	...	Embankment ends. Line begins straight stretch c. 1 $\frac{1}{2}$ miles.
18 $\frac{3}{4}$	30.3	HAYSHIDA	...	...
19 $\frac{1}{2}$	31.6	...	...	Embankment begins.
20	32.4	...	...	Line turns SSW. and begins straight stretch c. 2 $\frac{1}{2}$ miles.
20 $\frac{1}{4}$	32.7	...	Bridge over stream	...
20 $\frac{1}{2}$	33.3	...	Bridge over stream	...
21	34.1	...	Bridge over (?) river	...
21 $\frac{1}{4}$	34.3	...	...	Embankment ends.
21 $\frac{1}{4}$	34.4	HORIN	...	J with sugar refinery lines. Elevation marker, 103.12 m.
21 $\frac{3}{4}$	35.2	...	...	Embankment begins.
22	35.7	...	Bridge over stream	...
22 $\frac{3}{4}$	36.7	...	...	Line turns west.
23 $\frac{1}{4}$	37.5	...	...	Embankment ends.
23 $\frac{1}{4}$	37.6	...	...	Line turns SW. and begins straight stretch, c. 2 $\frac{1}{2}$ miles.
23 $\frac{1}{2}$	37.9	...	Bridge over stream	...
*23 $\frac{1}{2}$	38.1	...	Bridge over river Ban-li-kio-k'e	c. 900 ft.

RAILWAYS

Distance from		Stations	Engineering works	Details and facilities
miles	km.			
24	38.8	...	...	Embankment ends.
24 $\frac{1}{2}$	39.4	MARIBASHI	...	...
25 $\frac{1}{2}$	41.1	...	...	Embankment begins.
25 $\frac{3}{4}$	41.5	...	...	Embankment ends.
26	41.9	...	...	Line curves SE.
26 $\frac{1}{2}$	42.6	...	Bridge over stream	...
26 $\frac{1}{2}$	42.8	...	...	Line turns south.
26 $\frac{1}{2}$	42.9	...	Bridge over river	...
26 $\frac{3}{4}$	43.0	...	...	Embankment begins. Line follows curving fringe of foothills.
27 $\frac{1}{2}$	44.2	...	...	Line curves south.
27 $\frac{3}{4}$	44.9	...	Bridge over stream	...
28 $\frac{1}{4}$	45.5	...	...	Embankment ends. Line begins straight stretch <i>c.</i> 2 $\frac{1}{2}$ miles.
28 $\frac{1}{2}$	45.8	...	...	<i>J</i> (facing) left, with sugar refinery line.
28 $\frac{1}{2}$	46.0	MA-T'A-AN	...	...
28 $\frac{3}{4}$	46.5	...	Bridge over river	<i>c.</i> 300 ft.
29 $\frac{1}{2}$	47.6	...	...	Line crosses secondary road.
30 $\frac{1}{2}$	49.4	...	...	Line curves SW.
30 $\frac{3}{4}$	49.7	...	...	Line finishes curves and begins straight section <i>c.</i> 1 $\frac{3}{4}$ miles.
31 $\frac{1}{4}$	50.5	...	...	Line crosses secondary road.
31 $\frac{1}{2}$	50.9	...	...	Embankment begins.
32 $\frac{1}{2}$	52.3	...	...	Embankment ends.
32 $\frac{1}{2}$	52.5	...	...	Line curves south.
32 $\frac{3}{4}$	52.8	...	...	Embankment begins.
33	53.1	...	Bridge over river Kararan-k'e	<i>c.</i> 300 ft.
33 $\frac{1}{4}$	53.6	...	...	Embankment ends.
33 $\frac{1}{2}$	54.0	YAMATO	...	...
33 $\frac{3}{4}$	54.7	...	...	Line takes wide curve SW. and runs alongside road.
34 $\frac{1}{4}$	55.3	...	Bridge over stream	...
34 $\frac{1}{2}$	55.7	...	...	Elevation marker, 168.38 m.
35	56.3	...	...	Line turns south.
35	56.5	...	...	Line crosses secondary road.
35 $\frac{1}{4}$	56.9	BASSHI	...	...
36 $\frac{1}{2}$	59.0	...	...	Line crosses secondary road, and turns SW.
36 $\frac{1}{2}$	59.1	...	...	Embankment begins.

Distance from		Stations	Engineering works	Details and facilities
miles	km.			
*36 $\frac{3}{4}$	59.4	...	Bridge over river Ma-lan-tio-k'e	c. 600 ft. Elevation marker, 134.81 m.
37	59.7	...	...	Line curves south.
37 $\frac{3}{4}$	60.9	...	...	Embankment ends.
38 $\frac{3}{4}$	62.4	...	Bridge over stream	...
38 $\frac{3}{4}$	62.6	...	...	Trig. point, 108.3 m.
39 $\frac{3}{4}$	64.2	...	...	Embankment begins.
40	64.5	...	Bridge over stream	...
40 $\frac{1}{4}$	64.8	...	Bridge over dry valley	...
40 $\frac{1}{2}$	65.3	...	Bridge over dry valley	...
41	65.9	...	...	Embankment ends.
41	66.0	...	...	Elevation marker, 98.9 m.
41	66.1	MIZUHO	...	Line crosses minor road. I. with push-car lines running east-west.
41 $\frac{1}{4}$	66.4	...	...	Line curves SW.
41 $\frac{3}{4}$	67.3	...	...	Embankment begins.
41 $\frac{3}{4}$	67.4	...	Bridge over dry valley	...
42	67.6	...	...	Embankment ends.
42	67.7	...	...	Line curves WSW.
42 $\frac{3}{4}$	69.0	...	...	Line curves SW.
43	69.3	...	...	Embankment begins. Elevation marker, 132.76 m.
43	69.5	...	Bridge over river Ang-hioq-k'e	c. 330 ft.
43 $\frac{1}{2}$	70.0	...	...	Embankment ends.
43 $\frac{1}{2}$	70.2	...	...	Line curves WSW.
44	70.7	...	...	Line gradually curves south.
*44	71.0	...	Tunnel	c. 3600 ft. Tunnel runs in straight line under foot-hills.
44 $\frac{1}{4}$	71.2	...	...	Line turns SE.
44 $\frac{1}{4}$	71.4	...	Bridge over (?) stream	...
45 $\frac{1}{4}$	72.8	...	Bridge over dry valley	... Line gradually curves SSW. and descends to level country.
45 $\frac{1}{2}$	73.2	...	...	Embankment begins. Line begins straight stretch, c. 2 $\frac{1}{2}$ miles.
45 $\frac{3}{4}$	73.9	...	...	Embankment ends.
			Bridge over dry valley	...
46 $\frac{1}{4}$	74.7	MIKASA	...	...
47 $\frac{3}{4}$	76.8	...	...	Line turns SW.
48 $\frac{3}{4}$	78.5	...	...	Elevation marker, 107.9 m.

RAILWAYS

Distance from		Stations	Engineering works	Details and facilities
miles	km.			
48 $\frac{3}{4}$	78.6	...	Bridge over river Tabira-k'e	Line turns south. c. 450 ft.
48 $\frac{3}{4}$	78.8	...	...	Embankment begins.
48 $\frac{3}{4}$	78.9	...	...	Line curves SE.
49	79.0	...	Bridge over (?) stream	...
49	79.2	...	...	Embankment ends.
49 $\frac{1}{4}$	79.5	...	...	Line curves south.
49 $\frac{1}{4}$	79.6	...	...	Line begins straight section, c. 2 $\frac{1}{2}$ miles.
49 $\frac{3}{4}$	80.1	...	Bridge or culvert, over stream	...
49 $\frac{3}{4}$	80.3	SUEHIRO	...	...
51	82.3	...	Bridge over dry valley	Embankment begins.
51 $\frac{3}{4}$	83.2	...	...	Embankment ends. Line curves SW.
51 $\frac{3}{4}$	83.4	...	...	Embankment begins.
52	83.9	...	...	Embankment ends.
52 $\frac{1}{4}$	84.0	...	Bridge over river To-k'e	Line turns SSW. c. 300 ft.
52 $\frac{1}{4}$	84.1	...	...	Embankment begins.
52 $\frac{1}{4}$	84.3	...	...	Embankment ends.
53	85.3	...	...	Line turns south.
53 $\frac{1}{4}$	85.6	...	...	Line crosses secondary road.
53 $\frac{1}{4}$	85.7	...	Bridge or culvert over stream	...
*53 $\frac{1}{4}$	85.9	TAMAZATO	...	ES. W.
53 $\frac{3}{4}$	86.5	...	...	Line gradually curves east.
53 $\frac{3}{4}$	86.8	...	Bridge over stream	...
54	86.9	...	...	Embankment begins.
54	87.2	...	Bridge over stream	...
54 $\frac{1}{4}$	87.3	...	...	Trig. point, 133.2 m. Embankment ends.
54 $\frac{1}{4}$	87.6	...	...	Embankment begins.
54 $\frac{1}{2}$	87.7	...	Bridge over stream	...
*54 $\frac{3}{4}$	88.4	...	Bridge over river Chioq-kong-k'e	c. 1500 ft.
55 $\frac{1}{4}$	89.1	...	...	Line gradually curves south.
55 $\frac{1}{2}$	89.3	...	...	Embankment ends.
55 $\frac{1}{2}$	89.5	...	Bridge over river	...
56	90.0	...	...	Line curves SSW.
56 $\frac{1}{4}$	90.7	...	...	Embankment begins.
56 $\frac{1}{2}$	91.0	(?) ANTSU	...	...

<i>Distance from</i>		<i>Stations</i>	<i>Engineering works</i>	<i>Details and facilities</i>
<i>miles</i>	<i>km.</i>			
	KARENKO			
56½	91.2	...	...	Embankment ends.
56¾	91.3	...	...	Line turns south.
56¾	91.5	...	Bridge over tributaries of river Chioq-kong-k'e	c. 300 ft. Elevation marker, 139.75 m.
57	91.9	...	...	Line curves SW.
58¼	93.8	...	Bridge over stream	...
58¼	93.9	...	...	Elevation marker, 149.2 m.
58½	94.0	...	...	Line turns further SW.
58¾	94.8	...	Bridge over stream	...
59	95.2	...	...	Line crosses main road.
59¼	95.5	TAISHO	...	...
59½	95.7	...	Bridge over river	c. 300 ft.
59½	96.0	...	...	Line gradually curves SSW.
60¼	97.1	...	Bridge over river A-bai-k'e	c. 300 ft.
61	98.3	...	...	Line turns SW.
61¾	99.5	...	...	Line gradually curves south.
62½	100.5	...	...	Elevation marker, 186.55 m.
62¾	101.1	...	Bridge over stream	...
63	101.5	T'AU-LANG-PO	...	...
63½	102.2	...	Bridge over river Kau-hua-k'e	c. 300 ft.
63¾	102.5	...	...	Line turns SSW.
64	103.1	...	...	Embankment begins.
64¼	103.5	...	...	Embankment ends.
65	104.5	...	...	Embankment begins.
*65	104.7	...	Bridge over tributary of river Shykoran	c. 540 ft. Embankment ends.
65½	105.3	...	...	Line turns SW.
65½	105.3	...	Bridge over river	...
66¼	106.8	...	...	Elevation marker, 210.94 m.
66¾	107.5	...	...	Line turns SSW.
67	108.0	KOHO	...	...
				J with sugar refinery line.
*67½	108.7	...	Bridge over river Piq-k'e	c. 600 ft.
68	109.3	...	Bridge over river	c. 300 ft.
68¼	109.8	...	...	Embankment begins.
68¼	109.9	...	...	Line gradually curves SE.
68½	110.3	...	...	Embankment ends. Line curves south and runs between river and road for c. ¾ mile.

RAILWAYS

<i>Distance from KARENKO miles • km.</i>	<i>Stations</i>	<i>Engineering works</i>	<i>Details and facilities</i>
69 111.0	Elevation marker, 264.08 m.
69½ 112.2	...	Bridge over stream	Road comes to an end.
70 112.7	...	Bridge over stream	Embankment begins. Line gradually turns SW.
70 112.9	Elevation marker, 258.29 m.
70¼ 113.0	...	Bridge over stream	Embankment ends. ...
70¾ 114.0	Embankment begins.
71 114.3	...	Bridge over river	...
71¼ 114.7	Embankment ends.
71¾ 114.9	IKEGAMI	...	...
71¾ 115.6	Line turns west.
73½ 118.2	Embankment begins. Line gradually curves SW.
*73¾ 118.7	...	Bridge over river Sin-bu-lo-k'e	c. 1350 ft.
74¼ 119.6	Line reaches foothills and turns SSW.
74½ 120.0	Line curves SSE.
74½ 120.1	...	Bridge over stream	Embankment ends. ...
75¼ 121.0	SHIMBURO *	...	...
75½ 121.5	Line turns south.
75½ 121.6	Line crosses road and runs beside it.
76¾ 123.5	Line recrosses road. Elevation marker 263.26 m.
76¾ 123.6	Line turns SSW.
77¾ 125.4	Elevation marker 242.98 m.
79 127.0	...	Bridge or culvert over stream	...
79 127.3	RIRYU	...	Elevation marker 220.17 m.
79½ 128.1	Line curves SE. and south.
79¾ 128.3	...	Bridge over stream	...
80¾ 129.9	Line completes wide loop and curves west.
80¾ 130.0	Line crosses road.
81 130.2	Line gradually curves SW. and south.
81½ 131.3	Line curves SE.
81¾ 131.6	Line recrosses road.
82 131.8	HOKITSU	...	...
82 131.9	Line turns south.
82¼ 132.4	Line curves SE.
82½ 132.8	Line curves south.

<i>Distance from</i>		<i>Stations</i>	<i>Engineering works</i>	<i>Details and facilities</i>
<i>miles</i>	<i>km.</i>			
KARENKO				
82 $\frac{3}{4}$	133.2	...	...	Line begins SW.-SE. loop.
83 $\frac{1}{4}$	133.9	...	...	Line completes loop, and curves south.
83 $\frac{3}{4}$	134.9	...	...	Line curves SE.
83 $\frac{3}{4}$	135.0	TAIHOKU	...	...
84 $\frac{1}{4}$	135.5	...	...	Line turns SSE.
85 $\frac{1}{4}$	137.1	...	...	Line turns south.
85 $\frac{3}{4}$	138.0	Station	...	...
86 $\frac{1}{2}$	139.4	...	...	Line crosses 160 m. contour-line. Line curves SW.
*87 $\frac{1}{4}$	140.4	...	Bridge over river Lok-liau-k'e	c. 1800 ft.
87 $\frac{1}{4}$	140.6	...	...	Line crosses road and gradually curves south.
87 $\frac{3}{4}$	141.3	...	...	Line recrosses road, curves SW.
88 $\frac{1}{4}$	142.0	...	...	Line turns SSW.
88 $\frac{3}{4}$	142.9	...	...	Line curves south.
88 $\frac{3}{4}$	143.1	Station	...	...
89 $\frac{3}{4}$	144.6	...	...	Line curves SE.
90	145.1	...	...	Line turns south.
*90 $\frac{1}{2}$	145.8	...	Bridge over river Pak-si-k'au-k'e	c. 900 ft.
90 $\frac{3}{4}$	145.9	...	...	Line curves east.
91	146.4	...	...	Line enters foothills.
91 $\frac{1}{2}$	147.3	INABA	...	...
91 $\frac{3}{4}$	147.6	...	Bridge over valley	...
92 $\frac{3}{4}$	149.2	...	...	Line runs along edge of foothills.
93 $\frac{1}{4}$	150.0	...	...	Line turns SW.
93 $\frac{1}{2}$	150.4	...	Bridge over stream	...
93 $\frac{3}{4}$	150.9	...	...	Line curves SE. and south.
94	151.4	...	...	Elevation marker, 241.86 m. Line gradually curves east and SW.
94 $\frac{1}{2}$	152.3	HASHIKAO	...	...
94 $\frac{3}{4}$	152.6	...	...	Line turns south.
95	153.1	...	...	Line crosses road, and runs close beside it.
95 $\frac{1}{2}$	153.8	...	...	Elevation marker, 209.02 m.
95 $\frac{3}{4}$	154.2	...	...	Line turns SE.
96	154.6	...	...	Line turns south.
96 $\frac{3}{4}$	155.8	...	...	Line takes wide curve SW. and south, away from road.
97	156.1	...	Bridge over dry valley	...
				Line completes curve and rejoins road.

Distance from		Stations	Engineering works	Details and facilities
miles	km.			
KARENKO				
97½	157.0	...	...	Line begins wide curve SW.-south-SE.
98	157.7	...	...	Line completes curve and turns south.
98	158.0	...	...	Line turns east and crosses road.
98¼	158.1	...	Bridge over dry valley	c. 300 ft.
98¼	158.3	...	...	Line curves SSE.
98½	158.5	HINASHIKI	...	Line crosses road.
99	159.4	...	...	Line turns SE. and begins straight stretch c. 2 miles.
99¼	159.6	...	...	Elevation marker, 85.21 m.
99¾	160.4	...	...	Elevation marker, 56.36 m.
101½	163.4	...	...	Line turns farther SE. and begins straight stretch c. 2 miles.
102	164.2	...	...	Line crosses road.
102¼	164.5	...	...	Line crosses sugar refinery line.
102½	164.8	BARAN	...	...
102¾	165.3	...	Bridge over dry valley	...
103½	166.6	...	...	Line curves SSE.
103½	166.8	...	Bridge over stream	..
103¾	166.9	...	...	Line turns SE.
*103¾	167.2	TAITO	...	ES. Tbl. W. Small SY. Line proceeds through the town to the port, when it turns north and west to describe a circle, rejoining the main line at Baran.
104	167.4	...	...	Line crosses road.
104	167.6	...	...	Line gradually curves east and NE.
104¼	168.0	...	Bridge over lagoon	...
104¾	168.5	...	...	Line crosses minor road.
104¾	168.7	...	...	J (facing) right, with short DES. line to coast, crossing lagoon by bridge c. 200 ft. Line turns NW.
105¼	169.5	...	...	Line crosses main road.
105½	169.9	...	...	Line curves SW.
106¼	171.0	...	...	Line curves NW., rejoining main line from Karenko.
107¼	172.7	BARAN	...	Line connects with main line at Baran.

WEST COAST LINES

1. Shinchiku-Ma-lin-ts'u-Po-lo-bun

(Plans 15, 17, 31A)

This line starts at Shinchiku main railway station and runs north to Ma-lin-ts'u (about 3 miles), where there is a junction (facing) right to E-sua.

At Ma-lin-ts'u line turns west and then north-west, reaching the coast at about 6¾ miles. Here it gradually curves east, leaving the coast, and reaches the main Chikunan-Taiko-Shoka line (Route 5) at Po-lo-bun (121°2'E., 24°53'N).

The line runs through flat country crossing several large rivers.

Length: c. 11¼ miles.

Gauge: 2 ft. 6 in.

Bridges (principal)

At (miles)

Over

1½ river T'au-chieng-k'e. c. 900 ft.

2 river. c. 900 ft.

4½ river Hong-sua-k'e. c. 950 ft.

Tunnels: None.

2. Ma-lin-ts'u-E-sua (Plans 15, 17)

At Ma-lin-ts'u line curves east, crossing the main road and railway (Route 5) at $1\frac{3}{4}$ miles. Line also crosses a stream at this point, and follows a south-easterly course down the wide T'au-chieng-k'e valley to E-sua. At $\frac{3}{4}$ mile before E-sua, junction (facing) right, with short dead-end spur, about $\frac{1}{2}$ mile long.

Line runs through flat country with several rivers.

Length: $6\frac{3}{4}$ miles.

Gauge: 2 ft. 6 in.

Bridges (*principal*)

At (miles)	Over	
$1\frac{3}{4}$	river.	c. 600 ft.
$2\frac{3}{4}$	river.	c. 600 ft.
$5\frac{1}{2}$	river.	c. 600 ft.
$6\frac{1}{4}$	river.	c. 600 ft.

Tunnels: None.

3. Shinchiku-Kyuko (Plans 15, 31A)

Line runs north-west from Shinchiku through flat country to Kyuko on the coast, crossing the mouth of the river T'au-chieng-k'e just before reaching Kyuko.

Length: $3\frac{1}{2}$ miles.

Gauge: 2 ft. 6 in.

Bridges (*principal*)

Over river T'au-chieng-k'e. c. 750 ft.

Tunnels: None

4. Shinchiku-Lam-iu-ch'ia-kang

(Plans 15, 31A)

Line runs west from Shinchiku, turning north after about 2 miles and running parallel with coast.

Line takes uneventful course through flat country to Lam-iu-ch'ia-kang ($120^{\circ}54'E.$, $24^{\circ}50'N.$)

Length: $2\frac{3}{4}$ miles.

Gauge: 2 ft. 6 in.

Bridges (*principal*): None.

Tunnels: None.

5. Koryu-Hokusei-T'au-ts'u (Plan 15)

Line runs in an easterly direction, following valley of river Au-lieng-k'e.

Between Koryu and Hokusei (about $2\frac{1}{4}$ miles), line follows an uneventful course, keeping close to the river at first and then branching inland.

At Hokusei it crosses the main Chikunan-Byoritsu-Shoka line (Route 4) and continues to T'au-ts'u ($120^{\circ}50'E.$, $24^{\circ}35'N.$).

Length: 5 miles.

Gauge: 2 ft. 6 in.

Bridges (*principal*)

At (miles)	over	
$2\frac{3}{4}$	river.	
$3\frac{1}{2}$	river.	
$3\frac{1}{2}$	stream.	
5	river.	

Tunnels: None.

6. Twa-a-kang-Taiko-Kori (Plan 15)

Line follows a winding course eastwards from the coast at Twa-a-kang ($120^{\circ}35'E.$, $24^{\circ}20'N.$) and crosses several rivers.

At (miles)

$2\frac{3}{4}$	J (trailing) left, with narrow-gauge dead-end line running north c. $4\frac{1}{4}$ miles.
$3\frac{1}{4}$	J (trailing) right, with narrow-gauge dead-end line running west c. $2\frac{1}{2}$ miles.
$3\frac{1}{2}$	Line crosses main road.
$3\frac{3}{4}$	Line crosses the main Chikunan-Taiko-Shoka line (Route 5) by a bridge, then curves north, crosses a secondary road, curves east and follows a winding course to Kori, on the main Chokunan-Byoritsu-Shoka line (Route 4).

Length: 14 miles.

Gauge: 2 ft. 6 in.

Bridges (*principal*): At 1 mile, over river.

Tunnels: None.

Line runs through gradually rising country, making several curves and crossing several streams.

7. E-gu-po-Kiyomizu

(Plan 15)

Line runs south from E-gu-po ($120^{\circ}3'E.$, $24^{\circ}18'N.$) to Kiyomizu, on main Chikunan-Taiko-Shoka line (Route 5).

Line crosses the delta of the river Taiko immediately after leaving E-gu-po. Three river-crossings are followed by a bridge over an arm of the Taiko-kei and another bridge over a stream, all within one mile of leaving E-gu-po.

At $1\frac{1}{2}$ miles, line turns east and then south, crossing several more rivers before reaching Kiyomizu.

Length: $2\frac{3}{4}$ miles.

Gauge: 2 ft. 6 in.

Bridges (*principal*): At $\frac{1}{4}$ mile, over arm of river Taiko.

Tunnels: None.

8. Gosei-Sharoku

(Plan 15)

Line leaves coast at Gosei ($120^{\circ}30'E.$, $24^{\circ}15'N.$) and runs practically in a straight line eastwards to Sharoku, on main Chikunan-Taiko-Shoka line (Route 5). Line crosses main line just north of Sharoku, where it connects with (?) narrow-gauge dead-end lines running north and south. Line runs through flat country, crossing several streams.

Length: $2\frac{1}{2}$ miles.

Gauge: 2 ft. 6 in.

Bridges (*principal*)

At $\frac{1}{4}$ mile, 2 over streams.

At $\frac{3}{4}$ mile, over stream.

Tunnels: None.

9. Hogen-Kan-a-e-Tsui-te-liau

(Plan 15)

Line runs north-east from Hogen on main Chikunan-Byoritsu-Shoka line (Route 4), and then takes wide bend east and south, following valley of river Taiko.

Line runs through wide, flat valley for about 3 miles after leaving Hogen, after which the valley becomes narrower and line skirts foothills.

At Kan-a-e, about 7 miles from Hogen, I. with push-car line running along opposite side of valley. Line turns west, away from river, and then takes S-bend before finally turning south for Tsui-te-liau ($120^{\circ}50'E.$, $24^{\circ}10'N.$).

Length: 12 miles.

Gauge: 2 ft. 6 in.

Bridges (*principal*): At $1\frac{3}{4}$ miles, over river. c. 300 ft.

Tunnels: None.

10. E-ki-k'au-Shoka

(Plan 15)

Line follows winding course, mainly east and south from E-ki-k'au ($120^{\circ}25'E.$, $24^{\circ}7'N.$) to Shoka (Routes 4 and 5) through flat country.

At (miles)

$1\frac{3}{4}$	J (trailing) right, with narrow-gauge dead-end line running south and west, c. $2\frac{3}{4}$ miles.
$2\frac{3}{4}$	J (trailing) right, with narrow-gauge line from Rokko.
4	J (trailing) left, with line from Wabi ($120^{\circ}30'E.$, $24^{\circ}6'N.$).
$4\frac{1}{2}$	Sin-ko sugar refinery.
$4\frac{3}{4}$	J (trailing) left, with dead-end line running north, c. $1\frac{1}{4}$ miles.
$5\frac{1}{2}$	J (trailing) right, with line running south to join Shoka-Rokko line.

Length: 7 miles.

Gauge: 2 ft. 6 in.

Bridges (*principal*): None. Numerous bridges over streams.

Tunnels: None.

11. Shoka-Rokko-Keiko

(Plans 14, 15)

From Shoka (Routes 4 and 5) to Rokko ($120^{\circ}25'E.$, $24^{\circ}5'N.$) line runs westwards through flat country, crossing two rivers and several streams.

From Rokko to Keiko line runs mainly south-east and south through similar country, crossing one river and numerous streams.

At (miles)

- 1 *J* (facing) left, with narrow-gauge line running south to Lam-nga, *c.* 3 miles SE. of Inrin (Route 6).
 1½ *J* (trailing) right, with connexion to E-ki-k'au-Shoka line.
 1¾ *J* (facing) left, with dead-end line running south *c.* 3¾ miles.
 3¼ *J* (facing) left, with dead-end line running south *c.* 5 miles.
 3¼ *J* (facing) left, with dead-end line running south *c.* 5 miles.
 6¾ Rokko.
 12½ *J* (trailing) right, with line running north *c.* 4¾ miles.
 14 *J* (trailing) left, with Inrin-Nirin line.
 14 Keiko sugar refinery.

Length: 14 miles.

Gauge: 2 ft. 6 in.

Bridges (principal)

At (miles)	Over
1½	river.
2¾	river.
8¼	river.

Tunnels: None.

12. Inrin-Keiko-Nirin-Keishu-Tieng-ts'an-bue-Inrin (Plan 14)

This circular route runs through flat coastal country, crossing several large rivers and numerous smaller ones.

At (miles)

- 4 From Inrin (Route 6). *J* (trailing) right, with Shoka-Rokka-Keiko line.
 4 Keiko.
 7 *J* (facing) right, with dead-end line from west, *c.* 9¼ miles.
 7¼ *J* (facing) left, with dead-end line from south, *c.* 4 miles.
 9¾ Nirin.
 11¼ *J* (trailing) right, with dead-end line from west, *c.* 3 miles.
 11½ Station.
 12½ Station, and *J* (trailing) right, with line to Tua-sia, *c.* 4½ miles SW. of Nirin.
 15 Station (Tiek-tong).
 15¾ *J* (trailing) left, line running north to Go-tsng-a, *c.* 2¼ miles.
 16¾ Station (Tau-lak-kaq).
 17½ *J* (trailing) right, with dead-end line running SW. to bank of Seira river, *c.* 2½ miles.
 18¼ *J* (trailing) right, with dead-end line running SW., *c.* 1¼ miles.
 19 *J* (facing) right, with dead-end line from SE., *c.* 3 miles.
 19¼ Keishu.
 20¾ *J* (facing) right, with line from Hokuto, *c.* 2¼ miles.
 22 Pak-se-liau.
 22¾ *J* (facing) left, with dead-end line from north, *c.* 6¼ miles.
 23 Tieng-ts'an-bue. *J* (trailing) right, with line running south to Hokuto, *c.* 1½ miles.
 23½ *J* (trailing) right, with line to Tanaka. Line reaches main road and proceeds along it to Inrin.

Length: 28¼ miles.

Gauge: 2 ft. 6 in.

Bridges (principal)

At (miles)	Over	
½	road.	<i>c.</i> 300 ft.
6	river Beq-su-ts'u-k'e.	<i>c.</i> 450 ft.
21	river Tak-tsui-k'e.	<i>c.</i> 450 ft.
22½	arm of river Beq-su-ts'u-K'e.	<i>c.</i> 300 ft.

Tunnels: None.

13. Tieng-ts'an-bue-Tanaka (Plan 14)

Line runs in a south-easterly direction through flat country, connecting Tieng-ts'an-bue, on the Inrin circular line, with Tanaka (Route 6). Line crosses a few rivers.

At ¼ mile. Line crosses the main road. There are two stations, at 1¾ miles and 2¾ miles respectively.

Length: 4¾ miles.

Gauge: 2 ft. 6 in.

Bridges (principal): At 4 miles over river Pueq-pots'un.

Tunnels: None.

14. Nanto-Nama-Nisui (Plan 14)

This line is called the Meiji sugar refinery line, and continues southwards down the valley followed by the standard-gauge Teiko Ku sugar refinery line (the latter running between Taichu (Route 4) and Nanto). The line closely follows the road, which it crosses several times; it also crosses several rivers.

At Nama it turns south-west and runs parallel with the standard-gauge Nisui-Nama-Chip-chip-tua-sua line to Nisui.

At (miles)

- 1¾ Sin-k'e station.
 4½ Nama. Line runs almost straight for 3¼ miles, skirting foothills, and then turns west.
 9¼ Pi-a-t'au station. Line turns NW. following straight stretch to Nisui.

Length: 11 miles.

Gauge: 2 ft. 6 in.

Bridges (principal)

At (miles)	Over
2½	river.
7	river.

Tunnels: None.

15. Toroku-K'am-t'au-ts'u (Plan 14)

This line runs mainly south from Toroku (Route 6) through low-lying country with several rivers and streams.

At (miles)

- 2¼ *J* (trailing) left, with dead-end line from NE., *c.* 4¼ miles.
 2¼ Triangular *J* with line running east to Tua-lun, *c.* ¼ mile. Line turns west.
 2¾ *J* (facing) right, with dead-end line to the east, *c.* 3 miles. Line turns south.
 4¾ Kang-ts'u-a station.
 4¾ *J* (facing) right, with dead-end line running south and SW., *c.* 4 miles.
 6 Ko-ke station.
 7¼ Kam-t'au-ts'u.

Length: 7¼ miles.

Gauge: 2 ft. 6 in.

Bridges (principal)

At (miles)	Over
½	tributary of river Ho-bue-k'e.
2¾	tributary of river Ho-bue-k'e.
3½	river.
6¼	valley.

Tunnels: None.

16. Si-tsu-liau } Go-te-ts'u-Lam'a-Tonan Sua-lun-au }

(Plan 14)

At Go-te-ts'u (120°20'E., 23°45'N.) the lines from Si-tsu-liau (about 3½ miles) and Sua-lun-au (about 4¼ miles) combine, the line then continuing east and SE. to Tonan (Route 6). At Lam'a the line becomes part of the Dai Nippon sugar refinery line network (Lam'a-Kobi-Hokko). The whole line runs through low-lying country and crosses numerous rivers, the largest being the Sin-ho-bue-k'e.

<i>At (miles)</i>	
5½	from Go-te-ts'u
	<i>J</i> (trailing) left, with line from Seira. Line turns south.
5¾	Lam'a.
6	<i>J</i> (trailing) left, with dead-end line running east, <i>c.</i> 8 miles.
9	Bue-liau station.
10	<i>J</i> (facing) left, with connecting line to dead-end line running east from Kobi.
10½	Kobi. <i>J</i> with dead-end line running eastwards, <i>c.</i> 8¾ miles. Also <i>J</i> with Kaiko-Tonan line.
11¾	<i>J</i> (facing) right, with dead-end line running south, <i>c.</i> 4¾ miles.
12¾	Sin-ts'u station.
13	<i>J</i> (facing) left, with dead-end line running NE., <i>c.</i> 5½ miles.
14½	Line crosses main road and turns north to Tonan.

Length (including branch lines to Si-tsu-liau and Su-lun-au): 22¼ miles.

Gauge: 2 ft. 6 in.

Bridges (principal)

<i>At (miles)</i>	<i>Over</i>
6¼ (from Go-te-ts'u)	river Sin-ho-bue-k'e. <i>c.</i> 1350 ft.
10¾ (from Go-te-ts'u)	river Ho-bue-k'e. <i>c.</i> 600 ft.

Tunnels: None.

17. Seira-lam'a (Plan 14)

This short line is the connecting link between Seira, on Seira river (120°25'E., 23°48'N.) and the Lam'a-Kobi-Tonan-Hokko network, which it joins at Lam'a.

Line runs SE. and south through level country, and crosses numerous streams.

Length: 5½ miles.

Gauge: 2 ft. 6 in.

Bridges (principal): None.

Tunnels: None.

18. Kaiko-Tonan (Plan 14)

Line begins near the coast at Kaiko (120°10'E., 23°40'N.) and runs east to Kobi, where it joins the Lam'a-Kobi-Tonan line. Line runs through low-lying country, crossing several rivers.

<i>At (miles)</i>	
1½	<i>J</i> (trailing) right, with dead-end spur running south, <i>c.</i> 1½ miles.
3	<i>J</i> (trailing) left, with dead-end spur running north, <i>c.</i> 1¼ miles.
3½	<i>J</i> (trailing) right, with line from Tang-se-ts'u, <i>c.</i> ¾ mile.
6¾	<i>J</i> (facing) left, with line making detour north and east and rejoining original line <i>c.</i> 1 mile before reaching Kobi.
12¾	<i>J</i> (trailing) right, with line from Hokko.
13½	Station.
15	<i>J</i> (trailing) left, with detour line.
16	Kobi.

From Kobi to Tonan line continues as described in Go-te-ts'u-Lam'a-Tonan route. (See p. 62.)

Length: 20¾ miles.

Gauge: 2 ft. 6 in.

Bridges (principal)

<i>At (miles)</i>	<i>Over</i>
2¼	river.
15¼	river.
16¼	river Ho-bue-k'e. <i>c.</i> 600 ft.

Tunnels: None.

19. Tonan-Hokko-Shinko-Kagi (Plans 14, 29A)

From Tonan (Route 6) line runs eastwards to Kobi, and thence turns south to Hokko. From Hokko it runs south-east to Shinko and Kagi (Route 6). Section Kobi-Hokko is Dai Nippon sugar refinery

line; and section Shinko-Kagi is Toyo sugar refinery line. Line follows winding course through characteristic low-lying country, and crosses two large rivers and several smaller ones.

<i>At (miles)</i>	
1¾	<i>J</i> (trailing) right, with dead-end line running NE., <i>c.</i> 5½ miles.
2	Sin-ts'u station.
3	<i>J</i> (trailing) left, with dead-end line running south, <i>c.</i> 4¾ miles.
4	Bridge over river Ho-bue-k'e.
4¼	<i>J</i> (trailing) right, with dead-end line running eastwards, <i>c.</i> 8¾ miles.
4½	Kobi.
5½	<i>J</i> (facing) right, with branch line to Kaiko.
7	Station.
7¾	<i>J</i> (facing) right, with line to Kaiko.
8½	To-k'o.
9¼	<i>J</i> (facing) left, with detour line running south and rejoining line <i>c.</i> 3 miles before Hokko.
11½	Pun-ki-o station.
12½	<i>J</i> (facing) right with dead-end line running SW., <i>c.</i> 4½ miles.
13¼	Tsu-bo station.
15¾	(?) Guan-tio station.
16¼	Station.
18¾	<i>J</i> (facing) left, with detour line mentioned at 9¼ miles.
19¾	Sin-ke station.
21¾	Hokko. <i>J</i> with lines from O'kau and Gi-go. Just after leaving Hokko line crosses river Pak-kang-k'e.
23	Pan-t'au-ts'u station. Line crosses another line running from dead-end in north to Una-Kagi line in south.
24¾	Shinko. <i>J</i> with Shinko-Koume line.
26¾	Station. Just before station line crosses another line running from dead-end in south to join Shinko-Koume line.
28¼	Sa-kieng-tiam station.
28¾	Line crosses river Gu-tiau-k'e.
32	Station. Line crosses Lam-tse-Kagi line.
32¾	Kagi. Triangular <i>J</i> with Una-Kagi line.

Length: 32¾ miles.

Gauge: 2 ft. 6 in.

Bridges (principal)

<i>At (miles)</i>	<i>Over</i>
4	river Ho-bue-k'e. <i>c.</i> 600 ft.
22	river Pak-kang-k'e. <i>c.</i> 750 ft.
28¾	river Gu-tiau-k'e. <i>c.</i> 450 ft.

Tunnels: None.

20. O'kau }-Hokko (Plan 14)

The lines from O'kau (120°10'E., 23°35'N.) and Gi-go (120°10'E., 23°32'N.) run eastwards towards Hokko (120°20'E., 23°34'N.), as separate branches until 4½ miles before Hokko when they combine into one line. Lines run through flat, coastal country, crossing several rivers.

<i>At (miles)</i>	
1¼	from O'kau Station.
2½	<i>J</i> (trailing) left, with dead-end line running NW., <i>c.</i> ¾ mile.
3½	Station.
4	<i>J</i> (trailing) right, with line from Gi-go.

The line from Gi-go starts by crossing a river, and then continues NE. until it crosses another river at 4 miles, and joins the line from O'kau at 5 miles.

<i>At (miles)</i>	
1	from <i>J</i> Tsui-na station.
2¼	<i>J</i> (trailing) left, with dead-end line running west, <i>c.</i> 8¼ miles.
3¾	<i>J</i> (trailing) right, with dead-end line running SW., <i>c.</i> 7¼ miles.

At (miles) Also *J* (trailing) left, with dead-end line running NW., c. $4\frac{3}{4}$ miles.
 $4\frac{1}{4}$ Hokko.
 Length (including branches from O'kau and Gi-go): $13\frac{1}{4}$ miles.
 Gauge: 2 ft. 6 in.
 Bridges (principal)
 At (miles) Over
 $2\frac{3}{4}$ from O'kau river.
 Gi-go river.
 4 from Gi-go river.
 Tunnels: None.

21. Shinko-Koume (Nitaka sugar refinery line) (Plan 14)

This line runs north-east from Shinko ($120^{\circ}20'E.$, $23^{\circ}32'N.$) to Koume ($120^{\circ}30'E.$, $23^{\circ}33'N.$). It runs through flat country, crossing numerous rivers, and crosses the main line 2 miles north of Tairin (Route 6).

At (miles)
 Shinko *J* with Tonan-Hokko-Shinko-Kagi line.
 $2\frac{3}{4}$ Pi-a-t'au station.
 $4\frac{1}{4}$ (?) K'e k'au station.
 $5\frac{3}{4}$ *J* (trailing) right, with dead-end line running SW., c. $6\frac{1}{2}$ miles.
 Also *J* (trailing) right, with dead-end line running south, c. $6\frac{1}{2}$ miles.
 6 Station.
 $6\frac{3}{4}$ Bridge over river.
 7 Station.
 8 *J* (facing) right, with dead-end line running south and east, c. $9\frac{1}{2}$ miles.
 9 Triangular *J* with branch line to Tairin (Route 6).
 $9\frac{1}{2}$ Station.
 $10\frac{1}{2}$ Station. Line crosses main line (Route 6).
 $11\frac{1}{2}$ *J* (facing) right, with dead-end line running south c. 4 miles.
 14 *J* (facing) right, with dead-end line running SW., c. $1\frac{3}{4}$ miles.
 $14\frac{1}{4}$ Station.
 $15\frac{3}{4}$ Bridge over river.
 17 Koume.
 Length: 17 miles.
 Gauge: 2 ft. 6 in.
 Bridges (principal)
 At (miles) Over
 $2\frac{1}{2}$ river.
 $6\frac{3}{4}$ river Sa-t'iap-k'e. c. 450 ft.
 $15\frac{3}{4}$ river.
 Tunnels: None.

22. Una-Kagi (Plans 14, 29A)

This line runs eastwards from the coast to Kagi, the final section being the Meiji sugar refinery line. Line runs through low-lying country and crosses several rivers and streams.

From Una ($120^{\circ}10'E.$, $23^{\circ}25'N.$) line runs north and then turns east.

At (miles)
 $\frac{3}{4}$ Bridge over river.
 $1\frac{1}{2}$ Siang-lian-t'am station and line crosses road to Toseki.
 $4\frac{1}{2}$ Bokushi.
 $6\frac{3}{4}$ Station.
 8 *J* (trailing) left, with dead-end lines running west, c. $7\frac{1}{2}$ miles, and north, c. 8 miles.
J (trailing) right, with dead-end line running south, c. $5\frac{3}{4}$ miles. Station.
 $8\frac{1}{4}$ *J* (facing) right, with dead-end line running SE., c. 3 miles.
 9 Bridge over river.
 $9\frac{3}{4}$ Station.
 $10\frac{3}{4}$ (?) K'e-lam station.
 $12\frac{1}{2}$ (?) Kue-kau station.
 Line crosses detour. Line running north and east from Lam-tse, $1\frac{1}{2}$ miles SW. of Mizukami (Route 6).

At (miles)
 14 Station.
 $15\frac{1}{2}$ Station.
 Line crosses Lam-tse-Kagi line.
 $17\frac{1}{2}$ Kagi. Triangular *J* with Tonan-Hokko-Shinko-Kagi line.
 Length: $17\frac{1}{2}$ miles.
 Gauge: 2 ft. 6 in.
 Bridges (principal)
 At (miles) Over
 $\frac{3}{4}$ river. c. 300 ft.
 5 road.
 9 river. c. 300 ft.
 Tunnels: None.

23. Kagi-Hui-long (Arisan line) (Plan 14)

This timber line, which is government owned, runs eastwards from Kagi (Route 6). It crosses the plain and then enters the mountains, where it follows an extremely winding course with numerous tunnels and the famous 'Arisan Spiral' (photographs C2, 22, 24).

At (miles)
 $\frac{3}{4}$ Station.
 $1\frac{1}{2}$ *J* (trailing) left, with Lam-tse-Kagi line.
 $1\frac{3}{4}$ Bridge over river.
 4 Uan-kio station.
 $6\frac{1}{4}$ Station.
 $8\frac{1}{4}$ Takesaki. Valley becomes narrower and line begins to climb into mountains.
 $8\frac{1}{2}$ Bridge over river Gu-tiau-k'e (?) Gioto-thei (photograph C23).
 11 Tuan-ts'u-liu station.
 $13\frac{1}{4}$ Station.
 $13\frac{1}{2}$ 'Arisan Spiral' (photograph C2).
 $17\frac{1}{2}$ Station.
 $19\frac{1}{2}$ Station.
 $22\frac{1}{4}$ Tsui-ch'ia-liu station.
 $25\frac{1}{2}$ Hunk'i-o station (photograph C12).
 $25\frac{3}{4}$ Bridge.
 26 Bridge.
 $26\frac{1}{4}$ Bridge.
 28 To-lo-ian station.
 30 Tsap-dzi-lo station.
 33 Pe-chia-na station.
 $34\frac{3}{4}$ Station.
 $36\frac{1}{4}$ Dzi-ban-pe station.
 $37\frac{3}{4}$ Station.
 $39\frac{1}{4}$ Chiu-pe station.
 $43\frac{1}{2}$ Bian-gueq station.
 $46\frac{1}{4}$ Line passes village of Hui-tong.
 $47\frac{1}{2}$ Line reaches Chikusan-Nitaka boundary and ends.

Length: $47\frac{1}{2}$ miles.

Gauge: 2 ft. 6 in.

Bridges (principal)

At (miles) Over
 $1\frac{3}{4}$ river.
 $8\frac{1}{2}$ river Gu-tiau-k'e. c. 450 ft.
 $25\frac{3}{4}$ valley.
 26 valley.
 $26\frac{3}{4}$ valley.

Tunnels: (N.B. All tunnels are on curves, unless otherwise stated.)

At (miles)
 $12\frac{1}{4}$ c. 900 ft.
 $13\frac{1}{2}$ 10 tunnels in 'Arisan Spiral' (photograph C2).
 $16\frac{3}{4}$ c. $\frac{1}{2}$ mile (wide curve east and south).
 20 2 almost consecutive tunnels, c. 450 ft. and c. 360 ft. respectively.
 $20\frac{3}{4}$ c. 750 ft.
 $21\frac{1}{4}$ c. 760 ft.
 $22\frac{3}{4}$ c. 450 ft. (straight).
 $23\frac{1}{4}$ c. 450 ft.
 $23\frac{3}{4}$ c. 1500 ft. (straight).
 24 c. 600 ft. (sharp SW. and SE. curves).
 $24\frac{1}{2}$ c. 1500 ft.
 $25\frac{1}{4}$ c. 300 ft.

WEST COAST LINES

<i>At (miles)</i>	
26 $\frac{3}{4}$	c. $\frac{1}{2}$ mile (straight).
27	c. $\frac{1}{4}$ mile.
28 $\frac{1}{4}$	c. 1050 ft.
30 $\frac{3}{4}$	c. 300 ft.
31	c. 450 ft.
31 $\frac{3}{4}$	c. 450 ft.
32	c. 180 ft.
32 $\frac{3}{4}$	c. 180 ft.
33 $\frac{3}{4}$	c. 600 ft.
34 $\frac{1}{4}$	c. 300 ft.
34 $\frac{1}{2}$	c. 450 ft.
35	c. 300 ft.
35 $\frac{3}{4}$	c. 450 ft.
42 $\frac{1}{4}$	c. 1250 ft. (straight).
42 $\frac{3}{4}$	c. 450 ft.
43	2 almost consecutive tunnels, c. 300 ft. and c. 600 ft. respectively.
43 $\frac{1}{4}$	c. 450 ft.
44 $\frac{1}{4}$	c. 600 ft. (straight).
44 $\frac{1}{2}$	c. 300 ft.
45 $\frac{1}{4}$	c. 300 ft.
46	c. 150 ft.
46 $\frac{1}{2}$	2 almost consecutive tunnels, both c. 300 ft.
47	c. 450 ft.
47 $\frac{1}{4}$	c. 300 ft.

24. Lam-tse-Kagi (Plans 14, 29A)

This line begins at Lam-tse, 1 $\frac{1}{2}$ miles south-west of Mizukami (*Route 6*), and runs north-east, crossing the main line about 2 miles north of Kagi (*Route 6*) and then turning south to join the Arisan line. Line runs through level country, crossing several rivers.

Just after leaving Lam-tse a junction (facing) left, with line connecting with network of dead-end lines running south-east, south, south-west, west, and detour line running north and rejoining this line at 5 $\frac{1}{2}$ miles.

<i>At (miles)</i>	
$\frac{1}{4}$	<i>J</i> (facing) right, with line running NE. to Kagi, on opposite side of main line, c. 6 $\frac{1}{2}$ miles.
4 $\frac{1}{4}$	Line crosses secondary road.
5 $\frac{1}{2}$	<i>J</i> (trailing) left, with detour line from Lam-tse.
6 $\frac{1}{4}$	Line crosses Tonan-Hokko-Shinko-Kagi line.
7 $\frac{1}{4}$	<i>J</i> (facing) left, with dead-end line running north c. $\frac{3}{4}$ mile.
7 $\frac{3}{4}$	Line turns east and passes under main line and main road.
8 $\frac{1}{4}$	Line turns south.
9 $\frac{1}{2}$	<i>J</i> (trailing) right, with Arisan line.

Length: 9 $\frac{1}{2}$ miles.

Gauge: 2 ft. 6 in.

Bridges (principal)

<i>At (miles)</i>	<i>Over</i>
2 $\frac{1}{4}$	river.
4 $\frac{1}{2}$	river.
5 $\frac{1}{2}$	river.

Tunnels: None.

25. Sin-ts'u-a-Shinei (Iam-tsui-kang sugar refinery line) (Plan 14)

Line runs south-east from Sin-ts'u-a on the coast (120°10'E., 23°20'N.) to Shinei (*Route 6*). It runs through level country, crossing one major river (Pueq-chio) and several minor ones.

<i>At (miles)</i>	
1 $\frac{1}{4}$	Station.
3 $\frac{1}{4}$	Line crosses road to Hotei.
3 $\frac{1}{2}$	Station.
5 $\frac{1}{2}$	Station. <i>J</i> (trailing) right, with dead-end line running SW. c. 5 $\frac{1}{2}$ miles.
6	<i>J</i> (trailing) left, with dead-end lines running NW. c. 6 $\frac{1}{2}$ miles and north c. 6 $\frac{3}{4}$ miles. Line crosses river Pueq-chio.
6 $\frac{1}{4}$	Station.

<i>At (miles)</i>	
6 $\frac{1}{2}$	<i>J</i> (facing) left, with dead-end line running NE. c. 5 $\frac{3}{4}$ miles.
7	<i>J</i> (facing) right, with dead-end line running west, c. 6 $\frac{3}{4}$ miles.
7 $\frac{1}{4}$	Ensui.
8	Line crosses Hokumon-Shinei road.
8 $\frac{3}{4}$	Triangular <i>J</i> with dead-end line running SE. c. 4 $\frac{3}{4}$ miles.
9	Station.
9 $\frac{3}{4}$	<i>J</i> (trailing) right, with dead-end line running SW. c. 3 miles.
11 $\frac{1}{2}$	<i>J</i> (trailing) right, with dead-end line running SW. and west, c. 11 $\frac{1}{4}$ miles.
11 $\frac{3}{4}$	Station.
12 $\frac{1}{4}$	Shinei.
	<i>J</i> (facing) left, with dead-end line running north, c. 2 $\frac{1}{4}$ miles.

Length: 12 $\frac{1}{4}$ miles.

Gauge: 2 ft. 6 in.

Bridges (principal)

<i>At (miles)</i>	<i>Over</i>
1 $\frac{1}{4}$	river.
2	river.
4	river. c. 300 ft.
6	river Pueq-chio. c. 450 ft.

Tunnels: None.

26. Dzi-tieng-kang-Banshiden (Plan 14)

Line runs from Dzi-tieng-kang (120°10'E., 23°15'N.) to Banshiden (*Route 6*). From Dzi-tieng-kang push-car line runs to Hokumon, on coast (120°8'E., 23°16'N.). Line takes a zigzag course, alternately south and east, and runs through level coastal country, crossing a few rivers and streams.

<i>At (miles)</i>	
$\frac{3}{4}$	Station.
2 $\frac{1}{4}$	Station.
5	Station.
6 $\frac{1}{2}$	<i>J</i> (trailing) left, with line to Banshiden. Line curves west.
6 $\frac{3}{4}$	Station. Trains reverse for Banshiden. <i>J</i> with 2 dead-end lines running NW. (combined lengths c. 7 miles) and with dead-end line running south and SW. c. 8 $\frac{1}{2}$ miles. Line proceeds east.
7	<i>J</i> (facing) right, with dead-end line running south, c. 4 $\frac{1}{2}$ miles.
7 $\frac{1}{4}$	<i>J</i> (facing) left, with same line to Hokumon.
9 $\frac{1}{4}$	Station.
10	<i>J</i> (trailing) left, with dead-end line running north and east, c. 3 $\frac{3}{4}$ miles.
11 $\frac{1}{4}$	Station. <i>J</i> (trailing) right, with (?) push-car line to Saiko.
12 $\frac{1}{4}$	Station.
13 $\frac{1}{4}$	Station.
15 $\frac{3}{4}$	Banshiden.

Length: 15 $\frac{3}{4}$ miles.

Gauge: 2 ft. 6 in.

Bridges (principal)

<i>At (miles)</i>	<i>Over</i>
4 $\frac{1}{2}$	tributary of river Chiang-kun-k'e.
6 $\frac{1}{2}$	tributary of river Chiang-kun-k'e.

Tunnels: None.

27. Shoko-Hosan (Plan 13)

Line runs from Shoko, on coast about 5 $\frac{3}{4}$ miles south of Takao, almost due north to Hosan (*Route 6*). Line runs through flat country and crosses one river.

At 5 miles line crosses main road from Takao.

Length: 5 $\frac{1}{4}$ miles.

Gauge: 2 ft. 6 in.

Bridges (principal): At 2 miles, over river, c. 300 ft.

Tunnels: None.

28. Rinshinen-Hosan (Sin-hieng sugar refinery line) (Plan 13)

Line starts from Rinshinen (120°23'E., 22°30'N.)

(about $4\frac{1}{2}$ miles north-west of Toko) and curves north and north-west to Hosan (*Route 6*).

At (miles)

- $3\frac{1}{2}$ Sin-tsng-a. Station. Line crosses road.
- $8\frac{1}{4}$ Line crosses road.
- $9\frac{3}{4}$ Line crosses main Takao-Heito road.
- $11\frac{1}{4}$ Hosan.

Length: $11\frac{1}{4}$ miles.

Gauge: 2 ft. 6 in.

Bridges (principal): At $10\frac{1}{2}$ miles, over river, c. 300 ft.

Tunnels: None.

29. Kyukyo-Kisan-Mi-lat-to (Plan 13)

Line runs due north from Kyukyo (*Route 6*), between Hosan and Heito at point where main line turns east to cross river E-tam-tsui-k'e, to Kisan ($120^{\circ}29'E.$, $22^{\circ}55'N.$). At Kisan it crosses a river, and curves south to Mi-lat-to. Line follows level valley at river E-tam-tsui-k'e, and also crosses several minor rivers.

At (miles)

- $\frac{1}{2}$ Main line turns east.
- $2\frac{1}{4}$ Tua-ch'iu.
- $5\frac{1}{4}$ Kepo.
- 8 Line crosses secondary road from Nanshi.
- 10 Sa-kak-k'ut.
- $11\frac{3}{4}$ Lau-chieng-k'e.
- $15\frac{1}{4}$ Pak-se.
- $16\frac{1}{4}$ J (trailing) left, from Kisan c. $\frac{1}{2}$ mile.
- $17\frac{1}{4}$ J (facing) left, with dead-end line running NE. c. $\frac{3}{4}$ mile.
- $18\frac{1}{4}$ J (facing) left, with dead-end spur, c. $\frac{1}{2}$ mile.
- $20\frac{1}{2}$ Mi-lat-to.

Length: $20\frac{1}{2}$ miles.

Gauge: 2 ft. 6 in.

Bridges (principal)

<i>At (miles)</i>	<i>Over</i>	
$14\frac{1}{4}$	river.	c. 300 ft.
$16\frac{1}{4}$	river.	c. 300 ft.
$16\frac{1}{2}$	river E-tam-tsui-k'e.	c. 600 ft.
$17\frac{3}{4}$	river Bi-long-k'e.	c. 600 ft.
$18\frac{3}{4}$	river.	c. 300 ft.
$19\frac{1}{2}$	river.	c. 300 ft.
20	river.	c. 300 ft.

Tunnels: None.

30. Kau-pe-Kisan (Plan 13)

Line runs south from Kau-pe ($120^{\circ}30'E.$, $22^{\circ}59'N.$) to I-tam-a, where it turns east and then swings south to Kisan. Line runs through narrow valley between hills and I-tam-a, after which the valley widens out into level country.

At (miles)

- 1 Ts'an-le-k'ut.
- $2\frac{3}{4}$ Lai-a-k'e.
- $4\frac{3}{4}$ I-tam-a.
- $5\frac{3}{4}$ J (trailing) left, with dead-end line running north, c. $1\frac{3}{4}$ miles.

At (miles)

- $8\frac{3}{4}$ Kisan.
- Length:* $8\frac{3}{4}$ miles.
- Gauge:* 2 ft. 6 in.
- Bridges (principal):* At 7 miles, over river, c. 300 ft.
- Tunnels:* None.

31. Toko-Heito-Ku-liau (Taiwan sugar refinery line) (Plan 13)

Line runs north and north-east from Toko, on coast about $15\frac{1}{2}$ miles south of Takao, through a wide, level valley, and crosses several rivers and streams.

At (miles)

- $4\frac{1}{2}$ J (facing) right, with 2 ft. 6 in. line to Chosu
- 5 Line crosses river Ai-liau-k'e.
- 10 Mandan.
- 15 Line crosses river.
- $15\frac{1}{4}$ Liu-ts'u.
- $15\frac{3}{4}$ Line crosses main line (*Route 6*).
- 16 Line crosses road and push-car line, and by-passes Heito.
- 18 Line crosses river.
- 20 Line crosses river Bu-loq-k'e.
- $21\frac{3}{4}$ Sa-te-ts'u.
- $24\frac{1}{4}$ Riko.
- $25\frac{1}{2}$ Bu-loq.
- $28\frac{1}{2}$ Sin-lam-se.
- $30\frac{1}{4}$ Ku-tsng.
- Push-car line continues north to Tiong-tsng, c. 11 miles.
- $32\frac{1}{2}$ Kuai-chiu.
- $34\frac{1}{2}$ Ku-liau.

Length: $34\frac{1}{2}$ miles.

Gauge: 2 ft. 6 in.

Bridges (principal)

<i>At (miles)</i>	<i>Over</i>	
5	river Ai-liau-k'e.	c. 1500 ft.
15	river.	c. 300 ft.
18	river.	c. 300 ft.
$18\frac{3}{4}$	river.	c. 300 ft.
20	river Bu-loq-k'e.	c. 900 ft.

Tunnels: None.

32. Toko-Choshu (Plan 13)

Line runs north and north-east from Toko through level country, and follows the left bank of river Ai-liau-k'e.

- $4\frac{1}{2}$ Line leaves Toko-Ku-liau line, and curves NE.
- 5 Au-po.
- $5\frac{3}{4}$ Chiu-a.
- $6\frac{3}{4}$ Lat-sia.
- $8\frac{1}{4}$ Line crosses river.
- $8\frac{1}{2}$ Choshu (*Route 6*).

Length: $8\frac{1}{2}$ miles.

Gauge: 2 ft. 6 in.

Bridges (principal): At $8\frac{1}{4}$ miles, over river, c. 300 ft.

Tunnels: None.

EAST COAST LINES

33. Kian-ts'a-pe-Rato (Lo-tang forest line) (Plan 7)

This line begins at Kian-ts'a-pe ($121^{\circ}30'E.$, $24^{\circ}34'N.$) and follows the narrow, winding valley of river To-bun-k'e for $\frac{1}{4}$ mile. Here it turns north-north-east, and enters the wider Tak-tsui-k'e valley.

At (miles)

- $10\frac{1}{2}$ Line reaches Chieng-tsui, almost at the confluence of rivers Chieng-tsui and Tak-tsui.

At (miles)

- J with spur, c. $2\frac{1}{4}$ miles, running SE. along Ch'iang-Sui-k'e valley.
- $12\frac{1}{4}$ J (trailing) left, with spur running west across valley and into foothills, c. 4 miles.
- $22\frac{3}{4}$ Line then crosses Dakusui-kei delta to Rato.
- Rato. I. with main line, Hatto-Suo (*Route 2*).

Length: $22\frac{3}{4}$ miles.

Gauge: 2 ft. 6 in.

Bridges (principal)

At (miles)	Over	
2	river Tenguru-k'e.	c. 900 ft.
4 $\frac{3}{4}$	river Banun-k'e.	c. 900 ft.
6	river.	c. 900 ft.
10 $\frac{1}{2}$	river Chieng-tsui-k'e.	c. 900 ft.
15 $\frac{1}{4}$	river.	c. 900 ft.
17	river.	c. 900 ft.
21	river Dakusui.	c. 1500 ft.

Tunnels

At (miles)	
8	c. 1500 ft.
10 $\frac{1}{2}$	c. 1500 ft.

34. Busegan-sia-Toran

(Plans 17, 18)

This sugar refinery line starts from the river-bank at Busegan-sia (121°37'E., 24°5'N.) and runs south-

wards through a flat coastal strip to Toran (c. 1 $\frac{1}{4}$ miles west of Karenko). It has few curves.

At (miles)

1 $\frac{3}{4}$	Line reaches the coast, and turns south.
6 $\frac{1}{2}$	Line begins to leave the coast, and turns inland.
8 $\frac{3}{4}$	Line crosses main road and follows straight stretch to Toran.
	Toran. J with main line Karenko-Taito (Route 7).

Length: c. 12 miles.

Gauge: 2 ft. 6 in.

Bridges (principal)

At (miles)	Over	
c. 3 $\frac{3}{4}$	river.	c. 900 ft.
c. 10 $\frac{1}{4}$	river.	c. 900 ft.
c. 11 $\frac{3}{4}$	river.	c. 900 ft.

Tunnels: None.

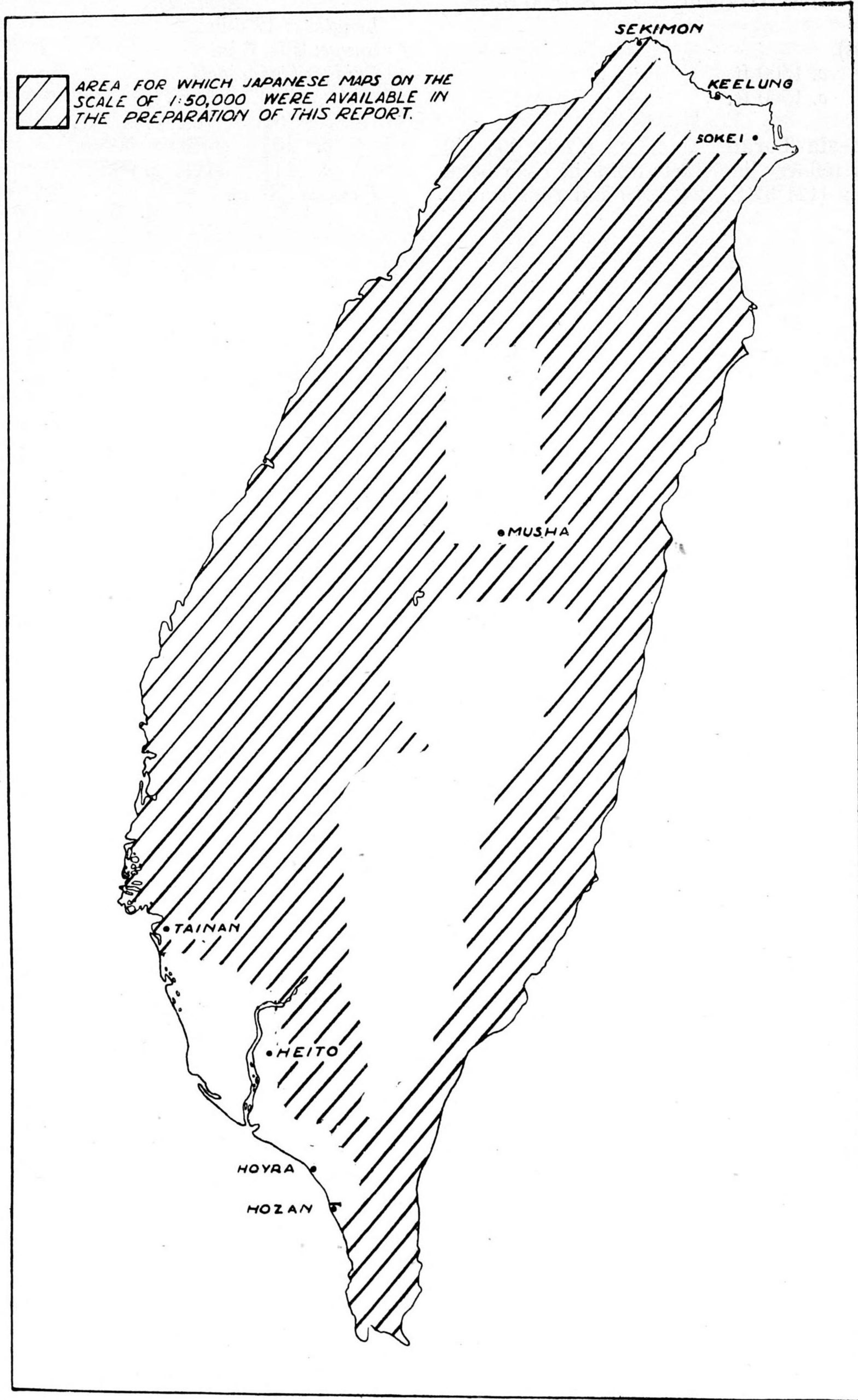


FIG. 2

(B) ROADS

(Plans 1, 11-19; photographs D.1-37)

INTRODUCTION

(1) Road system

Until 1936 the road system of Formosa was very undeveloped; in that year work was rapidly organized and carried out by unskilled labour from the districts through which the roads were being built. There is now a continuous road down the west side of the island from Kirun to Heito; south of Heito there is a secondary road to Garambi at the southern tip; off this trunk road lead many secondary roads which serve the whole area of the western plain; several roads also run east into the foothills of the mountainous interior, in particular to Hori and in the region of Lake Jitsugetsu.

From Kirun a military road leads south down the east coast of the island to Karenko, being cut into the face of the cliff between Suo and Karenko. Between Karenko and Taito, though no continuous road is shown on any available map, it is probable that through connexion is possible in good weather, though the rivers are not all bridged; a narrow-gauge railway provides an alternative line of communication over this stretch. From Taito to the south-east coast it is believed that there is an inferior road through Daibu and Aroe to Fuko. There are no motorable roads across the main mountain range of the island south of the Taihoku to Shokei road, though a decision appears to have been taken to construct one between Hori and Karenko.

(2) Tracks

The road system is supplemented by numerous tracks across the mountainous interior, the most important of which are marked on the 1:250,000 maps issued with the report. Tracks A-D cross the island from west to east, while Tracks E-H form links in the lines of communication on the east and south-east coasts. (*Photographs D.4-9, 35-37.*)

(3) Unmapped roads

A certain number of roads which have not been mapped or which have not been verified from air photographs are believed to exist.

In 1939 a road was reported to have been completed between Fuko, on the south-west coast south of Hozan, and the south-east coast at Aroe, south of Daibu; this is said to have reduced the time by bus from Choshu to Taito to five hours.

A press report of April 1940 stated that the Chuaen motor-road linking Taito and Karenko had been completed for several years but that many of the rivers crossed on the route had not yet been bridged; it was proposed to complete the bridges between 1940 and 1945.

During 1940 and 1941 there were many articles in the Formosan press about the future construction of an east-to-west road from Hori via Musha to Karenko; a road is believed to be complete as far as Musha, but in view of the mountainous terrain to be crossed and the estimated time required (5 years), it is most improbable that this is complete even if the work has been put in hand.

(4) Terrain

All the roads in the north end and along the north-east side of the island cross wooded mountainous country cut up by rivers and streams which run in steep valleys and in some places in gorges. On the east coast between Karenko and Taito there is a broad valley up to 10 miles inland in which run Routes 33 and 34 and Tracks F and G; this valley is largely rough uncultivated land but has some paddy-fields.

In the western plain the roads run principally across flat paddy land; there is also much land devoted to sugar growing on the west coast of the

island south of Taichu, though paddy still predominates farther inland.

In the north of the island there are some tea plantations on the higher ground. Several roads, principally Routes 39 and 40, follow river valleys up into the main mountain range; these valleys are normally steep-sided and narrow, but in places open out to allow a strip of paddy land along the bottom. In their lower reaches the rivers fan out into several branches, between which lies rough and often boulder-covered land.

(5) Deployment

In general there is little possibility of deployment of vehicles off the roads, as most of the higher land is wooded and the flat low-lying plains are chiefly wet paddy land. However, limited deployment might be possible in parts of the south-west where there is level ground under mixed cultivation, largely sugar.

(6) Cover from air observation

In the western plain there is very little opportunity of getting complete cover from air for vehicles; however, many of the roads are tree-lined and would provide partial cover. On the roads in the mountainous areas good cover from air might be obtained among trees if the ground is not too steep for vehicles to move off the road.

(7) Construction of roads

The roads generally are very primitive, and even the best of them cannot be expected to sustain heavy or continuous traffic for any length of time without serious deterioration of their already poor condition.

The roads in the plains of the west coast are usually traffic consolidated and are composed of earth, or earth surfaced with sand, or sand and shingle. A few isolated sections, however, principally on steep gradients, are concrete, and in major towns the streets and approaches are sometimes tar-macadam. Their width varies from 14 to 18 feet and sometimes 24 feet and more. Some roads are of excessive width, up to 65 feet (ref. road itineraries) owing probably to side creepage characteristic of traffic-consolidated roads. The roads in mountain regions of the north and east coasts are usually only wide enough for one line of traffic, with occasional passes (*photograph D.27*) and not infrequently run through narrow tunnels also only wide enough for one line of traffic and vehicles probably not higher than some 10 feet or so (*photographs D.25, 26*). Where the coastal roads are cut in solid rock the formation is probably very firm and capable of taking high loads. In stretches, however, these roads often run on loose stone embankments which form a ledge projecting from the mountain face. The outer edge of these embankments either slopes away sharply down the mountain side (*photograph D.26*), or are held by rough masonry, or, in isolated instances only, concrete retaining walls (*photographs D.23, 24*). On these stretches slipping of the road embankments under heavy loads is possible.

The mountain roads are liable to blockage by landslides which occur frequently.

(8) Push-car lines. (*Photographs D.1, 2*)

A large number of the roads of Formosa, especially in the western plain, have narrow-gauge push-car lines running along them; these are light rails with a gauge of 18 to 24 inches. They run either on the verge of the road or on the side of the road itself; the small trucks on these lines were used for conveying both personnel and agricultural produce. Propulsion was by hand only.

(9) Classification of road bridges

It is not possible to classify the bridges in any definite manner from the information available. In

the vast majority of crossings the construction and materials used are not known. Many crossings, even on the principal road, Route 1, are not bridged at all and must be forded. It is possible that alongside, or near, many bridges, particularly the more modern bridges, old fords still exist and may be used as alternatives to the bridges in the event of demolition or insufficient capacity of the latter. Except in isolated instances (e.g. Seira) and in the case of some of the bridges in major towns, they are for one line of traffic only, the width being probably 8 to 9 feet.

The modern bridges in Taihoku, Tainan, Takao, Meto, Toko, Seira, and probably a few other places, can take two lines of traffic and may quite possibly be Class 18 or even 24. It is unlikely that they would be of a higher classification.

The bridges on the three principal roads, i.e. Route 1 (west coast), Route 2 (north coast) and Route 35 (east coast), are known to be capable of taking motor buses which are probably 3 or at the most 5 tons loaded. Whether heavier loads can safely cross all the bridges, particularly the suspension bridges, is not known, although it is probably safe to assume that the short-span modern concrete bridges (*photograph D.21*) can take loads up to at least 9 tons. The railway line often flanks the road, as in Roads 1 and 35, and a number of railway bridges can probably be adapted for use by road vehicles (*see 'Railways'*). Deployment from road to railway track may present serious difficulties, particularly in mountainous regions.

Mountain streams and rivers run mostly in deep gorges, and although they themselves may be of insignificant width the effective gap of crossings at road level higher up the gorge slopes may often be considerable. (*Photographs D.3, 32.*)

(10) Condition

Information as to the condition of roads in Formosa is very scanty; the general impression, however, is that, at least up to 1940, the roads were wearing badly owing to lack of foundation and negligent maintenance.

It is believed that, under the stress of increasing military requirements, the Japanese may have improved and resurfaced some of the more important roads. Materials available are local river gravels only.

(11) Gradients

Gradients on the west plain roads are very slight and those on Routes 2 and 35 moderate. The four trans-mountain routes—3, 29, 37, and 38—and the inland sectors of Routes 39 and 40 have steep gradients up to 1 in 10.

(12) Sharp turns

The more mountainous stretches of road are in places extremely tortuous with many hairpin bends which have, however, been reported as well engineered with some super-elevated curves.

Roads on the western plain appear to be very straight.

(13) Observation

For the purpose of assessing cover from ground observation and opportunities of observing the surrounding country, the roads of Formosa fall roughly within two categories:

(1) MOUNTAIN ROADS

These roads run through very dissected country covered with forest. The trees are believed to grow right up to the road and therefore provide good cover from the ground. Owing to the broken nature of the country, observation of the surrounding land is limited.

(2) PLAIN ROADS

These roads run on low embankments through either paddy-fields or sugar plantations. Cover from ground observation is therefore nil, but observation of the surrounding land is excellent.

(14) Seasonal variations

A full description of climatic conditions on this island will be found in *I.S.T.D. Report F.382*.

The main effects of weather on the roads are felt in the typhoon season (July and August) when the rivers become swollen and the many fords become impassable.

(15) Vulnerable points

The many tunnels and stretches of road on side-long land in the mountain districts are susceptible to demolition, as are also all bridges.

(16) List of maps

International 1:1,000,000, Sheets N.F. 51 and N.G. 51.

U.S.A. Army Map Service L.592, 1:250,000, Sheets 1, 4, 5, 11, 12, 13, 14, 15.

Japanese 1:50,000, Series F. 51 and G. 51.

The 1:50,000 series does not cover certain portions of the island which are defence areas or undeveloped mountain country: these portions are shown on *Fig. 2*.

The overprinted additional roads on the 1:250,000 maps are all taken from air photographs.

(17) Air photographs

Vertical air photographs, mostly of 24-inch focal length at about 30,000 feet, from which additional roads are shown on the 250,000 maps, were available of the following districts: Shinchiku, Taichu, Toyohora (Hogen), Rokko, Kagi, Tainan, Takao, Heito, Okayama, Toshien, Kato, Suo, Giran to Rato, Tsui-li-K'e to Lake Jitsugetsu.

(18) Road transport

(a) The number of vehicles of different classes on the island in 1940 is reported to have been as follows:

Trucks	...	...	972
Cars	...	...	1300
Buses	...	...	1278 (includes 36 large ones)
Motor cycles	...	...	600
Bicycles	...	...	20,000 (estimated)
Bullock carts	...	...	(numerous in rural districts)

(b) *Garage and repair facilities.* It is known that there are garage facilities in Taihoku (*for details see I.S.T.D. Report, F.387*); information on other towns is not available.

(19) List of routes

- Route 1. Kirun-Taihoku-Toen-Shinchiku-Koryu-Taiko-Hogen-Taichu-Inrin-Seira-Kagi-Tainan-Takao-Hosan.
- „ 2. Kirun-Sekimon-Tansui-Taihoku.
- „ 3. Taihoku-Heiren-Shokei.
- „ 4. Tua-tiek-ui-Shinsho.
- „ 5. Taihoku-Itahishi-Sankyo-Toen.
- „ 6. Toen-Tiek-ui-Taien-P'ollau-Chureki.
- „ 7. Chureki-Ryutan-Kwansai-Route 1.
- „ 8. Shinchiku-Chikuto-Hoppo.
- „ 9. Chiam-sua-e-Byoritsu-Sansa-Hogen.
- „ 10. Byoritsu-Taiko-Lam-o.
- „ 11. Taichu-Sai-tun-Sharoku.
- „ 11A. Gosei-Sharoku-Taichu.
- „ 12. T'o-kat-k'ut-Taito-Ong-Ts'an.
- „ 13. Taichu-Nanto-Nama.
- „ 14. Inrin-Nisui-Toroku-Koume-Tairin.
- „ 15. Hokuto-Nirin-Soasua.
- „ 16. Seira-Hokko-Bokushi-Ensui-Hokumon.
- „ 17. Kagi-Shirakawa-Banshiden.
- „ 18. Tamio-Hokko-Shinko (on coast).
- „ 19. Kagi-Bokushi-Toseki.
- „ 20. Shinei-Hotei.
- „ 21. Banshiden-Mato-Kari-Hokumon.
- „ 22. Shinshi-Kambyo-Tainan.
- „ 23. Kosen-Kisan-Nanshi.
- „ 24. Rokki-Kibi-Heito-Toko.
- „ 25. Hosan-Heito-Naiho-Choshu-Toko.
- „ 26. Hosan-Mandan-Choshu-Suiteiryō.
- „ 27. Hosan-Rinshinen.

Route 28. Toko-Koshun-Garambi.
 „ 29. Koshun-Kau-pe.
 „ 30. Chioq-t'e-Taito-Chihon.
 „ 31. Taito-Li-ke-Chihon.
 „ 32. Baran-Hashikao.
 „ 33. Shimburo-Shikano.
 „ 34. Go-tsuan-sia-Horin-Basshi.

Route 35. Kirun-Rato-Karenko.
 „ 36. Rato-T'i-sang-pi.
 „ 37. Shirin-E-tiong-ko.
 „ 38. Hokuto-Sozan.
 „ 39. Soton-Hori-Tsui-li-k'e.
 „ 40. Nisui-Nama-Shushu-Tsui-li-k'e.

ROUTE 1

KIRUN—TAIHOKU—TOEN—SHINCHIKU—KORYU—TAIKO—HOGEN—TAICHU—
 INRIN—SEIRA—KAGI—TAINAN—TAKAO—HOSAN

Distance: 270 $\frac{7}{8}$ miles

Maps: A.M.S. L 592, Sheets 1, 4, 5, 11, and 13;
 Japanese 1:50,000, G/51/29, Sheets 6, 10,
 11, 15; G/51/35, Sheets 3, 4; G/51/36,
 Sheets 1, 5, 6, 7, 8; F/51/31, Sheets 5, 9, 10,
 11, 12; F/51/32, Sheets 9, 10, 14, 15

Photographs: D.10, 11, 12

(1) General

This is the main trunk road of Formosa and runs from the port of Kirun through Taihoku the capital, Taichu, and Kagi to Takao and Hosan in the south-west. Many other routes branch off Route 1, and cross-island communication can be made on foot by using any of the several mountain tracks. A push-car line runs between Taihoku and Toen, Inrin and Hokuto, and Seira and Shido.

(2) Terrain

From Kirun to Taihoku the road runs in the valley of the Kirun river; from Taihoku to Shinchiku it crosses a plain with the foothills of the central mountain mass on the south-east. From Shinchiku to Sharoku the road follows the coastline, then turns east and south to Taichu and Tainan. At Tainan it reaches the coast again and parallels it to Takao, finally turning east again and ending at Hosan. For the whole of its length after Taihoku the road skirts the central mountain foothills, though in some areas it crosses undulating country. A general division of the country crossed gives paddy and tea in the north and paddy and sugar in the south, with mixed forest on the hills.

As so much of this route runs through paddy, possibilities of deployment are nil. Cover from air and ground observation is poor generally, though slight cover is provided on sections which are tree-lined.

(3) Construction and condition

Details of construction and condition are available only as follows:

(a) KIRUN TO TAIHOKU

The road is reported to be 20 feet wide, with an asphalt surface on a poor mud and gravel foundation. It has grass and mud verges and in September 1941 was wearing badly under heavy traffic.

(b) TAIHOKU TO SHINCHIKU

The road is reported to be 16 feet wide and very

bumpy; in 1941 it had only some short stretches of poor asphalt.

(c) ENRI TO TAIKO

The road is 24 feet wide and is reported to have an earth surface, except for the vicinity of Taiko, where some gravel has been used.

(d) SHAROKU TO TAICHU

The road is reported to be 24 feet wide, with an earth surface.

(e) NEAR SHOKA

The road is 30 feet wide, with a gravel surface.

(f) SEIRA TO SHIDO

The road is 16 feet wide, with an earth surface.

(g) NEAR BANSHIDEN

A few miles of road are reported to be 14 feet wide, with an earth and sand surface.

(h) TAINAN AND ITS ENVIRONS

The road is reported to be 30 feet wide, with a concrete surface.

(i) TAKAO TO HOSAN

The road is reported to be 18 feet wide: sections near Hosan are concreted, the remainder being earth and gravel.

(4) Bridges, fords, and ferries

This road crosses many bridges and fords. All river crossings have not been mentioned in this itinerary; all bridges, however, have been listed in the Bridge Schedule on page 133.

(5) Seasonal variations

The road between Kirun and Taihoku is chiefly affected by the winter north-east monsoon, which brings heavy rain to swell the rivers. The rest of this route, running along the western plain, is most susceptible to seasonal variations in the months of July and August. Typhoons occur in this period and break on the central mountain massif: the rivers running west become swollen and fords may be impassable.

(4) Vulnerable points

None apart from bridges.

Distance from Kirun Distance from

KIRUN (miles)	HOSAN (miles)
0	270 $\frac{7}{8}$
$\frac{1}{4}$	270 $\frac{5}{8}$
1	269 $\frac{7}{8}$

KIRUN (KEELUNG). Bridge over canal.

Route runs south-west from the centre of the town.

For details of roads in town see I.S.T.D. Report, F.387. As far as Taihoku, mile 17 $\frac{3}{4}$, the road runs alongside the railway, in the valley of the Keelung river.

$\frac{1}{4}$ 270 $\frac{5}{8}$

Cross-roads.

Route runs straight on. L. Route 35 runs south-east. R. Route 2 runs north-west. To Matsuyama, mile 14, road runs through paddy-fields, with mixed forest on the hills bordering the $\frac{3}{4}$ -mile-wide valley.

1

269 $\frac{7}{8}$

Road runs through tunnel for 200 yards.

<i>Distance from</i> KIRUN (miles)	<i>Distance from</i> HOSAN (miles)	
3½	267⅜	SHICHITO. Bridge over Keelung river.
6½	264⅜	PA-TIO-K'E. L. Minor road runs south-west and north-west 1 mile to rejoin route at mile 7¾.
8½	262⅜	SHIODOME. Bridge over small tributary of river Keelung.
11½	259⅜	NANKO. Bridge over stream. L. Track runs south and south-east about 2 miles into mountains.
13¾	257⅜	L. Track runs south-east ⅞ mile, and becomes path running into hills.
13¾	257	Bridge over river.
14	256⅞	MATSUYAMA. For next ½ mile the road runs through the town.
14½	256⅜	L. Secondary road runs south-west 3¼ miles to Route 3, with other secondary roads running west to Taihoku from miles 1⅜ and 1⅞. R. Minor road runs north-west 2¼ miles to the Keelung river, connecting with several other minor roads, tracks, and paths serving paddy-fields. To Taihoku the river is 2 to 2½ miles north of the road, which now crosses a plain 4 to 4½ miles wide and cultivated with paddy.
15½	255⅜	R. Minor road runs north-west 1⅜ miles to road serving paddy-fields. L. Minor road runs south 1⅜ miles to road from mile 14½.
16¼	254⅝	L. Minor road runs south 1 mile through paddy to other roads serving the rice fields. R. Minor road runs north-west 1¾ miles to outskirts of Taihoku.
16¾	254¼	Level crossing.
17¾	253⅝	Road enters Taihoku. <i>For details of road in town see I.S.T.D. Report, F.387.</i>
18½	252⅜	Route turns right.
19⅜	251½	Route turns left on to Taihoku bridge over Tansui river (<i>photograph D.10</i>).
19¾	251⅝	R. Secondary road runs north-west 2½ miles to He-sio-chiu, then south-west 2¾ miles to rejoin route at mile 22¾.
19¾	251	R. Minor road runs north ⅛ mile to join road from mile 19¾. To mile 27¾ the road runs across flat land, cultivated with paddy; to mile 23¾ it is only a few yards north of the Tansui river.
20¾	250⅝	R. Track runs north, west, and south-west 2⅝ miles to rejoin route at mile 21⅞. L. For next mile several tracks lead to the Tansui river.
21⅞	249	R. Track from mile 20¾ rejoins route.
22¾	248⅝	R. Secondary road from mile 19¾ rejoins route.
23¾	247⅞	SHINSHO. R. Route 4 runs north-west. The road now leaves the Tansui river, which bends away to the south.
24¼	246⅝	L. Secondary road runs south to the Tansui river.
25½	245⅜	R. Minor road runs north-east 2⅜ miles to Route 4.
25⅝	245¼	Bridge over stream. For next ½ mile the road runs on an embankment.
25⅞	245	Bridge over stream. The road now follows a narrow valley up into hills for 2¼ miles. These hills rise sharply on either side of the road to an average height of 750 feet, and are covered with mixed deciduous and coniferous trees.
29⅞	241¾	Bridge over tributary of river Tansui.
30½	240⅜	Road enters low-lying rice land surrounding Toen. There are many small reservoirs, which form part of the irrigation scheme. To mile 32 the Lam-k'am-k'e river winds from a few yards to ¼ mile north of the road.
32½	238⅜	For next ¼ mile there is a single-track railway a few yards south of the road.

<i>Distance from KIRUN (miles)</i>	<i>Distance from HOSAN (miles)</i>	
32 $\frac{3}{4}$	238 $\frac{1}{8}$	Route turns right. L. Route 5.
32 $\frac{7}{8}$	238	L. Minor road runs south and west about 9 miles to rejoin route at Chureki, mile 39 $\frac{3}{8}$.
33 $\frac{1}{8}$	237 $\frac{3}{4}$	TOEN. Route turns left. Straight on, Route 6 runs north-west.
33 $\frac{5}{8}$	237 $\frac{1}{4}$	Bridge over stream.
35	235 $\frac{7}{8}$	Bridge over stream.
35 $\frac{1}{2}$	235 $\frac{3}{8}$	From here to Yobai, mile 45 $\frac{1}{4}$, the road is followed by a single-track railway.
36 $\frac{3}{8}$	234 $\frac{1}{2}$	Bridge over minor road. The road now crosses land with mixed cultivation, generally paddy and bamboo on the low ground and tea on slightly higher ground.
37 $\frac{3}{4}$	233 $\frac{1}{4}$	Bridge over stream.
38 $\frac{1}{4}$	232 $\frac{5}{8}$	Bridge over stream with steep banks.
38 $\frac{5}{8}$	232 $\frac{1}{4}$	Road turns sharp right. Bridge over stream. Road turns sharp left.
39 $\frac{1}{4}$	231 $\frac{5}{8}$	R. Secondary road runs north.
39 $\frac{3}{8}$	231 $\frac{1}{2}$	L. Minor road from mile 32 $\frac{7}{8}$ rejoins route.
39 $\frac{1}{2}$	231 $\frac{3}{8}$	CHUREKI. R. Route 6 runs north-west. L. Route 7 runs south. Many minor roads radiate from the city to serve the cultivated plain.
39 $\frac{5}{8}$	231 $\frac{1}{4}$	Bridge over stream.
39 $\frac{3}{4}$	231 $\frac{1}{8}$	For the next $\frac{3}{4}$ mile there is a stream, which appears to run in a steep-sided gully, from 50 to 200 yards from the left of the road.
42	228 $\frac{7}{8}$	Level crossing.
42 $\frac{3}{4}$	228 $\frac{1}{8}$	HEICHIN. To Koko, mile 51, the road runs through a narrow valley, $\frac{1}{8}$ to $\frac{3}{4}$ mile wide, between a northern hill ridge with an average height of 700 feet and a southern plateau mass with an average height of 900 to 1000 feet. The valley is cultivated with paddy, while there is tea on the lower hill slopes and mixed forest on the higher slopes.
43 $\frac{3}{4}$	227 $\frac{1}{8}$	Bridge over river Siaatsui.
44 $\frac{1}{2}$	226 $\frac{3}{8}$	Bridge over river Siaatsui tributary.
45 $\frac{1}{8}$	225 $\frac{3}{4}$	Bridge over stream.
45 $\frac{1}{4}$	225 $\frac{5}{8}$	YOBAL. R. Secondary road runs north-west about 11 miles to the coast at Kiam-t'au-ts'u, with a branch running west 6 miles to Sa-kak-k'ut from a point 2 $\frac{3}{8}$ miles from Yobai.
45 $\frac{5}{8}$	225 $\frac{1}{4}$	Bridge over stream.
49 $\frac{5}{8}$	221 $\frac{1}{4}$	Bridge over stream.
51	219 $\frac{7}{8}$	KOKO.
51 $\frac{1}{4}$	219 $\frac{5}{8}$	R. Minor road runs north 3 $\frac{1}{2}$ miles to Hok-lieng. The road now enters the gently undulating west coastal plain, with extensive paddy-fields and isolated areas of bamboo. Tea is found on the rising ground 1 $\frac{1}{2}$ miles south-east of the road, while a distinctive feature of the coastal plain is the many irrigation reservoirs.
51 $\frac{5}{8}$	219 $\frac{1}{4}$	Road divides. L. Alternative road runs south-west crossing a plateau 600 feet high in 3 miles and rejoining route at mile 58. R. Route 1 runs north-west.

<i>Distance from</i> KIRUN (miles)	<i>Distance from</i> HOSAN (miles)	
53 $\frac{3}{4}$	217 $\frac{1}{8}$	PO'LO-B'UN. Route turns left. Straight on, minor road runs west to Ch'ia-na-a.
54	216 $\frac{7}{8}$	Bridge over stream. To mile 54 $\frac{3}{8}$ there is a hill about 400 feet high very close to the left of the road.
55 $\frac{3}{4}$	215 $\frac{1}{8}$	Bridge over stream.
56 $\frac{3}{8}$	214 $\frac{1}{2}$	For the next $\frac{1}{2}$ mile the road appears to be running in a cutting.
57 $\frac{1}{2}$	213 $\frac{3}{8}$	Bridge over river Hong-sua-k'e.
57 $\frac{3}{4}$	213 $\frac{1}{8}$	Bridges over two small streams.
58	212 $\frac{7}{8}$	Cross-roads; route runs straight on. L. Alternative road from mile 51 $\frac{5}{8}$ rejoins route. R. Alternative road runs south-west to the northern outskirts of Shinchiku, crossing six rivers.
58 $\frac{1}{4}$	212 $\frac{5}{8}$	L. Route 7.
58 $\frac{1}{2}$	212 $\frac{3}{8}$	Bridge over river. To Iam-tsui-kang, mile 68 $\frac{1}{4}$, there is a single-track railway alongside the left of the road.
59	211 $\frac{7}{8}$	Bridge over small stream.
59 $\frac{1}{2}$	211 $\frac{3}{8}$	Bridge over two arms of river T'au-chieng-k'e.
59 $\frac{3}{4}$	211 $\frac{1}{8}$	Bridge over river Tau-chieng-k'e. The ground between the three arms of this river appears to be low-lying and swampy.
60 $\frac{1}{4}$	210 $\frac{5}{8}$	Bridge over stream.
60 $\frac{3}{8}$	210 $\frac{1}{2}$	Bridge over river.
61	209 $\frac{7}{8}$	Bridge over river.
61 $\frac{1}{8}$	209 $\frac{3}{4}$	Bridge over stream.
61 $\frac{1}{2}$	209 $\frac{3}{8}$	L. Route 8 runs south-east.
61 $\frac{3}{4}$	209 $\frac{1}{8}$	SHINCHIKU. <i>For details of road through town see I.S.T.D. Report, F.387.</i>
62	208 $\frac{7}{8}$	Bridge over stream.
62 $\frac{5}{8}$	208 $\frac{1}{4}$	Bridge over river Keg-nga-k'e.
63 $\frac{3}{8}$	207 $\frac{1}{2}$	Bridge over stream.
63 $\frac{7}{8}$	207	Bridge over stream.
64 $\frac{3}{8}$	206 $\frac{1}{2}$	R. Alternative road runs back 2 $\frac{1}{2}$ miles to Shinchiku.
64 $\frac{1}{2}$	206 $\frac{3}{8}$	Bridge over stream.
65	205 $\frac{7}{8}$	Bridge over stream. To Iam-tsui-kang, mile 68 $\frac{1}{4}$, the road runs along a narrow coastal strip cultivated with paddy and coconuts. On the left of the road the land rises gradually to form a hill mass 300-500 feet high. Paddy is found in the valleys of the many small streams, mixed forest and scrub appearing elsewhere.
66 $\frac{1}{2}$	204 $\frac{3}{8}$	R. Poor alternative road runs a few yards west of the road and rejoins it at mile 67 $\frac{1}{4}$.
66 $\frac{3}{4}$	204 $\frac{1}{8}$	Bridge over river.
67	203 $\frac{7}{8}$	KOZAN.
67 $\frac{1}{4}$	203 $\frac{5}{8}$	R. Alternative road from mile 66 $\frac{1}{2}$ rejoins route. Level crossing.
68 $\frac{1}{4}$	202 $\frac{5}{8}$	IAM-TSUI-KANG. Route forks left. R. Minor road runs south-west 5 $\frac{1}{4}$ miles to Chuko.
68 $\frac{3}{8}$	202 $\frac{1}{2}$	Bridge over river.
68 $\frac{1}{2}$	202 $\frac{3}{8}$	To mile 69 $\frac{1}{4}$ there is a scrub-covered hill on the left of the road and a $\frac{1}{4}$ -mile-wide river valley, cultivated with paddy on the right.

<i>Distance from KIRUN (miles)</i>	<i>Distance from HOSAN (miles)</i>	
69 $\frac{1}{4}$	201 $\frac{5}{8}$	TIONG-IEK. Bridge over river. To mile 69 $\frac{1}{2}$ the road crosses the river valley.
69 $\frac{1}{2}$	201 $\frac{3}{8}$	To mile 70 the road winds over a low ridge of land, about 200 feet high, covered with scrub and mixed forest.
70 $\frac{1}{2}$	200 $\frac{3}{8}$	L. A track winds back north-east for several miles into the inland mountain mass. The road now returns to the main west coast plain, which is cultivated with paddy: tea is grown on the lower slopes of the hills to the east of the plain.
71 $\frac{3}{4}$	199 $\frac{1}{8}$	Bridge over stream.
72 $\frac{1}{8}$	198 $\frac{3}{4}$	Bridge over stream.
72 $\frac{1}{2}$	198 $\frac{3}{8}$	T'AU-HUN. Bridge over stream. Road crosses light railway. L. Minor road runs south-east to Lam-tsng.
72 $\frac{7}{8}$	198	R. Secondary road runs west 1 $\frac{5}{8}$ miles to Chikunan, and further 1 mile west to Chuko.
74 $\frac{3}{8}$	196 $\frac{1}{2}$	Bridge over stream.
74 $\frac{7}{8}$	196	Bridge over river Tiong-kang-k'e.
75 $\frac{1}{4}$	195 $\frac{5}{8}$	CHIAM-SUA-E. Route turns sharp right. Straight on, Route 9 runs south.
75 $\frac{3}{8}$	195 $\frac{1}{2}$	Level crossing. For the next 1 $\frac{3}{4}$ miles there is a single-track railway running, for most of its length on embankments, a few yards to $\frac{1}{4}$ mile from the right of the road.
75 $\frac{1}{2}$	195 $\frac{3}{8}$	Bridge over small stream.
76 $\frac{1}{8}$	194 $\frac{3}{4}$	Ford over river Nanko-kei. To mile 77 there is a scrub-covered hill slope on the left of the road, which appears in some places to be cut into the hill-side.
77	193 $\frac{7}{8}$	The road now winds through undulating land with some deciduous woods and scrub areas, though paddy is still predominant.
77 $\frac{1}{4}$	193 $\frac{5}{8}$	Bridge over river.
78 $\frac{1}{4}$	192 $\frac{5}{8}$	Bridge over stream.
79 $\frac{1}{2}$	191 $\frac{3}{8}$	R. To mile 79 $\frac{3}{4}$ lake.
81 $\frac{1}{4}$	189 $\frac{5}{8}$	For the next 3 miles the road crosses the flood-plain of the river Au-lieng-k'e. This plain is cultivated with paddy, though there is rough land, probably swampy, adjacent to the river.
81 $\frac{5}{8}$	189 $\frac{1}{4}$	Bridge over small stream.
81 $\frac{7}{8}$	189	Bridge over river Au-lieng-k'e and small tributary.
82 $\frac{3}{4}$	188 $\frac{1}{8}$	KORYU. For the next $\frac{3}{4}$ mile there is a railway on the right of the road.
83	187 $\frac{7}{8}$	Bridge over two arms of river Au-lieng-k'e and narrow island.
83 $\frac{1}{2}$	187 $\frac{3}{8}$	Bridge over tributary of river Au-lieng-k'e.
83 $\frac{5}{8}$	187 $\frac{1}{4}$	Cross-roads. Route runs straight on. L. Minor road runs south-east 4 miles to Byoritsu on Route 9. R. Secondary road runs north-west 1 $\frac{1}{2}$ miles to Koshiryo on the coast.
83 $\frac{7}{8}$	187	To Peq-sua-t-un, mile 90 $\frac{1}{2}$, the road crosses two hill ridges divided by the valley of the river O-bai-k'e; this valley is $\frac{1}{4}$ mile wide at the crossing. The road generally follows small stream valleys in this area, though some short sections are cut into the hill-side.
85 $\frac{1}{8}$	185 $\frac{3}{4}$	There is scrub and deciduous forest on the hills and small areas of paddy in the valleys.
85 $\frac{5}{8}$	185 $\frac{1}{4}$	Bridge over stream.

<i>Distance from</i> KIRUN (miles)	<i>Distance from</i> HOSAN (miles)	
86 $\frac{1}{8}$	184 $\frac{3}{4}$	Bridge over stream.
86 $\frac{3}{4}$	184 $\frac{1}{8}$	Bridge over river O-bai-k'e.
87	183 $\frac{7}{8}$	To Peq-sua-tua the road is very winding and is alternately on embankments and cut into the hill-side.
88 $\frac{3}{4}$	182 $\frac{1}{8}$	To mile 90 $\frac{1}{4}$, 6 bridges over streams.
90 $\frac{1}{2}$	180 $\frac{3}{8}$	PEQ-SUA-T-UN. To Enri, mile 99 $\frac{3}{4}$, the road follows the coastal plain which is $\frac{1}{4}$ to $\frac{1}{2}$ mile wide and cultivated with paddy and coconuts. The hills bordering the left of the road are covered with deciduous forest and some scrub; paddy is found in the many small stream valleys. A single-track railway line runs a few yards west of the road as far as the southern outskirts of Enri.
90 $\frac{3}{4}$	180 $\frac{1}{8}$	R. Road, $\frac{1}{8}$ mile, to railway station.
91 $\frac{3}{8}$	179 $\frac{1}{2}$	To mile 94 the road is broken in 8 places, which appears to indicate the presence of small mountain streams and fords in wet weather.
96 $\frac{1}{4}$	174 $\frac{5}{8}$	TSUSHO. L. Minor road runs east to Dora on Route 9.
99 $\frac{1}{8}$	171 $\frac{3}{4}$	Bridge over river.
99 $\frac{3}{4}$	171 $\frac{1}{8}$	ENRI. L. Minor road runs south-east 3 miles through paddy-fields to Ku-sia.
100 $\frac{1}{2}$	170 $\frac{3}{8}$	Level crossing. The railway now runs south-east and south-west and rejoins the route at Taiko, mile 107. For the next 5 $\frac{3}{4}$ miles the road crosses the delta of the river Taian-kei, which is very low lying and probably swampy. It crosses numerous streams and 4 larger rivers, probably by fords, though the rivers may be bridged. Large sections of the delta are covered with flood boulder deposits.
101 $\frac{3}{8}$	169 $\frac{7}{8}$	Road crosses light railway.
103 $\frac{1}{2}$	167 $\frac{3}{8}$	Road crosses light railway.
105	165 $\frac{7}{8}$	Road crosses dyke.
106 $\frac{1}{4}$	164 $\frac{5}{8}$	L. Secondary road runs back north-east $\frac{3}{4}$ mile to Tieng-tiam.
106 $\frac{3}{4}$	164 $\frac{1}{8}$	Bridge over stream.
107	163 $\frac{7}{8}$	TAIKO. Bridge over stream. L. Secondary road runs south-east, 6 $\frac{3}{4}$ miles across undulating country with mixed cultivation to Au-li on Route 9.
107 $\frac{1}{2}$	163 $\frac{3}{8}$	Road crosses light railway.
108	162 $\frac{7}{8}$	Bridge over stream. To Kiyomizu, mile 113 $\frac{1}{4}$, the road crosses the delta and flood-plain of the river Taiko-kei, which is mainly rough, stony uncultivated land, though mixed cultivation is found on some slightly higher areas.
108 $\frac{3}{4}$	162 $\frac{1}{8}$	To mile 110 $\frac{3}{4}$ the road crosses 5 arms of the river Taiko-kei. A single-track railway line runs immediately east of the road in this section.
110 $\frac{5}{8}$	160 $\frac{1}{4}$	Railway leaves road and runs about $\frac{1}{2}$ mile east of it.
110 $\frac{7}{8}$	160	R. Alternative minor road runs about 300 yards west of the road, rejoining in Kiyomizu.
111	159 $\frac{7}{8}$	Bridge over stream.
111 $\frac{1}{2}$	159 $\frac{3}{8}$	Bridge over stream.
112 $\frac{3}{8}$	158 $\frac{1}{2}$	Bridge over stream.
113	157 $\frac{7}{8}$	Bridge over stream. Immediately after this bridge the road crosses the railway, which runs about $\frac{1}{4}$ mile west of the road as far as Sharoku.
113 $\frac{1}{4}$	157 $\frac{5}{8}$	KIYOMIZU. L. Secondary road runs south-east 2 $\frac{5}{8}$ miles to Kong-kuan, rising steeply in the first $\frac{1}{2}$ mile on to a hill ridge.

<i>Distance from</i> KIRUN (miles)	<i>Distance from</i> HOSAN (miles)	
113 $\frac{1}{2}$	157 $\frac{3}{8}$	To Sharoku, mile 115 $\frac{7}{8}$, there is a steep hill slope, covered with scrub and rocks, on the left of the road, and flat paddy-fields on the right.
115	155 $\frac{7}{8}$	Bridge over stream.
115 $\frac{7}{8}$	155	SHAROKU. Route turns left. Straight on, Route 11 runs south-east. R. Minor road runs north-west 2 $\frac{1}{4}$ miles through paddy to Gosei on the coast.
116	154 $\frac{7}{8}$	For the next 3 $\frac{5}{8}$ miles the road is winding as it climbs a spur. L. For the first 2 $\frac{1}{2}$ miles of this section there is a rocky, dry valley, through which there is a torrent in very wet weather.
119 $\frac{5}{8}$	151 $\frac{1}{4}$	To mile 122 $\frac{3}{4}$ the road crosses the ridge, then descends a gentle slope to Hogen. The ridge top is uncultivated, but the eastern slope has tea, some paddy, bamboo, and coniferous woods.
120 $\frac{1}{2}$	150 $\frac{3}{8}$	KONG-KUAN. L. Secondary road from mile 113 $\frac{1}{4}$ rejoins route. R. Secondary road runs south-east 8 $\frac{3}{4}$ miles to Taichu.
123 $\frac{1}{4}$	147 $\frac{5}{8}$	SIN-KNG.
124	146 $\frac{7}{8}$	Bridge over stream.
125	145 $\frac{7}{8}$	SIA-KA'U. R. Minor road runs south-west 2 $\frac{3}{4}$ miles to Tua-nga on secondary road from mile 120 $\frac{1}{2}$.
127	143 $\frac{7}{8}$	HOGEN. Route turns right. L. Route 9 runs north. To Taichu, mile 135, the road crosses undulating country with mixed cultivation, paddy predominating especially in the south. There is a single-track railway line a few yards east of the road for the first 5 miles of this section: road and railway then diverge and the railway is about $\frac{3}{4}$ mile east of the road as it enters Taichu. A river meanders about $\frac{1}{2}$ to $\frac{3}{4}$ mile east of the road.
127 $\frac{1}{2}$	143 $\frac{3}{8}$	Bridge over stream.
128 $\frac{3}{4}$	142 $\frac{1}{8}$	Bridge over stream.
129 $\frac{5}{8}$	141 $\frac{1}{4}$	R. Minor road runs west 3 $\frac{1}{2}$ miles to Tua-nga on secondary road from mile 120 $\frac{1}{2}$.
129 $\frac{3}{4}$	141 $\frac{1}{8}$	TANSHI.
133 $\frac{1}{4}$	137 $\frac{5}{8}$	PAKTUN.
135	135 $\frac{7}{8}$	TAICHU. <i>For details of roads in town see I.S.T.D. Report, F.387.</i> L. Route 13 runs south. R. Route 11 runs north-west.
136	134 $\frac{7}{8}$	Cross-roads. Route runs straight on. L. Minor road runs back north-east into Taichu. R. Minor road runs west 2 miles to Lam-tun, connecting there with several other minor roads and tracks serving the many small towns and villages in this area.
136 $\frac{1}{4}$	134 $\frac{5}{8}$	Road crosses railway, which follows the right of the road. The road now follows the right bank of the river Taito-kei through paddy-fields cut by many rivers and small streams.
137	133 $\frac{7}{8}$	Bridge over stream.
137 $\frac{1}{4}$	133 $\frac{5}{8}$	Bridge over stream.
138 $\frac{1}{4}$	132 $\frac{5}{8}$	Bridge over river.
139 $\frac{1}{8}$	131 $\frac{3}{4}$	Bridge over river.
139 $\frac{3}{4}$	131 $\frac{1}{8}$	UJITSU.
140 $\frac{1}{8}$	130 $\frac{3}{4}$	Bridge over river.
140 $\frac{7}{8}$	130	Bridge over river.

<i>Distance from</i> KIRUN (miles)	<i>Distance from</i> HOSAN (miles)	
142 $\frac{1}{2}$	128 $\frac{3}{8}$	Road crosses railway, which runs about 100 yards east of the road for the next $1\frac{1}{4}$ miles.
142 $\frac{5}{8}$	128 $\frac{1}{4}$	Route turns left. R. Route 12 runs north-west.
142 $\frac{3}{4}$	128 $\frac{1}{8}$	Bridge over river Taito-kei, 150 yards of rocky ground, and tributary of river Taito-kei.
143 $\frac{3}{4}$	127 $\frac{1}{8}$	Bridge over river. Road crosses railway and runs through paddy fields to Shoka.
145	125 $\frac{7}{8}$	Road enters the outskirts of Shoka.
145 $\frac{1}{8}$	125 $\frac{3}{4}$	R. Secondary road runs into town.
145 $\frac{3}{8}$	125 $\frac{1}{2}$	Bridge over river.
146	124 $\frac{7}{8}$	SHOKA. R. Secondary road runs south-west. The road runs through paddy-fields as far as Hokuto.
147	123 $\frac{7}{8}$	LAM-KOK. R. Minor road runs back north into Shoka.
147 $\frac{1}{8}$	123 $\frac{3}{4}$	Bridge over stream. To Inrin, mile 155, a single-track railway runs from 200 yards to $\frac{1}{2}$ mile right of the road.
147 $\frac{3}{8}$	123 $\frac{1}{2}$	Bridge over stream.
148 $\frac{7}{8}$	122	Bridge over stream. To mile 149 $\frac{3}{4}$ this stream runs very close to the left of the road.
149 $\frac{1}{4}$	121 $\frac{5}{8}$	Bridge over stream.
149 $\frac{1}{2}$	121 $\frac{3}{8}$	R. Minor road runs south-west $\frac{1}{2}$ mile to Katan.
149 $\frac{3}{4}$	121 $\frac{1}{8}$	Bridge over stream.
149 $\frac{7}{8}$	121	KATAN.
150 $\frac{3}{4}$	120 $\frac{1}{8}$	R. Minor road runs back north-west 1 mile into Katan.
151 $\frac{1}{4}$	119 $\frac{5}{8}$	L. Minor road runs back north 2 $\frac{3}{4}$ miles to Peq-sua-k'e.
151 $\frac{3}{8}$	119 $\frac{1}{2}$	Bridge over dry valley.
151 $\frac{7}{8}$	119	Bridge over stream.
152 $\frac{7}{8}$	118	Bridge over stream.
153 $\frac{5}{8}$	117 $\frac{1}{4}$	Bridge over stream.
154	116 $\frac{7}{8}$	Bridge over stream.
154 $\frac{3}{4}$	116 $\frac{1}{8}$	Bridge over small stream.
155	115 $\frac{7}{8}$	INRIN.
155 $\frac{5}{8}$	115 $\frac{1}{4}$	L. Route 14 runs south-east. R. Minor road runs west to sugar refinery. Road crosses railway line, which diverges south-east.
156	114 $\frac{7}{8}$	Bridge over stream.
156 $\frac{1}{8}$	114 $\frac{3}{4}$	Bridge over stream.
156 $\frac{3}{8}$	114 $\frac{1}{2}$	Bridge over stream.
158 $\frac{1}{4}$	112 $\frac{5}{8}$	IENG-TSE. R. Minor road runs west.
158 $\frac{5}{8}$	112 $\frac{1}{4}$	R. Minor road runs north-west $\frac{1}{4}$ mile to join minor road from mile 158 $\frac{1}{4}$.
159 $\frac{7}{8}$	111	Bridge over stream.

<i>Distance from</i> KIRUN (miles)	<i>Distance from</i> HOSAN (miles)	
160 $\frac{5}{8}$	110 $\frac{1}{4}$	R. Secondary alternative road runs 200 yards west of the road for 1 $\frac{1}{4}$ miles, rejoining route at mile 161 $\frac{3}{4}$.
161 $\frac{1}{8}$	109 $\frac{3}{4}$	Road crosses light railway.
161 $\frac{5}{8}$	109 $\frac{1}{4}$	Bridge over river.
161 $\frac{3}{4}$	109 $\frac{1}{8}$	Cross-roads. Route runs straight on. L. Secondary road runs south-east into Hokuto. R. Secondary road from mile 160 $\frac{5}{8}$ rejoins route. For the next $\frac{3}{4}$ mile the route by-passes Hokuto on the west. The route now runs through mixed cultivation.
162 $\frac{1}{2}$	108 $\frac{3}{8}$	R. Route 15 runs north-west. L. Secondary road runs south-east 4 $\frac{1}{2}$ miles, through Hokuto, to Tanaka on Route 14.
162 $\frac{3}{4}$	108 $\frac{1}{8}$	Bridge over river Tak-tsui-k'e.
163 $\frac{1}{4}$	107 $\frac{5}{8}$	Road crosses light railway.
163 $\frac{3}{4}$	107 $\frac{1}{8}$	Bridge over river.
164 $\frac{1}{4}$	106 $\frac{5}{8}$	L. Minor road runs east and north 2 $\frac{3}{4}$ miles to Hokuto.
164 $\frac{3}{8}$	106 $\frac{1}{2}$	KEISHU. R. Minor road runs north-west 3 $\frac{3}{4}$ miles to Route 15.
164 $\frac{1}{2}$	106 $\frac{3}{8}$	Road crosses light railway.
165 $\frac{1}{2}$	105 $\frac{3}{8}$	Road crosses light railway.
166 $\frac{3}{8}$	104 $\frac{1}{2}$	Road crosses light railway.
166 $\frac{3}{4}$	104 $\frac{1}{8}$	To mile 167 $\frac{3}{4}$ there is a bridge across the delta of the river Seira-kei.
168 $\frac{3}{4}$	102 $\frac{1}{8}$	SEIRA.
168 $\frac{7}{8}$	102	R. Route 16 runs south-west.
169 $\frac{1}{2}$	101 $\frac{3}{8}$	Bridge over river.
169 $\frac{3}{4}$	101 $\frac{1}{8}$	Bridge over stream.
170 $\frac{1}{4}$	100 $\frac{5}{8}$	Bridge over stream.
170 $\frac{1}{2}$	100 $\frac{3}{8}$	Bridge over stream.
170 $\frac{5}{8}$	100 $\frac{1}{4}$	R. Alternative secondary road runs 100 yards west of the road for $\frac{1}{2}$ mile to rejoin route at mile 171.
171	99 $\frac{7}{8}$	R. Alternative road from mile 170 $\frac{5}{8}$ rejoins route.
171 $\frac{3}{4}$	99 $\frac{1}{8}$	Bridge over small stream.
172	98 $\frac{7}{8}$	Road crosses light railway.
172 $\frac{1}{8}$	98 $\frac{3}{4}$	Bridge over stream.
172 $\frac{1}{2}$	98 $\frac{3}{8}$	SHIDO. Route bears south-west. L. Secondary road runs south-east 4 miles to Toroku on Route 14.
173	97 $\frac{7}{8}$	Ford across river Sin-ho-bue-k'e.
173 $\frac{5}{8}$	97 $\frac{1}{4}$	Bridge over canal. For the next $\frac{1}{4}$ mile this canal runs immediately to the right of the road.
174 $\frac{1}{8}$	96 $\frac{3}{4}$	Road crosses light railway.
175 $\frac{1}{8}$	95 $\frac{3}{4}$	Bridge over river.
175 $\frac{1}{4}$	95 $\frac{5}{8}$	Ferry over stream.
176	94 $\frac{7}{8}$	To mile 176 $\frac{3}{4}$ the road crosses the river Ho-bue-k'e three times, probably by fords.
176 $\frac{3}{4}$	94 $\frac{1}{8}$	Road crosses light railway.

<i>Distance from</i> KIRUN (miles)	<i>Distance from</i> HOSAN (miles)	
177 $\frac{3}{4}$	93 $\frac{1}{8}$	Ford over river Chioq-gu-k'e.
178 $\frac{1}{8}$	92 $\frac{3}{4}$	L. Secondary road runs north-east 4 $\frac{1}{2}$ miles to Toroku on Route 14.
178 $\frac{3}{8}$	92 $\frac{1}{2}$	TONAN. R. Secondary road runs north-west 3 $\frac{3}{4}$ miles to Kobi. R. Just after this road junction, minor road runs west about 5 $\frac{1}{2}$ miles to T'o-k'o.
178 $\frac{3}{4}$	92 $\frac{1}{8}$	R. Minor road runs south-west about 11 $\frac{1}{2}$ miles to Shinko on Route 18.
179	91 $\frac{7}{8}$	Road crosses light railway.
179 $\frac{1}{4}$	91 $\frac{5}{8}$	To Hosan, mile 270 $\frac{7}{8}$, the road is followed closely by a single-track railway which it crosses in several places. For the first 6 miles the railway is east of the road.
179 $\frac{3}{8}$	91 $\frac{1}{2}$	Bridge over river Tua-o-k'au-k'e.
179 $\frac{7}{8}$	91	Ford over stream.
180 $\frac{1}{8}$	90 $\frac{3}{4}$	Ford over stream.
181 $\frac{5}{8}$	89 $\frac{1}{4}$	Ford over stream.
181 $\frac{3}{4}$	89 $\frac{1}{8}$	Ford over river. Sugar refinery railway crosses road.
182 $\frac{1}{4}$	88 $\frac{5}{8}$	Ford over stream.
183 $\frac{3}{8}$	87 $\frac{1}{2}$	Sugar refinery railway crosses road. Bridge over stream.
183 $\frac{1}{2}$	87 $\frac{3}{8}$	Bridge over river.
183 $\frac{7}{8}$	87	TAIRIN. L. Route 14 runs east.
184 $\frac{1}{4}$	86 $\frac{5}{8}$	Sugar refinery railway crosses road.
184 $\frac{1}{2}$	86 $\frac{3}{8}$	Bridge over stream.
184 $\frac{7}{8}$	86	Bridge over river Sa-tuap-k'e. Bridge over stream.
185 $\frac{1}{4}$	85 $\frac{5}{8}$	Level crossing.
187 $\frac{1}{2}$	83 $\frac{3}{8}$	TAMIO. R. Route 18 runs west.
187 $\frac{3}{4}$	83 $\frac{1}{8}$	Bridge over river.
188 $\frac{3}{8}$	82 $\frac{1}{2}$	Bridge over river.
188 $\frac{1}{2}$	82 $\frac{3}{8}$	Road runs in cutting for 200 yards.
189 $\frac{1}{2}$	81 $\frac{3}{8}$	Bridge over stream.
190	80 $\frac{7}{8}$	R. Minor road runs north-west 5 $\frac{1}{2}$ miles to Route 18.
190 $\frac{3}{4}$	80 $\frac{1}{8}$	Bridge over river Gu-tiau-k'e. To mile 192 road runs immediately east of railway on embankment.
191 $\frac{3}{8}$	79 $\frac{1}{2}$	Road crosses light railway.
192 $\frac{3}{8}$	78 $\frac{1}{2}$	Bridge over river.
192 $\frac{1}{2}$	78 $\frac{3}{8}$	Route turns right and skirts the town of Kagi about $\frac{1}{4}$ mile to the west. <i>For details of roads in town see I.S.T.D. Report, F.387.</i>
192 $\frac{5}{8}$	78 $\frac{1}{4}$	Level crossing.
194 $\frac{1}{8}$	76 $\frac{3}{4}$	Bridge over river.
194 $\frac{1}{4}$	76 $\frac{5}{8}$	R. Route 19 runs south-west.
195 $\frac{3}{8}$	75 $\frac{1}{2}$	Bridge over stream.
197 $\frac{3}{4}$	73 $\frac{1}{8}$	MIZUKAMI. (Photograph D.11.)

<i>Distance from</i> KIRUN (miles)	<i>Distance from</i> HOSAN (miles)	
197 $\frac{7}{8}$	73	R. Minor road runs north-west 3 $\frac{1}{2}$ miles to Route 19.
199 $\frac{1}{8}$	71 $\frac{3}{4}$	Bridge over stream.
200 $\frac{1}{8}$	70 $\frac{3}{4}$	Bridge over river Pueq-chio-k'e.
200 $\frac{1}{2}$	70 $\frac{3}{8}$	Road crosses light railway.
200 $\frac{3}{4}$	70 $\frac{1}{8}$	Bridge over river in gorge.
201 $\frac{7}{8}$	69	Bridge over stream in gorge.
202 $\frac{7}{8}$	68	Bridge over river.
203	67 $\frac{7}{8}$	Bridge over river in gorge and about 200 yards farther on, level crossing.
203 $\frac{1}{4}$	67 $\frac{5}{8}$	KOHEKI. L. Secondary road runs south-east to Shirakawa on Route 17.
203 $\frac{3}{4}$	67 $\frac{1}{8}$	Bridge over stream, which runs south-west away from the road, in a gorge for $\frac{1}{4}$ mile.
204	66 $\frac{7}{8}$	Bridge over stream.
204 $\frac{7}{8}$	66	Road crosses light railway.
205 $\frac{1}{8}$	65 $\frac{3}{4}$	Bridge over lake.
205 $\frac{3}{8}$	65 $\frac{1}{2}$	Bridge over stream.
207 $\frac{7}{8}$	63	Level crossing.
208 $\frac{1}{4}$	62 $\frac{5}{8}$	Road crosses light railway.
208 $\frac{7}{8}$	62	SHINEI. R. Route 20 runs west.
209 $\frac{1}{8}$	61 $\frac{3}{4}$	Road crosses light railway.
209 $\frac{3}{8}$	61 $\frac{1}{2}$	Bridge over river Kip-tsui-k'e.
209 $\frac{5}{8}$	61 $\frac{1}{4}$	Road crosses light railway.
210	60 $\frac{7}{8}$	Bridge over lake.
211	59 $\frac{7}{8}$	R. Lake.
212	58 $\frac{7}{8}$	Bridge over river Tiq-sua-kio.
212 $\frac{3}{8}$	58 $\frac{1}{2}$	Road crosses light railway.
212 $\frac{3}{4}$	58 $\frac{1}{8}$	Ford over stream.
213 $\frac{5}{8}$	57 $\frac{3}{8}$	Ford over river.
214 $\frac{1}{2}$	56 $\frac{3}{8}$	Bridge over river.
215	55 $\frac{7}{8}$	Ford over stream.
215 $\frac{5}{8}$	55 $\frac{1}{4}$	Bridge over stream in gorge.
215 $\frac{7}{8}$	55	R. Lake.
216 $\frac{1}{2}$	54 $\frac{3}{8}$	Bridge over river.
216 $\frac{7}{8}$	54	BANSHIDEN. R. Route 21 runs south and west. Level crossing.
217 $\frac{3}{8}$	53 $\frac{1}{2}$	L. Route 17 runs south-east to Kwanden, thence north.
218 $\frac{1}{2}$	52 $\frac{3}{8}$	Road crosses light railway.
218 $\frac{3}{4}$	52 $\frac{1}{8}$	Bridge over river Kua-ts'an-k'e.
219 $\frac{3}{8}$	51 $\frac{1}{2}$	Bridge over river. To mile 220 $\frac{7}{8}$ the road runs on embankments.

<i>Distance from</i> KIRUN (miles)	<i>Distance from</i> HOSAN (miles)	
220 $\frac{1}{2}$	50 $\frac{3}{8}$	Bridge over river Tsan-bun-k'e.
222 $\frac{1}{2}$	48 $\frac{3}{8}$	Road crosses light railway. Bridge over stream.
222 $\frac{7}{8}$	48	Cross-roads. Route runs straight on. L. and R. Minor roads serving paddy-fields and small villages.
224 $\frac{1}{8}$	46 $\frac{3}{4}$	Ford over stream with steep banks.
225 $\frac{5}{8}$	45 $\frac{1}{4}$	Road crosses light railway.
225 $\frac{3}{4}$	45 $\frac{1}{8}$	L. Minor road runs north-east, south-east, and south-west 8 miles through paddy to rejoin route at mile 226 $\frac{7}{8}$.
225 $\frac{7}{8}$	45	To mile 226 $\frac{3}{4}$ the road runs on an embankment through paddy fields.
226 $\frac{7}{8}$	44	L. Minor road from mile 225 $\frac{3}{4}$ rejoins route.
227 $\frac{3}{4}$	43 $\frac{1}{8}$	SIA-LAI. L. Route 22 runs south-east.
228 $\frac{1}{8}$	42 $\frac{3}{4}$	Road turns sharp right, crosses railway, then turns sharp left. To mile 230 $\frac{3}{8}$ the road runs on an embankment.
228 $\frac{5}{8}$	42 $\frac{1}{4}$	Bridge over stream.
228 $\frac{7}{8}$	42	Bridge over river.
230	40 $\frac{7}{8}$	Bridge over stream.
231 $\frac{3}{8}$	39 $\frac{1}{2}$	Road crosses light railway.
232 $\frac{3}{8}$	38 $\frac{1}{2}$	Ford over stream.
233	37 $\frac{7}{8}$	Ford over stream.
233 $\frac{7}{8}$	37	R. Minor road runs north-west 10 $\frac{1}{2}$ miles to Kari on Route 21. Immediately after this junction, route forks left. R. Minor road runs south-west as an alternative road into Tainan.
234 $\frac{1}{8}$	36 $\frac{3}{4}$	Bridge over river.
236 $\frac{1}{8}$	34 $\frac{3}{4}$	TAINAN. Centre of town. <i>For details of roads in town see I.S.T.D. Report, F.387.</i> L. Route 22 runs south-east.
236 $\frac{3}{8}$	34 $\frac{1}{2}$	Route turns sharp left and then right and runs within $\frac{1}{4}$ mile west of the railway to mile 239 $\frac{1}{2}$.
237 $\frac{1}{4}$	33 $\frac{5}{8}$	Bridge over river in gorge.
240 $\frac{5}{8}$	30 $\frac{1}{4}$	Road crosses light railway.
241 $\frac{1}{4}$	29 $\frac{5}{8}$	Bridge over river Sa-ia-kieng-k'e.
241 $\frac{5}{8}$	29 $\frac{1}{4}$	Bridge over river.
242 $\frac{1}{8}$	28 $\frac{3}{4}$	Bridge over river Dzi-tsan-hang-k'e.
246 $\frac{3}{8}$	24 $\frac{1}{2}$	ROCHIKU.
247 $\frac{3}{8}$	23 $\frac{1}{2}$	Level crossing.
249 $\frac{5}{8}$	21 $\frac{1}{4}$	Bridge over river.
250 $\frac{1}{8}$	20 $\frac{3}{4}$	Level crossing.
251 $\frac{3}{8}$	19 $\frac{1}{2}$	OKAYAMA. L. Airfield.
252 $\frac{3}{8}$	18 $\frac{1}{2}$	Bridge over river Tiek-a-kang-k'e.
252 $\frac{7}{8}$	18	Bridge over river.
253 $\frac{7}{8}$	17	Bridge over river.

<i>Distance from</i> KIRUN (miles)	<i>Distance from</i> HOSAN (miles)	
255 $\frac{5}{8}$	15 $\frac{1}{4}$	Level crossing.
256 $\frac{7}{8}$	14	NANSHI. L. Route 23 runs north-east.
257 $\frac{1}{8}$	13 $\frac{3}{4}$	Route turns right. L. Secondary road runs south 7 $\frac{1}{2}$ miles to Hosan. Bridge over river Au-kieng-ts'ui.
257 $\frac{3}{8}$	13 $\frac{1}{2}$	Level crossing.
257 $\frac{5}{8}$	13 $\frac{1}{4}$	Bridge over river.
260 $\frac{1}{8}$	10 $\frac{3}{4}$	L. Lake.
265 $\frac{3}{8}$	5 $\frac{1}{2}$	TAKAO. <i>For details of roads in town see I.S.T.D. Report, F.387.</i> Route turns left.
265 $\frac{5}{8}$	5 $\frac{1}{4}$	Level crossing, main railway runs south into Takao, branch line follows close to the left of the road.
265 $\frac{7}{8}$	5	Bridge over river. (<i>Photograph D.12.</i>)
270 $\frac{7}{8}$	0	HOSAN.

ROUTE 2

KIRUN—SEKIMON—TANSUI—TAIHOKU

Distance: 47 miles*Maps:* A.M.S. L 592, Sheet 1; Japanese 1:50,000,
G/51/29; Sheets 5, 6, 9, 10*Photographs:* D.13-15**1) General**

This road runs round the northern tip of Formosa, mostly a few miles inland, though one section is right on the coast. The area enclosed between it and the main Kirun to Taihoku road, Route 1, is served by a large number of tracks and bridle-paths; and there is one secondary road, Route 37, which diverges south-east at E-tiong-ko, mile 11, and, branching at T'au-o, rejoins the route at Shirin and near Hokuto. A push-car line follows the road from Se-ki-liang to Tansui.

(2) Terrain

The road skirts the edge of the hill-mass which fills the northernmost part of Formosa north of the Kirun to Taihoku road; this is over 6000 feet high in the middle and drops in every direction. The road crosses hilly country, which is broken up by numerous streams. Vegetation is chiefly scrub and deciduous trees, but there are also many stretches of paddy-land in the flatter parts. In the centre section of the route the road runs along the coast and is often shut in by steeply rising ground on the inland side. South of Tansui the road follows the east bank of the estuary of the Tansui river, runs inland chiefly through paddy from Kanto to Shirin, and finally enters the built-up area of Taihoku. The road is hilly, but no steep gradients are known; it is winding, especially where it runs along the coast.

(3) Construction

From Kirun to E-tiong-ko the road is dressed with gravel on an earth formation; there is concrete on the steeper hills. Between Tansui and Taihoku it is at least 15 feet wide, except for bridges, which are 9 feet wide; it is well built, but is probably not metalled from Tansui to Kanto; in 1933 a bituminous surface was laid over the first 6 miles from Taihoku.

(4) Bridges, fords, and ferries

Small, concrete bridges are extremely numerous throughout the route, and there is a large modern bridge across the Keelung river between Shirin and Taihoku. All river crossings have not been mentioned in this itinerary; all bridges, however, have been listed in the Bridge Schedule on page 145.

(5) Seasonal variations

The route lies in the area affected by the north-east monsoon. Heavy rain may cause landslips to block the road and the surface to deteriorate.

(6) Vulnerable points

The road could be effectively blocked at many points on the coast, where it is bordered by steeply rising ground or cliffs. Most of the bridges are too small to be worth demolishing, except for that over the Keelung river north of Taihoku.

Distance from

<i>Distance from</i> KIRUN (miles)	<i>Distance from</i> TAIHOKU (miles)	
0	47	KIRUN. <i>For details of roads in town see I.S.T.D. Report, F.387.</i> Details of the first section of the road, approximately 16 miles long, are not known.
6	41	MA-LAT-KANG-KAU. The road reaches the coast at about mile 6, and continues within $\frac{1}{2}$ mile of it.
11	36	E-TIONG-KO. Route 37 runs south-east.

<i>Distance from</i> KIRUN (miles)	<i>Distance from</i> TAIHOKU (miles)	
13	34	From about this point is a stretch on which the road is closely confined between the coast and steep hills.
16	31	A-LI-LAU.
17 $\frac{3}{8}$	29 $\frac{5}{8}$	Bridge over small river.
19 $\frac{1}{4}$	27 $\frac{3}{4}$	SEKIMON.
20	27	To mile 21 $\frac{3}{4}$ the road runs inland of Cape Fuki-kaku.
20 $\frac{5}{8}$	26 $\frac{3}{8}$	LAU-MUI. To mile 21 $\frac{1}{4}$ the road is very winding.
21 $\frac{3}{4}$	25 $\frac{1}{4}$	To mile 22 $\frac{5}{8}$ the road is separated from the coast by a strip of deciduous forest about 100 yards wide.
22 $\frac{5}{8}$	24 $\frac{3}{8}$	T'AU-UI. The road leaves the coast and turns south-west.
23 $\frac{1}{2}$	23 $\frac{1}{2}$	R. Footpath runs west rejoining route at mile 26 $\frac{1}{8}$.
24 $\frac{1}{8}$	22 $\frac{7}{8}$	Bridge over stream. To mile 26 $\frac{1}{8}$ the road runs through paddy.
24 $\frac{7}{8}$	22 $\frac{1}{8}$	SE-KI-LIONG. The road turns right. From here to Tansui a push-car track follows the line of the road.
25 $\frac{1}{2}$	21 $\frac{1}{2}$	Bridge over stream.
26 $\frac{1}{4}$	20 $\frac{3}{4}$	To mile 28 the road runs close to the coast with low hills rising inland.
26 $\frac{3}{4}$	20 $\frac{1}{4}$	Bridge over stream.
28 $\frac{1}{8}$	18 $\frac{7}{8}$	To mile 28 $\frac{7}{8}$ road crosses an expanse of paddy.
28 $\frac{7}{8}$	18 $\frac{1}{8}$	Bridge over stream.
29 $\frac{1}{4}$	17 $\frac{3}{4}$	L. Bridle path runs east. Bridge over stream.
29 $\frac{7}{8}$	17 $\frac{1}{8}$	Bridge over stream.
30 $\frac{3}{8}$	16 $\frac{5}{8}$	L. Bridle-path runs east. Bridge over stream.
30 $\frac{1}{2}$	16 $\frac{1}{2}$	Bridge over stream.
31	16	L. Bridle-path runs east.
31 $\frac{3}{8}$	15 $\frac{5}{8}$	Bridge over stream.
31 $\frac{3}{4}$	15 $\frac{1}{4}$	R. Bridle-path runs north-west and south 2 miles.
32 $\frac{1}{4}$	14 $\frac{3}{4}$	Bridge over stream.
32 $\frac{7}{8}$	14 $\frac{1}{8}$	Bridge over stream.
33 $\frac{1}{4}$	13 $\frac{3}{4}$	L. A road leads about 6 miles north-east, connecting with tracks running east from the route.
33 $\frac{1}{2}$	13 $\frac{1}{2}$	Road enters built-up area.
33 $\frac{3}{4}$	13 $\frac{1}{4}$	TANSUI. Centre of town.
34	13	Road leaves built-up area and continues by the railway line. It crosses at least 4 bridges over mountain streams before mile 38 $\frac{5}{8}$.
35	12	L. Bridle-path runs east and south about 5 miles to Hokuto. To mile 36 $\frac{1}{4}$ the road crosses the railway 6 times.
37 $\frac{3}{8}$	9 $\frac{5}{8}$	To mile 37 $\frac{1}{2}$ the road crosses railway twice.
38 $\frac{1}{2}$	8 $\frac{1}{2}$	Road turns sharply right and makes a hairpin bend.
38 $\frac{5}{8}$	8 $\frac{3}{8}$	Road crosses railway. Junction. Straight on a bridle-path runs $\frac{1}{2}$ mile south to the Tansui river, the road bears left and runs through flat paddy-land to mile 42 $\frac{3}{4}$.

Distance from KIRUN (miles)	Distance from TAIHOKU (miles)	
39	8	Bridge over stream.
39 $\frac{1}{4}$	7 $\frac{3}{4}$	Bridge over stream.
40 $\frac{3}{4}$	6 $\frac{1}{4}$	Road junction. L. A road runs north-east about 13 miles through hilly terrain to Route 2, mile 11. At mile $\frac{3}{4}$ it passes through Hokuto.
40 $\frac{7}{8}$	6 $\frac{1}{8}$	Bridge over tributary of Tansui river.
41	6	Bridge over tributary of Tansui river.
42 $\frac{3}{8}$	4 $\frac{5}{8}$	Bridge over tributary of Tansui river.
42 $\frac{7}{8}$	4 $\frac{1}{8}$	Bridge over tributary of Tansui river.
43 $\frac{1}{2}$	3 $\frac{1}{2}$	SHIRIN. L. A road runs north about 6 miles to connect with the road from mile 40 $\frac{3}{4}$.
43 $\frac{3}{4}$	3 $\frac{1}{4}$	Road crosses railway.
44 $\frac{5}{8}$	2 $\frac{3}{8}$	L. Minor road runs east, affording access by means of ferries to Route 1 at Matsuyama and Nanko. Bridge over Keelung river. (Photographs D.13-15.)
45 $\frac{3}{4}$	1 $\frac{1}{4}$	Road enters built-up area of Taihoku. For details of roads in town see I.S.T.D. Report, F.387.
47	0	TAIHOKU. Centre of town.

ROUTE 3

TAIHOKU—HEIREN—SHOKEI

Distance: 39 $\frac{1}{8}$ milesMaps: A.M.S. L 592, Sheets 1 and 5; Japanese
1:50,000, 6/51/29, Sheets 3, 4, 6, 7

Photograph: D.16

(1) General

This route cuts across the mountainous region in the north of the island from Taihoku to Shokei on the east coast road, Route 35. This is an alternative to proceeding on Route 1 to Kirun and round the coast on Route 35. Route 3 is very much shorter but crosses difficult country. A push-car line follows the road from 1 mile west of Shinko to Chioq-tia.

(2) Terrain

From Taihoku the road crosses 2 miles of flat paddy-land before climbing into steep, wooded hills; it then drops down into the valley of the Kieng-bue-k'e, which, for 4 miles, contains a narrow strip of flat land planted with paddy. At mile 12 the road again rises into wooded hills, reaching a height of over 1950 feet, and, after a descent to Heiren, rises again to 1650 feet before dropping down to the east coast plain. In the hill section the road is extremely winding and there are long steep stretches. The vegetation on the hills is mixed scrub and deciduous trees.

(3) Construction

Construction is not known, but is believed to be of earth or gravel 18-24 feet wide.

(4) Bridges, fords, and ferries

There are numerous bridges over the mountain rivers and streams, the largest being that over the Pak-se-k'e at Heiren. All river crossings have not been mentioned in this itinerary; all bridges, however, have been listed in the Bridge Schedule on page 146.

(5) Seasonal variations

During the north-east monsoon very heavy rains fall in this area and may cause landslides to block the route.

(6) Vulnerable points

In the hills the road could be easily blocked by demolitions, as in many places it is cut into steep sidelong ground.

Distance from TAIHOKU (miles)	Distance from SHOKEI (miles)	
0	39 $\frac{1}{8}$	TAIHOKU. For details of roads in town see I.S.T.D. Report, F.387. Road runs east from Route 1.
1 $\frac{1}{4}$	37 $\frac{7}{8}$	Road forks. R. Alternative road runs south and east through Keibi, rejoining route at mile 8 $\frac{3}{8}$. From mile 1 $\frac{1}{4}$ along it a road runs north-east back to the route at mile 3 $\frac{1}{2}$. L. Route 3.
2 $\frac{3}{8}$	36 $\frac{3}{4}$	L. A minor road runs north to Route 1.
3 $\frac{1}{2}$	35 $\frac{5}{8}$	Cross-roads. L. A road runs north to Matsuyama on Route 1. R. Road from mile 1 $\frac{1}{4}$ rejoins route. Straight on Route 3. To mile 8 $\frac{3}{8}$ the road crosses wooded hills, following a very tortuous course; it rises to about 530 feet at mile 5-6.

<i>Distance from TAIHOKU (miles)</i>	<i>Distance from SHOKEI (miles)</i>	
8 $\frac{1}{8}$	31	The road enters the valley of the Kieng-bue-k'e. To mile 12 it follows the north edge of the valley, a narrow strip of paddy occupying the flat valley-bottom.
8 $\frac{3}{8}$	30 $\frac{3}{4}$	R. Alternative road from mile 1 $\frac{1}{4}$ rejoins route.
9 $\frac{1}{8}$	30	SHINKO.
12	27 $\frac{1}{8}$	The valley narrows, steep hills lining the road on both sides.
12 $\frac{1}{4}$	26 $\frac{7}{8}$	Bridge over stream.
12 $\frac{3}{8}$	26 $\frac{3}{4}$	Short tunnel.
18 $\frac{1}{4}$	20 $\frac{7}{8}$	Summit of pass at height of 1978 feet. Road starts to drop.
21 $\frac{1}{4}$	17 $\frac{7}{8}$	HEIREN.
21 $\frac{3}{8}$	17 $\frac{3}{4}$	Bridge over river Liau-kak-k'e. The road ascends the valley of the Tai-hi-k'ut-k'e. To mile 23 $\frac{1}{2}$ there is paddy on the right in the valley-bed.
23 $\frac{1}{2}$	15 $\frac{5}{8}$	The road starts to climb through woods above the river.
31	8 $\frac{1}{8}$	Summit of pass at about 1650 feet.
37	2 $\frac{1}{8}$	Road leaves the mountains and for the rest of the way descends gently through wooded country.
39 $\frac{1}{8}$	0	The road joins Route 35, south of Shokei.

ROUTE 4

SHINSHO TUA-TIEK-UI

Distance: 12 $\frac{3}{4}$ miles

Maps: A.M.S. L 592, Sheet 1; Japanese 1:50,000, G/51/29, Sheet 10

(1) General

This route gives access from the coast area, south of the estuary of the Tansui river, to Route 1 at Shinsho. Westward it is connected to Route 6 by numerous tracks; and the area north-east of Shinsho is served by an extensive network of minor roads.

(2) Terrain

The first 3 $\frac{1}{2}$ miles run across flat land mostly under paddy. Then the road climbs up a wooded hill-side to a plateau 600-700 feet high, which is covered with tea plantations. From mile 7 $\frac{1}{2}$ to mile 10 $\frac{1}{4}$ the road drops down again to the plain and, finally, traverses 2 miles of flat paddy-land. The hills leading on to the plateau have gradients believed to exceed 1 in 10, and at mile 9 $\frac{1}{2}$ there is a double hairpin bend.

(3) Construction

Construction is not known, but is believed to be of earth or gravel and 18-24 feet wide.

(4) Bridges, fords, and ferries

All the bridges on this route are small. All river crossings have not been mentioned in this itinerary; all bridges, however, have been listed in the Bridge Schedule on page 147.

(5) Seasonal variations

Seasonal variations are believed to affect the surface only, though landslips may occur on the steeper sections.

(6) Vulnerable points

On the two steep sections where the road climbs on to the plateau it could be blocked by demolitions. This is particularly possible from mile 9 to mile 10 where the road is on steep sidelong ground.

<i>Distance from SHINSHO (miles)</i>	<i>Distance from TUA-TIEK-UI (miles)</i>	
0	12 $\frac{3}{4}$	SHINSHO. To mile 2 $\frac{1}{8}$ road runs straight through paddy.
2 $\frac{1}{8}$	10 $\frac{5}{8}$	Road turns right at cross-roads in village. L. A track runs south 2 $\frac{1}{2}$ miles to Route 1.
2 $\frac{3}{8}$	10 $\frac{3}{8}$	Road junction. R. Minor road runs north to river Tansui. L. Route 4.
2 $\frac{1}{2}$	10 $\frac{1}{4}$	To mile 5 $\frac{1}{4}$ the road climbs across a steep wooded hill-side on to a plateau 600-700 feet high.
3 $\frac{1}{8}$	9 $\frac{5}{8}$	Sharp right-hand bend.
3 $\frac{1}{4}$	9 $\frac{1}{2}$	Sharp left-hand bend.

<i>Distance from</i> SHINSHO (miles)	<i>Distance from</i> TUA-TIEK-UI (miles)	
5½	7¼	CH'IU-NA-K'AU.
5¾	7	L. A minor road runs west to a system of tracks connecting with Route 6.
6	6¾	To mile 8½ the road runs through tea plantations.
6¼	6½	L. Track leads north-west to the coast.
8½	4¼	To mile 9¼ the road descends from the plateau across wooded slopes.
9⅝	3⅞	Bridge over stream.
10¾	2	Bridge over stream.
11	1¾	L. Track runs west along the coast.
12½	¼	R. Track runs south down the bank of the river Tansui. To mile 12¾ road is on an embankment.
12¾	0	TUA-TIEK-UI.

ROUTE 5

TAIHOKU—ITAHISHI—SANKYO—TOEN

Distance: 21⅞ miles

Maps: A.M.S. L 592, Sheets 1, 5; Japanese 1:50,000, G/51/29, Sheets 6, 10, 11

(1) General

This route forms an alternative to that part of Route 1 between Taihoku and Toen. It runs south-west through Itahishi, turns north-west at Sankyo, and runs past Okaseki to Toen. From Itahishi and T'o-sia roads run east to Shinko on Route 3 and east and south to Shinten. From Okaseki there is a road through Taikei to Ryutan on Route 7. A push-car line follows the road between Taihoku and Okaseki.

(2) Terrain

Leaving Taihoku the road crosses the river Shinten and runs through paddy-land to Itahishi. From here to Sankyo it follows the south side of the wide valley of the Tansui river. Wooded hills rise steeply on the south of the road, though in places there is a narrow strip of paddy; on the north is paddy and swamp on the river valley. After crossing the Tansui river the road traverses fairly flat paddy-land to Toen. There are no serious gradients on the route and the alignment of the road is generally direct.

(3) Construction

From Tien to Okaseki the road is reported to be of earth construction, 36 feet wide; the rest of the route is believed to be narrower.

(4) Bridges, fords, and ferries

There is a large bridge over the river Shinten south-west of Taihoku, and a series of bridges where the road crosses the valley of the Tansui river. All river crossings have not been mentioned in this itinerary; all bridges, however, have been listed in the Bridge Schedule on page 148.

(5) Seasonal variations

The road is believed to be liable to flooding after typhoons in the valley of the Tansui between Sankyo and Okaseki.

(6) Vulnerable points

The bridge over the river Shinten.

<i>Distance from</i> TAIHOKU (miles)	<i>Distance from</i> TOEN (miles)	
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0	21⅞	TAIHOKU. <i>For details of roads in town see I.S.T.D. Report, F.387.</i>
2	19⅞	Bridge over tributary of Tansui river.
2⅞	19	Road forks. L. A road runs 1¼ miles south to a tributary of the river Tansui. R. Route 5.
2½	18⅝	To mile 2¾ bridge over river Shinten.
3¼	17⅞	Road forks. L. Alternative road runs south and south-west rejoining route at mile 7¼. R. Route 5.
4⅝	16¾	Road crosses railway.
4⅝	16½	ITAHISHI. L. A secondary road runs east and south about 8 miles to Shinten.
5⅞	16	Road crosses railway.
5⅞	15¼	Bridge over stream.

<i>Distance from TAIHOKU (miles)</i>	<i>Distance from TOEN (miles)</i>	
7 $\frac{1}{4}$	13 $\frac{7}{8}$	T'O-SIA. The road which diverged at mile 3 $\frac{1}{4}$ rejoins route.
9 $\frac{1}{2}$	11 $\frac{5}{8}$	TIENG-PO.
10 $\frac{1}{2}$	10 $\frac{5}{8}$	L'AT-A.
12	9 $\frac{1}{8}$	HUAI-K'E. Road junction. L. A minor road runs east 2 $\frac{1}{2}$ miles to Sieng-hok. R. Route 5.
12 $\frac{1}{8}$	9	Bridge over Huai-k'e-ts'ui.
15	6 $\frac{1}{8}$	SANKYO. L. A minor road runs south up the valley of the Sa-kiap-ho.
15 $\frac{3}{4}$	5 $\frac{3}{8}$	To mile 16 $\frac{7}{8}$ the road crosses the valley of the Tansui river; there are 4 separate bridges.
16 $\frac{7}{8}$	4 $\frac{1}{4}$	OKASEKI. The route turns left.
17	4 $\frac{1}{8}$	Road crosses the railway.
17 $\frac{1}{4}$	3 $\frac{7}{8}$	Road forks. L. A minor road runs south-west to Taikei. R. Route 5.
18	3 $\frac{1}{8}$	Railway bridge over road.
21	$\frac{1}{8}$	Road crosses railway.
21 $\frac{1}{8}$	0	The road joins Route 1 in the southern outskirts of Toen.

ROUTE 6

TOEN—TIEK-UI—TAIEN—P'OLIAU—CHUREKI

Distance: 30 miles*Maps:* A.M.S. L 592, Sheets 1, 5; Japanese
1:50,000, G/51/29, Sheets 4, 10, 15, 16**(1) General**

This route serves the coastal area north-west of Chureki and Toen. It could be used as an alternative to that section of Route 1 which runs between these two places, or could serve as a means of access inland from Kannon, Taien, or Hai-o. Besides the route detailed in the itinerary, there is also a good road direct from Taien to Toen and a minor one from Taien to Chureki. Push-car lines follow the road between P'oliau and Chureki and from Toen to Tiek-ui with the exception of a 2-mile stretch north-west of Lam-k'am-e.

(2) Terrain

The road runs for its entire length across flat paddy-land, which is interspersed with raised, irrigation ponds mostly about $\frac{1}{4}$ mile in diameter. It crosses a number of rivers running north-west, none of them of large size, and is lined with trees in many sections. There are no appreciable gradients; the only sharp corners occur in towns and villages, where the road changes direction.

(3) Construction

Construction is not known, but is reported to have been not wider than 12 feet and of gravel or earth in 1941.

(4) Bridges, fords, and ferries

There are numerous small bridges over rivers and streams; the crossing of the river Lam-k'am-k'e at mile 5 $\frac{1}{8}$ may be only a ford. All river crossings have not been mentioned in this itinerary; all bridges, however, have been listed in the Bridge Schedule on page 149.

(5) Seasonal variations

The ford at mile 5 $\frac{1}{8}$ would probably be impassable after heavy rains.

(6) Vulnerable points

None, apart from the bridges, which, even if demolished, are mostly too small to cause serious blockage.

<i>Distance from TOEN (miles)</i>	<i>Distance from CHUREKI (miles)</i>	
0	30	TOEN. The route runs north from Route 1. Another road runs north-west and leads direct to Taien; from mile 1 $\frac{1}{2}$ on this road a right turn runs back 4 $\frac{1}{4}$ miles to Route 6, mile 6 $\frac{1}{8}$.
1 $\frac{1}{4}$	28 $\frac{3}{4}$	Bridge over Lam-k'am-k'e river.
3	26	LAM-K'AM-K'E. L. Minor road runs south-west to the road from Toen to Taien.

<i>Distance from</i> TOEN (miles)	<i>Distance from</i> CHUREKI (miles)	
5 $\frac{1}{8}$	24 $\frac{7}{8}$	Road crosses the Lam-k'am-k'e, probably by a ford.
6 $\frac{1}{8}$	23 $\frac{7}{8}$	L. Alternative road from Toen joins the route.
9 $\frac{1}{2}$	20 $\frac{1}{2}$	TIEK-UI. Road junction. R. A track, probably without bridges, crosses the mouth of the Lam-k'am-k'e river to Hai-o. L. Route 6.
12 $\frac{1}{2}$	17 $\frac{1}{2}$	Bridge over stream.
13	17	Bridge over stream.
13 $\frac{3}{8}$	16 $\frac{5}{8}$	R. Minor road runs 1 $\frac{3}{4}$ miles north-west to mouth of Lou-ke-k'e.
13 $\frac{1}{2}$	16 $\frac{1}{2}$	TAIEN. In centre of town the route turns left, and after about half a furlong, right, where the direct road to Toen leads straight on.
15 $\frac{1}{8}$	14 $\frac{7}{8}$	L. A minor road runs south-west, rejoining Route 6 at mile 23 $\frac{1}{4}$.
17	13	TS'AU-LE.
17 $\frac{1}{8}$	12 $\frac{7}{8}$	L. Minor road runs south, joining the road from mile 15 $\frac{1}{8}$.
20 $\frac{3}{8}$	9 $\frac{5}{8}$	P'OLIAU. Road junction. Straight on a road runs west, $\frac{3}{4}$ mile to Kannon. L. Route 6 turns back south-east.
22 $\frac{3}{8}$	7 $\frac{5}{8}$	Bridge over Tua-k'ut-ts'ui river.
23 $\frac{1}{4}$	6 $\frac{3}{4}$	L. Minor road, which diverged at mile 15 $\frac{1}{8}$, rejoins route.
26 $\frac{3}{4}$	3 $\frac{1}{4}$	SA-TSO-TS'U.
30	0	CHUREKI. Road joins Route 1.

ROUTE 7

CHUREKI—RYUTAN—KWANSAI—ROUTE 1

Distance: 25 $\frac{1}{8}$ miles

Maps: A.M.S. L 592, Sheets 4, 5; Japanese
1:50,000 G/51/29, Sheets 15, 16; G/51/35,
Sheet 3

(1) General

This route forms an alternative to the section of Route 1 from Chureki to a point about 4 miles north of Shinchiku. From Chureki it runs south through Ryutan to Kwansai, where it turns west and leads back through Shinpo to Route 1. There are connexions from Ryutan east to Taiki and north-west to Heichin on Route 1. A push-car line follows the road for its entire length.

(2) Terrain

Leaving Chureki the road crosses fairly level paddy-land for the first 3 $\frac{1}{2}$ miles, followed by 2 miles of higher land, which is planted with tea. Paddy-land recurs as far as 1 mile south-west of Ryutan, where the road climbs up a wooded escarpment on to a tea-planted plateau, which extends for a mile at a height of just under 1000 feet. There follows a 3 $\frac{1}{2}$ -mile descent across wooded slopes to Kwansai. The rest of the route follows the line of the Hong-sua-k'e river; as far as Shinpo the road is on the north side of the valley, with paddy on the left and steep hills rising on the right; west of Shinpo the road cuts across the valley which is planted with paddy. There are long but gentle gradients between Ryutan and Kwansai, and the southern descent on this section is very winding. There is a possible deviation between

Ryutan and Kwansai, where an inferior road crosses the plateau in a direct line farther west.

(3) Construction

Construction is not known, but is believed to be of earth and gravel and 18-24 feet wide.

(4) Bridges, fords, and ferries

Apart from small bridges over streams there are important ones over the Sio-lai-k'e, east of Shinpo, and over two branches of the Hong-sua-k'e, south-west of the town. All river crossings have not been mentioned in this itinerary; all bridges, however, have been listed in the Bridge Schedule on page 151.

(5) Seasonal variations

The route is thought to be liable to flooding after heavy rain in the valley of the Hong-sua-k'e, especially where it crosses the valley west of Shinpo.

(6) Vulnerable points

The two sections of the route leading into the plateau between Ryutan and Kwansai are on fairly steep sidelong ground, especially the northern one, and could be blocked by demolitions. The Huan-sua-k'e bridges are also vulnerable.

<i>Distance from CHUREKI (miles)</i>	<i>Distance from ROUTE 1 (miles)</i>	
0	25 $\frac{1}{8}$	CHUREKI. The route runs south from Route 1. To mile 3 $\frac{1}{2}$ the road runs chiefly through paddy.
$\frac{5}{8}$	24 $\frac{1}{2}$	Road crosses railway.
2 $\frac{1}{8}$	23	Bridge over stream.
2 $\frac{1}{2}$	22 $\frac{5}{8}$	Track cuts across route.
3 $\frac{1}{4}$	21 $\frac{7}{8}$	L. Loop road provides alternative for $\frac{1}{8}$ -mile stretch.
3 $\frac{1}{2}$	21 $\frac{5}{8}$	To mile 5 $\frac{1}{2}$ the road runs on higher ground mostly flanked with tea.
4 $\frac{3}{8}$	20 $\frac{3}{4}$	O-CH'IU-NA.
5 $\frac{1}{2}$	19 $\frac{5}{8}$	To mile 7 $\frac{1}{4}$ the road runs through paddy-land.
6 $\frac{1}{4}$	18 $\frac{7}{8}$	RYUTAN. Small town. The road to Taikei runs east. The route turns right.
6 $\frac{1}{2}$	18 $\frac{5}{8}$	Route forks left: road to Heichin on Route 1 forks right.
7 $\frac{1}{4}$	17 $\frac{7}{8}$	Road forks. R. Alternative but inferior road runs south-west over a tea-planted plateau rejoining the route at mile 12 $\frac{1}{4}$. L. Route 7. To mile 8 $\frac{1}{2}$ the road climbs gradually up a wooded escarpment.
8 $\frac{1}{2}$	16 $\frac{5}{8}$	To mile 9 $\frac{5}{8}$ the road runs through tea plantations.
9 $\frac{1}{8}$	16	R. Minor road runs south-west to alternative road.
9 $\frac{5}{8}$	15 $\frac{1}{2}$	To mile 13 $\frac{1}{4}$ the road descends along wooded slopes on the west side of a river-valley. First $\frac{1}{2}$ mile is very winding.
12 $\frac{1}{4}$	12 $\frac{7}{8}$	R. Alternative road from mile 7 $\frac{1}{4}$ rejoins route. Bridge over stream.
13 $\frac{1}{4}$	11 $\frac{7}{8}$	KWANSAL. Two roads run south and west into the hills, but give no through communication for vehicles.
15	10 $\frac{1}{8}$	Bridge over stream.
19 $\frac{5}{8}$	5 $\frac{1}{2}$	Bridge over Sio-lai-k'e river.
20	5 $\frac{1}{8}$	R. Minor road runs north-east for several miles.
20 $\frac{1}{4}$	4 $\frac{7}{8}$	SHINPO. Small town.
20 $\frac{3}{4}$	4 $\frac{3}{8}$	R. Minor road runs north-west about one mile.
20 $\frac{7}{8}$	4 $\frac{1}{4}$	To mile 21 $\frac{1}{8}$ two bridges over branches of the Hong-sua-k'e river.
23 $\frac{5}{8}$	1 $\frac{1}{2}$	Bridge over stream.
24 $\frac{7}{8}$	$\frac{1}{4}$	Road crosses railway.
25 $\frac{1}{8}$	0	The road joins Route 1.

ROUTE 8

SHINCHIKU—CHIKUTO—HOPPO

Distance: 13 miles

Maps: A.M.S. L 592, Sheets 4, 5; Japanese
1:50,000, G/51/29, Sheet 16; G/51/35,
Sheet 4

(1) General

This route diverges south-east from Shinchiku on Route 1 and runs to Chikuto, with a branch eastwards to Kyurin. At Chikuto the route turns south-west to Hoppo, from which an inferior road leads north-west direct to Shinchiku. From Chikuto other roads run south-east to Lai-uan and south to Inoue-un-tsua. A push-car line follows the road for its entire length.

(2) Terrain

Between Shinchiku and Chikuto the road crosses gently undulating country on the south side of the valley of the T'au-chieng-k'e river. Vegetation is mostly paddy, but there are some tea plantations and areas of woodland on the higher ground from mile 4 $\frac{1}{2}$ to Chikuto. From Chikuto to Hoppo the road rises about 400 feet along a valley through wooded country and reaching the summit at mile 11

drops down again, through similar country, to Hoppo. On both these hills the gradients are very easy; on the descent to Hoppo there is a tortuous section from mile 11-12.

(3) Construction

Construction is not known, but is believed to be of earth or gravel; width is unknown.

(4) Bridges, fords, and ferries

All the bridges on this route are of small size. There are no fords.

All river crossings have not been mentioned in this itinerary; all bridges, however, have been listed in the Bridge Schedule on page 152.

(5) Seasonal variations

The road might be blocked by flooding after heavy rains.

(6) Vulnerable points

At several points between mile 10½ and mile 12 the road is cut into the hill-side and could be effectively blocked by demolitions.

Distance from SHINCHIKU (miles)	Distance from HOPPO (miles)
0	13
3/8	12 5/8
7/8	12 1/8
3 3/4	9 1/4
8 3/4	4 1/4
8 7/8	4 1/8
9 1/8	3 7/8
11 7/8	1 1/8
13	0

SHINCHIKU. For details of roads in town see I.S.T.D. Report, F.387.

The road runs east from Route 1 in the north-east corner of the town. It crosses the railway immediately.

		L. A road runs 1 3/4 miles east to the T'au-chieng-k'e river.
		R. A minor road runs back west into Shinchiku.
		L. A minor road runs east to Kyurin but has no bridge across the T'au-chieng-k'e river.
		CHIKUTO.
		Road junction. L. A road runs south-east about 7 1/2 miles to Lai-uan. R. Route 8.
		L. A road forks south-east and runs about 15 miles through hilly terrain to Inoue-un-tsua. There is a tunnel, 1/4 mile long, at mile 13.
		Sharp left-hand bend.
		HOPPO.
		From here a minor road runs back north-west direct to Shinchiku.

ROUTE 9

CHIAM-SUA-E—BYORITSU—SANSА—HOGEN

Distance: 33 miles

Maps: A.M.S. L 592, Sheet 4; Japanese 1:50,000, G/51/36, Sheets 1, 2, 6, 7

(1) General

This route runs east of Route 1 from Chiam-sua-e through Byoritsu, Dora, and Sansa to Hogen, where it rejoins Route 1, which runs eastwards from Sharoku. It is an important alternative to Route 1, being far more direct, though inferior in quality and possessing doubtful crossings of the Taian and Taiko rivers. It is connected to Route 1 by lateral roads from Hokusei to Koryu, from Byoritsu, from Dora to Tsusho, and from Au-li to Taiko. There is also a branch road running south-east from Byoritsu to Taiko and Lam-o, Route 10. From Byoritsu to Sansa it runs close to the railway: there are no push-car lines on the road.

(2) Terrain

Leaving Chiam-sua-e the road traverses wooded hill-country for 6 miles to Hokusei, then crosses the valley of the Au-lieng-k'e. From here to Byoritsu there is flat paddy-land, followed by another ascent over a range of wooded hills to Dora. To Sansa the road rises up a steep-sided valley with paddy on the valley-floor; south of Sansa the road rises to 1200 feet over open tea-planted hills, then drops right down through a wooded valley to the broad plain of the Taian river. Farther south the narrower valley of the Taiko-kei is crossed, and is followed by 2 miles of paddy land into Hogen. The route includes several

long hills, notably between Sansa and the Taian-kei, but all gradients are easy. The alignment of the road is generally very straight, but there is a winding section over the hills between Chiam-sua-e and Hokusei, and at mile 27 3/8 the road zigzags for 1/4 mile up a steep escarpment.

(3) Construction

The road is reported to be about 24 feet wide, and is probably constructed of earth or gravel.

(4) Bridges, fords, and ferries

The absence of road bridges over the Au-lieng-k'e, Taian, and Taiko rivers seriously affects the use of this road as a through route, especially after heavy rains. All river crossings have not been mentioned in this itinerary; all bridges, however, have been listed in the Bridge Schedule on page 153.

(5) Seasonal variations

After heavy rains the fords over the Au-lieng-k'e and Taian rivers would probably be impassable.

(6) Vulnerable points

At mile 24 1/2-25 and mile 27 3/8-27 7/8, the road is on very steep land verging on cliffs, and could be effectively blocked by demolitions.

<i>Distance from CHIAM-SUA-E (miles)</i>	<i>Distance from HOGEN (miles)</i>	
0	33	CHIAM-SUA-E. The road diverges south from Route 1. To mile 1 the road runs over flat land mostly under paddy with the railway parallel on the west side.
1	32	Bridge over Nanko river. To mile $3\frac{1}{4}$ road climbs up a valley covered with wood and scrub to a height of about 170 feet.
$1\frac{1}{8}$	$31\frac{7}{8}$	Road crosses the railway.
2	31	Road crosses the railway.
$2\frac{1}{8}$	$30\frac{7}{8}$	Road crosses the railway.
$3\frac{1}{4}$	$29\frac{3}{4}$	To mile $5\frac{3}{8}$ road descends across wooded slopes.
$4\frac{1}{4}$	$28\frac{1}{2}$	Railway bridge over road.
$5\frac{3}{8}$	$27\frac{5}{8}$	To mile 6 road crosses paddy-land.
6	27	HOKUSEI. To mile $6\frac{1}{2}$ is the valley of the Au-lieng-k'e river. It is believed that there is no road bridge; there is a railway bridge slightly west and a possible ford crossing a further $\frac{1}{2}$ mile west. A road runs westwards along the north side of the river to Koryu on Route 1.
$6\frac{1}{2}$	$26\frac{1}{2}$	To mile $8\frac{1}{2}$ road runs across level paddy-land.
$7\frac{1}{8}$	$25\frac{7}{8}$	TS'AN-LIAU. R. A road runs north-west crossing the Au-lieng-k'e river by ford $\frac{1}{2}$ mile west of railway bridge and connecting with road leading to Koryu.
$8\frac{1}{2}$	$24\frac{1}{2}$	Road enters built-up area of Byoritsu.
$9\frac{1}{4}$	$23\frac{3}{4}$	R. A road runs north-west to Route 1.
$9\frac{1}{2}$	$23\frac{1}{2}$	BYORITSU. Centre of town.
$9\frac{3}{4}$	$23\frac{1}{4}$	Road junction. Straight on Route 10 to Taiko. R. Route 9. To mile $13\frac{1}{2}$ road crosses undulating country covered with wood and scrub. West $\frac{3}{4}$ mile it rises from 190 to 575 feet.
$12\frac{1}{2}$	$20\frac{1}{2}$	Road bridge over railway.
$13\frac{1}{2}$	$19\frac{1}{2}$	To mile $17\frac{3}{8}$ road crosses paddy land.
$14\frac{1}{2}$	$18\frac{1}{2}$	Road crosses railway.
$14\frac{5}{8}$	$18\frac{3}{8}$	R. A road runs west to Tsusho on Route 1.
$14\frac{3}{4}$	$18\frac{1}{4}$	DORA. To mile $17\frac{3}{8}$ railway runs parallel on the right of road.
$17\frac{3}{8}$	$15\frac{5}{8}$	Road crosses railway. To mile $19\frac{5}{8}$ mostly paddy on right, woods and rough country on left.
$17\frac{3}{4}$	$15\frac{1}{4}$	Railway bridge over road.
$19\frac{5}{8}$	$13\frac{3}{8}$	Road crosses railway.
$20\frac{1}{2}$	$12\frac{1}{2}$	SANSA.
$20\frac{5}{8}$	$12\frac{3}{8}$	Railway bridge over road.
21	12	Road crosses railway. To mile 24 road runs chiefly through tea plantations.
$22\frac{1}{2}$	$10\frac{1}{2}$	To mile 25 the road descends from 1200 feet to 630 feet.
24	9	To mile 25 road descends through woods and scrub.
25	8	To mile $27\frac{3}{8}$ road crosses the plain of the Taian river, which is covered with scrub and boulders. For west $1\frac{1}{4}$ miles road deteriorates to a track.
$25\frac{1}{8}$	$7\frac{7}{8}$	Road crosses a branch of the Taian river.
$25\frac{5}{8}$	$7\frac{3}{8}$	Road crosses a second branch of the Taian river.

<i>Distance from</i> CHIAM-SUA-E (miles)	<i>Distance from</i> HOGEN (miles)	
27 $\frac{3}{8}$	5 $\frac{5}{8}$	To mile 27 $\frac{5}{8}$ road zigzags up a steep escarpment.
28 $\frac{5}{8}$	4 $\frac{3}{8}$	AU-LI. R. A road runs west to Taiko on Route 1. L. A road runs east $\frac{5}{8}$ mile to Kori.
30 $\frac{1}{4}$	2 $\frac{3}{4}$	To mile 31 the road crosses the boulder-covered valley of the Taiko-kei.
30 $\frac{5}{8}$	2 $\frac{3}{8}$	Road crosses the Taiko river probably by a ford.
31	2	Remainder of route crosses paddy-land.
33	0	HOGEN. The road joins Route 1 in the south-west corner of the town.

ROUTE 10

BYORITSU—TAIKO—LAM-O

Distance: 14 $\frac{3}{8}$ miles*Maps:* A.M.S. L 592, Sheet 4; Japanese 1:50,000, G/51/36, Sheets 1, 2**(1) General**

This route runs from Byoritsu on Route 9 south-east to Taiko and Lam-o; here the road ends, but tracks lead on south to the valley of the Taian-kei and give access to Hogen. There is also an inferior road running north from Hun-tsui which, after 6 miles, deteriorates into a track connecting with the road east from Chikunan. A push-car line follows the road for its entire length.

(2) Terrain

The first 6 $\frac{1}{4}$ miles run across flat paddy-land inside a wide bend of the Au-lieng-k'e river, which is crossed at mile 1. The rest of the route lies in the narrow steep-sided valleys of the upper Au-lieng-k'e and Tua-o-k'e; for the first 3 miles of this section the road keeps to the north edge of the valley, with cliffs and steep slopes on the left and the narrow boulder-covered plain on the right. Farther south the valleys open out and the road runs through some paddy north of Taiko. Though the road is generally winding there are few sharp corners and no steep gradients.

(3) Construction

Construction is not known, but is believed to be of earth or gravel and 18-24 feet wide.

(4) Bridges, fords, and ferries

There is a medium-sized bridge over the Au-lieng-k'e at mile 1, and smaller ones over its tributaries the Hun-tsui-k'e and Tua-o-k'e. All river crossings have not been mentioned in this itinerary; all bridges, however, have been listed in the Bridge Schedule on page 155.

(5) Seasonal variations

It is believed that after heavy rains the road would be blocked by flooding in the valley of the Au-lieng-k'e.

(6) Vulnerable points

The most vulnerable part of the route is that from mile 6 $\frac{1}{4}$ to mile 9 $\frac{1}{4}$, where the road runs under cliffs and could easily be blocked by demolitions. This applies particularly to the tunnel at mile 6 $\frac{1}{2}$. The Au-lieng-k'e bridge at mile 1 is also vulnerable.

Distance from

BYORITSU

(miles)

0

Distance from

LAM-O

(miles)

14 $\frac{3}{8}$

BYORITSU.

Road diverges south from Route 9 in south corner of the town.

1

13 $\frac{3}{8}$ Bridge over Au-lieng-k'e river. To mile 1 $\frac{1}{2}$ road crosses the river's flood plain.3 $\frac{5}{8}$ 10 $\frac{3}{4}$

KOKAN.

6 $\frac{1}{4}$ 8 $\frac{1}{8}$

Road enters the narrow valley of the Au-lieng-k'e.

6 $\frac{1}{2}$ 7 $\frac{7}{8}$ Tunnel, $\frac{1}{8}$ mile long, under a projecting crag.10 $\frac{1}{8}$ 4 $\frac{1}{4}$ L. A minor road runs north-east about 6 miles up a mountain valley to Hok-hieng, from where a track leads north and west to Byoritsu. To mile 10 $\frac{1}{2}$ road crosses plain of the Hun-tsui-k'e.10 $\frac{1}{4}$ 4 $\frac{1}{8}$

Bridge over Hun-tsui-k'e.

12 $\frac{5}{8}$ 1 $\frac{3}{4}$

TAIKO.

12 $\frac{3}{4}$ 1 $\frac{5}{8}$

Two bridges over branches of the Tua-o-k'e.

14 $\frac{3}{8}$

0

LAM-O.

ROUTE 11
SHAROKU—SAI-TUN—TAICHU

Distance: 10½ miles

Maps: A.M.S. L 592, Sheet 4; Japanese 1:50,000
G/51/36, Sheets 7, 8

(1) General

This route runs direct from Sharoku through Sai-tun to Taichu, cutting off the large loop which Route 1 makes to the north-east through Hogen. From Sharoku there is also a road due south joining Route 12 at Taito. Sai-tun at mile 6¾ is the meeting point of minor roads running north, south, and north-east.

A push-car line runs from Sai-tun to Taichu.

(2) Terrain

Leaving Sharoku, the road rises for ½ mile then levels out as far as mile 1¾, from where it climbs again through wooded country to a height of 920 feet, and drops down again immediately on the other side of the ridge. At mile 5¼ it enters paddy land, which continues as far as Taichu. There are gradients of about 1 in 8 on both sides of the ridge between mile 1¾ and mile 5¼; on the steeper sections the road is winding, but elsewhere the alignment is direct.

(3) Construction

No details are available, but the road is believed to have an average width of from 16 to 18 feet and to be of earth or gravel construction.

(4) Bridges, fords, and ferries

All the bridges on this route are small. All river crossings have not been mentioned in this itinerary; all bridges, however, have been listed in the Bridge Schedule on page 156.

(5) Seasonal variations

Only the surface of the road would be affected by seasonal variations.

(6) Vulnerable points

The most vulnerable parts of the route are the steep sections of the hills on either side of the ridge; the road, however, is not on sidelong ground, but runs almost straight up the line of the slope.

<i>Distance from</i> SHAROKU (miles)	<i>Distance from</i> TAICHU (miles)	
0	10½	SHAROKU.
		The road runs east from south end of town. To mile ½ it climbs through woods.
1¾	8¾	The road begins to rise again.
3½	7	Summit of rise at height of 920 feet.
3¾	6¾	The road starts to drop, first sharply, then more gradually.
5¼	5¼	To mile 9¾ the road runs through paddy.
6¾	3¾	SAI-TUN.
		Cross-roads. L. Minor road runs north to Tua-nga and Route 1. R. Minor road runs south to Lam-tun and Ujitsu.
9¾	¾	Road enters built-up area of Taichu.
10½	0	TAICHU.
		The road joins Route 1 in the centre of the town. <i>For details of roads in town see I.S.T.D. Report, F.387.</i>

ROUTE 11a

GOSEI—SHAROKU—TAICHU

Distance: 13 miles

Maps: A.M.S. L 592, Sheet 4; Japanese 1:50,000,
G/51/36, Sheets 7, 8

(1) General

This is a new road which has been constructed from the recently developed port of Gosei to Taichu. From Sharoku the road runs east, then turns south and crosses Route 11 about 3 miles from Sharoku; after a further ¾ mile it turns south-east and runs roughly parallel to Route 11, and ¾ to 1 mile south of it, into Taichu. Between Gosei and Sharoku the alignment of the road is not known, but is believed to follow the old road in a direct line.

A push-car line runs from Gosei to Sharoku.

(2) Terrain

From Gosei to Sharoku the road crosses flat paddy-land. East of Sharoku the road crosses a wooded ridge about 900 feet high, climbing diagonally up the steep west side, levelling out for ½ mile on the summit, then running direct down the more gentle east side. The rest of the route lies across gently undulating paddy-land. Gradients are very easy and all curves are extremely gradual.

(3) Construction

The road is believed to have a width of at least 30 feet and a gravel or earth surface. It is well engineered, with side ditches, and should be capable of taking a large volume of heavy traffic.

(4) Bridges, fords, and ferries

Numerous streams are crossed by bridges, which are all much narrower than the general width of the road. There are no fords or ferries. All bridges have been listed in the Bridge Schedule on page 157.

(5) Seasonal variations

The surface only is believed to be affected by seasonal variations.

(6) Vulnerable points

None, except for the bridges.