

Importance: Rank in Japan - 250 + ; rank in Chugoku supply area - 25 +

Date of Construction: Unknown; in operation as early as Dec 1926 and as recently as Dec 1934

Details: Plant, equipment -

Boilers - 2 (incl 1 res) @ Garbe-type, 200 m², SB-make

Turbines - 1 @ 1500 hp, impulse reaction-type, BBC-make

Generators - 1 @ 1250 kva, 3-ph, 3500 v, 3600 rpm, 60 cyc, BBC-make

Transformers - 4 (incl 1 res) @ 300 kva, 1-ph, 3.5, 3.3/21, 20, 19 kv, D-D conn, self-cooled, 60 cyc, shell-type, Shibaura-make

4 (incl 1 res) @ 110 kva, 1-ph, 3.5, 3.3/20, 19, 10.8, 9.5 kv, D-D conn, 60 cyc, core-type, Shibaura-make

Sources: DJY 1927; DJY 1929 p.360

874. TOWADA HYDRO PLANT

Approx. Lat. 40°35'
Long. 141°05'

Company: Tohoku Shinko Denryoku KK

Location: Plant - Tochikubo-aza, Okuse-oaza, Towada-mura, Kamikita-gun, Aomori-ken

Dam - Shiribeyama-aza, Okuse-oaza, Towada-mura, Kamikita-gun, Aomori-ken

Capacity Commonly in Use (in kw): 21,600 (see Date of Construction)

Importance: Rank in Japan - 111 ; rank in Tohoku supply area - 4

Source of Power: Okunyuse-kawa and Towada-ko

Date of Construction: Construction was begun Oct 1939 at which time completion was scheduled for 1941; under construction Mar 1940

Details: Particular capacities (in kw) - 10,800 reg; 10,800 spec
Layout - Aqueduct-type
Eff head - 194 m; flow - 13.3 m³/sec
Plant operates on 50 cyc

Sources: DnN 1940; DGS 1/40 p.116; Ohm 8/38 pp.863-68

TOYAMA KARYOKU STEAM PLANT - See IWASE STEAM PLANT

875. TOYOHIRA NO. 1 HYDRO PLANT

Approx. Lat. 43°02'
Long. 141°22'

Company: Sapporo Soden KK

Location: Plant - Hirakishi-oaza, Toyohira-machi, Sapporo-gun,
Hokkaido

Capacity Commonly in Use (in kw): 2677, as of Dec 1936

Importance: Rank in Japan -250 †; rank in Hokkaido supply area - 15 †

Source of Power: Toyohira-kawa of the Ishikari-gawa system

Date of Construction: Founded June 1925; in operation Mar 1940

Details: Particular capacities (in kw) - *2320 installed cap;
1269 reg; 1408 spec
Eff head - 300 ft
Plant, equipment -
Turbines - 2 @ 1850 hp, Francis-type, horizontal-shaft,
Dengyosha-make
Generators - 2 @ 1450 kva, 3-ph, 6600 v, 720 rpm, 60 cyc,
Shibaura-make
Transformers - 4 (incl 1 res) @ 1500 kva, 1-ph, 6.9, 6.6,
6.3/44, 25.4 kv, D-Y conn, water-cooled, 60 cyc, core-
type, Shibaura-make

Sources: DnN 1940; ZKT 1939 p.1652; DnK; DJY 1927; DJY 1929 p.410

876. TOYOKAWA HYDRO PLANT

Approx. Lat. 34°36'
Long. 131°52'

Company: Izumo Denki KK

Location: Plant - 1460, Inokidani-oaze, Toyokawa-mura, Mino-gun,
Shimane-ken

Capacity Commonly in Use (in kw): 3720, as of Dec 1934

Importance: Rank in Japan - 250 † ; rank in Chugoku supply area - 25 †

Source of Power: Hikimi-kawa

Date of Construction: Founded Sept 1928; in operation Mar 1940

Details: Particular capacities (in kw) - 1720 reg; 2000 spec; 4670 max pk
Plant operates on 60 cyc

Sources: DnN 1940; ZKT 1939 p.1649; DnK; Chm 10/28 p.522, 2/29 p.121

877. TOYOMI HYDRO PLANT

Approx. Lat. 37°42'
Long. 139°34'

Company: Toshin Denki KK

Location: Plant - 2718, Toyoda-oaza, Toyomi-mura, Higashi Kambara-gun,
Niigata-ken

Capacity Commonly in Use (in kw): 44,800, as of Dec 1935

Importance: Rank in Japan - 49 ; rank in Tokyo supply area - 19

Source of Power: Agano-gawa

Date of Construction: Completed Nov 1929; in operation Mar 1940

Details: Particular capacities (in kw) - *52,800 installed cap
Layout - Dam-type
Eff head - 24.85 m; flow - 222.62 m³/sec
Dam - 99 m high, 205 m long, straight overflow gravity-
type, of concrete construction, with 19 tainter gates
Reservoir - 6,200,000 m³ cap
Fishway - 5.5 m wide
Plant, external features - Of concrete construction,
2 stories high, 43.5 m high. 22.2 m wide, and 74.9 m long
Plant, Plant, equipment -
Turbines - 6 @ 14,000 hp, Francis-type, vertical-shaft,
Hitachi-make
Generators - 6 @ 11,000 kva, 3-ph, 11,000 v, 150 rpm,
50 cyc, Hitachi-make
Transformers - 4 (incl 1 res) @ 18,333 kva, 1-ph,
11/90.7, 95.3, 97.6 kv, D-Y conn, water-cooled, core-
type, Hitachi-make
Other equipment - 6 exciters @ 110 kw

See: Photographs No. V-63, V-64, V-65, V-66
Figure No. V-22a, V-22b

Sources: DnN 1940; ZKT 1939 p.1648; DnK; DnGZ 4/31 back cover, 9/31
p.556, 12/35 p.(56); Ohm 1/29 p.64 and cover, 8/29 adv p.8, 1/30
p.60, 6/41 p.449; Ohm-sha Guide 1933 pp.2,59-61; HSG pp.286,318

878. TOYONE HYDRO PLANT

Approx. Lat. 35°18'
Long. 137°45'

Company: Toho Denryoku KK; formerly Chubu Denryoku KK

Location: Plant - 3, Yunoshima-aza, Komatachi-oaza, Toyone-mura,
Kita Shitara-gun, Aichi-ken

Capacity Commonly in Use (in kw): 3450, as of Dec 1936

Importance: Rank in Japan - 250 + ; rank in Osaka-nagoya supply area-100 +

Source of Power: Kurume-gawa of the Tenryu-gawa system

Date of Construction: Completed June 1921; in operation Mar 1940

Details: Particular capacities (in kw) - *4000 installed cap; 2150 reg; 1300 spec

Layout - Aqueduct-type

Eff head - 680 ft; flow - 16,300 ft³/sec

Dam - 108 ft long, gravity-type

Intake - Bell-shaped mouth with a wooden sluice gate

Aqueduct - About 13,200 ft long

Forebay - Rectangular and partly semi-circular

Penstocks - 2 @ 1376.7 ft long

Fishway - 4.5 ft wide, 4 ft deep, 61.5 ft long

Plant, external features - Of reinforced concrete construction, 2 or 3 stories high. A wooden bridge crosses river in front of plant.

Plant, equipment -

Turbines - 2 @ 1500 hp, Pelton-type, horizontal-shaft, Dengyosha-make

2 (incl 1 res) @ 1500 hp, Pelton-type, horizontal-shaft, EW-make

Generators - 2 @ 1250 kva, 3-ph, 11,000 v, 500 rpm, 50 cyc, Hitachi-make

2 (incl 1 res) @ 1250 kva, 3-ph, 11,000 v, 500 rpm, 50 cyc, Shibaura-make

Other equipment - 2 exciters @ 20 kw and 2 exciters @ 18 kw; 1 travelling crane @ 8-ton cap

See: Photographs No. V-67, V-68

Sources: DnK; DJY 1927; DJY 1929 p.318; DnN 1940; Ohm 1/33 p.69

879. TOYOOKA HYDRO PLANT

Approx. Lat. 35°02'
Long. 137°55'

Company: Toho Denryoku KK; formerly Chubu Denryoku KK and Tenryu Denki KK

Location: Plant - 570, Ishikiriwatari-aza, Toyooka-aza, Keta-mura, Suchi-gun, Shizuoka-ken

Dams - 1 (Keta-gawa) - Oshimayama-aza, Yamasumiji-oaza, Mizukubo-machi, Suchi-gun, Shizuoka-ken

2 (Oshima-tani) - Oshimayama-aza, Yamasumiji-oaza, Mizukubo-machi, Suchi-gun, Shizuoka-ken

3 (Akunawa-numa) - Akunawayama-aza, Toyooka-oaza, Keta-mura, Suchi-gun, Shizuoka-ken

Capacity Commonly in Use (in kw): 8130, as of Feb 1938

Importance: Rank in Japan - 250 †; rank in Osaka-Nagoya supply area- 100 †

Source of Power: Akunawa-numa, Oshima-tani, and Keta-gawa of the Tenryu-gawa system

Date of Construction: Construction was begun May 1935 and completed Feb 1938; in operation Mar 1940

Details: Particular capacities (in kw) - 8000 installed cap; 1810 reg; 6320 spec; 4530 reg pk

Layout - Aqueduct-type

Eff head - 212.1 m; flow - 5.01 m³/sec

Date of Construction: Completed June 1921; in operation Mar 1940

Details: Particular capacities (in kw) - *4000 installed cap; 2150 reg;
1300 spec
Layout - Aqueduct-type
Eff head - 680 ft; flow - 16,300 ft³/sec
Dam - 108 ft long, gravity-type
Intake - Bell-shaped mouth with a wooden sluice gate
Aqueduct - About 13,200 ft long
Forebay - Rectangular and partly semi-circular
Penstocks - 2 @ 1376.7 ft long
Fishway - 4.5 ft wide, 4 ft deep, 61.5 ft long
Plant, external features - Of reinforced concrete construction,
2 or 3 stories high. A wooden bridge crosses river in front
of plant.
Plant, equipment -
Turbines - 2 @ 1500 hp, Pelton-type, horizontal-shaft,
Dengyosha-make
2 (incl 1 res) @ 1500 hp, Pelton-type, horizontal-
shaft, EW-make
Generators - 2 @ 1250 kva, 3-ph, 11,000 v, 500 rpm, 50 cyc,
Hitachi-make
2 (incl 1 res) @ 1250 kva, 3-ph, 11,000 v,
500 rpm, 50 cyc, Shibaura-make
Other equipment - 2 exciters @ 20 kw and 2 exciters @
18 kw; 1 travelling crane @ 8-ton cap

See: Photographs No. V-67, V-68

Sources: DnK; DJY 1927; DJY 1929 p.318; DnN 1940; Ohm 1/33 p.69

879. TOYOOKA HYDRO PLANT

Approx. Lat. 35°02'
Long. 137°55'

Company: Toho Denryoku KK; formerly Chubu Denryoku KK and Tenryu Denki KK

Location: Plant - 570, Ishikiriwatari-aza, Toyooka-aza, Keta-mura,
Suchi-gun, Shizuoka-ken
Dams - 1 (Keta-gawa) - Oshimayama-aza, Yamasumiji-oaza,
Mizukubo-machi, Suchi-gun, Shizuoka-ken
2 (Oshima-tani) - Oshimayama-aza, Yamasumiji-oaza,
Mizukubo-machi, Suchi-gun, Shizuoka-ken
3 (Akunawa-numa) - Akunawayama-aza, Toyooka-oaza,
Keta-mura, Suchi-gun, Shizuoka-ken

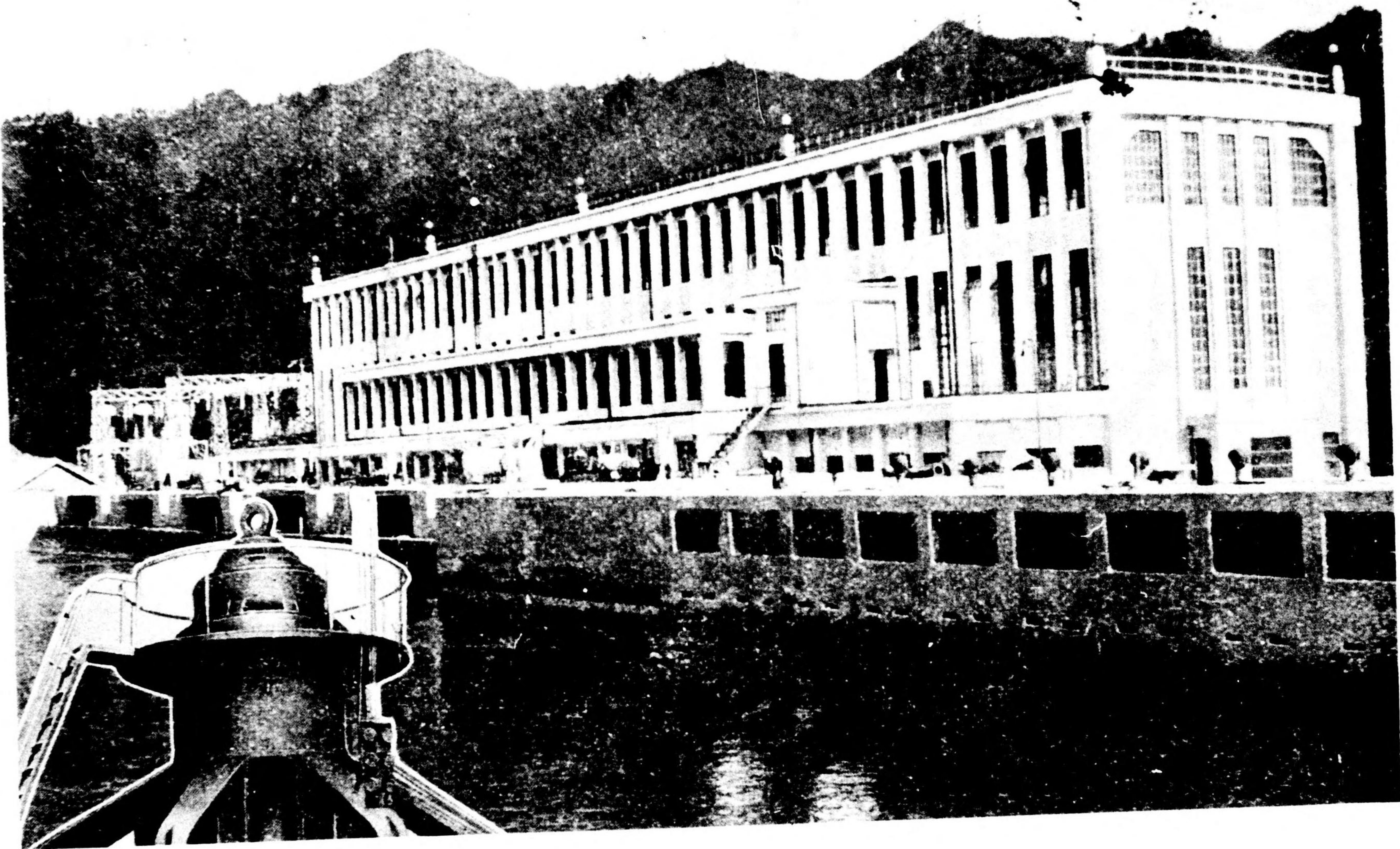
Capacity Commonly in Use (in kw): 8130, as of Feb 1938

Importance: Rank in Japan - 250 †; rank in Osaka-Nagoya supply area- 100 †

Source of Power: Akunawa-numa, Oshima-tani, and Keta-gawa of the
Tenryu-gawa system

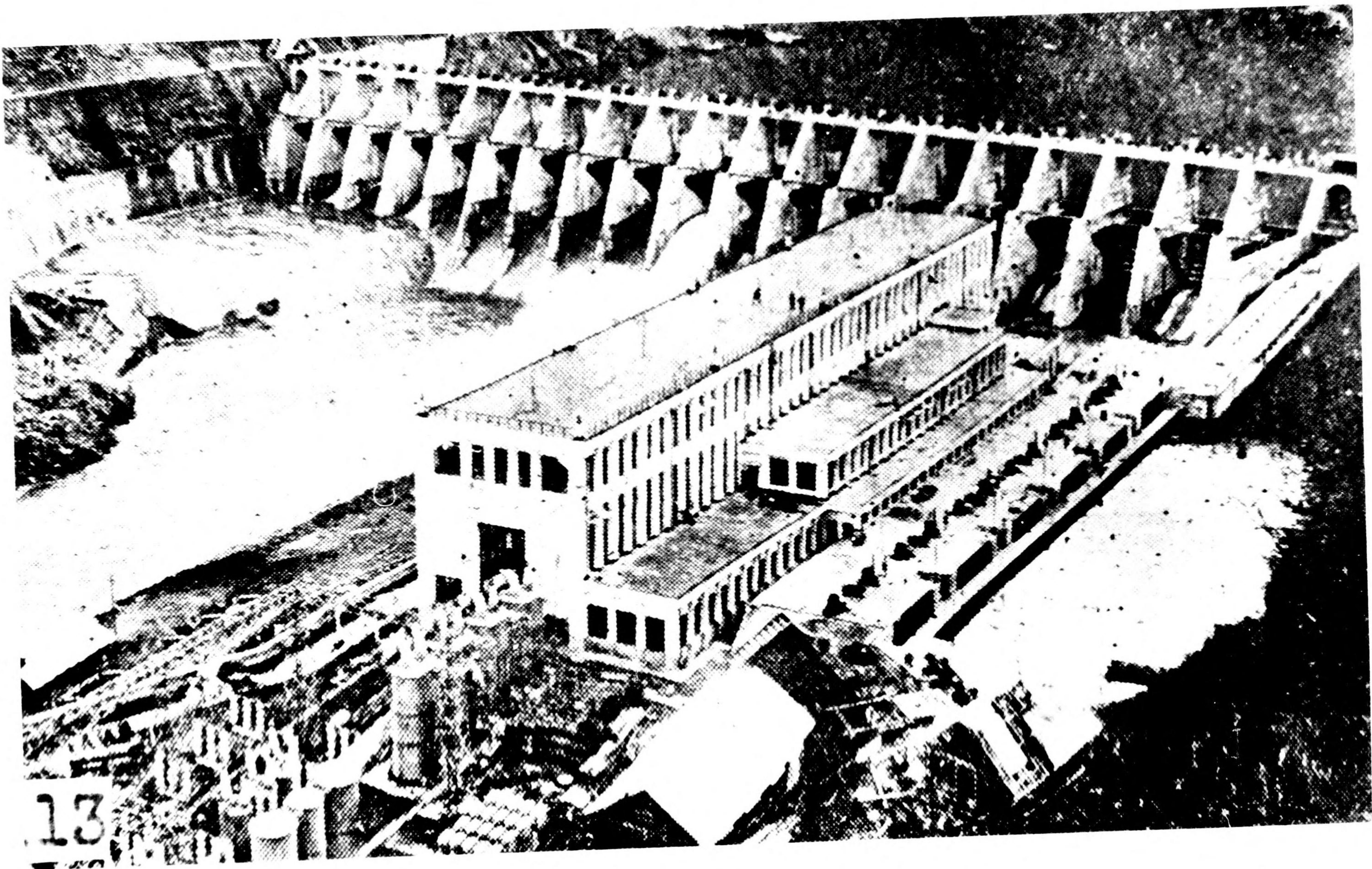
Date of Construction: Construction was begun May 1935 and completed
Feb 1938; in operation Mar 1940

Details: Particular capacities (in kw) - 8000 installed cap; 1810 reg;
6320 spec; 4530 reg pk
Layout - Aqueduct-type
Eff head - 212.1 m; flow - 5.01 m³/sec



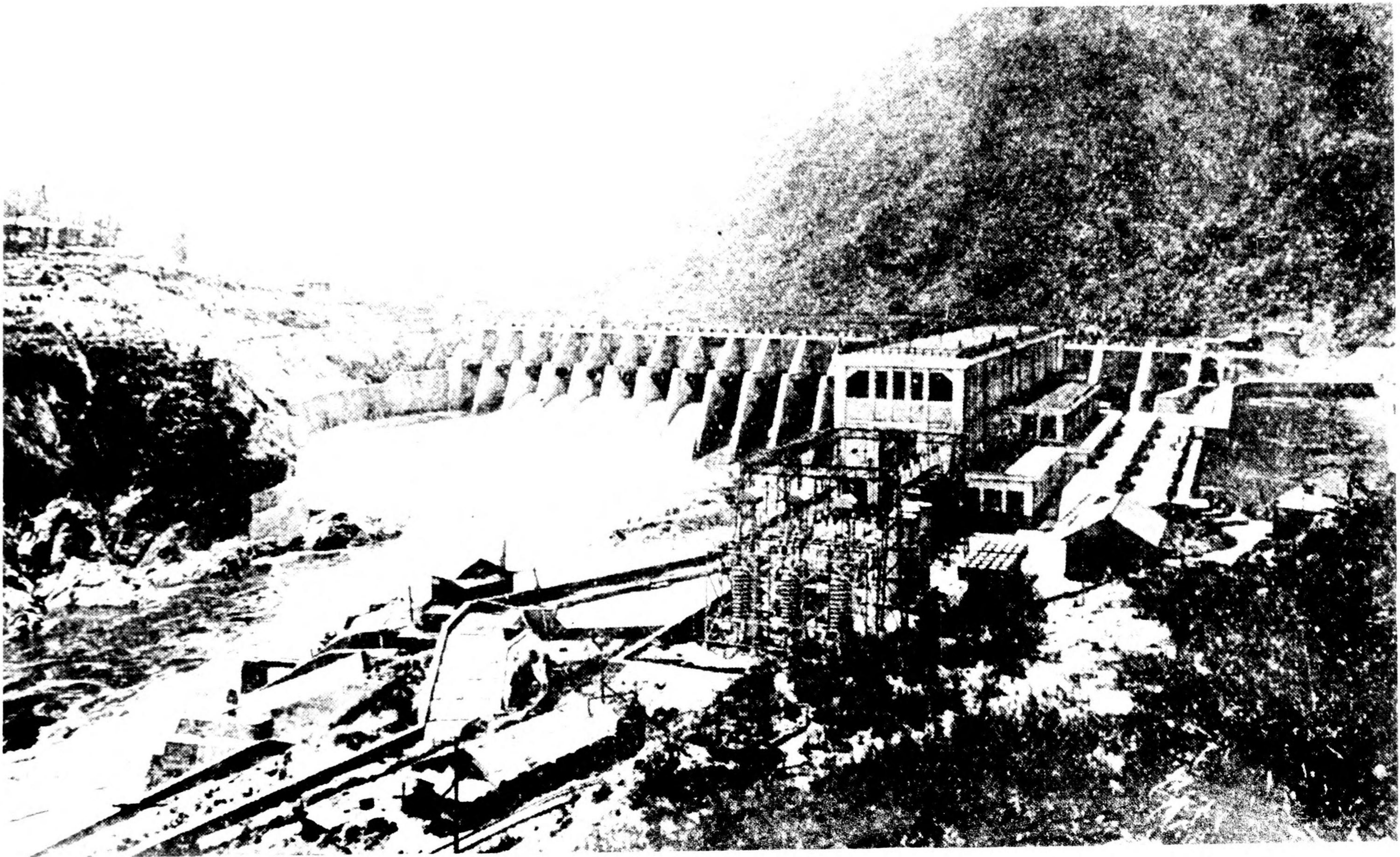
Photograph No. V-63 Toyomi Hydro Plant in 1931

RESTRICTED



Photograph No. V-64, Toyomi Hydro Plant and dam
in 1931

RESTRICTED



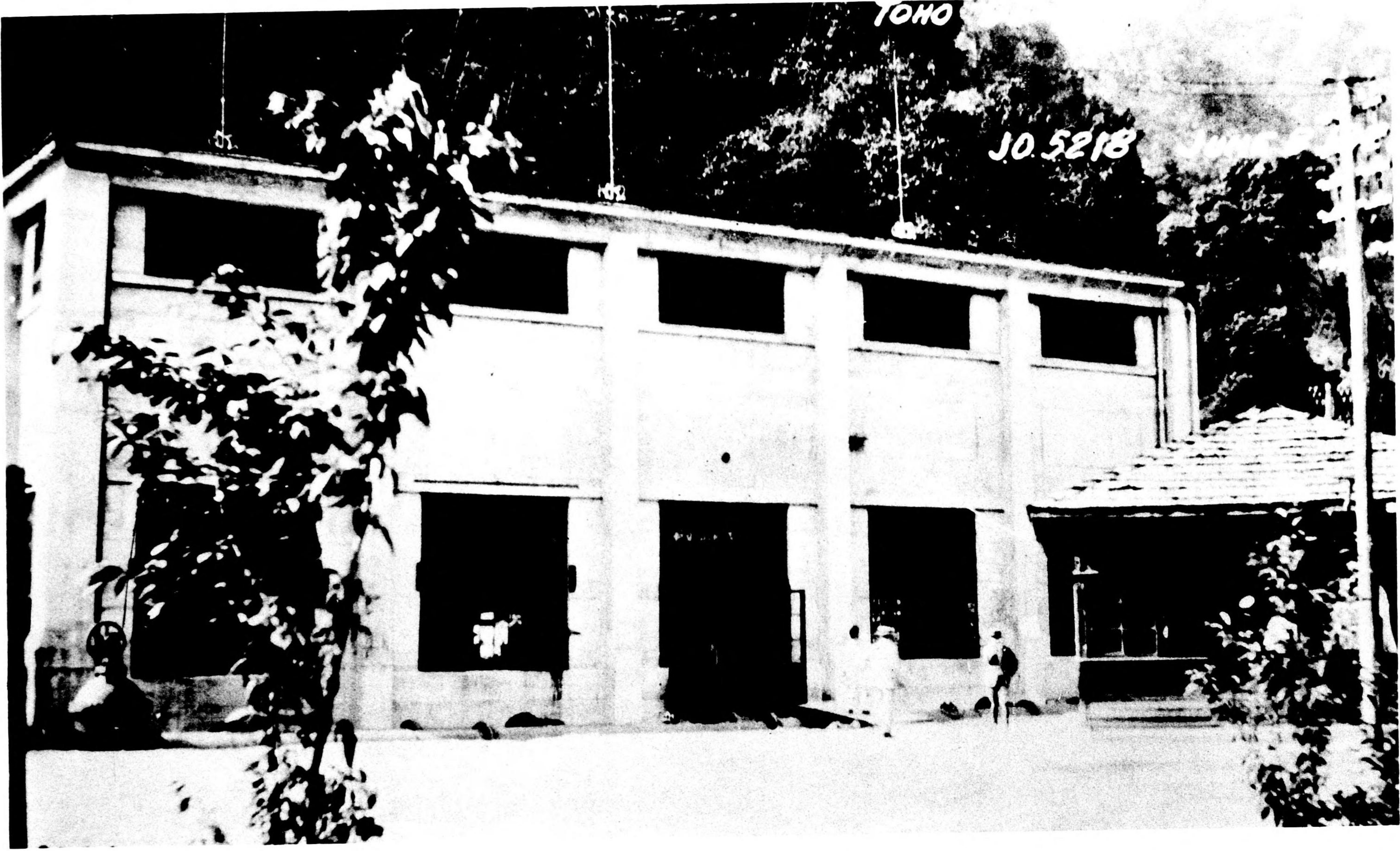
Photograph No. V-65 Toyomi Hydro Plant and dam in 1938

RESTRICTED

RESTRICTED



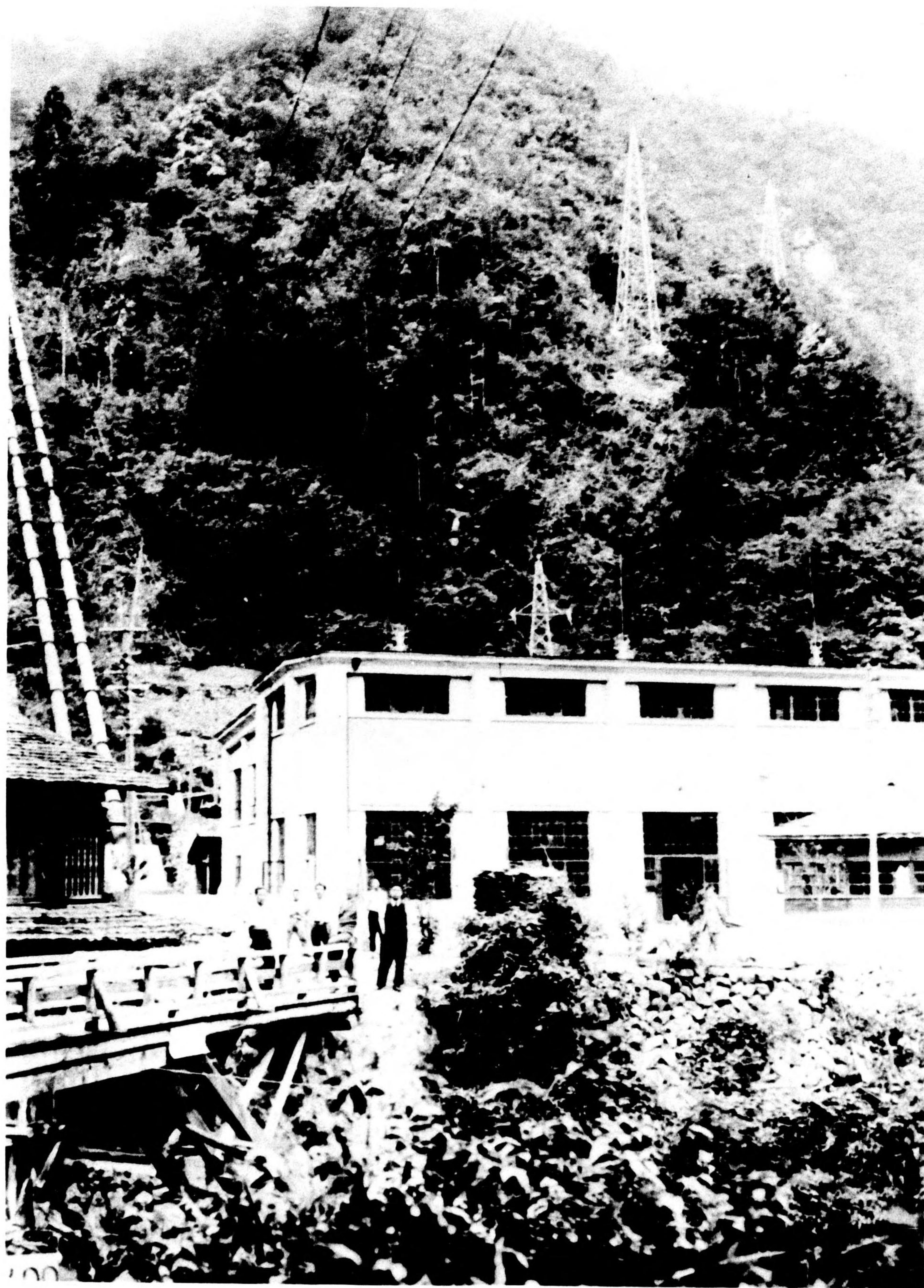
Photograph No. V-66 Toyomi Hydro Plant and dam under construction



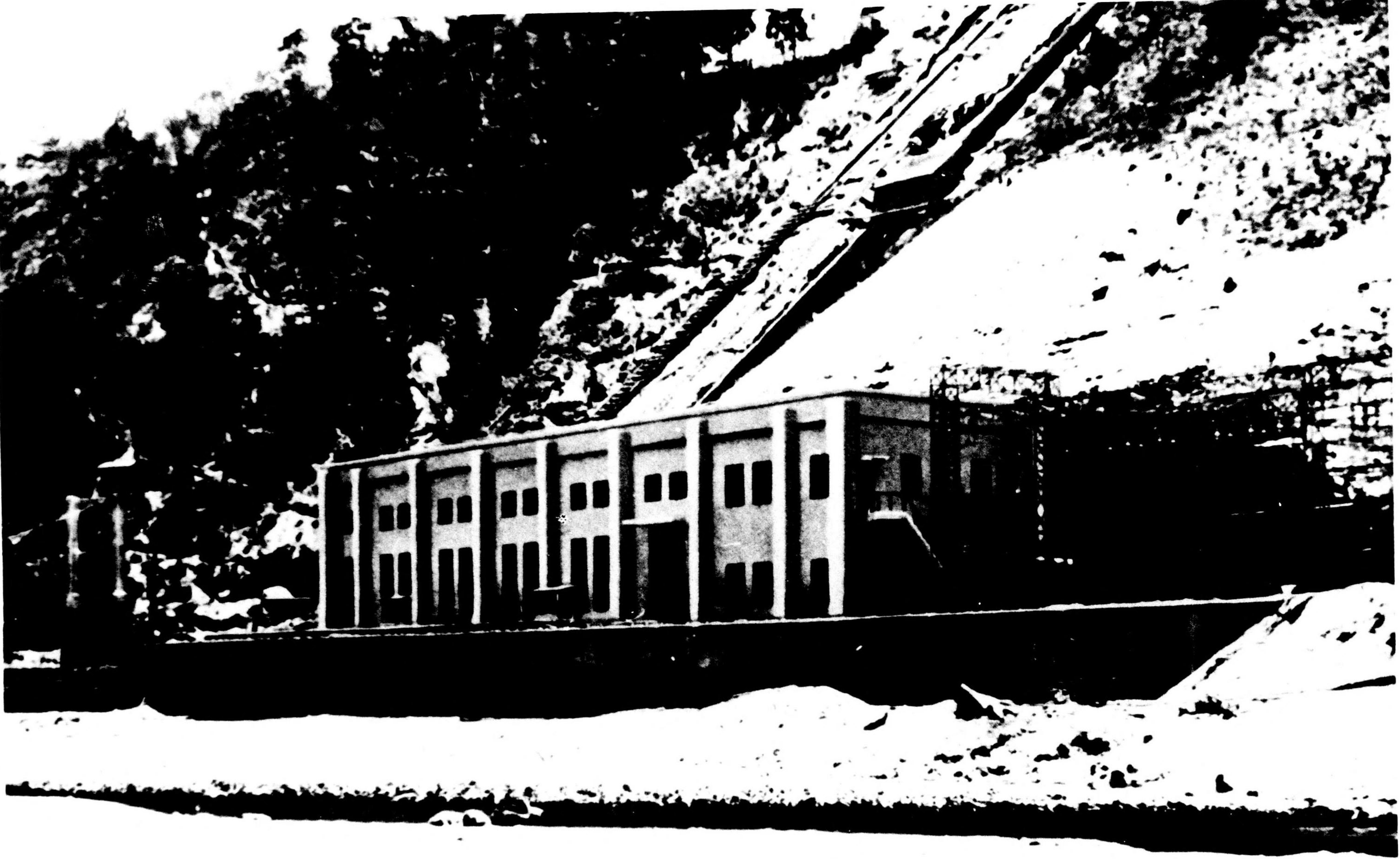
Photograph No. V-67 Toyone Hydro Plant in 1928

RESTRICTED

RESTRICTED

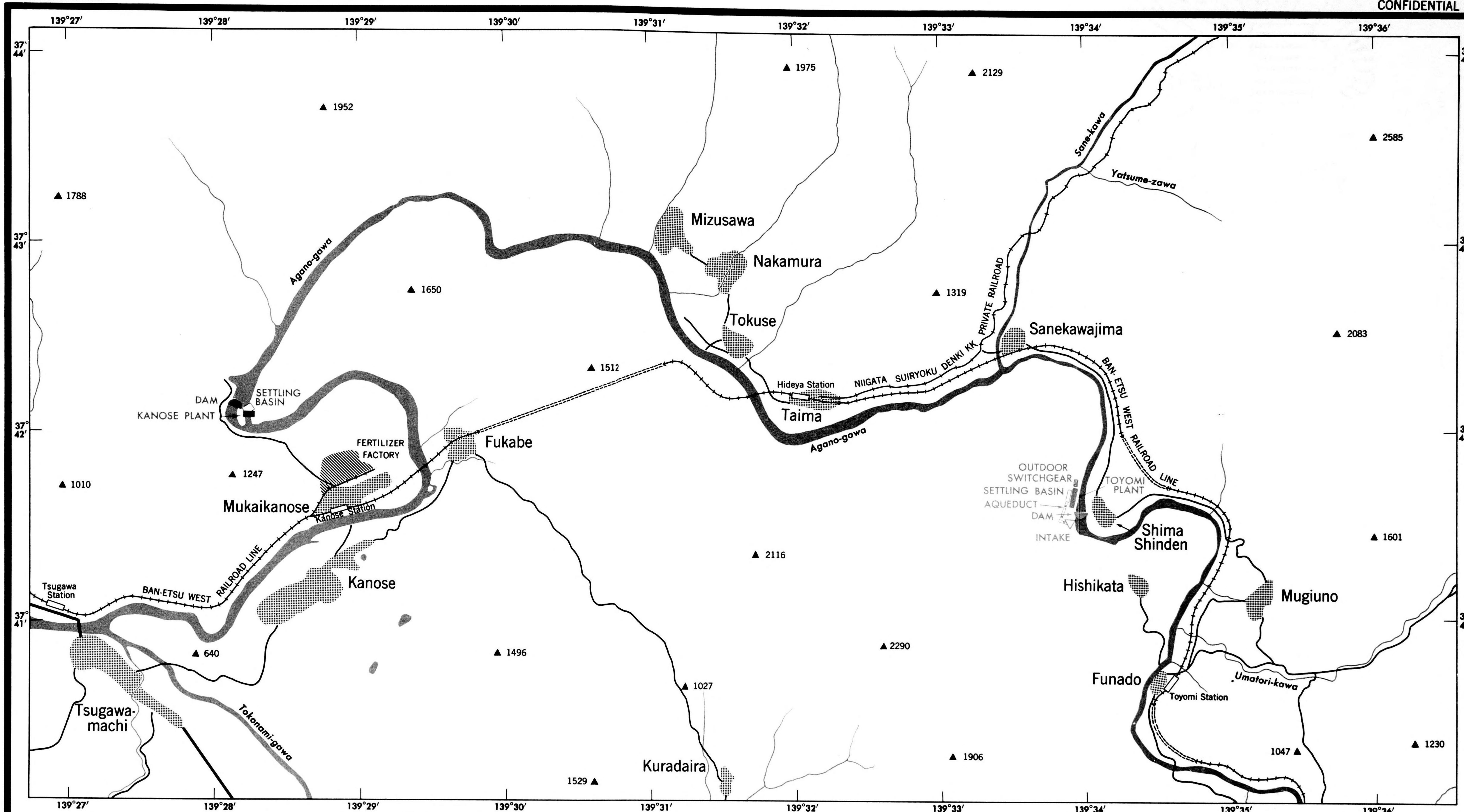


Photograph No. V-68 Toyone Hydro Plant in 1928



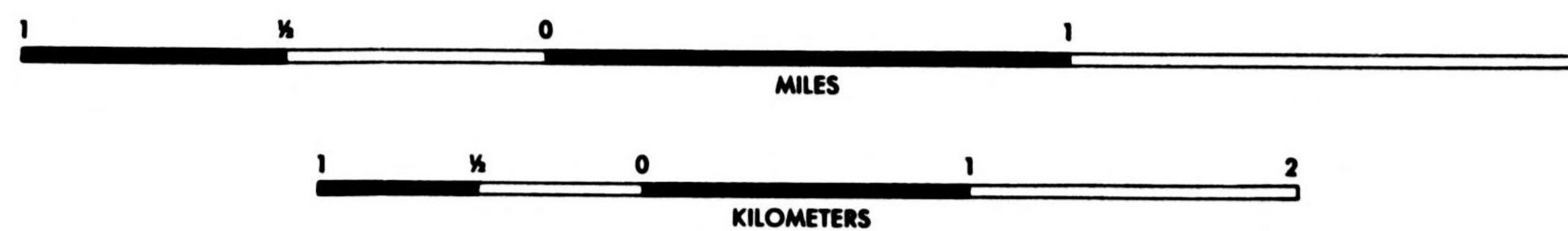
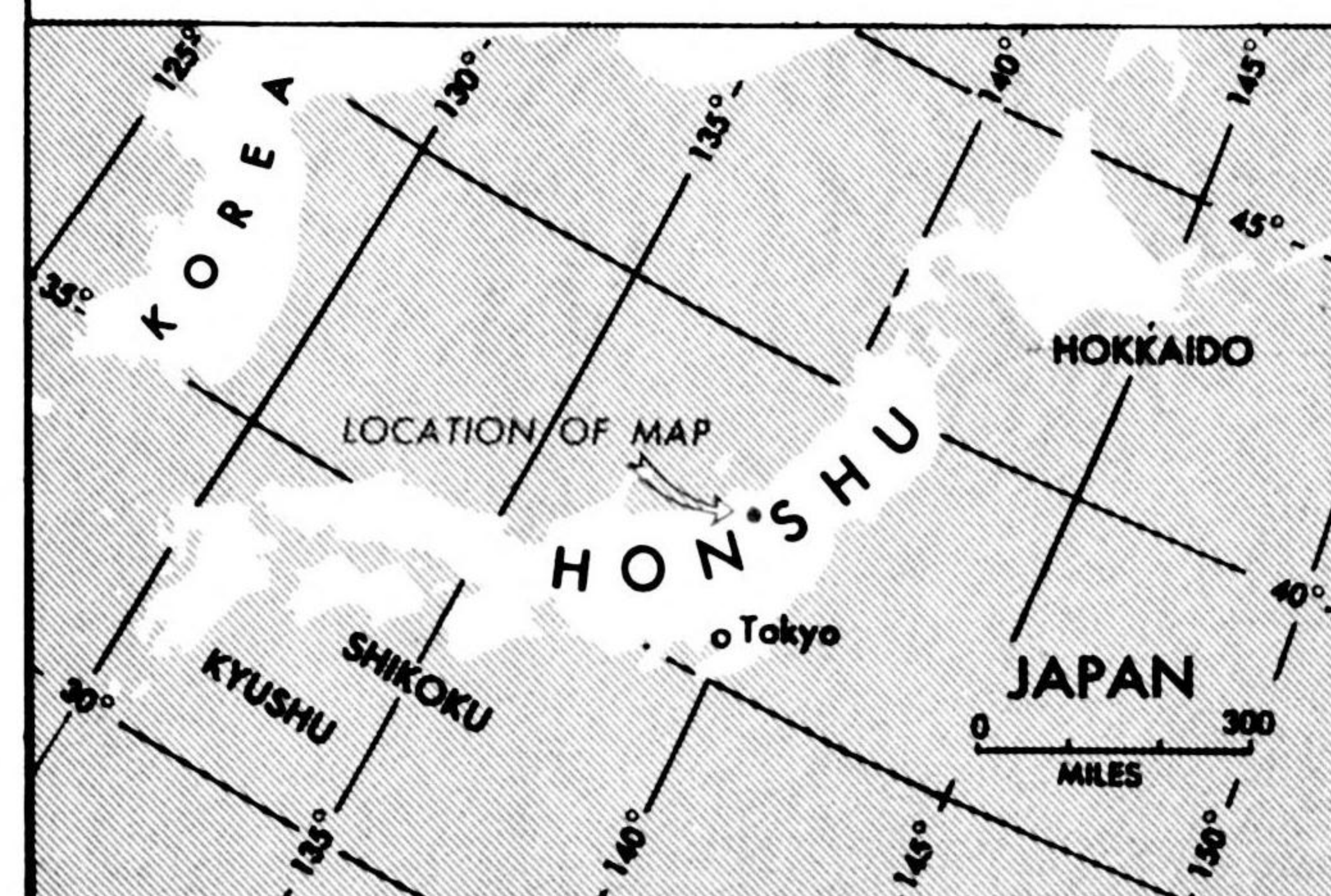
Photograph No. V-69 Toyooka Hydro Plant in 1938

RESTRICTED



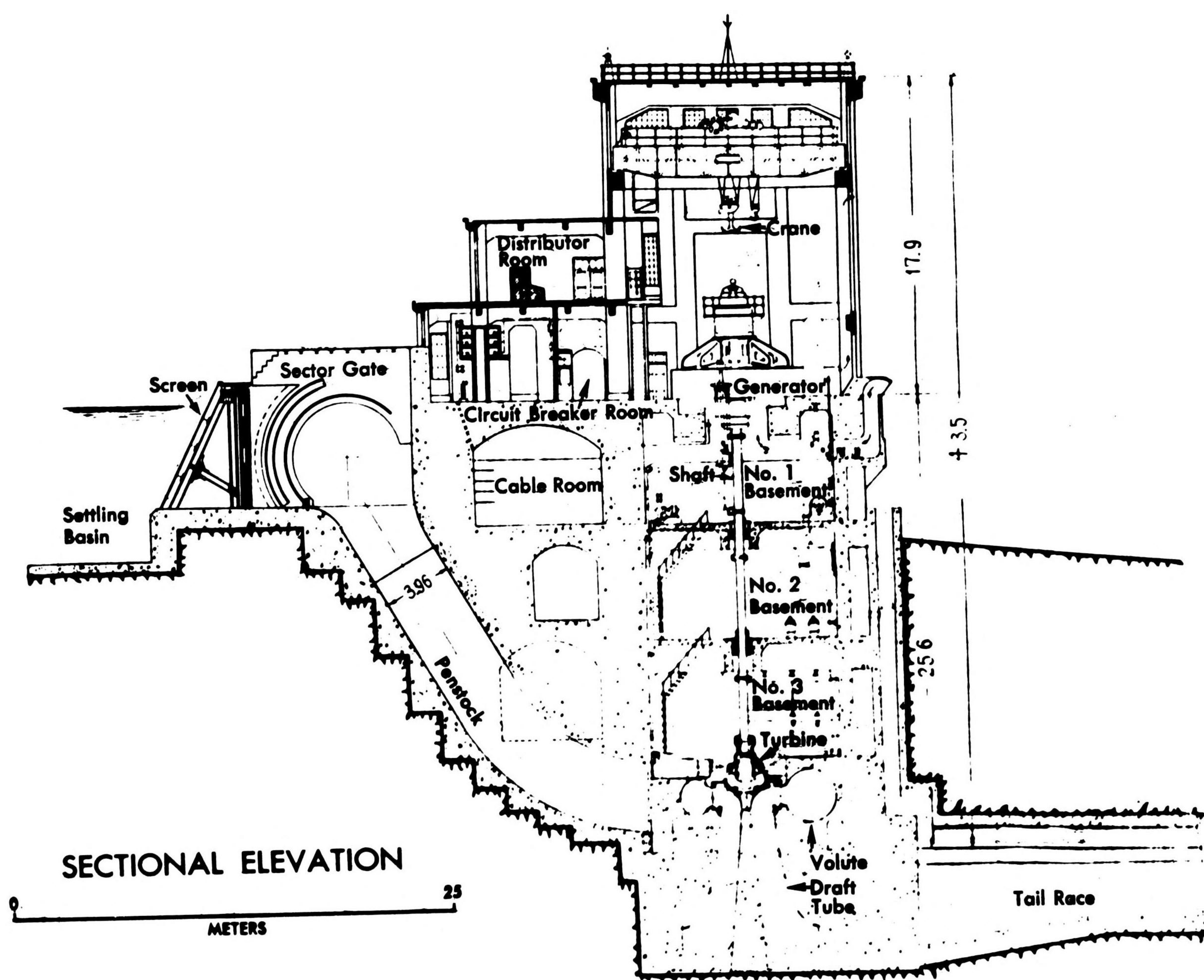
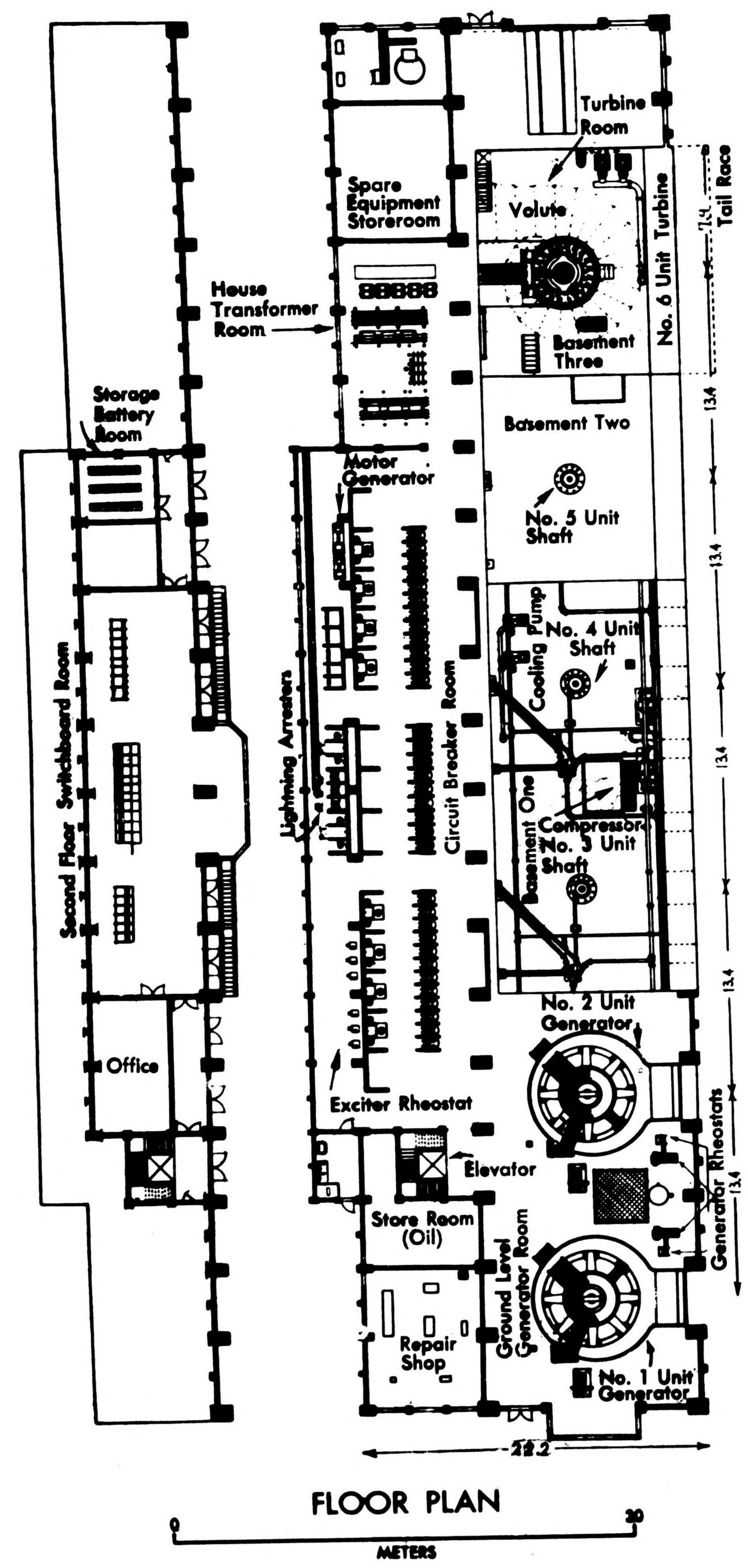
KANOSE AND TOYOMI HYDROELECTRIC PLANTS NIIGATA-KEN

BASE MAP FROM 1:50,000 SERIES, JAPAN IMPERIAL LAND SURVEY BUREAU, 1934
W. D. M. C. FILE NO. JAPAN S30-JGS-50, SHEETS 66-6 and 66-10.



Reliability Code 1B-1B-1

- SETTLEMENT CENTER
- TUNNEL
- PRINCIPAL HIGHWAY
- SECONDARY ROAD
- SPOT HEIGHT (IN FEET)



TOYOMI HYDROELECTRIC PLANT

NIIGATA-KEN

FROM: ZENKOKU DAI HATSUDENSHO ICHIRAN 10,000 KVA IJO
 (Large Power Stations in Japan Over 10,000 Kva.) 1933

Dam - 14.54 m high, 26.97 m long, 1.82 m wide at top,
gravity-type, of concrete construction with 1 stony gate
@ 4.24 m high and 18.18 m wide
Intake - 2 gates
Aqueduct - 7871 m long
Surge tank - 5 m diam, 10 m deep, of concrete construction, non-
overflow
Penstocks - 1, dividing into 2, @ 379.4 m long
Plant, external features - Of reinforced concrete construction,
2 stories high
Plant, equipment -
Turbines - 4 @ 2500 kw, Pelton-type, horizontal-shaft,
Dengyosha-make
Generators - 2 @ 5000 kva, 80% pf, 3-ph, 400 rpm, 60 cyc,
Shibaura-make
Transformers - 4 @ 4000 kva
Tail race - 4 channels

See: Photograph No. V-69

Sources: DnN 1940; SR 1/38 p.5, 4/38 p.(1); Ohm 8/35 p.829, 5/38 p.510;
DGS 4/37 p.111, 7/37 p.732; DnGZ 9/37 p.(139); KN 1938 p.199

TOYO SODA INDUSTRIES FACTORY STEAM PLANT - See TONDA FACTORY STEAM PLANT

TSU STEAM PLANT - See TSU KARYOKU STEAM PLANT

880. TSUCHIDA HYDRO PLANT

Approx. Lat. 37°37'
Long. 140°09'

Company: Tokyo Dento KK

Location: Plant - Wakanomiya-oaza, Azuma-mura, Yama-gun, Fukushima-ken

Capacity Commonly in Use (in kw): 8100 (see Date of Construction)

Importance: Rank in Japan -250 †, rank in Tokyo supply area - 90

Source of Power: Akimoto-ko on the Nagase-kawa of the Agano-gawa system

Date of Construction: Construction was begun Dec 1937 at which time
completion was scheduled for 1939; probably completed on schedule

Details: Particular capacities (in kw) - 1660 reg; 6440 spec
Plant probably operates on 50 cyc

Sources: KN 1939 p.166; Ohm 3/38 p.321

CONFIDENTIAL

881. TSUCHITOI STEAM PLANT

Approx. Lat. 38°15'
Long. 140°52'

Company: Sendai-shi

Location: Tsuchittoi-cho, Sendai-shi, Miyagi-ken

Installed Capacity (in kw): 2500, as of Dec 1936

Importance: Rank in Japan - 250 + ; rank in Tohoku supply area - 20 +

Date of Construction: Unknown; in operation as early as Jan 1928 and as recently as Mar 1940

Details: Particular capacities (in kw) - 2500 supp
Plant, equipment -

Boilers - 2 @ B&W-type, 220 lbs/in², 6150 F, 2823 ft²,
B&W-make

Turbines - 1 @ 3550 hp, Curtis-type, BTH-make

Generators - 1 @ 3125 kva, 3-ph, 3300 v, 3000 rpm,
50 cyc, BTH-make

Transformers - 4 (incl 1 res) @ 600 kva, 1-ph, 2.2, 2.1, 2/
21, 20 kv, Y-D conn, water-cooled, 50 cyc, shell-type,
Fuji Denki-make

Sources: DnN 1940; DnK; Ohm 4/28 p.244; DJY 1929 pp.281,384

TSUDOME HYDRO PLANT - See TSURU HYDRO PLANT

882. TSUETATE HYDRO PLANT

Approx. Lat. 33°08'
Long. 131°03'

Company: Kyushu Suiryoku Denki KK; formerly Tsuetategawa Denki KK

Location: Plant - Kobatake-aza, Shimonjo-oaza, Koguni-machi,
Aso-gun, Kumamoto-ken

Capacity Commonly in Use (in kw): 3200, as of Dec 1936

Importance: Rank in Japan - 250 + ; rank in Kyushu supply area - 50 +

Source of Power: Tsuetate-gawa

Date of Construction: Unknown; in operation as early as 1928 and as recently as Mar 1940

Details: Particular capacities (in kw) - *3200 installed cap; 960 reg;
2240 spec

Plant, equipment -

Turbines - 1 @ est 3200 kw, vertical-shaft

Generators - 1 @ 4000 kva, 3-ph, 11,500 v, 50/60 cyc

Sources: DnN 1940; DnK; Ohm 8/28 p.406, 8/32 p.451

883. TSUKABARU HYDRO PLANT

Approx. Lat. 32°30'
Long. 131°19'30"

Company: Kyushu Soden KK; formerly Sumitomo Kichizaemon

Location: Plant - 2596, Edanosaki-aza, Ieshiro-oaza, Morotsuka-mura,
Nishi Usuki-gun, Miyazaki-ken

Capacity Commonly in Use (in kw): 50,000, as of Dec 1938

Importance: Rank in Japan - 40 ; rank in Kyushu supply area - 8

Source of Power: Yanaihara-gawa and Nanatsu-gawa of the Mimi-gawa system

Date of Construction: Completed Sept 1938; in operation Mar 1940

Details: Particular capacities (in kw) - *51,200 installed cap;
9500 reg; 40,500 spec
Layout - Aqueduct-type
Eff head - 106.3 m; flow - 58.9 m³/sec
Dam - 80 m high, 181.5 m long, gravity straight line-type,
of concrete construction with 8 tainter gates @ 5.5 m
high and 7 m wide
Reservoir - 19,550,000 m³ cap
Penstocks - 2
Plant, external features - Of concrete construction, 3
stories high
Plant, equipment -
Turbines - 4 @ unknown cap, Francis-type, vertical-shaft,
Dengyosha-make
Generators - 4 @ 16,000 kva, 3-ph, 11,000 v, 333/400 rpm,
50/60 cyc, Shibaura-make

See: Photographs No. V-70, V-71
Figure No. V-23

Sources: DnN 1940; Ohm 2/36 p.212, 9/37 p.993, 12/38 p.1311, 6/41
p.449; KN 1938 p.199, 1939 p.166; SR 1/38 p.4, 11/38 p.(1); DnGZ
7/37, 9/37 p.(139), 1/41 p.(11); DGS Kaimu 1937 p.82

884. TSU KARYOKU STEAM PLANT

Approx. Lat. 34°45'
Long. 136°31'

Company: Toho Denryoku KK; formerly Mie Godo Denki KK and Godo Denki KK

Location: 203, Furukawa-oaza, Tsu-shi, Mie-ken; 50 yds from inlet

Installed Capacity (in kw): *9600, as of Dec 1933

Importance: Rank in Japan - 250 † ; rank in Osaka-Nagoya supply area - 98

Date of Construction: Completed Sept 1925; in operation Mar 1940

Details: Particular capacities (in kw) - 2700 reg; 5000 supp
Plant, external features - Of concrete construction

Plant, equipment -

Fuel supply - Used 2.4 lbs of 6000 to 6300 Btu/lb coal
for each kwh generated in 1927

Boilers - 3 @ B&W water tube-type, 17.55 kg/cm²,
575 m², B&W-make

3 @ B&W water tube-type, 14.1 kg/cm², 575 m²,
B&W-make

Turbines - 1 @ 9000 hp, impulse-type, horizontal-shaft,
EW-make

1 (res) @ 4200 hp, impulse-type, horizontal-
shaft, EW-make

Generators - 1 @ 8250 kva, 3-ph, 3500 v, 3600 rpm,
60 cyc, W-make

1 (res) @ 3750 kva, 3-ph, 2300 v, 3600 rpm,
60 cyc, W-make

Transformers - 4 @ 2000 kva, 1-ph, 3.3/42.8, 40.4 kv and
3.5/38.2, 36.4 kv, D-Y conn, water-cooled, shell-type,
Hitachi-make

4 (incl 1 res) @ 5000 kva, 1-ph, 70, 66,
63/44, 42, 40 kv, D-D conn, water-cooled, 60 cyc,
shell-type, Kawakita-make

4 (incl 1 res) @ 1000 kva, 1-ph, 2.3, 2.2,
2.1, 3.3, 3.5/44, 42, 40 kv, D-D conn, water-cooled,
60 cyc, shell-type, Kawakita-make

4 (incl 1 res) @ 1000 kva, 1-ph, 2.3, 2.2,
2.1/44, 42, 40, 38 kv, D-D conn, water-cooled, 60 cyc,
shell-type, W-make

6 @ 500 kva, 1-ph, 3.5/19, 18, 17 kv,
D-D conn, water-cooled, 60 cyc, shell-type, Kawakita-
make

Other equipment - 1 exciter @ 50 kw and 1 exciter @
15 kw; 2 surface condensers; 6 superheaters; 2 chain-
grate stokers; 3 economizers

Area served - Mie-ken

Sources: DnN 1940; DnK; DJY 1927; DJY 1929 pp.249, 320; Ohm 1/31 p.61,
6/31 supp p.7, 11/34 p.879, 5/35 p.530; Ohm-sha Guide 1933 p.55;
TD Map

885. TSUKIMAUSHI HYDRO PLANT

Approx. Lat. 39°25'
Long. 141°30'

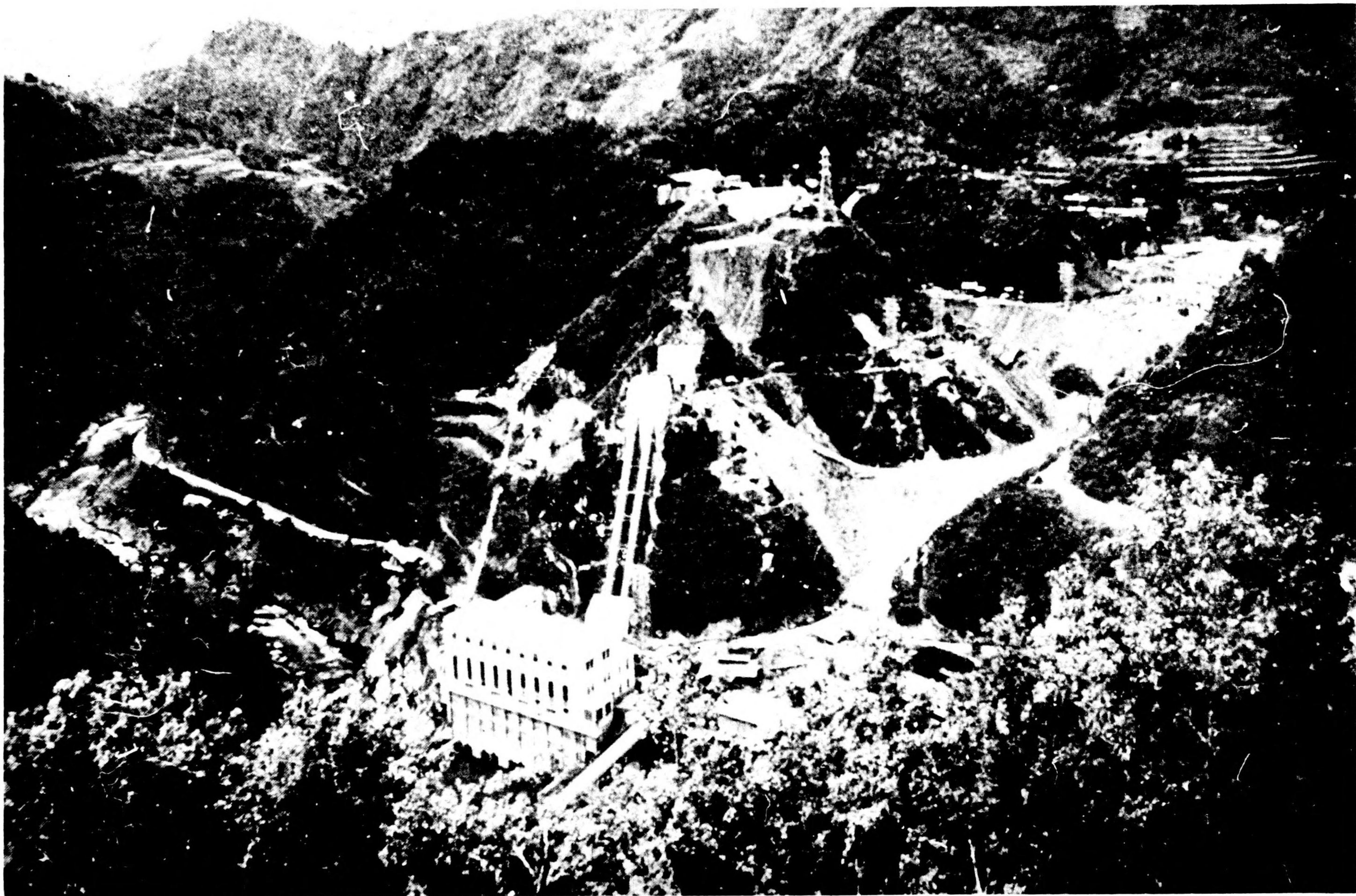
Company: Ou Dento KK; formerly Morioka Dento KK

Location: Plant - 107, Noboritsuchi-aza, 14-chiwari, Shimo
Tsukimaushi-mura, Kami Hei-gun, Iwate-ken

Capacity Commonly in Use (in kw): 2540, as of Dec 1936

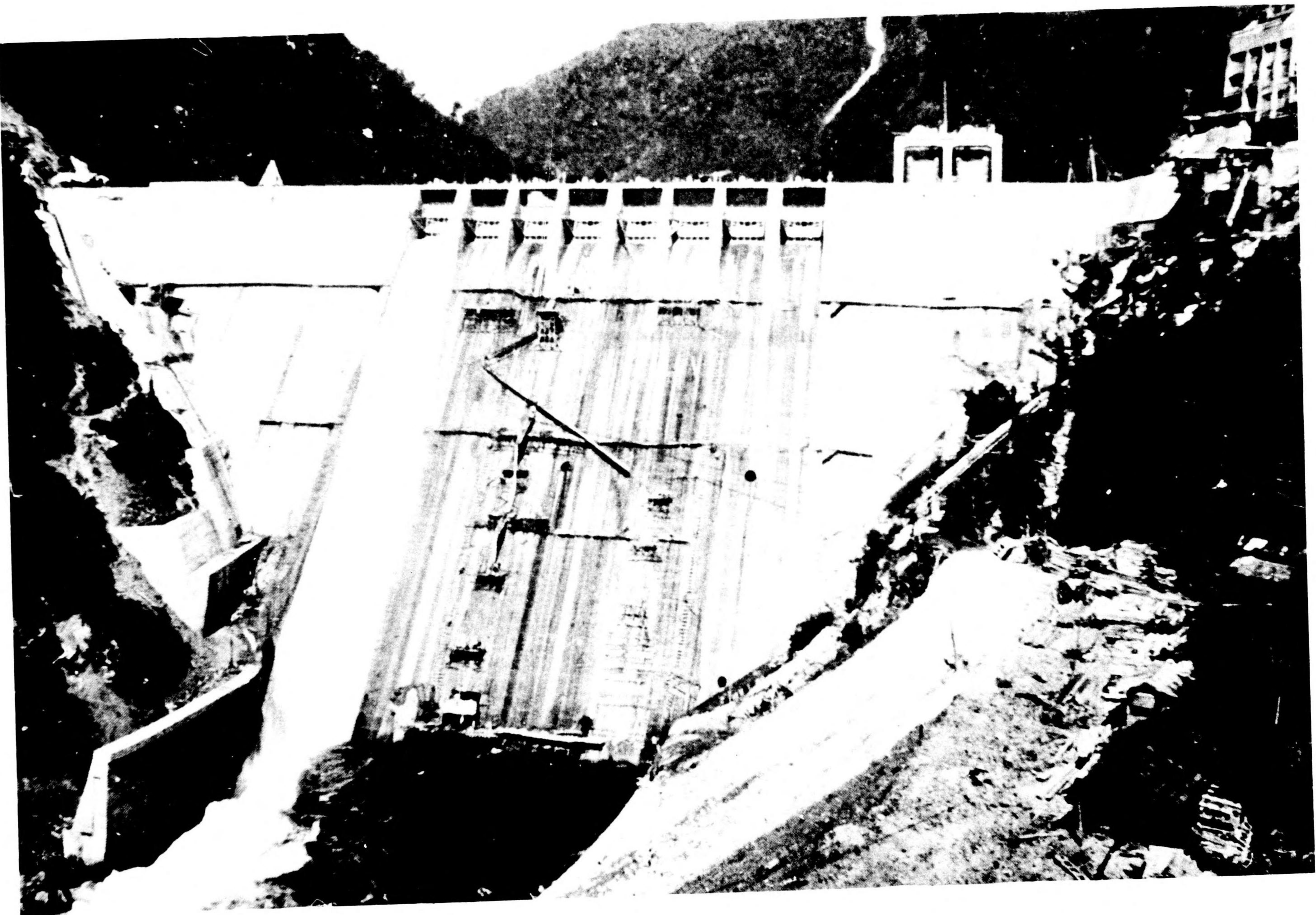
Importance: Rank in Japan - 250 + ; rank in Tohoku supply area - 20 +

Source of Power: Sarugaishi-kawa



Photograph No. V-70 Tsukabaru Hydro Plant in 1938

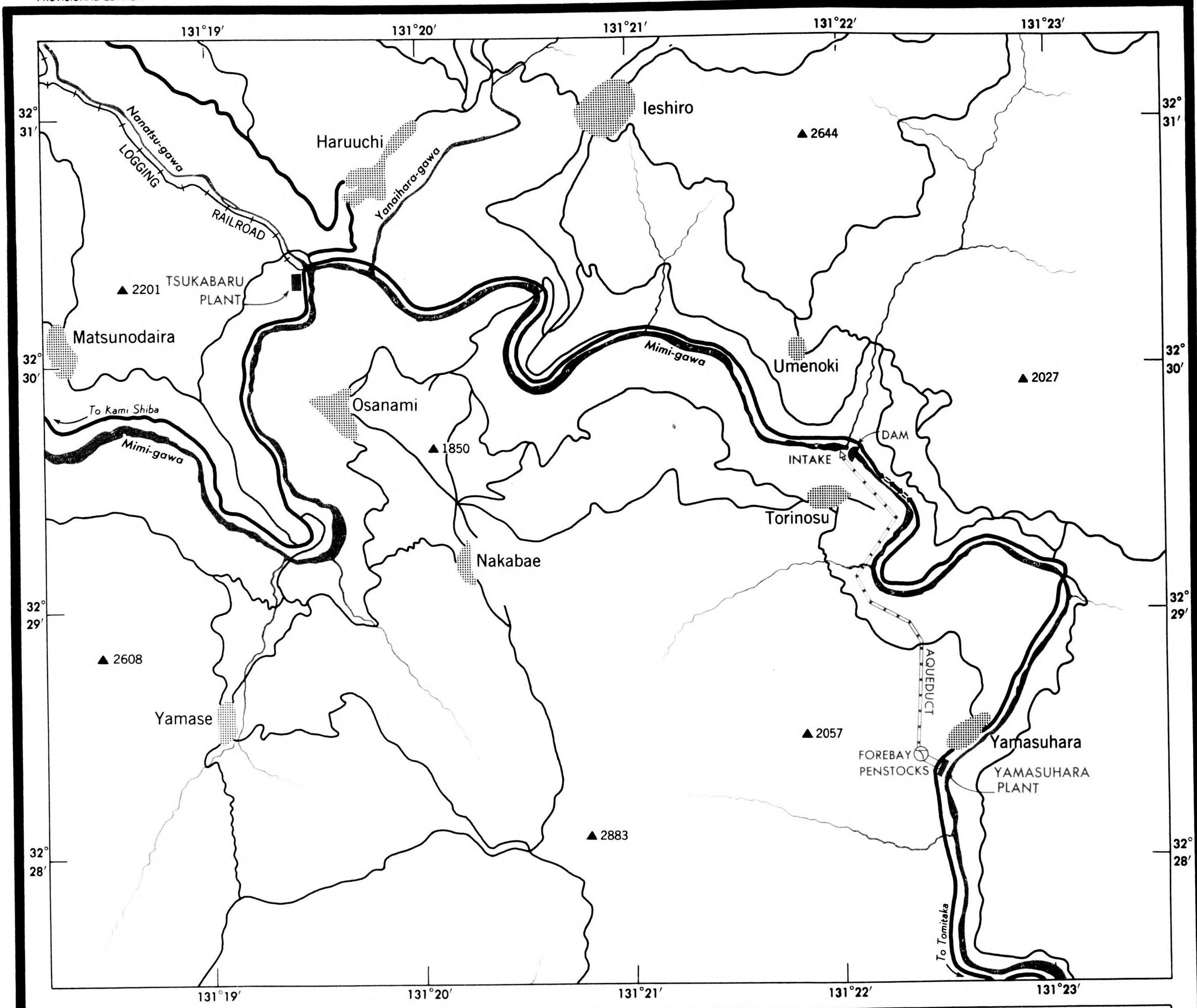
RESTRICTED



Photograph No. V-71 Tsukabaru Hydro Plant dam under
construction in 1938. The Yamasuhara Hydro
Plant is believed to be at the
right.

RESTRICTED

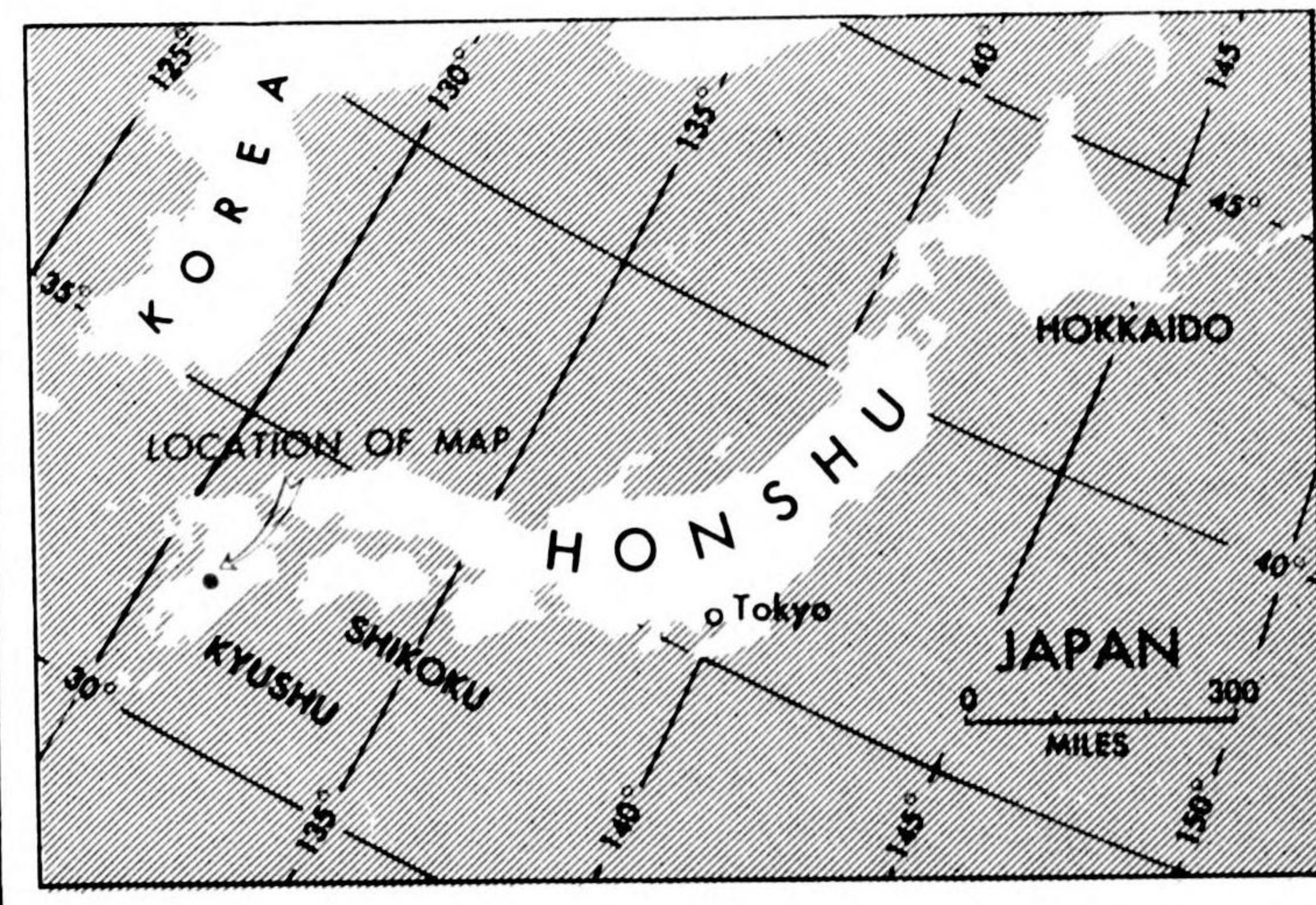
PROVISIONAL EDITION



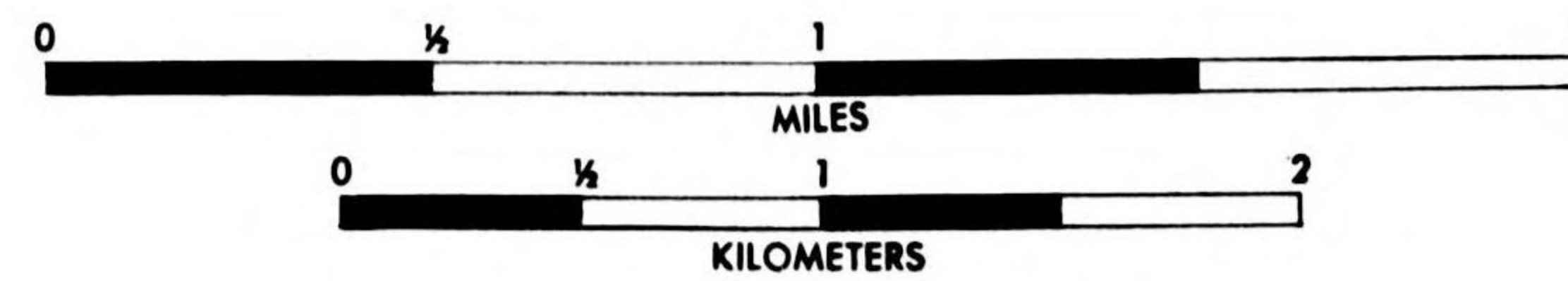
TSUKABARU AND YAMASUHARA HYDROELECTRIC PLANTS

MIYAZAKI-KEN

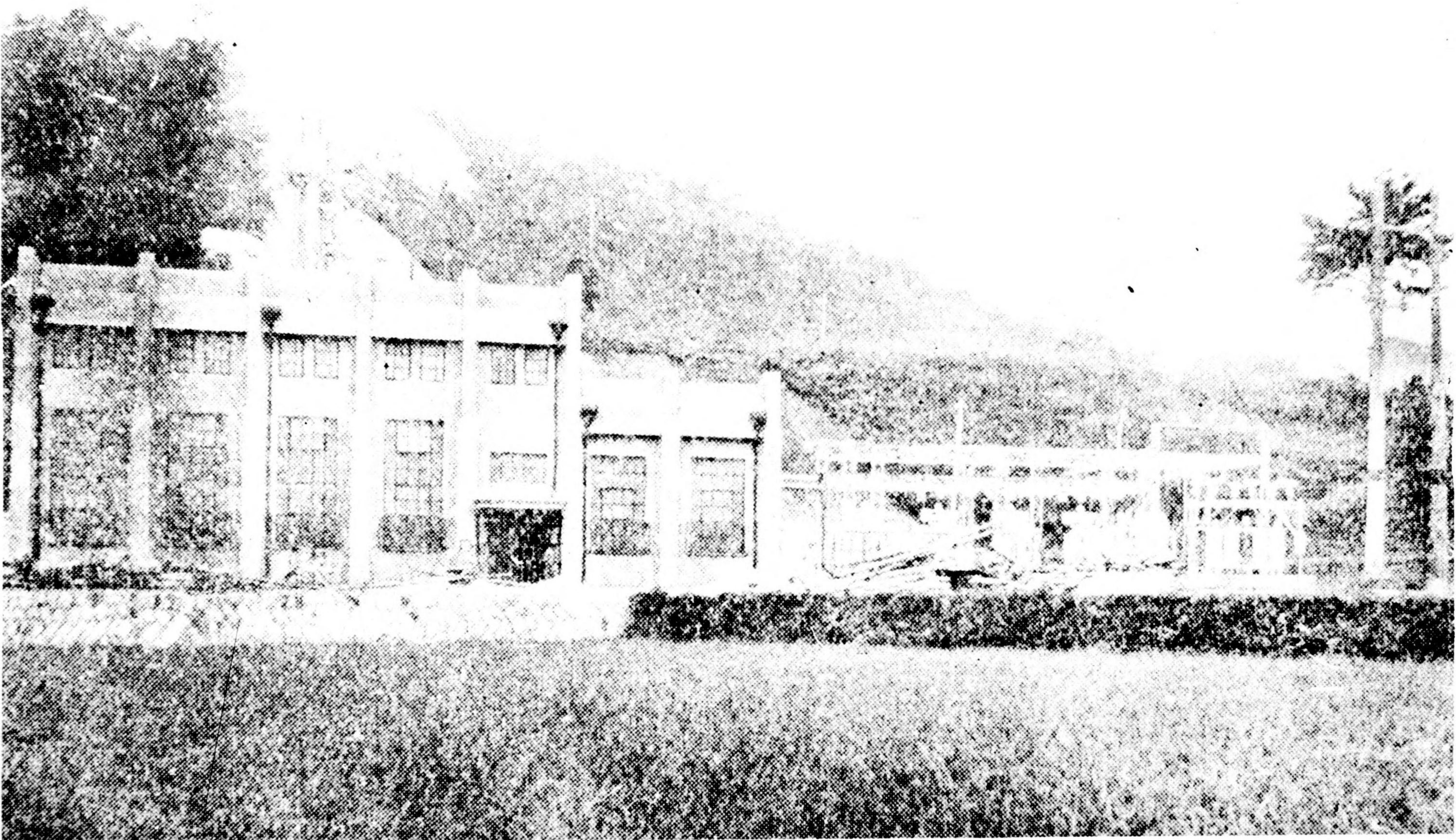
BASE MAP FROM 1:50,000 SERIES, JAPAN IMPERIAL LAND SURVEY BUREAU, 1934, 1935
W.D.M.C. FILE NO. JAPAN S30-JGS-50, SHEETS 8-9 AND 8-10



- | | | | |
|--|-------------------|--|-----------------------|
| | SETTLEMENT CENTER | | PRINCIPAL HIGHWAY |
| | PRIVATE RAILROAD | | SECONDARY ROAD |
| | TUNNEL | | SPOT HEIGHT (IN FEET) |

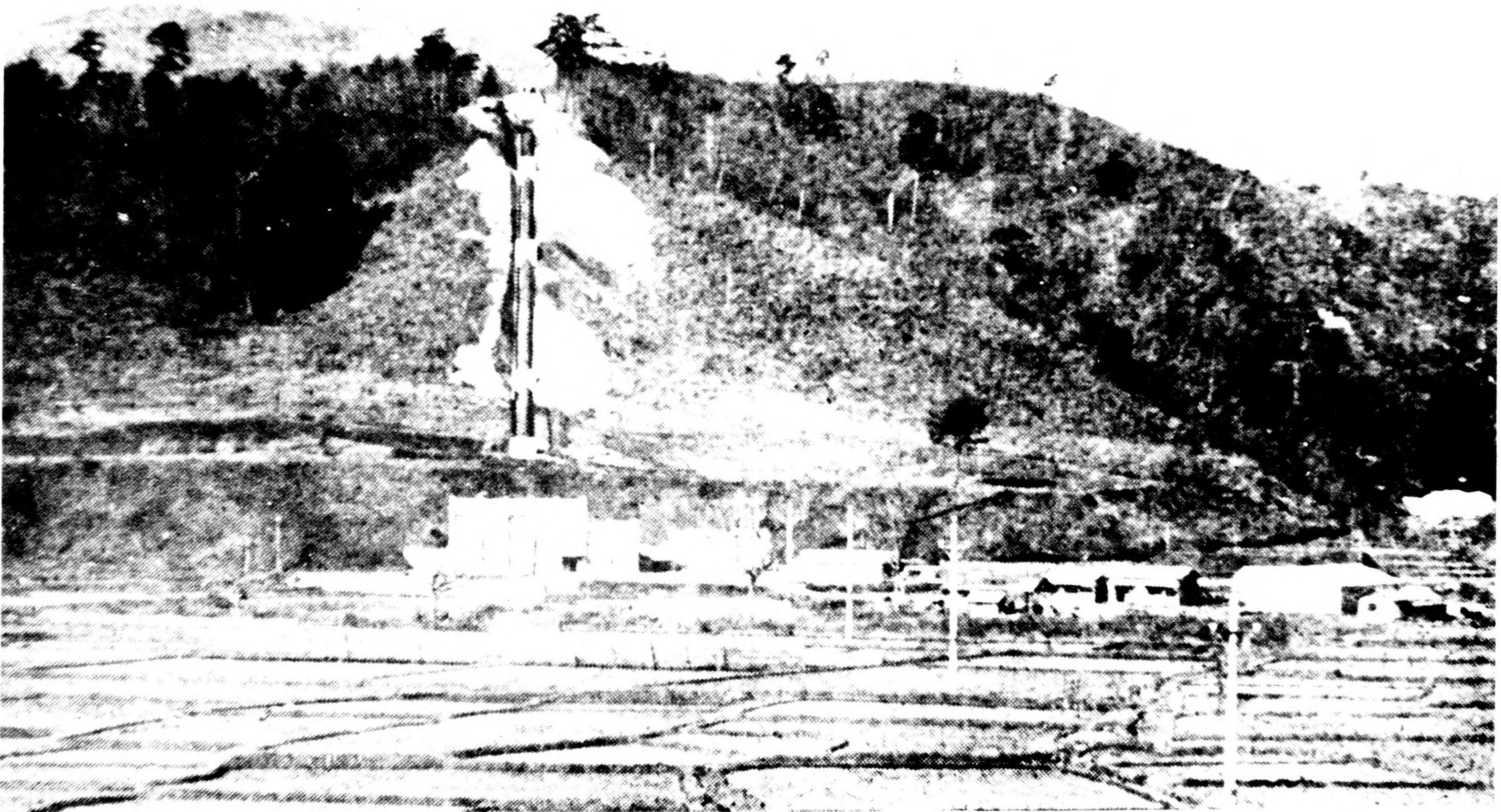


Reliability Code 1B-1B-1



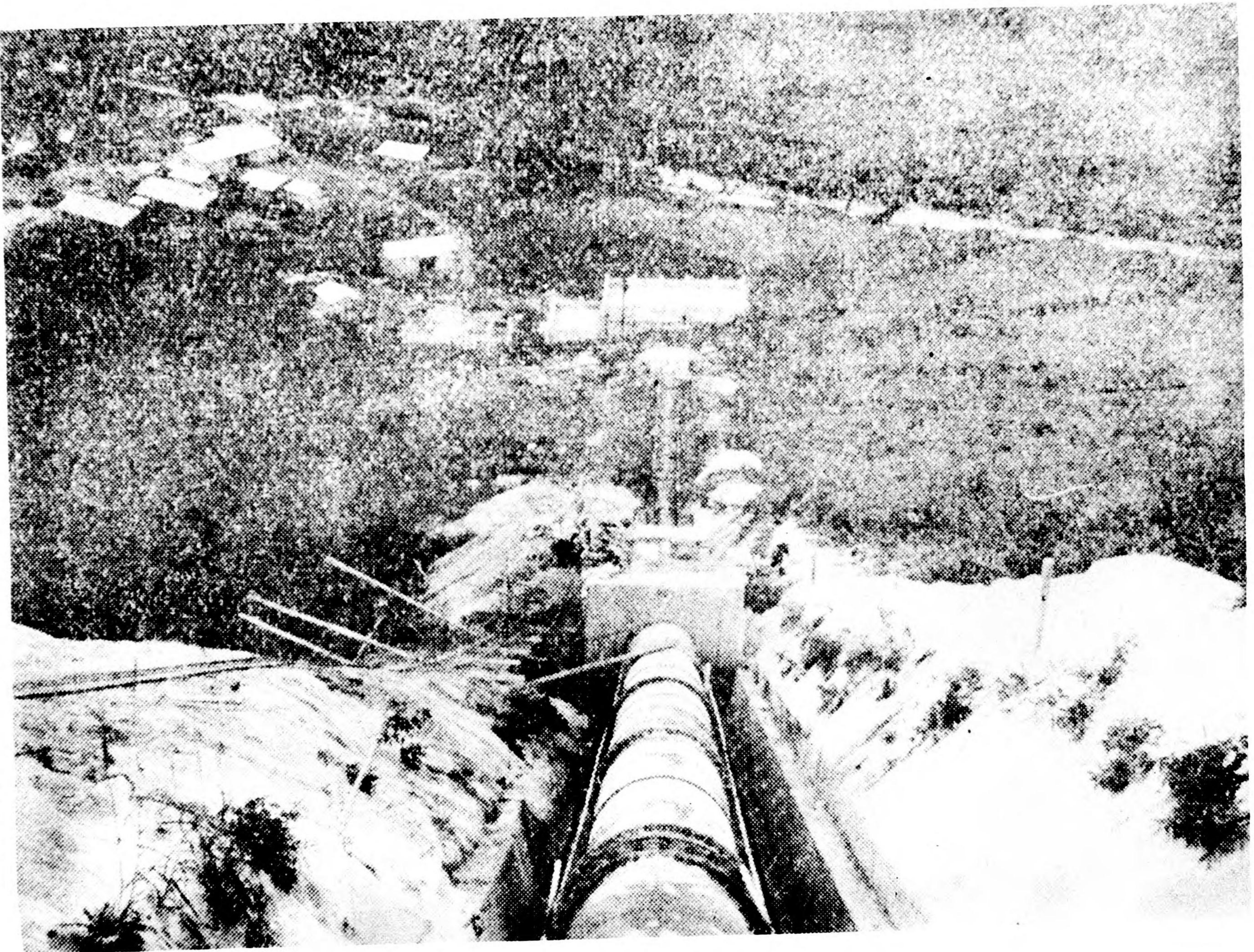
Photograph No. V-72 Tsukumaushi Hydro Plant in 1932

RESTRICTED



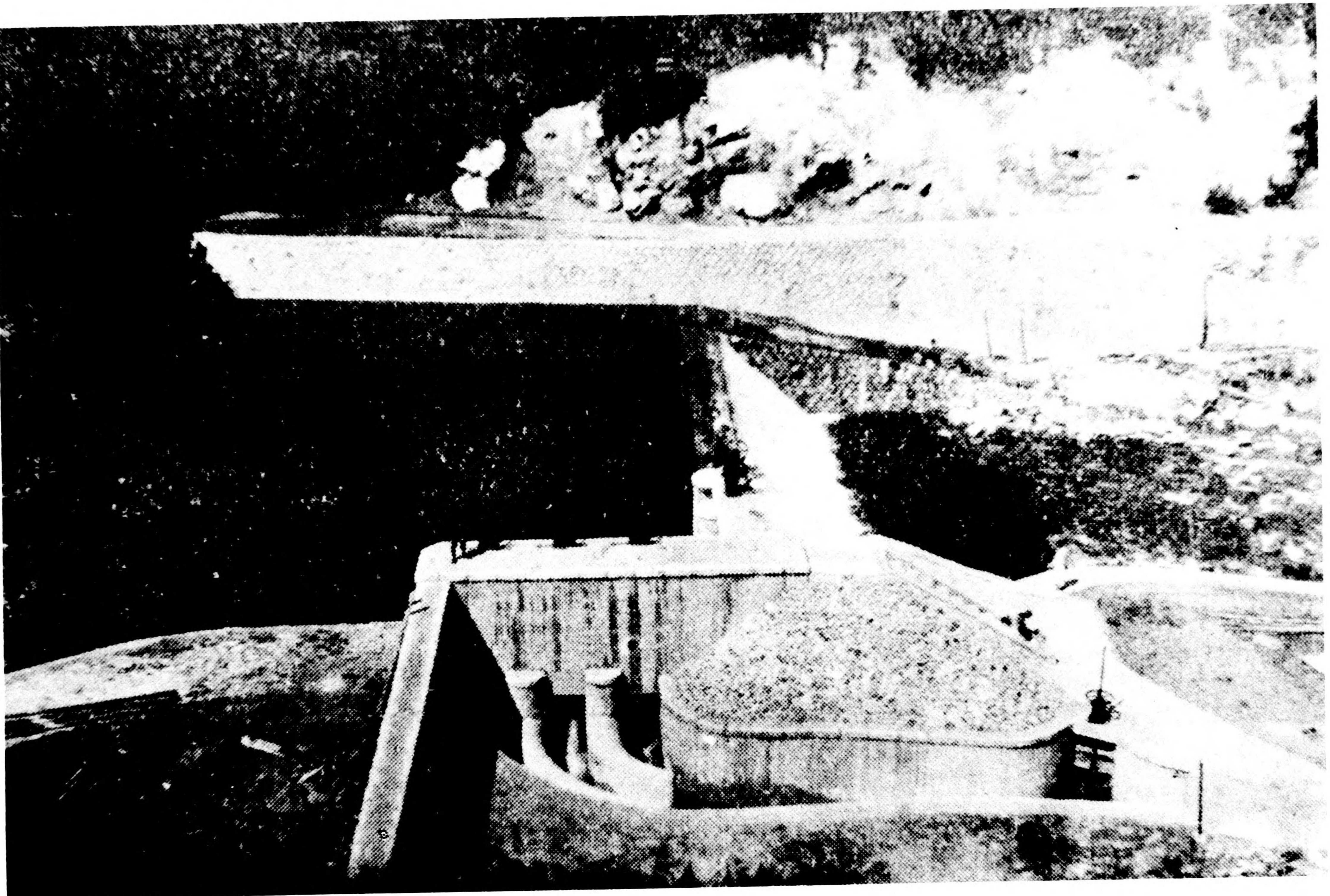
Photograph No. V-73 Tsukumaushi Hydro Plant in 1932

RESTRICTED



Photograph No. V-74 Tsukumaishi Hydro Plant in 1932

RESTRICTED



Photograph No. V-75 Tsukidmaushi Hydro Plant dam in 1932

RESTRICTED

Date of Construction: Construction was begun Feb 1931 and completed Feb 1932; in operation Mar 1940

Details: Particular capacities (in kw) - 3120 installed cap; 980 reg; 1560 spec
Layout - Aqueduct-type
Dam - 90 ft long
Aqueduct - 10,084 ft long
Forebay - 57 ft long, 6 to 25 ft wide, 9.5 ft deep
Penstocks - 1 @ 3116 ft long
Plant, external features - Of concrete construction, 3 stories high, 75 ft long and 33 ft wide
Plant, equipment -
Turbines - 2 @ 2250 hp, Francis-type, horizontal-shaft, Dengyosha-make
Generators - 1950 kva, 80% pf, 3-ph, 3300 v, 720 rpm, 60 cyc, Shibaaura-make

See: Photographs No. V-72, V-73, V-74, V-75

Sources: DnN 1940; DnK; SR 5/32 frontispiece, p.165; Ohm 5/31 p.259, 4/32 p.239

886. TSUKINO HYDRO PLANT

Approx. Lat. 31°32'
Long. 131°00'

Company: Kyushu Denki KK; formerly Kumagawa Denki KK

Location: Plant - Kubosaki-oaza, Tsukino-mura, So-gun, Kagoshima-ken

Capacity Commonly in Use (in kw): 1750, as of Feb 1935

Importance: Rank in Japan - 250 + ; rank in Kyushu supply area - 50 +
Source of Power: Hishida-gawa system

Date of Construction: Unknown; under construction Feb 1935 and in operation Mar 1940

Details: Particular capacities (in kw) -- 730 reg; 1020 spec

Sources: DnN 1940; ZKT 1939 p.1651; Ohm 5/35 p.530

887. TSUMAKAGO HYDRO PLANT

Approx. Lat. 35°34'
Long. 135°36'

Company: Kiso Hatsuden KK

Location: Plant - On the right bank of the Aranogi-gawa at 769, Omata-aza, Azuma-mura, Nishi Tsukuma-gun, Nagano-ken

Capacity Commonly in Use (in kw): 2620, as of Dec 1936

Importance: Rank in Japan - 250 + ; rank in Osaka-Nagoya supply area- 100 +

Source of Power: O-zawa and Kinji-zawa, branches of the Aranogigawa of the Kiso-gawa system

Date of Construction: Construction was begun Nov 1933 and completed Nov 1934; in operation Mar 1934

Details: Particular capacities (in kw) - *3360 installed cap; 1690 reg; 930 spec
Layout - Aqueduct-type
Dam - 4.3 m high 24.7 m long, gravity-type
Settling basin - 52.35 m long, 60 m wide
Aqueduct - 2994.5 m long tunnel, 62.8 m long open channel, 42 m long culvert
Forebay - 26 m long, 4 m wide, 3.3 m deep
Penstocks - 1 @ 499.4 m long
Excess water spillway - 432.3 m long
Fishway - 1.2 m wide
Plant, external features - Of reinforced concrete construction, 25 m long and 15 m wide
Plant, equipment -
Turbines - 1 @ 4300 hp, double spiral, 4-nozzle type
Generators - 1 @ 4200 kva, 3-ph, 60 cyc
Other equipment - 1 exciter
Tail race - 19.3 m long

Sources: DnN 1940; ZKT 1939 p.1646; DnK; DGS 2/35 p.320; Ohm 4/35 p.389; HSG p.318

888. TSUMORI FACTORY STEAM PLANT

Approx. Lat. 34°38'
Long. 135°30'

Company: Asano Cement KK

Location: Tsumori-cho, Nishinari-ku, Osaka-shi, Osaka-fu

Installed Capacity (in kw): 1500, as of 1929

Importance: Rank in Japan - 250 + ; rank in Osaka-Nagoya supply area-100 +
Serves the Tsumori Factory of the Osano Cement KK

Date of Construction: Unknown; in operation 1929

Details: Plant, equipment -
Fuel supply - Uses waste gas of cement kilns
Boilers - 2 @ Edgemoor water tube-type
Turbines - 1 @ 1500 kw, Ljungstrom-type, Mitsubishi-make
Generators - 1 @ 1500 kw, 3-ph

Sources: Directory of Japanese Portland Cement Manufacturers 1929 p.13

889. TSURU HYDRO PLANT

Approx. Lat. 32°38'
Long. 130°59'

Company: Kumamoto Denki KK

Location: Plant - 102, Tsuru-oaza, Shiraito-mura, Kami Mashiki-gun, Kumamoto-ken

Capacity Commonly in Use (in kw): 10,700, as of Dec 1936

Importance: Rank in Japan - 222 ; rank in Kyushu supply area - 29

Source of Power: Kikuchi-gawa, Sasawara-gawa and Oya-gawa of the Midori-gawa system

Date of Construction: Completed Nov 1927; in operation Mar 1940

Details: Particular capacities (in kw) - *11,200 installed cap;
4450 reg; 6250 spec
Eff head - 147.5 m; flow - 8.6 m³/sec
Dam - 13.20 m high, overflow gravity-type
Plant, equipment -
Turbines - 2 @ 6500 hp, Francis-type, horizontal-shaft, Hitachi-make
Generators - 2 @ 7000 kva, 3-ph, 6600 v, 514.3 rpm, 60 cyc, Hitachi-make
Transformers - 4 (incl 1 res) @ 4000 kva, 1-ph, 6.6/38.108 kv, D-Y conn, water-cooled, 60 cyc, shell-type, Hitachi-make
Area served - Kumamoto-ken

See: Figure No. V-24

Sources: DnN 1940; ZKT 1939 p.1650; DnK; DJY 1927; DJY 1929 pp.274, 370; Ohm 2/28 p.134, 6/31 supp p.6, 10/33 opp p.561; Ohm-sha Guide 1933 p.23; TD Map; DnGZ 8/33 p.673

TSURUDA HYDRO PLANT - See TSURUTA HYDRO PLANT

890. TSURUGA FACTORY STEAM PLANT

Approx. Lat. 35°39'
Long. 136°05'

Company: Toyo Boseki KK; formerly Showa Rayon KK

Location: Minami Nakashimizu-aza, Tsunai-cho, Tsuruga-shi, Fukui-ken

Installed Capacity (in kw): Est 14,000 (see Date of Construction)

Importance: Rank in Japan -166 ; rank in Osaka-Nagoya supply area - 74

Date of Construction: Factory and plant completed 1935; in operation Mar 1940

Details: Plant, equipment -
Generators - 2 @ 1875 kva, 3-ph, 4050/4650 rpm, 135/155 cyc, Shibaura-make

Additional generating equipment has been installed

Sources: DnN 1940; ZKT 1939 p.1108; SR 1/35 pp.2 ff; DnGZ 10/37 p.(143)

891. TSURUMI STEAM PLANT

Approx. Lat. 35°29'
Long. 139°42'

Company: Nippon Hassoden KK; formerly Tokyo Dento KK

Location: On reclaimed land at 3-banchi, Okawa-cho, Kawasaki Kyoku-ku, Kawasaki-shi, Kanagawa-ken. To the east of the plant is a 600-ft canal, on the other side of which is the Mitsui coal storage yard and the Kawasaki Steam Plant; to the south is Tokyo-wan; to the west is a railroad, on the other side of which are the Nissei Seifun KK flour mills and the factory of the Kagakuki Seizo KK

Installed Capacity (in kw): 178,500, as of Nov 1936. An unconfirmed report places the capacity at 231,500 kw.

Importance: Rank in Japan - 5 ; rank in Tokyo supply area - 1

Date of Construction: Completed Apr 1927 with units No. 1 and 2 @ 35,000 kw and 1 house unit @ 2500 kw; units No. 3 and 4 @ 50,000 kw and 2 additional house units @ 3000 kw were installed in July 1936; plant in operation Mar 1940

Details: Plant, external features - Of reinforced concrete construction, 5 and 6 stories high. Plant built in 2 sections: old plant - 193 ft wide and 197 ft long with 6 chimneys; extension - 213 ft wide, 236 ft long, and 90 ft high with 2 chimneys

Plant, equipment -

Fuel supply - Coal is unloaded from ships on the canal. 2 coal hoists @ 100 ton/hr and 170 ton/hr caps; 1 belt conveyor @ 250 ton/hr cap; 2 coal yards @ 50,000 and 15,000 ton caps. In 1936 about 0.7 kg of 6800 cal/kg coal was used for each kwh generated in old plant and about 0.6 kg of 6500 cal/kg coal was used for each kwh generated in extension

Boilers - Units No. 1 and 2 - 4 @ B&W water tube-type, 26.36 kg/cm², 1729 m², 404.4° C, B&W-make

2 @ B&W water tube-type, 26.36 kg/cm², 1670 m², 404.4° C, B&W-make

Units No. 3 and 4 - 4 @ CTM-type, 45 kg/cm², 1236 m², 450° C, B&W-make

Turbines - Units No. 1 and 2 - 2 @ 48,500 hp, Curtis impulse-type, horizontal-shaft, GE-make

Unit No. 3 - 1 @ 73,800 hp, tandem compound impulse-type, horizontal-shaft, AEG-make

Unit No. 4 - 1 @ 73,800 hp, tandem compound impulse-type, horizontal-shaft, Mitsubishi-make

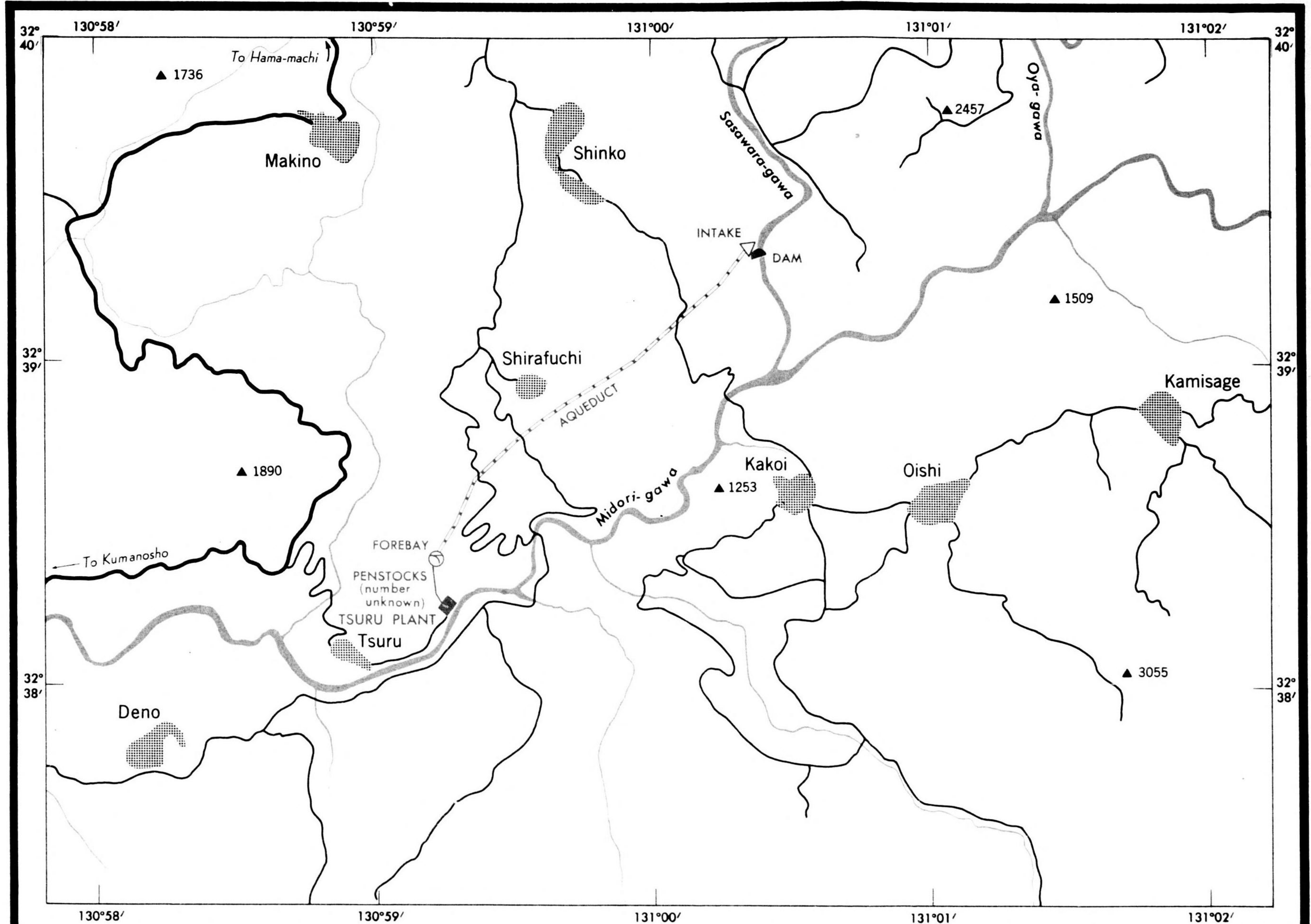
House units - 1 @ 3550 hp, Curtis impulse-type, horizontal-shaft, GE-make

2 additional house units have been installed

#12
142 x 1000 =

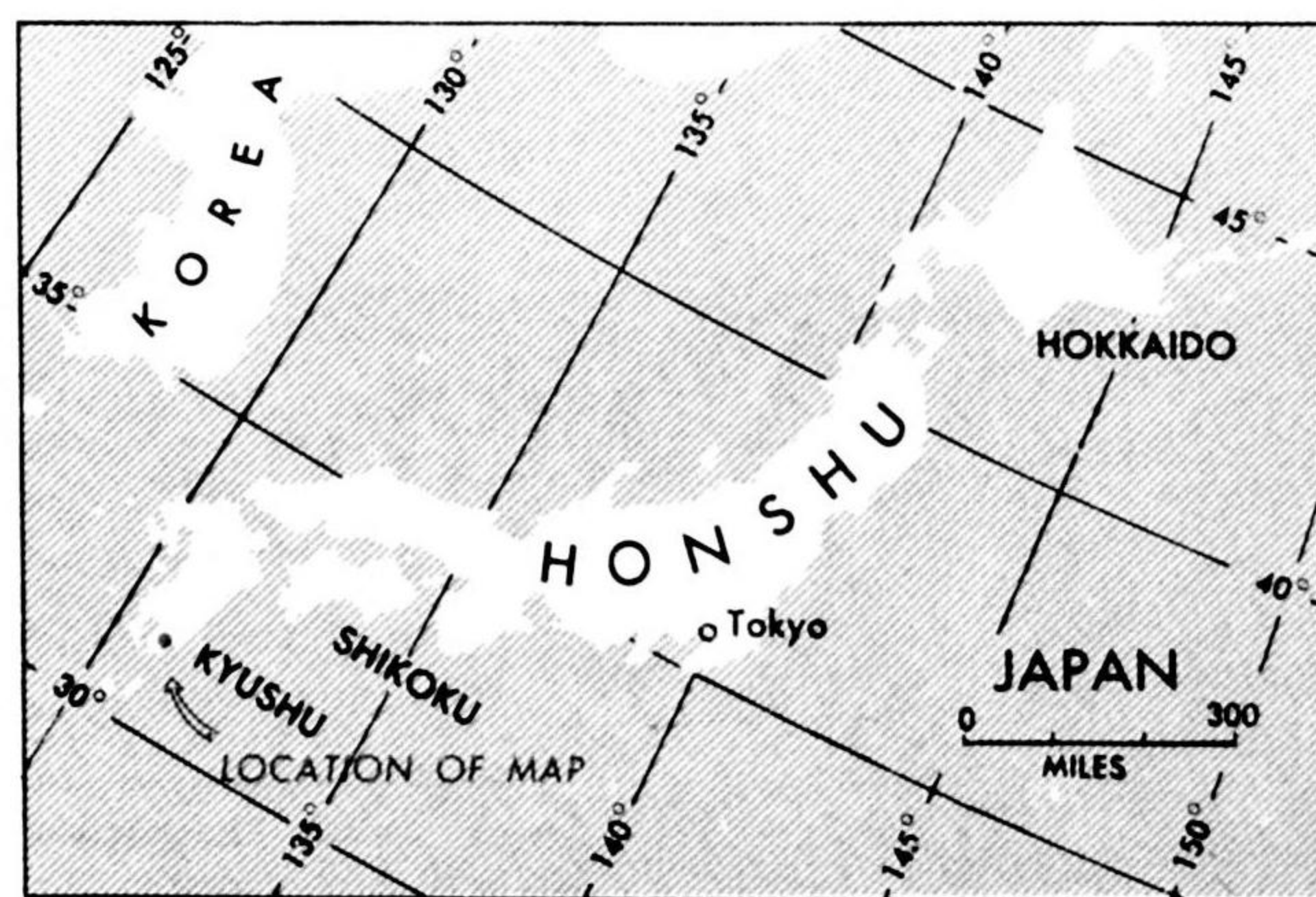
Figure V-24
CONFIDENTIAL





PROVISIONAL EDITION

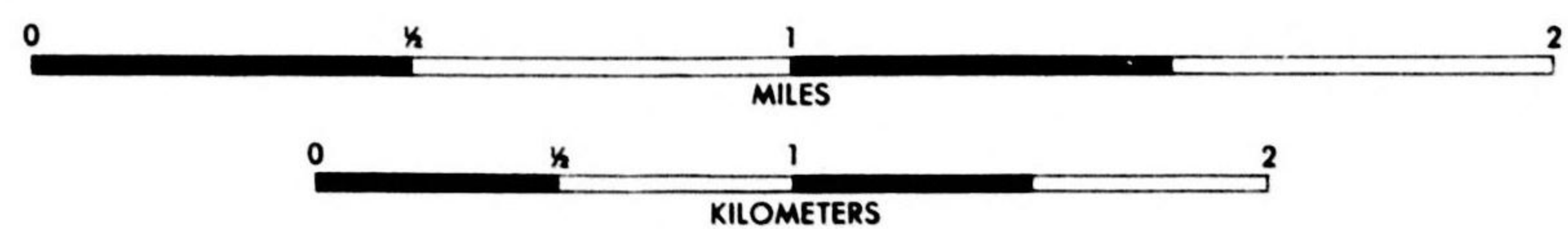


TSURU HYDROELECTRIC PLANT KUMAMOTO-KEN

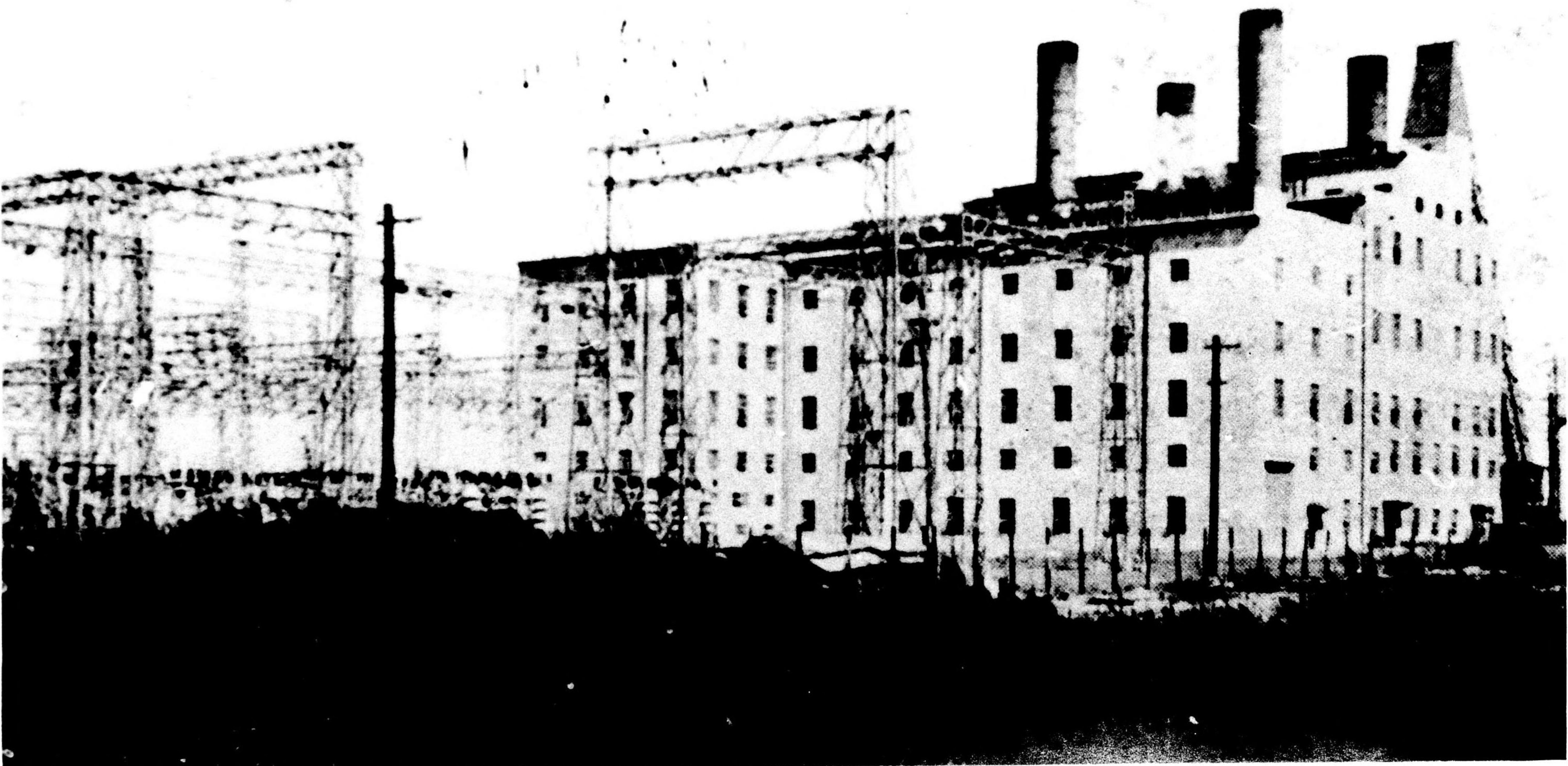
BASE MAP FROM 1:50,000 SERIES, JAPAN IMPERIAL LAND SURVEY BUREAU, 1929
W.D.M.C. FILE NO. JAPAN S30-JGS-50, SHEETS 8-1, 8-13



-  SETTLEMENT CENTER
-  PRINCIPAL HIGHWAY
-  SECONDARY ROAD
-  SPOT HEIGHT (IN FEET)

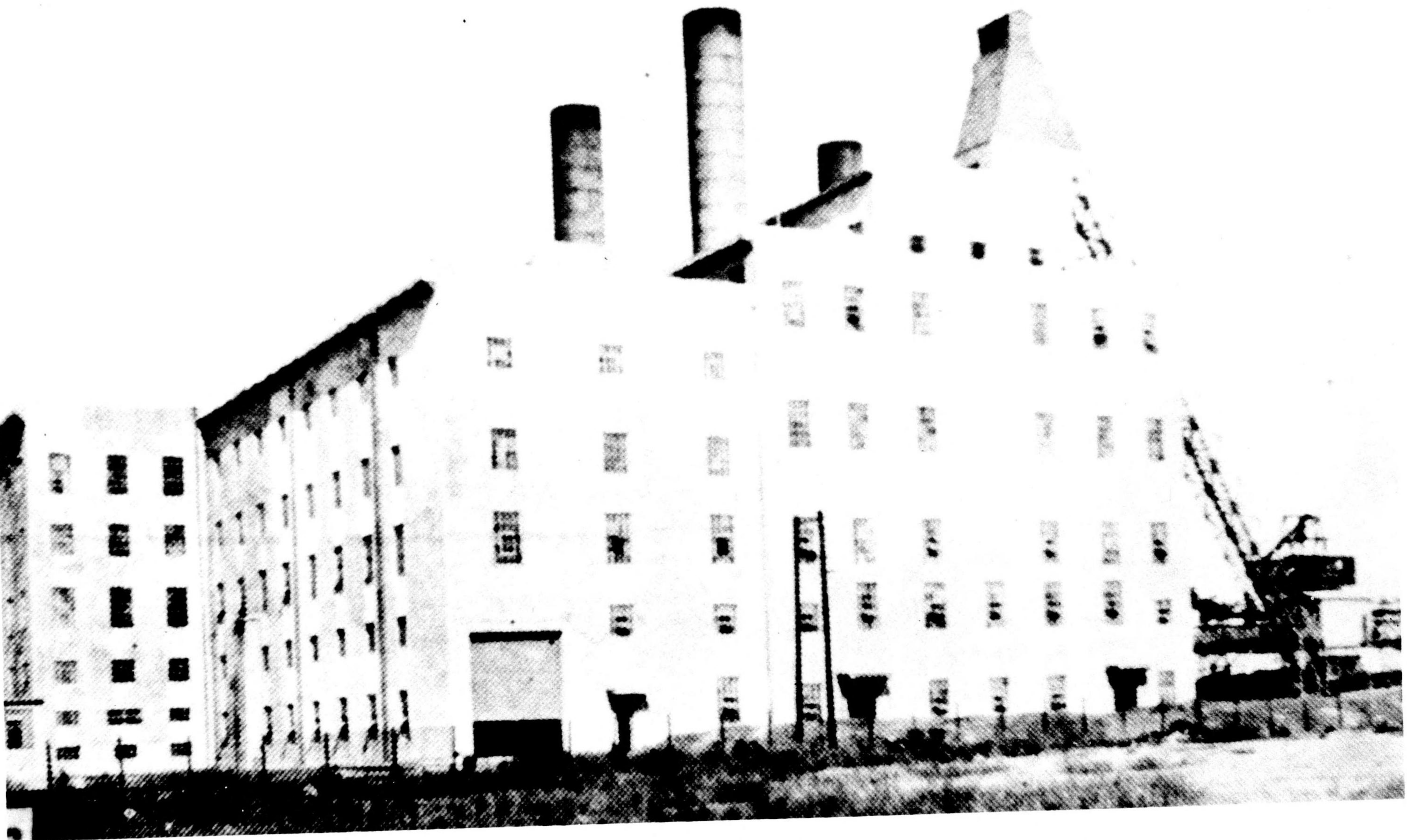


Reliability Code: 1B-1B-1



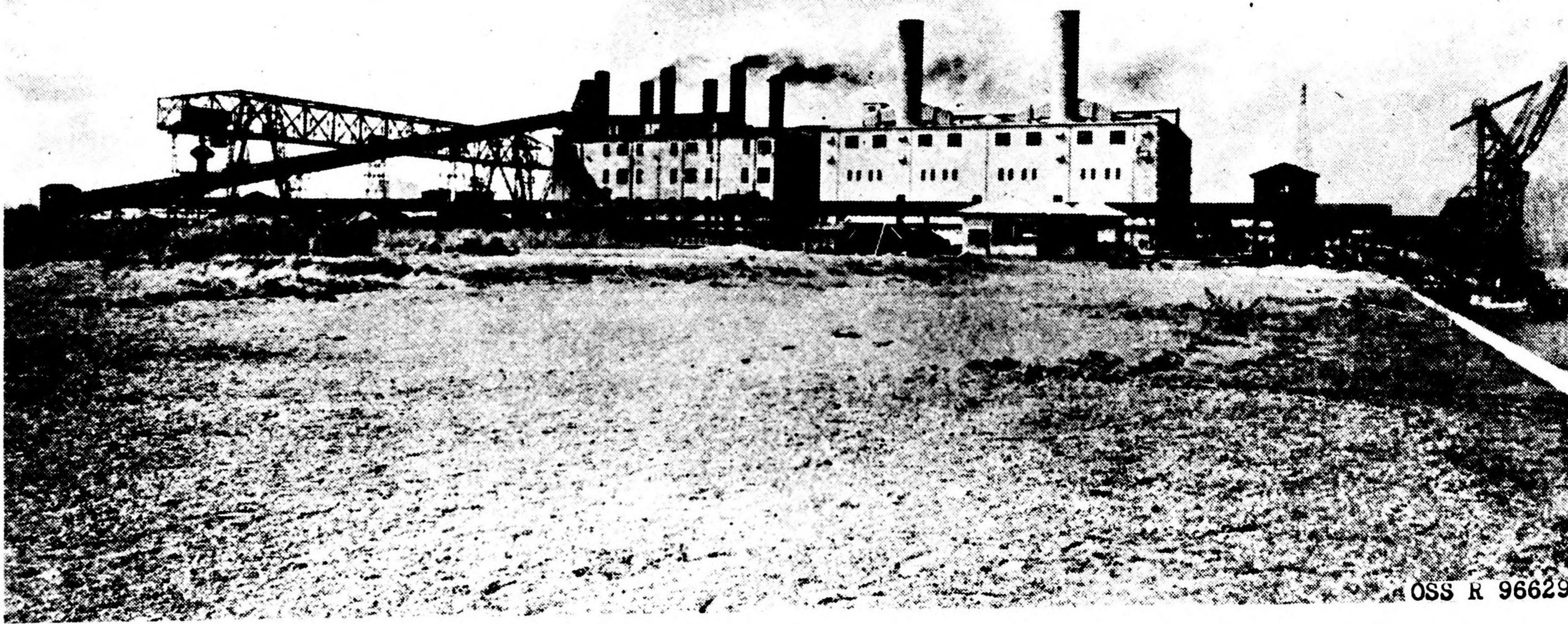
Photograph No. V-76 Tsurumi Steam Plant in 1927
before construction of extensions in 1936

RESTRICTED



Photograph No. V-77 Tsurumi Steam Plant in 1928
before construction of extensions in 1936

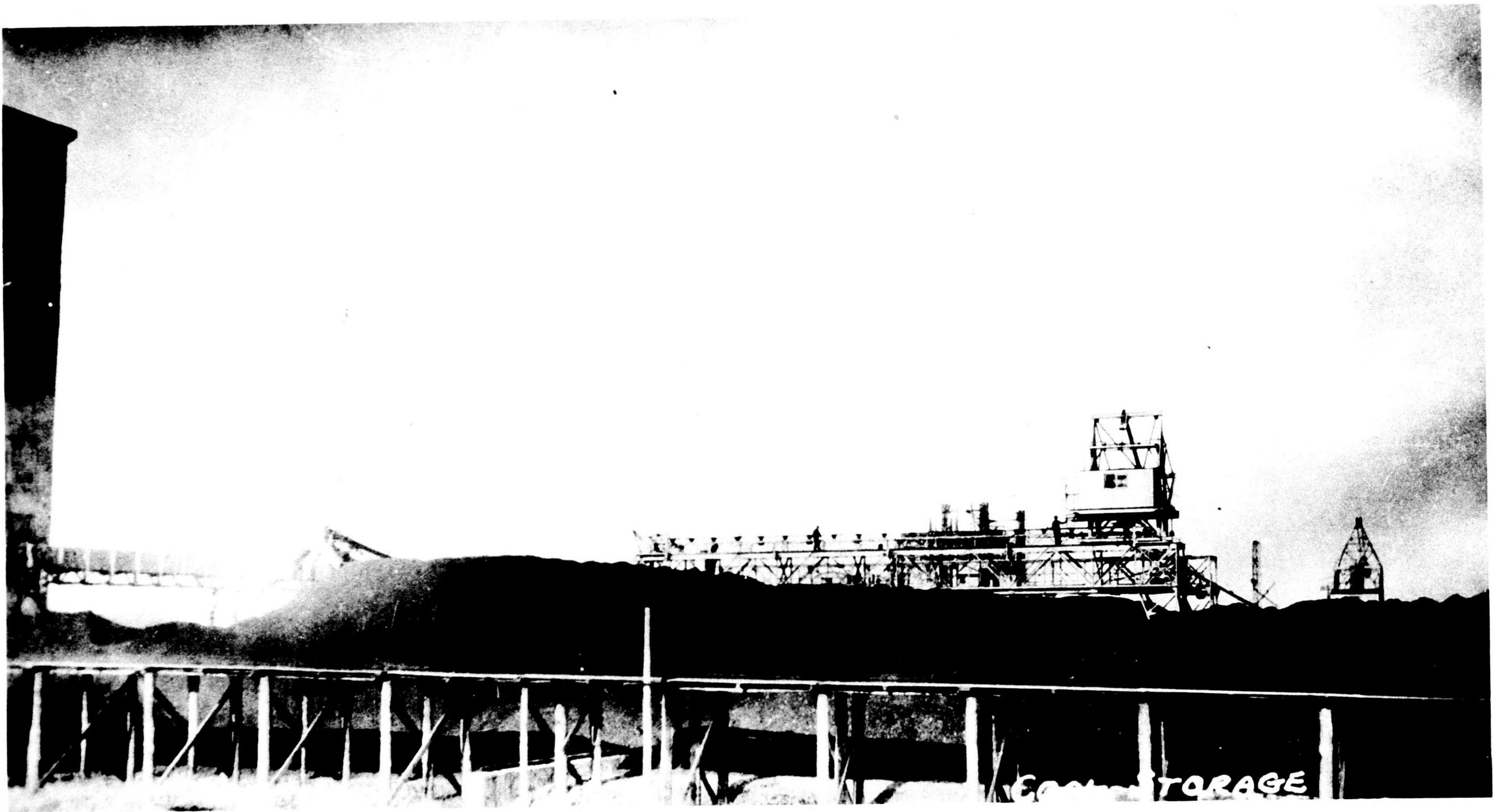
RESTRICTED



Photograph No. V-78 Tsurumi Steam Plant after
construction of extensions in 1936

OSS R 96629

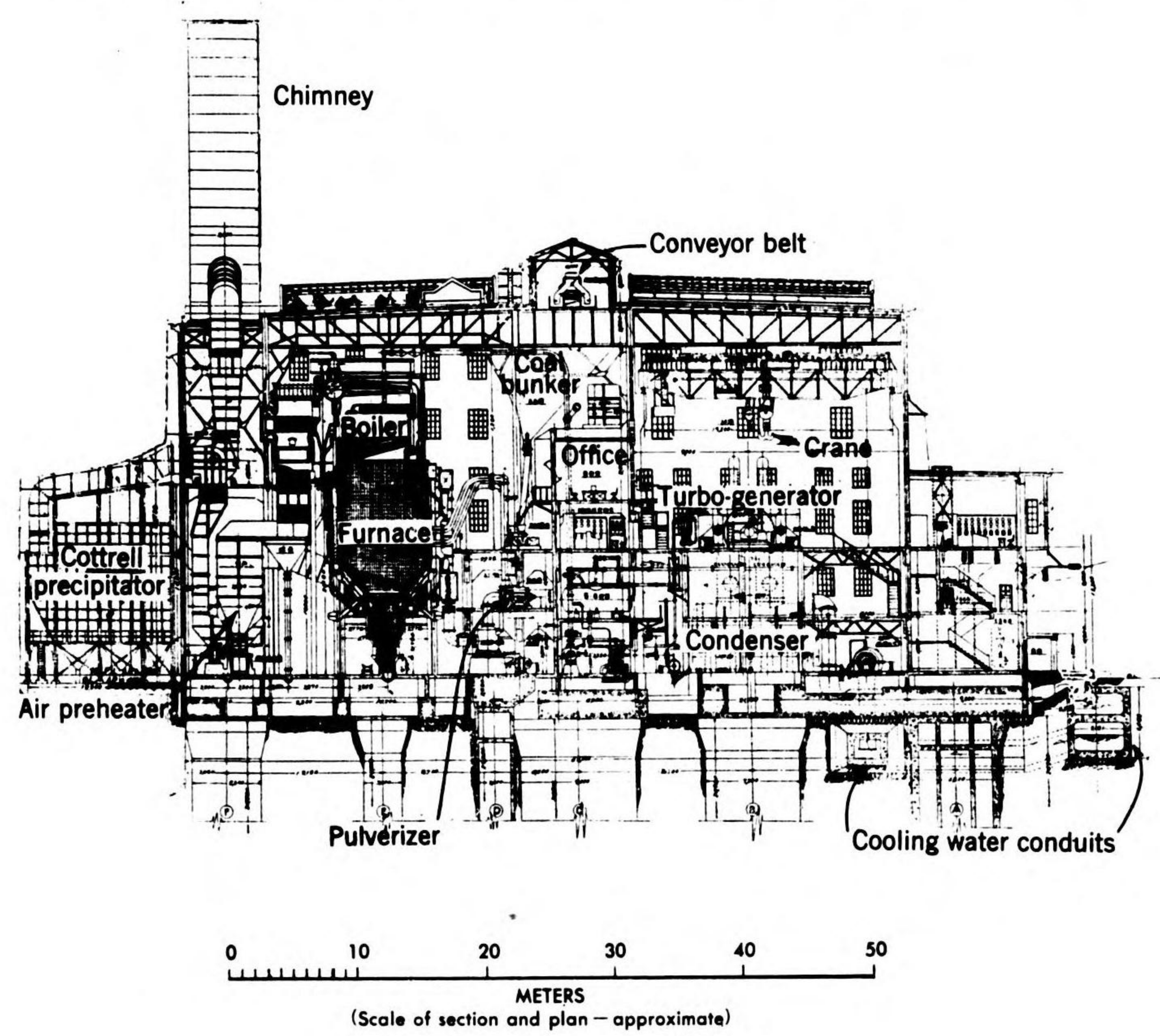
CONFIDENTIAL



Photograph No. V-79 Tsurumi Steam Plant coal yard in 1928

RESTRICTED

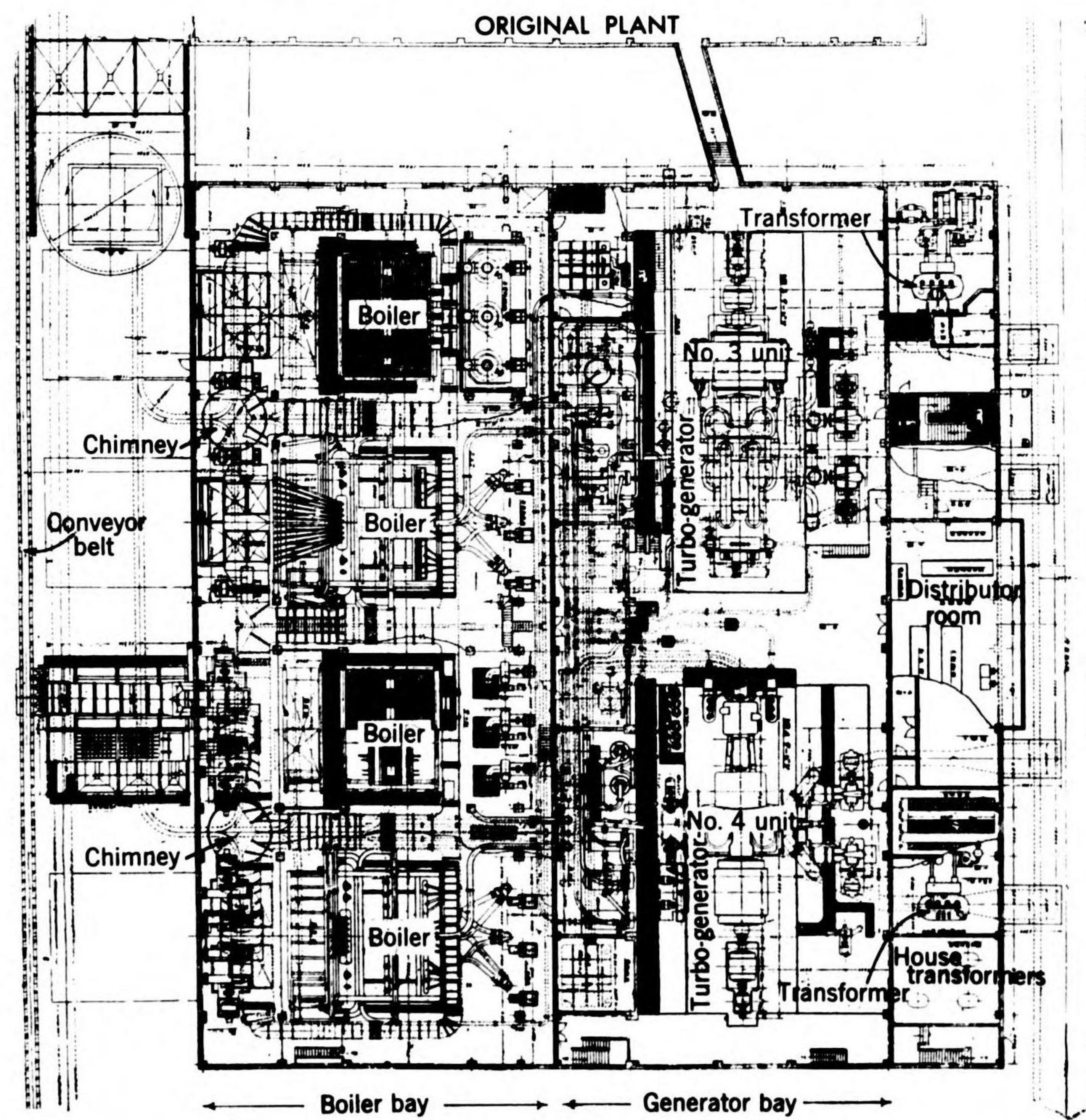
SECTIONAL ELEVATION OF PLANT EXTENSION



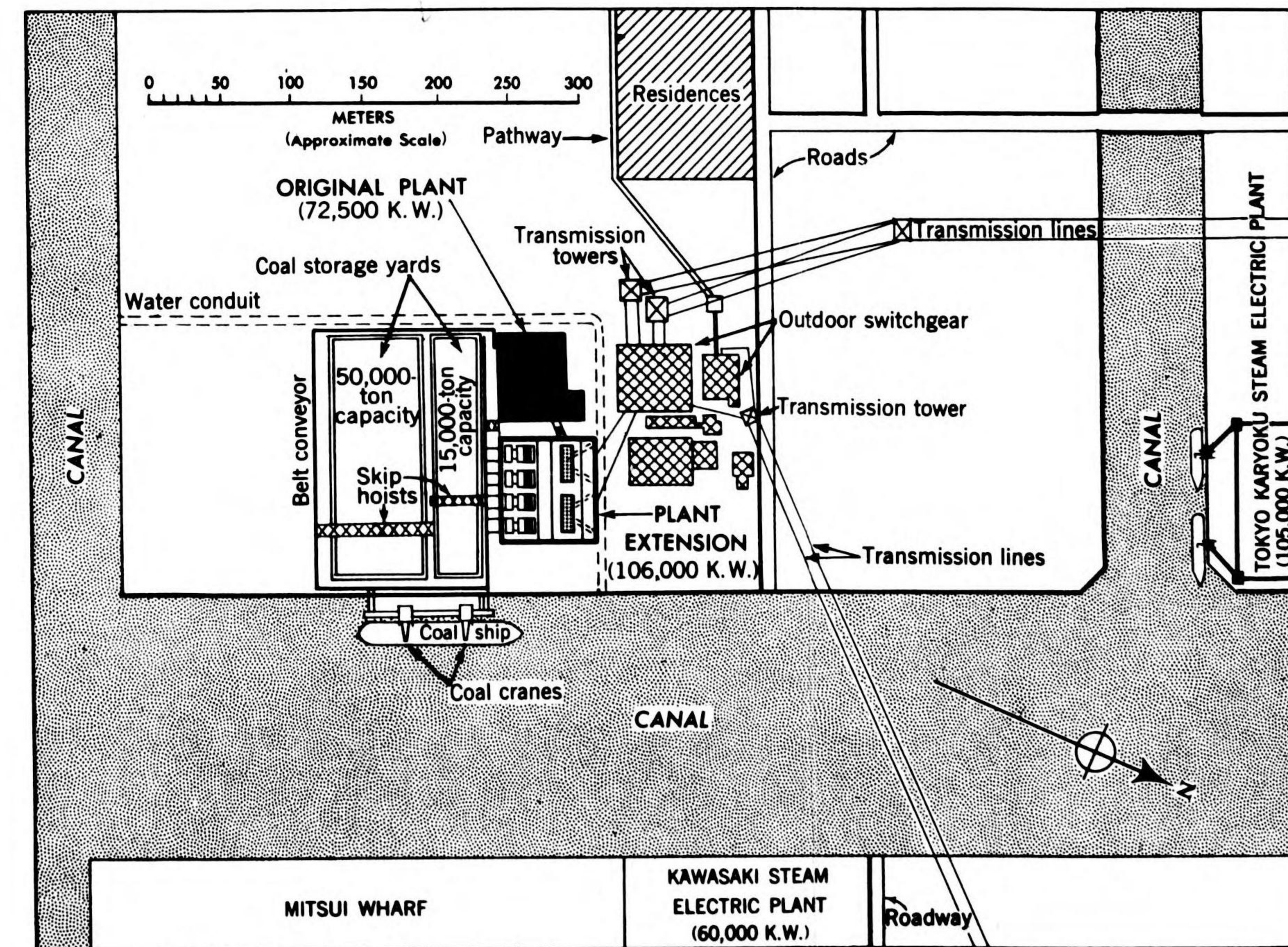
TSURUMI STEAM ELECTRIC PLANT KANAGAWA-KEN

FROM: DENKI GAKKAI ZASSHI
(Journal of the Society of Electrical Engineers)
November, 1936, pp. 23 and 24

GENERAL PLAN OF PLANT EXTENSION



GENERAL LAYOUT



Generators - Units No. 1 and 2 - 2 @ 43,750 kva,
80% pf, 3-ph, 11,000 v. 1500 rpm, 50 cyc,
GE-make

Unit No. 3 - 1 @ 62,500 kva, 80% pf,
3-ph, 11,000 v, 1500 rpm, 50 cyc, AEG-make

Unit No. 4 - 1 @ 62,500 kva, 80% pf,
3-ph, 11,000 v, 1500 rpm, 50 cyc, Mitsubishi-make

House units - 1 @ 3125 kva, 80% pf,
3-ph, 3300 v, 3000 rpm, 50 cyc, GE-make

1 @ 3750 kva, 80% pf,
3-ph, 3300 v, 3000 rpm, 50 cyc, GE-make

1 @ 3750 kva, 80% pf,
3-ph, 3300 v, 3000 rpm, 50 cyc, AEG-make

Transformers - 6 @ 15,000 kva, 1-ph, 11/19.05,18.5,
17.9,16.75,38.1,37,35.8,34.6,33.5/23,22,21 kv,
D-Y conn, water-cooled, 50 cyc, core-type,
Shibaura-make

2 @ 63,000 kva, 3-ph, 10.5/69,66,63,60
kv, D-Y conn, oil-cooled, 50 cyc, Shibaura-make

1 @ 2000 kva, 1-ph, 22/3.45 kv, D-D conn,
water-cooled, 50 cyc, Shibaura-make

3 @ 2000 kva, 1-ph, 23,22,21,20,19/
3.45 kv, D-D conn, self-cooled, 50 cyc, Fuji Denki-make

Other equipment - 7 exciters, incl 3 @ 190 kw, 1 @
20 kw, 1 @ 250 kw, 1 @ 3.6 kw, and 1 @ 3 kw; 3 sur-
face condensers; 2 closed-type feedwater heaters;
8 economizers; unknown no. superheaters @ 334° C;
underfeed stokers (for units No. 1 and 2) and coal
pulverizers (for units No. 3 and 4)

Area served - Connected to the Kawasaki substation via
4 transmission lines @ 66 kw

See: Photographs No. V-76, V-77, V-78, V-79
Figure No. V-26

Sources: DnN 1940; ZKT 1939 p.1644; Ohm-sha Guide 1928, 1933 p.31;
Ohm 1/27 pp.8,72, 6/27 pp.326,350, 8/27 cover, 1927 p.504, 2/29
adv p.4, 6/31 supp p.7, 6/34 p.401, 1/36 p.2, 3/36 p.226, 10/36 p.1007,
5/37 p.537; DnGZ 9/31 p.564, 11/36 pp.(21-36); SR 3/27 frontis-
piece; DJY 1929 p.304; TD Map; The Electrician 8/6/37

892. TSURUNUMAGAWA HYDRO PLANT

Approx. Lat. 37°18'
Long. 139°55'

Company: Aizu Denryoku KK

Location: Plant - Egawa-mura, Minami Aizu-gun, Fukushima-ken

Capacity Commonly in Use (in kw): 6250, as of Dec 1936

Importance: Rank in Japan - 250 †; rank in Tokyo supply area - 100 †

Source of Power: Tsurunuma-gawa of the Aka-gawa system

Date of Construction: Construction was begun Aug 1927 and completed in 1929; in operation Mar 1940

Details: Particular capacities (in kw) - 3260 reg; 3260 spec
Layout - Aqueduct-type
Dam - 9.7 m high, overflow gravity-type with tainter gates
Plant operates on 50 cyc

See: Figure No. V-25

Sources: DnN 1940; DnK; Ohm 5/28 p.265, 4/29 p.212, 3/31 p.165

893. TSURUTA HYDRO PLANT

Approx. Lat. 31°57'30"
Long. 130°29'

Company: Nippon Suiden KK

Location: Plant - Suwanodan-aza, Koshi-oaza, Tsuruta-mura, Satsuma-gun, Kagoshima-ken

Capacity Commonly in Use (in kw): 4384, as of Dec 1936

Importance: Rank in Japan - 250 + ; rank in Kyushu supply area - 50 +

Source of Power: Sendai-gawa

Date of Construction: Founded Nov 1924; in operation Mar 1940

Details: Particular capacities (in kw) - *4450 installed cap;
2360 reg; 2024 spec
Eff head - 53 ft
Plant, equipment -
Turbines - 3 @ 2400 hp, Francis-type, EN-make
Generators - 3 @ 1850 kva, 3-ph, 3300 v, 214/257 rpm, 50/60 cyc, GE-make
Transformers - 4 (incl 1 res) @ 1850 kva, 1-ph, 3.4, 3.3, 3.2/38.15 kv, D-Y conn, water-cooled, 50 cyc, shell-type, Shibaura-make
3 @ 900 kva, 1-ph, 3.45, 3.3, 3.15/38.15, 33 kv, D-Y conn, water-cooled, 60 cyc, core-type, Yasukawa-make
3 @ 400 kva, 1-ph, 3.3/11 kv, D-Y conn, water-cooled, 60 cyc, shell-type, Hitachi-make

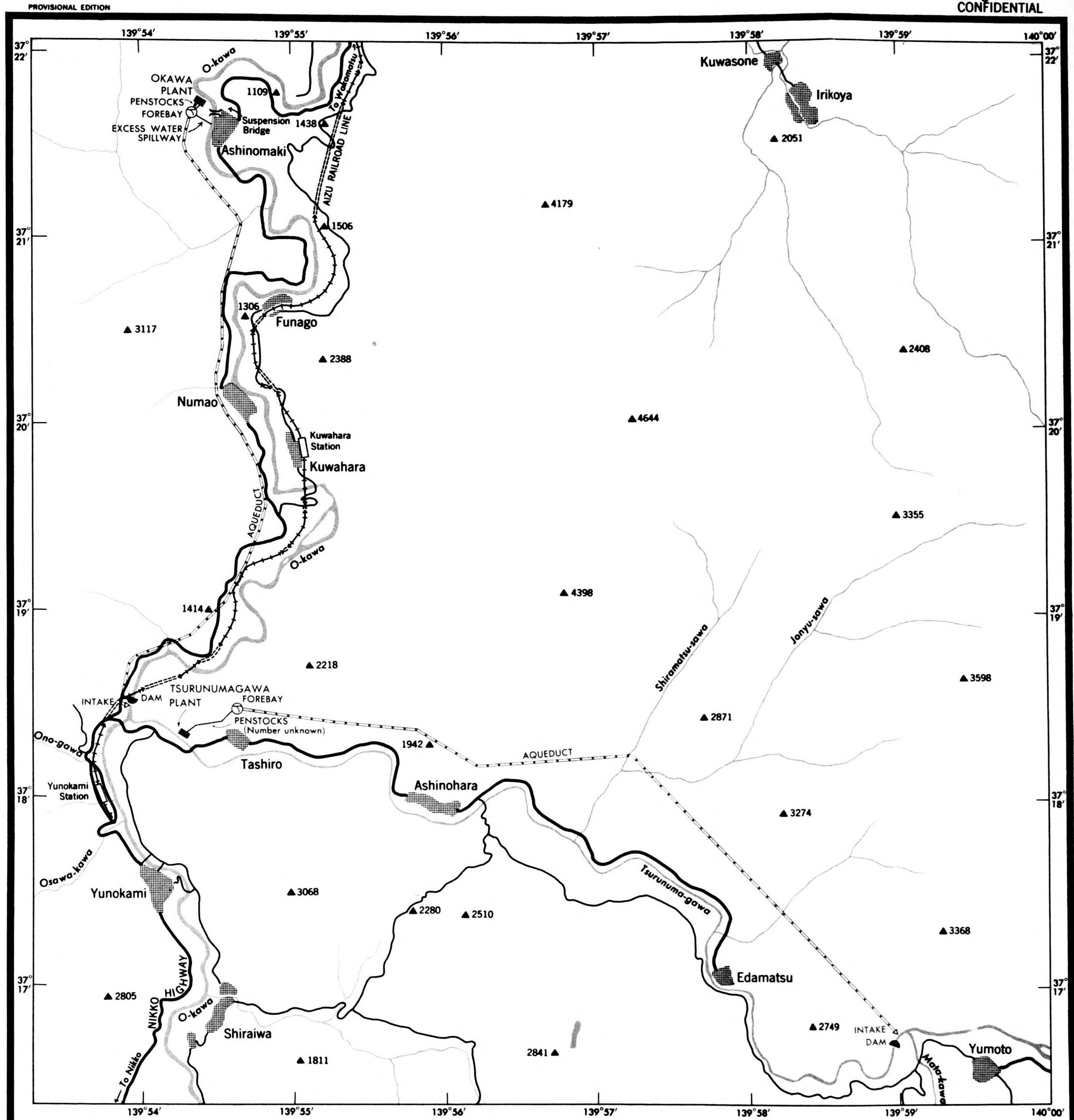
Sources: DnN 1940; ZKT 1939 p.1651; DnK; DJY 1929 pp.280, 382

894. UBE NO. 1 STEAM PLANT

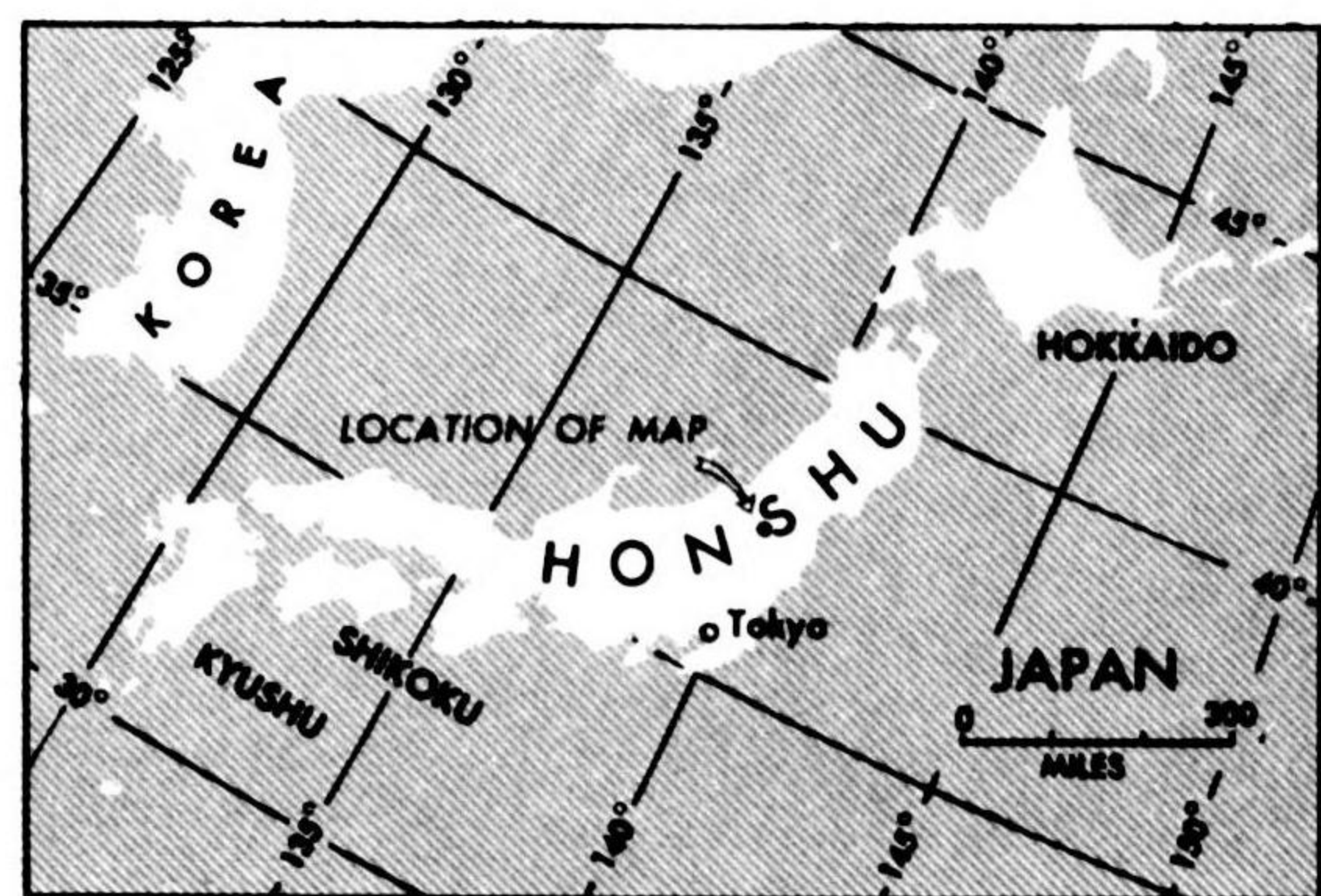
Approx. Lat. 33°56'
Long. 131°15'

Company: Yamaguchi-ken

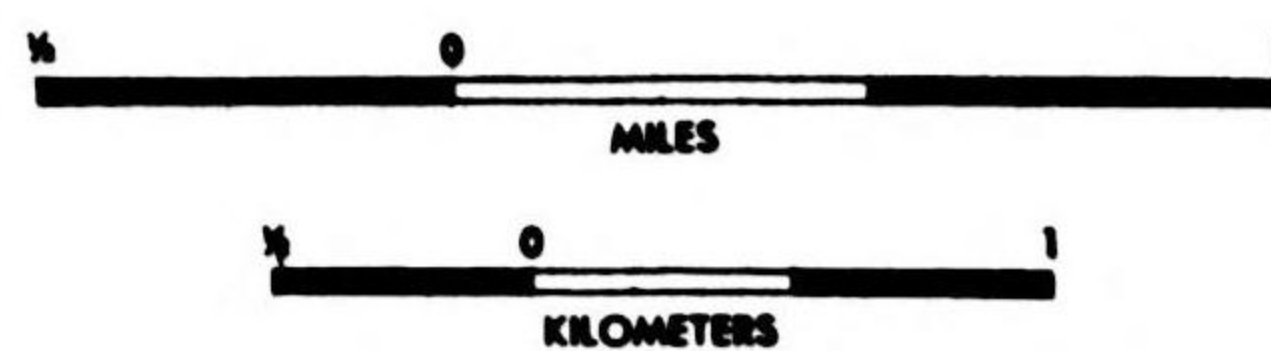
Location: 252, Nakaube, Ube-shi, Yamaguchi-ken



OKAWA AND TSURUNUMAGAWA HYDROELECTRIC PLANTS FUKUSHIMA-KEN



BASE MAP FROM 1:50,000 SERIES, JAPAN IMPERIAL LAND SURVEY BUREAU, 1934, 1936
W.D.M.C. FILE NO. JAPAN S30-JGS-50, SHEETS 61-1 AND 66-4



Reliability Code: 1B-1B-1

- SETTLEMENT CENTER
- PRINCIPAL HIGHWAY
- SECONDARY ROAD
- TUNNEL
- 2280 SPOT HEIGHT (IN FEET)

Installed Capacity (in kw): *12,000, as of 1933

Importance: Rank in Japan - 200 ; rank in Chugoku supply area - 15

Date of Construction: Completed May 1910; in operation Mar 1940

Details: Particular capacities (in kw) - 7500 supp, 4500 res

Plant, equipment -

Boilers - 2 @ B&W water tube-type, 14 kg/cm²,
373 m², B&W-make

4 @ B&W water tube-type, 14 kg/cm²,
498 m², B&W-make

1 @ B&W water tube-type, 14 kg/cm²,
468 m², B&W-make

Turbines - 1 @ 1800 hp, Parsons-type, horizontal-
shaft, Mitsubishi-make

1 @ 1800 hp, Curtis-type, horizontal-
shaft, GE-make

1 @ 2250 hp, Curtis-type, horizontal-
shaft, GE-make

1 @ 5800 hp, Zoelly-type, horizontal-
shaft, EW-make

1 @ 6500 hp, Curtis-type, horizontal-
shaft, AEG-make

Generators - 1 @ 1563 kva, 3-ph, 2200 v, 3600 rpm,
60 cyc, Mitsubishi-make

1 @ 1563 kva, 3-ph, 2200 v, 3600 rpm,
60 cyc, GE-make

1 @ 1875 kva, 3-ph, 2200 v, 3600 rpm,
60 cyc, GE-make

1 @ 5000 kva, 3-ph, 2200 v, 3600 rpm,
60 cyc, BBC-make

1 @ 5000 kva, 3-ph, 2200 v, 3600 rpm,
60 cyc, AEG-make

Transformers - 3 @ 2500 kva, 1-ph, 2.2/11 kv, D-D conn,
60 cyc, core-type, self-cooled, Mitsubishi-make

6 @ 850 kva, 1-ph, 2.1,2.15,2.2/
42,44,46 kv, D-D conn, 60 cyc, shell-type, self-
cooled, Hitachi-make

4 (incl 1 res) @ 300 kva, 1-ph, 2.2/
22 kv, D-D conn, 60 cyc, core-type, self-cooled,
Shibaura-make

Other equipment - 7 chain-grate stokers; 7 super-
heaters; 5 surface condensers; 5 exciters, incl
2 @ 15 kw, 1 @ 14 kw, 1 @ 21 kw, and 1 @ 32 kw;
2 feedwater heaters

Area served - Part of Yamaguchi-ken

See: Map of the City of Ube

Sources: DnN 1940; ZKT 1939 p.1910; DnK; DJY 1927; DJY 1929 pp.272,
364; Ohm 6/31 supp p.7, 5/32 p.291; Ohm-sha Guide 1933 p.49; TD Map

895. UBE NO. 2 STEAM PLANT

Approx. Lat. 33°56'
Long. 131°15'

Company: Nippon Hassoden KK; formerly Yamaguchi-ken

Location: 1979, Okinoyama-aza, Ogushi-oaza, Ube-shi, Yamaguchi-ken

Installed Capacity (in kw): *75,000, as of 1938

Importance: Rank in Japan - 18 ; rank in Chugoku supply area - 1

Date of Construction: Completed in Mar 1929 with 2 units @ *7000 kw.

Units No. 3 and 4 @ *18,000 kw were installed in Oct 1933 and Unit No. 5 @ 25,000 kw was installed in 1938, going into operation in Mar 1939; plant was in operation Mar 1940.

Details: Plant, external features - Of reinforced concrete construction, 6 stories high with 6 chimneys

Plant, equipment -

Fuel supply - By coal ship or barge

Boilers - Units No. 1 and 2 - 2 @ B&W water tube-type, 24.6 kg/cm², 971.5 m², B&W-make

Units No. 3 and 4 - 3 (incl 1 res) @ B&W water tube-type, 37.13 kg/cm², 165.5 m², B&W-make

Additional boiler plant of B&W-make was installed in 1938

Turbines - Units No. 1 and 2 - 2 @ 7500 kw, STAL-type, horizontal-shaft, Mitsubishi-make

Unit No. 3 - 1 @ 18,000 kw, impulse-type, horizontal-shaft, Mitsubishi-make

Unit No. 4 - 1 @ 18,000 kw, impulse-type, horizontal-shaft, Ishikawajima-make

Unit No. 5 - 1 @ unknown cap, horizontal-shaft, Ishikawajima-make

Generators - Units No. 1 and 2 - 2 @ 8750 kva, 3-ph, 11,000 v, 3600 rpm, 60 cyc, Mitsubishi-make

Unit No. 3 - 1 @ 22,500 kva, 80% pf, 3-ph, 11,000 v, 3600 rpm, 60 cyc, Mitsubishi-make

Unit No. 4 - 1 @ 22,500 kva, 80% pf, 3-ph, 11,000 v, 3600 rpm, 60 cyc, Shibaura-make

Unit No. 5 - 1 @ 31,250 kva, 80% pf, 3-ph, 11,000 v, 3600 rpm, 60 cyc, Shibaura-make

Other equipment - 2 chain-grate stokers (for units No. 1 and 2), pulverized coal firing (for units No. 3, 4, and 5); 5 surface condensers; 10 feedwater heaters (for units No. 1, 2, 3, and 4); 4 economizers,

incl 2 @ 60 kw, 1 @ 75 kw, 1 @ 90 kw; 5 superheaters, incl 3 @ 488 m²

Area served - Yamaguchi-ken, as of 1933

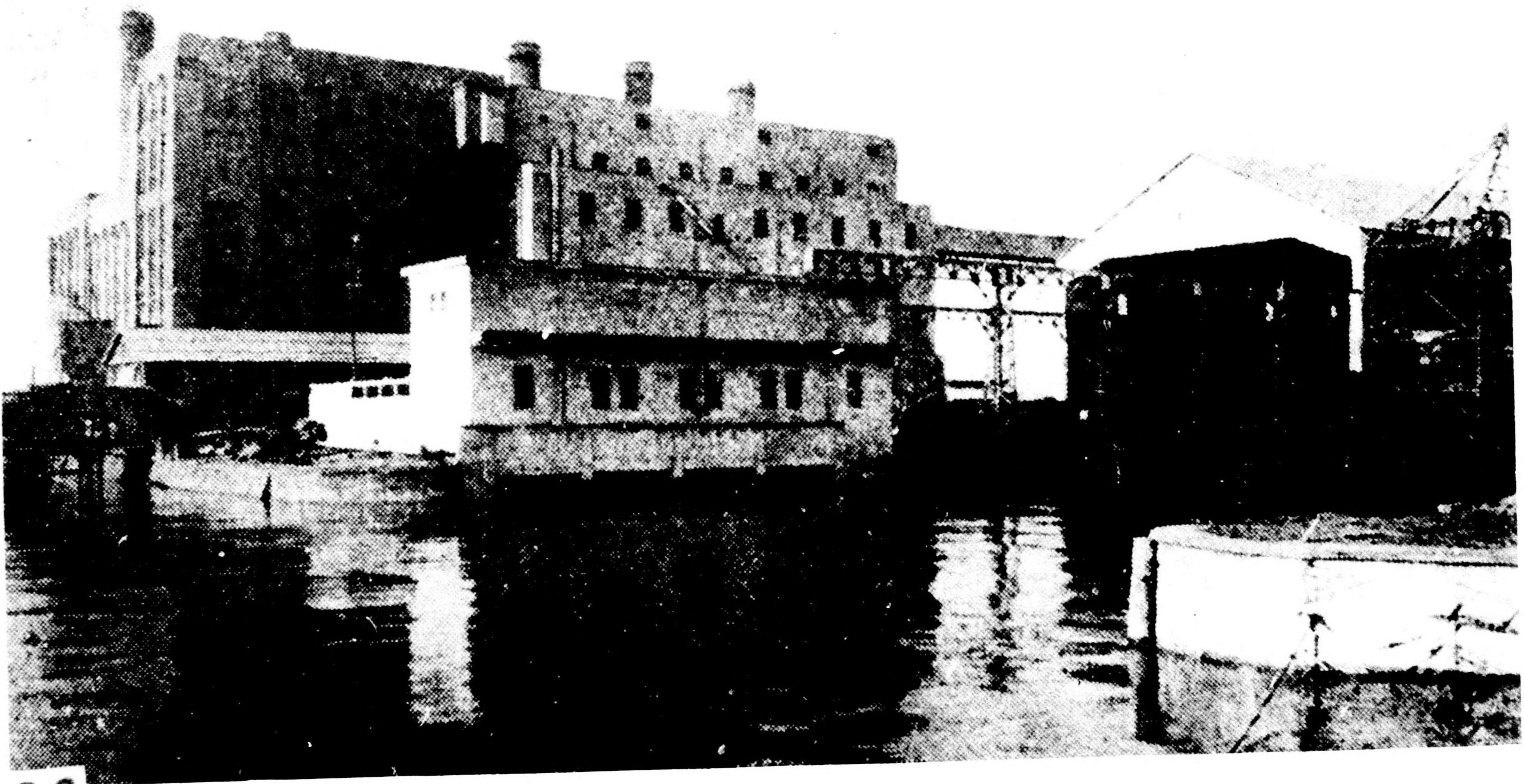
See: Photographs No. V-80, V-81
Map of the City of Ube

Sources: DnK; DnN 1940; SR 1/34 frontispiece, 1/38 p.3, 1/39 p.2, 7/39 p.(1), 9/39 p.353, 1/40 p.3; ZKT 1939; Ohm 6/29 p.307, 6/31 supp p.7, 5/32 p.291, 5/33 pp.238,295, 7/33 adv p.1, 12/33 inside front cover, 1/34 pp.4,15,76, 2/34 p.133, 4/34 inside front cover, 6/34 p.433, 9/34 pp.599,605, 11/34 adv p.1, 2/36 p.212; DnGZ 4/33 p.360, 9/33 p.(111), 10/35 p.(100); Ohm-sha Guide 1933 p.35; TD Map

896. UBE CEMENT FACTORY STEAM PLANT

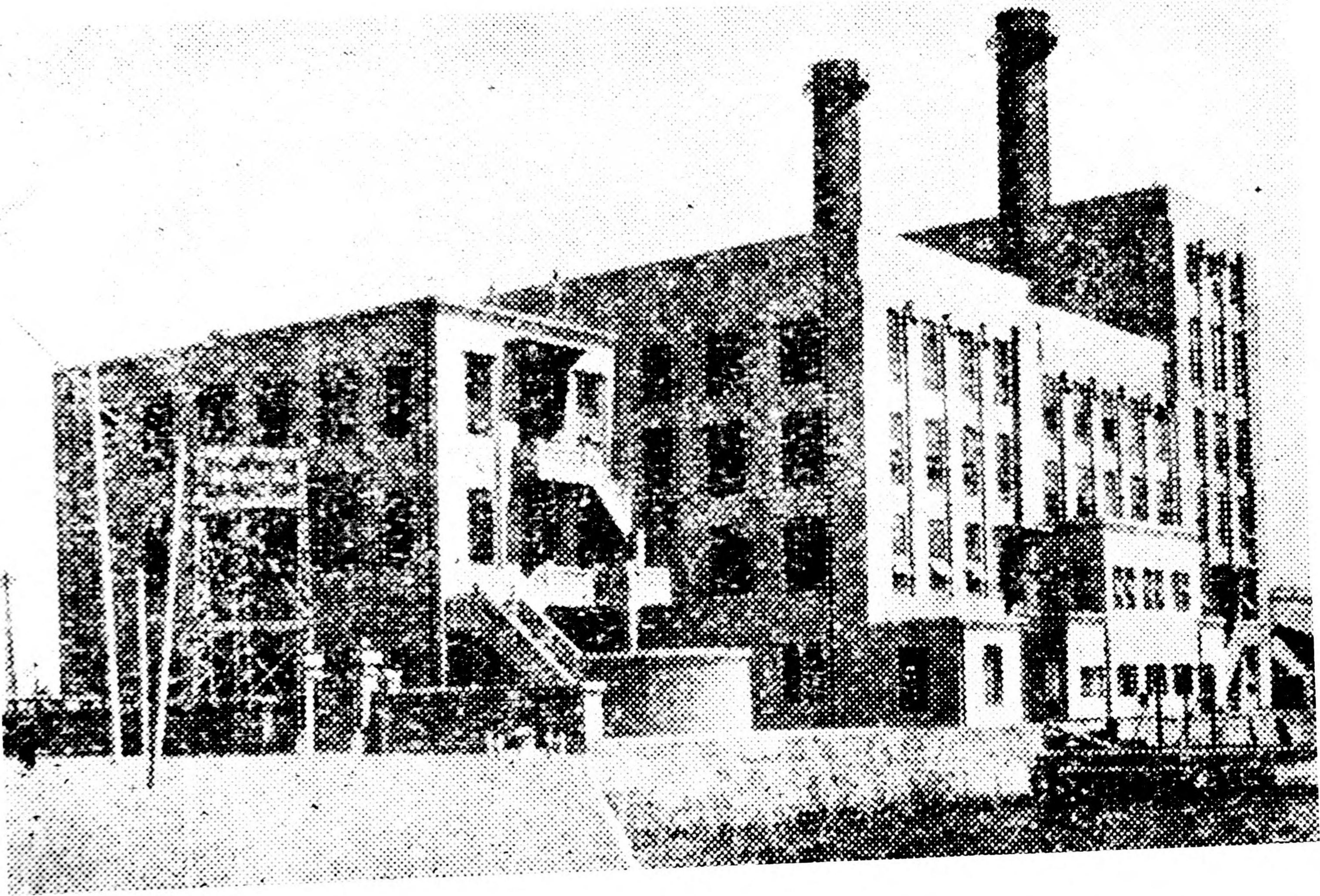
Approx. Lat. 33°57'
Long. 131°15'

Company: Ube Cement Seizo KK



Photograph No. V-80 Ube No. 2 Steam Plant after 1933 extension

RESTRICTED



Photograph No. V-81 Ube No. 2 Steam Plant before 1933 extension

RESTRICTED

Location: 2 of 1979, Okinoyama-aza, Ogushi-oaza, Ube-shi, Yamaguchi-ken

Installed Capacity (in kw): Est 13,000 kw, as of May 1932

Importance: Rank in Japan - 180 ; rank in Chugoku supply area - 12
Serves the Ube Cement KK Factory

Date of Construction: Unknown; in operation as early as 1929 and
as recently as Mar 1940

Details: Plant, equipment -

Fuel supply - Uses waste gas from cement kilns

Turbines - 1 @ 10,000 kw, Ljungstrom-type,
horizontal-shaft, Mitsubishi-make

An additional turbine is in operation

Generators - 1 @ est 12,500 kva, 3-ph, 11,000 v,
3600 rpm, 60 cyc, Mitsubishi-make

An additional generator is in operation

Sources: DnN 1940 part II p.312; Ohm 3/32 p.173, 5/32 p.272, adv p.1,
10/32 adv p.2; Directory of Japanese Portland Cement Manufacturers
1929 pp.79-81

897. UBE NITROGEN FACTORY STEAM PLANT

Approx. Lat. 33°57'
Long. 131°15'

Company: Ube Chisso Kogyo KK

Location: 10 of 1978, Ogushi-oaza, Ube-shi, Yamaguchi-ken; directly
behind Ube No. 2 Steam Plant

Installed Capacity (in kw): Est 13,000 (see Date of Construction)

Importance: Rank in Japan - 180 ; rank in Chugoku supply area - -12
Serves the nitrogen industries factory of Ube Chisso
Kogyo KK

Date of Construction: Unknown; the nitrogen factory was founded in
1933 and the power plant serving it was enlarged in 1938 by 13,000
kw; in operation Mar 1940

Details: Plant is believed to operate on 60 cyc

See: Photograph No. V-81a

Sources: ZKT 1939; DnN 1940 part II p.312; DnGZ 10/37 p.(143)

898. UBE SODA FACTORY STEAM PLANT

Approx. Lat. 33°56'
Long. 131°17'

Company: Ube Soda Kogyo KK

Location: 5253, Okiube-oaza, Ube-shi, Yamaguchi-ken

Installed Capacity (in kw): Est 3000 (see Date of Construction)

Importance: Rank in Japan - 250 + ; rank in Chugoku supply area - 25 +
Serves soda industries factory of Ube Soda Kogyo KK

Date of Construction: Unknown; factory went into operation in 1934;
power plant was in construction in Sept 1937 and is believed to have
been completed in 1938.

Details: Plant is believed to operate on 60 cyc

Sources: DnN 1940 part II p.312; DnGZ 10/37 p.(143); ZKT 1939 p.1824;
TKS 3/30/40 p.85

899. UCHINASHI HYDRO PLANT

Approx. Lat. 34°34'
Long. 132°11'

Company: Hiroshima Denki KK

Location: Plant - On the right bank of the Ota-kawa at 39, Rimban,
Uchinashi National Forest. Uchinashi-aza, Togawachi-
machi, Yamagata-gun, Hiroshima-ken
Dam - Seisui-oaza, Togawachi-machi, Yamagata-gun,
Hiroshima-ken

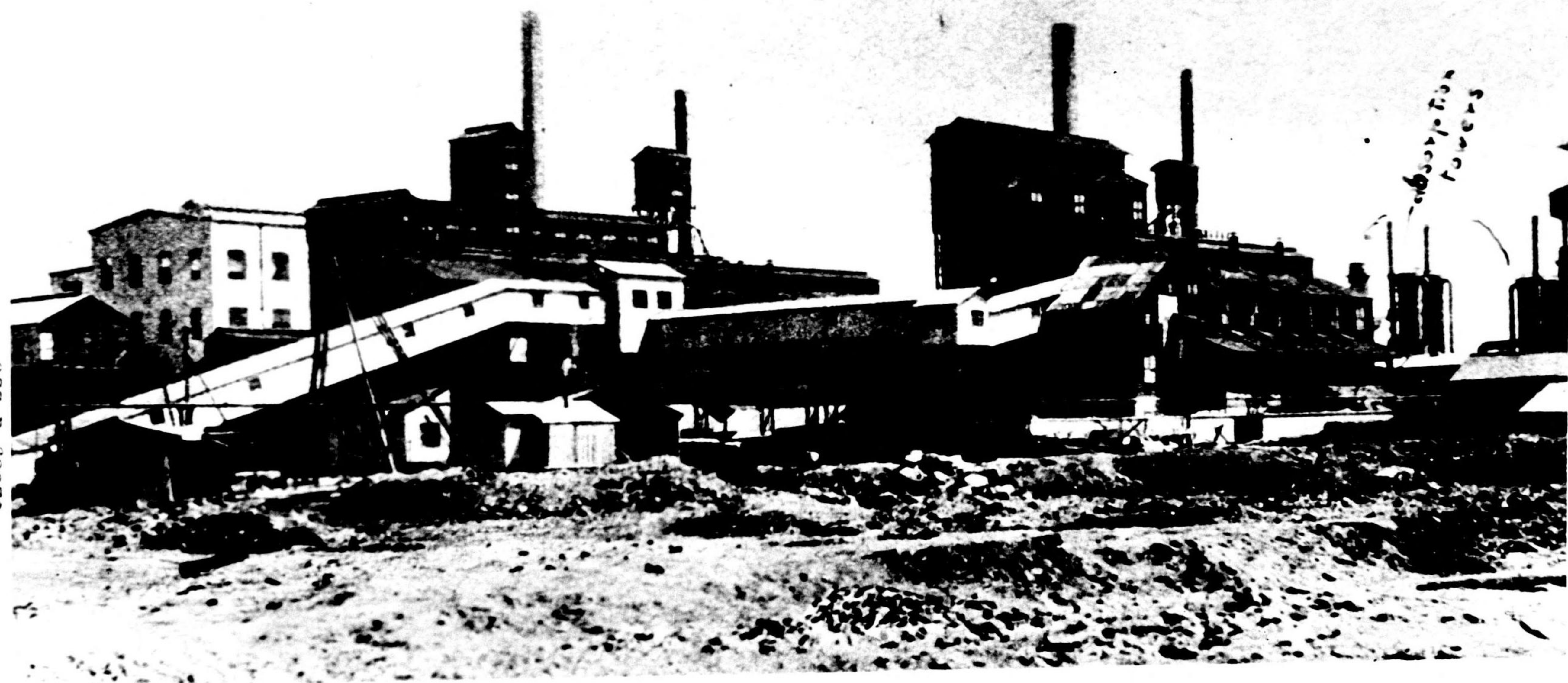
Capacity Commonly in Use (in kw): 14,500, as of 1939

Importance: Rank in Japan - 163 ; rank in Chugoku supply area - 9

Source of Power: Ota-kawa

Date of Construction: Construction was begun in Jan 1937 and com-
pleted in 1939; in operation Mar 1940

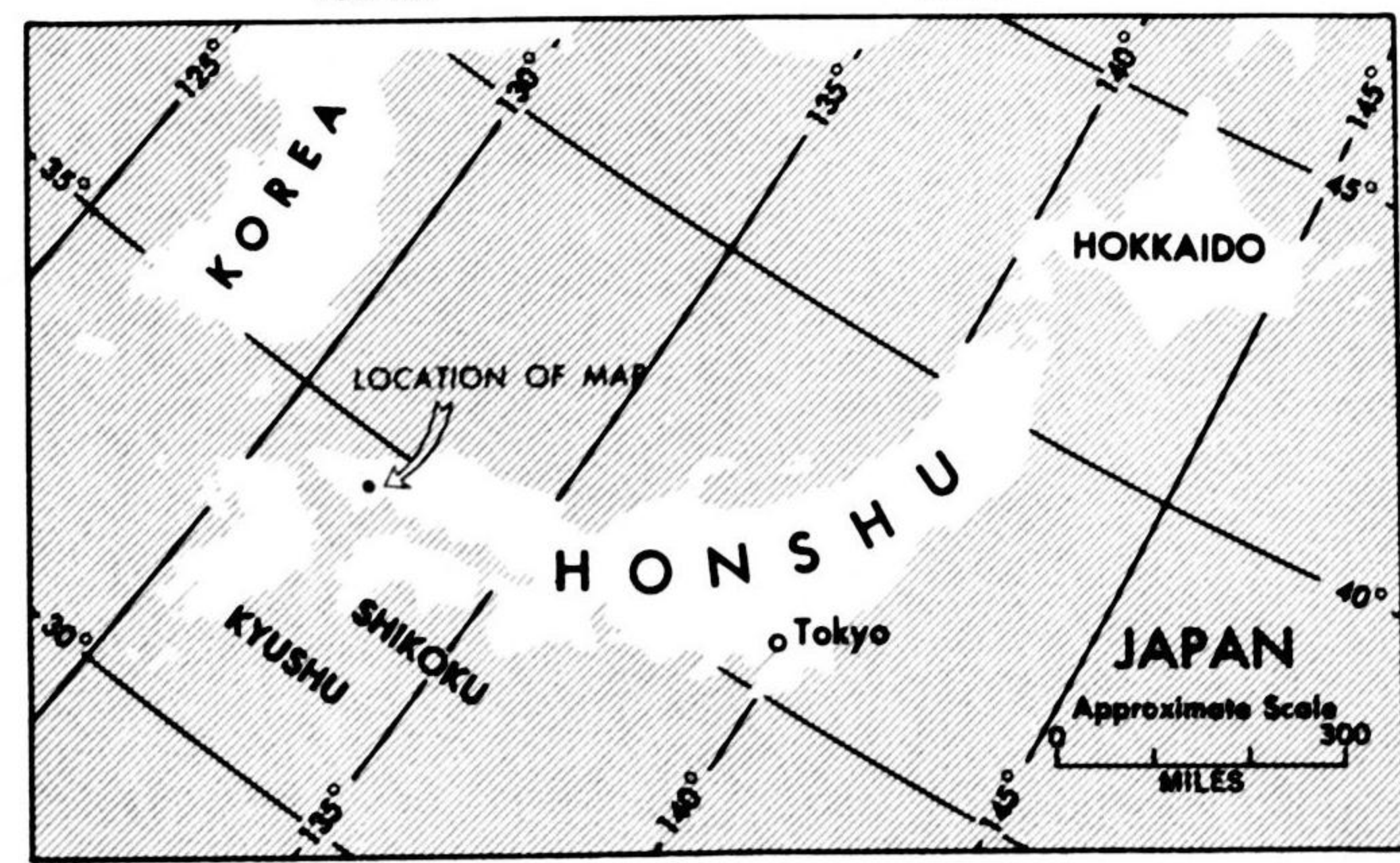
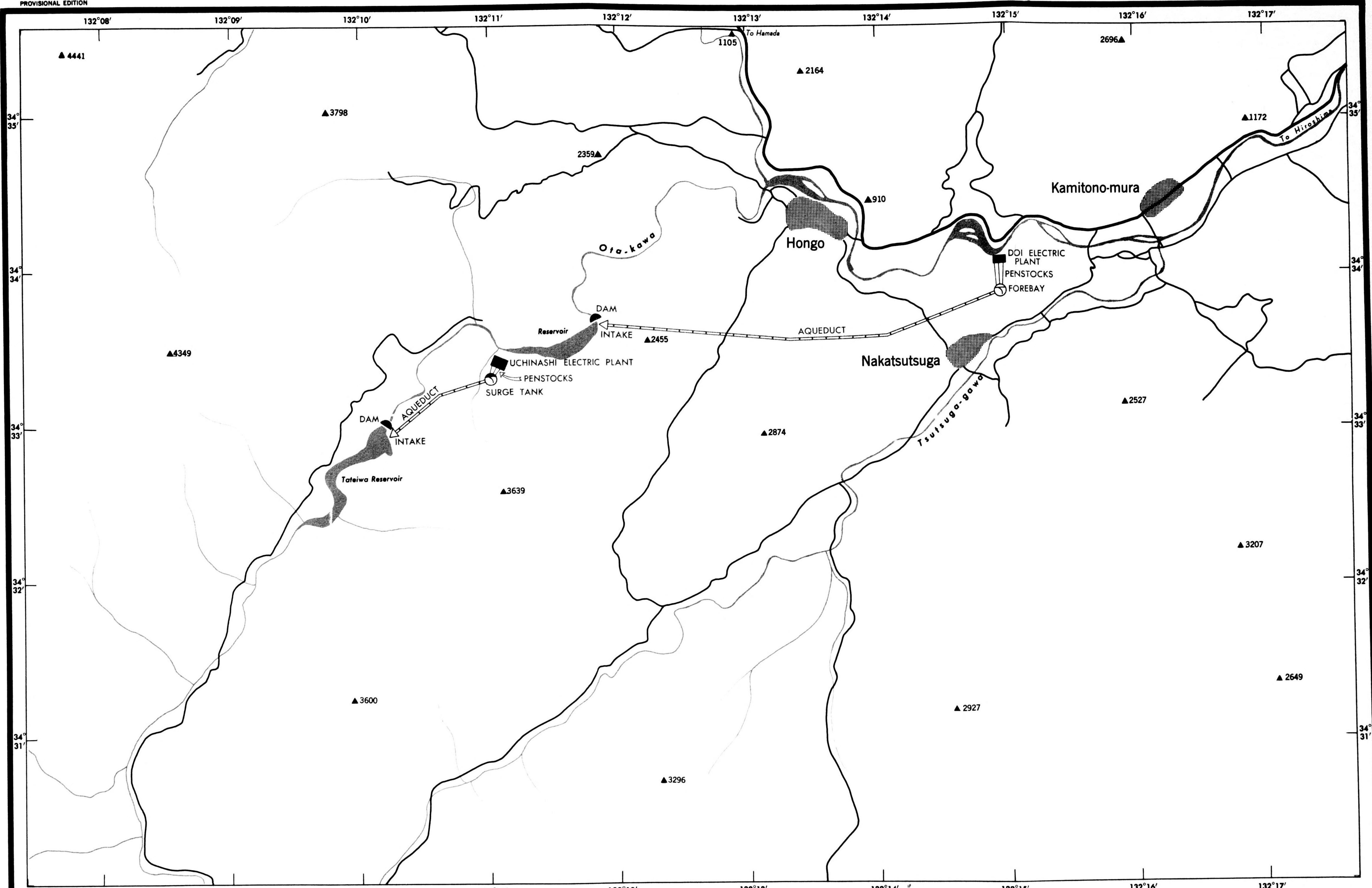
Details: Particular capacities (in kw) - 21,780 installed cap;
4900 reg; 9600 spec; 11,100 reg pk
Layout - Aqueduct-type
Eff head - 122.2 m; flow - 14.5 m³/sec
Dam - Of concrete construction imbedded with stone,
gravity overflow-type, 67.43 m high, 179 m long with
6 tainter gates @ 4.5 m high, 5.8 m wide
Reservoir - 15,200,000 m³ cap
Intake - At right bank behind dam
Aqueduct - 2833 m pressure tunnel of reinforced concrete
construction
Surge tank - 47.6 m high, 10 m diam
Penstocks - 3
Plant, external features - 3 stories high, of reinforced
concrete construction
Plant, equipment -
Turbines - 3 (incl 1 res) @ 8200 kw, Francis-type,
vertical-shaft
Generators - 3 (incl 1 res) @ 8250 kva, 88% pf, 3-ph,
514 rpm, 60 cyc
Tail race - 265.4 m culvert and tunnel



OSS R 52272
Photograph No. V-81a Ube Nitrogen Factory
Steam Plant of the Ube Chisso Kogyo KK

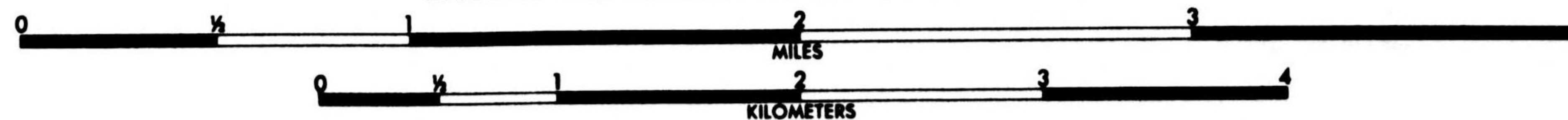
CONFIDENTIAL

PROVISIONAL EDITION



DOI AND UCHINASHI HYDRO PLANTS YAMAGATA-KEN

BASE MAP FROM 1:50,000 SERIES, JAPAN IMPERIAL LAND SURVEY BUREAU, 1902
W. D. M. C. FILE NO. JAPAN S30-JGS-50, SHEETS 24-13 AND 24-9



Reliability Code 2B-2B-1

- SETTLEMENT CENTER
- PRINCIPAL HIGHWAY
- SECONDARY ROAD
- SPOT HEIGHT (IN FEET)

See: Figure No. V-27

Sources: KN 1938 p.199, 1939 p.166; DnN 1940; DGS 3/37 p.305, 4/37 pp.111,400; DGS Kaimu 1939 opp p.49; DnGZ 7/37, 9/37 p.(139), 141 p.111; Ohm 4/37 p.400; HSG pp.86,161

900. UCHINO HYDRO PLANT

Approx. Lat. 35°20'
Long. 138°34'

Company: Tokyo Dento KK

Location: Plant - 1 of 173, Uchino-aza, Shiraito-mura, Fuji-gun, Shizuoka-ken

Capacity Commonly in Use (in kw): 1656, as of May 1936

Importance: Rank in Japan - 250 + ; rank in Tokyo supply area - 100 +

Source of Power: Shiba-kawa of the Fuji-kawa system

Date of Construction: Completed Mar 1916 and in operation Mar 1940

Details: Particular capacities (in kw) - 1800 installed cap; 1246 reg; 410 spec

Layout - Aqueduct-type, without a diversion dam

Eff head - 30.19 m; flow - 6.96 m³/sec

Aqueduct - 1054 m open channel, 250 m tunnel, 43 m aqueduct bridge

Forebay - 159 m² water surface

Penstocks - 1 @ 71.96 m long

Plant, external features - Of wood, 1 story high with 10 other wooden shacks nearby

Plant, equipment -

Turbines - 1 @ 2600 hp, Francis-type, horizontal-shaft, B-make

Generators - 1 @ 2250 kva, 80% pf, 3-ph, 3450 v, 450 rpm, 60 cyc, GE-make

Transformers - 4 (incl 1 res) @ 1500 kva, 1-ph, 3.5/66 kv, D-D conn. water-cooled, 60 cyc, shell-type, Shibaura-make

4 (incl 1 res) @ 1500 kva, 1-ph, 22.4/60 kv, D-D conn, water-cooled, 60 cyc, shell-type, Shibaura-make

Sources: DJY 1927; DJY 1929 p.300; DnN 1940; ZKT 1939 p.1647

901. UCHIYAMA HYDRO PLANT

Approx. Lat. 35°21'
Long. 139°05'

Company: Fuji Denryoku KK; formerly Fuji Gasu Boseki KK

Location: Plant - Uchiyama-oaza, Kita Ashigara-mura, Ashigarakami-gun, Kanagawa-ken

Capacity Commonly in Use (in kw): 2600, as of June 1938

Importance: Rank in Japan - 250 + ; rank in Tokyo supply area - 100 +

Source of Power: Sakawa-gawa

Date of Construction: Founded in Jan 1918; in operation Mar 1940

Details: Particular capacities (in kw) - 4500 installed cap; 2600 reg;
3350 reg pk
Eff head - 82 ft
Plant, equipment -
Turbines - 3 @ 1950 hp, Francis-type, BBC-make
Generators - 3 @ 1500 kw, 3-ph, 6600 v, 500 rpm, 50 cyc,
ASEA-make
Transformers - 4 (incl 1 res) @ 1500 kva, 1-ph, 6.6/66 kv,
D-D conn, water-cooled, 50 cyc, shell-type, Shibaura-make

Sources: DnN 1940; ZKT 1939 p.1644; DnK; DJY 1927; DJY 1929 p.306; TD Map

902. UCHIYASU HYDRO PLANT

Believed to be Approx. Lat. 36°23'
Long. 137°11'

Company: Nippon Denryoku KK

Location: Plant - Believed to be in Uchiyasu-oaza, Sakashimo-mura,
Yoshiki-gun, Gifu-ken

Capacity Commonly in Use (in kw): 26,000 kw (see Date of Construction)

Importance: If completed, rank in Japan - 94 ; rank in Osaka-
Nagoya supply area - 43

Source of Power: Probably Miya-kawa

Date of Construction: In construction Dec 1933; no evidence of com-
pletion has been received.

Sources: Ohm 6/34 p.401

UDE HYDRO PLANT - See HADE HYDRO PLANT

903. UEDA KARYOKU STEAM PLANT

Believed to be Approx. Lat. 36°55'
Long. 140°48'

Company: Dai Nippon Denryoku KK; formerly Tobu Denryoku KK

Location: Fukushima-ken; exact location unknown but believed to be
Ueda-machi, Iwaki-gun

Installed Capacity (in kw): 16,000 (see Date of Construction)

Importance: If completed, rank in Japan - 146 ; rank in Tohoku supply area - 6

Date of Construction: Under construction in 1933; no evidence of completion has been received.

Sources: Ohm 6/34 p.401; TD Map

904. UJI HYDRO PLANT

Approx. Lat. 34°44'
Long. 135°48'

Company: Ujigawa Denki KK

Location: Plant - Ujigo-oaza, Uji-mura, Kuze-gun, Kyoto-fu

Capacity Commonly in Use (in kw): 36,000, as of 1940

Importance: Rank in Japan - 64 ; rank in Osaka-Nagoya supply area - 27

Source of Power: Uji-gawa of the Oyodo-gawa system

Date of Construction: Completed July 1913 with capacity commonly in use of 32,000 kw. By means of improvements in equipment in 1940 and opening of Seta Dam capacity was increased to 36,000 kw. Plant was in operation in Mar 1940

Details: Particular capacities (in kw) - *36,000 installed cap; reg cap was formerly 29,000 kw but it has been raised recently by opening of Seta Dam in winter months, allowing greater flow from Biwa-ko into the Uji-gawa
Eff head - 62 m; flow - 64.2 m²/sec
Dam - 30.6 m high, 65.5 m long
Aqueduct - About 36,000 ft long
Penstocks - 6
Plant, external features - Of brick construction, 6 stories high with bridge crossing tailrace in front of plant
Plant, equipment -
Turbines - 6 @ 8100 hp, reaction-type, horizontal-shaft, Voith-make
Generators - 6 @ 7500 kva, 3-ph, 12,000 v, 360 rpm, 60 cyc, Shibaura-make
Transformers - 7 (incl 1 res) @ 7500 kva, 1-ph, 12/34.1 kv, D-Y conn, water-cooled, core-type, Hitachi-make

See: Photographs No. V-82, V-83, V-84
Figure No. V-3

Sources: DnN 1940; DnK; Ohm-sha Guide 1933 p.5; Ohm 6/31 supp p.6, 10/33 opp p.561, 1/40 p.13; ZKT 1939 p.1644; HSG p.332; DJY 1927; DJY 1929 p. 340

905. UJI FACTORY STEAM PLANT

Approx. Lat. 34°53'
Long. 135°48'

Company: Nippon Rayon KK

Location: Ujigo-oaza, Uji-machi, Kuze-gun, Kyoto-fu

Installed Capacity (in kw): Est 4800 (see Date of Construction)

Importance: Rank in Japan - 250 + ; rank in Osaka-Nagoya supply area - 100 +
Serves the Nippon Rayon KK Uji Factory

Date of Construction: Unknown; capacity increased in 1938

Details: Plant, external features - 3 stories high with peaked roof and 1 chimney on the original building; the extension has at least 1 more chimney
Plant is believed to operate on 60 cyc

See: Photographs No. V-84a

Sources: DnGZ 10/37 p.(143); ZKT 1939 p.1108

UJIMA STEAM PLANT - See UNOSHIMA STEAM PLANT

906. UMAMICHI HYDRO PLANT

Approx. Lat. 36°45'
Long. 139°30'

Company: Furukawa Sekitan Kogyo KK

Location: Plant - Nikko-machi, Kami Tsuga-gun, Tochigi-ken

Capacity Commonly in Use (in kw): 6000, as of Dec 1936

Importance: Rank in Japan - 250 + ; rank in Tokyo supply area - 100 +
Serves the Furukawa Sekitan Kogyo KK mines

Source of Power: Unknown. Probably Daiya-gawa

Date of Construction: Unknown; in operation as early as Dec 1936 and as recently as Mar 1940

Sources: DnN 1940; DnK

UMAMIHARA HYDRO PLANT - See MAMIHARA HYDRO PLANT

907. UMEDO STEAM PLANT

Approx. Lat. 32°12'
Long. 130°24'

Company: Nippon Chisso Hiryo KK

Location: Minamata-machi, Ashikita-gun, Kumamoto-ken

Installed Capacity (in kw): 14,000, as of 1936

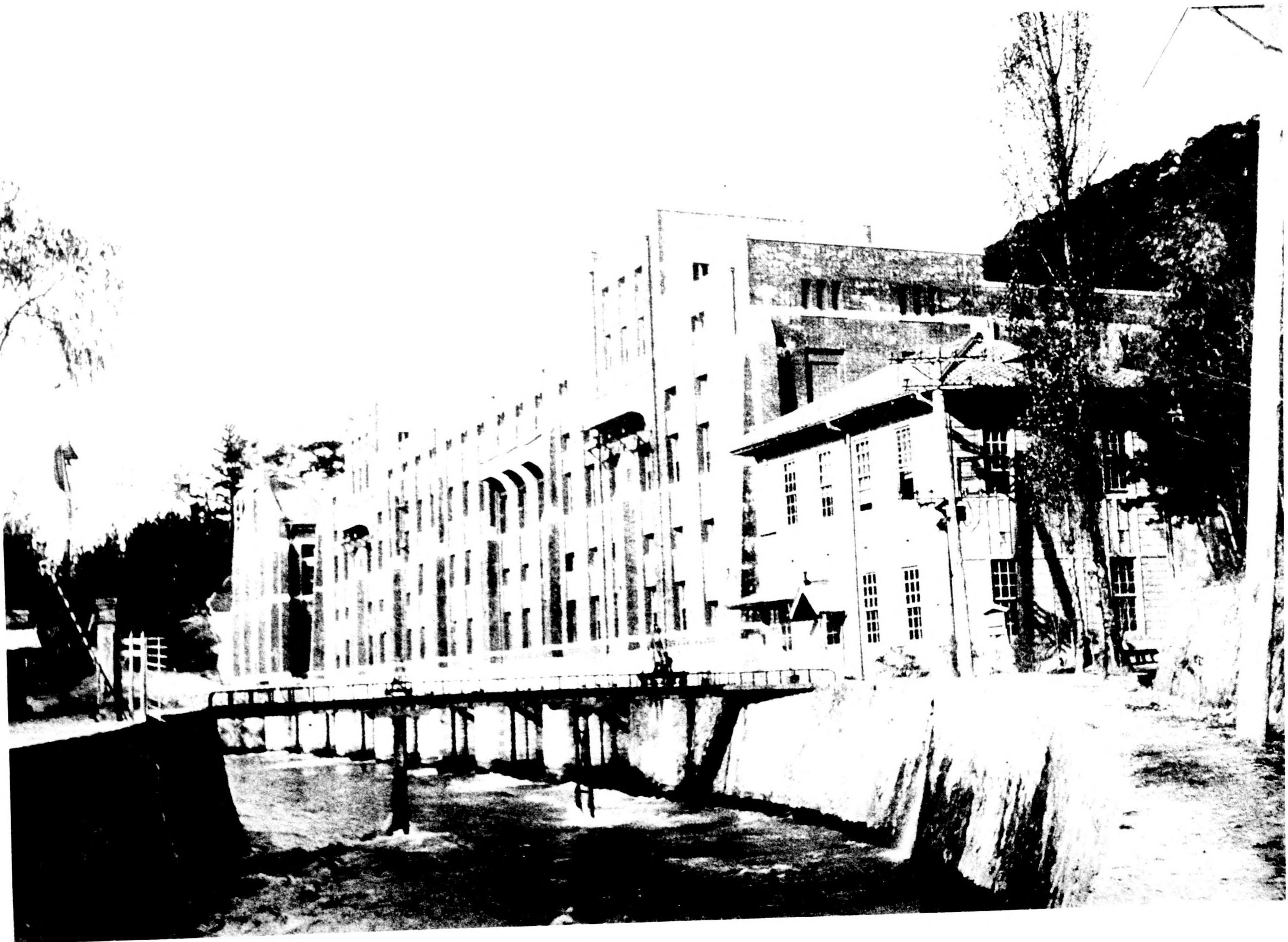
Importance: Rank in Japan - 166 ; rank in Kyushu supply area - 25
Serves the Nippon Chisso Hiryo KK nitrogen fertilizer factory at Minamata

Date of Construction: Completed Nov 1929; in operation Mar 1940

Details: Plant, equipment -
Boilers - 2 @ water-tube type, 23 kg/cm², 900 m², Mitsubishi-make
Turbines - 2 @ 9380 hp, STAL-Lungstrom-type, horizontal-shaft, Mitsubishi-make
Generators - 2 @ 8750 kva, 3-ph, 3300 v, 3000 rpm, 50 cyc, Mitsubishi-make
Transformers - 3 @ 6250 kva, 3-ph, 3.3, 3.15, 3/19 kv, D-D conn, 50 cyc, water-cooled, core-type, Mitsubishi-make
Other equipment - 2 surface condensers; 2 chain-grate compartment stokers; 2 economizers; 1 feedwater heater; 2 superheaters; 2 exciters @ 60 kw

See: Figure No. V-28

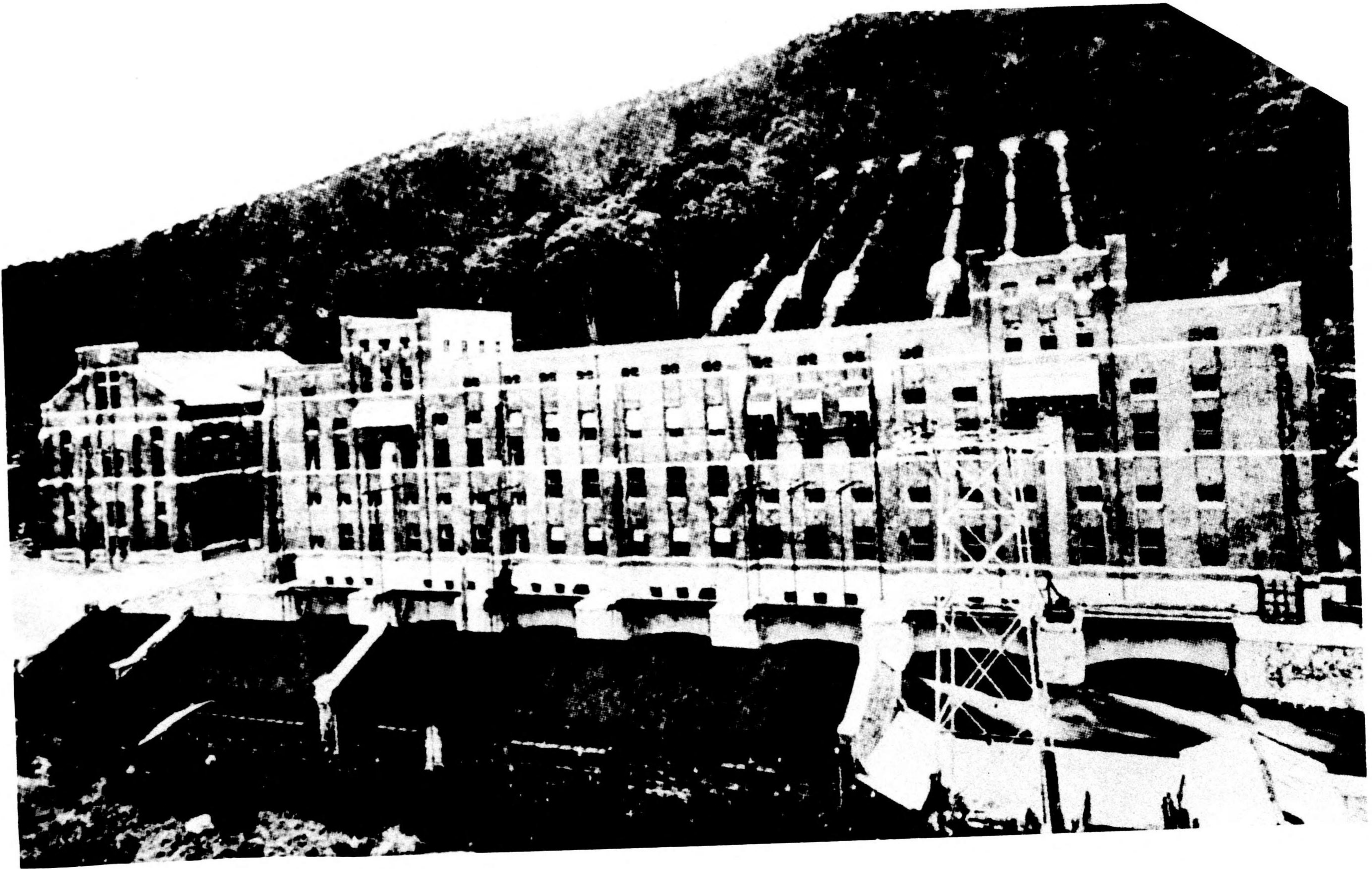
Sources: DnN 1940 part II p.251; Ohm-sha Guide 1933 p.45; DnK



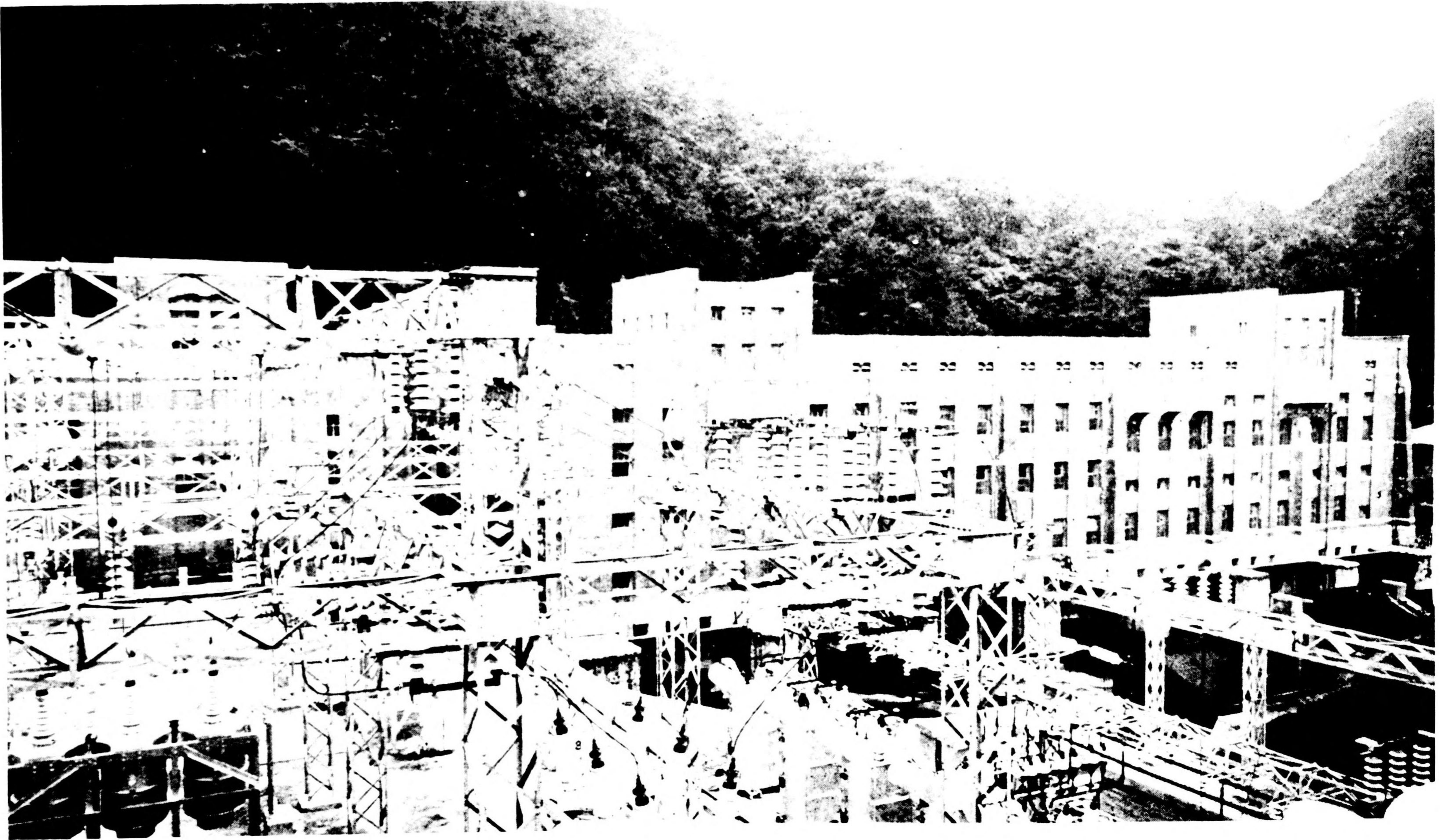
Photograph No. V-82 Uji Hydro Plant

RESTRICTED

Photograph No. V-83 Uji Hydro Plant

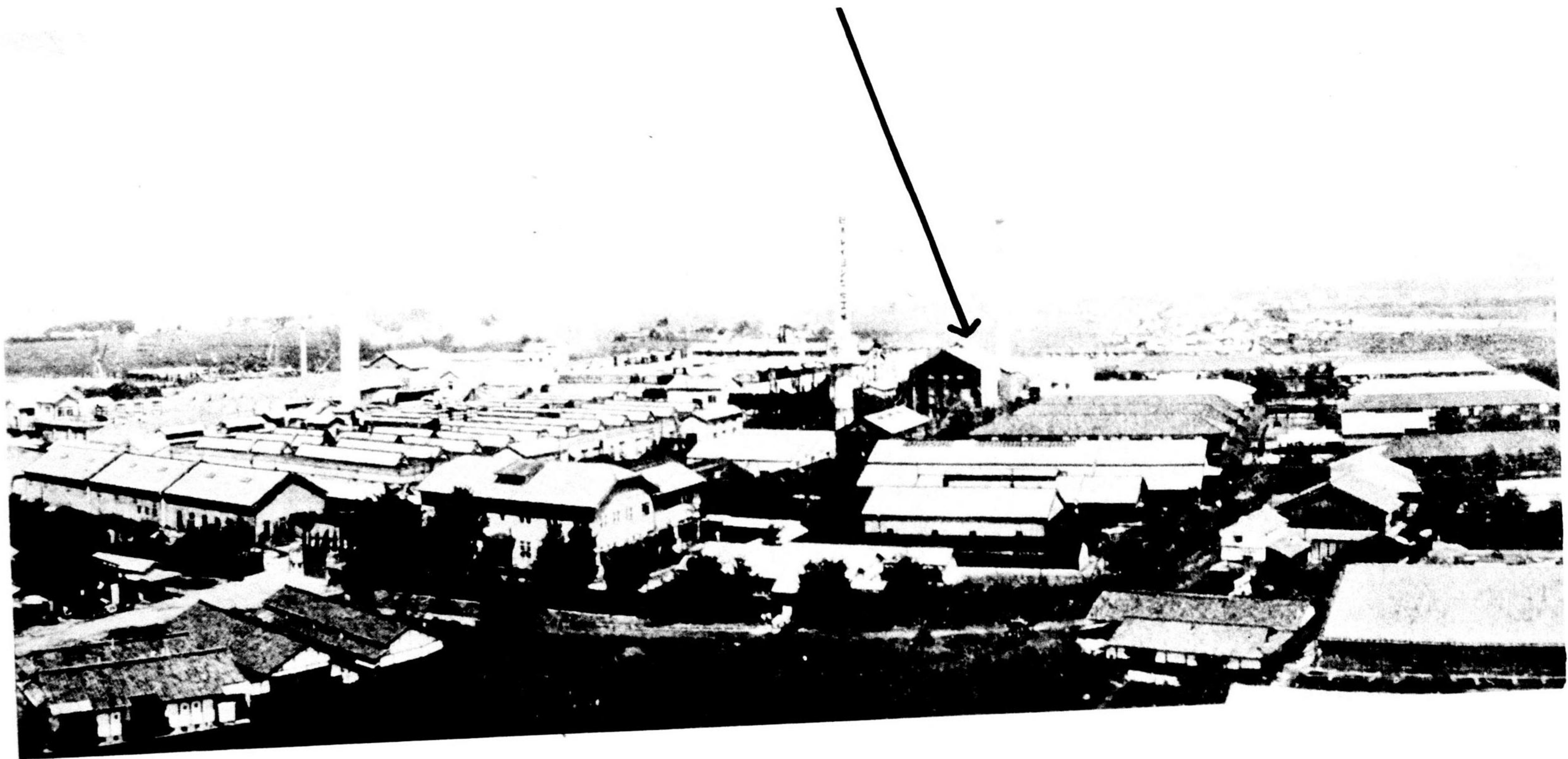


RESTRICTED



Photograph No. V-84 Uji Hydro Plant

RESTRICTED

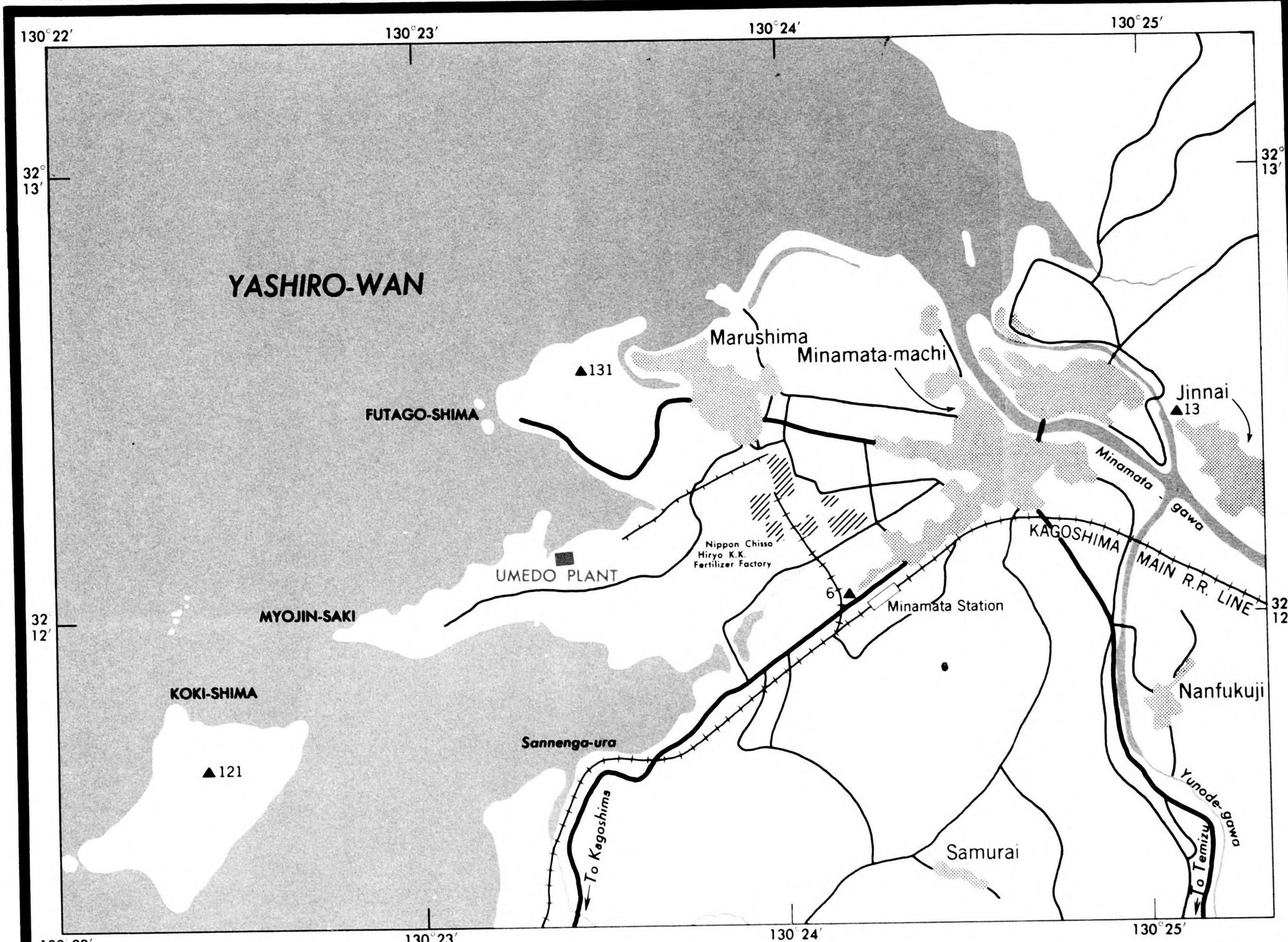


Photograph No. V-84a Uji Factory Steam
Plant (arrow) of the Nippon Rayon KK

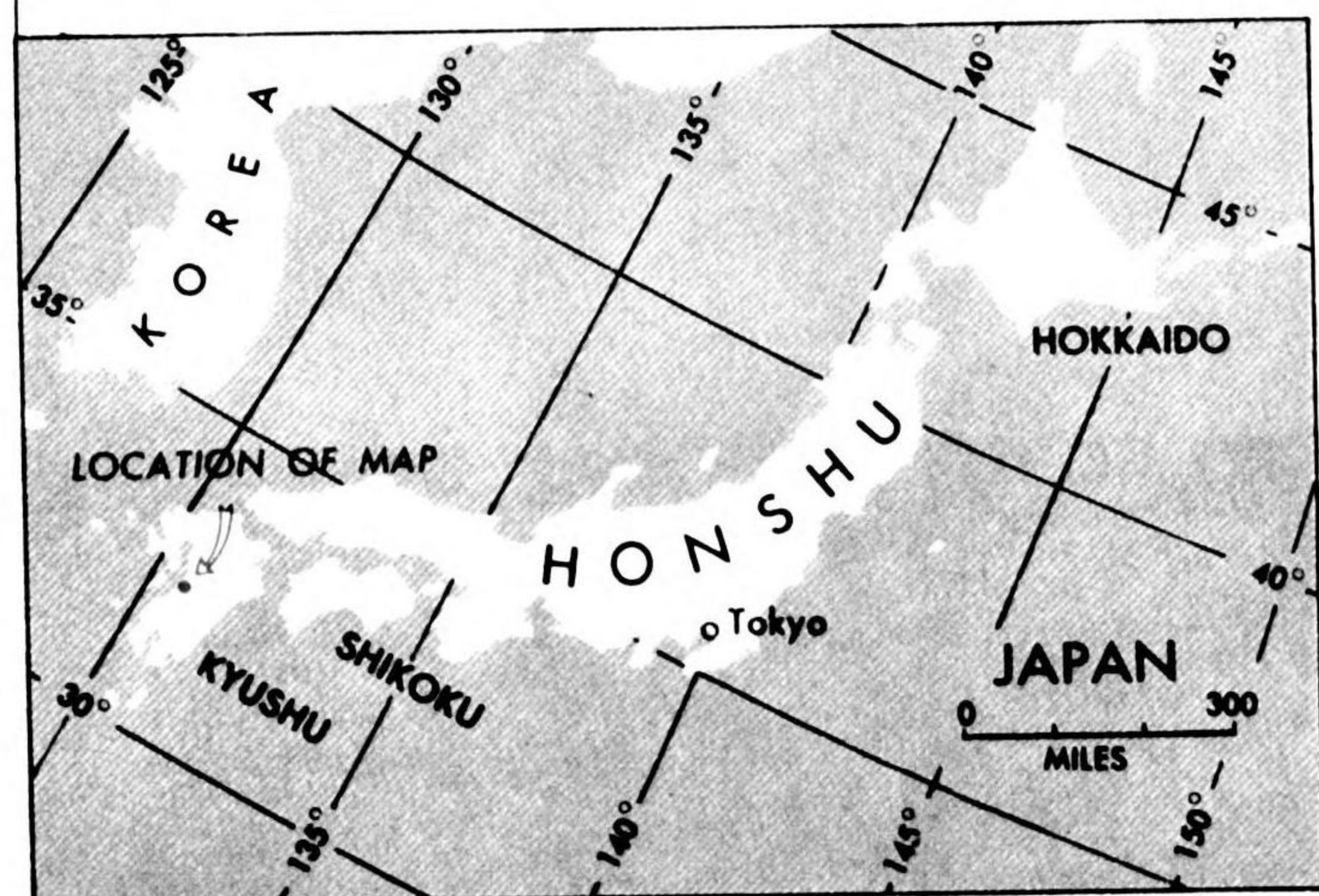
RESTRICTED

Figure V-28
CONFIDENTIAL

PROVISIONAL EDITION



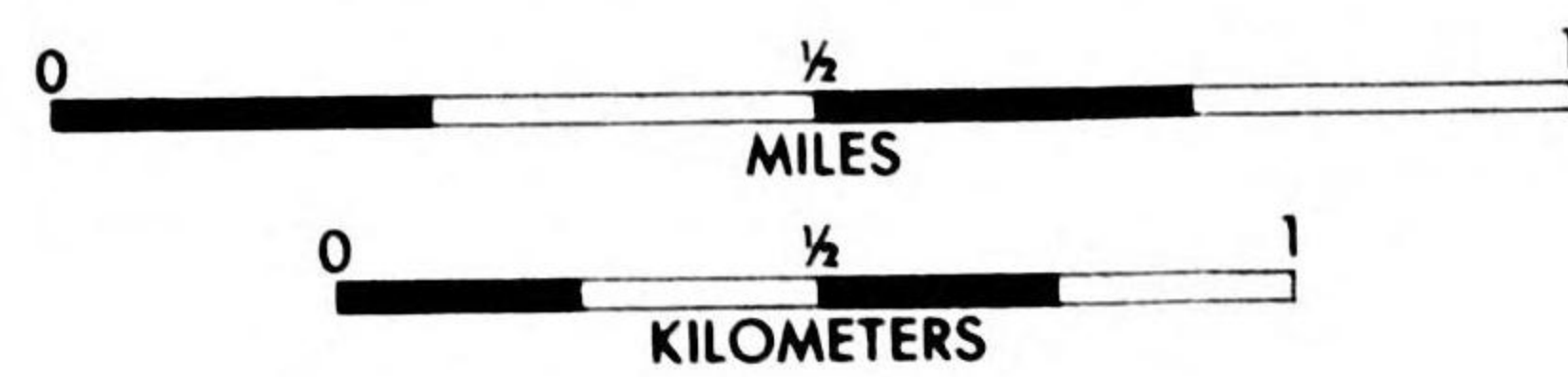
UMEDO STEAM ELECTRIC PLANT KUMAMOTO-KEN



BASE MAP FROM 1:50,000 SERIES, JAPAN IMPERIAL LAND SURVEY BUREAU, 1935
W.D.M.C. FILE NO. JAPAN S30-JGS-50, SHEET 7-11

- SETTLEMENT CENTER
- PRINCIPAL HIGHWAY
- RAILROAD
- SECONDARY ROAD
- TRAMWAY
- CANAL

▲ 121 SPOT HEIGHT (IN FEET)



Reliability Code 1B-1B-1

908. UMIGAWA CHURYU HYDRO PLANT

Approx. Lat. 37°00'
Long. 137°55'

Company: Kurobegawa Denryoku KK; formerly Echigo Denryoku KK

Location: Plant - Nishi Umi-mura, Nishi Kubiki-gun, Niigata-ken

Capacity Commonly in Use (in kw): 1587, as of Dec 1934

Importance: Rank in Japan -250 +; rank in Tokyo supply area -100 +
rank in Osaka-Nagoya supply area -

Source of Power: Umi-gawa

Date of Construction: Unknown; in operation as early as Dec 1926 and as recently as Mar 1940

Details: Particular capacities (in kw) - *2400 installed cap; 595 reg;
992 spec
Eff head - 622
Plant, equipment -
Turbines - 1 @ 4000 hp, Pelton-type, Denryosha-make
Generators - 1 @ 3000 kva, 3-ph, 3300 v, 450/514 rpm,
50/60 cyc, Shibaura-make
Transformers - 3 @ 1750 kva, 1-ph, 3.5, 3.28, 3.065/22, 20 kv,
D-D conn, water-cooled, 50 cyc, shell-type, W-make

Sources: DnN 1940; DJY 1927 pp. 288, 376; DJY 1929 pp. 284, 390

909. UMIGAWA JORYU NO. 1 HYDRO PLANT

Approx. Lat. 37°00'
Long. 137°55'

Company: Kurobegawa Denryoku KK; formerly Echigo Denryoku KK

Location: Plant - Gozenyama-aza, Nishi Umi-mura, Nishi Kubiki-gun,
Niigata-ken

Capacity Commonly in Use (in kw): 3470, as of Dec 1936

Importance: Rank in Japan -250 +; rank in Osaka-Nagoya supply area -100 +

Source of Power: Umi-gawa

Date of Construction: Construction was begun Oct 1929 and completed May
1930; in operation Mar 1940

Details: Particular capacities (in kw) - 520 reg; 2950 spec
Plant operates on 60 cyc

Sources: Ohm 1/30 p.72, 8/30 p.415; DnN 1940; DnK

910 . UMIGAWA JORYU NO. 2 HYDRO PLANT

Approx. Lat. 36°59'
Long. 137°54'

Company: Kurobegawa Denryoku KK; formerly Echigo Denryoku KK

Location: Kurumisawa-aza, Nishi Umi-mura, Nishi Kubiki-gun, Niigata-ken

Capacity Commonly in Use (in kw): 4060, as of Dec 1936

Importance: Rank in Japan - 250 + ; rank in Osaka-Nagoya supply area - 100 +

Source of Power: Umi-gawa

Date of Construction: Construction was begun in Oct 1929 and completed May 1930; in operation Mar 1940

Details: Particular capacities (in kw) - 610 reg; 3450 spec
Plant operates on 60 cyc

Sources: DnN 1940; Ohm 1/30 p.72, 8/30 p.415; DnK

911. UMINOKUCHI HYDRO PLANT

Approx. Lat. 36°00'
Long. 138°30'

Company: Nagano Denki KK; formerly Chugai Denryoku KK

Location: Plant - 1919 Fujinosawa-aza, Uminokuchi-oaza, Minamimaki-mura,
Minami Saku-gun, Nagano-ken

Capacity Commonly in Use (in kw): 2550, as of Dec 1936

Importance: Rank in Japan - 250 + ; rank in Osaka-Nagoya supply area - 100 +

Source of Power: Chikuma-gawa

Date of Construction: Completed Nov 1933; in operation Mar 1940

Details: Particular capacities (in kw) - 1500 reg; 1050 spec
Dam - 3.24 m high
Log chute - 2.73 m wide, 22.6 m wide
Fishway - 1.82 m wide
Plant operates on 60 cyc

Sources: Ohm 2/34 p.133; DnN 1940; DnK; HSG pp.318,324

UMISE HYDRO PLANT - See KAISE HYDRO PLANT

912.UNKAWA STEAM PLANT

Approx. Lat. 34°40'
Long. 135°11'

Company: Kobe-shi

Location: 10 of 10-chome, Higashi Shiraike-machi, Hayashida-ku, Kobe-shi, Hyogo-ken

Installed Capacity (in kw): 3000, as of Dec 1936

Importance: Rank in Japan - 250 + ; rank in Osaka-Nagoya supply area - 100 +

Date of Construction: Founded Apr 1910; in operation Mar 1940

Details: Plant, equipment -

Boilers - 4 @ B&W-type, 150 lbs/in², 2852 ft², B&W-make
4 (incl 1 res) @ B&W-type, 150 lbs/in², 5540 ft²,

B&W-make
Turbines - 1 @ 1500 hp, Curtis-type, horizontal-shaft,
BB-make

1 @ 1500 hp, Rateau-type, horizontal-shaft,
EW-make

At least one other unit has been added.
Generators - 1 @ 1250 kva, 3-ph, 3500 v, 300 rpm, 50 cyc,
BBC-make

1 @ 1250 kva, 3-ph, 3500 v, 3000 rpm, 50 cyc,
AEG-make

At least one other unit has been added
Transformers - 4 @ 600 kva, 3-ph, 10/3.5 kv, D-Y conn,
self-cooled, 60 cyc, core-type, GE-make
3 @ 625 kva, 3-ph, 11,10.5,10/3.5, D-Y conn,
self-cooled, 60 cyc, core-type, Shibaura-make

Sources: DnN 1940; ZKT 1939 p.1908; DnK; DJY 1927; DJY 1929 pp.264,346

913.UNO STEAM PLANT

Approx. Lat. 34°29'
Long. 133°57'

Company: Chugoku Godo Denki KK

Location: Uno-oaza, Uno-machi, Kojima-gun, Okayama-ken

Installed Capacity (in kw): 13,200, as of 1933

Importance: Rank in Japan - 179 ; rank in Chugoku supply area - 11

Date of Construction: Completed Dec 1926; in operation Mar 1940

Details: Plant, equipment -

Boilers - 2 @ B&W-type, 15.1 kg/cm², 512 m², B&W-make
3 @ Garbe-type, 15.1 kg/cm², 374 m², B&W-make

2 @ Garbe-type, 15.1 kg/cm², 218 m², EW-make
2 @ Garbe-type, 15.1 kg/cm², 232 m², EW-make

Turbines - 1 @ 7000 kw, STAL-type, horizontal-shaft,
Mitsubishi-make

1 @ 4000 kw, Curtis-type, horizontal-shaft,
GE-make

1 @ 2500 kw, Zoelly-type, horizontal-shaft, EW-make
Generators - 1 @ 8750 kva, 3-ph, 11,000 v, 3600 rpm,

60 cyc, Mitsubishi-make
1 @ 5000 kva, 3-ph, 3500 v, 1200 rpm,

60 cyc, GE-make
1 @ 2750 kva, 3500 v, 3600 rpm, 60 cyc, SS-make

CONFIDENTIAL

Transformers - 3 @ 2500 kva, 3-ph, 3.45/11 kv, Y-D-conn,
water-cooled, 60 cyc, core-type, Shibaura-make
3 @ 1500 kva, 1-ph, 11/22/3.5 kv, D-D conn,
self-cooled, 60 cyc, shell-type, Hitachi-make
Other equipment - 5 chain-grate stokers and 4 travelling
grate stokers; 9 superheaters; 8 economizers; 3 surface
condensers; 3 exciters, incl 1 @ 40 kw, 1 @ 50 kw, and
1 @ 15 kw

Area served - Okayama-ken and parts of Tottori-ken and
Hiroshima-ken, as of 1933

See: Figure No. V-29

Sources: Ohm 6/31 supp p.7, 9/32 p.505; DnN 1940; ZKT 1939 p.1649;
DnK; DJY 1927; DJY 1929 pp.271,362; Ohm-sha Guide 1933 p.46; TD Map

914. UNOSHIMA STEAM PLANT

Approx. Lat. 33°37'
Long. 131°08'

Company: Kyushu Suiryoku Denki KK

Location: 2544, Torinofuchi-aza, Hachiya-oaza, Hachiya-machi, Chikujo-
gun, Fukuoka-ken

Installed Capacity (in kw): *10,000. as of Dec 1936

Importance: Rank in Japan - 236 ; rank in Kyushu supply area - 32

Inte of Construction: Completed Jan 1926; in operation Mar 1940

Details: Plant, external features - Of concrete construction, 3 stories
high with 2 chimneys

Plant, equipment -

Boilers - 6 @ water-tube type, 17.58 kg/cm², 574.3 m²,
B&W-make

Turbines - 2 @ 7200 hp, Zoelly-type, horizontal-shaft,
EW-make

Generators - 2 @ 6250 kva, 3-ph, 6600 v, 3600 rpm,
60 cyc, SS-make

Transformers - 4 @ 4200 kva, 1-ph, 6.6/66 kv, D-D conn,
60 cyc, water-cooled, core-type, Shibaura-make

3 @ 2500 kva, 1-ph, 6.6/66 kv, D-D conn,
60 cyc, water-cooled, shell-type, Shibaura-make

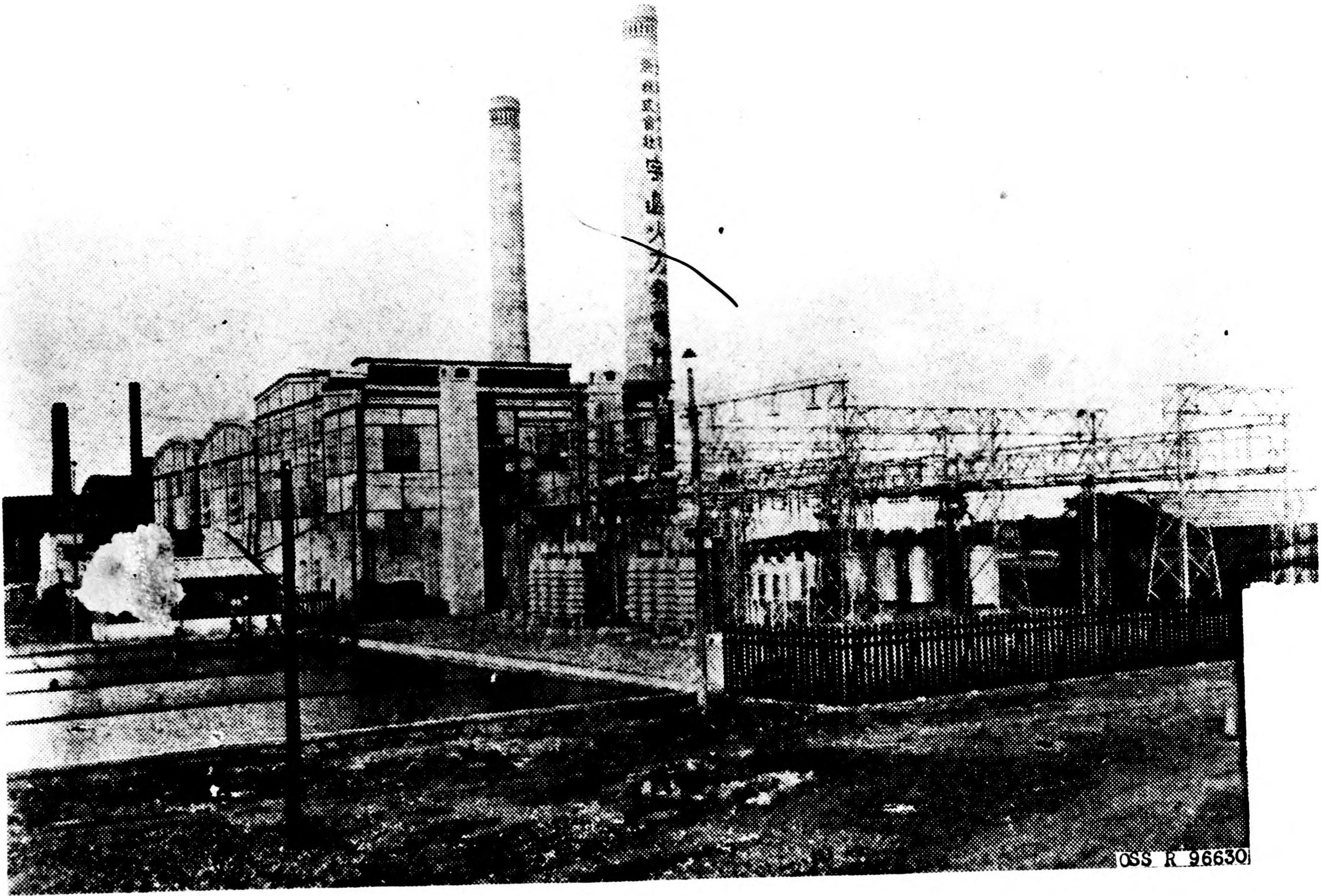
Other equipment - 6 superheaters; 6 economizers; 1 pre-
heater type feedwater heater; 2 surface condensers;
2 exciters @ 25 kw

Area served - Fukuoka-ken and Oita-ken, as of 1933

See: Photograph No. V-85
Figure No. V-30

Sources: DnN 1940; DnK; DJY 1927; DJY 1929 p.376; Ohm 3/27 p.201, 6/31 supp
6/31 supp p.7; ZKT 1939 p.1650; Ohm-sha Guide 1933 p.54; TD Map

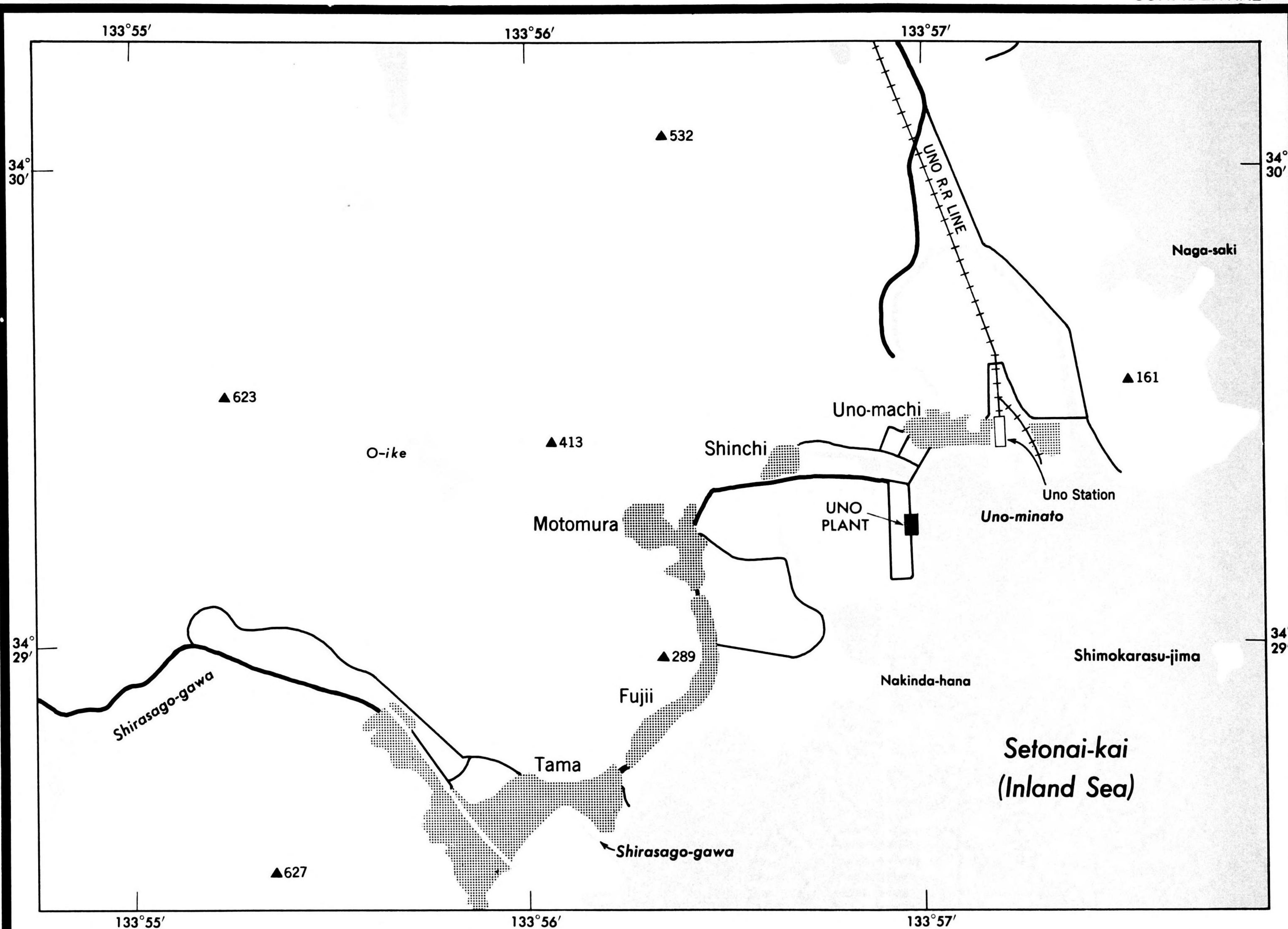
Photograph No. V-85 Unoshima Steam Plant in 1927



OSS R 96630

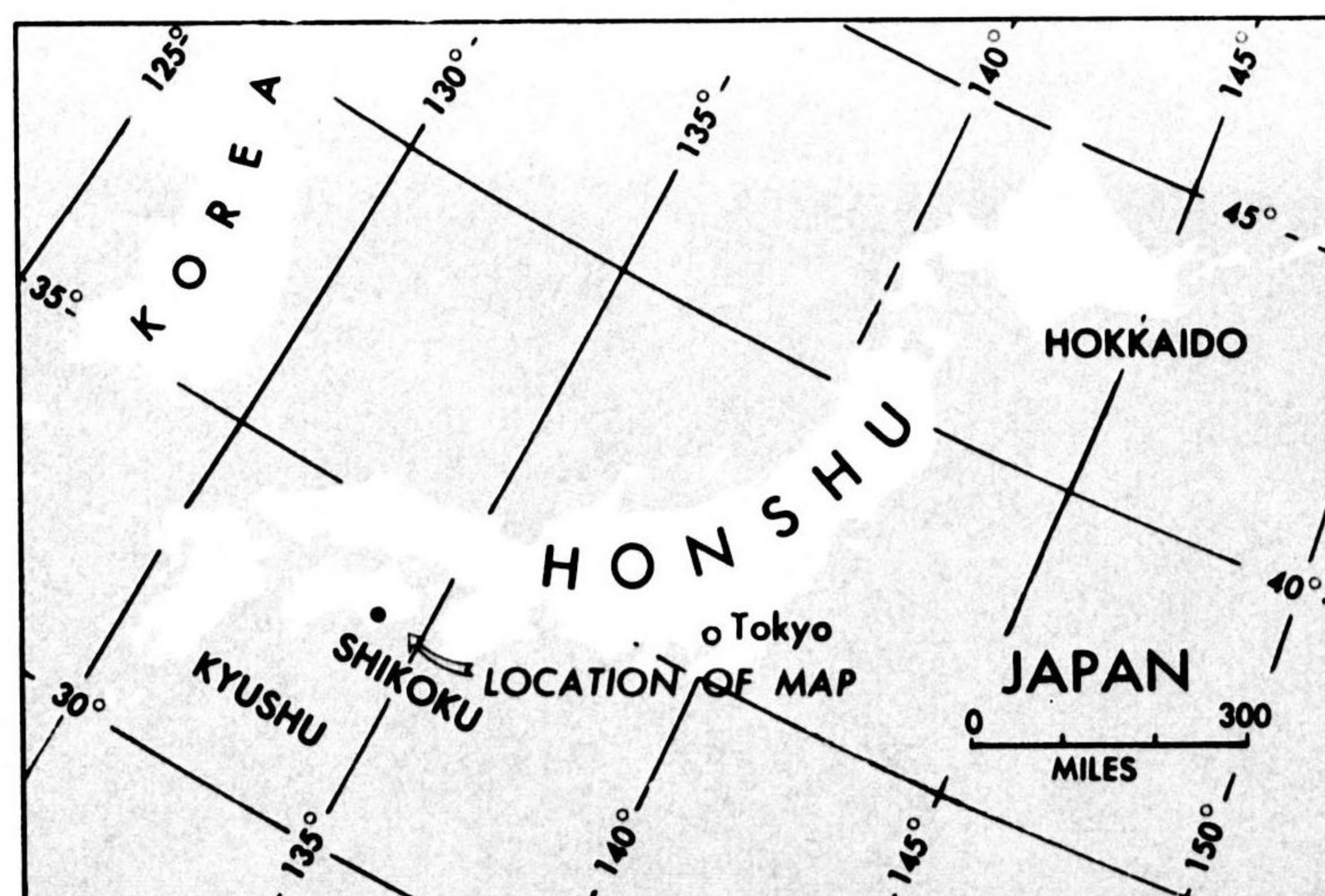
CONFIDENTIAL

PROVISIONAL EDITION

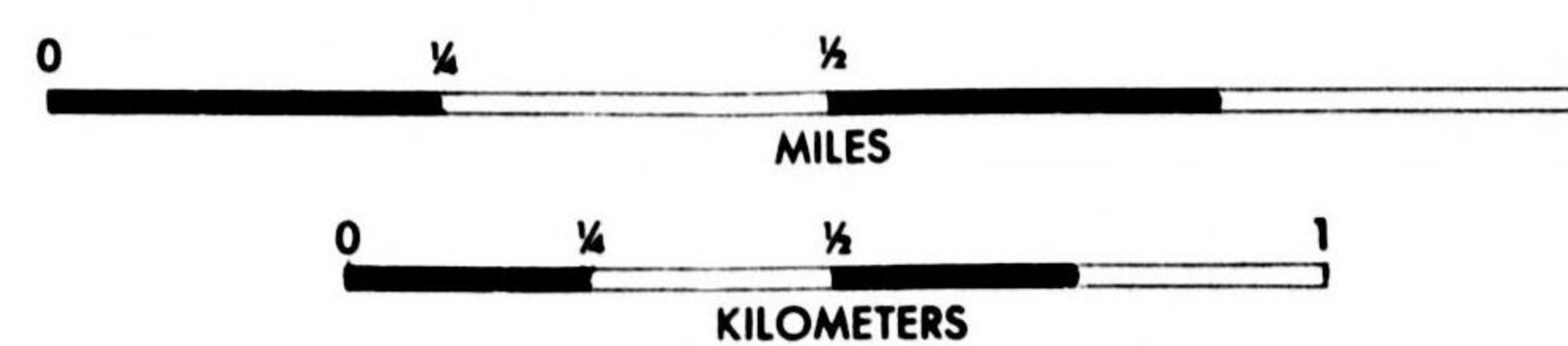


UNO STEAM ELECTRIC PLANT OKAYAMA-KEN

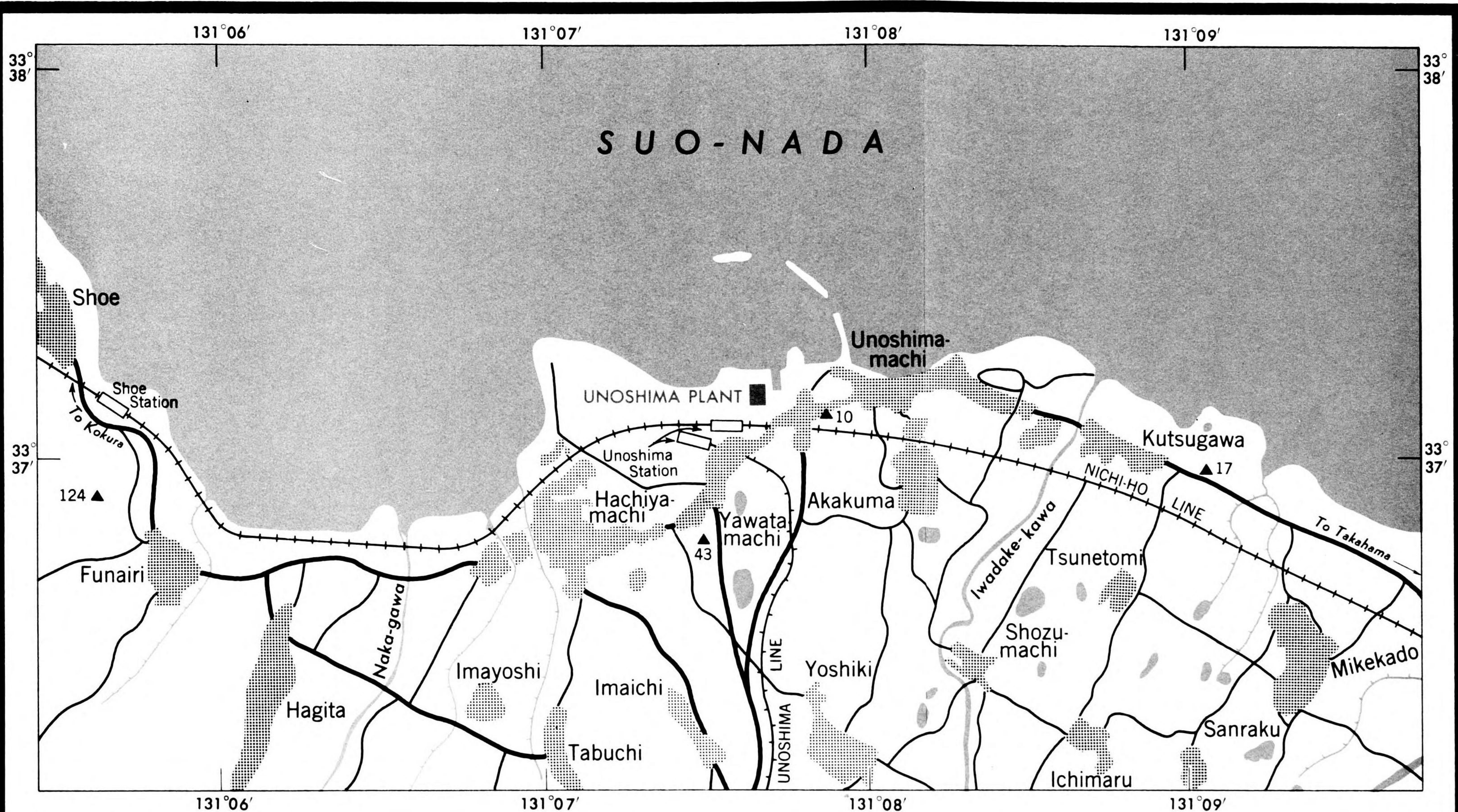
BASE MAP FROM 1:50,000 SERIES, JAPAN IMPERIAL LAND SURVEY BUREAU, 1931
W.D.M.C. FILE NO. JAPAN S30-JGS-50, SHEETS 25-1 AND 25-2



- | | | | |
|--|-------------------|--|----------------------------|
| | SETTLEMENT CENTER | | SECONDARY ROAD |
| | RAILROAD | | IRRIGATION DITCH |
| | PRINCIPAL HIGHWAY | | ▲161 SPOT HEIGHT (IN FEET) |

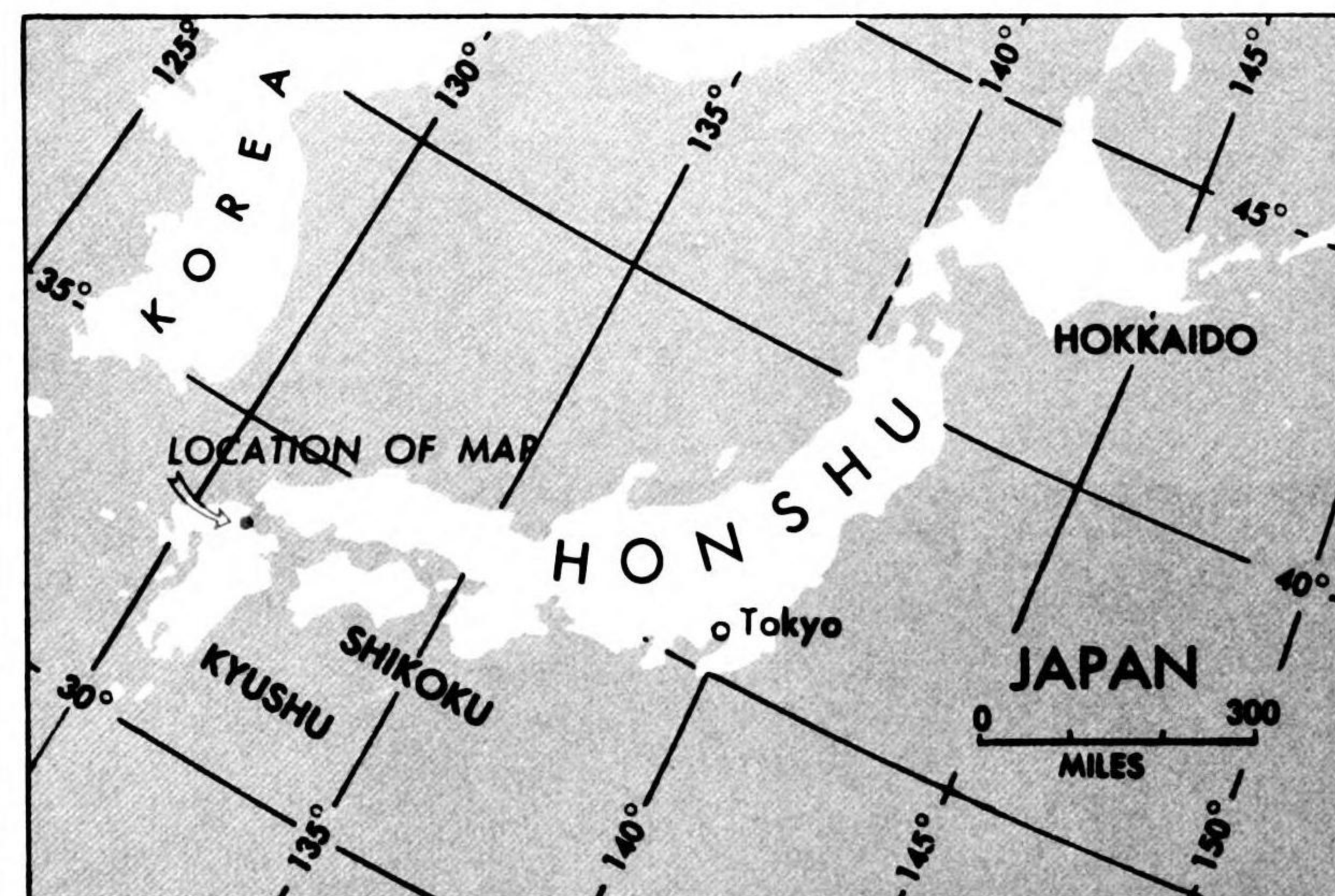


Reliability Code 1B-1B-1



UNOSHIMA STEAM ELECTRIC PLANT

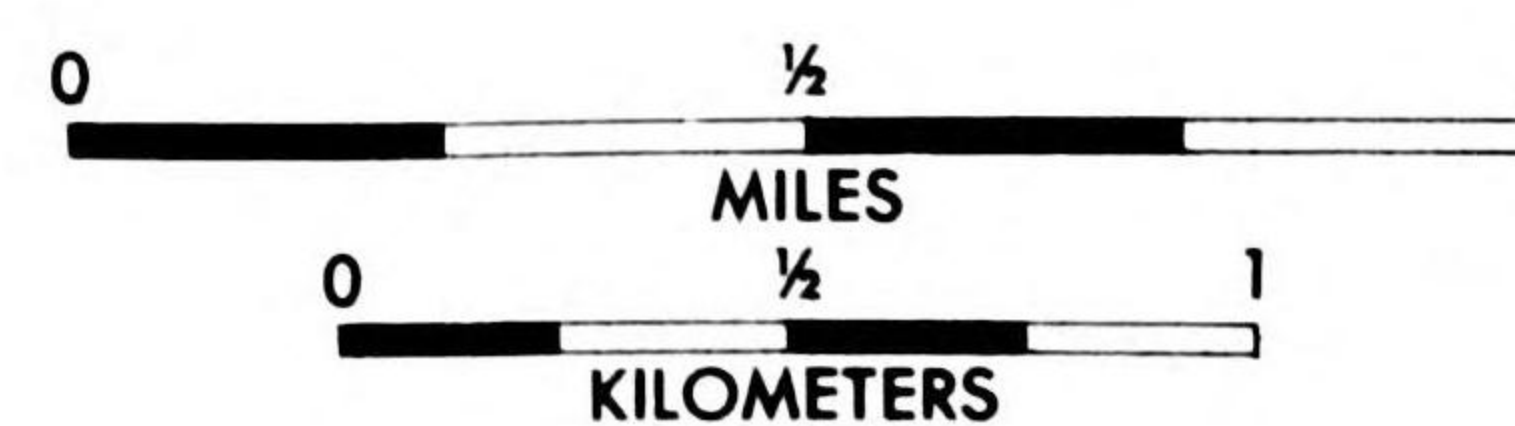
FUKUOKA-KEN



BASE MAP FROM 1:50,000 SERIES, JAPAN IMPERIAL LAND SURVEY BUREAU, 1930
W.D.M.C. FILE NO. JAPAN S30-JGS-50, SHEET 17-15

- | | | | |
|--|-------------------|--|-------------------|
| | SETTLEMENT CENTER | | PRINCIPAL HIGHWAY |
| | RAILWAY | | SECONDARY ROAD |
| | TRAMWAY | | CANAL |

▲ 10 SPOT HEIGHT (IN FEET)



Reliability Code: 1B-1B-1

915. URUSHITA HYDRO PLANT

Approx. Lat. 35°22'
Long. 138°59'

Company: Fuji Denryoku KK

Location: Plant - Oyama-machi, Sunto-gun, Shizuoka-ken

Capacity Commonly in Use (in kw): 1000, as of Dec 1934

Importance: Rank in Japan - 250 + ; rank in Tokyo supply area - 100 +

Source of Power: Ayusawa-kawa of the Sakawa-gawa system

Date of Construction: Unknown; in operation as early as June 1928
and as recently as Dec 1934

Details: Particular capacities (in kw) - 1,000 installed cap; 1000 spec

Eff head - 57 ft

Plant, equipment -

Turbines - 2 @ 810 hp, Francis-type, EM-make

Generators - 2 @ 500 kw, 3-ph, 600 v, 300 rpm,

50 cyc, GE-make

Sources: DJY 1929 pp.238,306; Ohm 4/29 p.212

916. URYU HYDRO PLANT

Approx. Lat. 44°16'30"
Long. 142°21'

Company: Uryu Denki KK

Location: Plant - Teshionokuni-oaza, Tayoro-mura, Kamikawa-gun,
Hokkaido

Dams - 1 (Butokamabetsu-kawa) - at Horokanai-mura, Uryu-gun,
Hokkaido

2 (Utsunai-kawa) - at Horokanai-mura, Uryu-gun,
Hokkaido

Capacity Commonly in Use (in kw): 51,000 (see Date of Construction)

Importance: Rank in Japan - 38 ; rank in Hokkaido supply area - 2

Source of Power: Butokamabetsu-kawa and Utsunai-kawa, branches of the
Uryu-kawa of the Ishikari-kawa system

Date of Construction: Construction was begun Sept 1937 and completed
Aug 1940; in operation Jan 1941

Details: Particular capacities (in kw) - *51,000 installed cap;
15,053 reg; 35,947 spec

Layout - Aqueduct. Water from Utsunai Reservoir is led to
the Butokamabetsu Reservoir at the eastern end of which
is an intake

Eff head - 158 m; flow - 14.7 m³/sec

Dams - 1 - 41 m high, of concrete construction, gravity
overflow-type

2 - 3.17 m high, of concrete construction, gravity-
overflow-type

3 - 20 m high, 120 m wide at base, of earth construction

Reservoir - 210,000,000 m³ eff cap, 12 m eff depth

Aqueduct - 6800 m pressure tunnel, 3.8 m diam

Penstocks - 3 @ 550 m long, 2.15 m diam

Plant, external features - In 2 reinforced concrete buildings as follows: turbo-generator building, 36 m long, 11 m wide, 25 m high; distributor building 36.5 m long, 26 m wide, 18 m high

Plant, equipment -

Turbines - 3 @ 21,700 kw, Francis-type, vertical-shaft, Hitachi-make. Turbines are placed 25 m below generators

Generators - 3 @ 21,250 kva, 3-ph, 11,000 v, 375 rpm, 50 cyc, Hitachi-make, set in concrete 40 m below ground

Other equipment - 2 cranes @ 50-ton cap

Tail race - 1100 m long; leads to the Teshio-gawa

Area served - Plant was to transmit power to Sapporo substation (60,000 kva cap) to be built in 1940

See: Figure No. V-31

Sources: Ohm 9/29 p.412, 9/36 pp.908,915, 12/37 p.1456; DGS 12/38 p.1314; DGS Kaimu 1939 p.91; HH 1/39 pp.4,5,10, 1/40 pp.3,6,54, 7/40 pp.404-405, 9/40 p.512, 1/41 p.3, 2/41 p.(2)

917. USAGIYA HYDRO PLANT

Approx. Lat. 35°40'
Long. 136°35'

Company: Mie Godo Denki KK

Location: Plant - Usagiya-oaza, Neo-mura, Motosu-gun, Gifu-ken

Capacity Commonly in Use (in kw): 1160 (see Date of Construction)

Importance: Rank in Japan - 250+; rank in Osaka-Nagoya supply area -100 +

Source of Power: Neo-kawa

Date of Construction: Unknown; construction was begun Apr 1929; it is believed that the plant has been completed since

Details: Particular capacities (in kw) - 435 reg; 725 spec

Sources: Ohm 7/29 p.355

918. USUDA HYDRO PLANT

Approx. Lat. 36°12'
Long. 138°29'

Company: Chikuma Denki KK

Location: Plant - 245 Katsuma-oaza, Usuda-machi, Minami Saku-gun, Nagano-ken

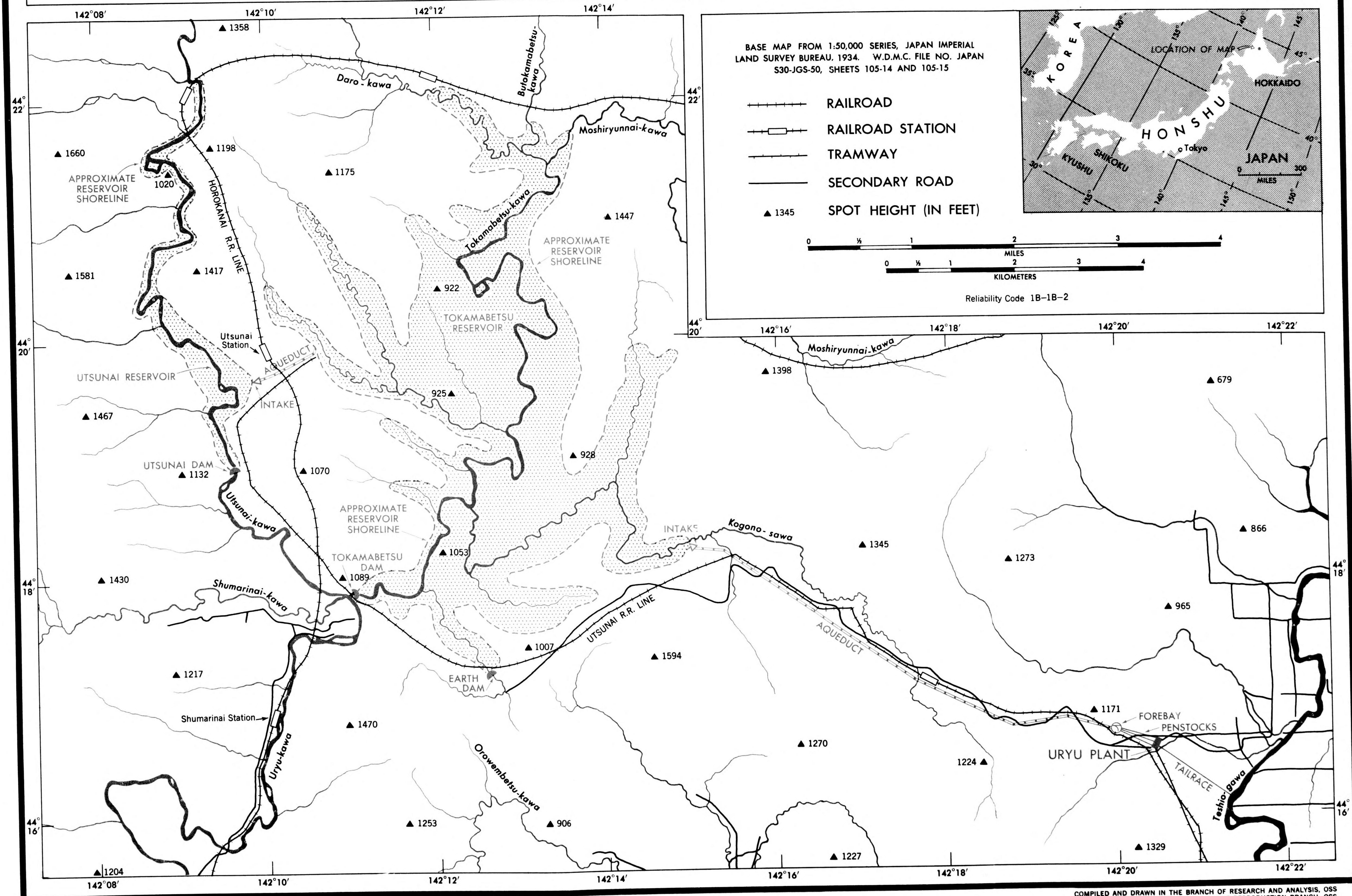
Capacity Commonly in Use (in kw): Est 2400, as of Dec 1936

Importance: Rank in Japan - 250 + ; rank in Osaka-Nagoya supply area- 100 +

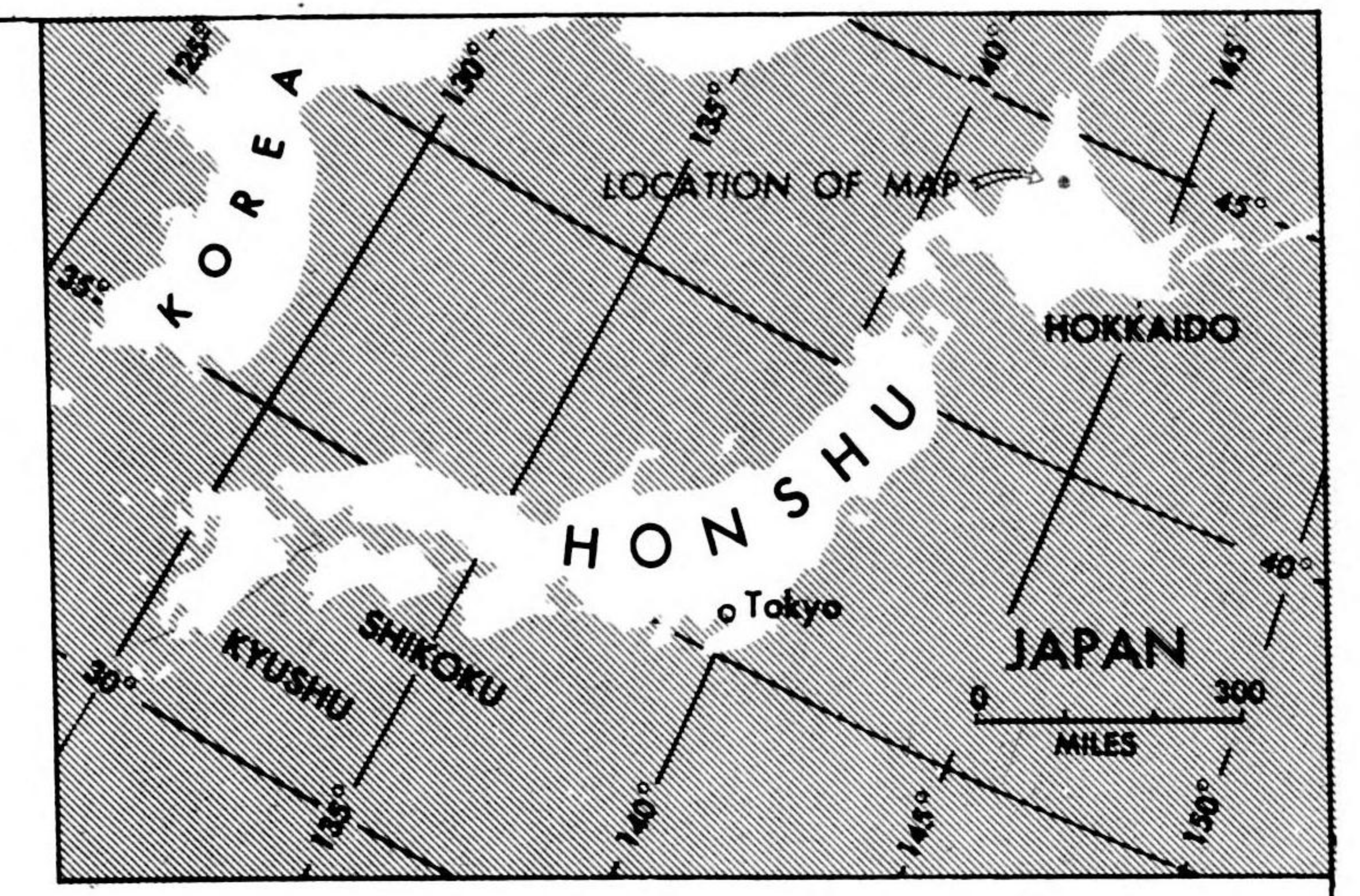
Source of Power: Probably Chikuma-gawa

PROVISIONAL EDITION

URYU HYDROELECTRIC PLANT HOKKAIDO



BASE MAP FROM 1:50,000 SERIES, JAPAN IMPERIAL LAND SURVEY BUREAU, 1934. W.D.M.C. FILE NO. JAPAN S30-JGS-50, SHEETS 105-14 AND 105-15



Date of Construction: Founded July 1927; in operation Mar 1940

Details: Plant operates on 60 cyc

Sources: DnN 1940; ZKT 1939 p.1646; DnK

919. USUKAWA NO. 2 HYDRO PLANT

Approx. Lat. 36°13'
Long. 138°02'

Company: Chuo Denki KK

Location: Plant - 111, Yamabe-oaza, Iriyamabe-mura, Higashi
Tsukuma-gun, Nagano-ken

Capacity Commonly in Use (in kw): 1300, as of Dec 1934

Importance: Rank in Japan - 250 + ; rank in Osaka-Nagoya supply area-100 +

Source of Power: Usu-kawa

Date of Construction: Founded Jan 1923 with 600 kw cap; additional
unit @ 700 kw installed Oct 1929; in operation Mar 1929

Details: Particular capacities (in kw) - 600 reg; 700 spec
Eff head - 521 ft

Plant, equipment -

Turbines - 1 @ 1100 hp, Pelton-type, Dengyosha-make

At least one additional unit in operation

Generators - 1 @ 600 kva, 3-ph, 2500 v, 375 rpm, 50 cyc,
GE-make

At least one additional unit in operation

Transformers - 3 @ 300 kva, 1-ph, 2.3, 2.2, 2.1/22, 11 kv,
D-D conn, shell-type, water-cooled, 50/60 cyc, Shibaura-
make

Sources: DnN 1940; ZKT 1939 p.1646; Ohm 1/30 p.72; DJY 1929 p.388

920. USUSHIMA HYDRO PLANT

Approx. Lat. 36°35'
Long. 137°10'

Company: Takaoka Dento KK

Location: Plant - 2 of 26 and 2 of 27 Yamashita-aza, Usushima-oaza,
Sugihara-mura, Nei-gun, Toyama-ken

Capacity Commonly in Use (in kw): 3670 (see Date of Construction)

Importance: Rank in Japan - 250 + ; rank in Osaka-Nagoya supply area-100 +

Source of Power: Jintsu-kawa

Date of Construction: Construction was begun Jan 1933 and plant was
under construction Nov 1935. It was in operation as early as Nov
1938 and as recently as Mar 1940.

Details: Particular capacities (in kw) - 2690 reg; 980 spec

Dam - 6 m high

Fishway - 5 m wide

Plant, equipment -

Turbines - 1 @ 3400 hp, Dengyosha-make

1 @ unknown cap, 3-ph, 60 cyc, Shibaura-make

Sources: DnN 1940; Ohm 4/33 p.299, 2/36 p.212; DnGZ 11/38 p.48;
HSG p.318

921. UTSUMI KARYOKU STEAM PLANT

Approx. Lat. 34°09'
 Long. 135°13'

Company: Nankai Suiryoku Denki KK; formerly Utsumi Suiryoku Denki KK

Location: Utsumi-machi, Kainan-shi, Wakayama-ken

Installed Capacity (in kw): *6000, as of Dec 1936

Importance: Rank in Japan - 250 + ; rank in Osaka-Nagoya supply area-100 +

Date of Construction: Unknown; in operation as early as Dec 1926 and
 as recently as Mar 1940

Details: Particular capacities (in kw) - 2340 reg; 1660 supp; 2000
 res

Plant, equipment -

Boilers - 4 @ Garbe-type, 200 lbs/in², 650° F, EW-make

Turbines - 1 @ 1450 hp, Zoelly-type, EW-make

1 @ 2000 hp, Zoelly-type, EW-make

1 (res) @ 3000 hp, Zoelly-type, EW-make

Generators - 1 @ 1250 kva, 3-ph, 3000 v, 3600 rpm,
 60 cyc, SS-make

1 @ 2500 kva, 3-ph, 3000 v, 3600 rpm,
 60 cyc, SS-make

1 (res) @ 3750 kva, 3-ph, 3000 v, 3600
 rpm, 60 cyc, SS-make

Sources: DnN 1940; DnK; Ohm 12/27 p.540, 6/31 supp p.7, 1/33 p.69;
DJY 1929 pp.266,352

922. WACHINO HYDRO PLANT

Approx. Lat. 35°18'
 Long. 137°49'

Company: Yahagi Suiryoku KK

Location: Plant - On the left bank of the Wachino-gawa in Wachino-
 oaza, Oshimojo-mura, Shimo Ina-gun, Nagano-ken

Capacity Commonly in Use (in kw): 6400 (see Date of Construction)

Importance: Rank in Japan - 250 + ; rank in Osaka-Nagoya supply area-100 +
 rank in Tokyo supply area - 100 +

Source of Power: Wachino-gawa of the Tenryu-gawa system

Date of Construction: Construction was begun April 1938 and com-
 pleted early in 1940; plant in operation Mar 1940

Details: Particular capacities (in kw) - *6000 installed cap; 1800 reg;
4600 spec
Eff head - 76 m
Plant, equipment -
Turbines - 1 @ 7500 kw, Francis-type, horizontal-shaft,
Hitachi-make
Generators - 1 @ 7500 kva, 3-ph, 11,000 v, 428/514 rpm,
50/60 cyc, Hitachi-make

Sources: Ohm 7/38 p.853; DnN 1940; KN 1939 p.166; HH 1/39 pp.7,10,
1/40 pp.3,6

923. WADA HYDRO PLANT

Approx. Lat. 36°14'
Long. 138°15'

Company: Shinshu Denki KK; formerly Suwa Denki KK

Location: Plant - Wada-mura, Chiisagata-gun, Nagano-ken

Capacity Commonly in Use (in kw): 1570, as of Dec 1934

Importance: Rank in Japan - 250 + ; rank in Tokyo supply area - 100 +

Source of Power: Yorita-kawa of the Shinano-gawa system

Date of Construction: Unknown; in operation as early as Dec 1926 and
as recently as Mar 1940

Details: Particular capacities (in kw) - *1440 installed cap; 1210
reg; 360 spec
Eff head - 418 ft
Plant, equipment -
Turbines - 1 @ 3000 hp, Francis-type, Hitachi-make
Generators - 1 @ 1800 kva, 3-ph, 3500 v, 600 rpm,
50 cyc, Hitachi-make
Transformers - 3 @ 600 kva, 3-ph, 3.5, 3.4/25, 23, 21 kv,
D-D conn, water-cooled, 50 cyc, shell-type, Shiba-
make

Sources: DnN 1940; DJY 1927; DJY 1929 p.328

924. WADA HYDRO PLANT

Approx. Lat. 34°11'30"
Long. 135°49'

Company: Ujigawa Denki KK

Location: Plant - Wada-oaza, Tennogawa-mura, Yoshino-gun, Nara-ken
Dams - 1 - Tsuzurao-aza, Tennogawa-mura, Yoshino-gun,
Nara-ken
2 - Tsuzurao-aza, Tennogawa-mura, Yoshino-gun,
Nara-ken

Capacity Commonly in Use (in kw): 2000, as of 1937

Importance: Rank in Japan - 250+ ; rank in Osaka-Nagoya supply area-100 +

Source of Power: Tenno-gawa of the Kumano-gawa system

Date of Construction: Construction was begun June 1936 and completed Sept 1937; in operation Mar 1940

Details: Particular capacities (in kw) - 2365 installed cap; 250 reg; 1750 spec
Layout - Aqueduct-type
Eff head - 34.3 m; flow - 7.49 m³/sec
Dams - 1 - Of concrete construction, gravity overflow reaction-type, 22.8 m high, 65.5 m long with 5 tainter gates @ 5.8 m high, 8 m wide
2 - Dimensions unknown
Aqueduct - 2247.6 m long pressure tunnel, of concrete construction
Surge tank - 18.2 m high, 9 m diam
Supplementary surge tank (at Kuwatani) - 11.5 m high, 2.5 m diam
Penstocks - 1 @ 53.4 m long
Excess water spillway - 46.8 m long
Plant, external features - Of reinforced concrete construction, cream colored, 2 stories high with flat roof; 10 wooden shacks are on the premises.
Plant, equipment -
Turbines - 1 @ 2850 kw, Francis-type, horizontal-shaft
Generators - 1 @ 2600 kva, 91% pf, 3-ph, 3300 v, 360 rpm, 60 cyc
Transformers - 1 @ 2600 kva, 3-ph, 3.3/77 kv, 60 cyc
Other equipment - 1 exciter @ 37 kw

See: Photographs No. V-86, V-87, V-88

Sources: DnN 1940; ZKT 1939 p.1645; DGS 4/37 n.111; DGS Kaimu 1936 p.97, 1937 p.109; DnGZ 9/37 p.(139), 5/38 p.(45); Ohm 9/36 p.911, 12/37 p.1456

925. WADAGAWA HYDRO PLANT

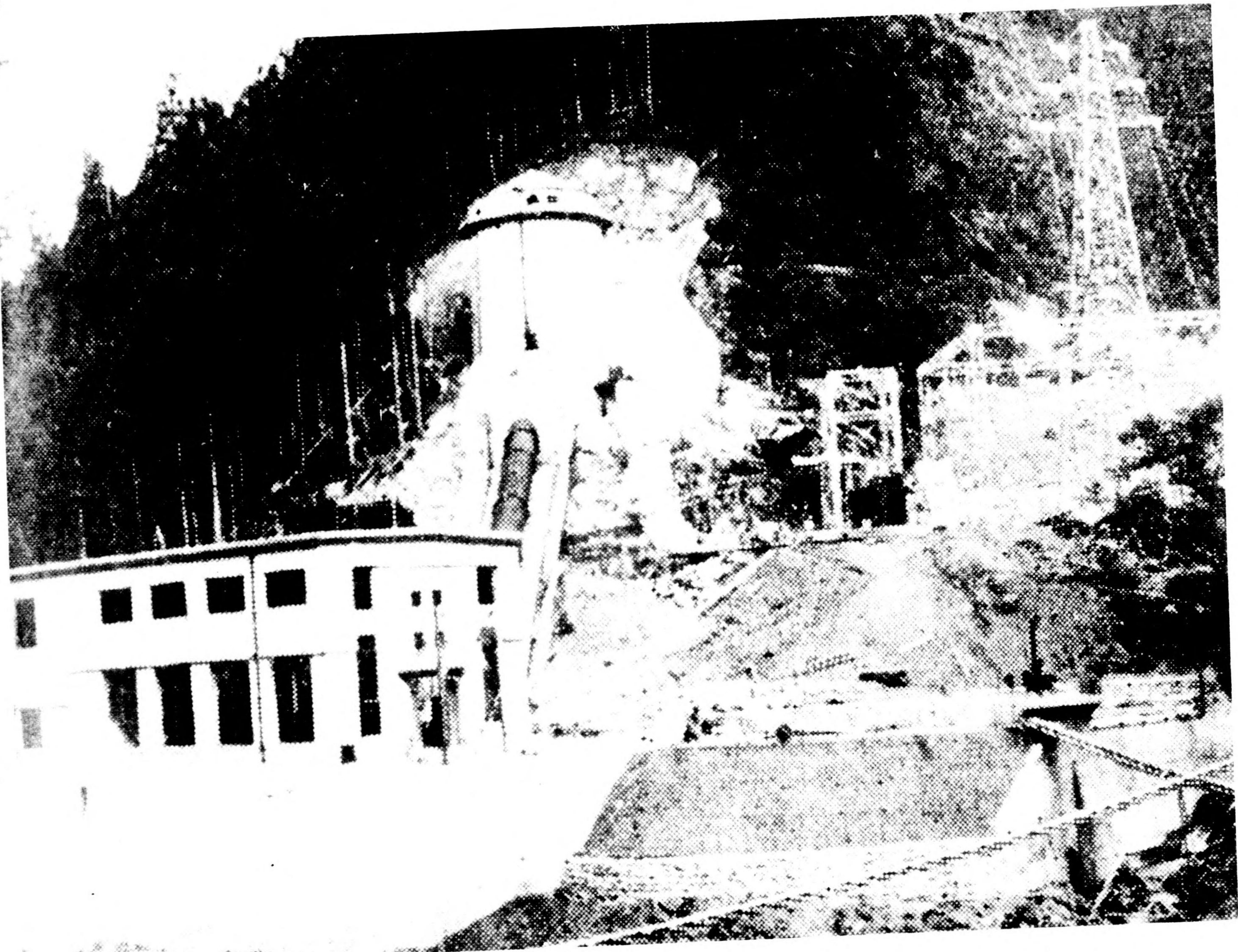
Approx. Lat. 36°28'
Long. 137°50'

Company: Toshin Denki KK

Location: Plant - 856, Nagabata-aza, Tokiwa-mura, Kita Azumi-gun, Nagano-ken

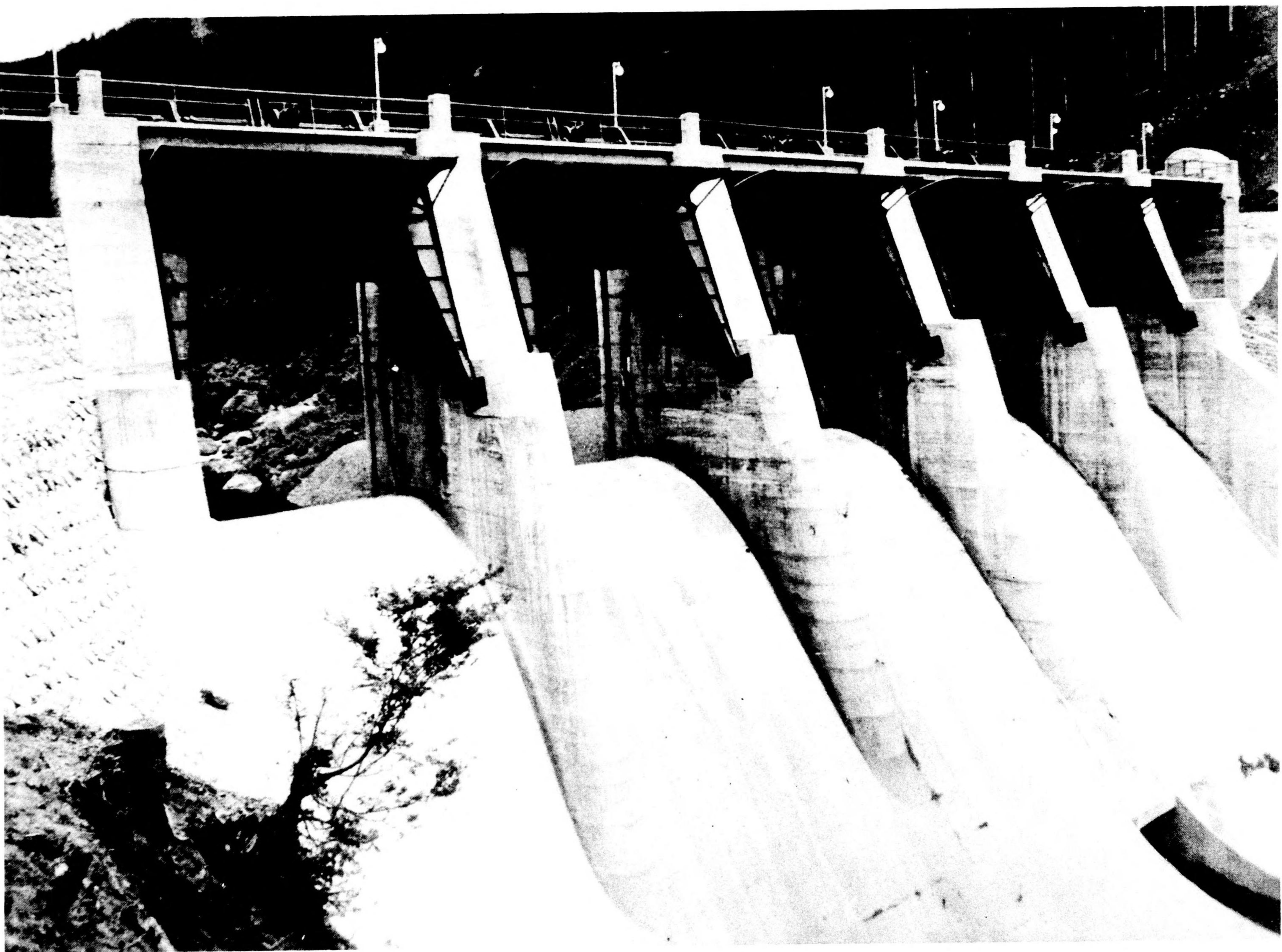
Capacity Commonly in Use (in kw): 10,000, as of 1939

Importance: Rank in Japan - 236 ; rank in Tokyo supply area - 82



Photograph No. V-86 Wada Hydro Plant of the Ujigawa Denki KK
In 1938

RESTRICTED



Photograph No. V-87 Tsuzurao Dam of the Ujigawa Denki
KK Wada Hydro Plant in 1937

RESTRI CTED



Photograph No. V-88 Tsuzurao Dam of the Ujigawa Denki KK
Wada Hydro Plant in 1937

RESTRICTED

Source of Power: Takase-kawa of the Shinano-gawa system

Date of Construction: Construction was begun May 1938 and completed in 1939 at which time it went into operation.

Details: Particular capacities (in kw) - *9600 installed cap; 3350 reg; 6650 spec
Eff head - 68.5 m
Plant, equipment -
Turbines - 2 @ 5280 kw, Francis-type, vertical-shaft, Hitachi-make
Generators - 2 @ 6000 kva, 3-ph, 428 rpm, 50 cyc, Hitachi-make

Sources: Ohm 8/38 p.944, 5/39 p.488; HH 1/39 pp.5,10, 1/40 pp.3ff; KN 1939 p.166

926. WADAGAWA HYDRO PLANT

Approx. Lat. 36°34'
Long. 137°23'

Company: Toyama-ken

Location: Plant - Kamegai-aza, Komi-oaza, Oyama-mura, Kami Niikawa-gun, Toyama-ken
Dam - Arimine-chi, Oyama-mura, Kami Niikawa-gun, Toyama-ken

Capacity Commonly in Use (in kw): 31,500 (see Date of Construction)

Importance: Rank in Japan - 72 ; rank in Osaka-Nagoya supply area- 32

Source of Power: Wada-gawa, Ashi-tani, Higashi Sakamori-tani, O-tani of the Joganji-gawa system and Shin-kawa

Date of Construction: Construction was begun May 1936 and completed in 1940; plant in operation Jan 1941

Details: Particular capacities (in kw) - *36,000 installed cap; 15,900 reg; 15,600 spec
Layout - Aqueduct-type
Dam - Of concrete construction, gravity overflow-type, 292.8 m long, 105 m high with no gates
Reservoir - 75,735,000 m³ cap
Plant, equipment -
Turbines - 3 @ unknown cap, Dengyosha-make
Generators - 3 @ 15,000 kva, 3-ph, 60 cyc, Shibaura-make

See: Figure No. V-31a

Sources: KN 1938 p.199, 1939 p.166; DnN 1940; HSG pp.86,149,150,161; DGS 4/37 p.111; DnGZ 9/37 p.(139); Ohm 8/36 p.805; SR 1/39 p.5, 1/41 p.4

WAGA HYDRO PLANT - See WAKA HYDRO PLANT

927. WAGO HYDRO PLANT

Approx. Lat. 35°18'
Long. 137°46'

Company: Yahagi Suiryoku KK

Location: Plant - 3 of 1095, Shitsudo-aza, Wago-oaza, Yutaka-mura,
Shimo Ina-gun, Nagano-ken

Capacity Commonly in Use (in kw): 3000, as of Dec 1937

Importance: Rank in Japan - 250 +; rank in Tokyo supply area - 100 +

Source of Power: Namiai-gawa, branch of Wachino-gawa of the
Tenryu-gawa system

Date of Construction: Construction was begun Dec 1936 and completed
Dec 1937; in operation Mar 1940

Details: Particular capacities (in kw) - 1300 reg; 1700 spec
Layout - Aqueduct-type
Eff head - 188 m
Penstocks - 1
Plant, equipment
Turbines - 1 @ 3800 kw, Pelton-type, double-nozzle,
Hitachi-make
1 @ unknown cap, 3-ph, 375 rpm, 50 cyc, Hitachi-
make

Sources: DnN 1940; KN 1938 p.199; Ohm 3/37 p.308, 3/38 p.321; DGS
4/37 p.111; DnGZ 9/37 p.(139); HH 1/39 p.4

928. WAKA HYDRO PLANT

Approx. Lat. 39°18'
Long. 140°59'

Company: Tohoku Dento KK; formerly Kurozawashiri Denki KK

Location: Plant - Yokokawame-mura, Waka-gun, Iwate-ken

Capacity Commonly in Use (in kw): 1200, as of Dec 1934

Importance: Rank in Japan - 250 + ; rank in Tohoku supply area - 20 +

Source of Power: Waka-gawa

Date of Construction: Unknown; in operation as early as 1926 and as
recently as 1940

Details: Particular capacities (in kw) - *1200 installed cap; 900 reg;
300 spec
Eff head - 35 ft

PROVISIONAL EDITION

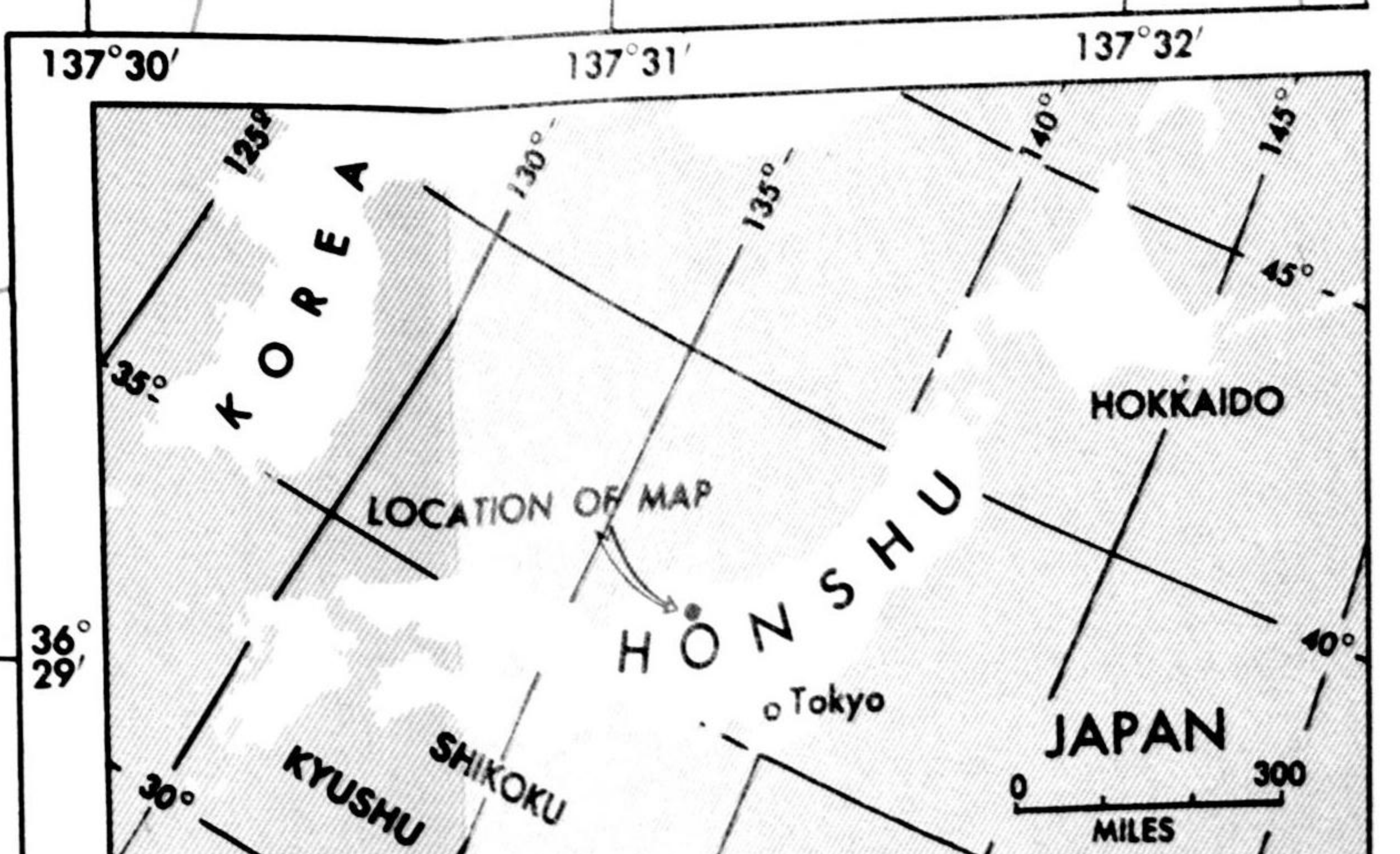
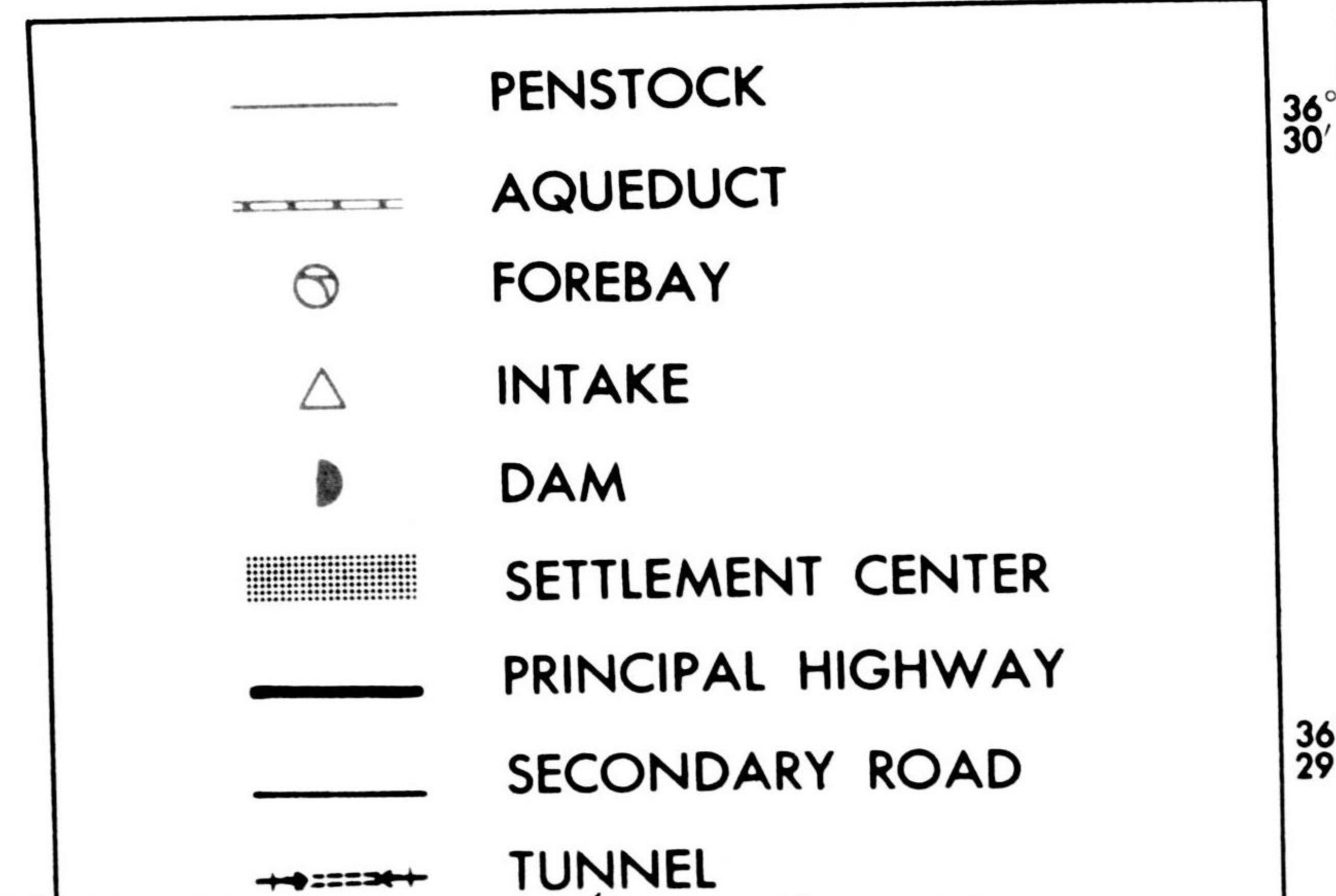
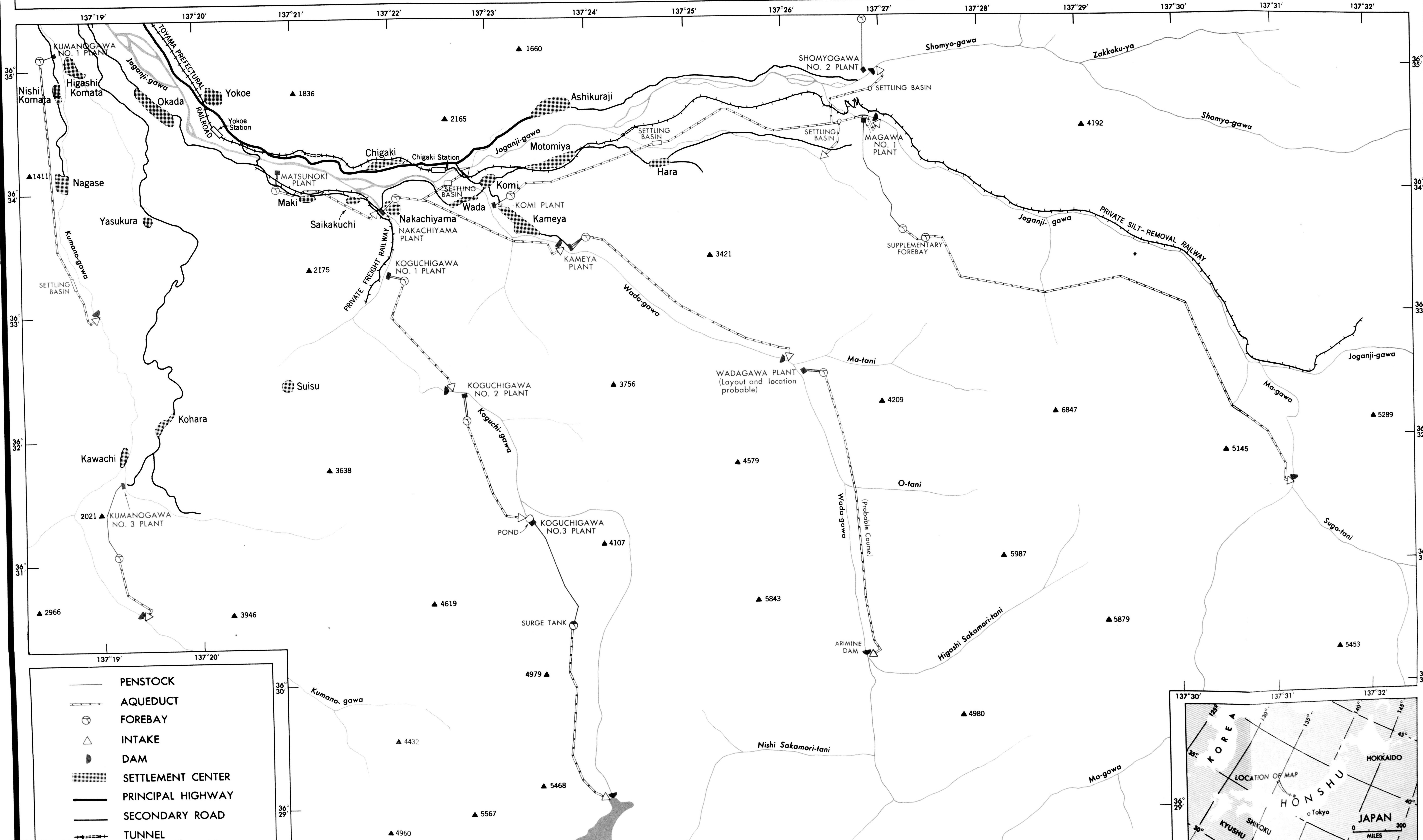
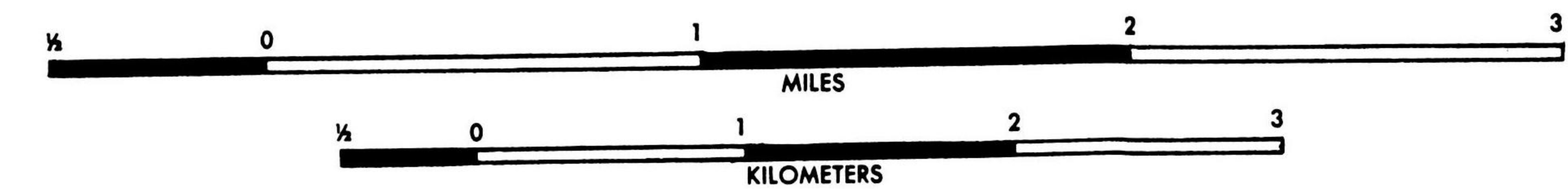
HYDROELECTRIC PLANTS ON THE JOGANJI-GAWA SYSTEM

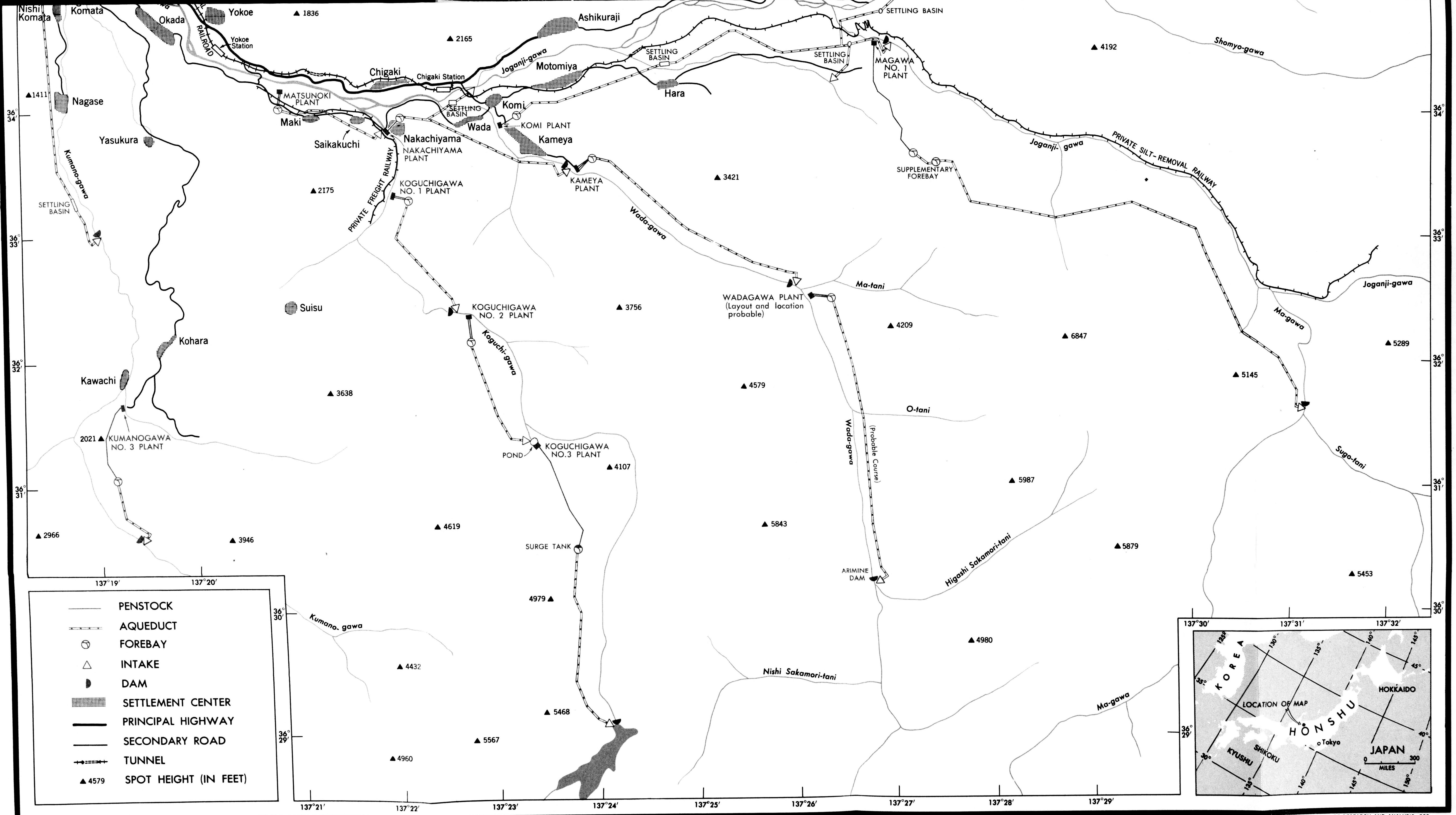
TOYAMA-KEN

BASE MAP FROM 1:50,000 SERIES, JAPAN IMPERIAL LAND SURVEY BUREAU, 1932, 1933

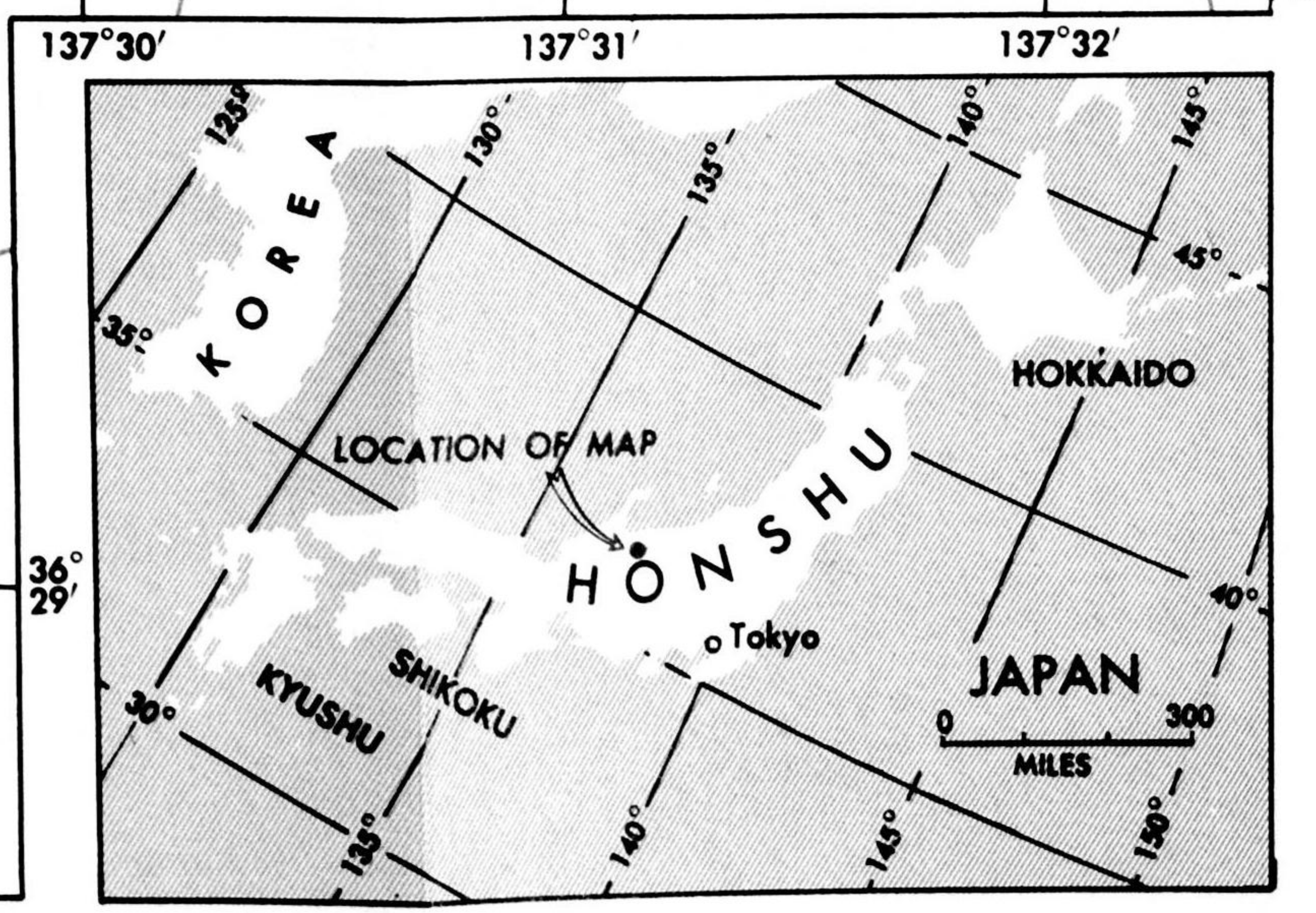
W.D.M.C. FILE NO. JAPAN S30-JGS-50, SHEETS 54-5, 54-9 and 54-10

Reliability Code: 1B-1B-1





	PENSTOCK
	AQUEDUCT
	FOREBAY
	INTAKE
	DAM
	SETTLEMENT CENTER
	PRINCIPAL HIGHWAY
	SECONDARY ROAD
	TUNNEL
	SPOT HEIGHT (IN FEET)



Plant, equipment -

Turbines - 2 @ 1120 hp, Francis-type, Dengyosha-make

Generators - 2 @ 750 kva, 3-ph, 3500 v, 300 rpm,
60 cyc, Shibaura-make

Transformers - 3 @ 85 kva, 1-ph, 6.6/3.3 kv, D-D conn,
self-cooled, 60 cyc, core-type, Shibaura-make

3 @ 200 kva, 1-ph, 3.5,3.3/33,30 kv,
D-D conn, self-cooled, 60 cyc, core-type, Shibaura-make

3 @ 300 kva, 1-ph, 3.5,3.3/35,33 kv,
D-D conn, self-cooled, 60 cyc, core-type, Shibaura-make

Sources: DnN 1940; DJY 1929 pp.287,398; DJY 1927

929. WAKAGAWA HYDRO PLANT

Company: Denki Kagaku Kogyo KK

Location: Plant - Iwate-ken, or Akita-ken; exact location unknown

Capacity Commonly in Use (in kw): 15,500 (see Date of Construction)

Importance: Rank in Japan - 152 ; rank in Tohoku supply area - 6

Source of Power: Waka-gawa of the Kitakami-gawa system

Date of Construction: Unknown; plant was under construction in Sept 1937
and Sept 1938, and in operation Jan 1940

Details: Particular capacities (in kw) - *15,040 installed cap
Dam - 32.3 m high, 70.5 m long

Plant, equipment -

Turbines - 2 @ unknown cap, Dengyosha-make

Generators - 2 @ 9400 kva, 3-ph, 11,000 v, 300 rpm,
Shibaura-make

Sources: DnGZ 7/37, 9/37 p.(139); KN 1939 p.166; SR 1/40 p.4

930. WAKAMATSU STEAM PLANT

Approx. Lat. 35°15'
Long. 139°40'

Company: Tokyo Dento KK; formerly Yokohama Denki KK

Location: Wakamatsu-cho, Yokosuka-shi, Kanagawa-ken

Installed Capacity (in kw): 1700, as of May 1936

Importance: Rank in Japan - 250+; rank in Tokyo supply area - 100 +
Serves as reserve source of power for Yokosuka Naval
Base

Date of Construction: Completed Nov 1906 and in operation until May 1936 when it was retired. It is not known if this plant has been dismantled.

Details: Particular capacities (in kw) - 1700 supp
 Plant, external features - Of brick construction, 1 story high, with 1 steel stack @ 57.9 m high, 2.2 m inner diam; 2 smaller steel-frame reinforced concrete one-story buildings are on the premises.
 Plant, equipment -
 Boilers - 5 res @ Heine-type, 170 lbs/in², 2826 ft², Heine-make
 Turbines - 2 res @ 1500 hp, Curtis-make, GE-make
 Generators - 2 res @ 1000 kva, 3-ph, 3500 v, 1000 rpm, 50 cyc, GE-make
 Transformers - 3 @ 400 kva, 1-ph, 11/3.3 kv, D-Y conn, self-cooled, 50 cyc, Shibaura-make
 8 (incl 2 res) @ 500 kva, 1-ph, 6.4, 10.4/6.6, 6.4, 6.2, 3.3, 3.2 kv, D-D conn, self-cooled, 50 cyc, core-type, Shibaura-make
 4 (incl 1 res) @ 1000 kva, 1-ph, 10.4, 6.4/3.1, 3.2, 3.3 kv, D-D conn, 50 cyc, core-type, Kawakita-make
 Other equipment - 25 chain-grate stokers; 4 economizers @ 109 m²; 10 superheaters @ 34 m²; 3 boiler feed pumps; 2 condensers @ 427 m²; 1 crane @ 12-ton cap

Sources: DJY 1927; DJY 1929 p.304

931. WAKAYANAGI HYDRO PLANT

Approx. Lat. 39°07'
 Long. 140°57'

Company: Tohoku Dento KK; formerly Kimoe Denryoku KK

Location: Plant - Komatsuyagi-aza, Wakayanagi-oaza, Wakayanagi-mura, Isawa-gun, Iwate-ken

Capacity Commonly in Use (in kw): 1400 (see Date of Construction)

Importance: Rank in Japan - 250 + ; rank in Tohoku supply area - 20 +

Source of Power: Kimoe-gawa

Date of Construction: Unknown; construction was begun Dec 1930 and plant was in operation Mar 1940

Details: Particular capacities (in kw) - 700 reg; 700 spec
 Plant operates on 50 cyc

Sources: Ohm 3/31 p.165; DnN 1940

WANISHI SEITETSU-SHO STEAM PLANT - See NIPPON SEITETSU-SHO WANISHI FACTORY STEAM PLANT

932. WATARIGAWA HYDRO PLANT

Approx. Lat. 32°22'
Long. 131°23'

Company: Miyazaki-ken

Location: Plant - Tateba National Forest, Shimo Sanga-oaza, Togo-mura,
Higashi Usuki-gun, Miyazaki-ken

Capacity Commonly in Use (in kw): 1051 (see Date of Construction)

Importance: Rank in Japan - 250 +; rank in Kyushu supply area - 50 +

Source of Power: Mizu-gawa of the Komaru-kawa

Date of Construction: Construction was begun Sept 1938 at which time
completion was scheduled for 1943

Details: Particular capacities (in kw) - 300 reg; 751 spec
Plant operates on 60 cyc

Sources: Ohm 12/38 p.1311; DnN 1940

933. WATARISE HYDRO PLANT

Approx. Lat. 37°58'
Long. 140°10'

Company: Miyagi-ken

Location: Plant - Minami Kawara-aza, Watarise-oaza, Shichigashuku-
mura, Katta-gun, Miyagi-ken

Capacity Commonly in Use (in kw): 1800, as of Dec 1934

Importance: Rank in Japan - 250+; rank in Tohoku supply area - 20 +

Source of Power: Shiroishi-kawa

Date of Construction: Completed June 1929; in operation Mar 1940

Details: Particular capacities (in kw) - 1100 reg; 700 spec
Plant operates on 50 cyc

Sources: Ohm 5/28 p.265, 9/29 p.450; DnN 1940; ZKT 1939 p.1910

934. YABEGAWA HYDRO PLANT

Approx. Lat. 33°10'
Long. 130°45'

Company: Toho Denryoku KK; formerly Mizuma Kochi Seiri Kumiai
(Mizuma Arable Land Management Union)

Location: Plant - Ofuchi-mura, Yame-gun, Fukuoka-ken

Capacity Commonly in Use (in kw): 1500, as of Dec 1934

Importance: Rank in Japan - 250 + ; rank in Kyushu supply area - 50 +

Source of Power: Yabe-gawa

Date of Construction: Unknown; in operation as early as June 1928 and as late as Mar 1940

Details: Particular capacities (in kw) - 1500 spec
Plant operates on 60 cyc

Sources: DnN 1940; DJY 1929 p.296; DnGZ 8/32 p.561

935. YABUKAMI HYDRO PLANT

Approx. Lat. 37°15'
Long. 138°59'

Company: Hokuetsu Suiryoku Denki KK

Location: Plant - 160, Hiraji-aza, Imaizumi-oaza, Yabukami-mura,
Kita Uonuma-gun, Niigata-ken

Capacity Commonly in Use (in kw): 8500 (see Date of Construction)

Importance: Rank in Japan - 250 + ; rank in Tohoku supply area - 15 ;
rank in Tokyo supply area - 87

Source of Power: Matsu-kawa and Ishikado-gawa of the Shinano-gawa system

Date of Construction: Construction was begun Nov 1938, turbogenerator units were installed about May 1940, and plant presumably went into operation shortly thereafter.

Details: Particular capacities (in kw) - *8800 installed cap;
2220 reg; 6280 spec
Eff head - 35 m
Plant, equipment -
Turbines - 2 @ 5500 kw, Francis-type, vertical-shaft,
Hitachi-make
Generators - 2 @ 5500 kva, 3-ph, 214/257 rpm, 50/60 cyc,
Hitachi-make

Sources: Ohm 2/39 p.204; HH 1/39 pp.7,10, 1/40 p.7, 7/40 p.404

936. YAFUTOKURA HYDRO PLANT

Approx. Lat. 36°50'
Long. 137°34'

Company: Kurobe Tetsudo KK

Location: Plant - 1406, Nakanoshima-aza, Otosawa-oaza, Ainoto-mura,
Shimo Niikawa-gun, Toyama-ken

Capacity Commonly in Use (in kw): 1500, as of Dec 1934

Importance: Rank in Japan - 250 + ; rank in Osaka-Nagoya supply area-100 +

Source of Power: Yafutokura-tani of the Kurobe-gawa system

Date of Construction: Founded 1923; in operation Dec 1938

Details: Particular capacities (in kw) - *1412 installed cap; 420 reg; 1080 spec

Eff head - 503 ft

Plant, equipment -

Turbines - 1 @ 2200 hp, Francis-type, Dengyosha-make

Generators - 1 @ 1765 kva, 3-ph, 11,000 v, 720 rpm, 60 cyc, Shibaaura-make

Transformers - 6 @ 100 kva, 1-ph, 10.5,10.25,10/3.3,3.15,3 kv, D-D conn, self-cooled, 60 cyc, shell-type, Hitachi-make

3 @ 600 kva, 1-ph, 11/23,22,21 kv, D-D conn, self-cooled, 60 cyc, shell-type, Okumura-make

Sources: DJY 1927; DJY 1929 p.338; ZKT 1939 p.1648

937. YAGUCHI STEAM PLANT

Approx. Lat. 35°33'
Long. 139°42'

Company: Tetsudo-sho

Location: Yaguchi-cho, Omori-ku, Tokyo-shi, Tokyo-fu

Installed Capacity (in kw): 4000, as of 1928 (see Date of Construction)

Importance: Rank in Japan - 250 + ; rank in Tokyo supply area - 100 +

Date of Construction: Unknown; an unconfirmed report reports plant in operation Dec 1928

Sources: TD Map

YAHAGIGAWA NO. 1 HYDRO PLANT - See KOSHIDO HYDRO PLANT

938. YAMABE HYDRO PLANT

Approx. Lat. 37°17'
Long. 138°49'

Company: Tetsudo-sho

Location: Plant - On the left bank of the Shinano-gawa at Kawara-oaza, Yamabe-mura, Kita Uonuma-gun, Niigata-ken
Intake - At tail race of Senju Hydro Plant at Senju-mura, Naka Uonuma-gun, Niigata-ken

Capacity Commonly in Use (in kw): 106,000 (see Date of Construction)

Importance: When completed, rank in Japan - 13 ; rank in Tokyo supply area - 5

Source of Power: Shinano-gawa

Date of Construction: In planning stage 1936; no evidence of completion has been received

Details: Layout - Aqueduct-type; two parallel aqueducts are to lead from tail race of Senju Hydro Plant to forebay of Yamabe Plant
Eff head - 51.573 m
Aqueducts - 2 @ approx 14,000 m long
Penstocks - 5 or 6
Plant operates on 50 cyc

See: Figure No. V-32

Sources: World Power Conference, Washington 1936, v.7 pp.243 ff

939. YAMAKITA HYDRO PLANT

Approx. Lat. 35°21'
Long. 139°04'

Company: Fuji Denryoku KK; formerly Fuji Gasu Boseki KK

Location: Plant - Yamakita-aza, Shimado-oaza, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken

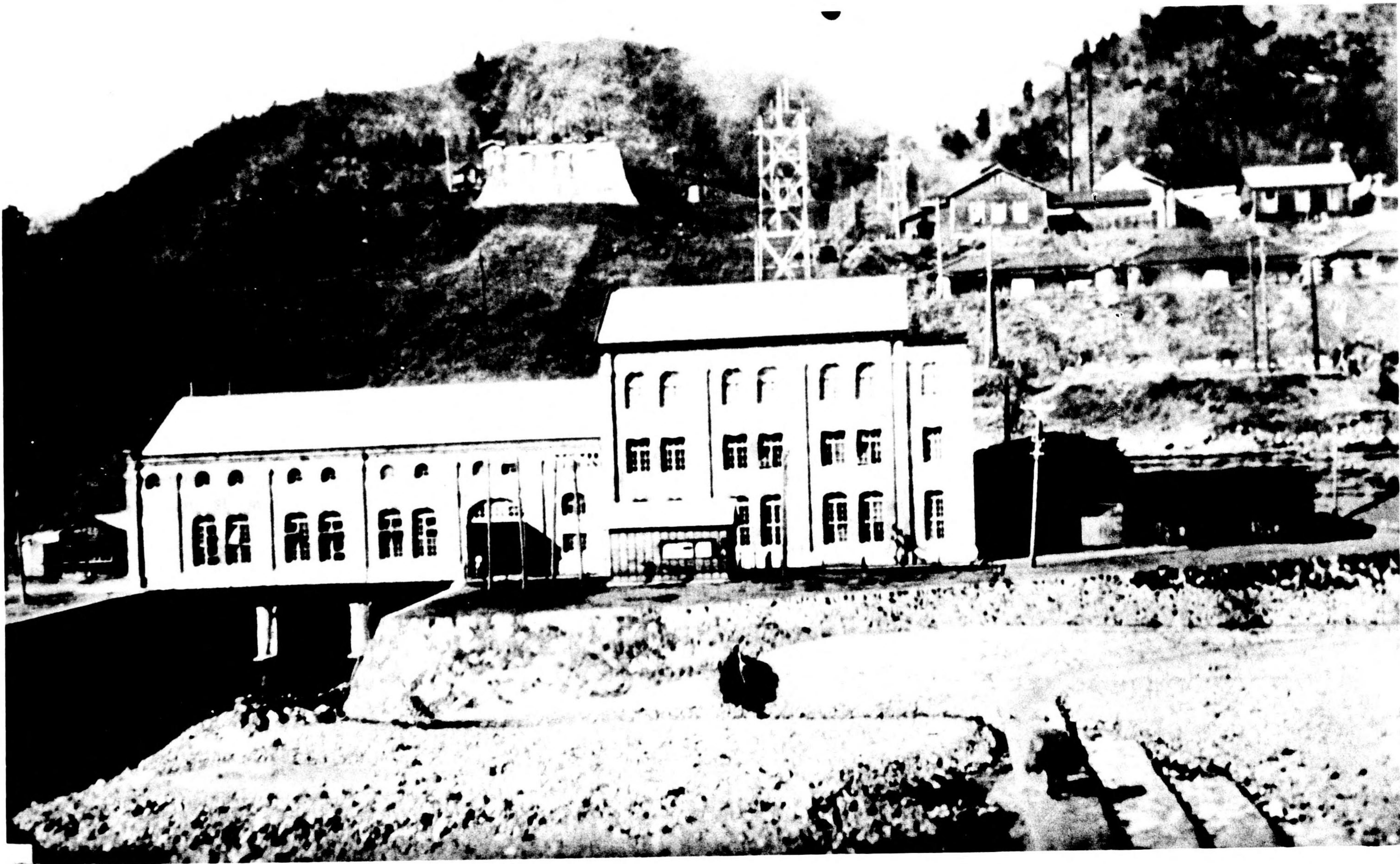
Capacity Commonly in Use (in kw): 4300, as of June 1928

Importance: Rank in Japan - 250 + ; rank in Tokyo supply area - 100 +

Source of Power: Sakawa-gawa

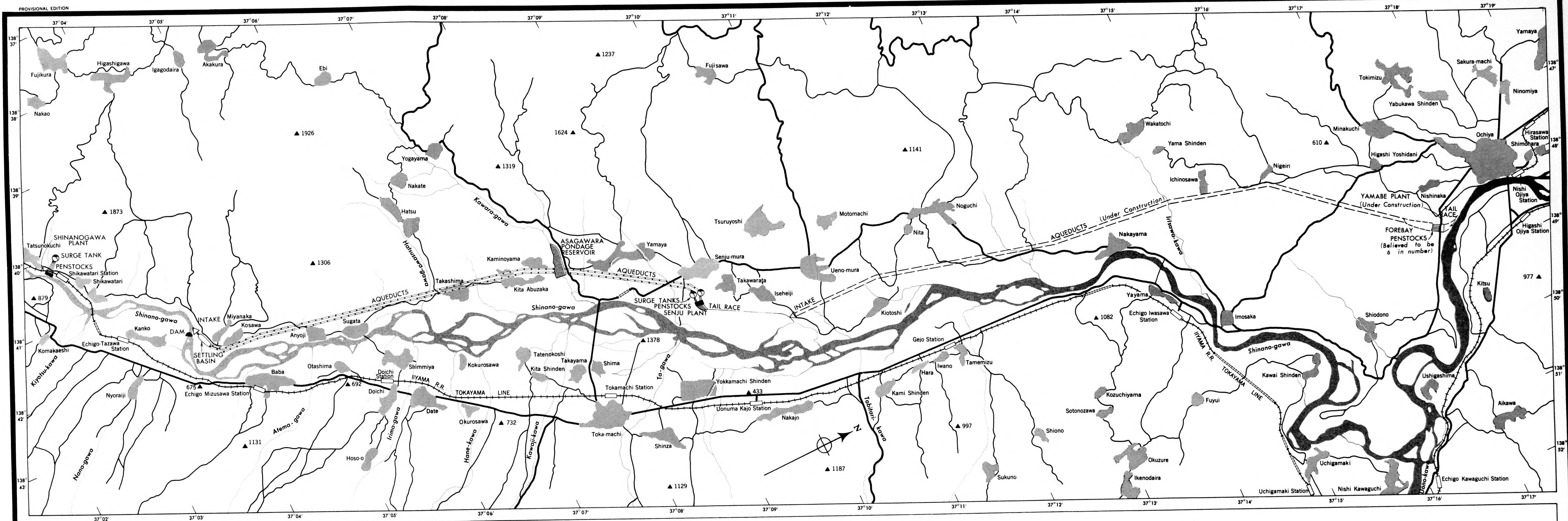
Date of Construction: Founded Dec 1914; in operation Mar 1940

Details: Particular capacities (in kw) - 6450 installed cap;
4300 reg; 5600 reg pk
Layout - Aqueduct-type
Eff head - 136 ft
Penstocks - 3
Plant, external features - Of concrete construction, 2 and 3 stories high with peaked roofs
Plant, equipment -
Turbines - 3 @ 3100 hp, Francis-type, BB-make
Generators - 3 @ 2150 kw, 3-ph, 6600 v, 500 rpm, 50 cyc, ASEA-make
Transformers - 7 (incl 1 res) @ 1600 kva, 1-ph, 6.93, 6.6, 6.27/66 kv, D-D conn, water-cooled, 50 cyc, core-type, AEG-make



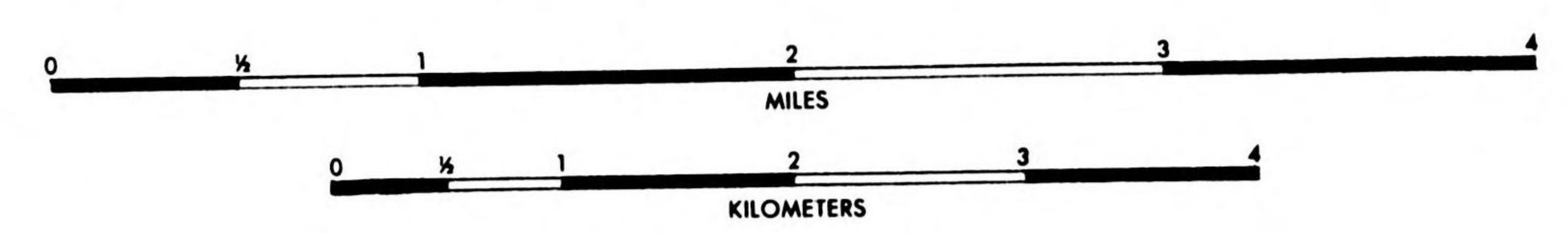
Photograph No. V-89 Yamakita Hydro Plant

RESTRICTED



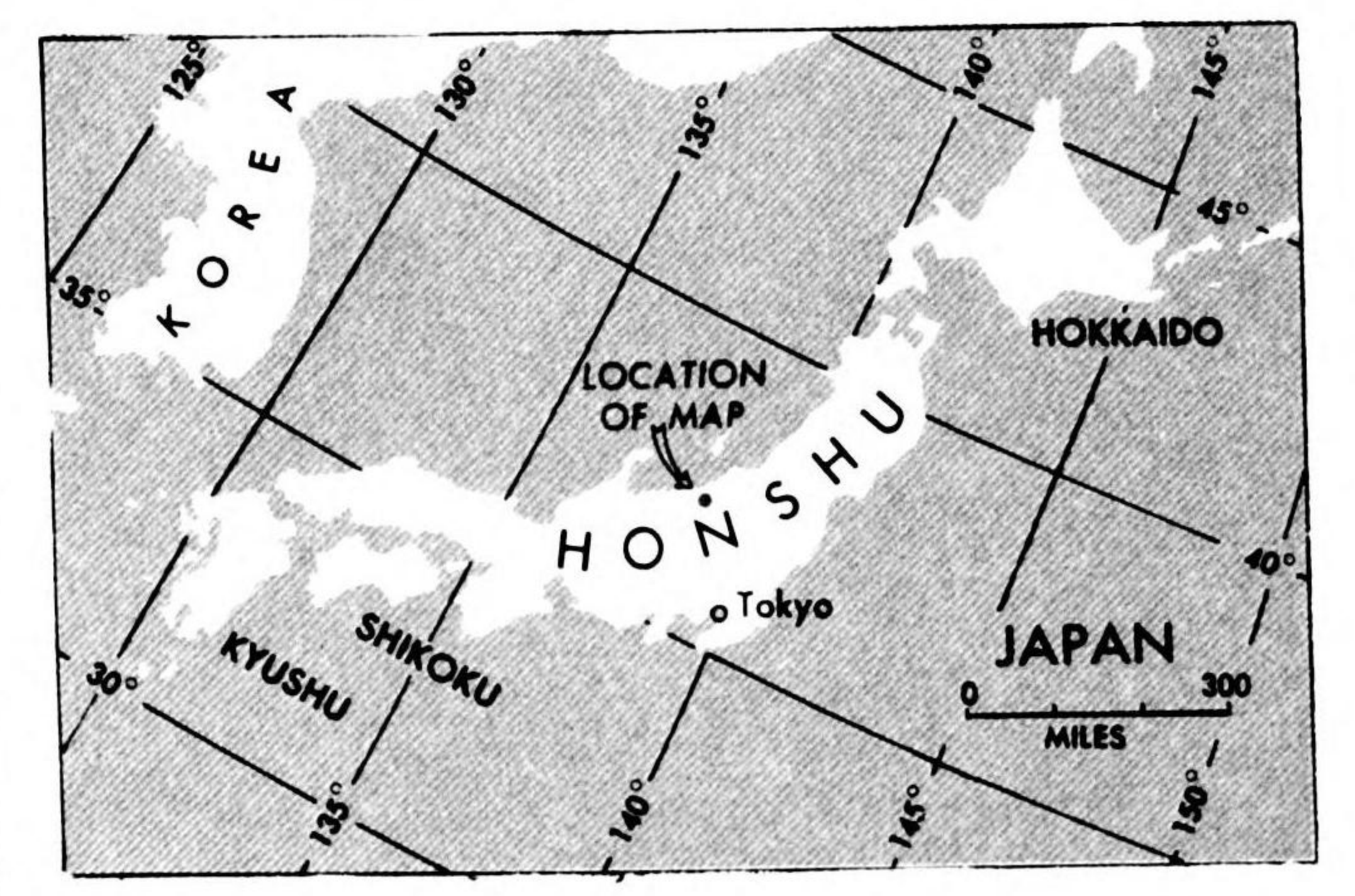
HYDROELECTRIC PLANTS ON THE SHINANO-GAWA NIIGATA-KEN

BASE MAP FROM 1:50,000 SERIES, JAPAN IMPERIAL LAND SURVEY BUREAU
W.D.M.C. FILE NO. JAPAN S30-JGS-50, SHEETS 60-1 (1934), 60-2 (1935), 60-5 (1933), 60-6 (1934)



Reliability Code: 1B-1B-2

- SETTLEMENT CENTER
- PRINCIPAL HIGHWAY
- SECONDARY ROAD
- RAILROAD
- TUNNEL
- SPOT HEIGHT (IN FEET)



See: Photograph No. V-89

Sources: DnN 1940; DJY 1927; DJY 1929 p.306; ZKT 1939 p.1644; DnK

940. YAMANO HYDRO PLANT

Approx. Lat. 34°40'
Long. 133°22'

Company: Fukuyama Denki KK

Location: Plant - Yamano-mura, Fukayasu-gun, Hiroshima-ken

Capacity Commonly in Use (in kw): Est 2006, as of 1936

Importance: Rank in Japan -250 + ; rank in Chugoku supply area - 25 +

Source of Power: Believed to be Oda-gawa

Date of Construction: Unknown; in operation as early as Dec 1934 and as recently as Mar 1940

Details: Plant operates on 60 cyc

Sources: DnN 1940; DnK

941. YAMASAKI HYDRO PLANT

Approx. Lat. 35°14'
Long. 139°07'

Company: Nippon Denryoku KK

Location: Plant - Shimo Kochi-aza, on the boundary line between Yumoto-machi and Okubo-mura in Ashigarashimo-gun, Kanagawa-ken

Capacity Commonly in Use (in kw): 1450, as of Oct 1936

Importance: Rank in Japan - 250 + ; rank in Tokyo supply area - 100 +

Source of Power: Haya-kawa

Date of Construction: Completed Oct 1936; in operation Mar 1940

Details: Particular capacities (in kw) - *1280 installed cap; 460 reg; 990 spec
Eff head - 60 m; flow - 3.06 m³/sec
Plant, external features - Of concrete construction and modernistic design, 1 and 2 stories high
Plant, equipment -
Turbines - 1 @ 1800 kw, Francis-type, Hitachi-make
Generators - 1 @ 1600 kva, 3-ph, 50 cyc, Hitachi-make

See: Photograph No. V-90

Sources: DnN 1940; DnGZ 12/36 p.(89); Ohm 1/37 p.118

942. YAMASATO HYDRO PLANT

Approx. Lat. 37°36'
Long. 139°41'

Company: Toshin Denki KK; formerly Showa Hiryo KK

Location: Plant -(Probably Chiisagamine-oaza), Yamasato-mura, Yamagun, Fukushima-ken

Capacity Commonly in Use (in kw): 33,500 (see Date of Construction)

Importance: Rank in Japan -67 ; rank in Tokyo supply area -23
It was planned to serve the ammonium sulphate plants of the Showa Hiryo KK

Source of Power: Agano-gawa

Date of Construction: Construction was begun in Mar 1939 and completed in early 1941; in operation Aug 1941

Details: Particular capacities (in kw) - 6700 reg; 26,800 spec;
25,100 reg pk
Eff head - 17 m
Plant, equipment -
Turbines - 2 @ 15,200 kw, Kaplan-type, vertical-shaft, probably Mitsubishi-make
Generators - 2 @ unknown cap, 3-ph, 125 rpm, 50 cyc, probably Mitsubishi-make

Sources: Ohm 4/34 p.293, 7/39 p.694, 9/41 pp.678 ff; TKS 12/7/40 p.53

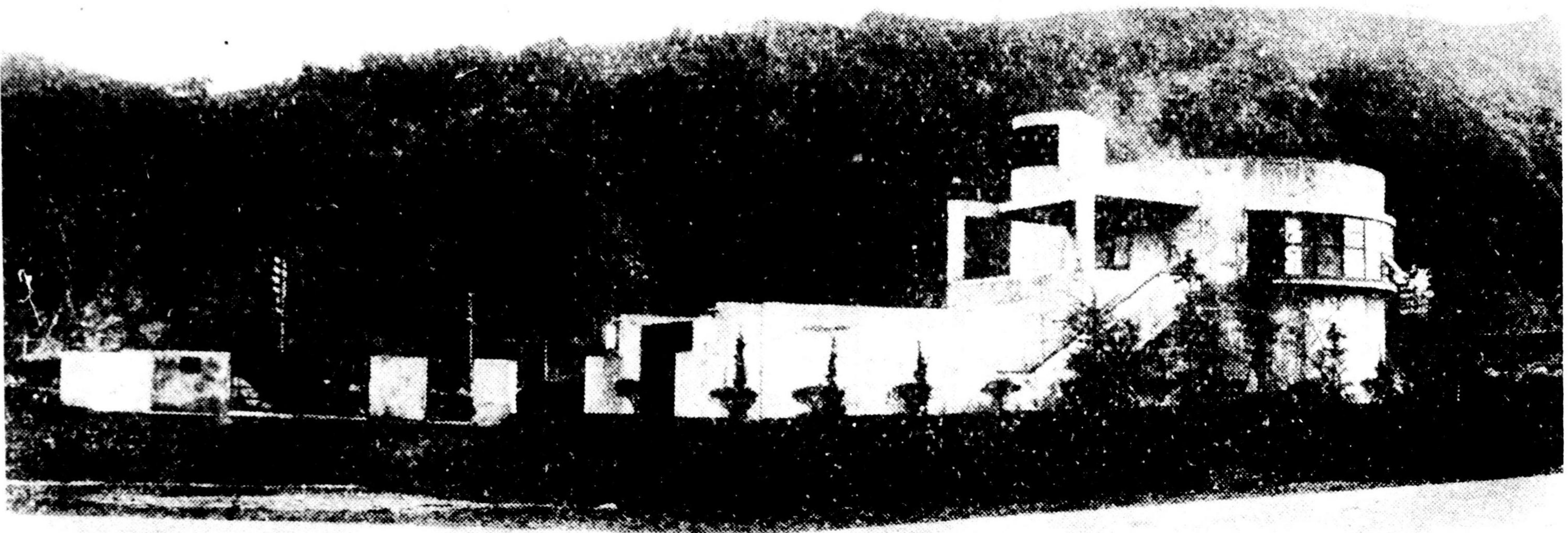
YAMASUBARA HYDRO PLANT - See YAMASUHARA HYDRO PLANT

943. YAMASUHARA HYDRO PLANT

Approx. Lat. 32°28'
Long. 131°22'

Company: Kyushu Soden KK; formerly Sumitomo, Kichizaemon

Location: Plant - Shokushitsunodaira-aza, Yamasanka-oaza, Saigomura, Higashi Usuki-gun, Miyazaki-ken



Photograph No. V-90 Yamasaki Hydro Plant in 1936

RESTRICTED

Capacity Commonly in Use (in kw): 13,000, as of Dec 1936

Importance: Rank in Japan - 180 ; rank in Kyushu supply area - 27

Source of Power: Mimi-gawa

Date of Construction: Completed Jan 1932; in operation Mar 1940

Details: Particular capacities (in kw) - *12,800 installed cap;
3200 reg; 9800 spec; 7200 reg pk

Layout - Aqueduct-type

Eff head - 40.5 m; flow - 38.96 m³/sec

Dam - 25.8 m high, 91.2 m long, overflow gravity-type
with tainter gates

Penstocks - 2

Plant, equipment -

Turbines - 2 @ 11,000 hp, Francis-type, vertical-shaft,
Hitachi-make

Generators - 2 @ 8000 kva, 3-ph, 11,000 v, 231/277 rpm,
50/60 cyc, Hitachi-make

Transformers - 4 @ 5500 kva, 1-ph, 11/63.5, 66, 69.5 kv,
D-Y conn, water-cooled, 50/60 cyc, core-type,
Shibaura-make

Area served - North Kyushu, as of 1933

See: Figure No. V-23

Sources: DnN 1940; Ohm 7/32 p.397; DnK; Ohm-sha Guide 1933 p.19; DnGZ
8/33 p.673

944. YAMURA HYDRO PLANT

Approx. Lat. 35°33'
Long. 138°54'

Company: Tokyo Dento KK

Location: Plant - 2165, Shimoya-aza, Yamura-machi, Minami Tsuru-gun,
Yamanashi-ken

Capacity Commonly in Use (in kw): 13,500, as of Dec 1936

Importance: Rank in Japan - 172 ; rank in Tokyo supply area - 63

Source of Power: Katsura-gawa of the Sagami-gawa system

Date of Construction: Completed in May 1920; in operation Mar 1940

Details: Particular capacities (in kw) - 19,200 installed cap;
11,000 reg; 2500 spec

Layout - Aqueduct-type

Eff head - 113.33 m; flow - 15.3 m³/sec

Dam - Of rubble concrete with stone pitching, 9.4 m long,
3.94 m high

Intake - 8 gates

Settling basins - 1 - 49.1 m long

2 - 12.1 m long, 3.3 m wide

Aqueducts - 421 m open channel, 449 m culvert, 4310 m
tunnel with 3 aqueduct bridges

Forebay - 231 m² water surface
 Penstocks - 4 @ 255.5 m long
 Excess water spillway - 295 m long
 Plant, external features - Of brick, 2 stories high
 with 4 basement floors; 16 wooden shacks are located
 nearby
 Plant, equipment -
 Turbines - 4 @ 7000 hp, Francis-type, vertical-shaft,
 EW-make
 Generators - 4 @ 6000 kva, 80% pf, 3-ph, 11,000 v,
 500 rpm, 50 cyc, GE-make
 Transformers - 9 (incl 3 res) @ 3180 kva, 1-ph, 11/40.5
 kv, D-Y conn, water-cooled, 50 cyc, shell-type,
 GE-make
 Other equipment - 4 exciters @ 50 kw; 1 crane @ 40-ton
 cap and 2 cranes @ 6-ton cap

See: Photograph No. V-90a
 Figure No. V-2

Sources: DJY 1927; DJY 1929 p.298; DnK; ZKT 1939 p.1647; Ohm 6/31
 supp p.6; 10/33 opp p.561; DnN 1940; Ohm-sha Guide 1933 p.13;
TD Map

945. YANAGAWARA HYDRO PLANT

Approx. Lat. 36°50'
 Long. 137°34'

Company: Nippon Denryoku KK

Location: Plant - 3, Osebatani-aza, Ootosawa-oaza, Aimoto-mura,
 Shimo Niikawa-gun, Toyama-ken, at the dam of the Aimoto
 Hydro Plant

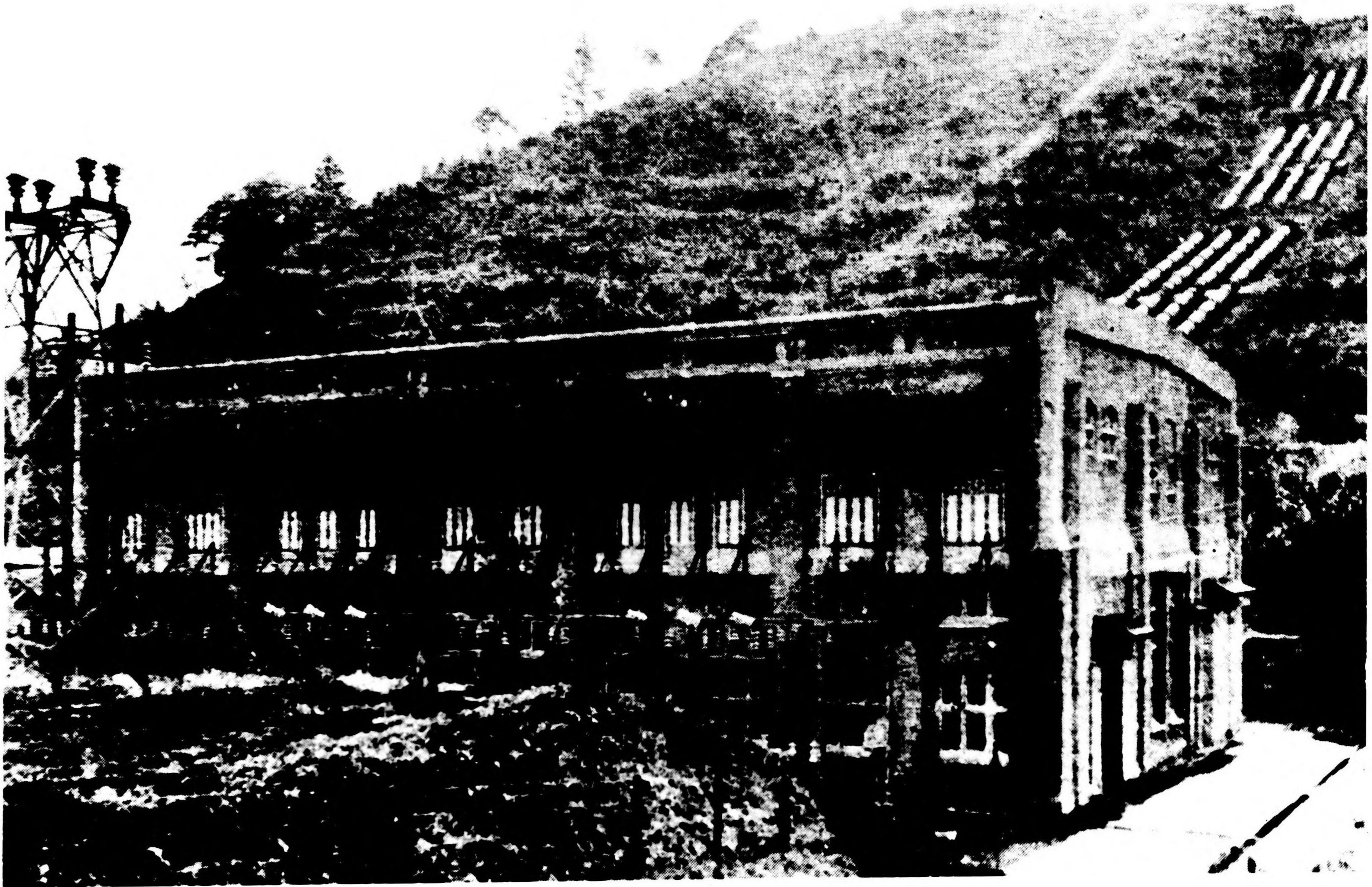
Capacity Commonly in Use (in kw): 50,700, as of 1938

Importance: Rank in Japan - 39 ; rank in Tokyo supply area - 15 ;
 rank in Osaka-Nagoya supply area - 17 .

Source of Power: Kurobe-gawa and Kuronagi-gawa

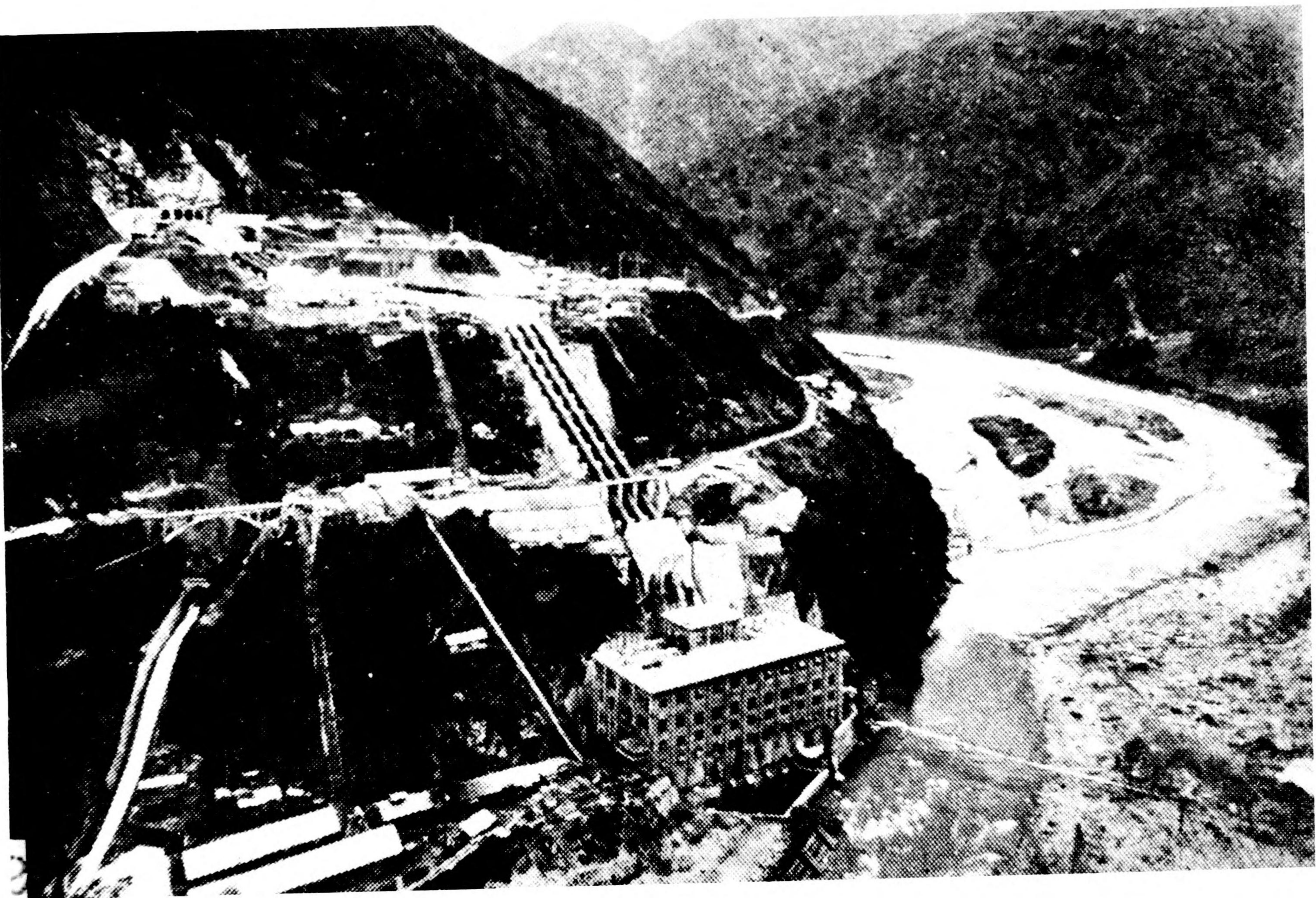
Date of Construction: Completed Nov 1927; in operation Mar 1940

Details: Particular capacities (in kw) - *48,000 installed cap;
 20,300 reg; 30,400 spec
 Layout - Aqueduct-type
 Eff head - 123 m; flow - 48.7 m³/sec
 Aqueduct - 9300 m long
 Penstocks - 3
 Log chute - 4.5 m wide, 0.9 m deep, 39 m long
 Fishway - 3.6 m wide
 Plant, external features - Of concrete construction,
 4 stories high



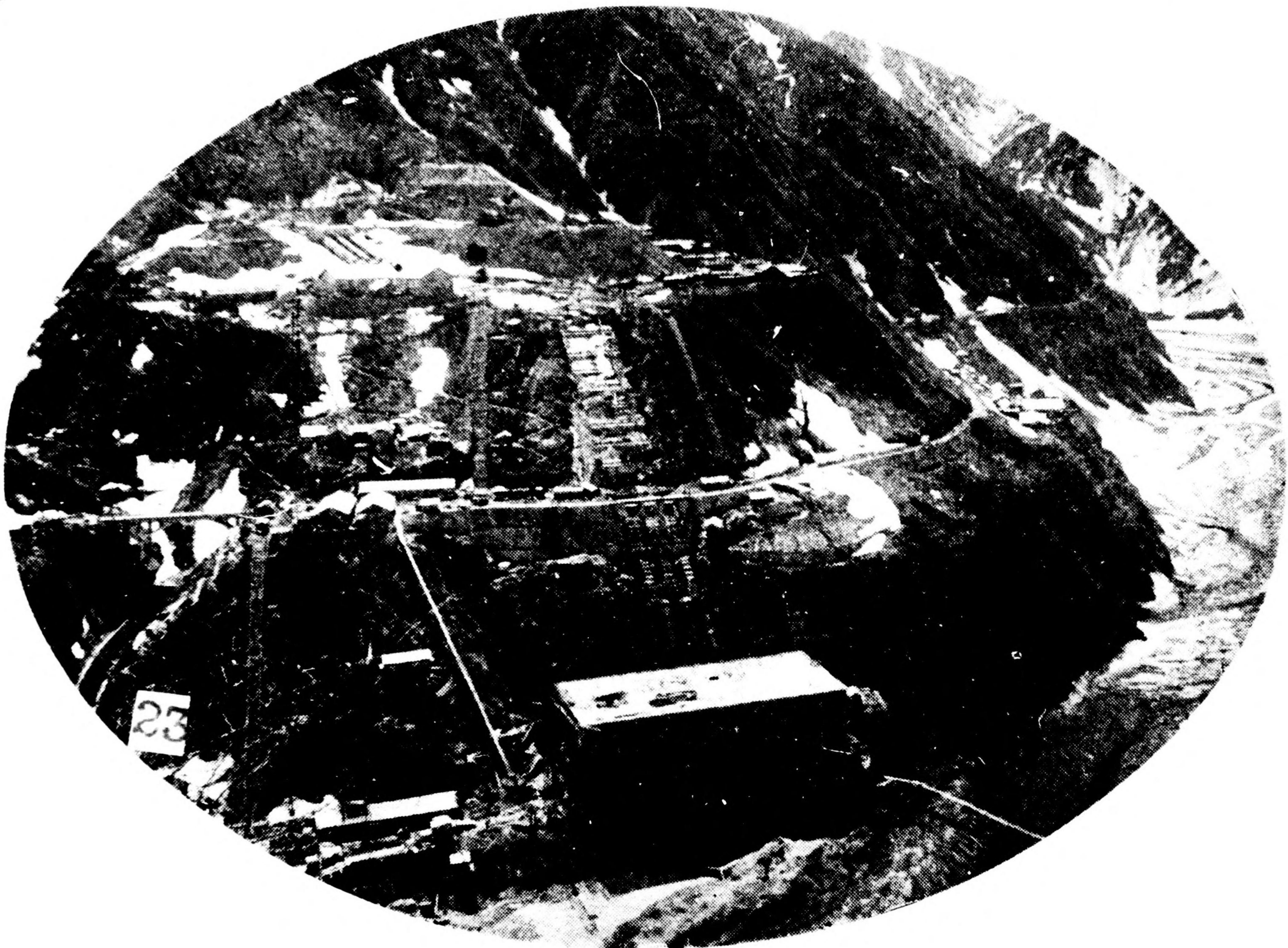
Photograph No. V-90a Yamura Hydro Plant
OSS R 114086

CONFIDENTIAL



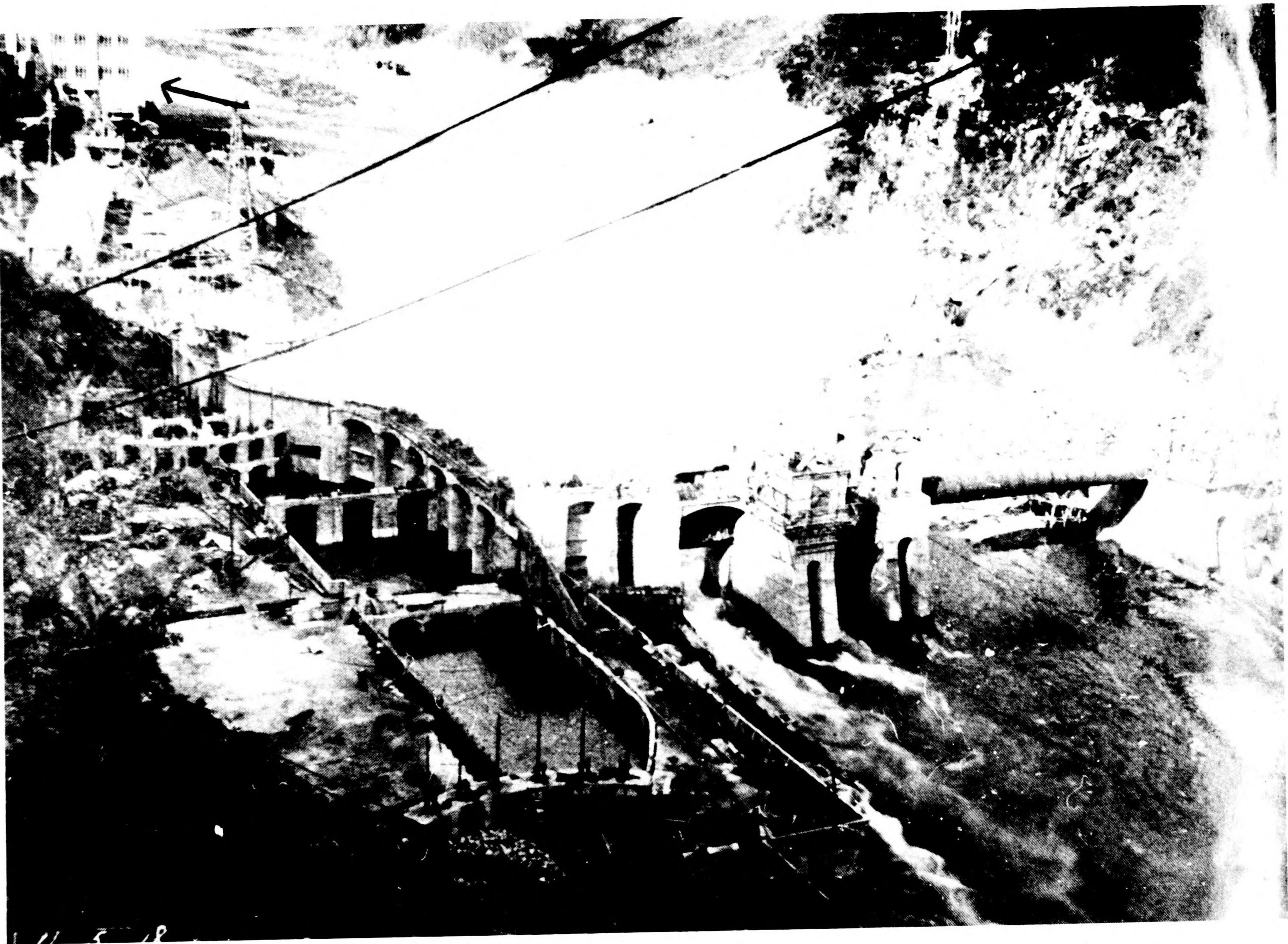
Photograph No. V-91 Yanagawara Hydro Plant in 1928

RESTRICTED



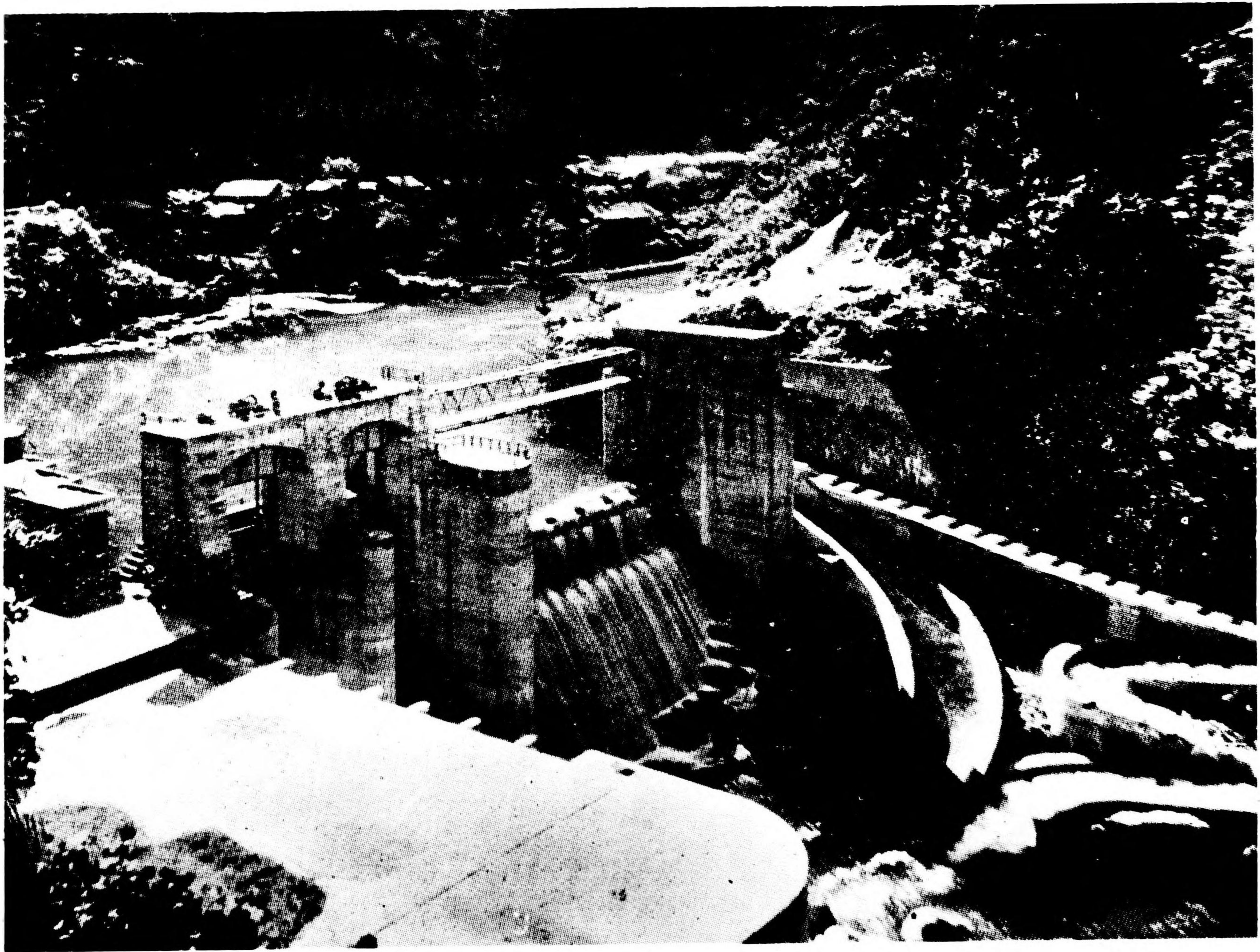
Photograph No. V-92 Yanagawara Hydro Plant under construction in 1927

RESTRICTED



Photograph No. V-93 Yanagawara Hydro Plant (arrow).
The dam of the Almoto Hydro Plant is in
the foreground.

RESTRICTED



Photograph No. V-93a Nekomata Dam of the Yanagawara
Hydro Plant
OSS R 114087

CONFIDENTIAL

Plant, equipment -
Turbines - 3 @ 27,500 hp, Francis-type, vertical-shaft,
EW-make
Generators - 3 @ 20,000 kva, 3-ph, 11,000 v, 300/360 rpm,
50/60 cyc, W-make
Transformers - 7 @ 10,000 kva, 1-ph, 11/89,93.5,98 kv,
D-Y conn, 50/60 cyc, water-cooled, core-type,
Shibaura-make
Area served - Kansai, Kanto, and Nagoya districts

See: Photographs V-91, V-92, V-93, V-93a
Figure No. V-33

Sources: Ohm 7/27 pp.286,370, 9/27 p.398, 1/28 inside front cover,
5/29 p.260, 6/31 supp p.6, 4/32 p.239; Ohm-sha Guide 1933 p.3;
DnGZ 8/28 Eng Ed p.97, Jap Ed p.828, 9/31 p.556, 12/35 p.(56);
DnN 1940; ZKT 1939 p.1648; HSG pp.5,231,318,324

946. YANAGISE HYDRO PLANT

Approx. Lat. 33°52'
Long. 135°28'

Company: Toho Denryoku KK; formerly Keihan Denki KK

Location: Plant - Shimo Sanji-mura, Hitaka-gun, Wakayama-ken

Capacity Commonly in Use (in kw): 1800, as of Dec 1934

Importance: Rank in Japan - 250 + ; rank in Osaka-Nagoya supply area -100+

Source of Power: Hitaka-kawa

Date of Construction: Unknown; in operation as early as 1926 and as
recently as Mar 1940

Details: Particular capacities (in kw) - *1600 installed cap; 725
reg; 1075 spec

Eff head - 130 ft

Plant, equipment -

Turbines - 2 @ 1200 hp, Francis-type, Dengyosha-make

Generators - 2 @ 1000 kva, 3300 v, 600 rpm, 60 cyc,
Shibaura-make

Transformers - 3 @ 700 kva, 1-ph, 3.3/33 kv, D-D conn,
water-cooled, shell-type, Shibaura-make

Sources: DJY 1927; DJY 1929 p.352; DnN 1940

947. YANAI HYDRO PLANT

Approx. Lat. 36°08'
Long. 139°01'

Company: Tokyo Dento KK

Location: Plant - Tetsuku-aza, Yanai-mura, Chichibu-gun, Saitama-ken

Capacity Commonly in Use (in kw): 1100, as of May 1936

Importance: Rank in Japan -250 † ; rank in Tokyo supply area - 100 †

Source of Power: Shinryu-gawa of the Tone-gawa system

Date of Construction: Completed Nov 1914; in operation Mar 1940

Details: Particular capacities (in kw) - 1500 installed cap; 1100 reg
Eff head - 70.85 m; flow - 2.23 m³/sec

Plant, equipment -

Turbines - 2 @ 1375 hp, Francis-type, horizontal-shaft,
Voith-make

Generators - 2 @ 937.5 kva, 80% pf, 3-ph, 3450 v,
600 rpm, 50 cyc, Shibaura-make

Transformers - 4 (incl 1 res) @ 625 kva, 1-ph, 3.45/35
kv, D-D conn, water-cooled, 50 cyc, shell-type,
Shibaura-make

Sources: DnN 1940; ZKT 1939 p.1645; DJY 1927; DJY 1929 p.306

948. YAOTSU HYDRO PLANT

Approx. Lat. 35°28'
Long. 137°09'

Company: Toho Denryoku KK

Location: Plant - 1770, Kagami-aza, Yaotsu-machi, Kamo-gun,
Gifu-ken

Capacity Commonly in Use (in kw): 9600, as of 1936 (see Date of
Construction). An unconfirmed report estimates the capacity
commonly in use at 19,600 kw

Importance: Rank in Japan -250 † ; rank in Osaka-Nagoya supply area- 98

Source of Power: Kiso-gawa

Date of Construction: Completed in Dec 1910 with 4 GE-make generators
@ 3125 kva; beginning in 1931 and completed by 1936, these units
were rebuilt by Shibaura and their cap was increased to 4375 kva.
Plant in operation Mar 1940.

Details: Particular capacities (in kw) - 14,000 installed cap;
9600 reg

Layout - Aqueduct-type

Eff head - 46.227 m; flow - 28.3 m³/sec

Dam -168 ft long at top, of concrete with stone pitching

Penstocks - 4 large and 2 small @ 580 ft long

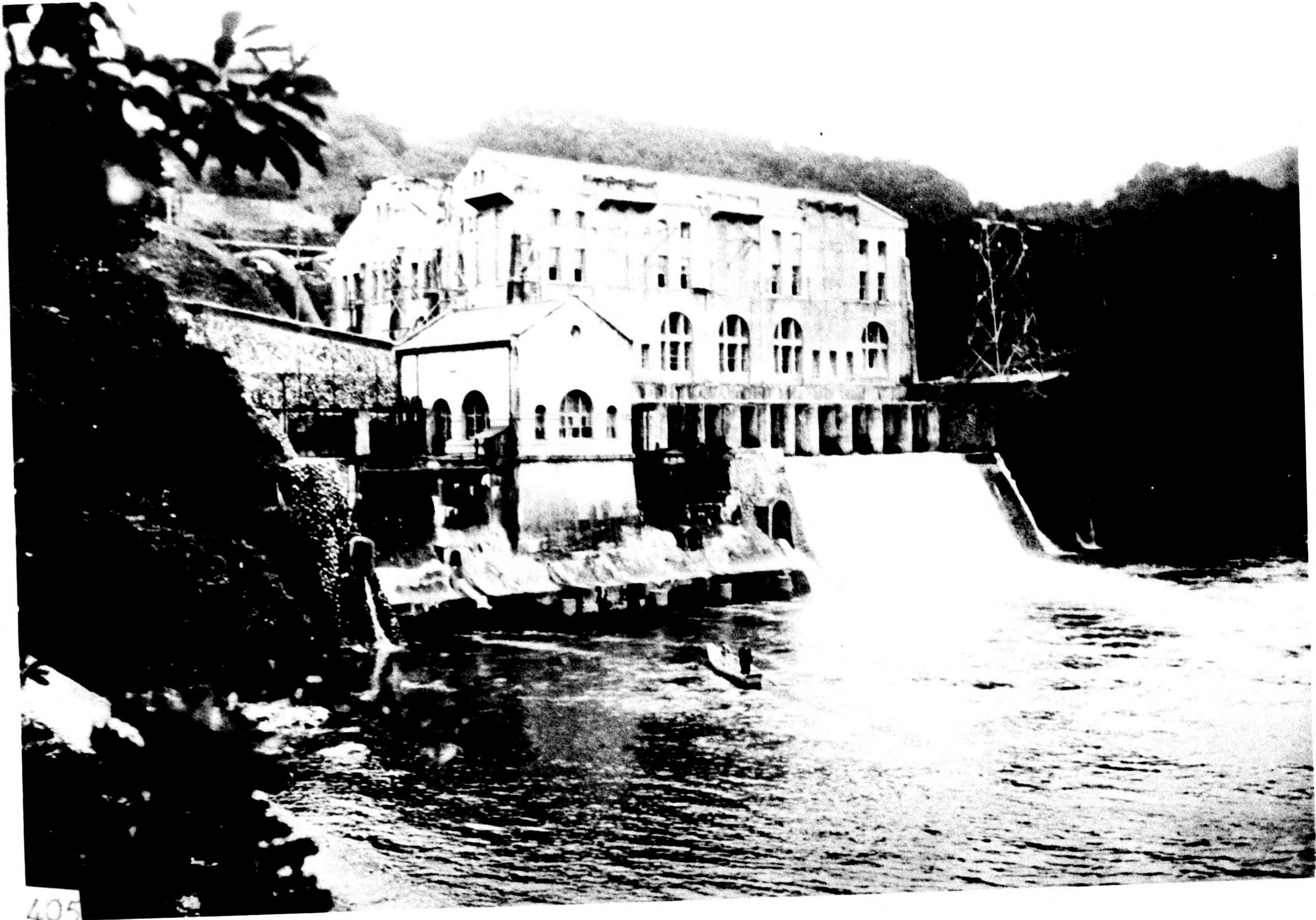
Plant, external features - Of concrete construction, 3
stories high with double peaked galvanized iron roof.

Plant, equipment -

Turbines - 4 @ 4600 hp, Francis-type, horizontal-shaft,
Dengyosha-make

Generators - 4 @ 4375 kva, 80% pf, 3-ph, 6600 v, 360 rpm,
60 cyc, GE-make, Shibaura-reconditioned

Photograph No. V-94 Yaotsu Hydro Plant



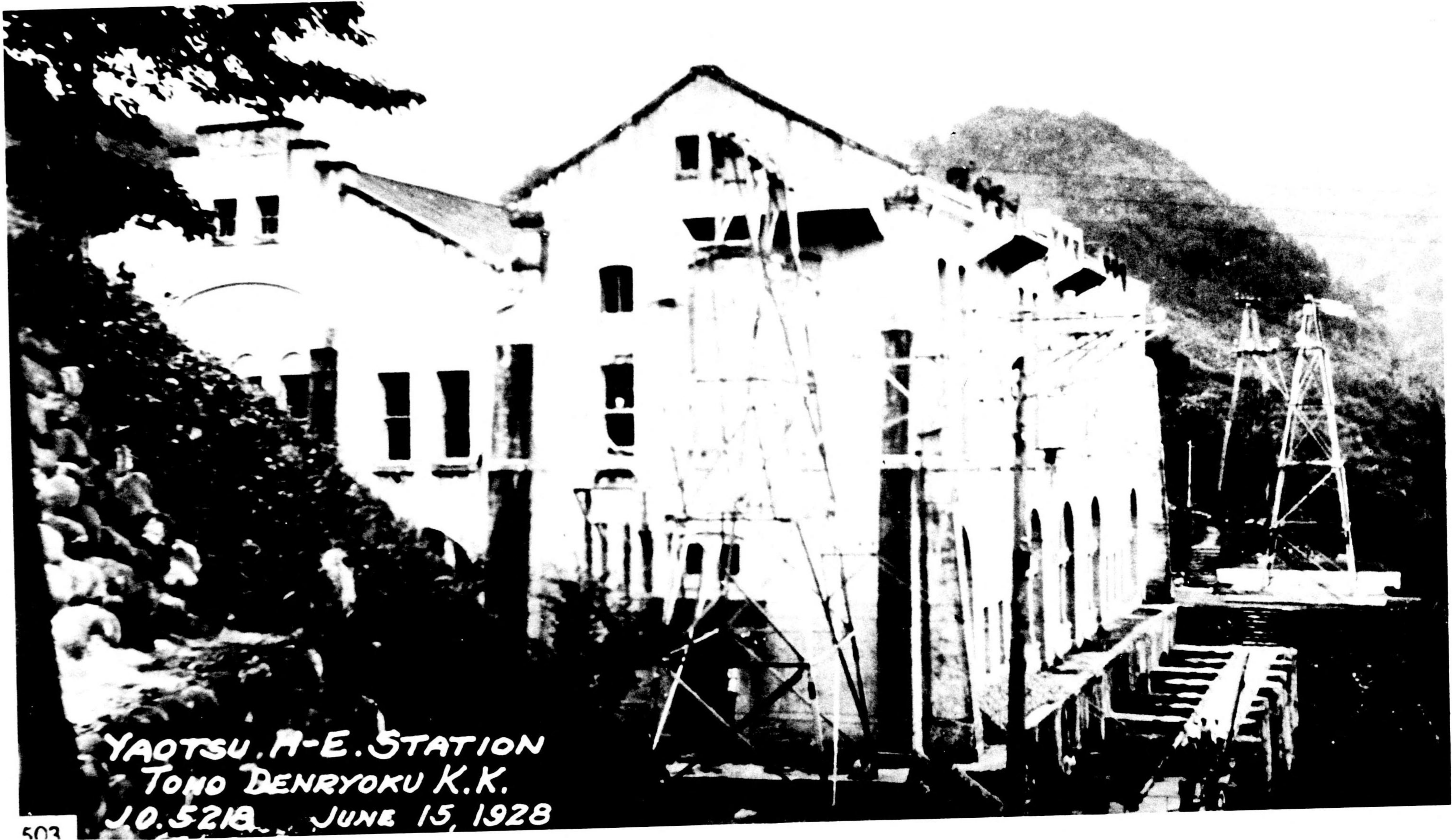
RESTRICTED



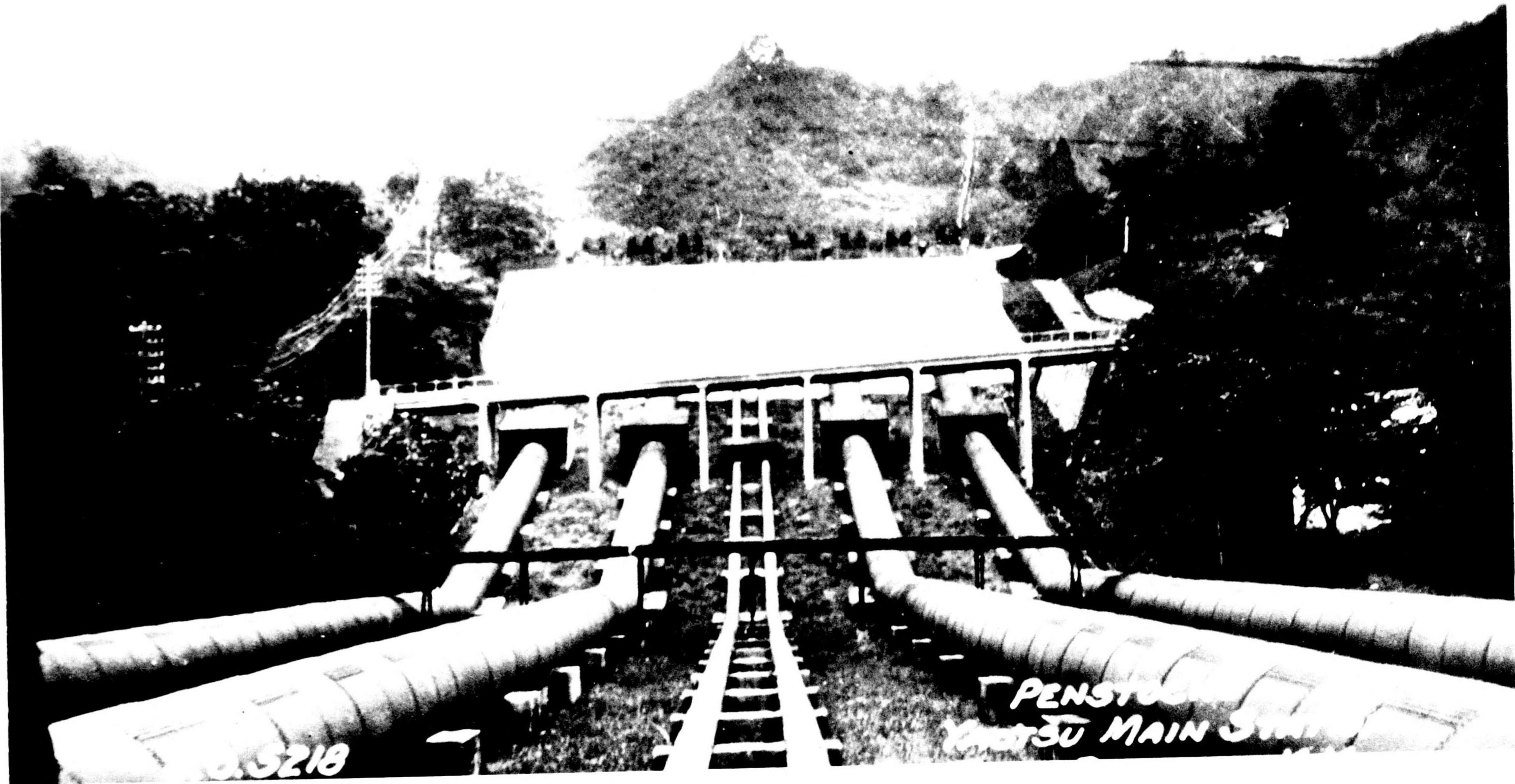
Photograph No. V-95 Yaotsu Hydro Plant

RESTRICTED

Photograph No. V-96 Yaotsu Hydro Plant in 1928



RESTRICTED



Photograph No. V-97 Yaotsu Hydro Plant penstocks
from the forebay

RESTRICTED