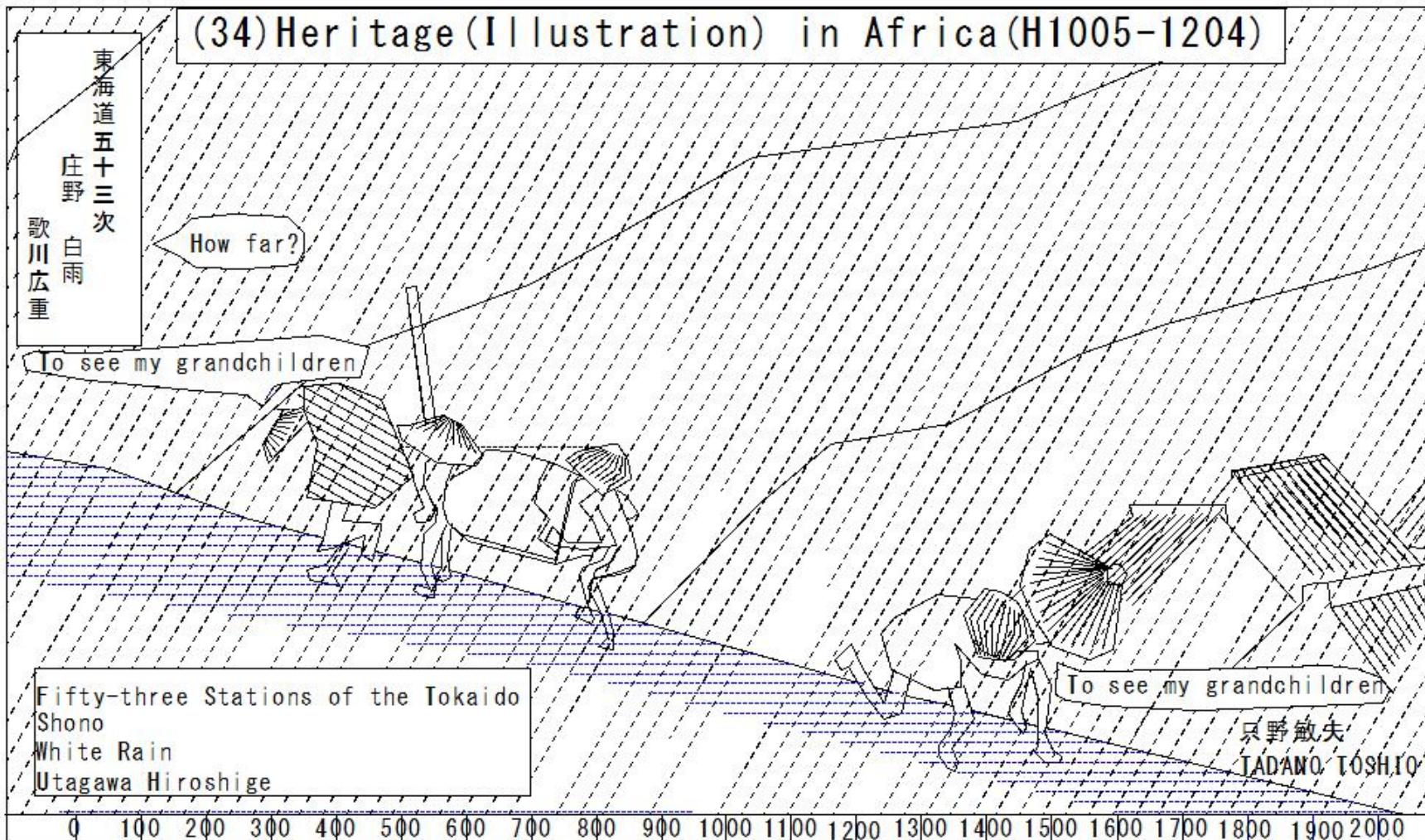


(34) Heritage (Illustration) in Africa (H1005-1204)



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3 林業土木ハンドブック Forestry Civil Engineering Handbook		千代田出版 Chiyoda Publishing Co., Ltd.
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9 土木コンクリート用語集 Glossary of civil engineering and concrete terms		東洋書店 Toyo Shoten Co., Ltd.
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		オーム社 Ohmsha

①香貫用水

① Kanuki Irrigation Canal

②寺谷用水

②Teratani Irrigation Canal

③本宿用水

③Honjuku Irrigation Canal

④北山用水

④Kitayama Irrigation System

⑤上江用水路(新潟県・上越市・妙高市)

Uwae Irrigation Canal

(Niigata Prefecture, Joetsu City, Myoko City)

⑥常西合口用水(富山県富山市)

Josaigoguchi Irrigation Canal

(Toyama City, Toyama Prefecture)

⑦七ヶ用水(石川県・白山市 他)

⑦Shichikayousui Irrigation Canal (Ishikawa)

沼津市産業振興部

Numazu City Industrial Promotion Department

郷土史講座「沼津あれこれ塾」

Local History Lecture Series "Numazu All About School"

静岡県公式ホームページ

Shizuoka Prefecture Official Website

静岡県・磐田市 寺谷用水土地改良区

Shizuoka Prefecture/Iwata City Teratani Irrigation Water Land Improvement District

静岡県磐田市教育委員会

Iwata City Board of Education, Shizuoka Prefecture

静岡県・長泉町産業振興課

Shizuoka Prefecture, Nagaizumi Town Industrial Promotion Division

静岡県富士宮市北山用水運営協力委員会

Kitayama Irrigation Canal Management Cooperation Committee,

Fujinomiya City, Shizuoka Prefecture

静岡県富士宮市

Fujinomiya City, Shizuoka Prefecture

富士宮市立中央図書館

Fujinomiya City Central Library

静岡県富士宮市 文化課埋蔵文化財センター

Fujinomiya City, Shizuoka Prefecture, Cultural Affairs Division,
Buried Cultural Properties Center

関川水系土地改良区

Sekigawa River Watershed Land Improvement District

水土里ネット関川水系

Water and Land Network Sekigawa River Watershed

水土里ネット富山

Midori Net Toyama

常西用水土地改良区

Josai Irrigation Land Improvement District

水土里ネットみやたけ(手取川宮竹用水土地改良区)

Miyatake Water and Land Network

(Tedorri River Miyatake Irrigation Canal Land Improvement District)

水土里ネット石川

- ⑧足羽川用水 [福井県・福井市]
⑧Asuwagawa Irrigation Canal (Fukui)
- ⑨曾代用水 (岐阜県・関市 他)
⑨Sodaiyousui Irrigation System(Gifu)
- ⑩入鹿池(愛知県犬山市)
⑩Iruka Pond (Inuyama City, Aichi Prefecture)

Ishikawa Perfectural Federation of Land Improvement Association
手取川七ヶ用水土地改良区
Tedori River Shichika Irrigation Canal Land Improvement District
白山市公式ホームページ
Hakusan City Official Website
足羽川堰堤土地改良区連合
Asuwagawa Dam Land Improvement District Association
曾代用水土地改良区
Sodaiyousui Land Improvement District
愛知県土地改良事業団体連合会(水土里ネット愛知)
Aichi Prefectural Land Improvement Association (Midori Net Aichi)
(愛知県犬山市)
(Inuyama City, Aichi Prefecture)

(He1005) Kanuki Irrigation Canal (Shizuoka)
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- (1141) Shichikayousui Irrigation Canal (Hakusan City, Ishikawa Prefecture, etc.)
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- (He1171) Sodaiyousui Irrigation System (Gifu Prefecture, Seki City, etc.)
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- (He1173) Sodaiyousui Irrigation System (Gifu Prefecture, Seki City, etc.)
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- (He1185)Iruka Pond (Inuyama City, Aichi Prefecture)
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- (He1204)Iruka Pond (Inuyama City, Aichi Prefecture)

(He1005)Genbegawa Irrigation Canal(Shizuoka)

(He1005) Kanuki Irrigation Canal (Shizuoka)

■ Kanuki Irrigation Canal

(Numazu City, Shizuoka Prefecture)

- ① To provide a stable supply of agricultural water to the area near the left bank of the mighty Kano River, which suffered from water shortages despite being located along the river.
- ② This approximately 5km-long agricultural canal was constructed by Ueda Naizen in the early 17th century.

■ Kanuki Irrigation Canal

(Numazu City, Shizuoka Prefecture)

Kano River

5km-long

Ueda Naizen

early 17th century



He1005



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(He1006) Kanuki Irrigation Canal (Shizuoka)

(He1006) Kanuki Irrigation Canal (Shizuoka)

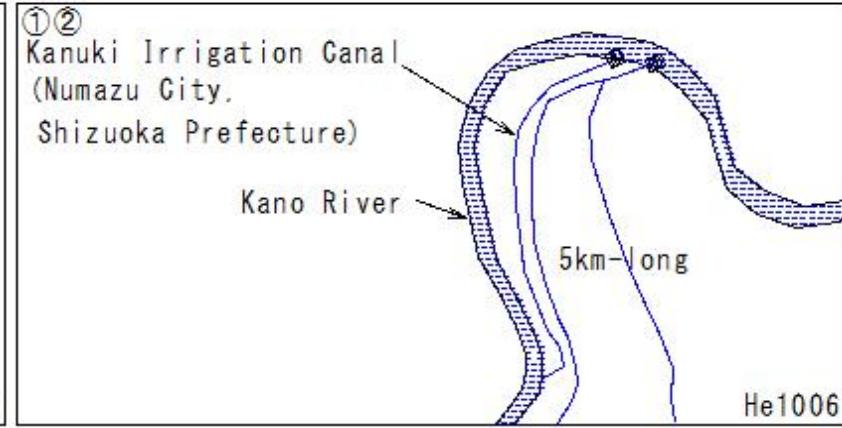
■ Kanuki Irrigation Canal

(Numazu City, Shizuoka Prefecture)

- ① To provide a stable supply of agricultural water to the area near the left bank of the mighty Kano River, which suffered from water shortages despite being located along the river.
- ② This approximately 5km-long agricultural canal was constructed by Ueda Naizen in the early 17th century.

Kanuki Irrigation Canal
(Numazu City, Shizuoka Prefecture)

Kano River
5km-long
Ueda Naizen
early 17th century



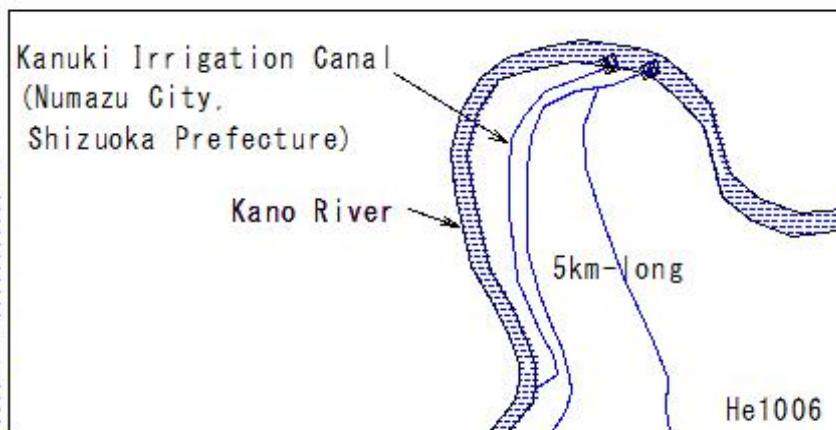
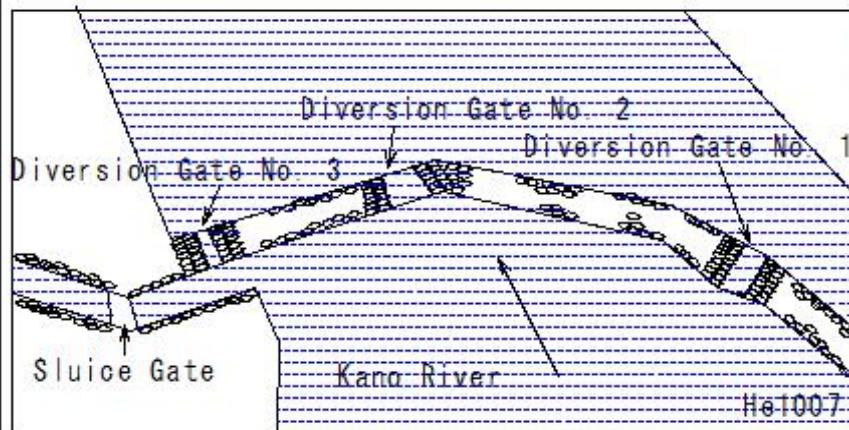
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(He1007) Kanuki Irrigation Canal (Shizuoka)

(He1007) Kanuki Irrigation Canal (Shizuoka)

■ Facility Construction

- ③ A crescent-shaped stone weir was installed at the intake, and a river storehouse was placed on the extension of the weir to raise the water level.
- ④ The water level was raised by damming up the water flow using horizontal logs, bamboo, and straw mats called "water-shedding gates."
- ⑤ Three gates were installed to allow water to flow during heavy rain.
- ⑥ Because the irrigation canal near the intake was built on sandy soil, furnace ash was mixed into the sand.
- ⑦ Through these and other measures to prevent water from seeping in, long-awaited agricultural water was successfully brought to the Kanuki area.

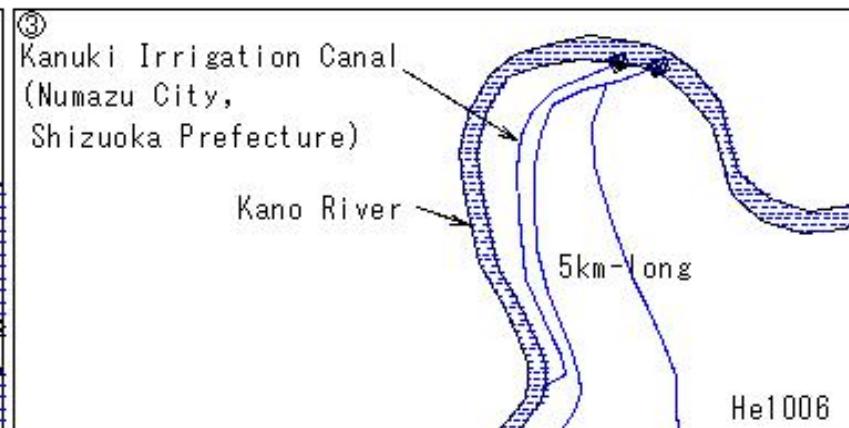
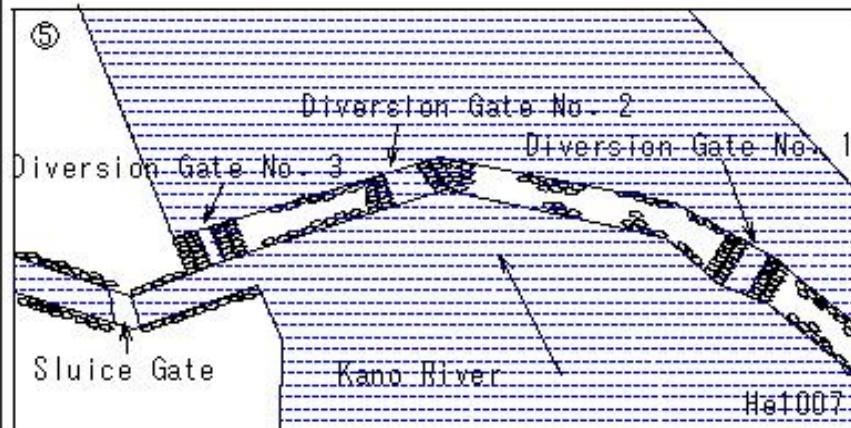
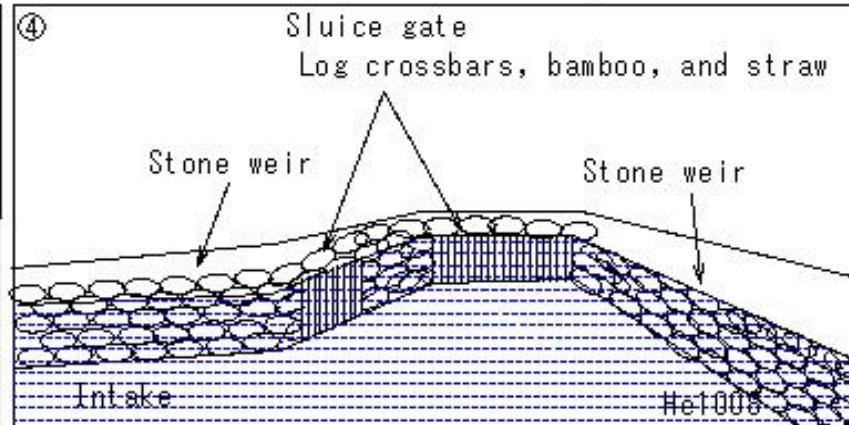


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(He1008) Kanuki Irrigation Canal (Shizuoka)

(He1008) Kanuki Irrigation Canal (Shizuoka)

- ③ A crescent-shaped stone weir was installed at the intake, and a river storehouse was placed on the extension of the weir to raise the water level.
- ④ The water level was raised by damming up the water flow using horizontal logs, bamboo, and straw mats called "water-shedding gates."
- ⑤ Three gates were installed to allow water to flow during heavy rain.

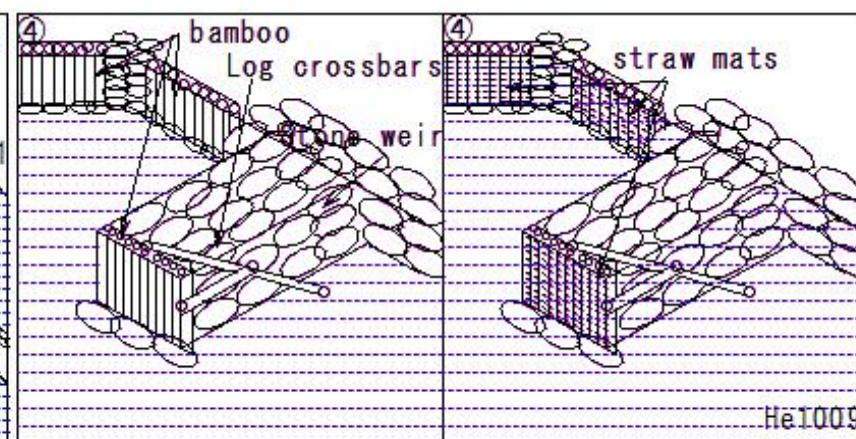
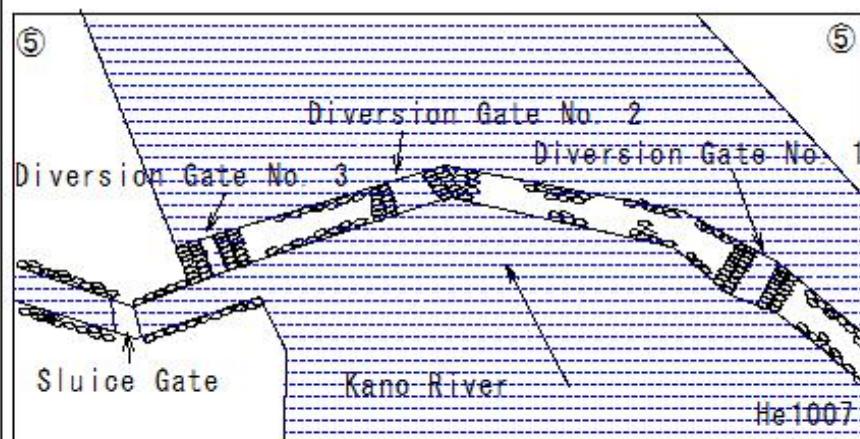
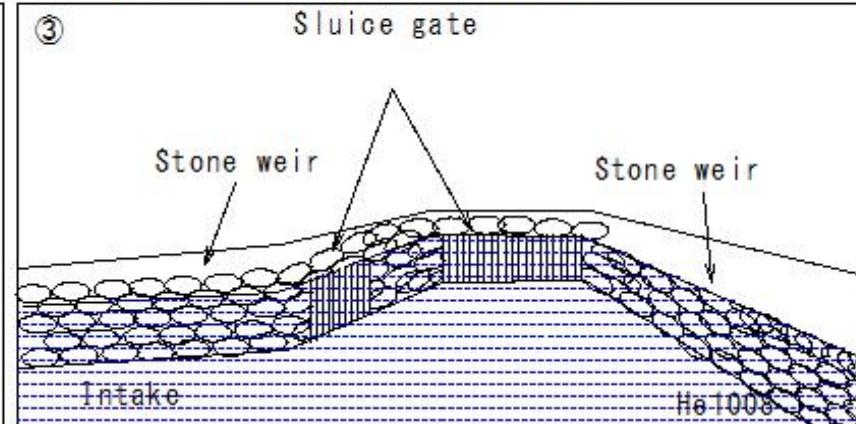


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(He1009) Kanuki Irrigation Canal (Shizuoka)

(He1009) Kanuki Irrigation Canal (Shizuoka)

- ③ A crescent-shaped stone weir was installed at the intake, and a river storehouse was placed on the extension of the weir to raise the water level.
- ④ The water level was raised by damming up the water flow using horizontal logs, bamboo, and straw mats called "water-shedding gates."
- ⑤ Three gates were installed to allow water to flow during heavy rain.



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(He1010) Kanuki Irrigation Canal (Shizuoka)

(He1010) Kanuki Irrigation Canal (Shizuoka)

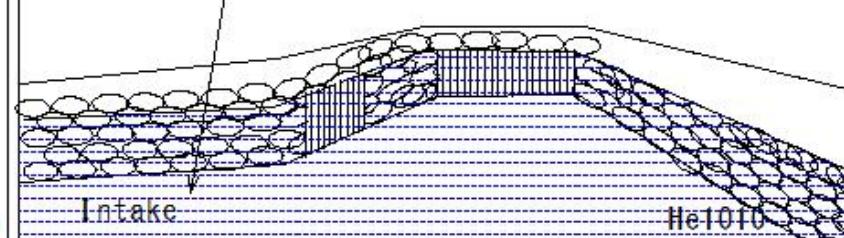
■ Facility Construction

⑥ Because the irrigation canal near the intake
furnace ash was mixed into the sand.
⑦ Through these and other measures to prevent
water from seeping in,
long-awaited agricultural water was
successfully brought to the Kanuki area.

He1010

⑥sandy soil

⑥furnace ash was mixed into the sand
⑦prevent water from seeping in



⑥sandy soil
⑥furnace ash was mixed into the sand
⑦prevent water from seeping in

Intake

Kano River

He1010

Kanuki Irrigation Canal
(Numazu City,
Shizuoka Prefecture)

Kano River

5km-long

⑥sandy soil
⑥furnace ash was mixed into the sand
⑦prevent water from seeping in

He1010

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(He1011) Kanuki Irrigation Canal (Shizuoka)

(He1011) Kanuki Irrigation Canal (Shizuoka)

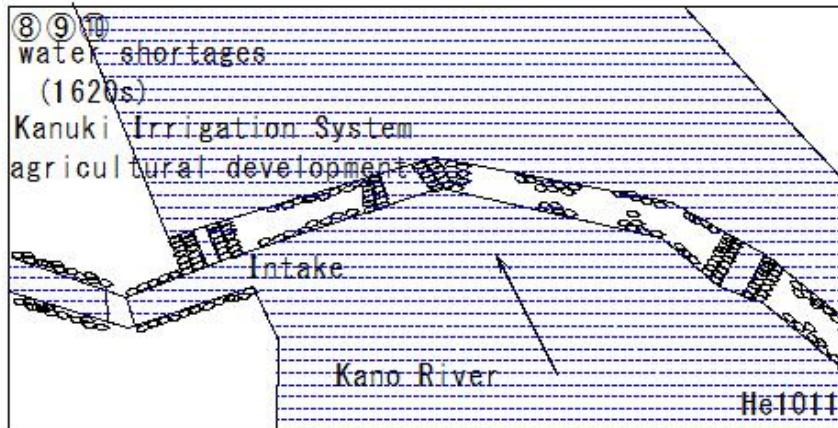
■ Agriculture in the Kanuki Region
⑧ The region had suffered from chronic water shortages, but around the 6th year of the Genna era (1620s),
⑨ the completion of the Kanuki Irrigation System (1620s) eliminated the droughts,
⑩ laying the foundation for agricultural development that was said to have yielded "2,000 koku of rice in Kanuki."

He1011

■ Kanuki Irrigation Canal (Numazu City, Shizuoka Prefecture)
⑧⑨⑩ water shortages (1620s)
Kanuki Irrigation System agricultural development

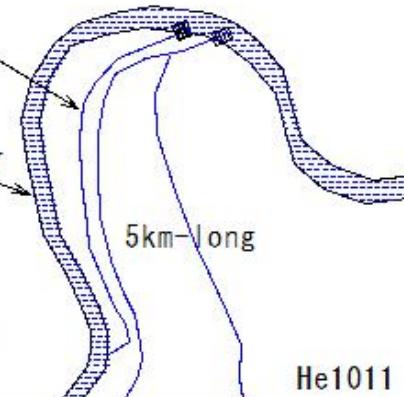


He1011



He1011

Kanuki Irrigation Canal (Numazu City, Shizuoka Prefecture)
Kano River
⑧⑨⑩ water shortages (1620s)
Kanuki Irrigation System agricultural development



He1011

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(He1012) Kanuki Irrigation Canal (Shizuoka)

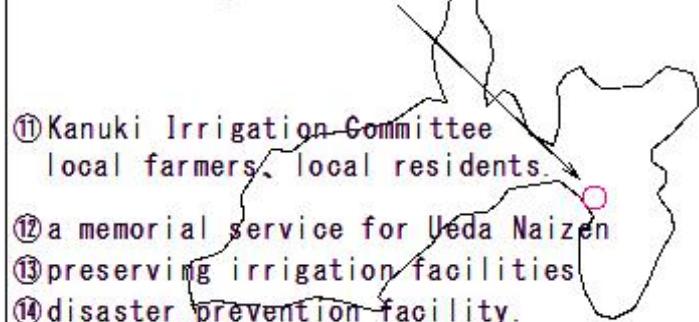
(He1012) Kanuki Irrigation Canal (Shizuoka)

■ Facility Maintenance

- ⑪ Numazu City is the primary authority, working in collaboration with the Kokan Irrigation Committee, an organization of local farmers, and local residents.
- ⑫ Every year on August 15th, a memorial service for Ueda Naizen is held at Reizanji Temple.
- ⑬ We are committed to preserving irrigation facilities that support local agriculture while preserving traditional culture.
- ⑭ Today, the Kanuki Irrigation Canal not only contributes to agricultural development, but also serves as a disaster prevention facility.

■ Kanuki Irrigation Canal

(Numazu City, Shizuoka Prefecture)



- ⑪ Kanuki Irrigation Committee local farmers, local residents
- ⑫ a memorial service for Ueda Naizen
- ⑬ preserving irrigation facilities
- ⑭ disaster prevention facility

He1012

Kanuki Irrigation Canal
(Numazu City,
Shizuoka Prefecture)

Kano River

- ⑪ Kanuki Irrigation Committee local farmers, local residents
- ⑫ a memorial service for Ueda Naizen
- ⑬ preserving irrigation facilities
- ⑭ disaster prevention facility

He1012

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(He1013) Kanuki Irrigation Canal (Shizuoka)

(He1013) Kanuki Irrigation Canal (Shizuoka)

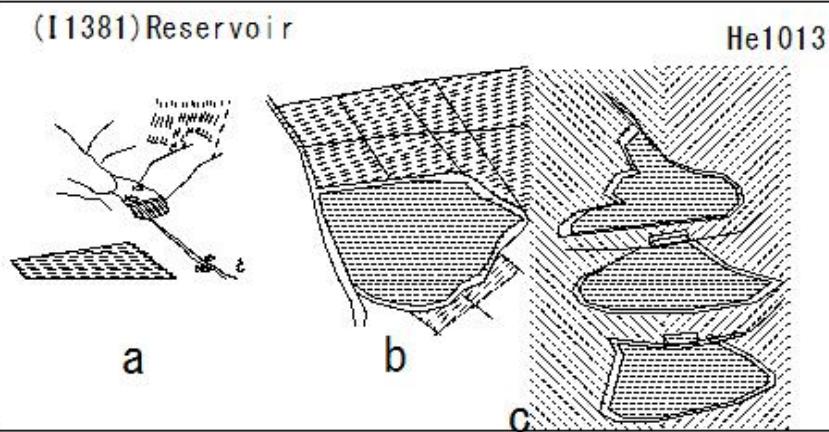
- ① The Kanuki Irrigation Canal is a waterway that channels water from the Kano River throughout the Kanuki area. It was built in the early Edo period and was used for agricultural irrigation until the late Showa period.
- ② Before the construction of Naizenburi, the Kanuki area collected rainwater to secure water for agriculture.
- ③ For this reason, several reservoirs were built around Mount Kanuki.
- ④ The structure of the Kanuki Irrigation Canal: The water intake was built near the confluence of the Kise River and Kano River.
- ⑤ To make it easier to draw river water into the intake, a weir was built in the river by piling stones to block part of the river's flow and guide the water.
- ⑥ Various ingenious ideas were incorporated into the construction of the canal.
- ⑦ To prevent sediment from entering the intake, the weir was built in a curved rather than straight line, a structure called a "fukuro-zeki."
- ⑧ Clay mixed with ash was laid at the bottom of the canal to prevent water leakage.
The ash method was adopted by Ueda Naizen.
- ⑨ Because the water level in the irrigation canal was lower than the ground surface of the fields, it was necessary to pump water using a foot-operated waterwheel.
- ⑩ A water intake pump was installed in 1947, and the use of the weir and intake was discontinued the following year.
- ⑪ When construction of the Kano River levee began in the 1960s, the weir and intake were removed, and today the pump's intake tower can be seen near Kurose Bridge.

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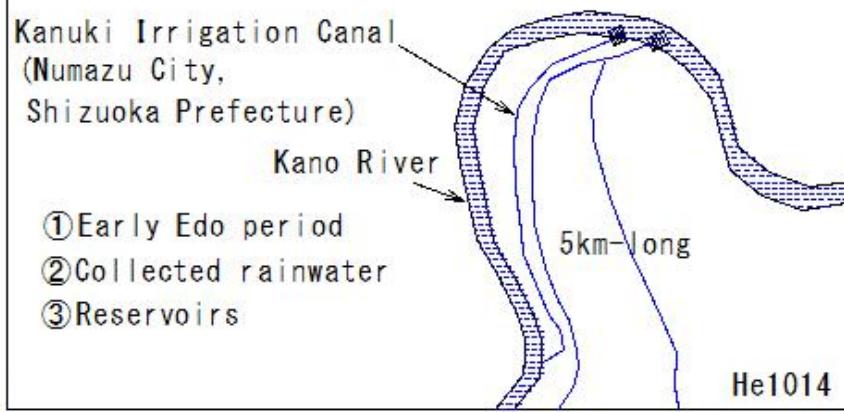
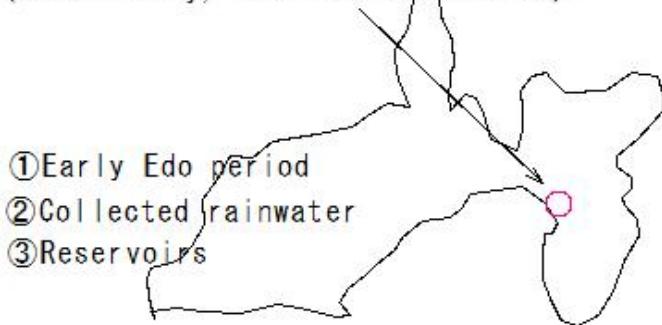
(He1014) Kanuki Irrigation Canal (Shizuoka)

(He1014) Kanuki Irrigation Canal (Shizuoka)

- ① The Kanuki Irrigation Canal is a waterway that channels water from the Kano River throughout the Kanuki area. It was built in the early Edo period and was used for agricultural irrigation until the late Showa period.
- ② Before the construction of Naizenburi, the Kanuki area collected rainwater to secure water for agriculture.
- ③ For this reason, several reservoirs were built around Mount Kanuki.



■ Kanuki Irrigation Canal (Numazu City, Shizuoka Prefecture)



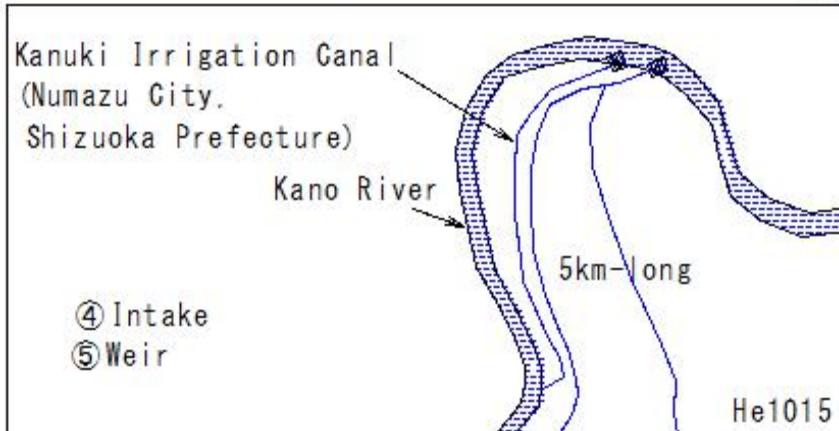
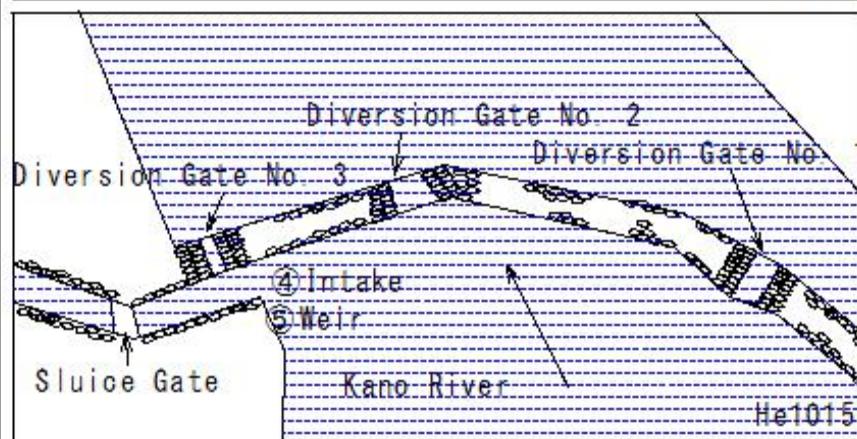
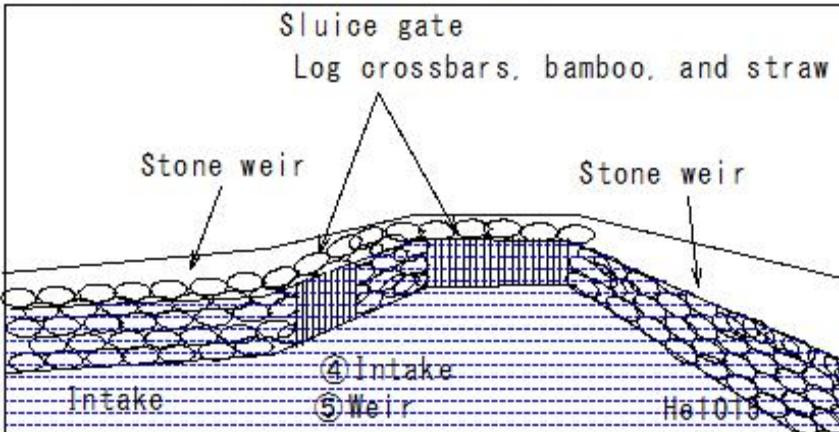
∅ 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1015) Kanuki Irrigation Canal (Shizuoka)

(He1015) Kanuki Irrigation Canal (Shizuoka)

- ④ The structure of the Kanuki Irrigation Canal:
The water intake was built near the confluence of the Kise River and Kano River.
- ⑤ To make it easier to draw river water into the intake, a weir was built in the river by piling stones to block part of the river's flow and guide the water.
- ⑥ Various ingenious ideas were incorporated into the construction of the canal.

He1015



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1016) Kanuki Irrigation Canal (Shizuoka)

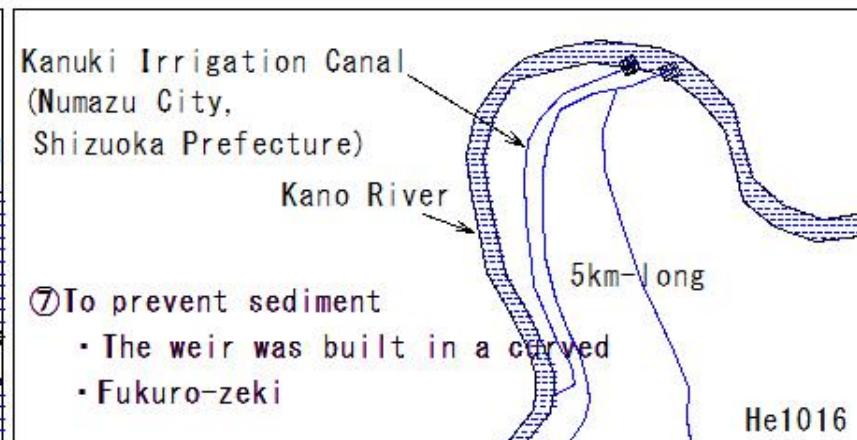
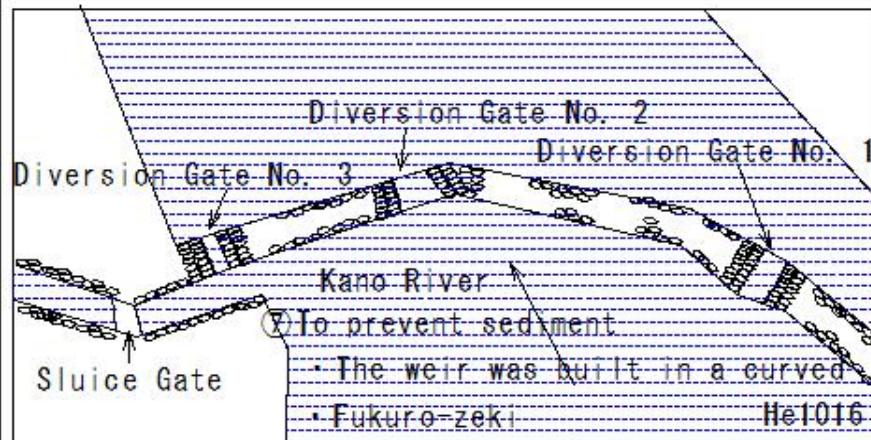
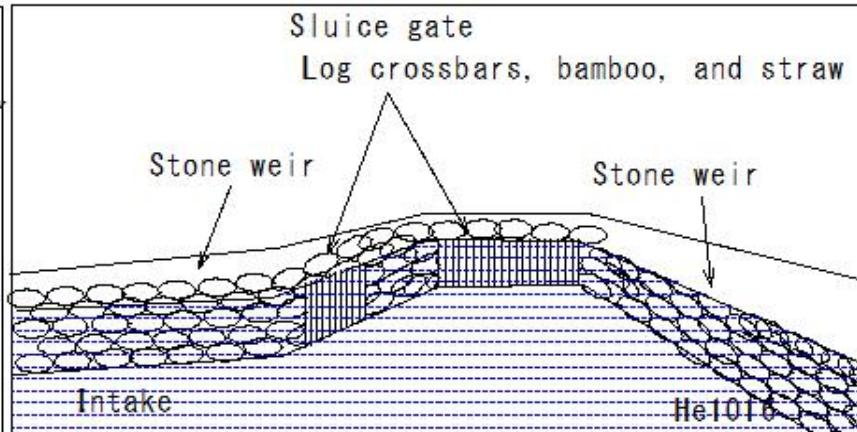
(He1016) Kanuki Irrigation Canal (Shizuoka)

⑦ To prevent sediment from entering the intake, the weir was built in a curved rather than straight line, a structure called a "fukuro-zeki."

⑦ To prevent sediment

- The weir was built in a curved
- Fukuro-zeki

He1016



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1017) Kanuki Irrigation Canal (Shizuoka)

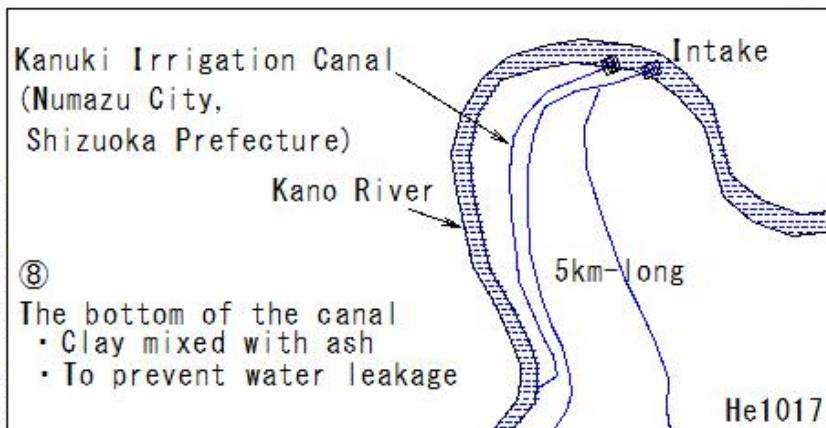
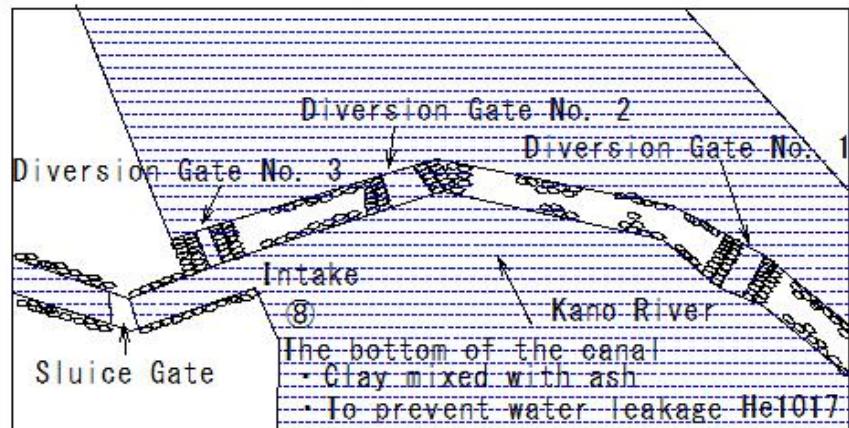
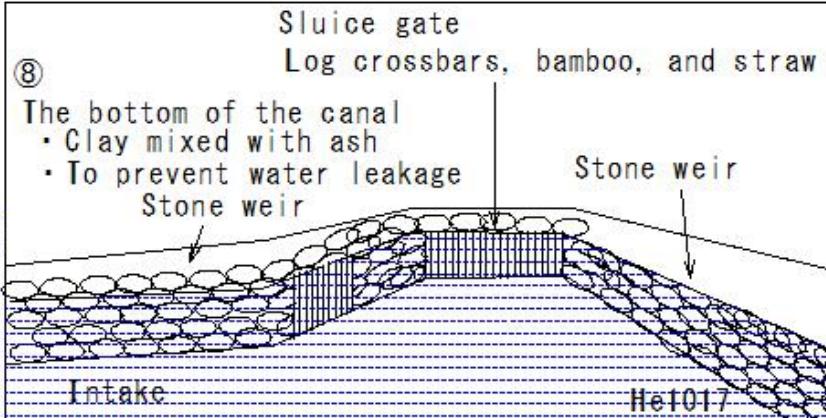
(He1017) Kanuki Irrigation Canal (Shizuoka)

⑧ Clay mixed with ash was laid at the bottom of the canal to prevent water leakage. The ash method was adopted by Ueda Naizen.

Intake

⑧ the bottom of the canal

- Clay mixed with ash
- To prevent water leakage He1017

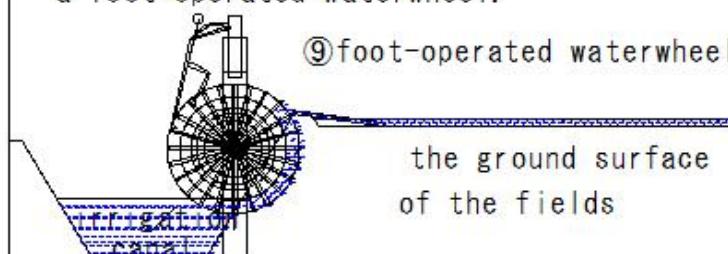


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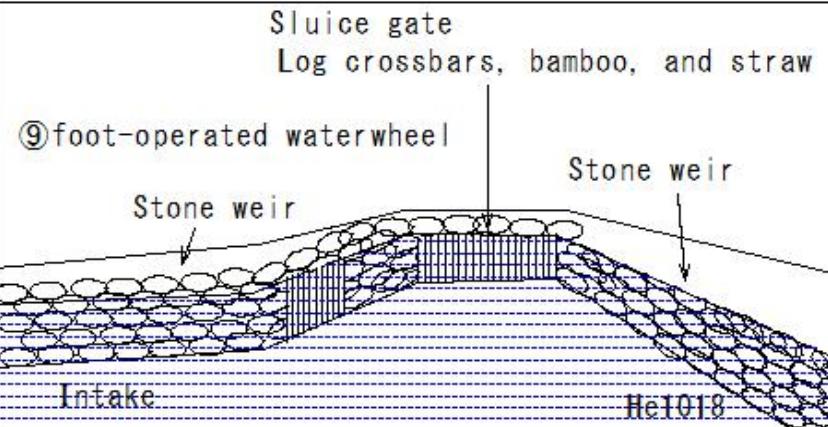
(He1018) Kanuki Irrigation Canal (Shizuoka)

(He1018) Kanuki Irrigation Canal (Shizuoka)

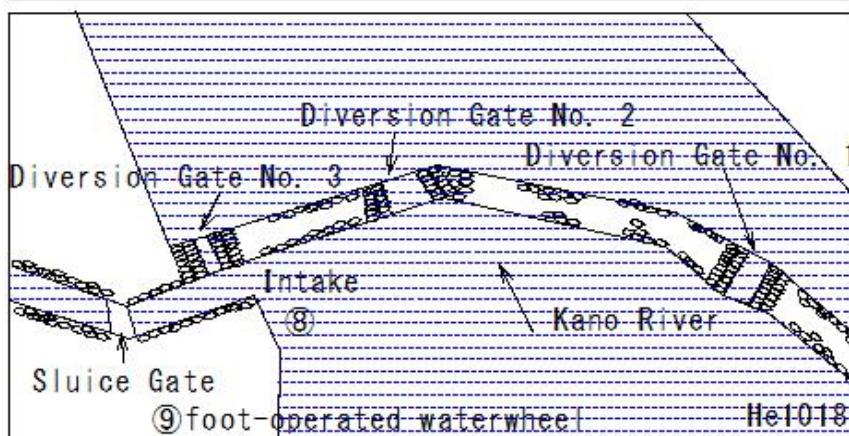
⑨ Because the water level in the irrigation canal was lower than , it was necessary to pump water using a foot-operated waterwheel.



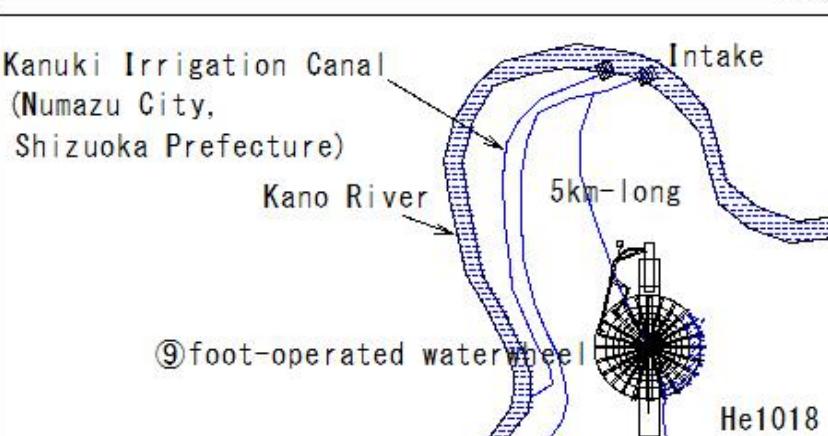
He1018



He1018



He1018

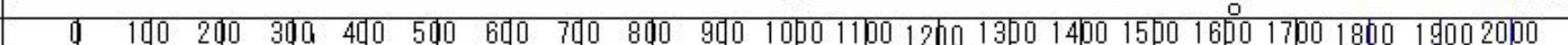
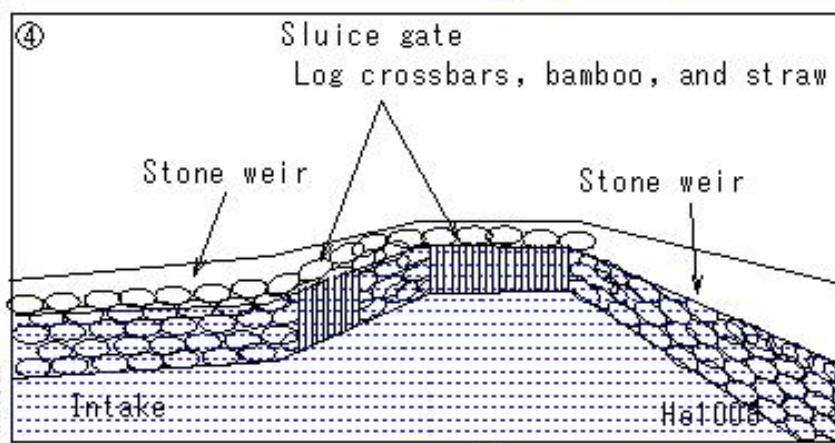
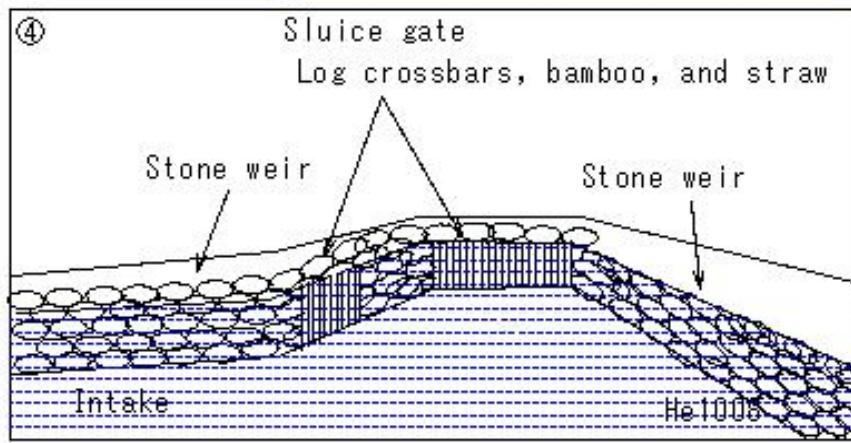
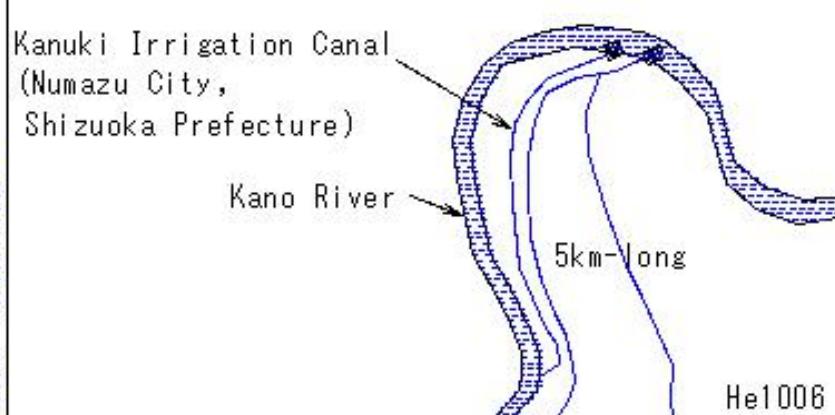
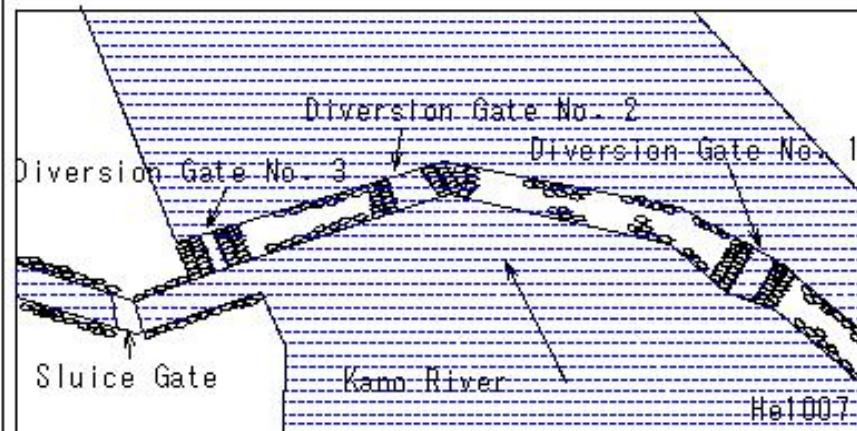


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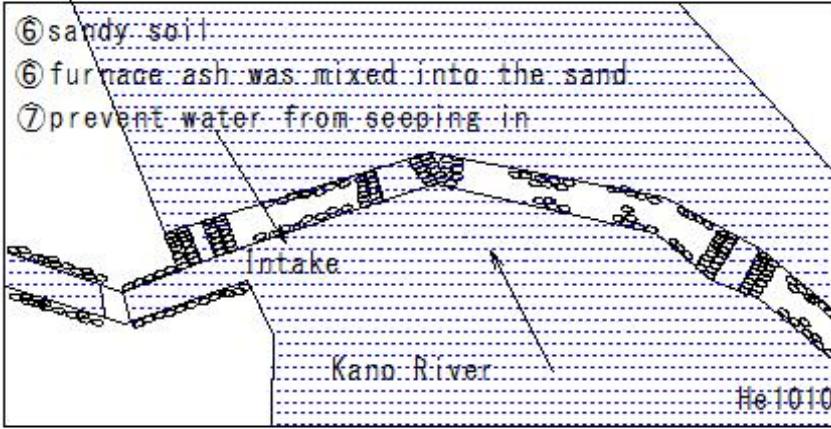
(He1019) Kanuki Irrigation Canal (Shizuoka)

(He1019) Kanuki Irrigation Canal (Shizuoka)



(He1020) Kanuki Irrigation Canal (Shizuoka)

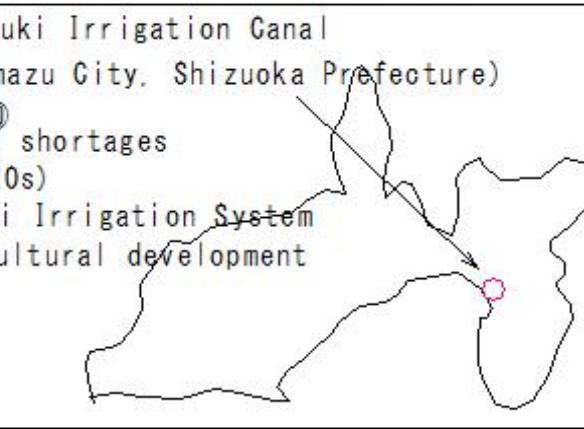
(He1020) Kanuki Irrigation Canal (Shizuoka)



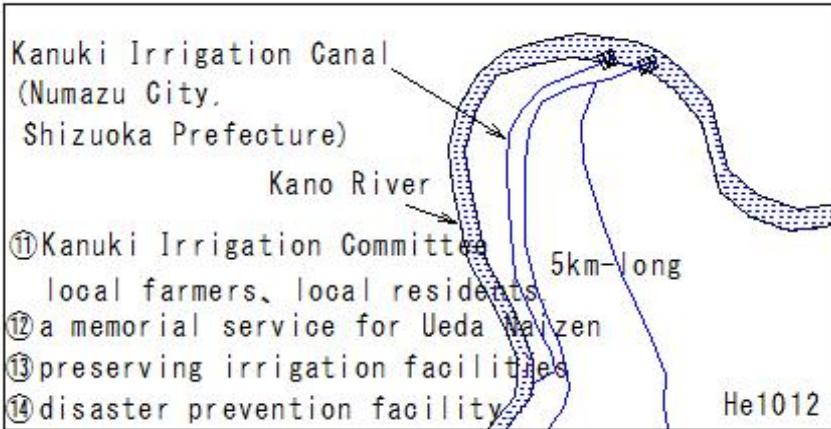
⑥ sandy soil
⑥ furnace ash was mixed into the sand
⑦ prevent water from seeping in
Intake
Kano River
He1010

■ Kanuki Irrigation Canal
(Numazu City, Shizuoka Prefecture)

⑧⑨⑩
water shortages
(1620s)
Kanuki Irrigation System
agricultural development

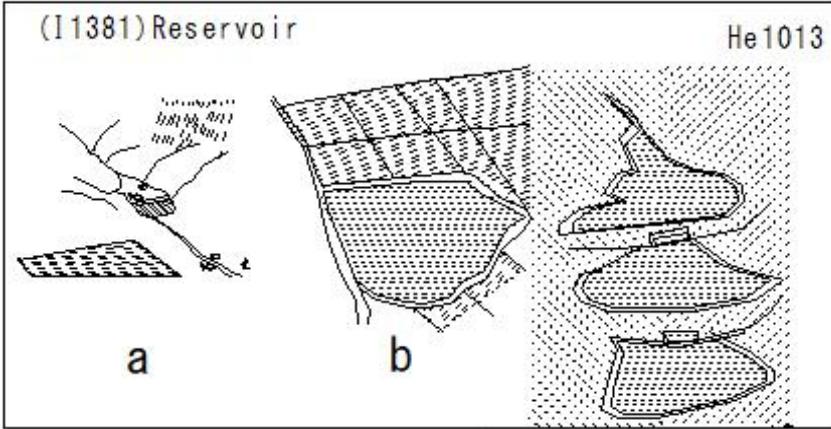


He1011



Kanuki Irrigation Canal
(Numazu City,
Shizuoka Prefecture)
Kano River
⑪ Kanuki Irrigation Committee
local farmers, local residents
⑫ a memorial service for Ueda Naizen
⑬ preserving irrigation facilities
⑭ disaster prevention facility
5km-long
He1012

(I1381) Reservoir



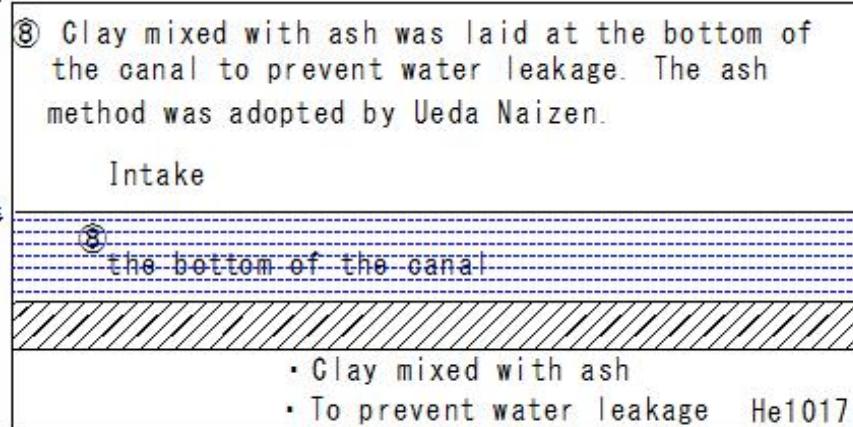
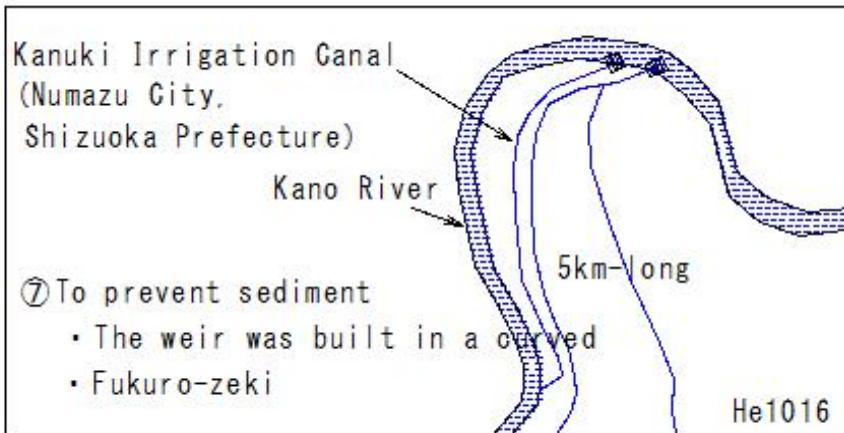
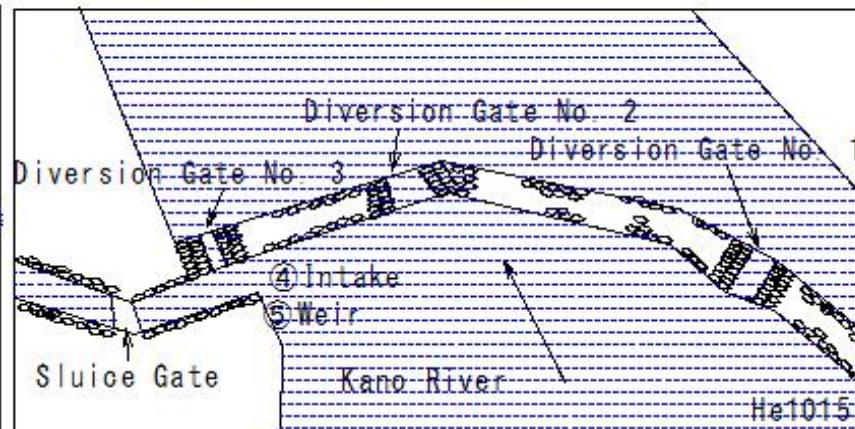
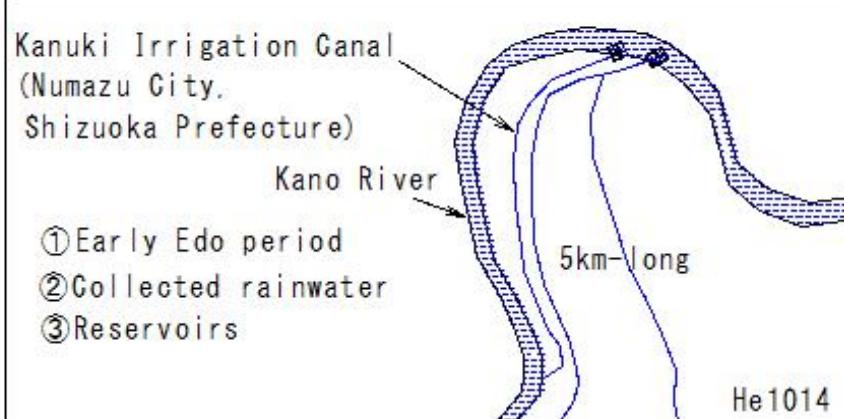
a
b
He1013

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1021) Kanuki Irrigation Canal (Shizuoka)

(He1021) Kanuki Irrigation Canal (Shizuoka)

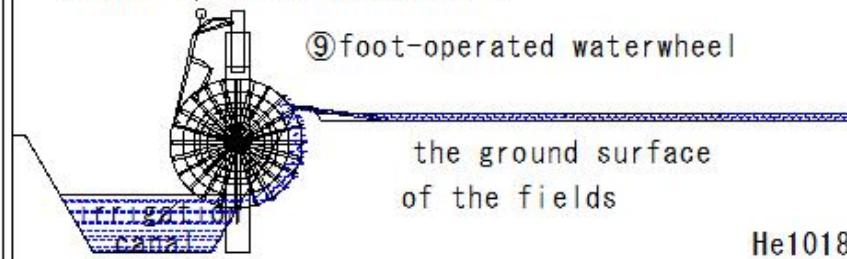


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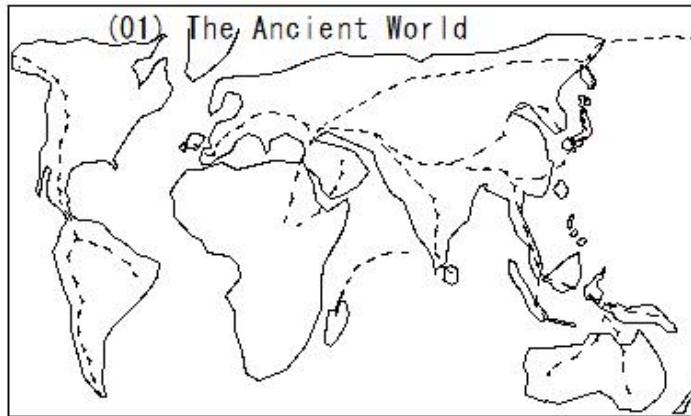
(He1022) Kanuki Irrigation Canal (Shizuoka)

(He1022) Kanuki Irrigation Canal (Shizuoka)

⑨ Because the water level in the irrigation canal was lower than , it was necessary to pump water using a foot-operated waterwheel.

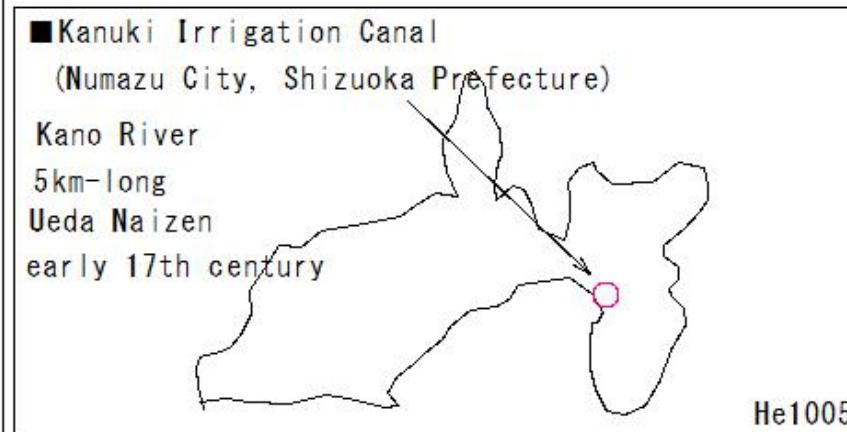


He1018

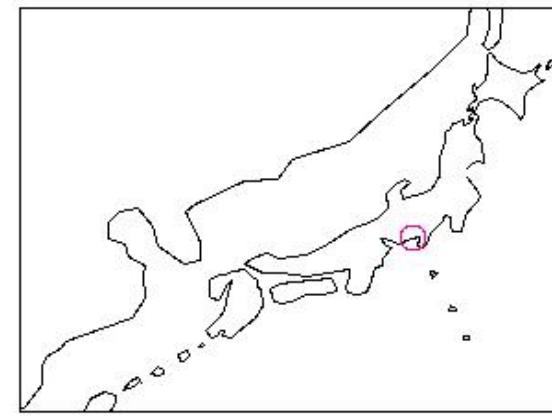


■Kanuki Irrigation Canal
(Numazu City, Shizuoka Prefecture)

Kano River
5km-long
Ueda Naizen
early 17th century



He1005



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1023)Teradani Irrigation System (Canal) Shizuoka

(He1023) Teradani Irrigation System (Canal) Shizuoka

Teradani Irrigation System (Canal)

[Iwata City, Shizuoka Prefecture]

A pioneering wide-area irrigation system drawing water from large rivers.

①Completed in 1590

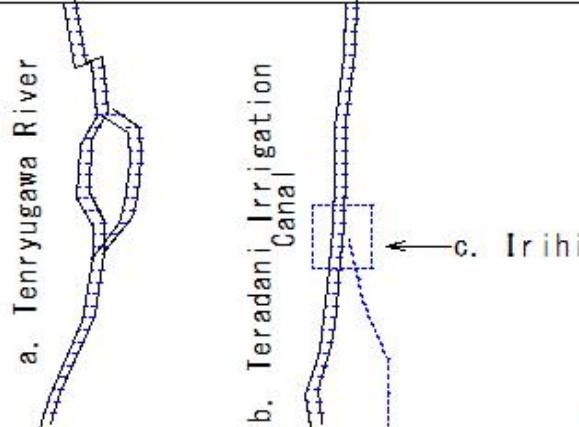
②Pioneering the introduction of innovative irrigation technology that integrated flood control and water utilization of large rivers.

Teradani Irrigation System (Canal)

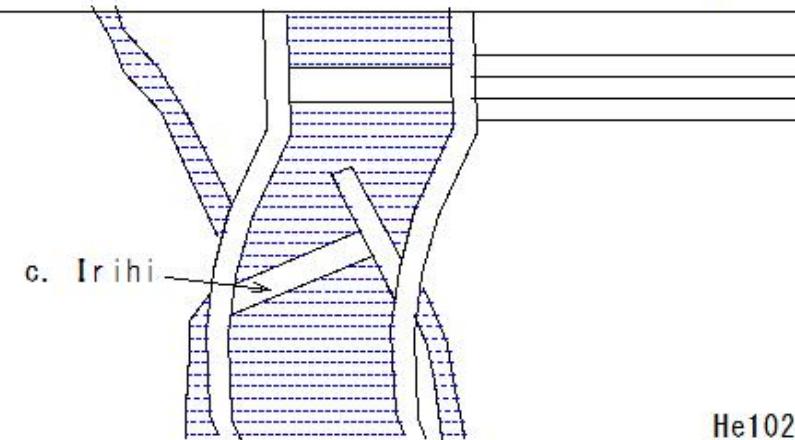


He1023

He1023



He1023



He1023

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1024)Teradani Irrigation System (Canal) Shizuoka

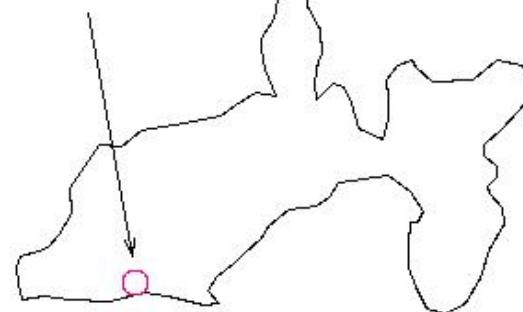
(He1024) Teradani Irrigation System (Canal) Shizuoka

Canal Construction Project

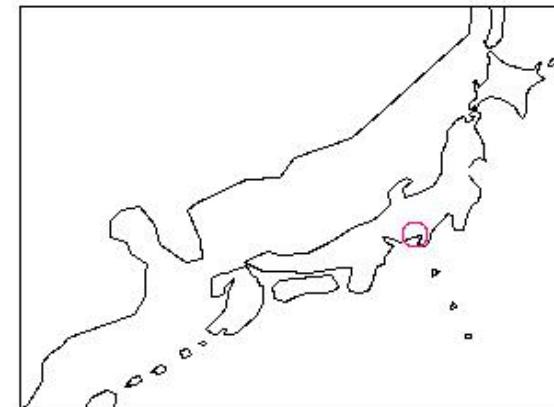
[Iwata City, Shizuoka Prefecture]

- ③ Aiming for economic growth through agricultural development
- ④ It was initiated by order of Tokugawa Ieyasu, who would later become Shogun of the Edo Shogunate.
- ⑤ Under his orders, Chief Ina Tadatsugu planned the project, and magistrate Hirano Shigesada began construction.
- ⑥ They constructed a levee to separate farmland from the floodplain of the Tenryu River, also known as the Violent Tenryu.
- ⑦ They constructed a 12-km canal.
- ⑧ The canal took two years from start to completion.
- ⑨ It irrigated 2,000 hectares of rice paddies, including 400 hectares of newly reclaimed land.

Teradani Irrigation System (Canal) [Iwata City, Shizuoka Prefecture]



He1023



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1025)Teradani Irrigation System (Canal) Shizuoka

(He1025) Teradani Irrigation System (Canal) Shizuoka

Canal Construction Project

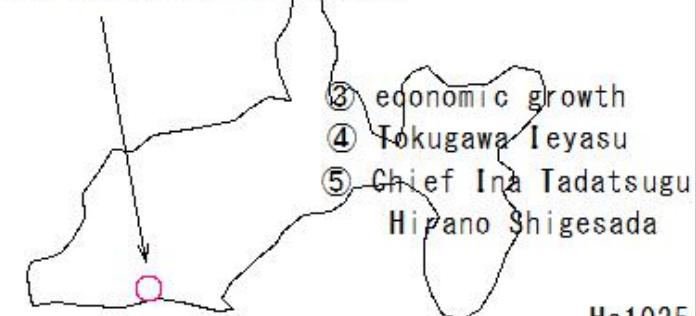
[Iwata City, Shizuoka Prefecture]

- ③ Aiming for economic growth through agricultural development
- ④ It was initiated by order of Tokugawa Ieyasu, who would later become Shogun of the Edo Shogunate.
- ⑤ Under his orders, Chief Ina Tadatsugu planned the project, and magistrate Hirano Shigesada began construction.

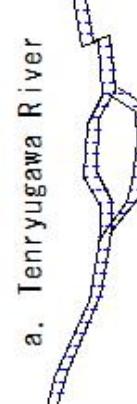
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Teradani Irrigation System (Canal)

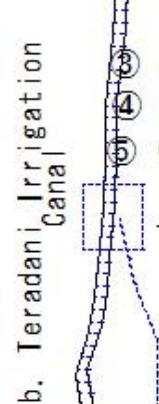
[Iwata City, Shizuoka Prefecture]



He1025



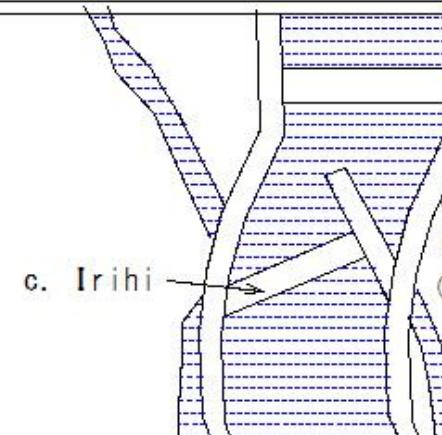
a. Tenryugawa River



b. Teradani Irrigation Canal

③ economic growth
④ Tokugawa Ieyasu
⑤ Chief Ina Tadatsugu
Hirano Shigesada

He1025



c. Irihi

③ economic growth
④ Tokugawa Ieyasu
⑤ Chief Ina Tadatsugu
Hirano Shigesada

He1025

∅ 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1026)Teradani Irrigation System (Canal) Shizuoka

(He1026) Teradani Irrigation System (Canal) Shizuoka

Canal Construction Project

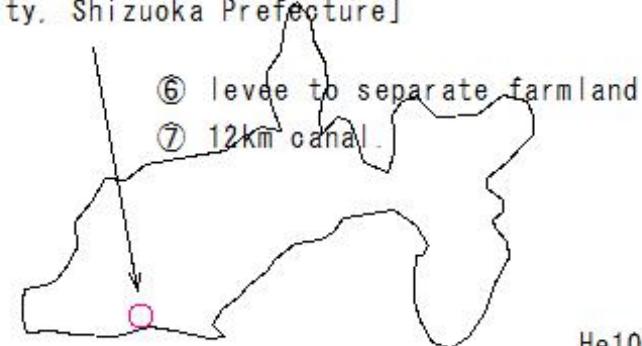
[Iwata City, Shizuoka Prefecture]

- ⑥ They constructed a levee to separate farmland from the floodplain of the Tenryu River, also known as the Violent Tenryu.
- ⑦ They constructed a 12-km canal.
 - ⑥ levee to separate farmland
 - ⑦ 12km canal.

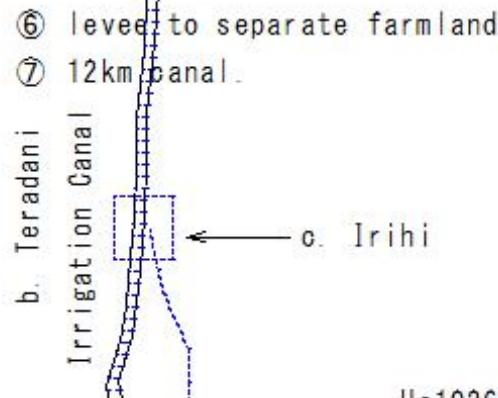
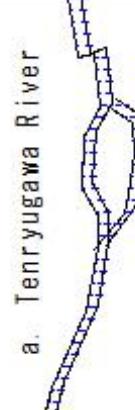
He1026

Teradani Irrigation System (Canal)

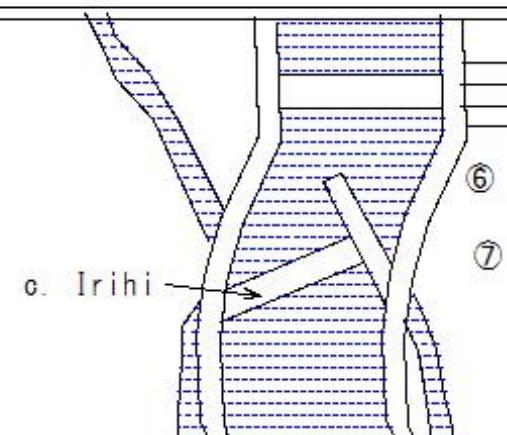
[Iwata City, Shizuoka Prefecture]



He1026



He1026



- ⑥ levee to separate farmland
- ⑦ 12km canal.

He1026

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1027)Teradani Irrigation System (Canal) Shizuoka

(He1027) Teradani Irrigation System (Canal) Shizuoka

Canal Construction Project
[Iwata City, Shizuoka Prefecture]

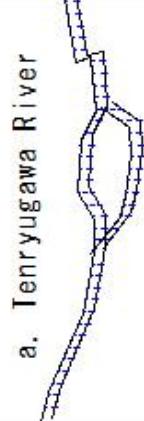
- ⑧ The canal took two years from start to completion.
- ⑨ It irrigated 2,000 hectares of rice paddies, including 400 hectares of newly reclaimed land.

⑧ two years
⑨ 2,000 hectares

Teradani Irrigation System (Canal)
[Iwata City, Shizuoka Prefecture]



He1027

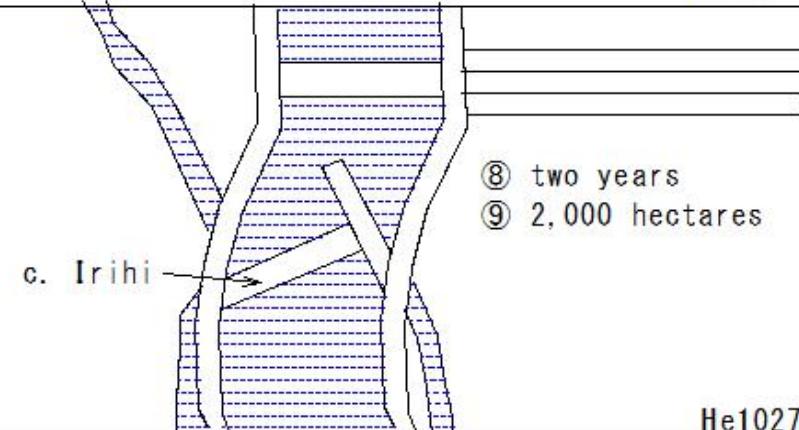


b. Teradani Irrigation Canal

- ⑧ two years
- ⑨ 2,000 hectares

← c. Irihi

He1027



He1027

∅ 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1028)Teradani Irrigation System (Canal) Shizuoka

(He1028) Teradani Irrigation System (Canal) Shizuoka

■ Canal Construction Project

- ⑩ To prevent floodwater overflow at the intake of the canal,
- ⑪ the intake was designed as a combination of a levee and a large wooden box culvert (4m wide, 2m high, and 21m long).

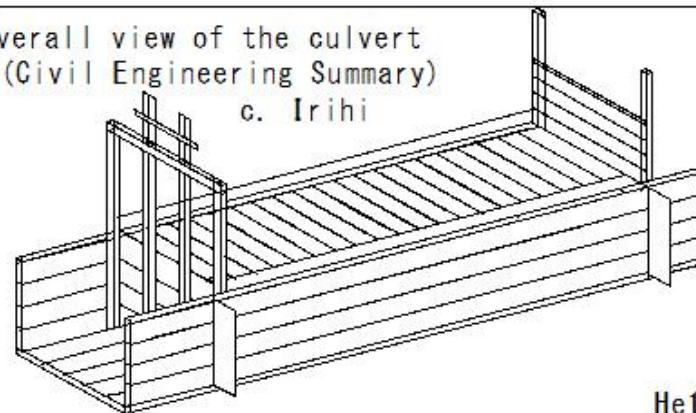
⑩ To prevent floodwater

⑪ large wooden box culvert

He1028

A: Overall view of the culvert
(Civil Engineering Summary)

c. Irihi



He1028

a. Tenryugawa River

b. Teradani

⑩ To prevent floodwater
⑪ large wooden box culvert

He1028

c. Irihi

⑩ To prevent floodwater
⑪ large wooden box culvert

c. Irihi

He1028

∅ 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1029)Teradani Irrigation System (Canal) Shizuoka

(He1029) Teradani Irrigation System (Canal) Shizuoka

■ Canal Construction Project

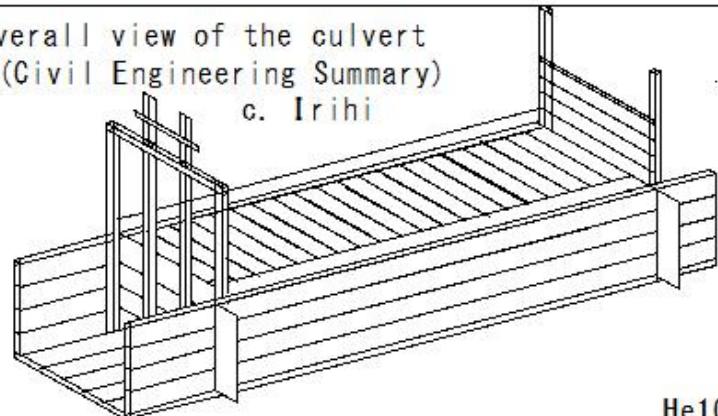
- ⑩ To prevent floodwater overflow at the intake of the canal,
- ⑪ the intake was designed as a combination of a levee and a large wooden box culvert (4m wide, 2m high, and 21m long).

⑩ To prevent floodwater

⑪ large wooden box culvert

He1028

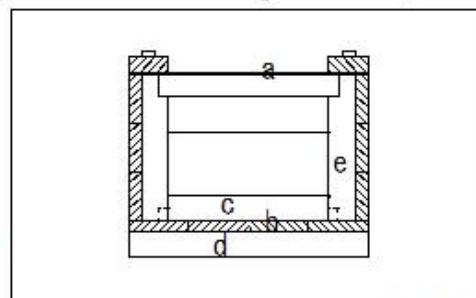
A: Overall view of the culvert
(Civil Engineering Summary)



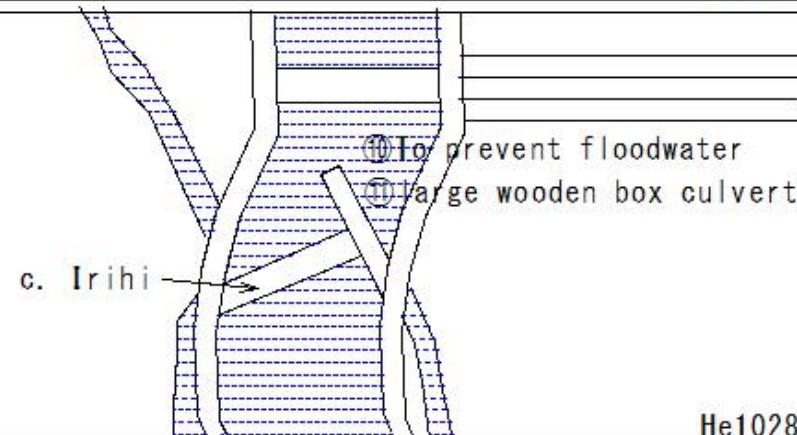
He1028

B: Cross-section of the culvert (Japanese Civil Engineering History before the Meiji Period)
(Kanto Style)

- a Cover plate
- b Floor plate (vertical)
- c Floor timber
- d Horizontal base
- e pillar



He1029



He1028

∅ 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1030)Teradani Irrigation System (Canal) Shizuoka

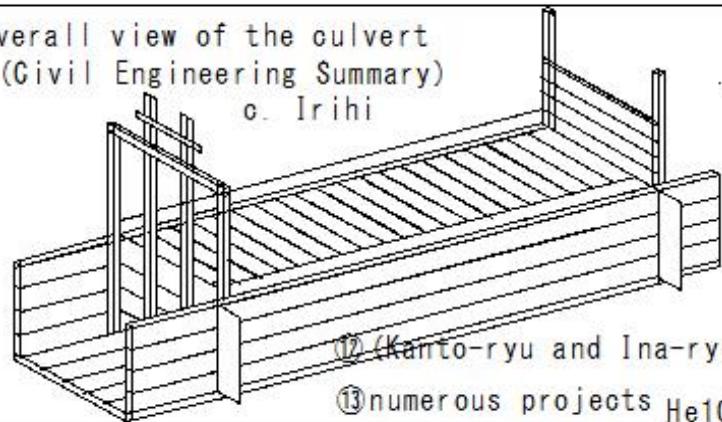
(He1030)Teradani Irrigation System (Canal) Shizuoka

■ After Completion

⑫ The groundbreaking system combining levees and canals on major rivers (Kanto-ryu and Ina-ryu) was highly praised.
⑬ The Edo Shogunate applied the system to numerous projects throughout the country.
 ⑫ (Kanto-ryu and Ina-ryu)
 ⑬ numerous projects

He1030

A: Overall view of the culvert
(Civil Engineering Summary)



c. Irihi

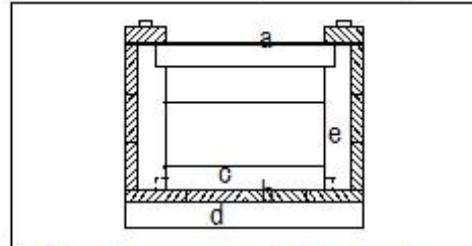
⑫ (Kanto-ryu and Ina-ryu)
⑬ numerous projects

He1030

B: Cross-section of the culvert (Japanese Civil Engineering History before the Meiji Period)

(Kanto Style)

a Cover plate
b Floor plate (vertical)
c Floor timber
d Horizontal base
e pillar



⑫ (Kanto-ryu and Ina-ryu)
⑬ numerous projects

c. Irihi

⑫ (Kanto-ryu and Ina-ryu)
⑬ numerous projects

He1030

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1031)Teradani Irrigation System (Canal) Shizuoka

(He1031) Teradani Irrigation System (Canal) Shizuoka

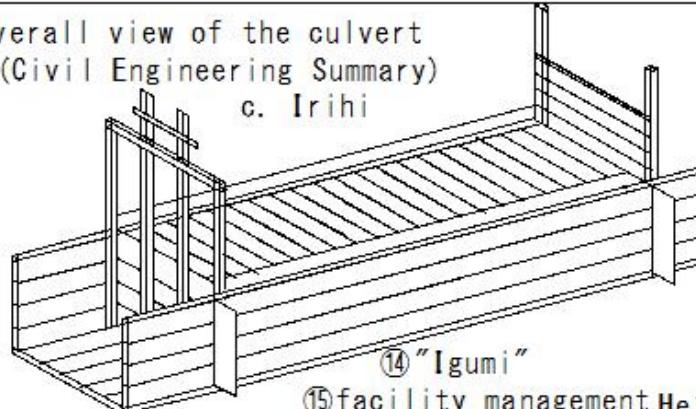
■After Completion

⑭ Hirano Shigesada organized a farmers' association called "Igumi" to ensure smooth water distribution to 73 villages and to maintain the canals.
⑮ Today, "Igumi" has been passed down to the Teratani Waterworks Land Improvement District and the Water Users Association, and water supply and facility management

He1031

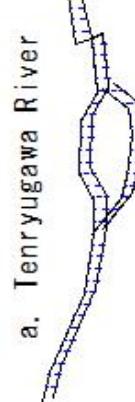
A: Overall view of the culvert
(Civil Engineering Summary)

c. Irihi



⑭ "Igumi"

⑮ facility management He1031



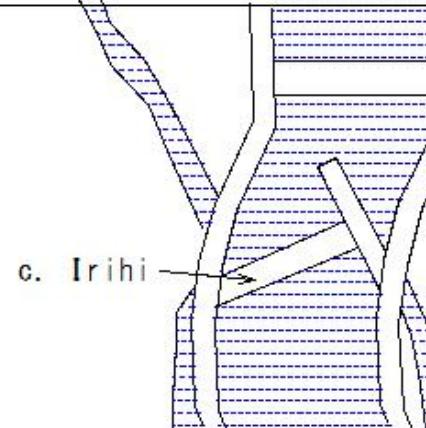
b. Teradani

Irrigation Canal

⑭ "Igumi"

⑮ facility management

He1031



c. Irihi

⑭ "Igumi"

⑮ facility management

He1031

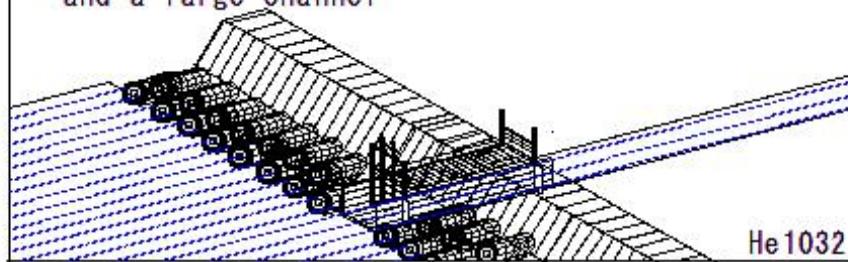
Ø 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1032)Teradani Irrigation System (Canal) Shizuoka

(He1032) Teradani Irrigation System (Canal) Shizuoka

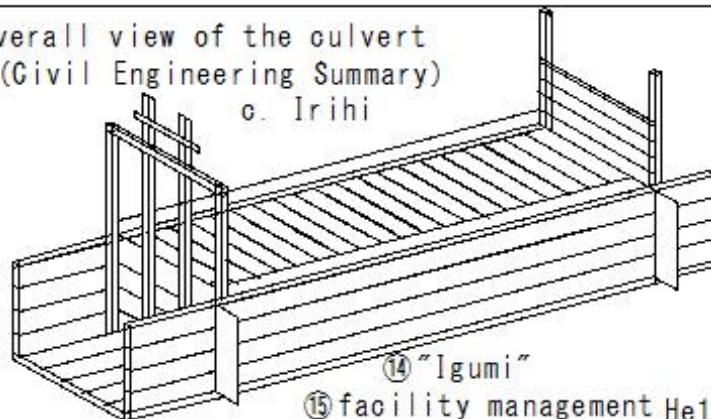
Large channel(Irihi)

- ⑯Enables water intake from the raging Tenryu
- ⑰Intake constructed by combining a large dike and a large channel



A: Overall view of the culvert
(Civil Engineering Summary)

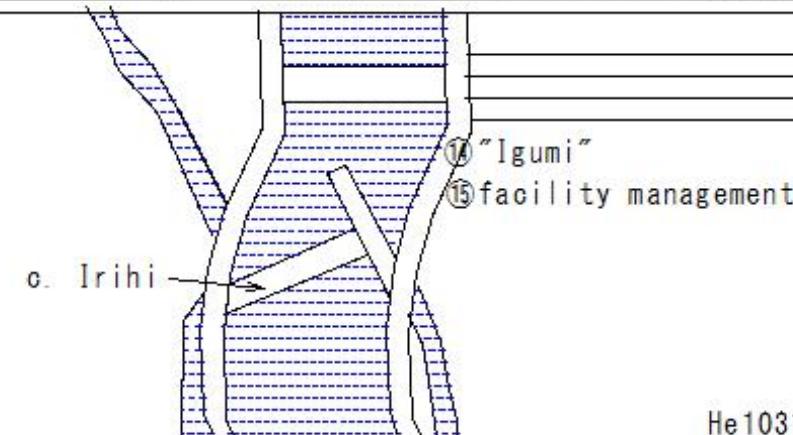
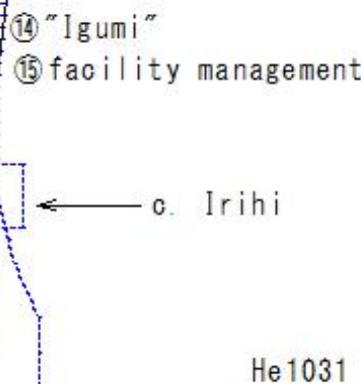
c. Irihi



a. Tenryugawa River

b. Teradani

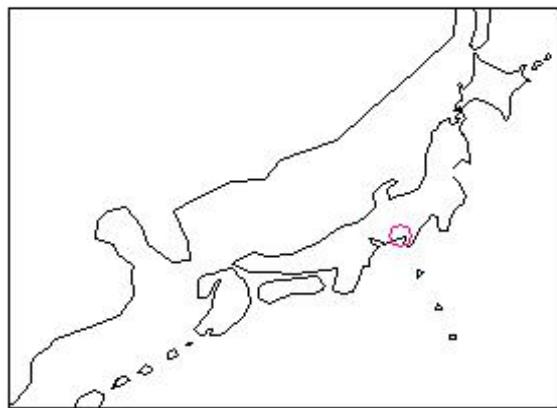
Irrigation Canal



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1033)Teradani Irrigation System (Canal) Shizuoka

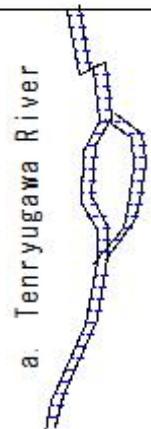
(He1033) Teradani Irrigation System (Canal) Shizuoka



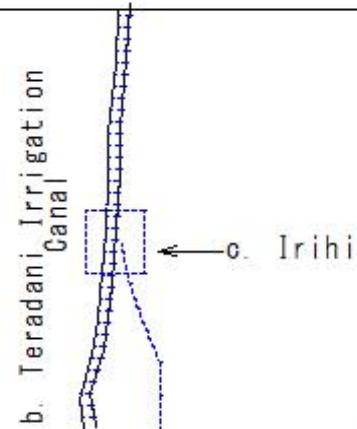
Teradani Irrigation System (Canal)



He1023

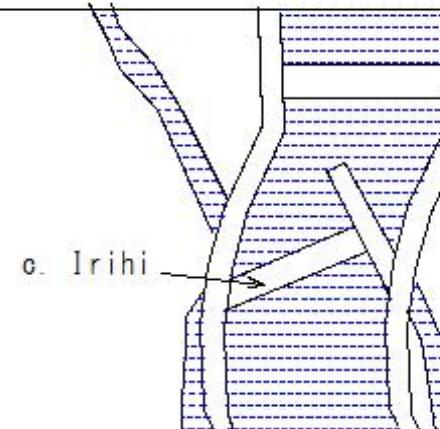


a. Tenryugawa River



b. Teradani Irrigation Canal

He1023



c. Irihi

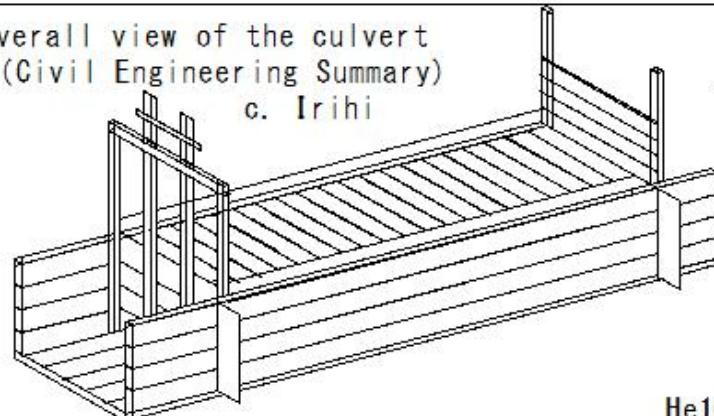
He1023

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1034)Teradani Irrigation System (Canal) Shizuoka

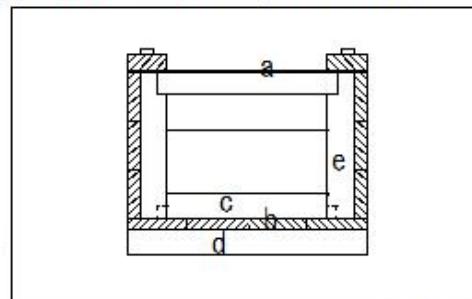
(He1034) Teradani Irrigation System (Canal) Shizuoka

A: Overall view of the culvert
(Civil Engineering Summary)
c. Irihi



B: Cross-section of the culvert (Japanese Civil
Engineering History before the Meiji Period)
(Kanto Style)

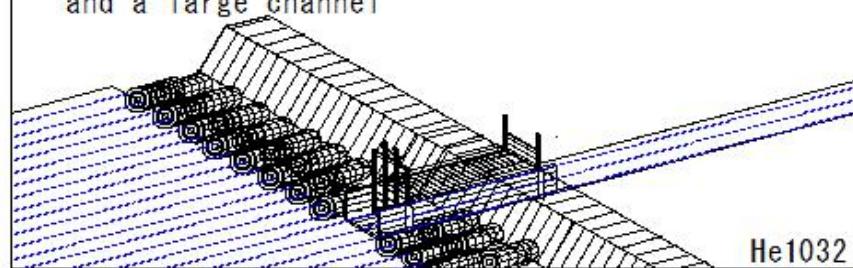
- a Cover plate
- b Floor plate (vertical)
- c Floor timber
- d Horizontal base
- e pillar



He1029

Large channel (Irihi)

- ⑯Enables water intake from the raging Tenryu
- ⑰Intake constructed by combining a large dike and a large channel



He1032

∅ 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1035)Honjukuyousui Irrigation Canal (Shizuoka)

(He1035) Honjukuyousui Irrigation Canal (Shizuoka)

Honjukuyousui Irrigation Canal

Honjuku Waterworks

[Nagaizumi Town, Shizuoka Prefecture]

~A model of Japanese water excavation technology
that built tunnels and waterways

Honjukuyousui Irrigation Canal



He1035

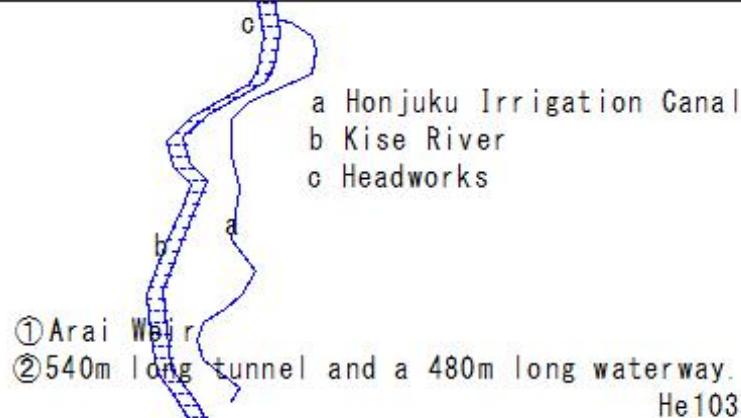
■ Honjuku Irrigation Canal

- ① Water is taken from the Arai Weir located above Ayutsubo Falls on the Kise River.
- ② It is an irrigation facility constructed with a 540m long tunnel and a 480m long waterway.

①Arai Weir

- ②540m long tunnel and a 480m long waterway.

He1035



He1035

∅ 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1036)Honjukuyousui Irrigation Canal (Shizuoka)

(He1036)Honjukuyousui Irrigation Canal (Shizuoka)

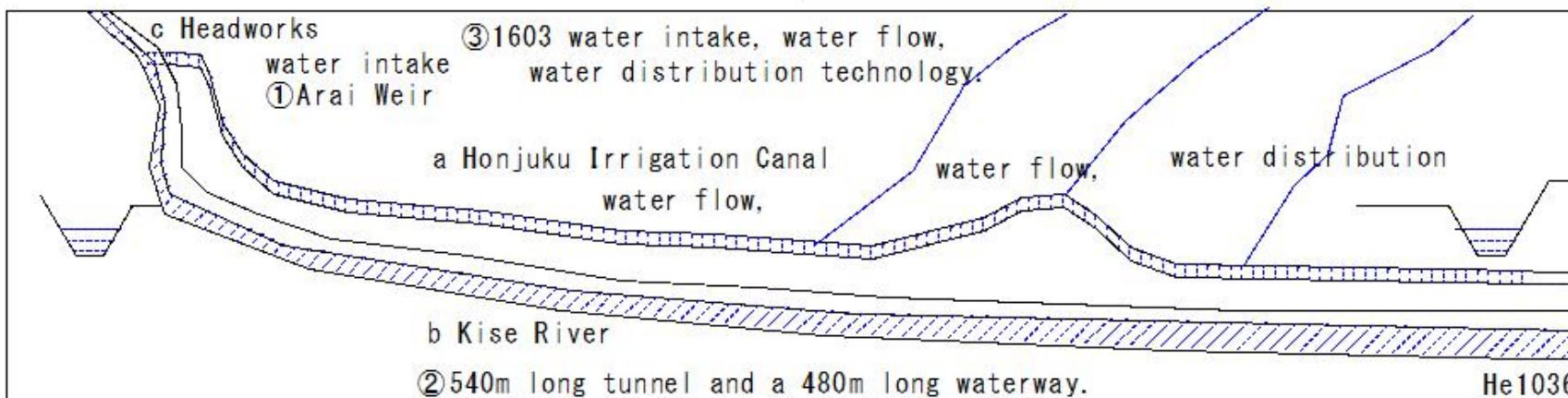
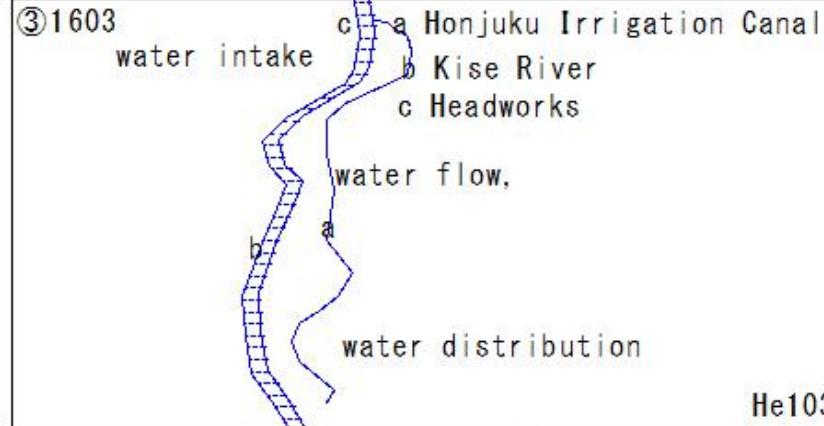
Honjukuyousui Irrigation Canal

■Honjuku Irrigation Canal

③Completed in 1603, it can be regarded as a "model" that brings together Japan's most advanced technologies in "water intake technology, water flow technology, and water distribution technology."

③1603 water intake, water flow, water distribution technology.

He1036



∅ 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1037)Honjukuyousui Irrigation Canal (Shizuoka)

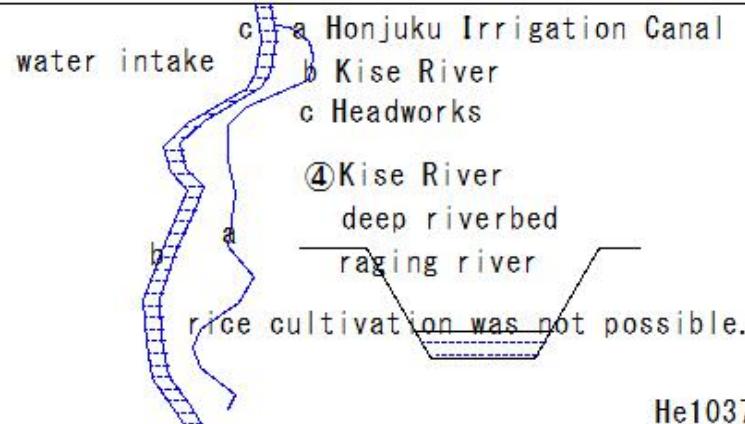
(He1037)Honjukuyousui Irrigation Canal (Shizuoka)

Honjukuyousui Irrigation Canal

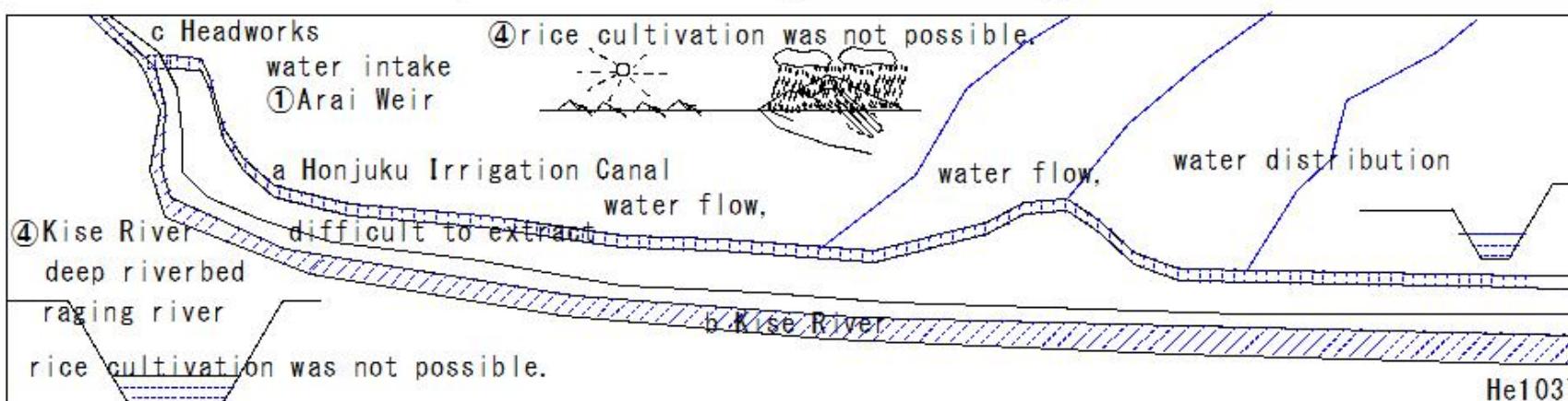
④ The Kise River basin has a deep riverbed and becomes a raging river during rainfall. It is technically difficult to extract river water, and until the 16th century, it was an impoverished region where rice cultivation was not possible.

④Kise River difficult to extract
deep riverbed
raging river
rice cultivation was not possible.

He1037



He1037



He1037

Ø 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1038)Honjukuyousui Irrigation Canal (Shizuoka)

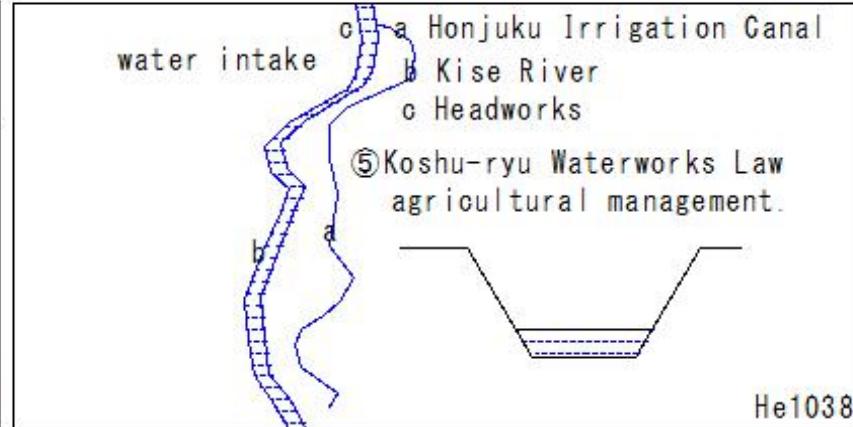
(He1038)Honjukuyousui Irrigation Canal (Shizuoka)

Honjukuyousui Irrigation Canal

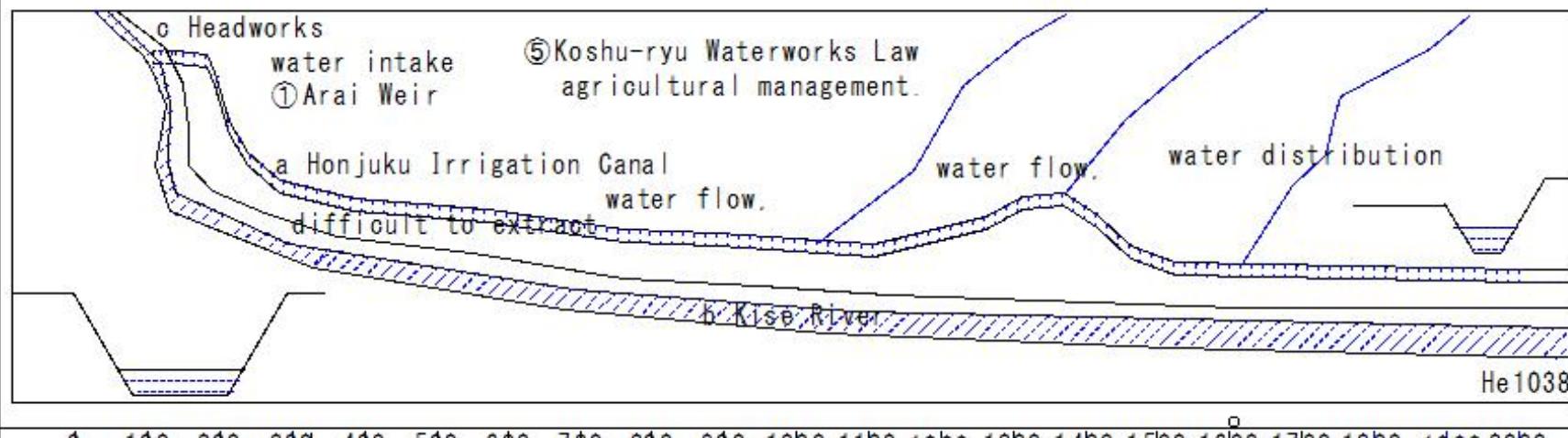
⑤ In 1601, Amano Saburobei Yasukage, lord of Koukokuji Castle and appointed by Tokugawa Ieyasu, utilized the Koshu-ryu Waterworks Law, the most advanced waterworks engineering technology of the time, to develop the area, establishing stable agricultural management.

⑤ Koshu-ryu Waterworks Law agricultural management.

He1038



He1038



He 1038

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1039)Honjukuyousui Irrigation Canal (Shizuoka)

(He1039) Honjukuyousui Irrigation Canal (Shizuoka)

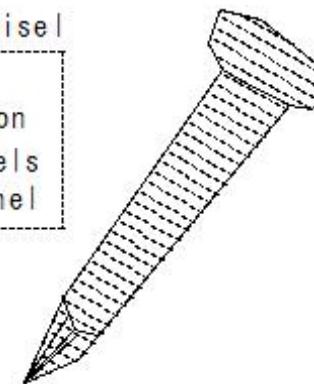
Honjukuyousui Irrigation Canal

⑥The water management techniques used to run the Honjuku Irrigation Canal through a tunnel and the manual excavation techniques using iron chisels

⑥tunnel
manual excavation
using iron chisels
②540m long tunnel

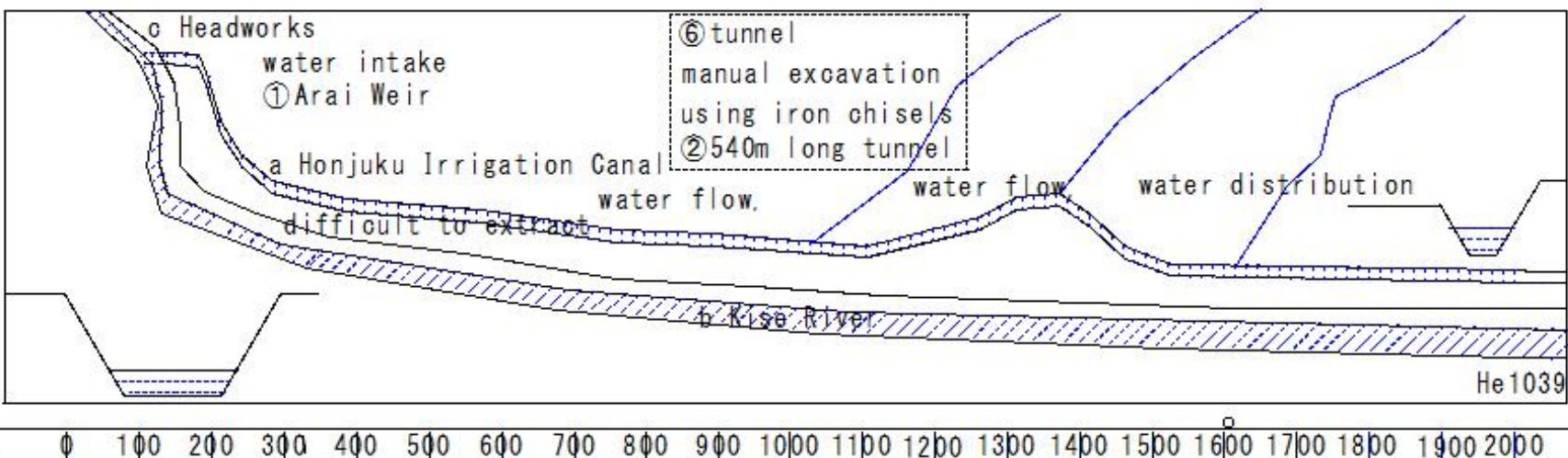
Hand-digging chisel

⑥tunnel
manual excavation
using iron chisels
②540m long tunnel



He1039

He954



(He1040)Honjukuyousui Irrigation Canal (Shizuoka)

(He1040)Honjukuyousui Irrigation Canal (Shizuoka)

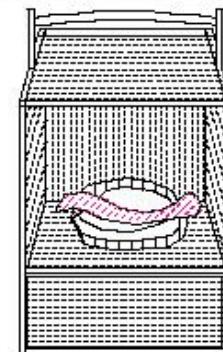
Honjukuyousui Irrigation Canal

⑦The surveying techniques using lanterns were used as models for the construction of the Fukara Irrigation Canal, which was built 67 years later.

- ⑦The surveying techniques using lanterns
- ②540m long tunnel

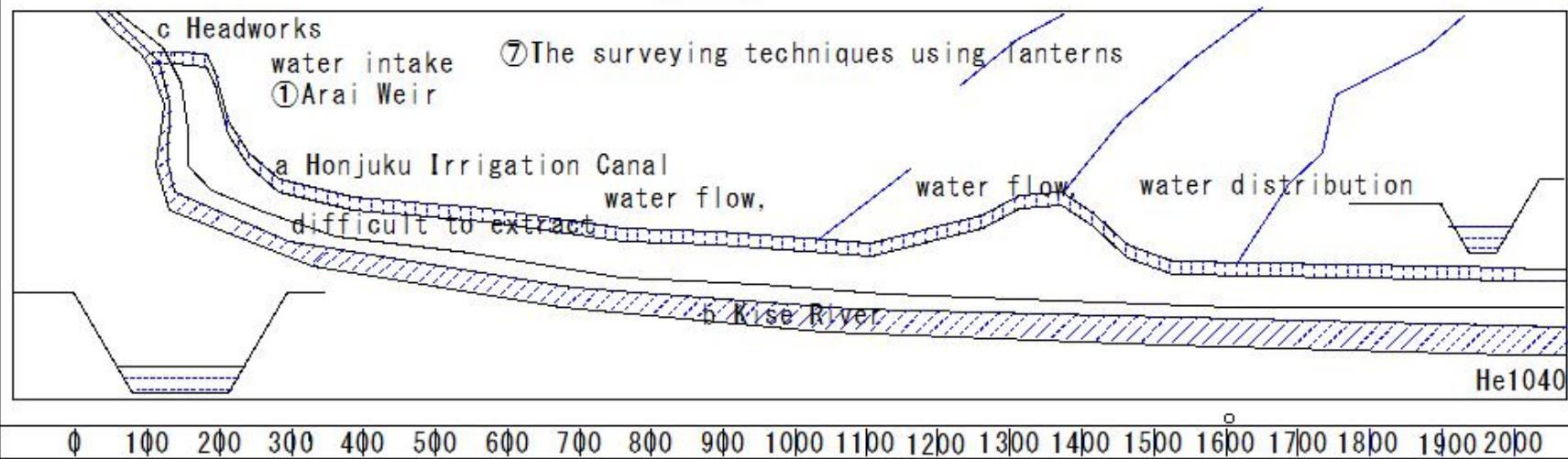
He1040

Lantern used in excavation



- ⑦The surveying techniques using lanterns

He954



(He1041)Honjukuyousui Irrigation Canal (Shizuoka)

(He1041) Honjukuyousui Irrigation Canal (Shizuoka)

Honjukuyousui Irrigation Canal

⑧The tunnel as it was completed in 1603 (hand-dug)

Utilizing the Koshu Irrigation Law (Kumosubakiri)

The tunnel as it was renovated in 1998

(Concrete lining)

The tunnel as it was completed in 1603 (hand-dug)

The tunnel as it was renovated in 1998 (Concrete lining)

He1041

He954

Lantern to dig straight!

IRRIGATION LINES

lanterns

straight line

He953

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1042)Honjukuyousui Irrigation Canal (Shizuoka)

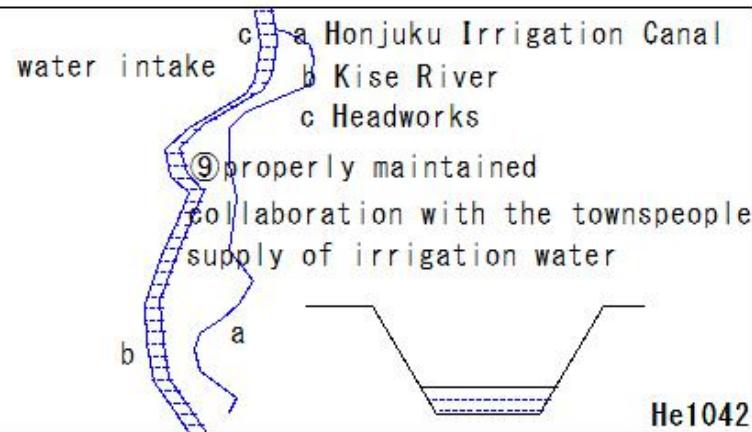
(He1042) Honjukuyousui Irrigation Canal (Shizuoka)

Honjukuyousui Irrigation Canal

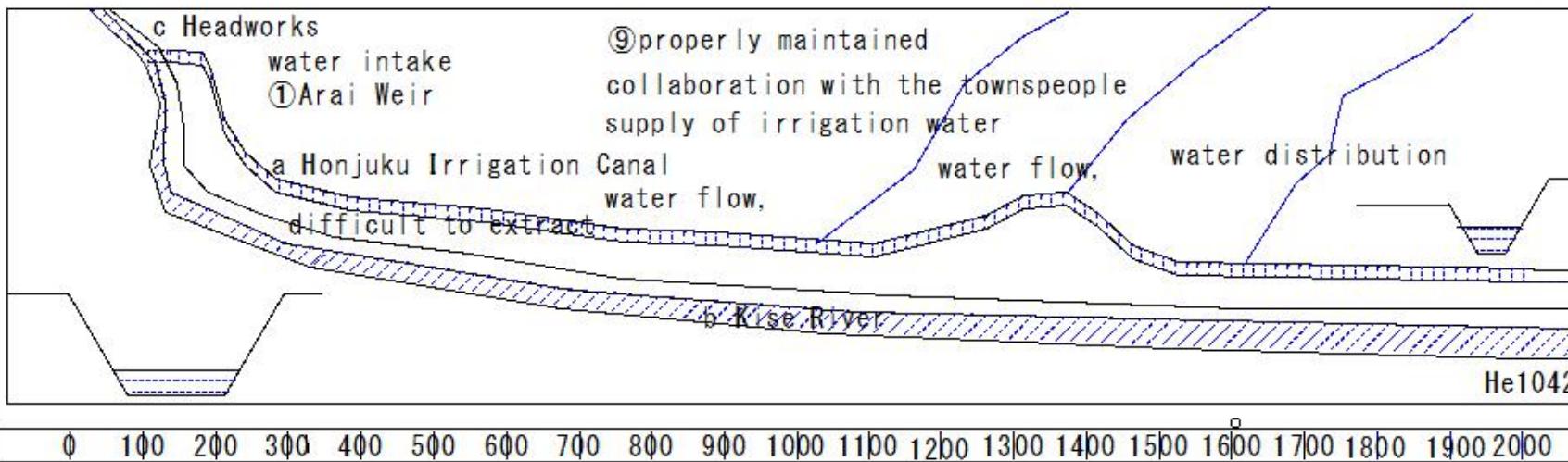
⑨Even now, 420 years after its completion, it has been properly maintained and used through cooperation and collaboration with the townspeople, and provides a stable supply of irrigation water to the rice paddies in the Honjuku area.

⑨ properly maintained
collaboration with the townspeople
supply of irrigation water

He1042



He1042



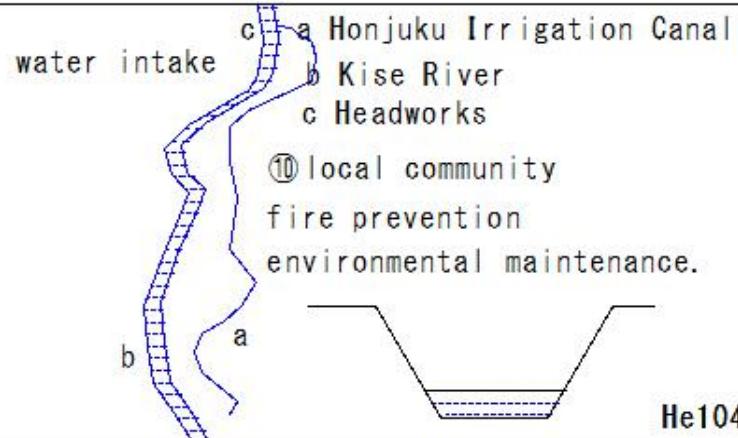
(He1043)Honjukuyousui Irrigation Canal (Shizuoka)

(He1043)Honjukuyousui Irrigation Canal (Shizuoka)

Honjukuyousui Irrigation Canal

⑩Today, it is carefully preserved and managed as an important water resource that supports the prosperous local community and agricultural development, including as water for fire prevention and environmental maintenance.
⑩local community fire prevention environmental maintenance.

He1043



c Headworks
water intake
①Arai Weir

⑩ local community
fire prevention
environmental maintenance.

a Honjuku Irrigation Canal
water flow,
difficult to extract

water flow,

water distribution

b Kise River

He1043

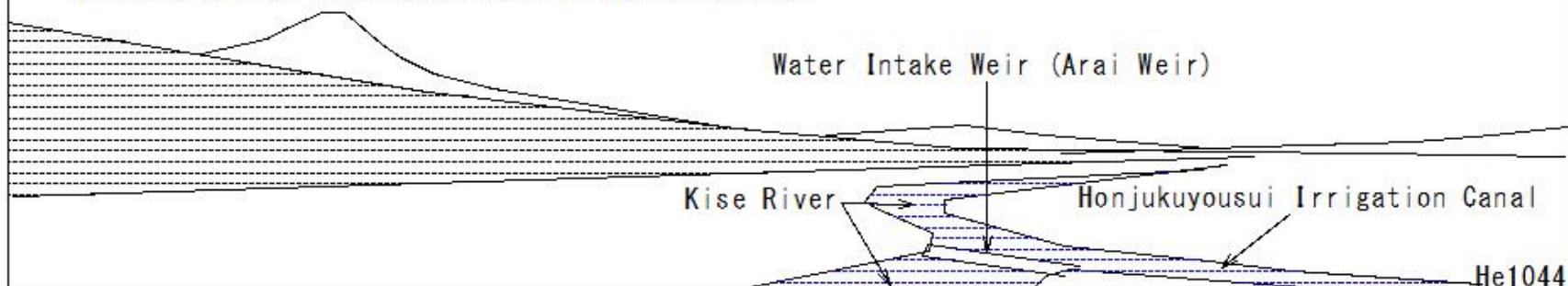
∅ 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1044)Honjukuyousui Irrigation Canal (Shizuoka)

(He1044) Honjukuyousui Irrigation Canal (Shizuoka)

Honjukuyousui Irrigation Canal

⑪ Honjukuyousui Irrigation Canal Water Intake Weir (Arai Weir) -
Panoramic view from downstream of the Kise River



c Headworks

water intake
① Arai Weir

a Honjuku Irrigation Canal
water flow,
difficult to extract

⑪ Honjukuyousui Irrigation Canal Water Intake Weir (Arai Weir) -
Panoramic view from downstream of the Kise River

water flow,

water distribution

Kise River

He1044

∅ 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1045) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1045) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

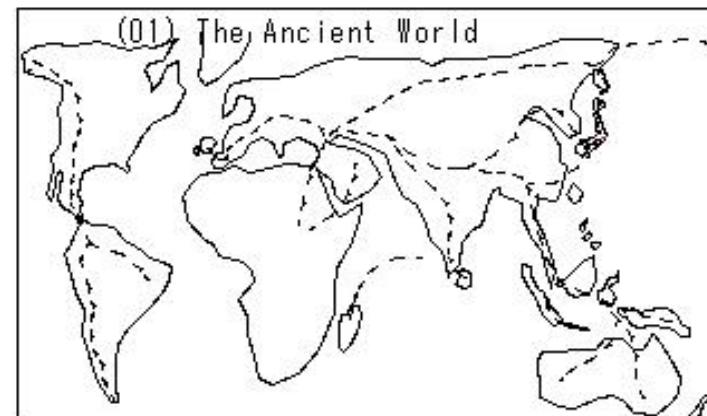
Kitayama Irrigation Canal
[Fujinomiya City, Shizuoka Prefecture]
①Advanced technology for hanging and buried
gutters that cross eroded valleys
①hanging and buried gutters

Kitayama Irrigation System
[Fujinomiya City, Shizuoka Prefecture]



He1045

He1045



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1046) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1046) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

Kitayama Irrigation Canal
[Fujinomiya City, Shizuoka Prefecture]

Kitayama Irrigation System
[Fujinomiya City, Shizuoka Prefecture]

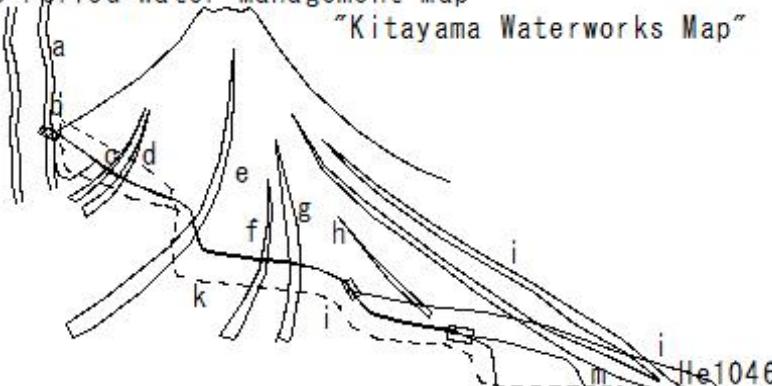


He1045

a Shiba River j Yamamiya Village
b Iguchi k Koshu Omichi
c Inukubosawa (Inokubo River)
d Kantansawa
e Mumidanisawa
f Takisawa (Takesawa)
g Okubosawa
h Shida Mizusawa 井戸 Honmyo-ji Temple
i Harusawa 井戸 Kitayama Honmon-ji Temple

He1046

Edo Period Water Management Map
"Kitayama Waterworks Map"



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1047) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1047) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

Kitayama Irrigation Canal

[Fujinomiya City, Shizuoka Prefecture]

① The Kitayama Irrigation Canal is an irrigation canal that flows through the western foot of Mount Fuji, Japan's highest peak. Drilling of the canal began toward the end of the Sengoku period, with the Shiba River as its water source.

By the mid-Edo period, it had grown into a massive canal that irrigated nine villages.

①foot of Mount Fuji water source.
Shiba River nine villages

a Shiba River i Yamamiya Village

b Iguchi k Koshu Omichi

c. Inukubosawa (Inokubo River)

d Kantapsawa

a Kantansawa

¶ Takiisawa (Takesawa)

Takizawa
et al.

b Shida Mizusawa | 飯 飯野寺 Temple

Haruya Mizusawa, Hiroki Yamada, Tomohiro Kitaoka, Hiroaki Horikoshi, and Toshiyuki Horikoshi

Edo Period Water Management Map

Kitayama Irrigation Canal

①foot of Mount Fuji
Shiba River
water source.
nine villages

Labels: a, b, c, d, e, f, g, h, i, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z

He1048

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1048) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1048) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

Kitayama Irrigation Canal

[Fujinomiya City, Shizuoka Prefecture]

② Construction of the canal began under the orders of Tokugawa Ieyasu, who would later become Shogun of the Edo Shogunate.

Under his orders, in 1582, magistrate Ide Masatsugu constructed a canal 8 km long and 5.4 m wide.

The canal was subsequently extended by Ina Tadatsugu,

now it is approximately 10 km long with an irrigation area of 110 hectares.

② Construction of the canal in 1582.	canal 8 km long 5.4 m wide	now, 10 km long 110 hectares.
---	-------------------------------	----------------------------------

a Shiba River j Yamamiya Village

b Iguchi k Koshu Omichi

c Inukubosawa (Inokubo River)

d Kantansawa

e Mumidanisawa

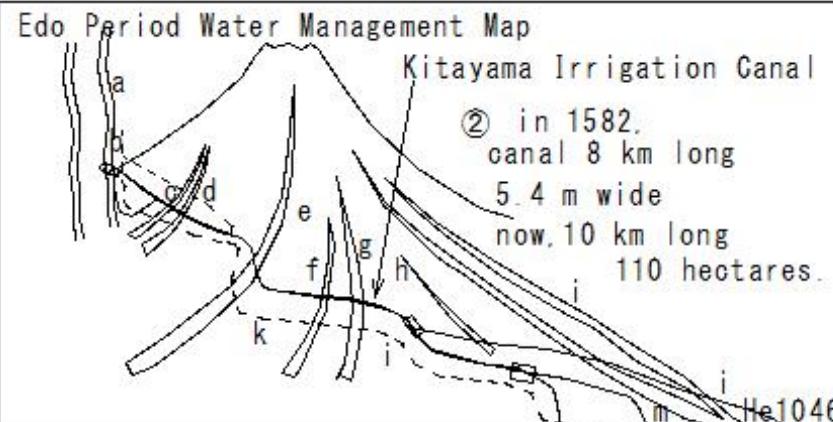
f Takisawa (Takesawa)

g Okubosawa

h Shida Mizusawa l 関 Honmyo-ji Temple

i Harusawa m 関 Kitayama Honmon-ji Temple

He1046



Ø 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1049) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1049) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

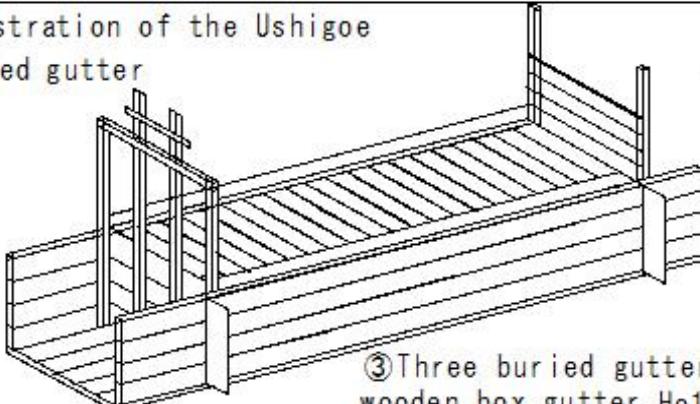
Kitayama Irrigation Canal

[Fujinomiya City, Shizuoka Prefecture]

③ The irrigation canal crossed seven eroded valleys at the foot of Mount Fuji.
Three buried gutter, each containing a wooden box gutter, carried water.
The largest gutter, both buried and hanging, was over 30 meters long.

③ Three buried gutter wooden box gutter He1049

Illustration of the Ushigoe Buried gutter



③ Three buried gutter wooden box gutter He1049

a Shiba River j Yamamiya Village

b Iguchi k Koshu Omichi

c Inukubosawa (Inokubo River)

d Kantansawa

e Mumidanisawa

f Takisawa (Takesawa)

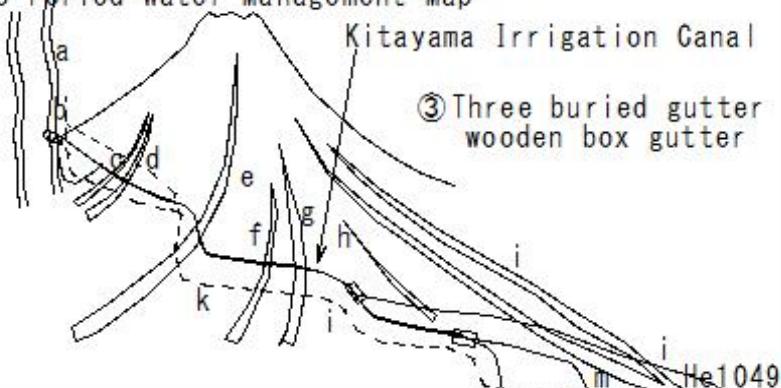
g Okubosawa

h Shida Mizusawa l 金 Honmyo-ji Temple

i Harusawa m 金 Kitayama Honmon-ji Temple

He1046

Edo Period Water Management Map



He1049

Ø 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1050) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1050) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

Kitayama Irrigation Canal

[Fujinomiya City, Shizuoka Prefecture]

④ Three hanging gutters with wooden box gutters to carry water and one open gutter were installed. The largest gutter, both buried and hanging, was over 30 meters long.

④ Three hanging gutters
wooden box gutters
Okubosawa "hanging gutter"
g Okubosawa

He1050

④ Three hanging gutters
wooden box gutters

Okubosawa "hanging gutter"
g Okubosawa

He1050

a Shiba River j Yamamiya Village

b Iguchi

j Yamamiya Village

k Koshu Omichi

c Inukubosawa (Inokubo River)

d Kantansawa

e Mumidanisawa

f Takisawa (Takesawa)

g Okubosawa

h Shida Mizusawa l 関 Honmyo-ji Temple

i Harusawa m 関 Kitayama Honmon-ji Temple

He1046

Edo Period Water Management Map

Kitayama Irrigation Canal

④ Three hanging gutters
wooden box gutters
Okubosawa "hanging gutter"
g Okubosawa

h

i

j

k

l

m

n

o

He1050

∅ 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1051) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1051) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

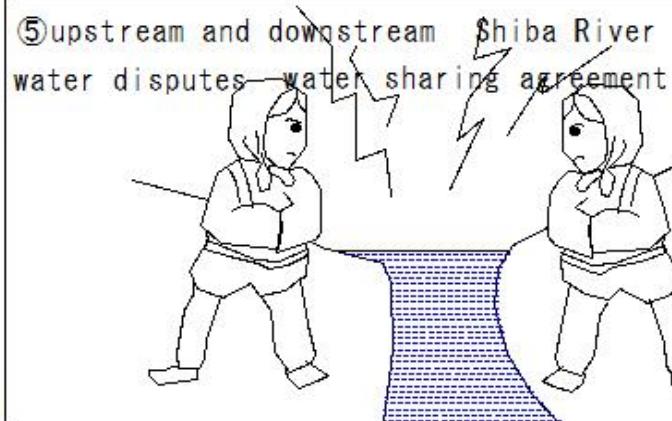
Kitayama Irrigation Canal

[Fujinomiya City, Shizuoka Prefecture]

⑤In the irrigation area, water disputes frequently arose between villages upstream and downstream of the Shiba River, but the people resolved the disputes through negotiation and signed a water sharing agreement in 1889.

⑤upstream and downstream Shiba River
water disputes water sharing agreement

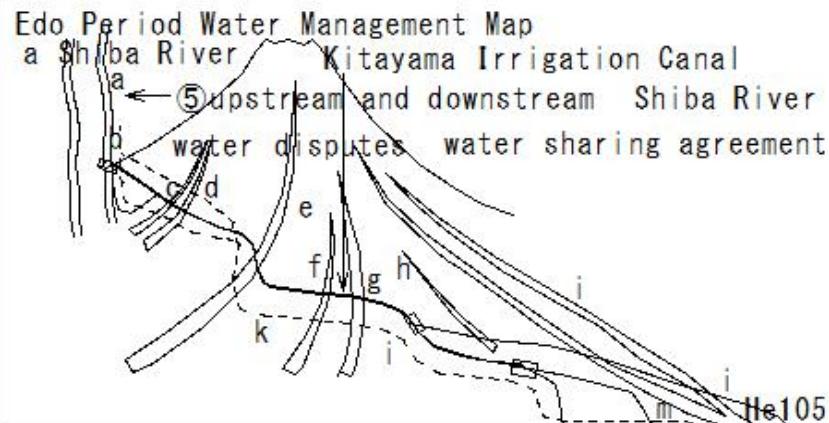
He1051



He1051

j Yamamiya Village
b Iguchi
c Inukubosawa (Inokubo River)
d Kantansawa
e Mumidanisawa
f Takisawa (Takesawa)
g Okubosawa
h Shida Mizusawa
i Harusawa
l 関 Honmyo-ji Temple
m 関 Kitayama Honmon-ji Temple

He1046



He1051

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1052) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1052) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

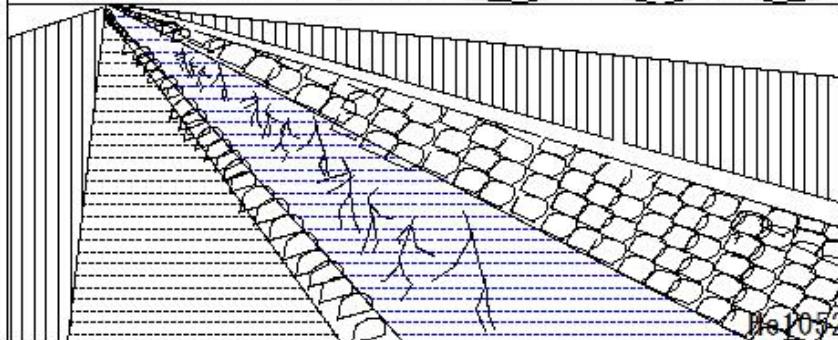
Kitayama Irrigation Canal
[Fujinomiya City, Shizuoka Prefecture]

⑥Since then, the Fujinomiya City Kitayama Irrigation Canal Management Cooperation Committee has been regularly cleaning soil and sand and mowing grass to maintain the Kitayama Irrigation Canal.

⑥cleaning soil and sand and mowing grass to maintain the Kitayama Irrigation Canal

He1052

⑥cleaning soil and sand and mowing grass to maintain the Kitayama Irrigation Canal.



He1052

a Shiba River j Yamamiya Village

b Iguchi k Koshu Omichi

c Inukubosawa (Inokubo River)

d Kantansawa

e Mumidanisawa

f Takisawa (Takesawa)

g Okubosawa

h Shida Mizusawa l 鬼 Honmyo-ji Temple

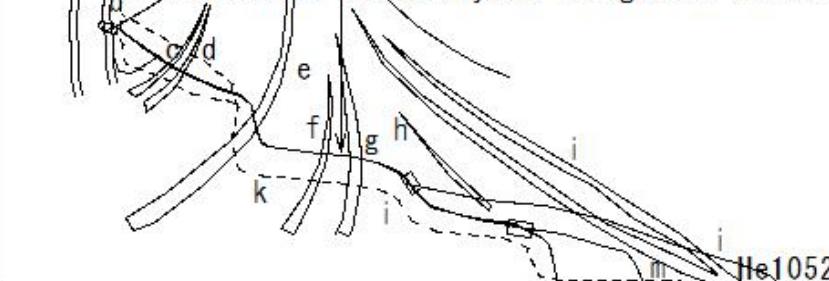
i Harusawa m 鬼 Kitayama Honmon-ji Temple

He1046

Edo Period Water Management Map

a Shiba River Kitayama Irrigation Canal

a ⑥cleaning soil and sand and mowing grass to maintain the Kitayama Irrigation Canal.



∅ 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1053) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1053) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

⑦Currently, three sides of the Kitayama Irrigation Canal have been renovated with concrete, utilizing the abundant water volume and head, small-scale hydroelectric power generation is being carried out at four locations.

The combined maximum output is 428 kW, generating 2,437 MWh of electricity.

He1053

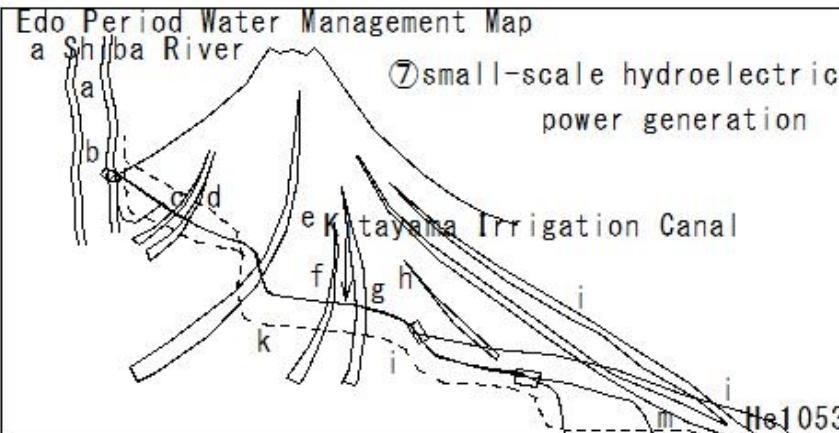
This has reduced CO₂ emissions by 1,048 tons per year, producing clean, carbon dioxide-free electricity.

⑦small-scale hydroelectric power generation 428 kW, generating 2,437 MWh clean, carbon dioxide-free electricity.

He1053

a Shiba River j Yamamiya Village
b Iguchi k Koshu Omichi
c Inukubosawa (Inokubo River)
d Kantansawa
e Mumidanisawa
f Takisawa (Takesawa)
g Okubosawa
h Shida Mizusawa l 関 Honmyo-ji Temple
i Harusawa m 関 Kitayama Honmon-ji Temple

He1046



He1053

∅ 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1054) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1054) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

Kitayama Irrigation Canal

[Fujinomiya City, Shizuoka Prefecture]

1. Iguchi (Intake)

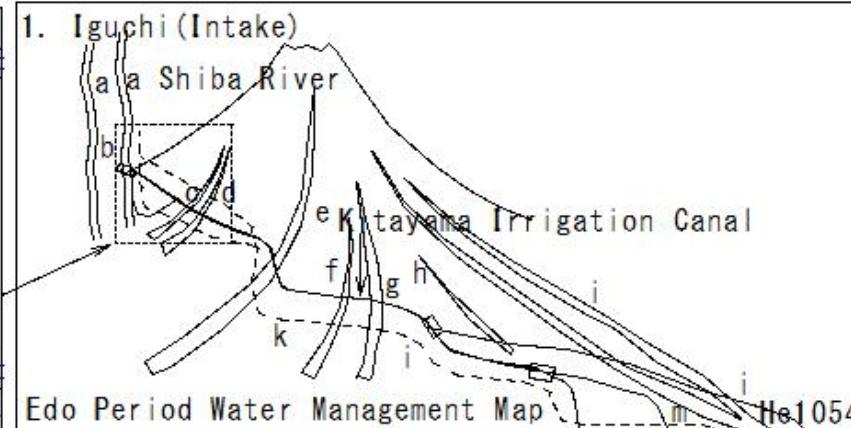
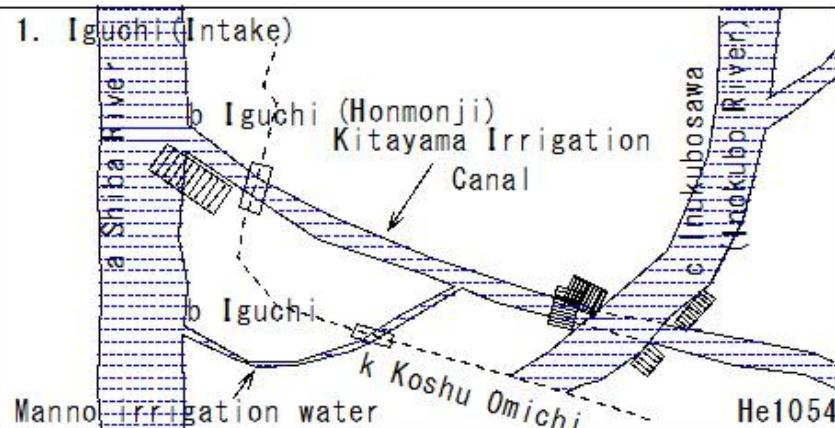
The Kitayama Irrigation Canal Intake underwent renovations in 1976 and 1977, but foundation stones and leveling stones installed in 1889 remain.

Currently, it also serves as a water intake for the Kitayama Water Purification Plant, the city's water supply system.

The Manno Irrigation Canal Intake is located approximately 100 meters downstream from the Kitayama Irrigation Canal Intake.

It flows approximately 500 meters before merging with the Kitayama Irrigation Canal.

He1054



Φ 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1055) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1055) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

Kitayama Irrigation Canal

[Fujinomiya City, Shizuoka Prefecture]

2. Inukubosawa (Inokubo River) and Kantanzawa

Inukubosawa was converted from a hanging canal to a buried canal in 1834.

At that time, it was 20 ken (approximately 36 m) long and 6 shaku (approximately 1.8 m) wide.

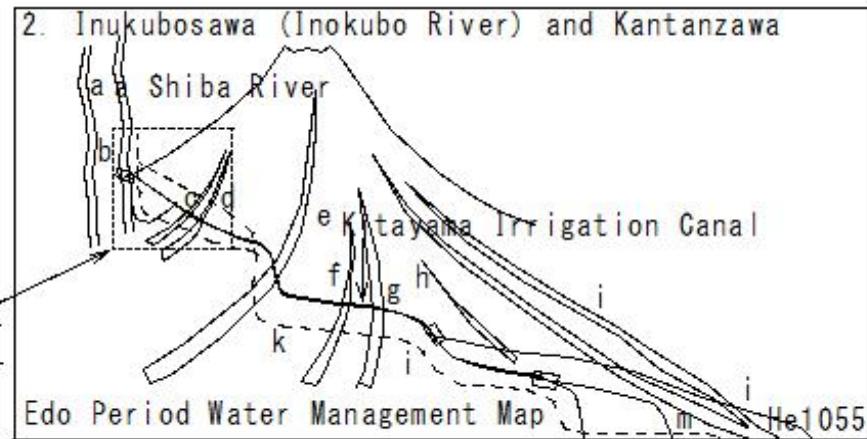
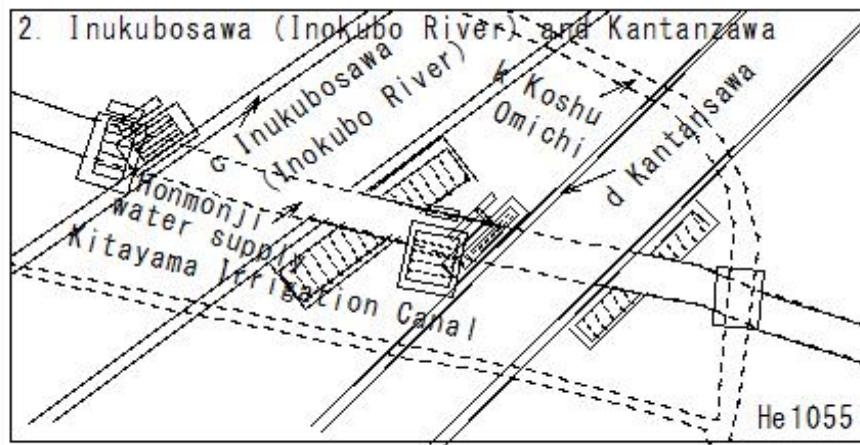
The buried canal is made of wood, and a sluice gate is installed on the upstream side.

(left side of the illustration) to prevent bad water from entering.

A buried canal was built for Kantanzawa in 1862, and it was renovated in 1908.

A monument commemorating this canal has been erected on top of it.

He1055



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1056) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1056) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

Kitayama Irrigation Canal

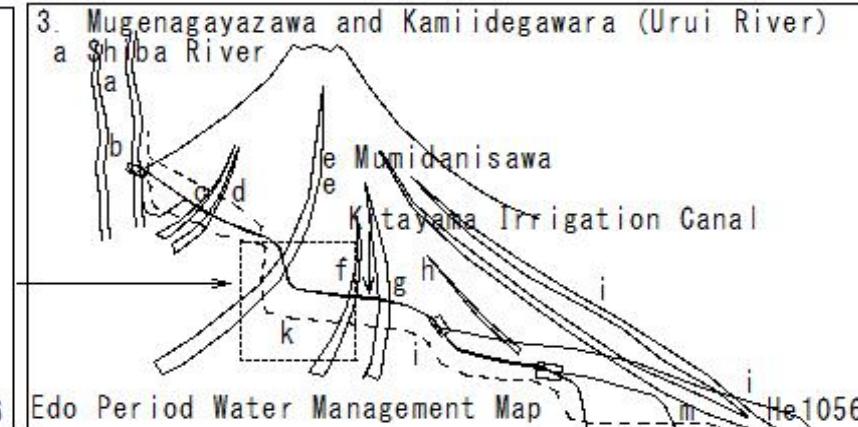
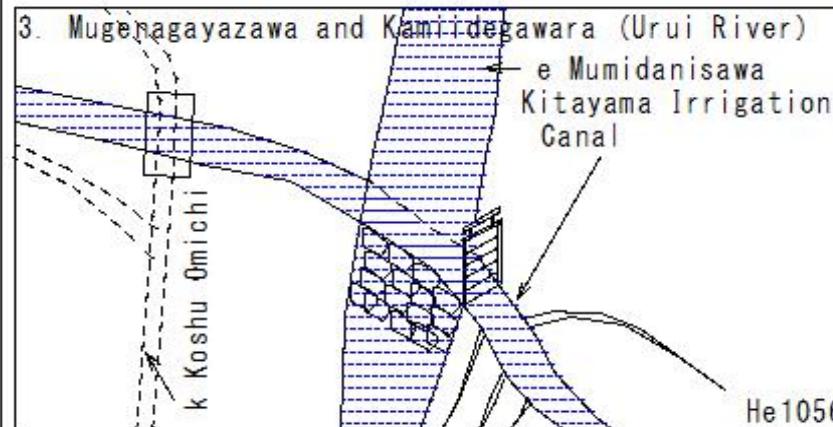
[Fujinomiya City, Shizuoka Prefecture]

3. Mugenagayazawa and Kamiidegawara (Urui River)

Mugenagayazawa refers to a large stream. During the Edo period, this area was called Kamiidegawara. Currently, the section downstream from Osawa Bridge is called the Jun'i River.

The Kitayama Irrigation Canal was constructed by lining large stones on the riverbank to create a weir, and then covering it with brushwood (tree branches) to prevent water leakage. During heavy floods, the weir would be washed away and sand would flow into the moat, causing frequent damage.

It appears that in 1862, along with the Kantanzawa, it was renovated into a buried culvert. He1056



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1057) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1057) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

Kitayama Irrigation Canal

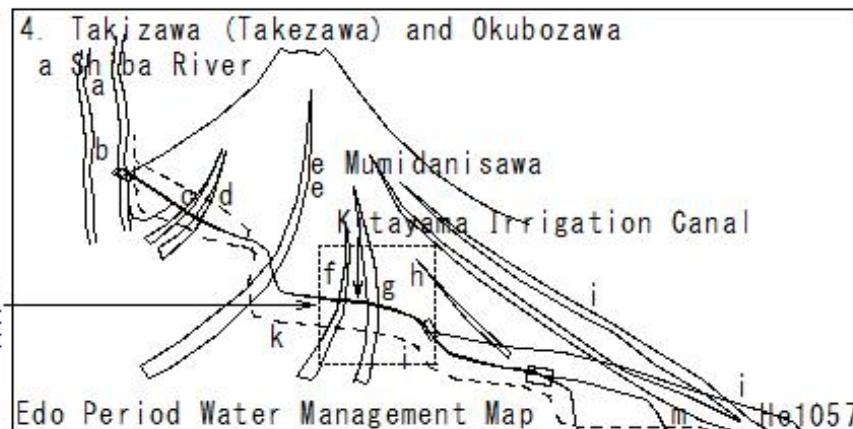
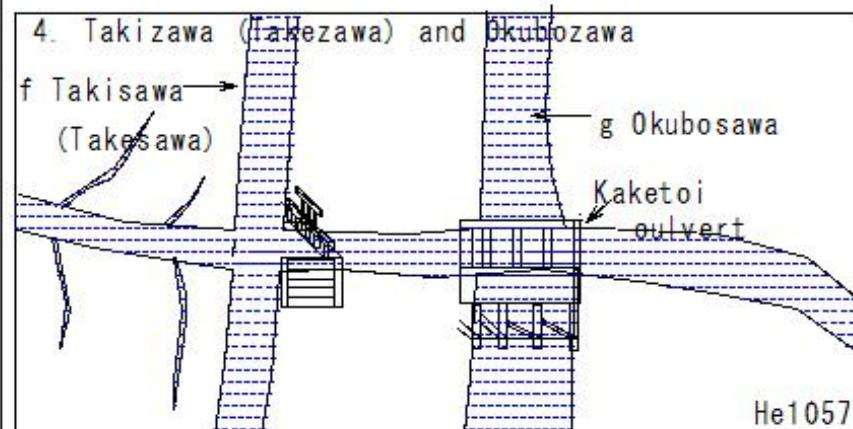
[Fujinomiya City, Shizuoka Prefecture]

4. Takizawa (Takezawa) and Okubozawa

At Takizawa (Takezawa), you can see the sluice gates and drainage frames of the wells.

The Okubozawa culvert was a large structure, measuring approximately 30 meters in length, 1.4 meters in width, and 50 cm in height, with pillars over 8 meters high.

He1057

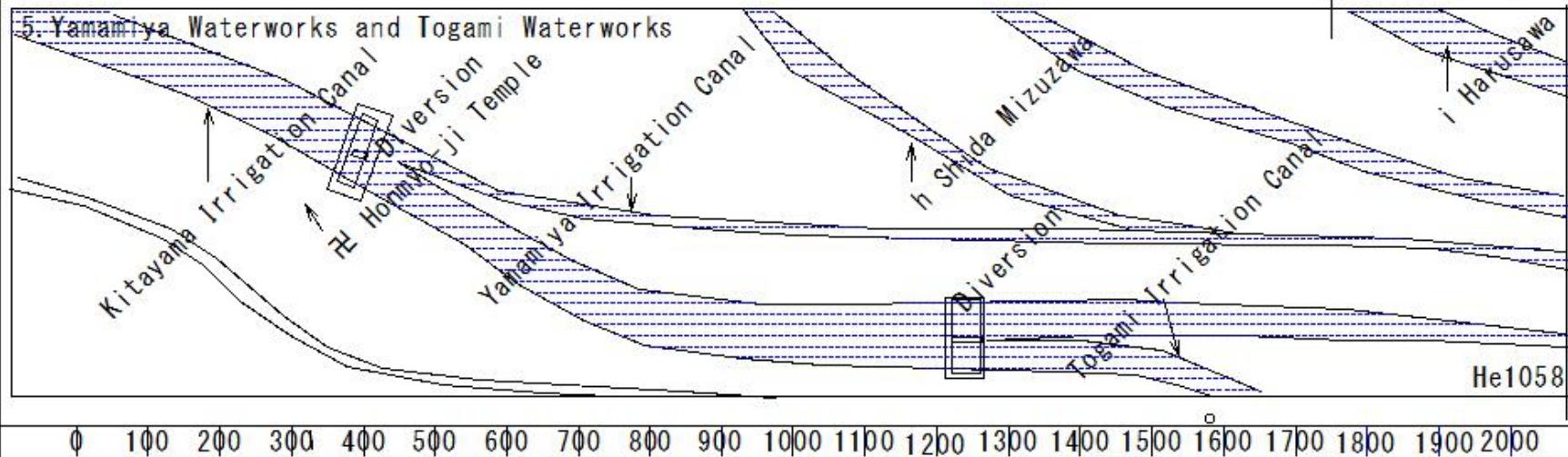
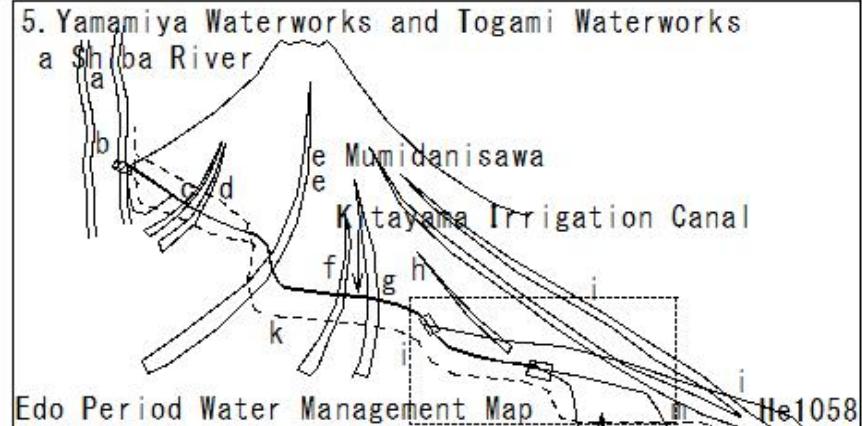


9 100 200 300 400 500 600 700 800 900 10b0 11b0 12b0 13b0 14b0 15b0 16b0 17b0 18b0 19b0 20b0

(He1058) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1058) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

Kitayama Irrigation Canal
[Fujinomiya City, Shizuoka Prefecture]
5. Yamamiya Waterworks and Togami Waterworks
The canal branches off into the Yamamiya Waterworks midway, and then further downstream into the Togami Waterworks.

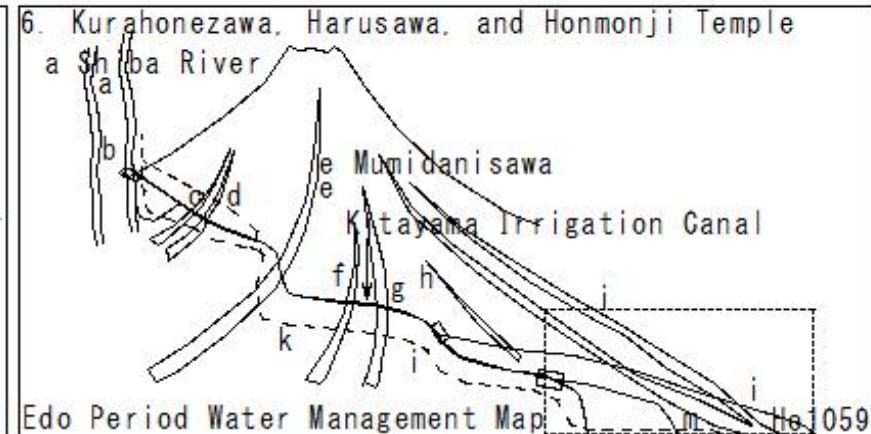


(He1059) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1059) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

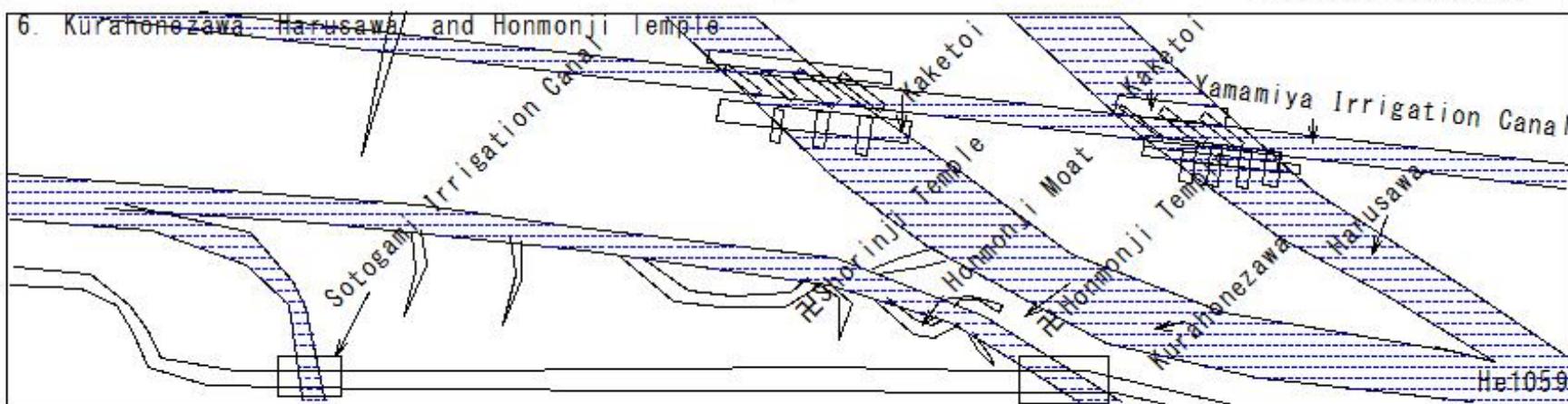
Kitayama Irrigation Canal
[Fujinomiya City, Shizuoka Prefecture]

6. Kurahonezawa, Harusawa, and Honmonji Temple
A Kaketoji is installed to cross the Kurahonezawa
and Harusawa streams near Kitayama Honmonji Temple.



He1059

He1059



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1060) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1060) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

Kitayama Irrigation Canal

[Fujinomiya City, Shizuoka Prefecture]

7. Waterwheels on the irrigation canals

Waterwheels are installed on the Togami, Miyahara, and Yamamiya canals.

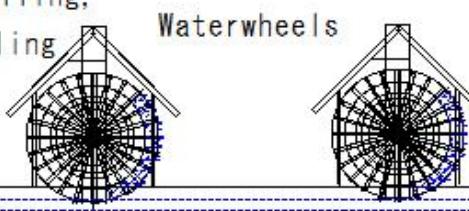
These waterwheels were used to power rice milling, barley milling, and flour milling.

7. Waterwheels on the irrigation canals

rice milling

barley milling,

flour milling



He1060

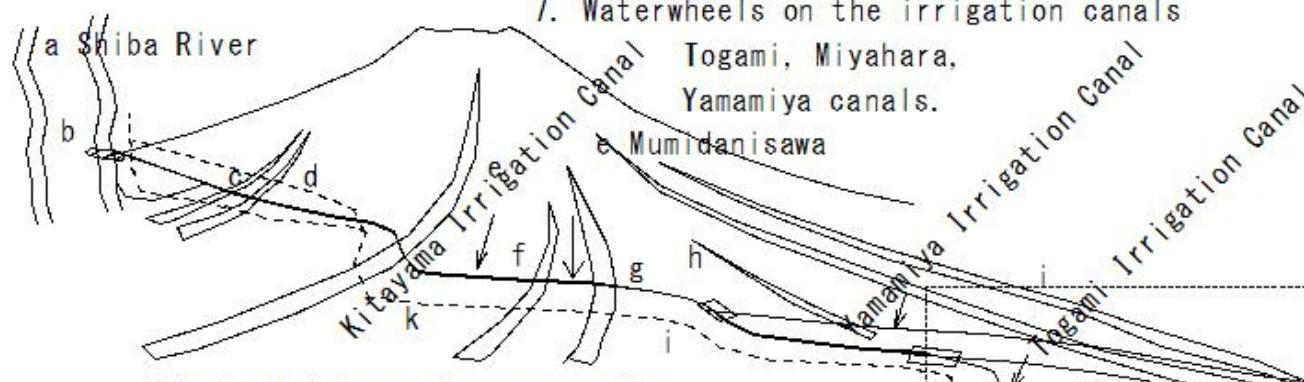
He1060

a Shiba River

7. Waterwheels on the irrigation canals

Togami, Miyahara,
Yamamiya canals.

Mumidanisawa



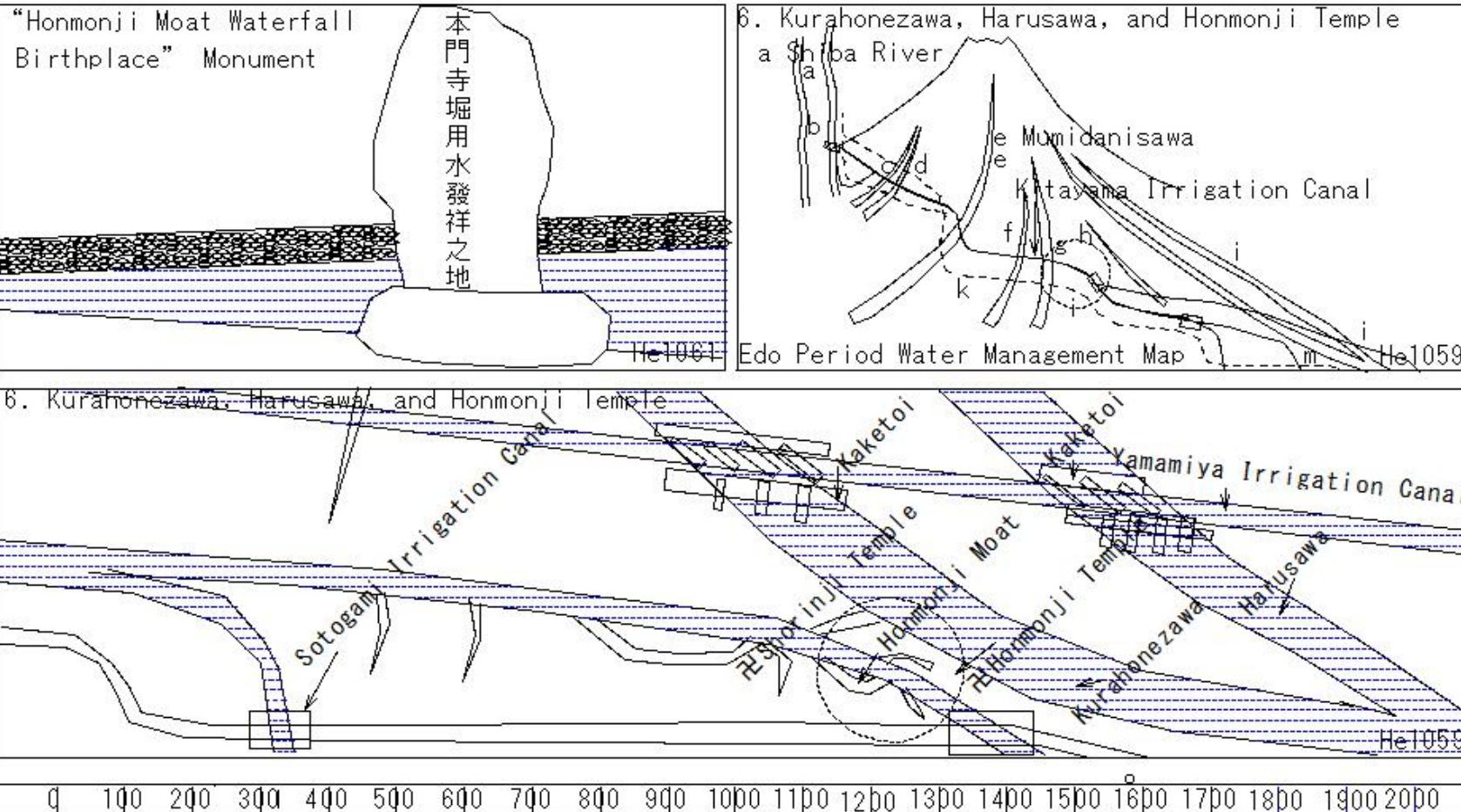
Edo Period Water Management Map

He1060

Ø 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

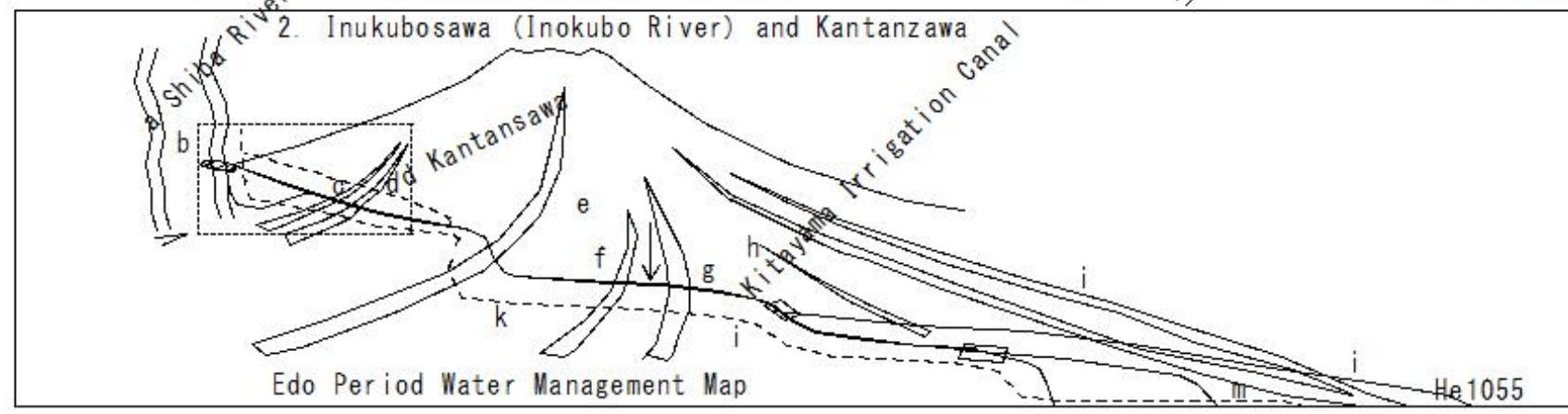
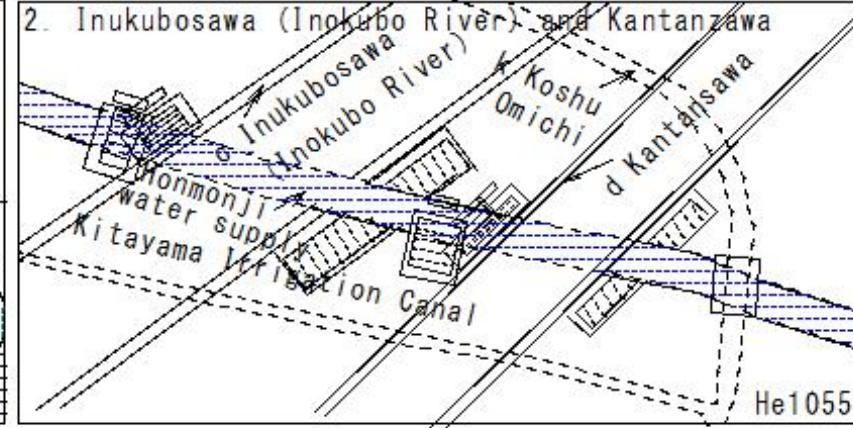
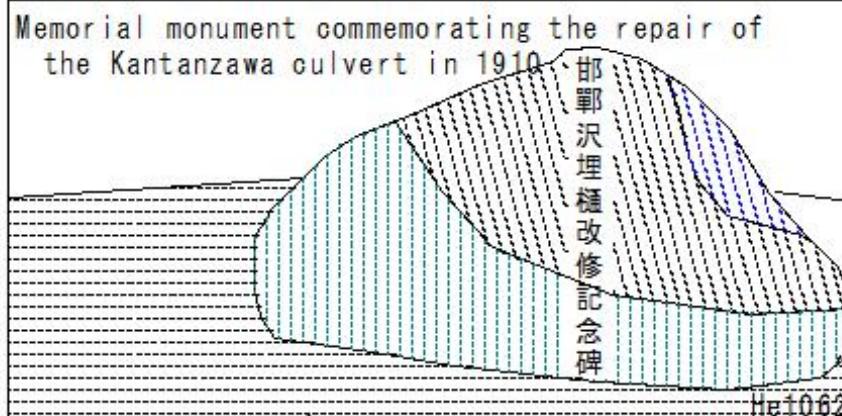
(He1061) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1061) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]



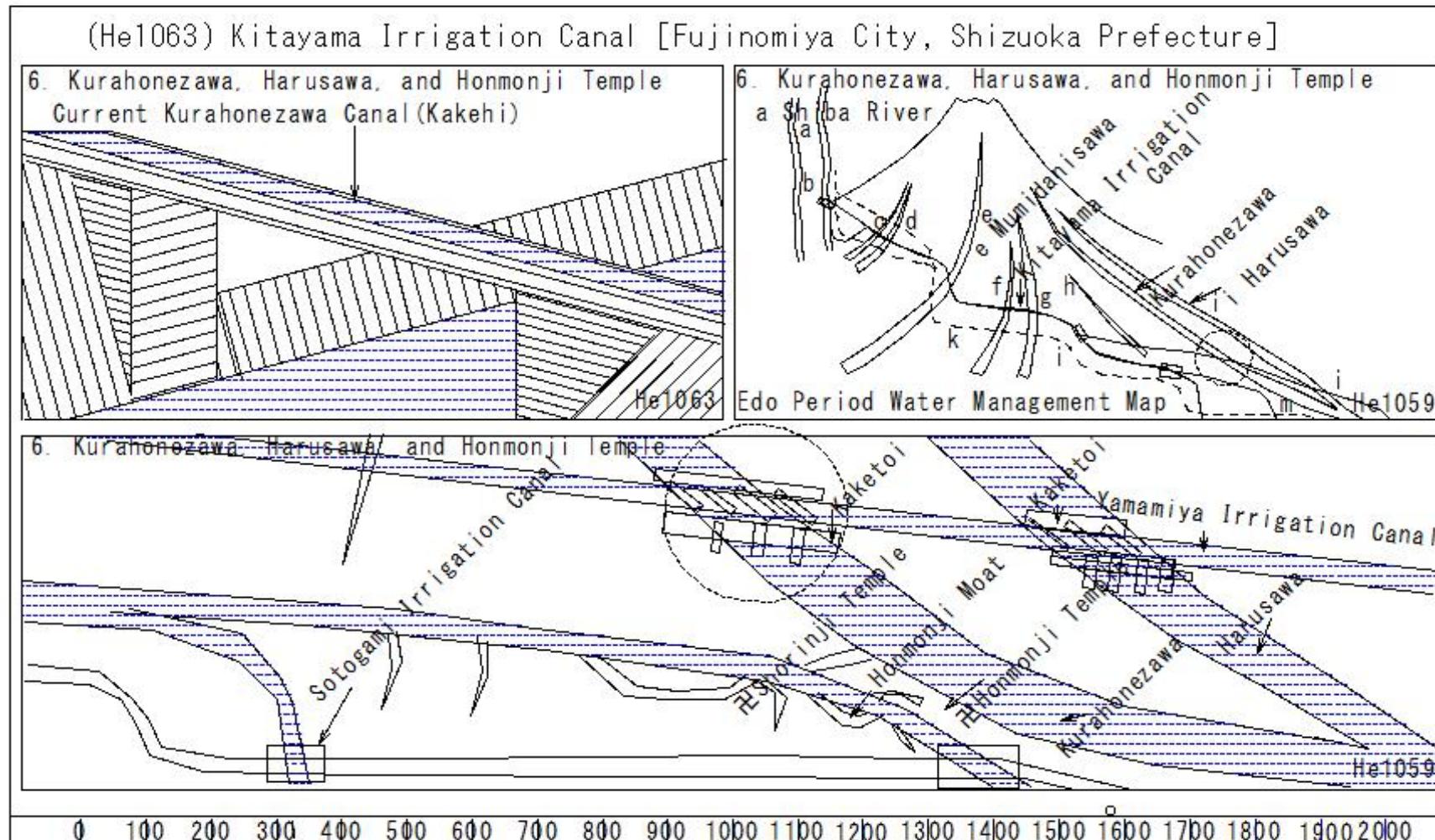
(He1062) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1062) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

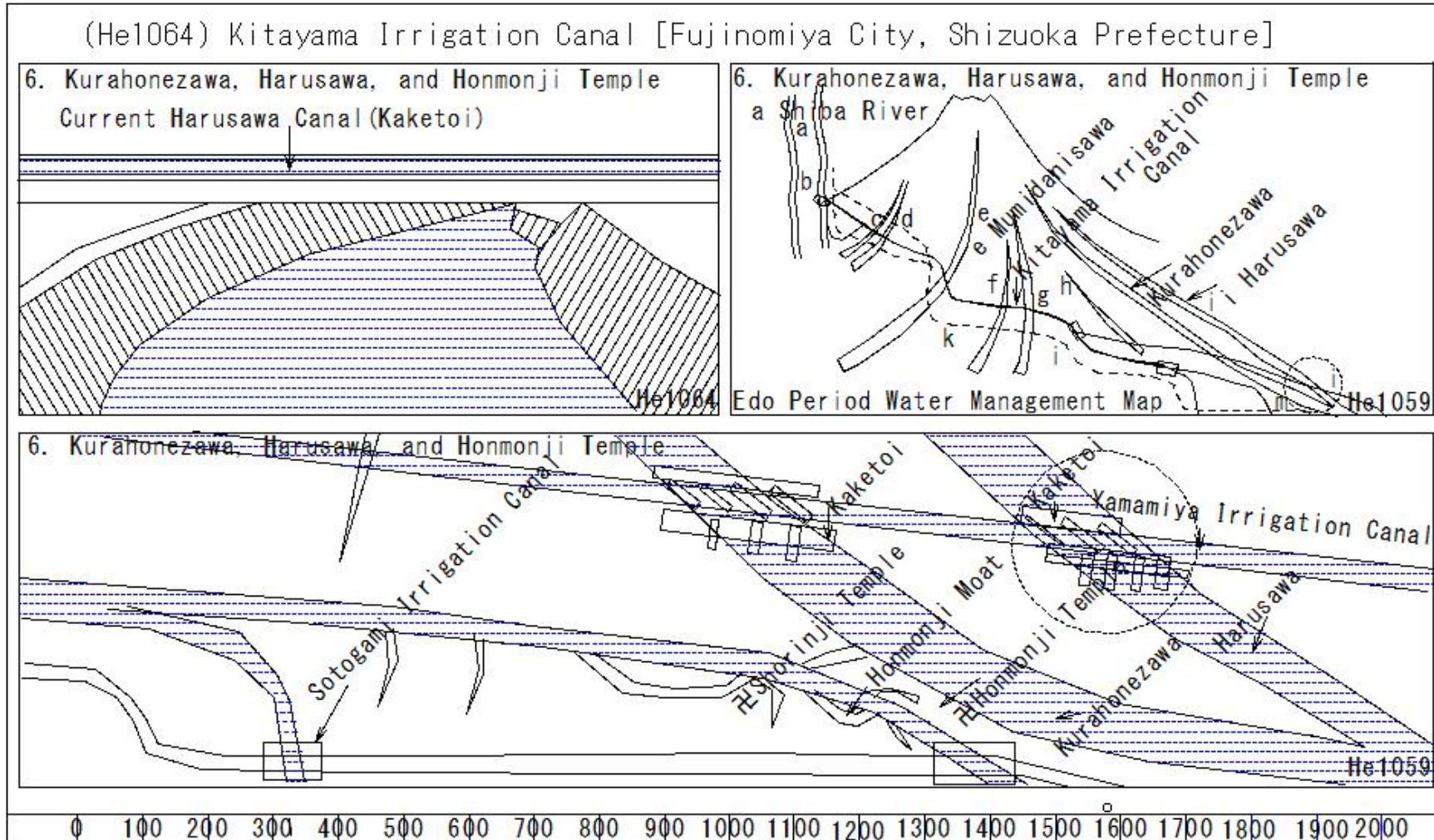


0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1063) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

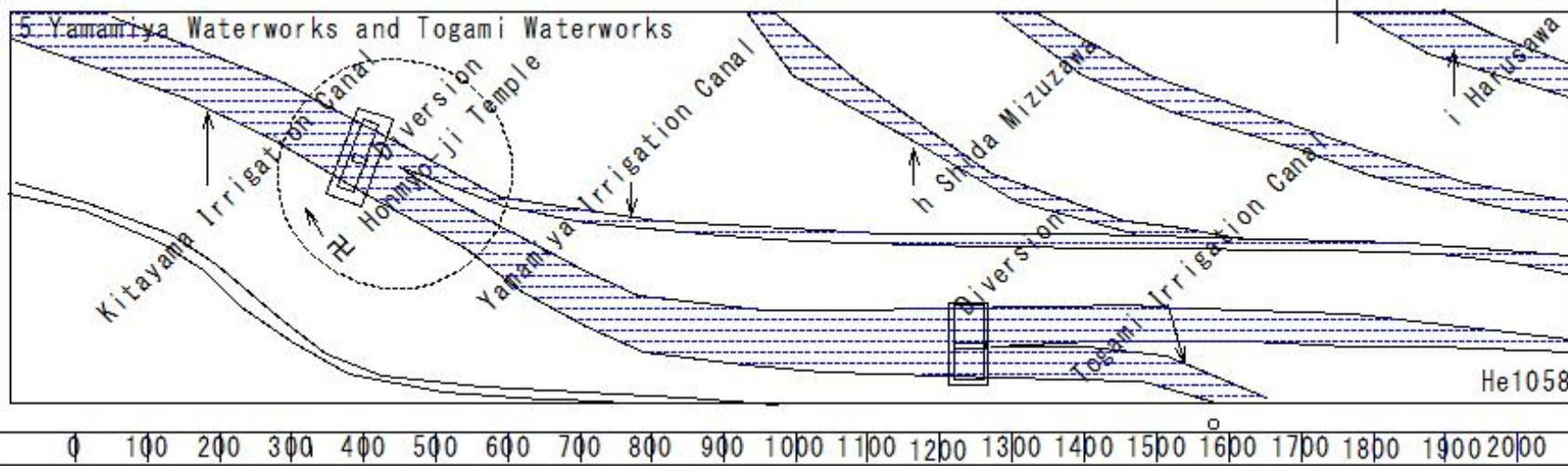
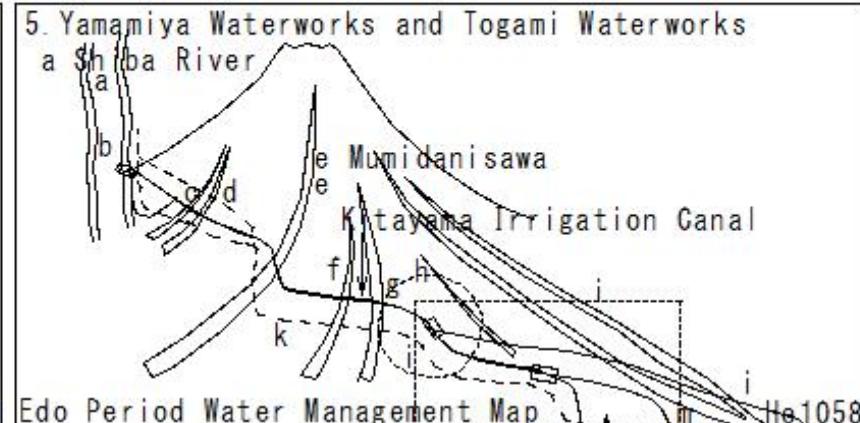
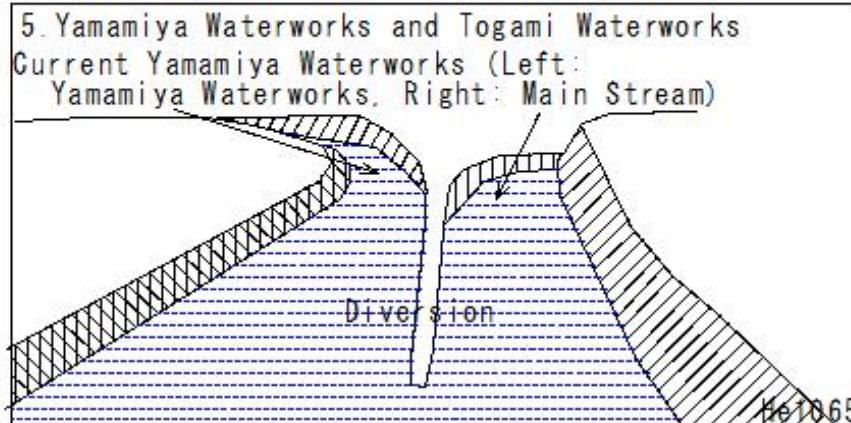


(He1064) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]



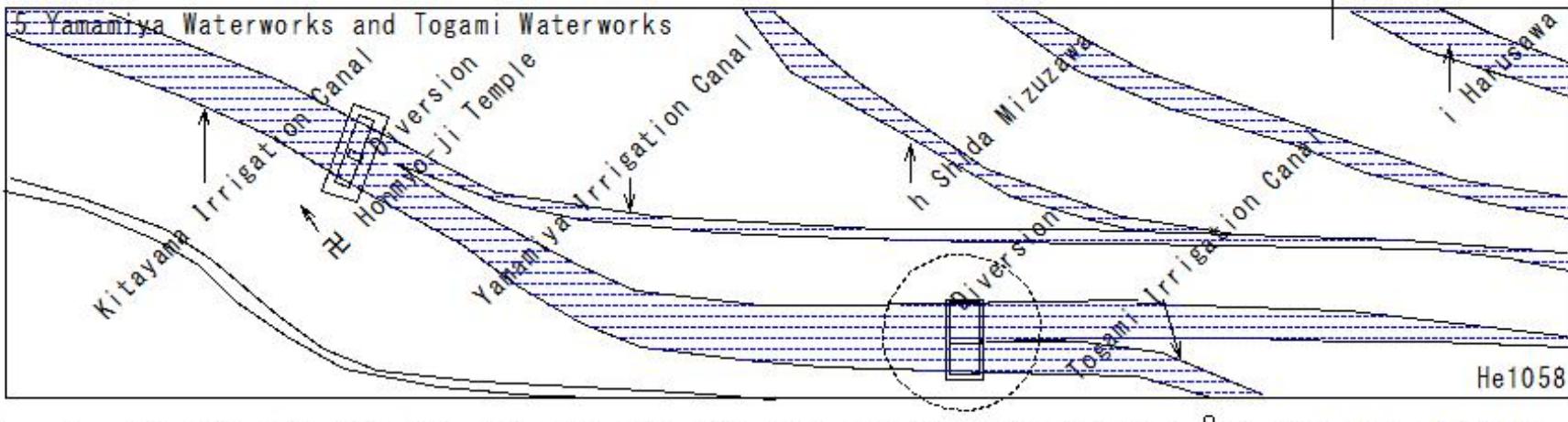
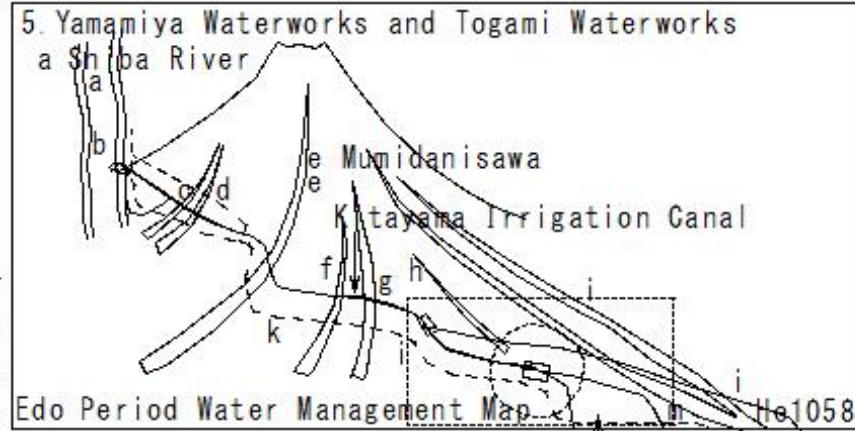
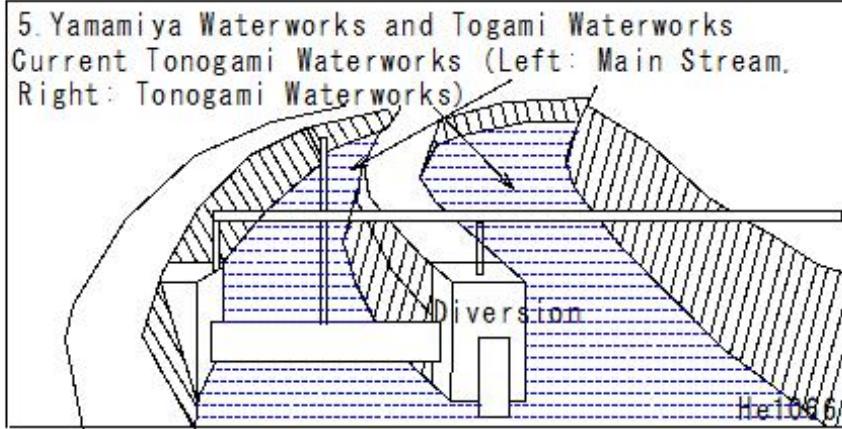
(He1065) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1065) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]



(He1066) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

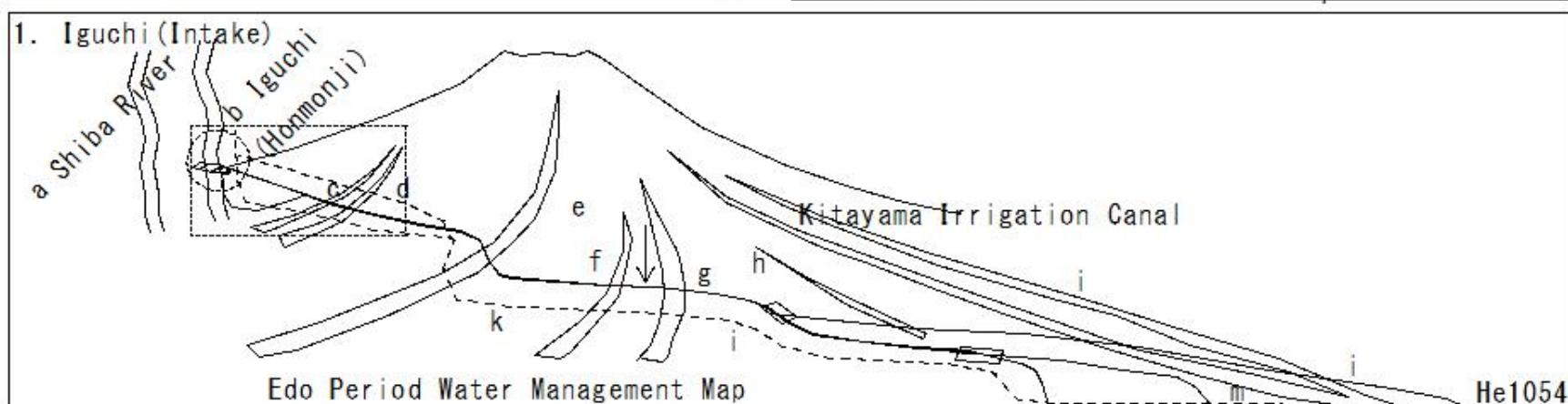
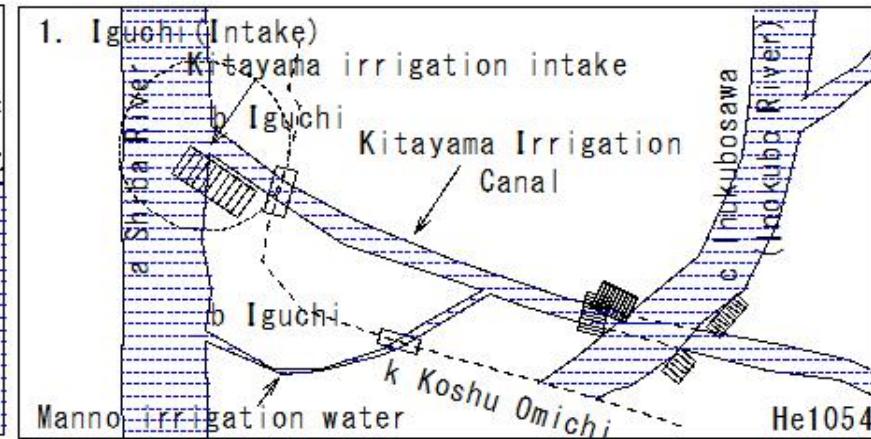
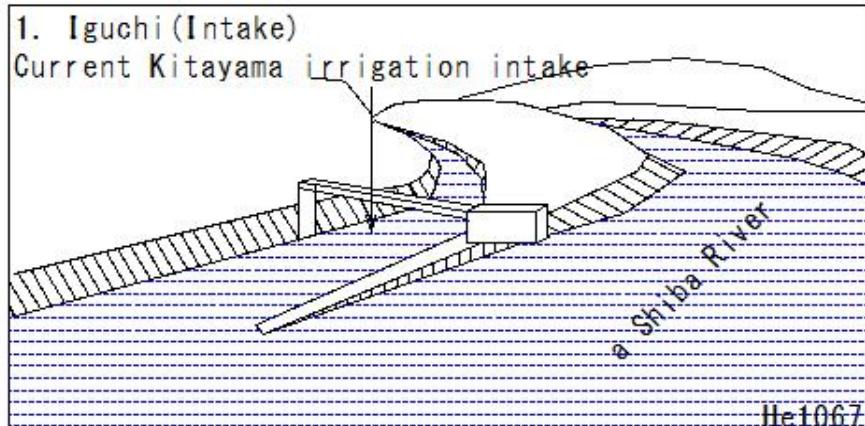
(He1066) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]



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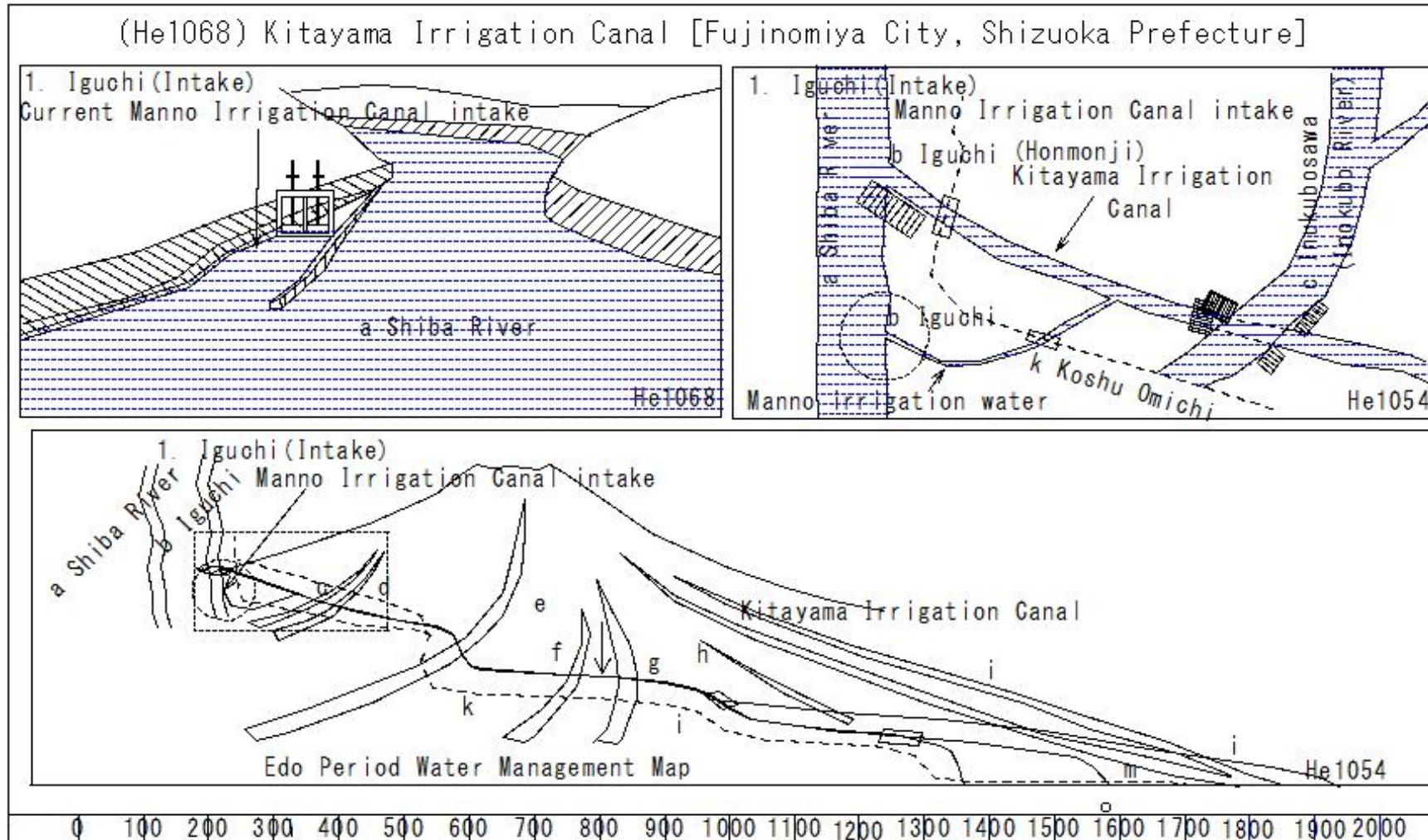
(He1067) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1067) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]



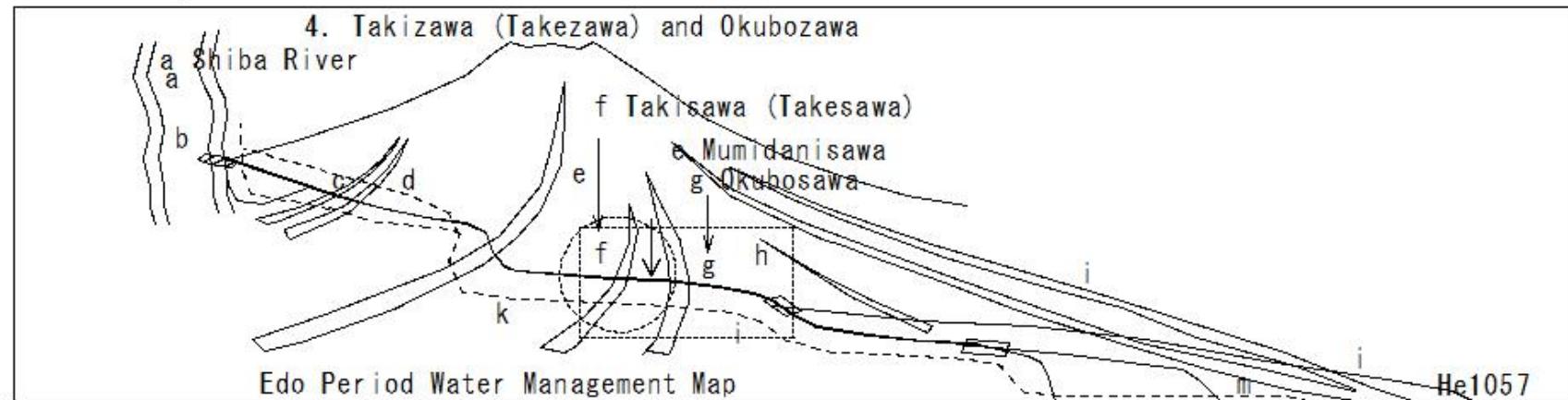
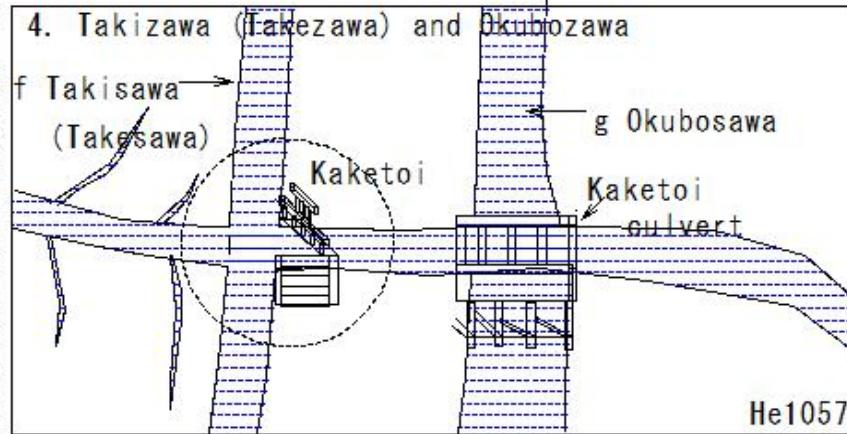
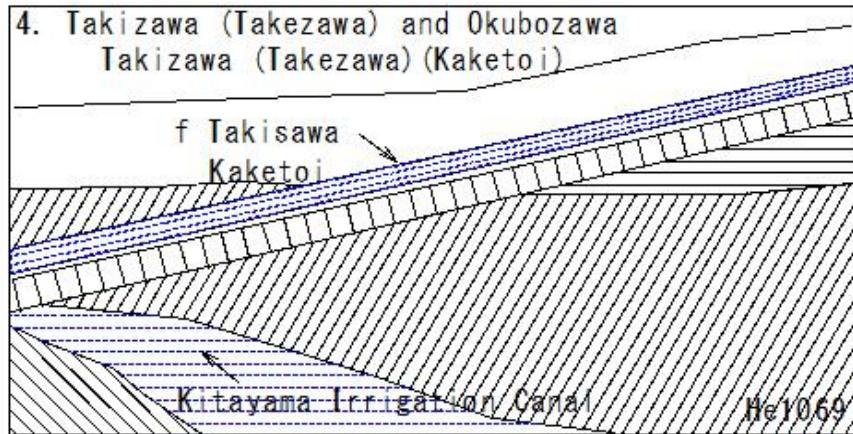
Ø 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1068) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]



(He1069) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

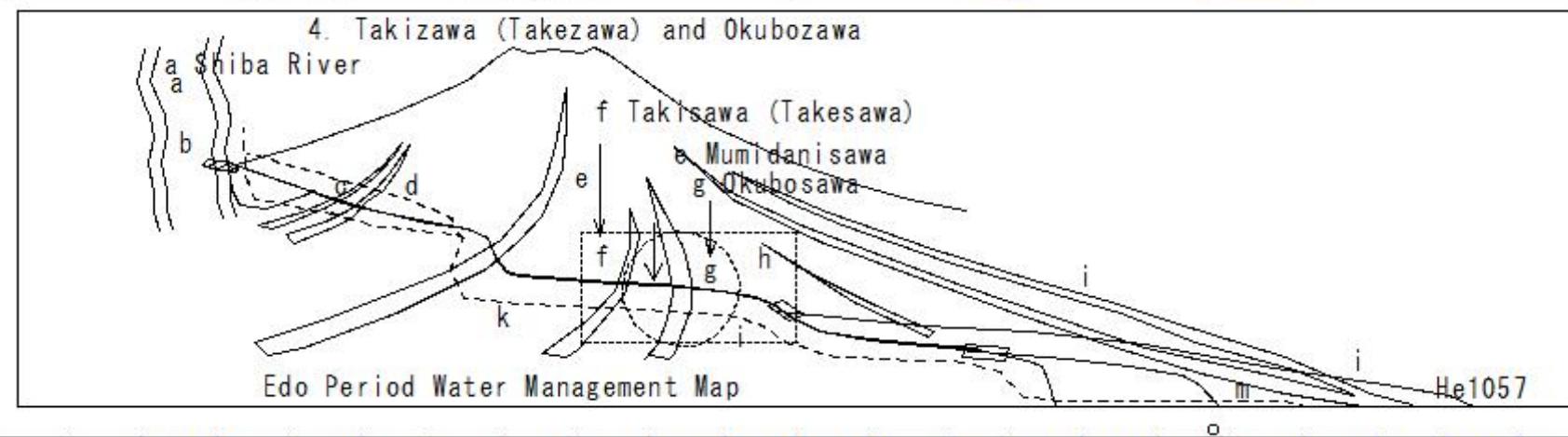
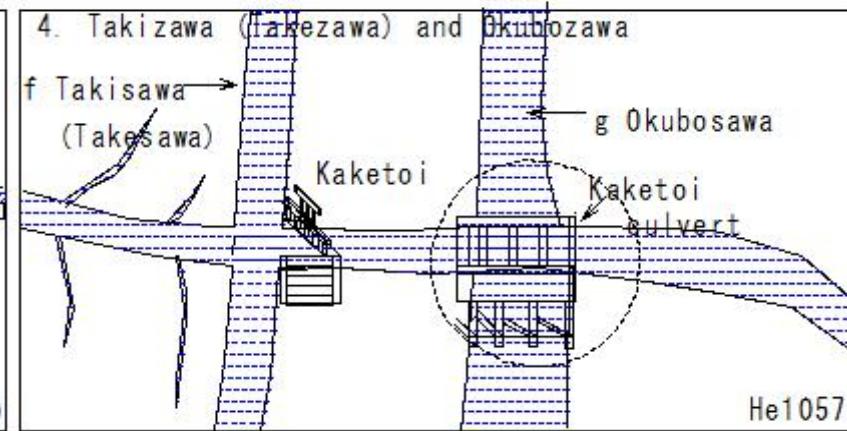
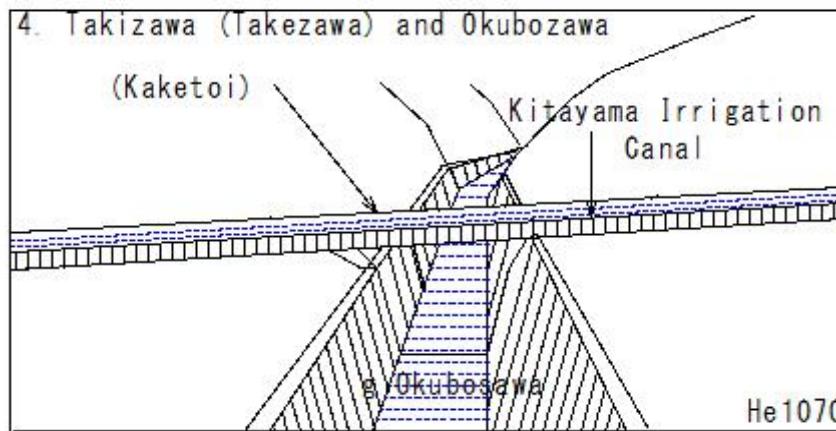
(He1069) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]



Ø 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

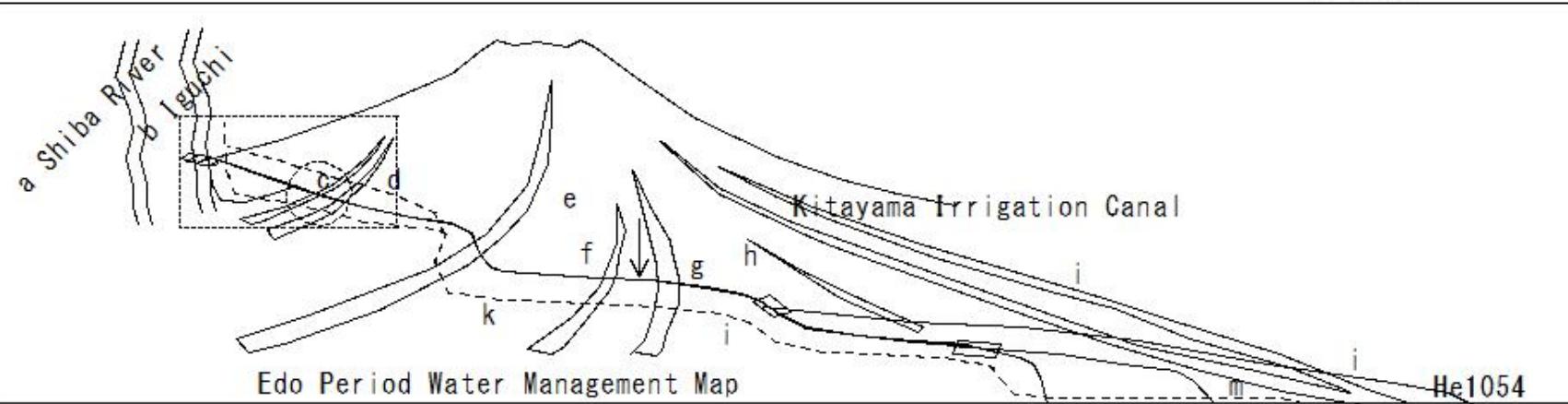
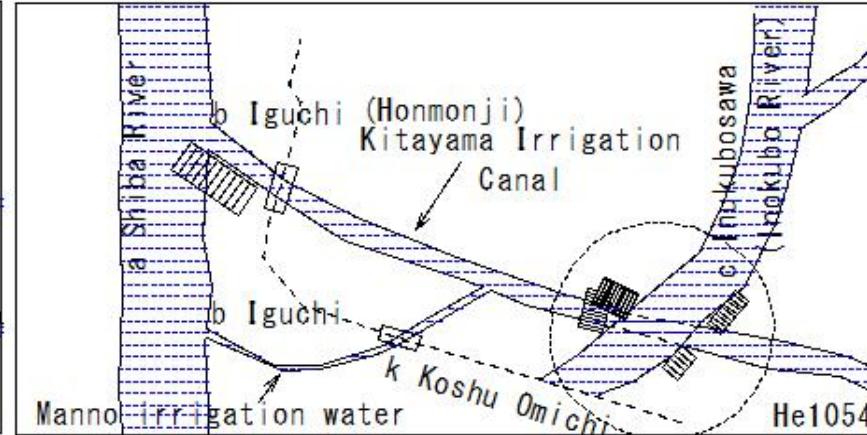
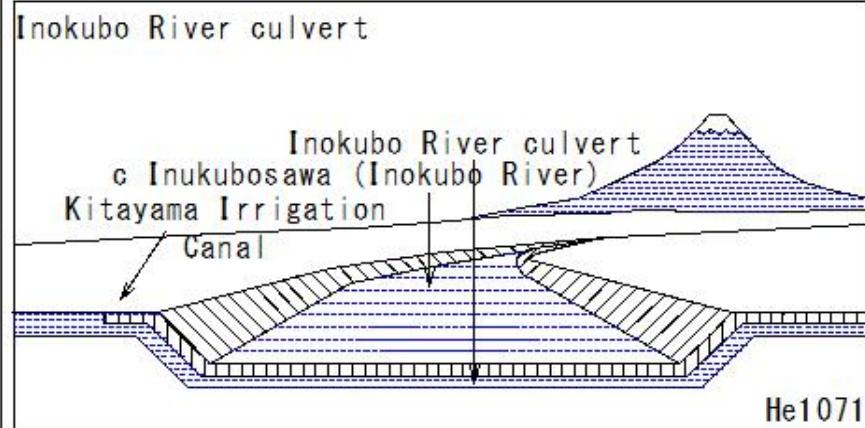
(He1070) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1070) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]



(He1071) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

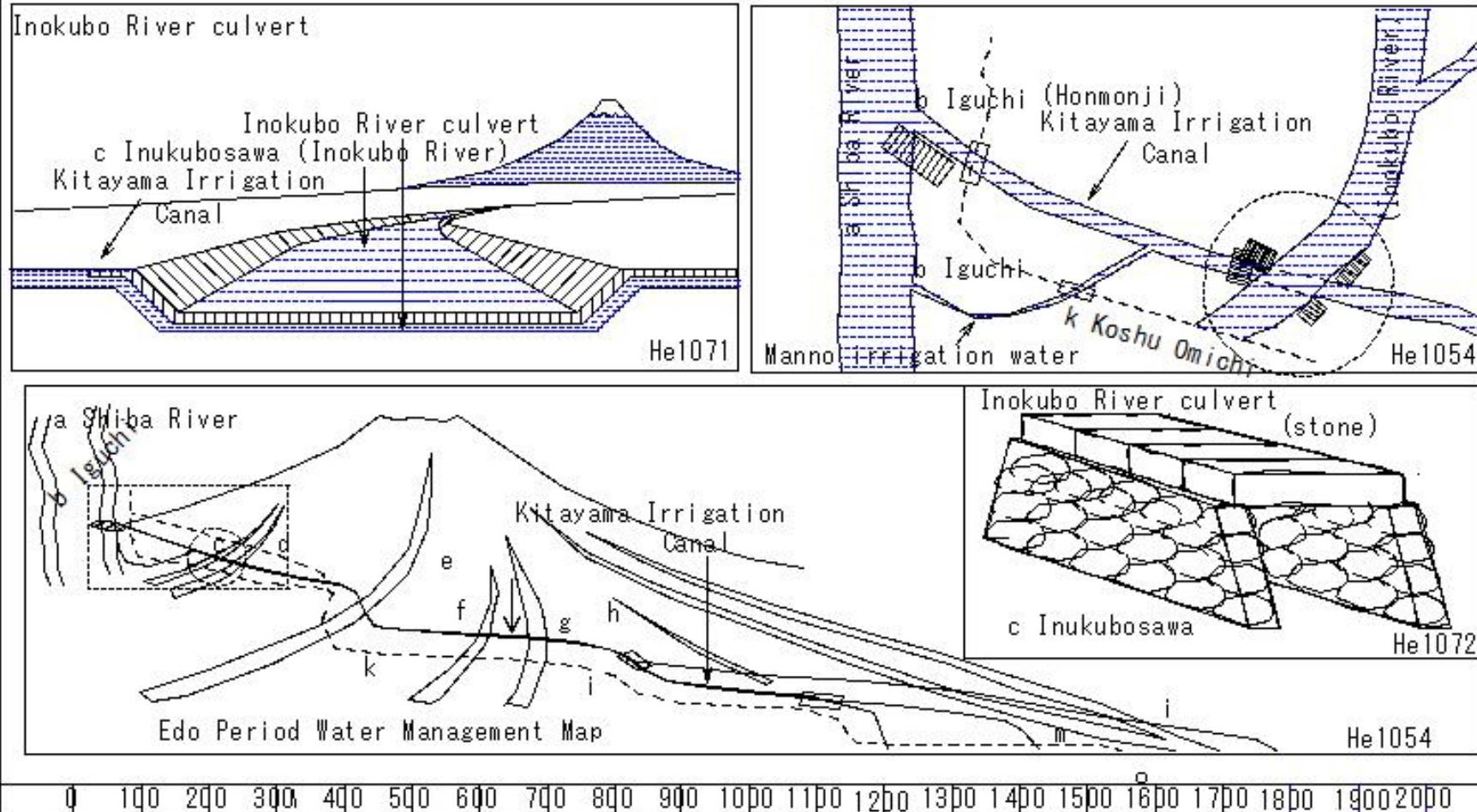
(He1071) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]



∅ 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1072) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1072) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]



(He1073) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1073) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

Kitayama Irrigation Canal
[Fujinomiya City, Shizuoka Prefecture]

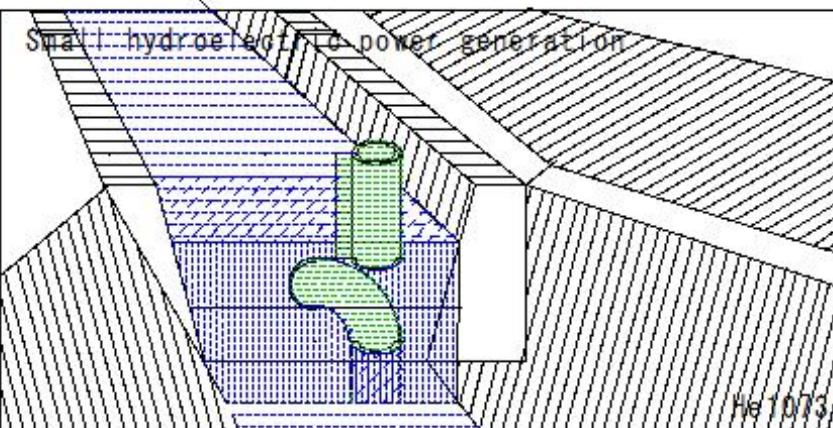
⑦Currently, three sides of the Kitayama Irrigation Canal have been renovated with concrete, utilizing the abundant water volume and head. small-scale hydroelectric power generation is being carried out at four locations. The combined maximum output is 428 kW, generating 2,437 MWh of electricity.

He1053

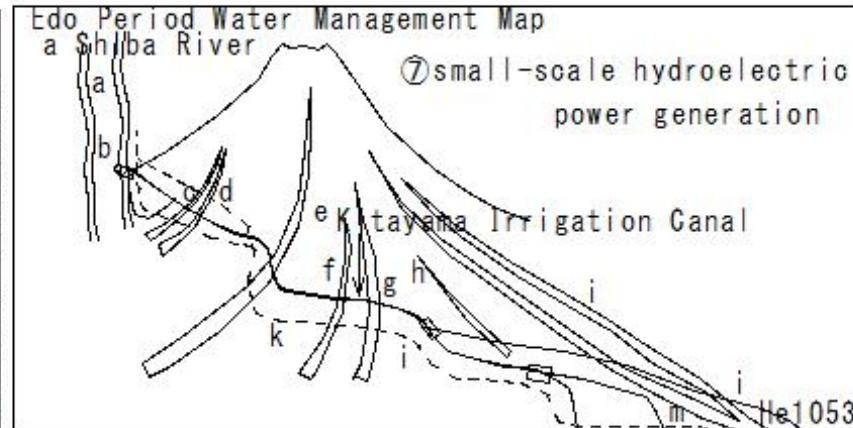
This has reduced CO₂ emissions by 1,048 tons per year, producing clean, carbon dioxide-free electricity.

⑦small-scale hydroelectric power generation 428 kW, generating 2,437 MWh clean, carbon dioxide-free electricity.

He1053



Φ 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000



Φ 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1074) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

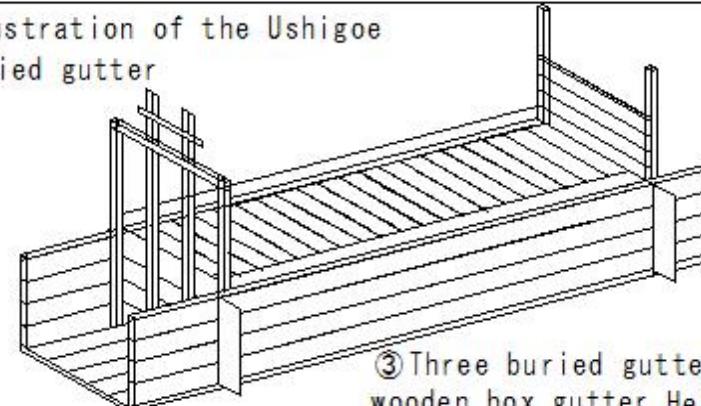
(He1074) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

Kitayama Irrigation System
[Fujinomiya City, Shizuoka Prefecture]



He1045

Illustration of the Ushigoe
Buried gutter



③ Three buried gutter
wooden box gutter He1049

a Shiba River j Yamamiya Village

b Iguchi k Koshu Omichi

c Inukubosawa (Inokubo River)

d Kantansawa

e Mumidanisawa

f Takisawa (Takesawa)

g Okubosawa

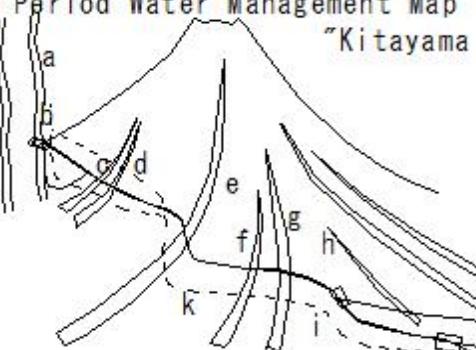
h Shida Mizusawa i Honmyo-ji Temple

i Harusawa m Kitayama Honmon-ji Temple

He1046

Edo Period Water Management Map

"Kitayama Waterworks Map"



He1046

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1075) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1075) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

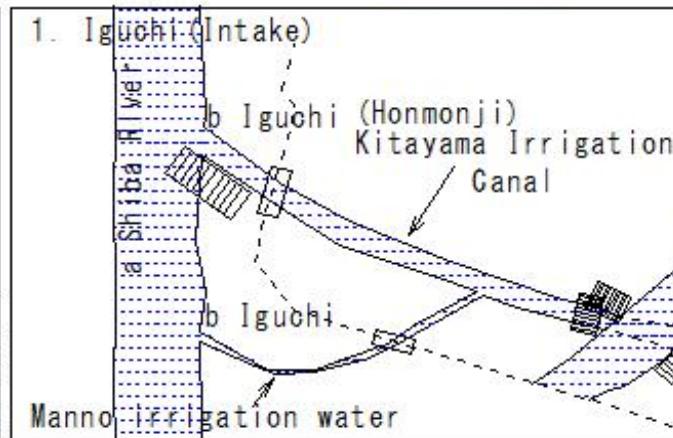
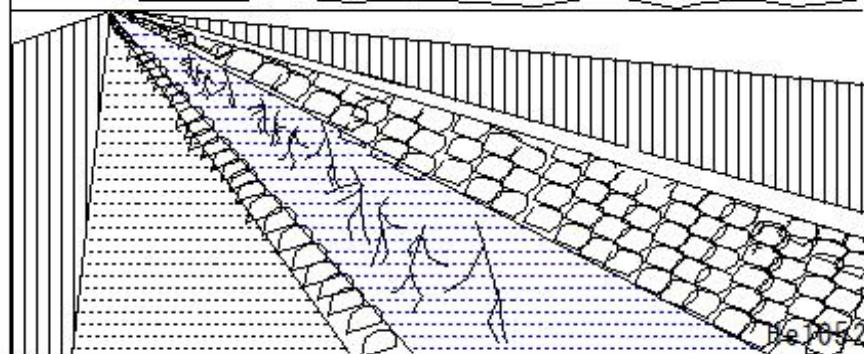
④ Three hanging gutters
wooden box gutters



⑤ upstream and downstream
Shiba River
water disputes
water sharing agreement



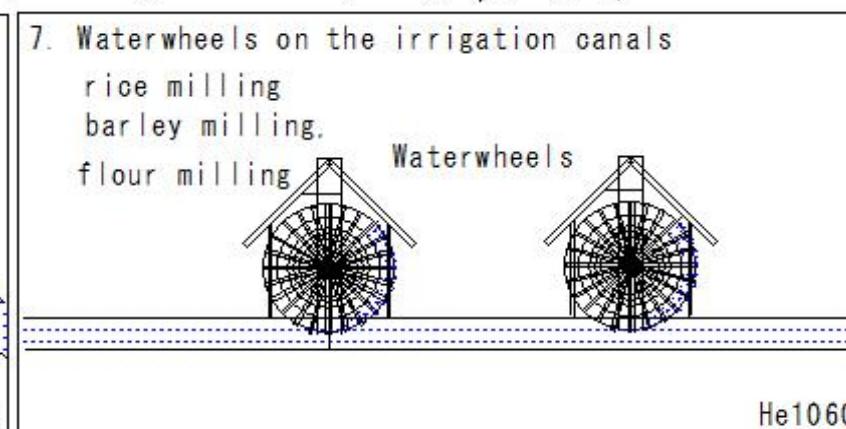
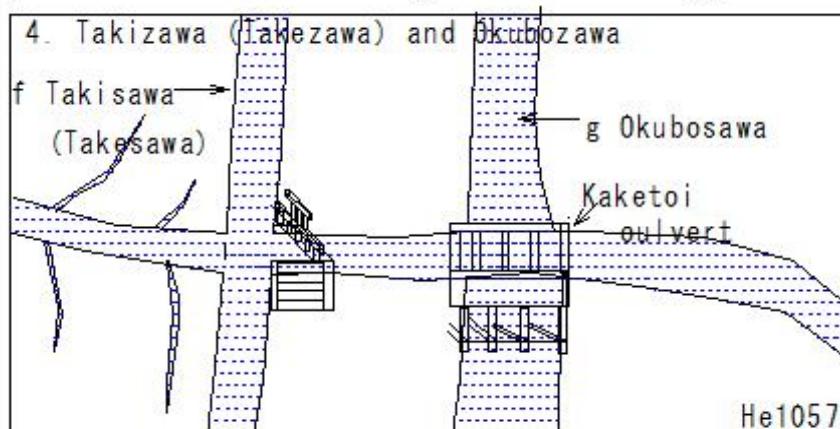
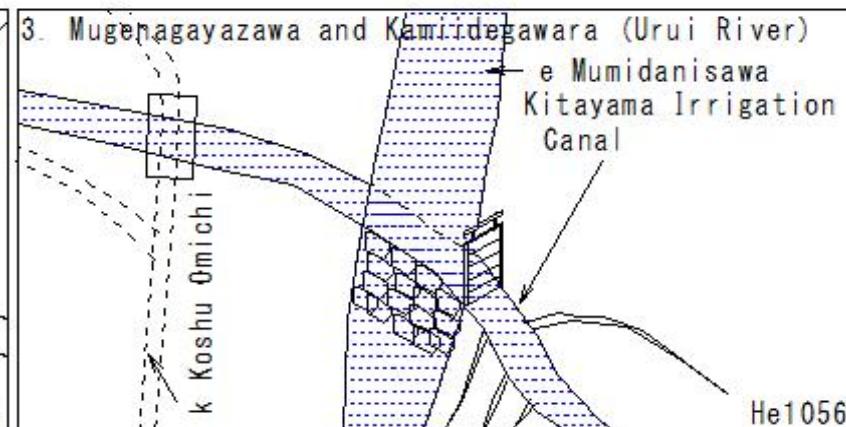
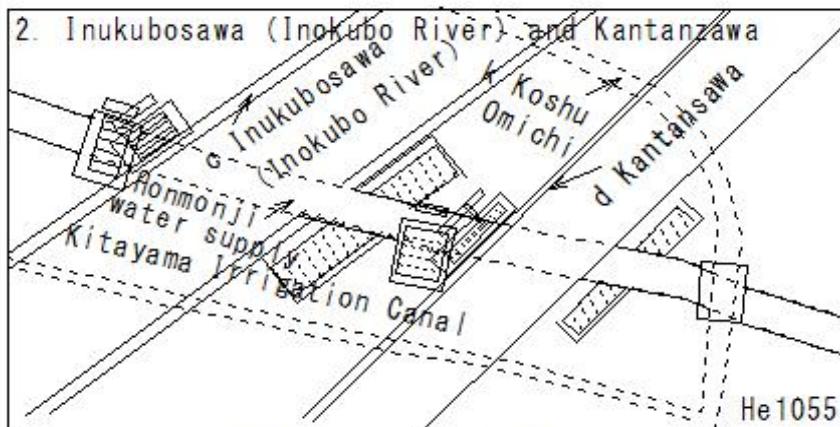
⑥ cleaning soil and sand and mowing grass
to maintain the Kitayama Irrigation Canal.



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

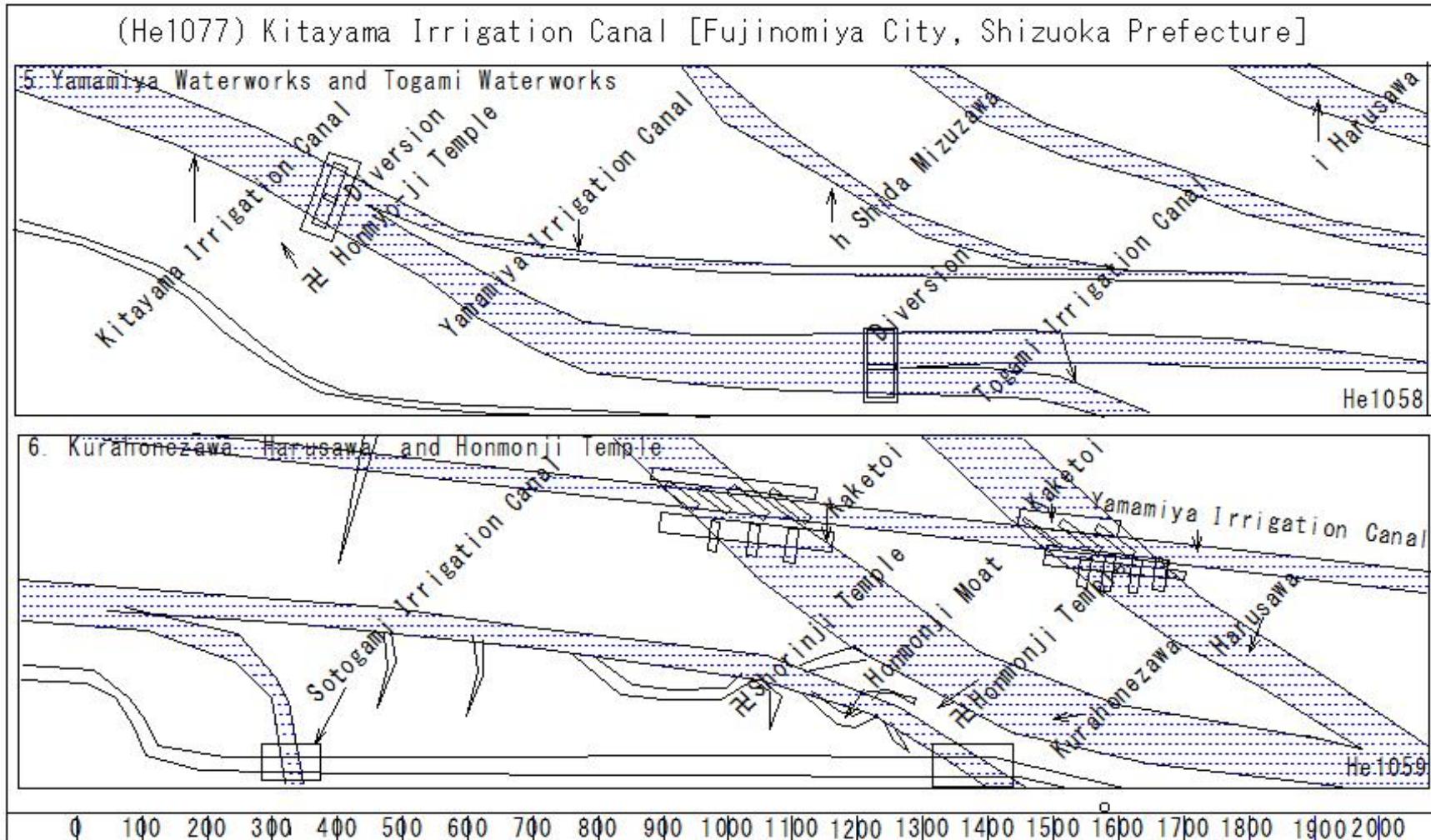
(He1076) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1076) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]



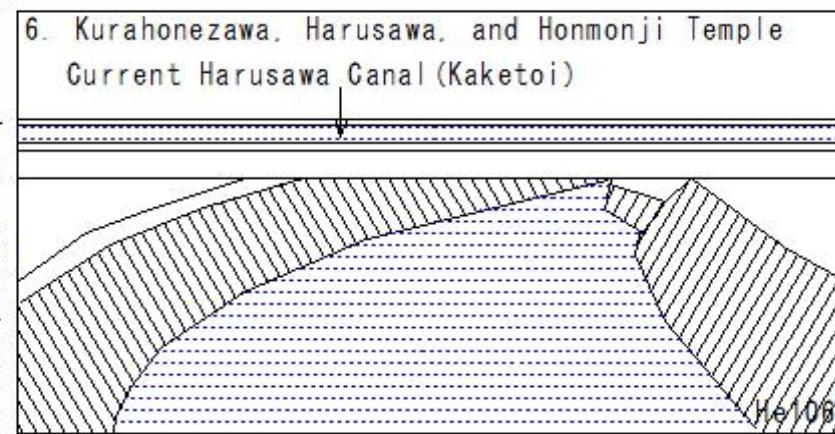
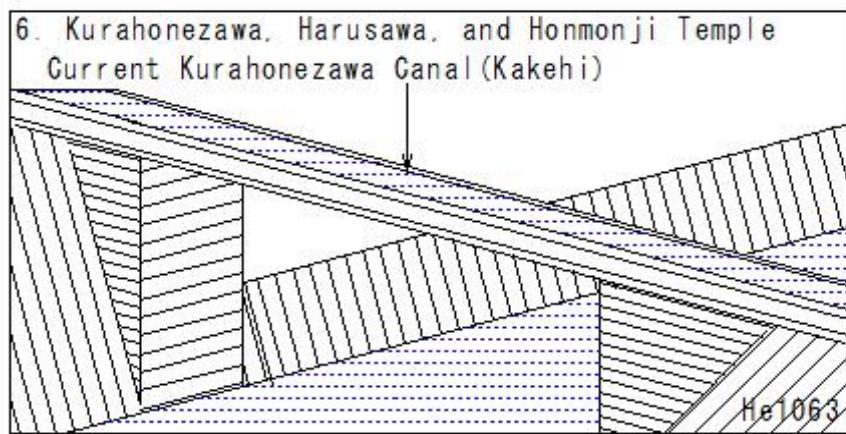
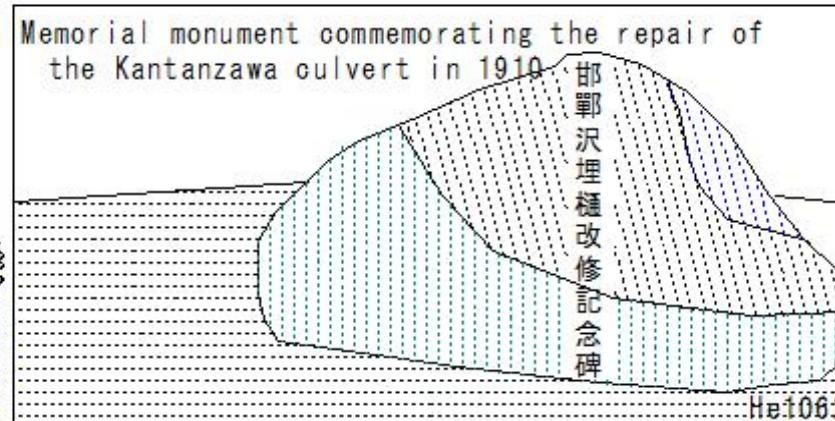
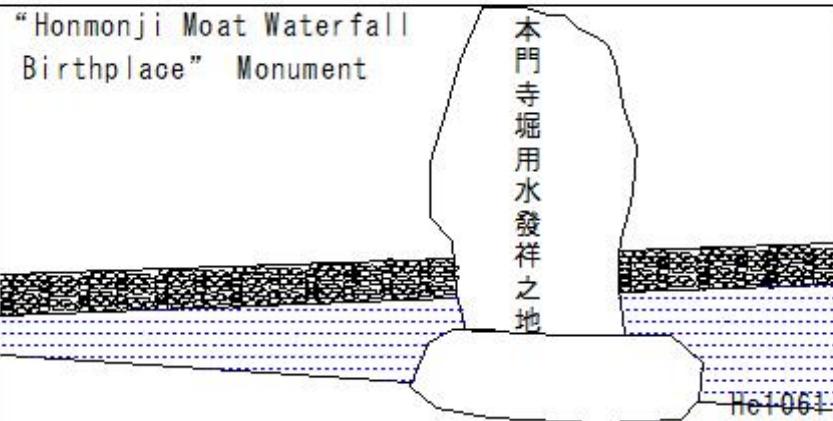
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1077) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]



(He1078) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1078) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]



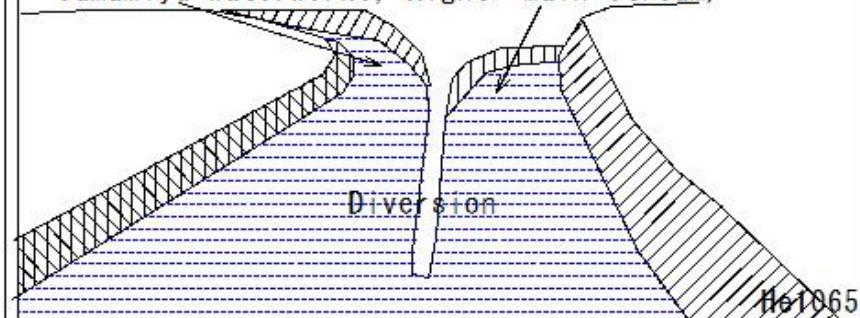
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(He1079) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1079) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

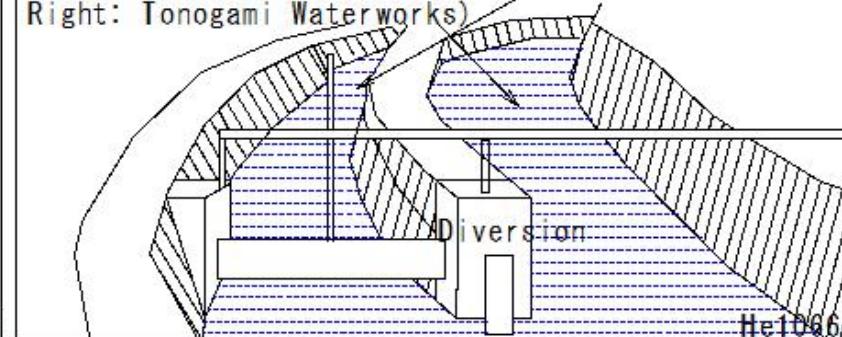
5. Yamamiya Waterworks and Togami Waterworks

Current Yamamiya Waterworks (Left: Yamamiya Waterworks, Right: Main Stream)



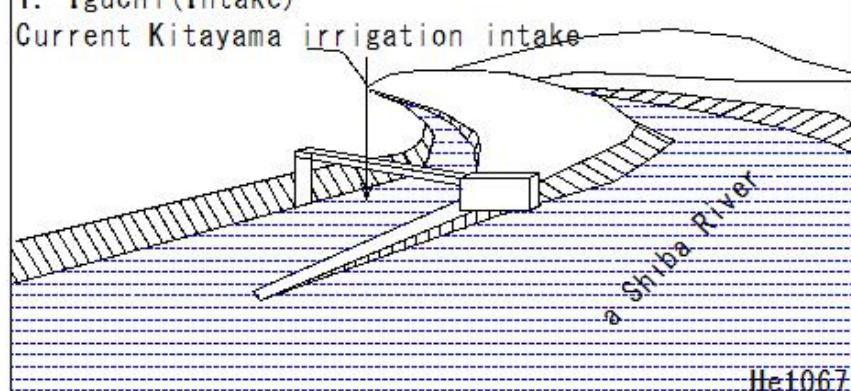
5. Yamamiya Waterworks and Togami Waterworks

Current Tonogami Waterworks (Left: Main Stream, Right: Tonogami Waterworks)



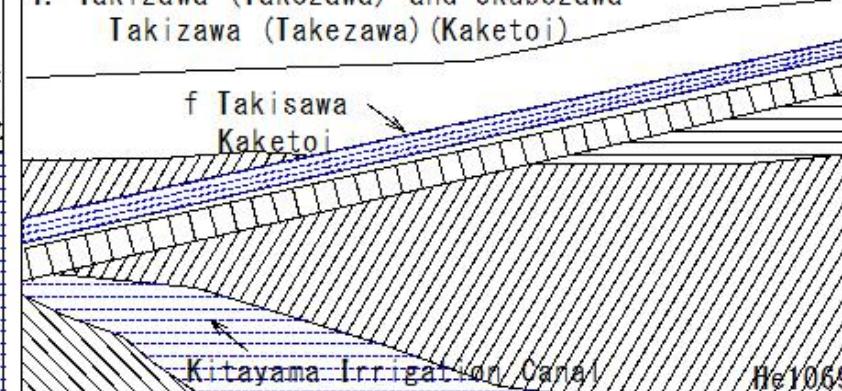
1. Iguchi (Intake)

Current Kitayama irrigation intake



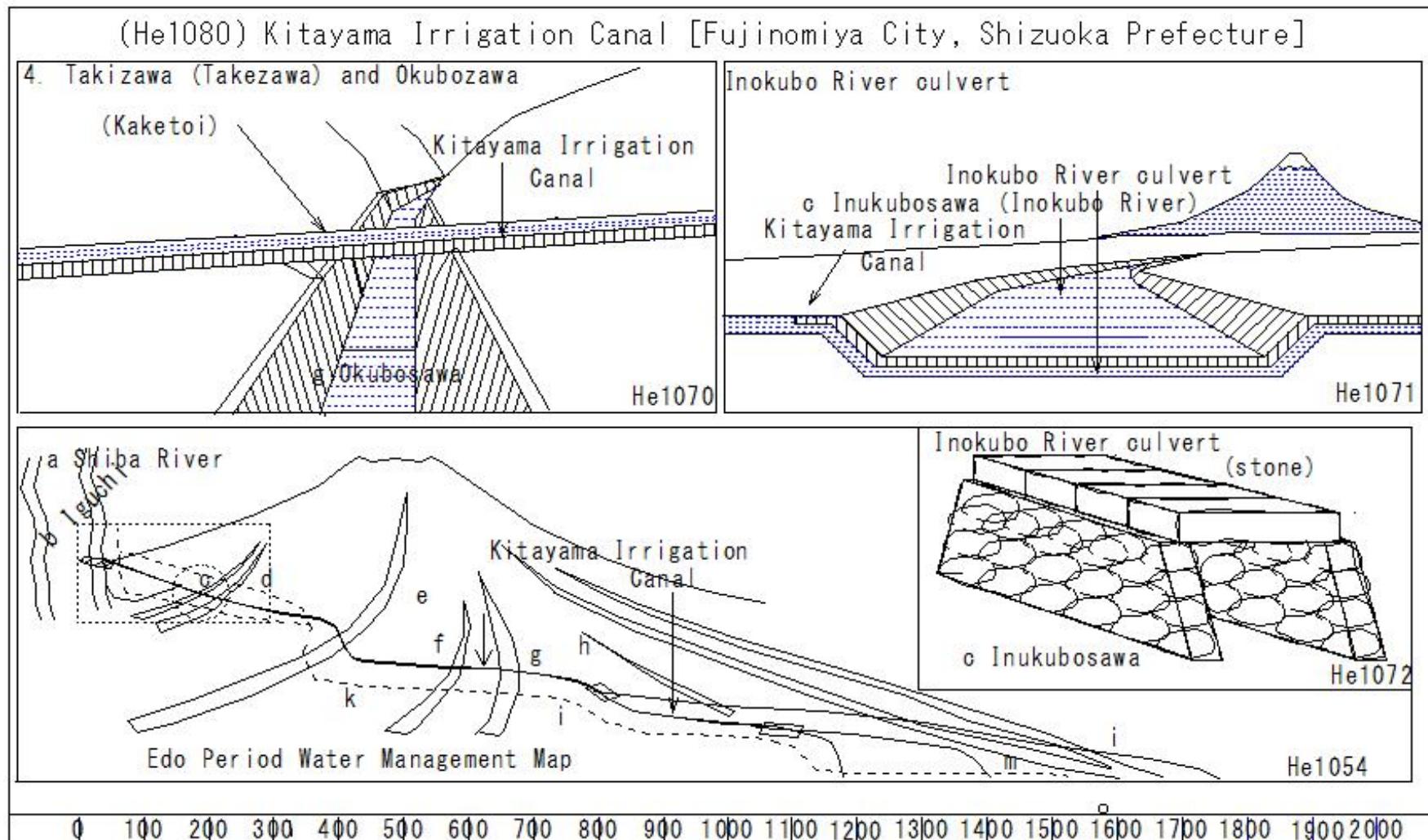
4. Takizawa (Takezawa) and Okubozawa

Takizawa (Takezawa) (Kaketoji)



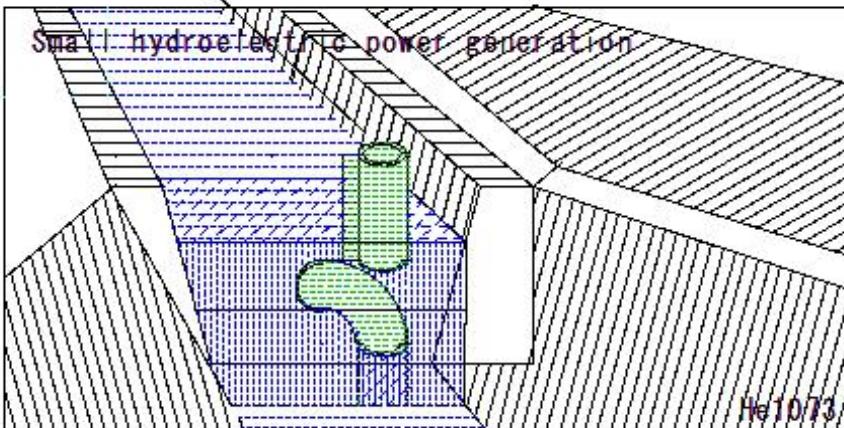
∅ 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1080) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

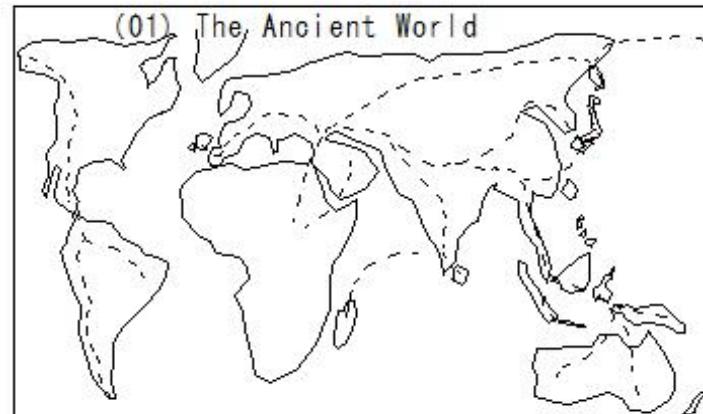


(He1081) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1081) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]



Kitayama Irrigation System
[Fujinomiya City, Shizuoka Prefecture]



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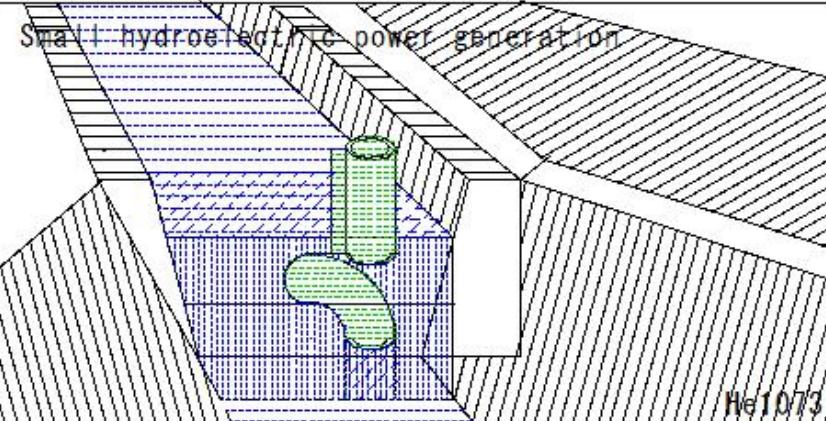
(He1082) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1082) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

⑦ Currently, three sides of the Kitayama Irrigation Canal have been renovated with concrete, utilizing the abundant water volume and head, small-scale hydroelectric power generation is being carried out at four locations. The combined maximum output is 428 kW, generating 2,437 MWh of electricity.

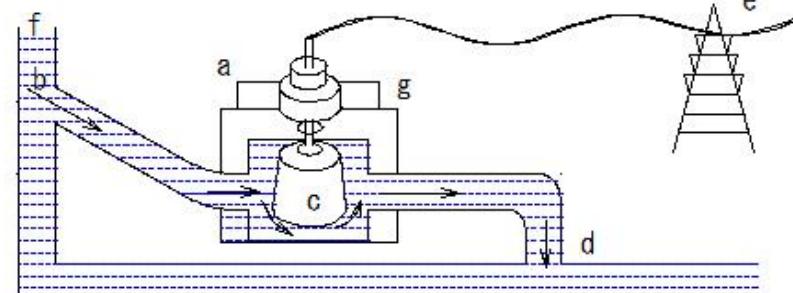
He1053



Hydroelectric Power Generation

- a Generator
- b Intake
- c Water Turbine
- d Outlet
- e Transmission Line
- f Water pipe
- g Water wheel inside

h. Small hydroelectric power generation
i. Power generation capacity: 1,000 kilowatts or less - Small power plant

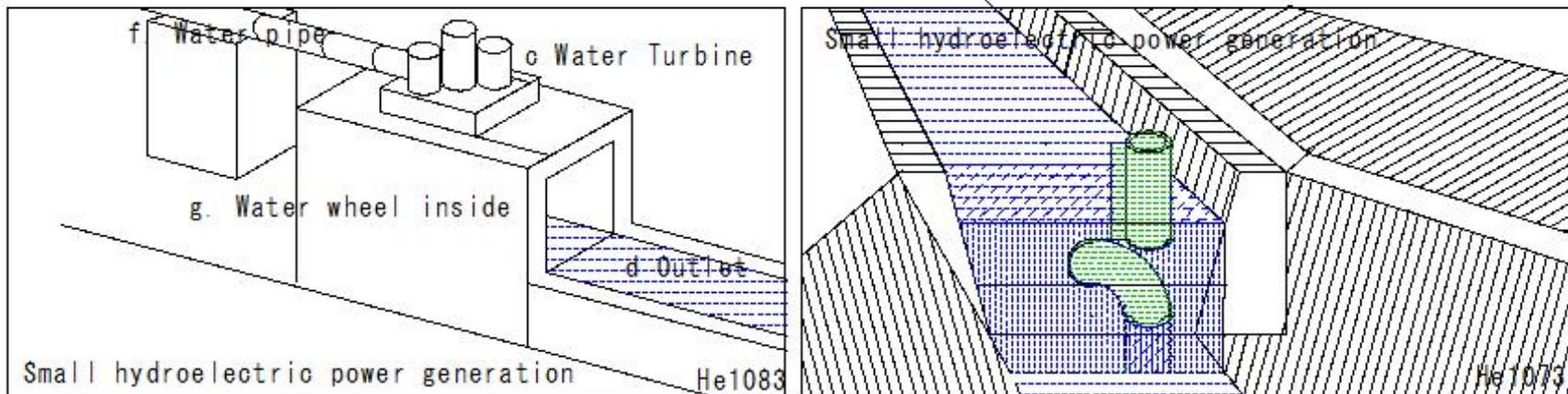


Fujinomiya City's small-scale hydroelectric power generation is the best in Japan!

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1083) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

(He1083) Kitayama Irrigation Canal [Fujinomiya City, Shizuoka Prefecture]

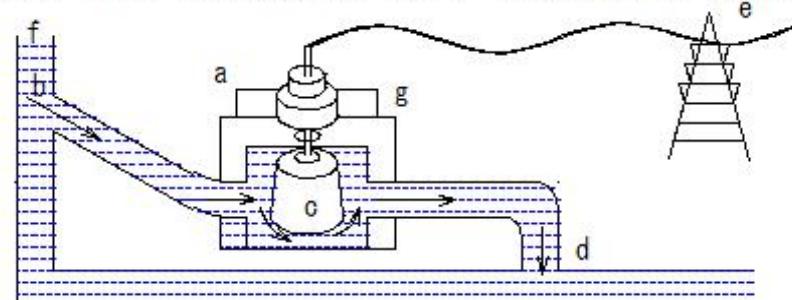


Hydroelectric Power Generation

- a Generator
- b Intake
- c Water Turbine
- d Outlet
- e Transmission Line
- f Water pipe
- g Water wheel inside

h. Small hydroelectric power generation

i. Power generation capacity: 1,000 kilowatts or less - Small power plant



Fujinomiya City's small-scale hydroelectric power generation is the best in Japan!

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1084) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

(He1084) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

Uwae Irrigation Canal

A 130-year project has created a major producer of high-quality rice.

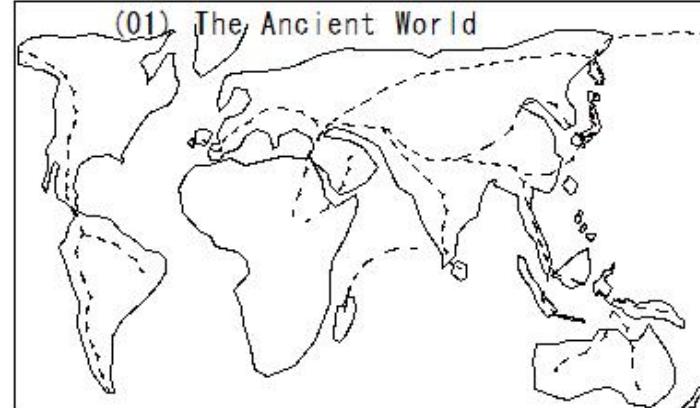
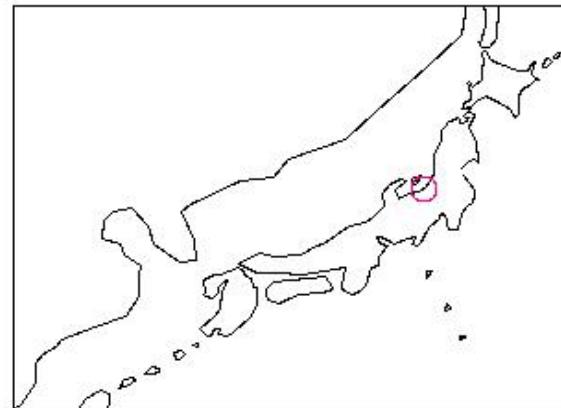
He1084

Uwae Irrigation Canal



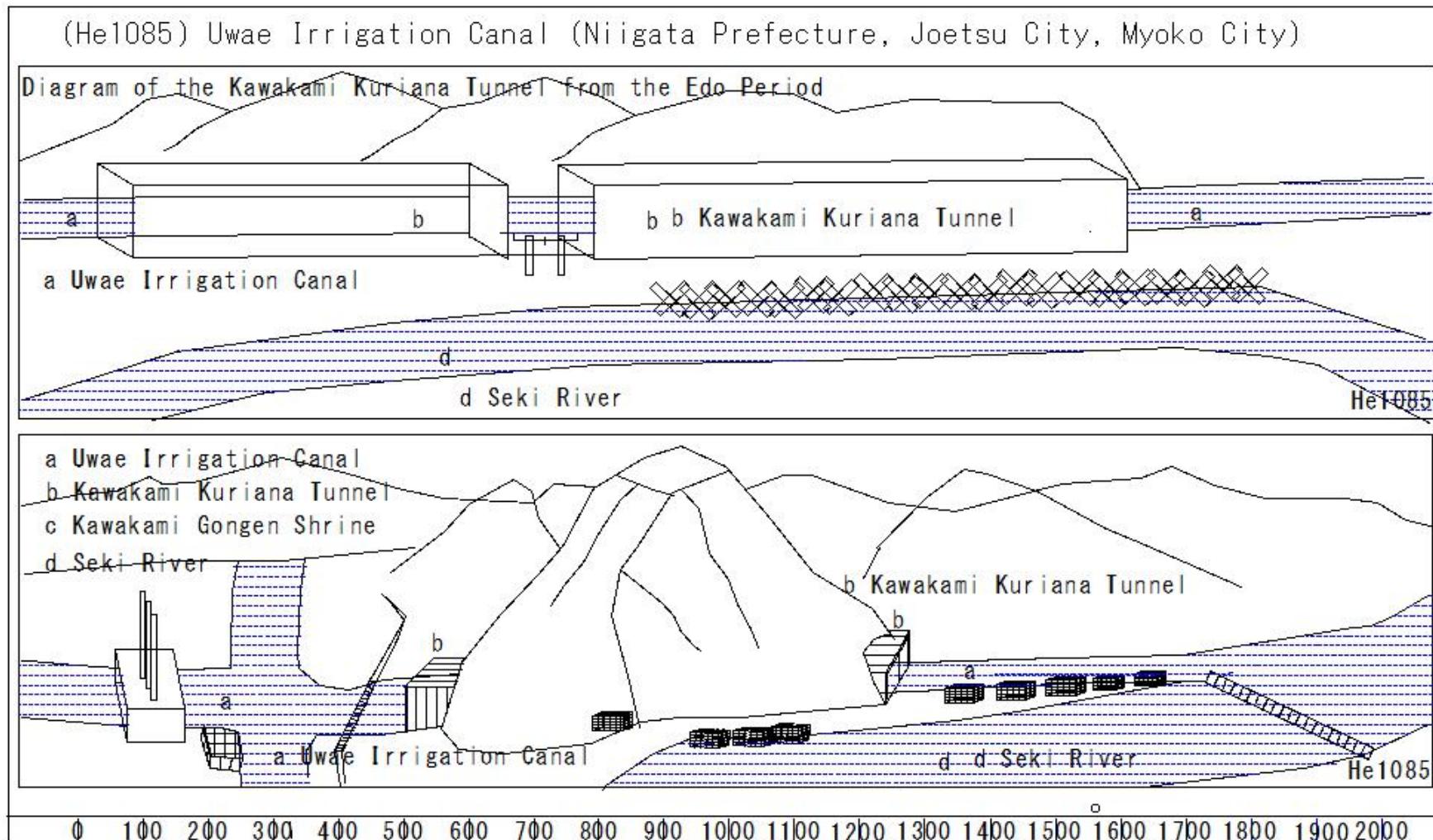
(Niigata Prefecture,
Joetsu City, Myoko City)

He1084

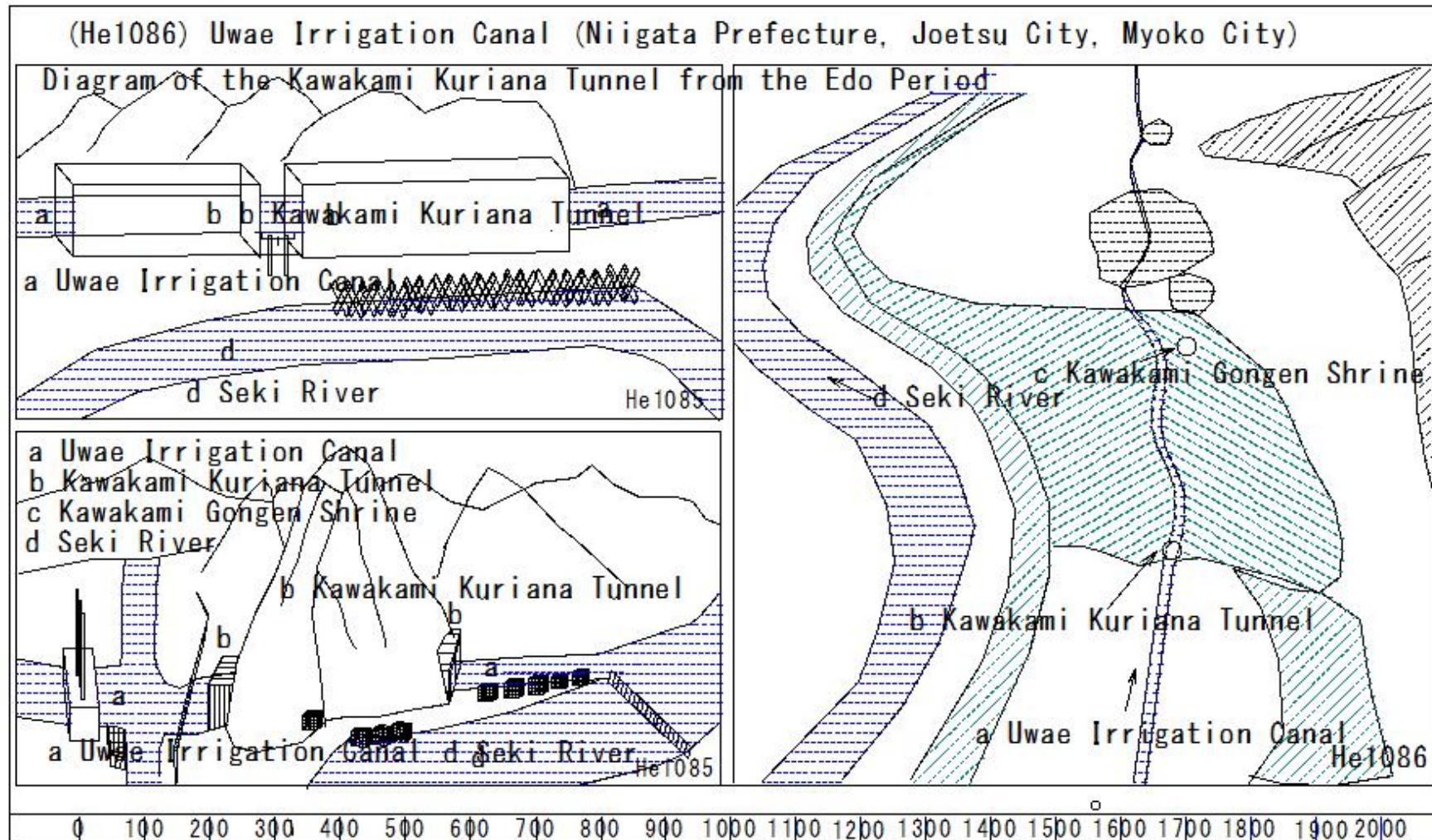


0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1085) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)



(He1086) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)



(He1087) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

(He1087) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

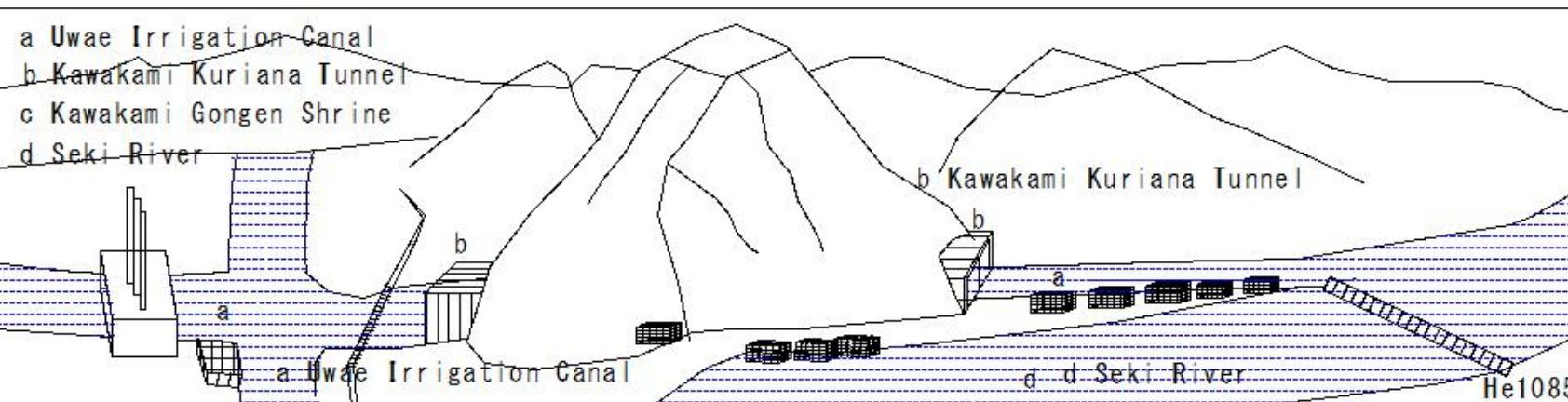
A 130-Year Project Realized a Major High-Quality Rice Production Area

① This region is nationally renowned for producing exceptionally high-quality rice.
However, before the construction of the Kamie Irrigation Canal,
securing water for harvest season was difficult.

before the construction

securing water for harvest season was difficult.

He1087

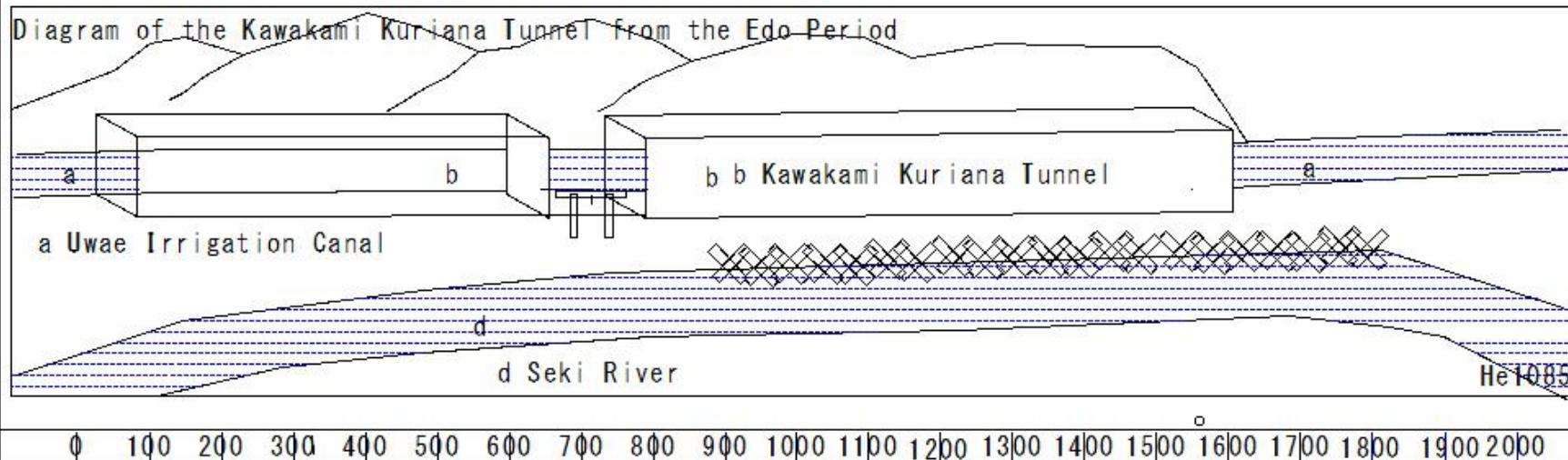
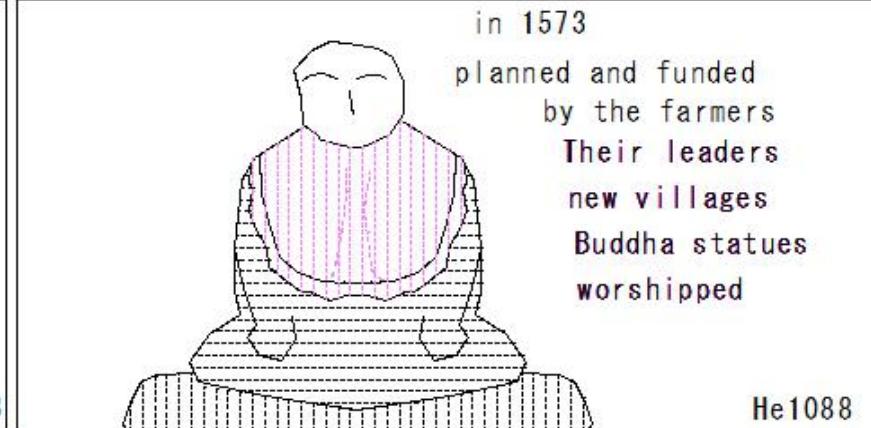


Ø 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1088) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

(He1088) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

② Construction of the canal, which began in 1573, progressed little by little, planned and funded by the farmers themselves. Their leaders were given names for new villages and Buddha statues were made, and they are still worshipped to this day.



(He1089) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

(He1089) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

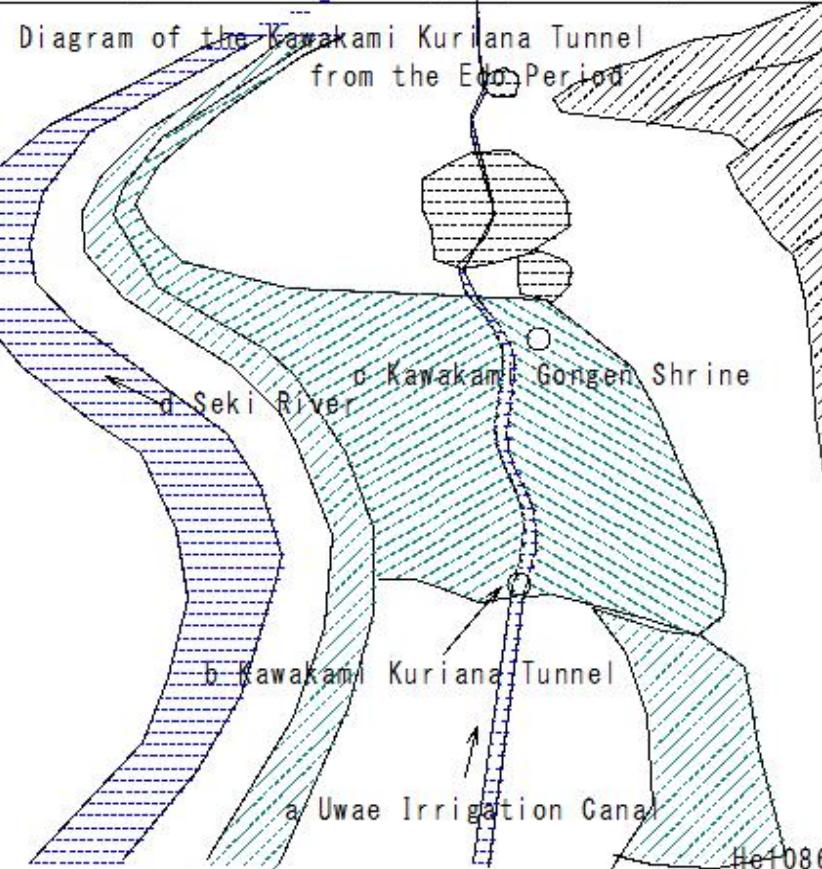
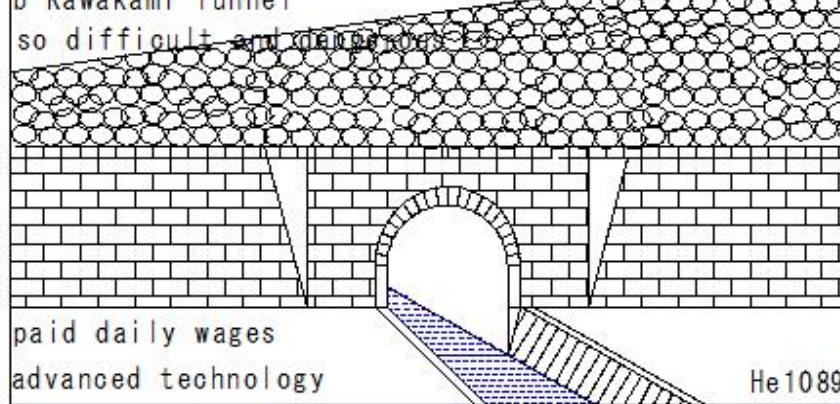
③ The tunnel construction was so difficult and dangerous that workers were paid daily wages, but the advanced technology allowed for minimal margin of error.

Completion of the canal provided food for 12,000 people.

tunnel paid daily wages advanced technology
so difficult and dangerous

He1089

b Kawakami Tunnel
so difficult and dangerous



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1090) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

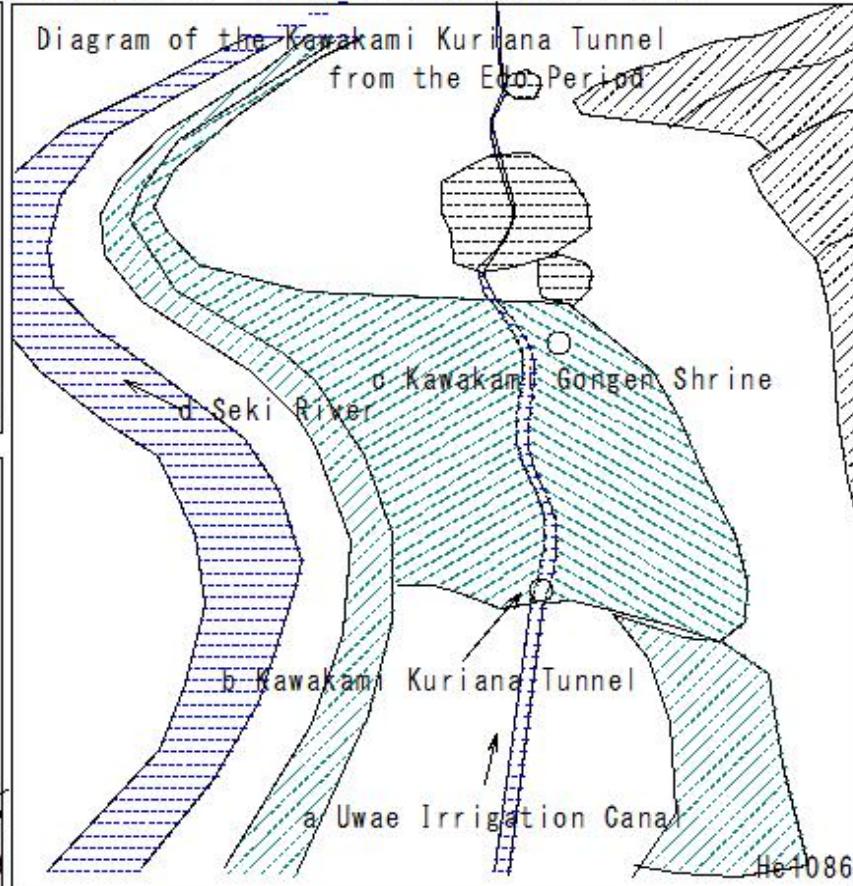
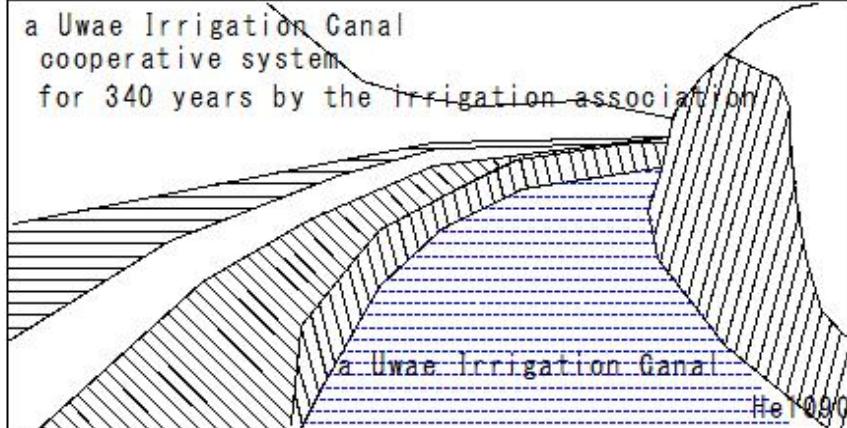
(He1090) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

④ The Sekigawa River Watershed Land Improvement District

Farmers from upstream and downstream of the Kyakusui area cooperated to dig and manage irrigation canals.

This cooperative system has been maintained and continued for 340 years by the irrigation association, ordinary water users' association, and land improvement district.

He1090



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

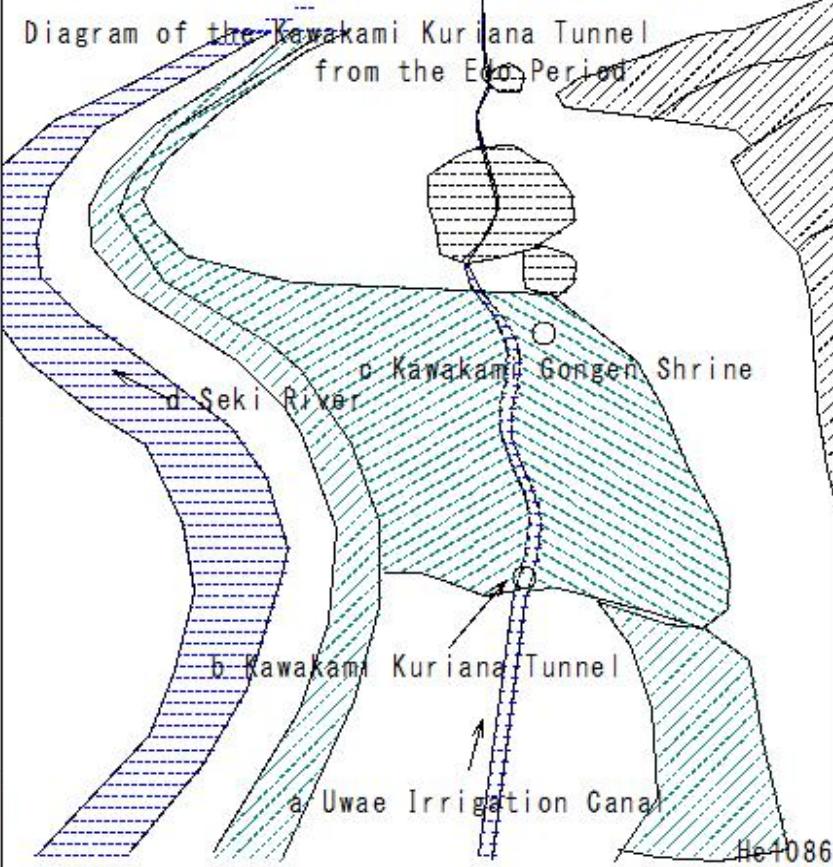
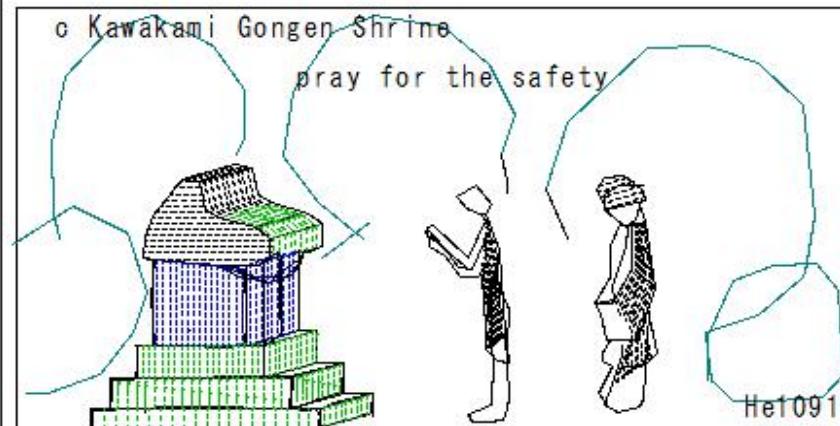
(He1091) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

(He1091) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

c Kawakami Gongen Shrine

⑤ Kawakami Gongensha Shrine This construction project involved boring through the mountain, and as such, Kawakami Gongensha Shrine was erected to pray for the safety of the work. Every year on April 21st, the local neighborhood association holds a solemn festival at the shrine.

He1091



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1092) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

(He1092) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

Uwae Irrigation Canal

First Phase of Construction (1573-1648)

a Lake Nojiri

b Sasaga Mine Dam

c Torizaka Power Station

d Intake

e Kawakami

f Hijiri (Hijiri Frame)

g Myoko City

h Sanga Irrigation Canal

i Sekigawa River j Kawakami Gongen Shrine

k Sekigawa Right Bank Diversion Works

l Sekigawa Right Bank Irrigation Canal

m Kawakami Kuriana Tunnel

n Intake

o Itakura Power Station

p Nakae Irrigation Canal

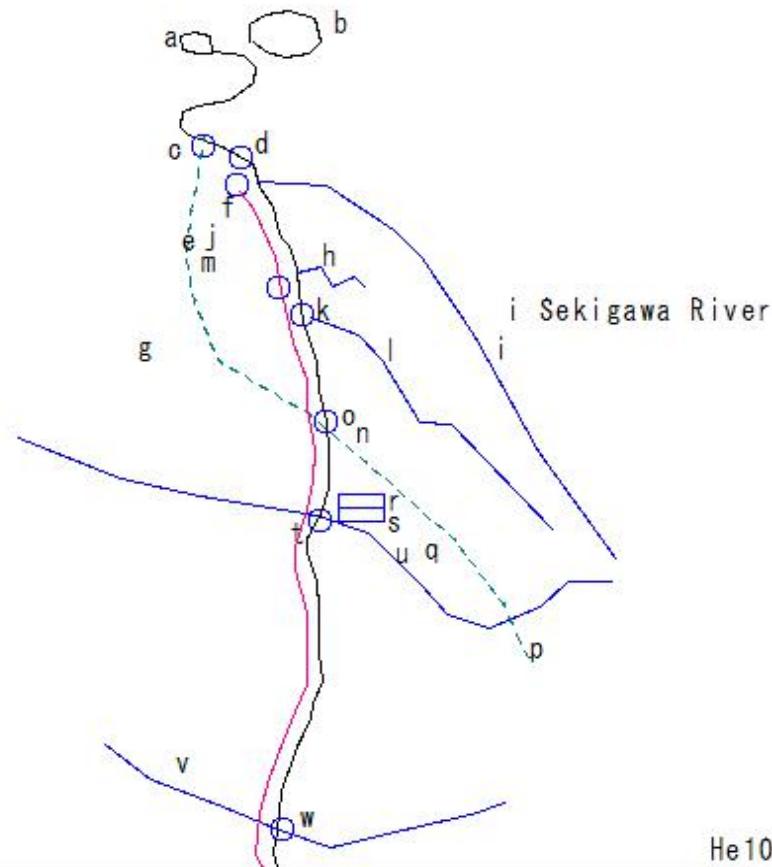
q Itakuraku, Joetsu City

r Buried Channel u Okuma River

s Sekiwaku

v Bessho River

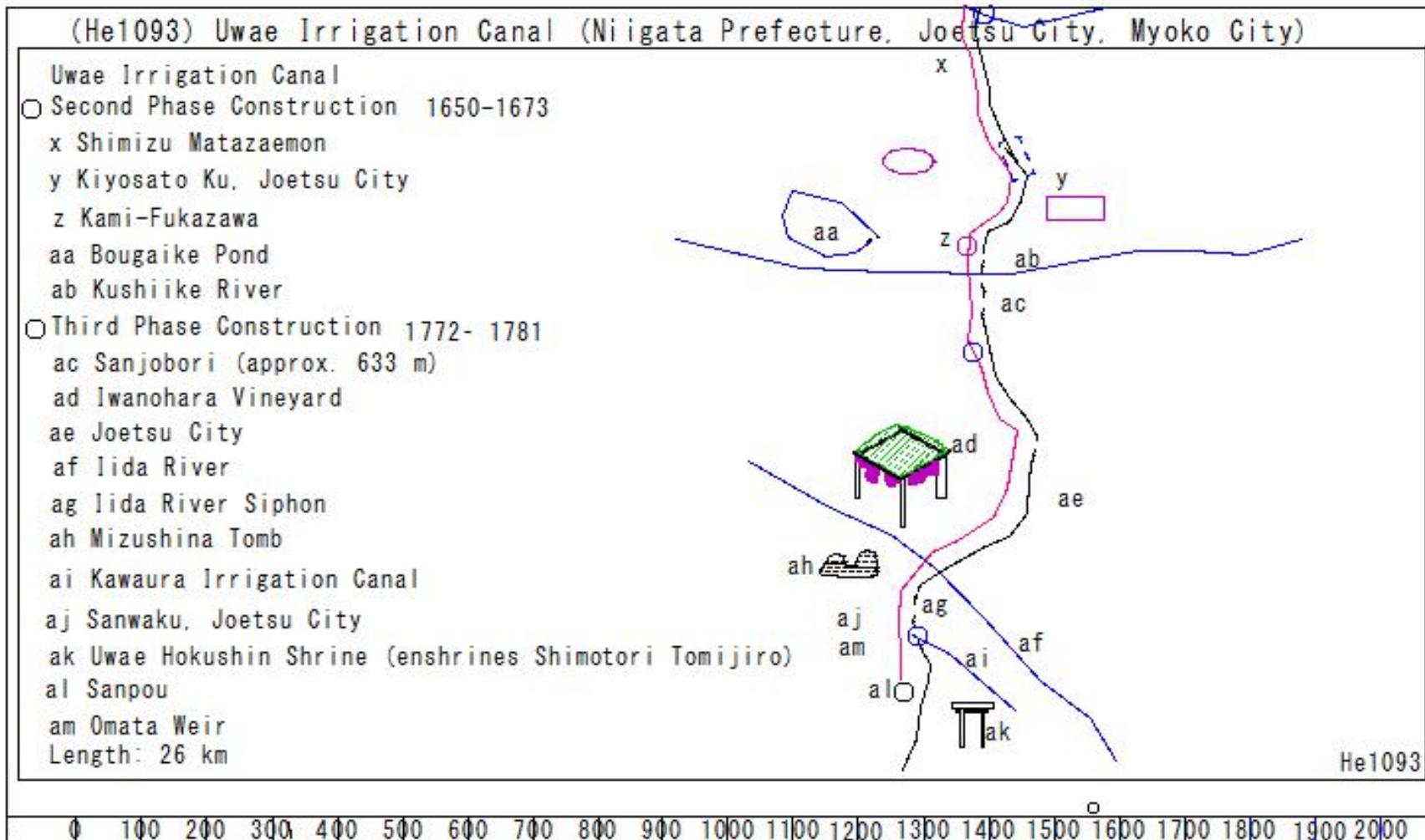
t Okuma River Siphon w Bessho River Siphon



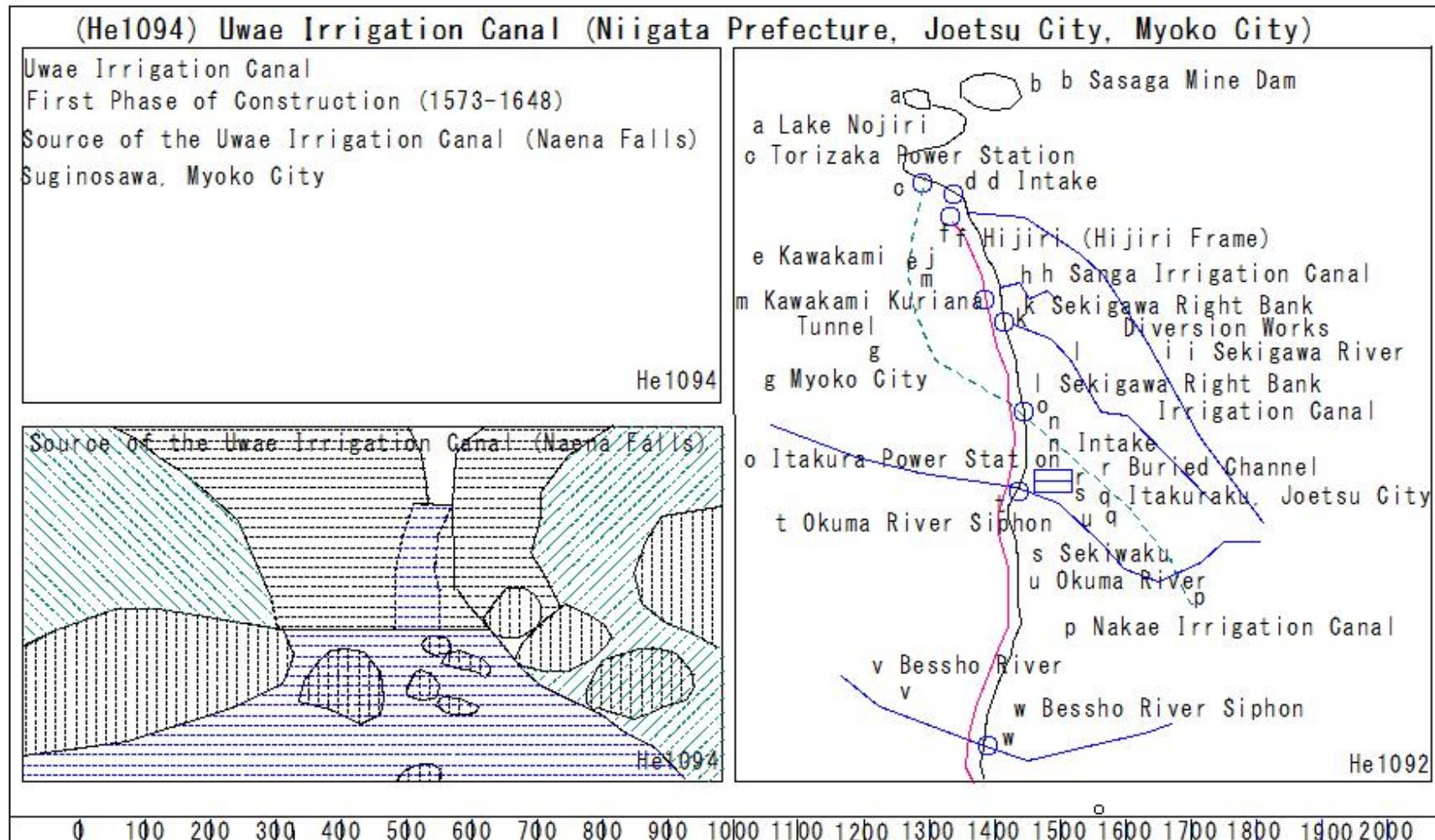
He1092

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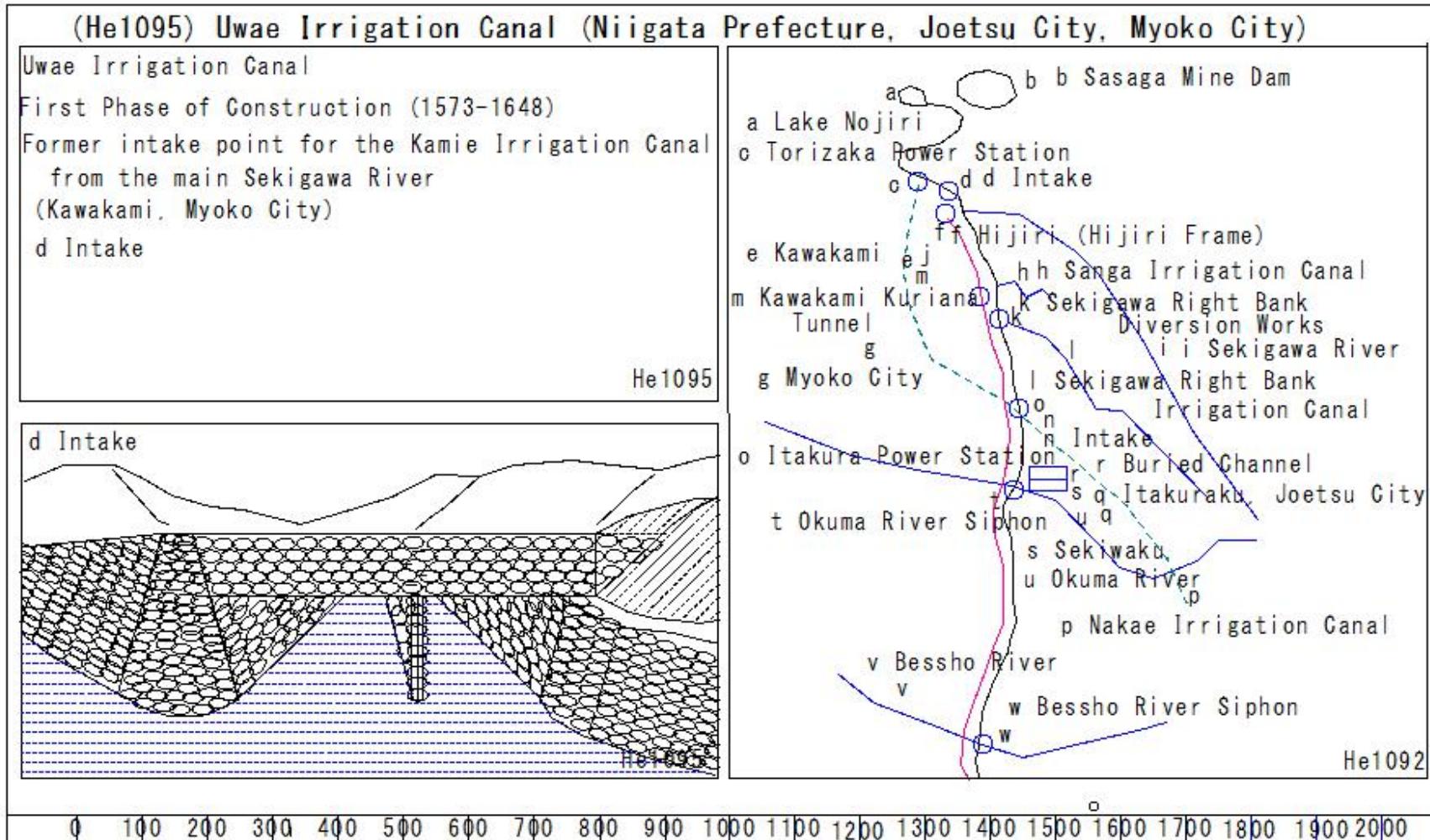
(He1093) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)



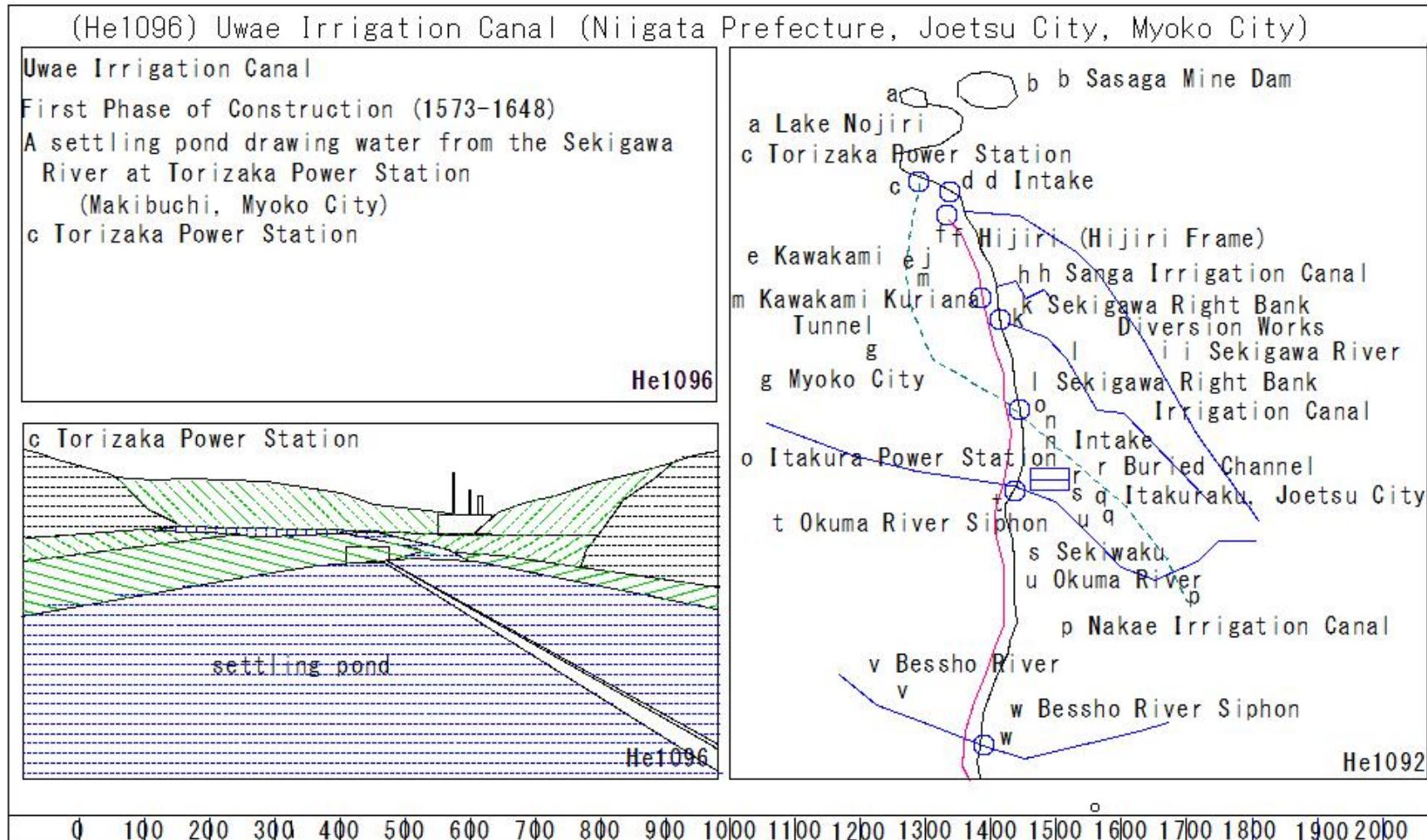
(He1094) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)



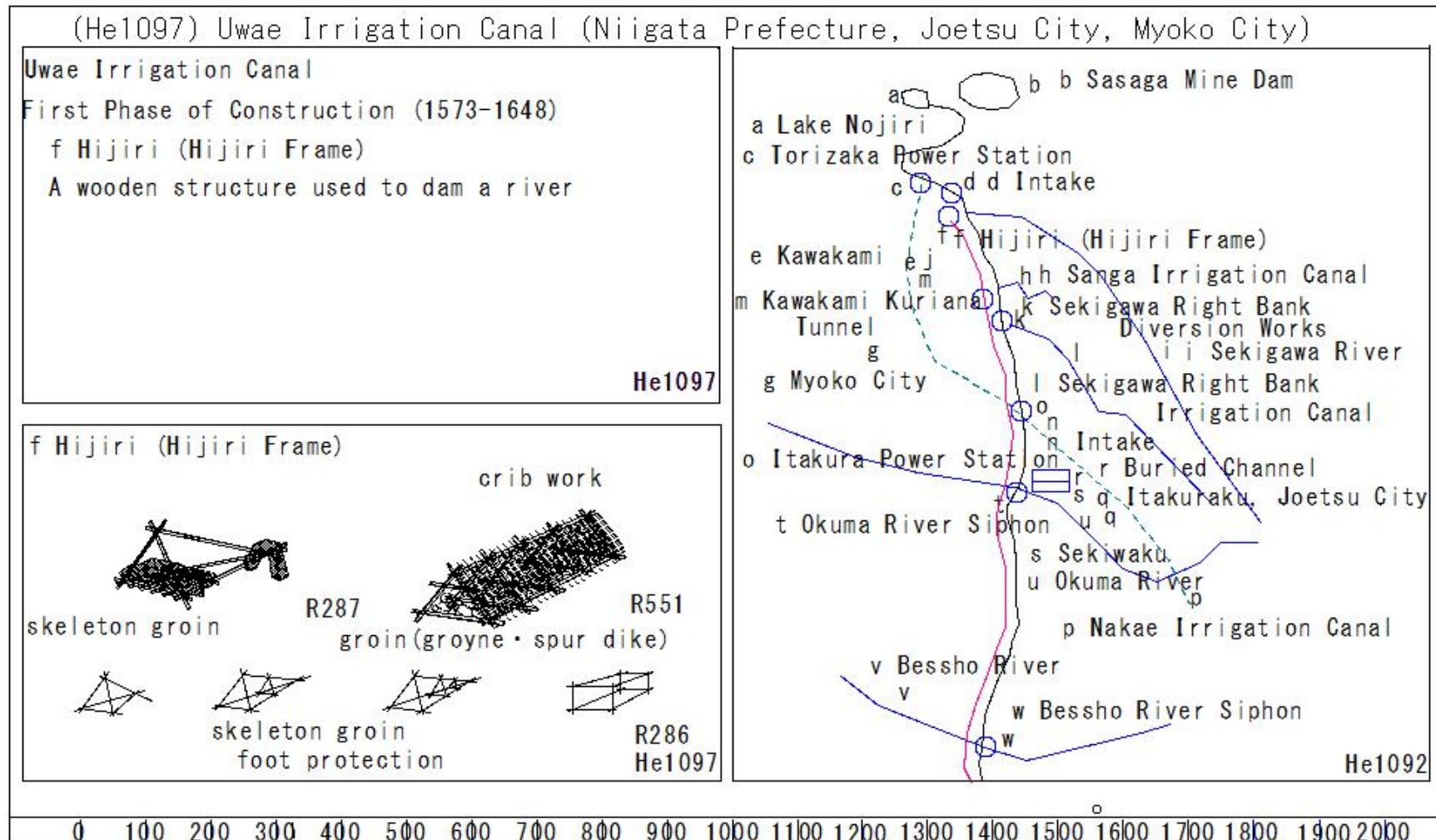
(He1095) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)



(He1096) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)



(He1097) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)



(He1098) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

(He1098) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

Uwae Irrigation Canal

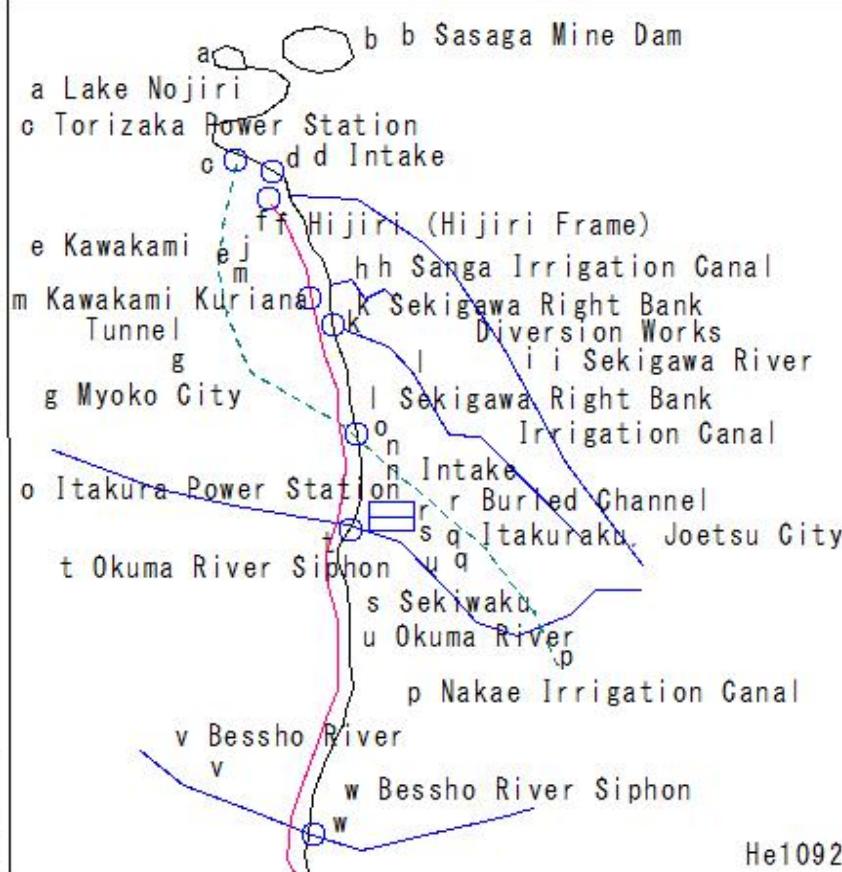
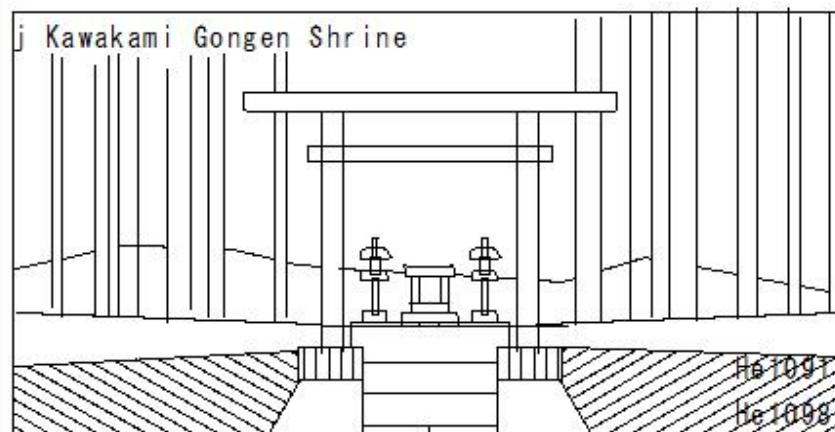
First Phase of Construction (1573-1648)

j Kawakami Gongen Shrine

⑤ Kawakami Gongensha Shrine This construction project involved boring through the mountain, and as such, Kawakami Gongensha Shrine was erected to pray for the safety of the work. Every year on April 21st, the local neighborhood association holds a solemn festival at the shrine.

He1091
He1098

j Kawakami Gongen Shrine



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

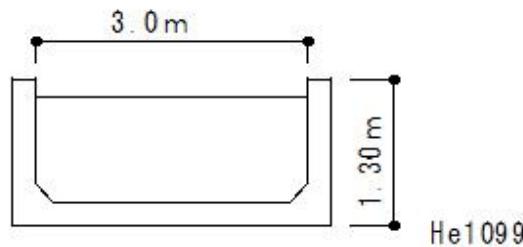
(He1099) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

(He1099) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

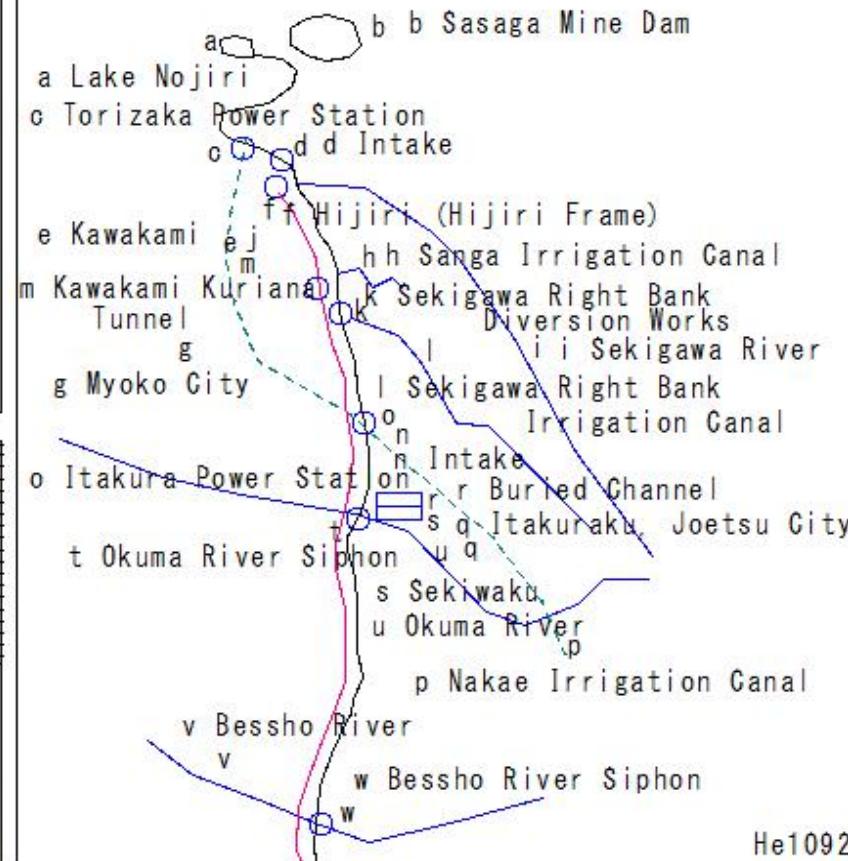
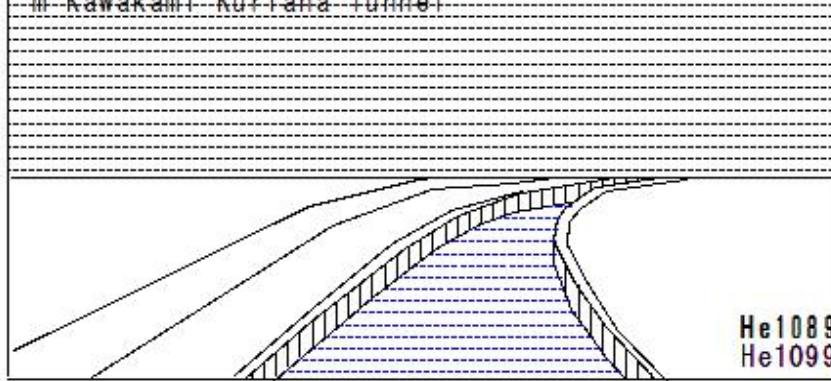
Uwae Irrigation Canal

First Phase of Construction (1573-1648)

m Kawakami Kuriana Tunnel
(Kawakami area, Myoko City)



m Kawakami Kuriana Tunnel



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1100) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

(He1100) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

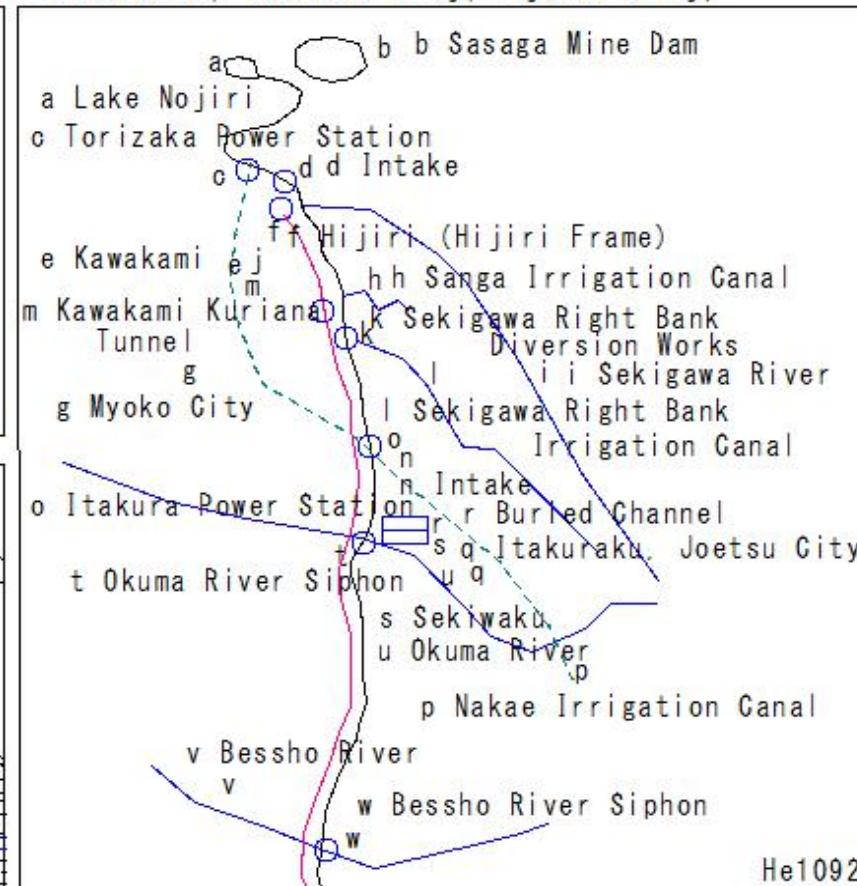
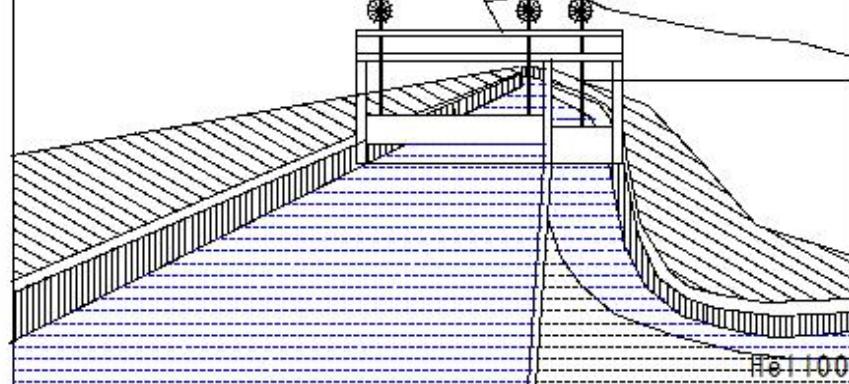
Uwae Irrigation Canal

First Phase of Construction (1573-1648)

k Sekigawa Right Bank Diversion Works
(Kamishinbo area, Myoko City)

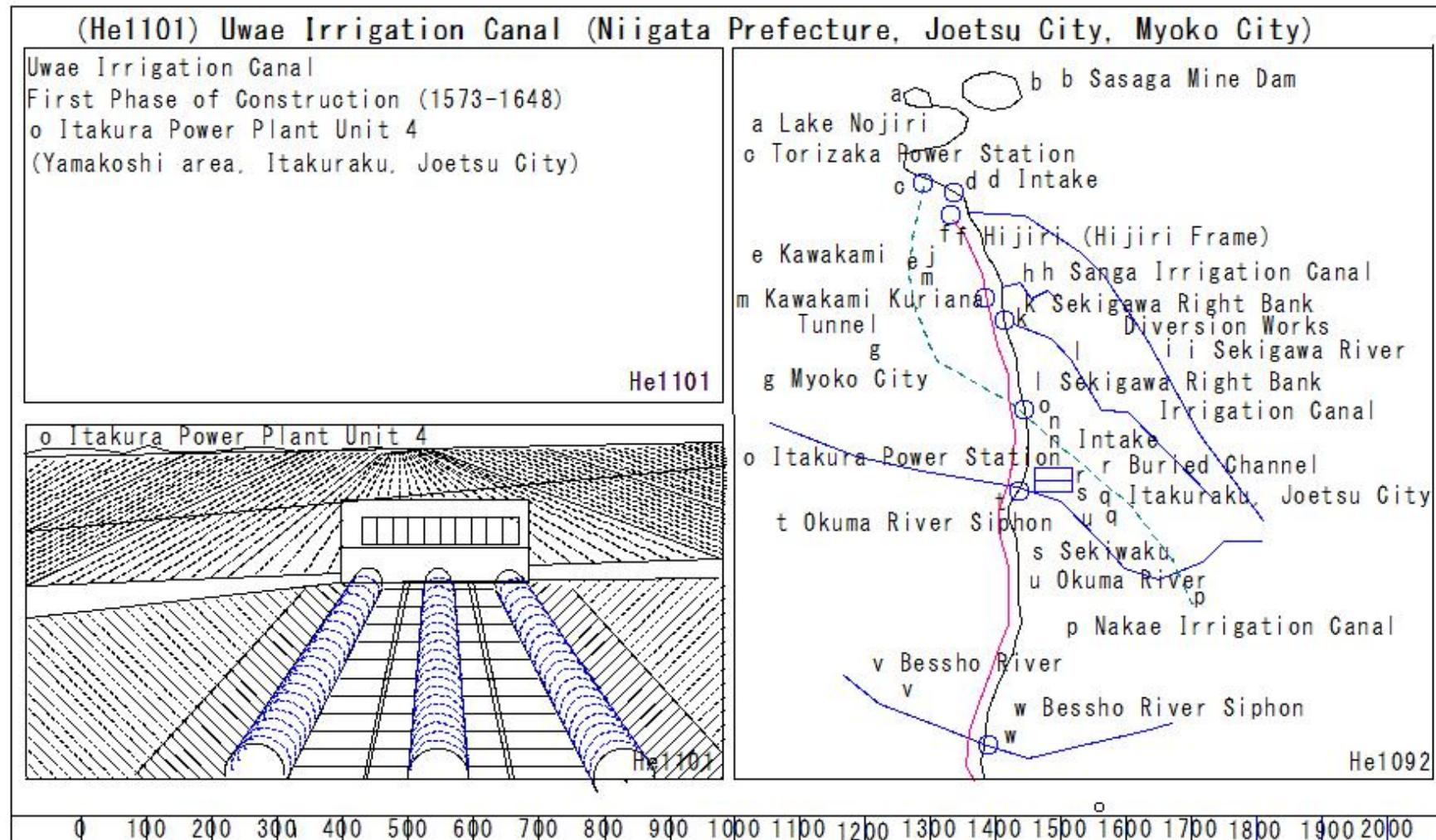
He1100

k Sekigawa Right Bank Diversion Works



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1101) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)



(He1102) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

(He1102) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

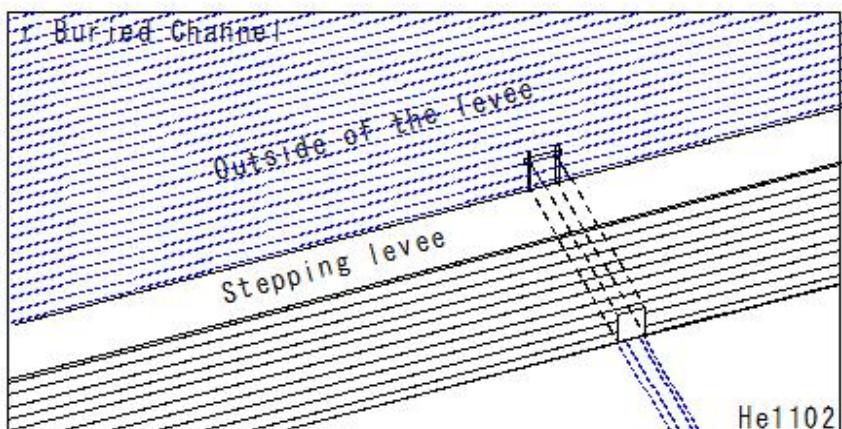
Uwae Irrigation Canal

First Phase of Construction (1573-1648)

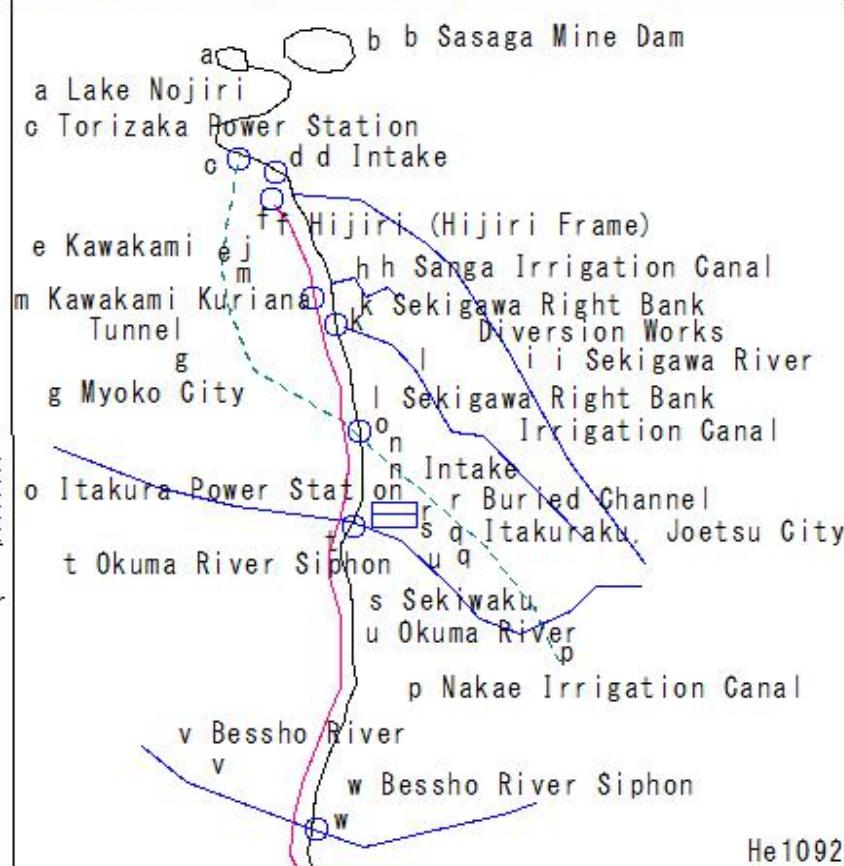
Buried Channel

A ditch buried underground to draw water across roads, levees, etc.

He 1102



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000



He 1092

(He1103) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

(He1103) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

Uwae Irrigation Canal

First Phase of Construction (1573-1648)

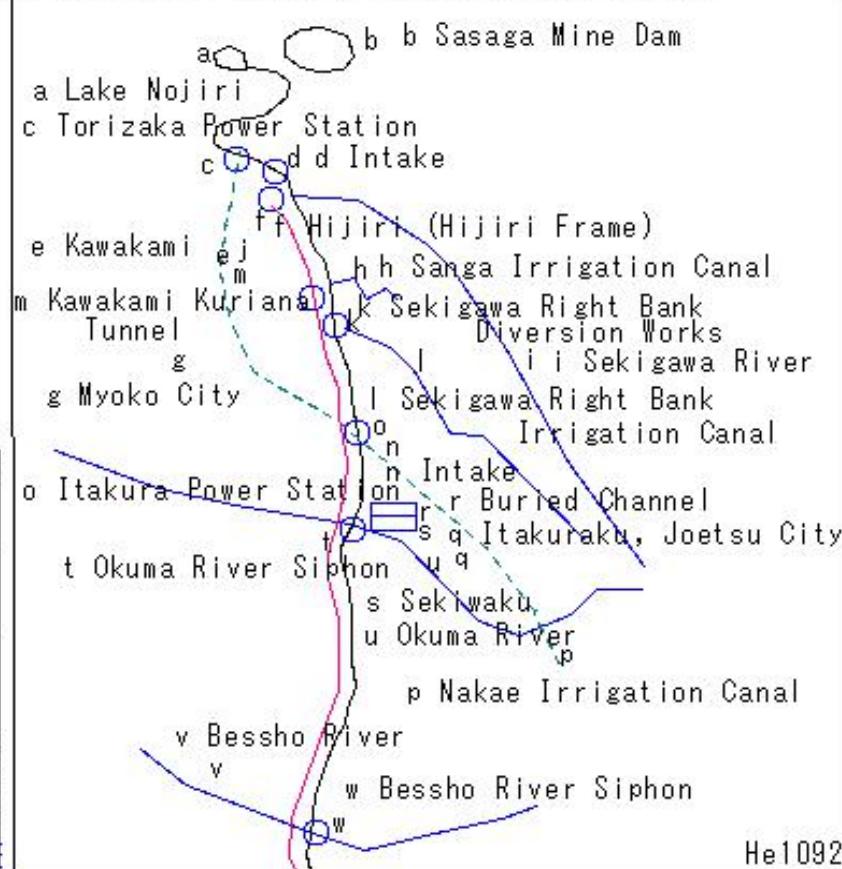
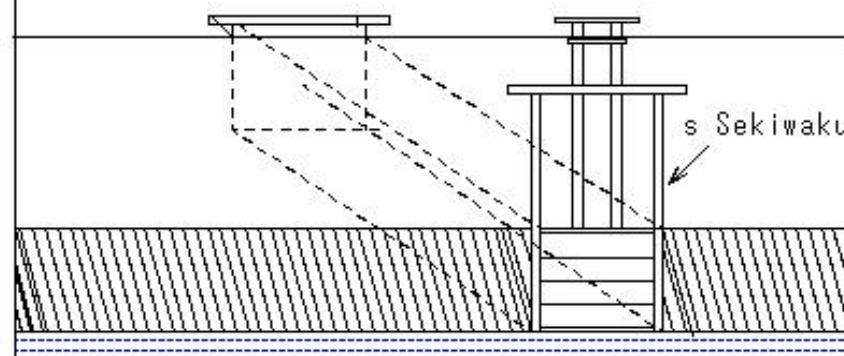
s Sekiwaku

The frame part that secures the gate of a water gate installed at an irrigation water outlet or branch point, etc.

He1103

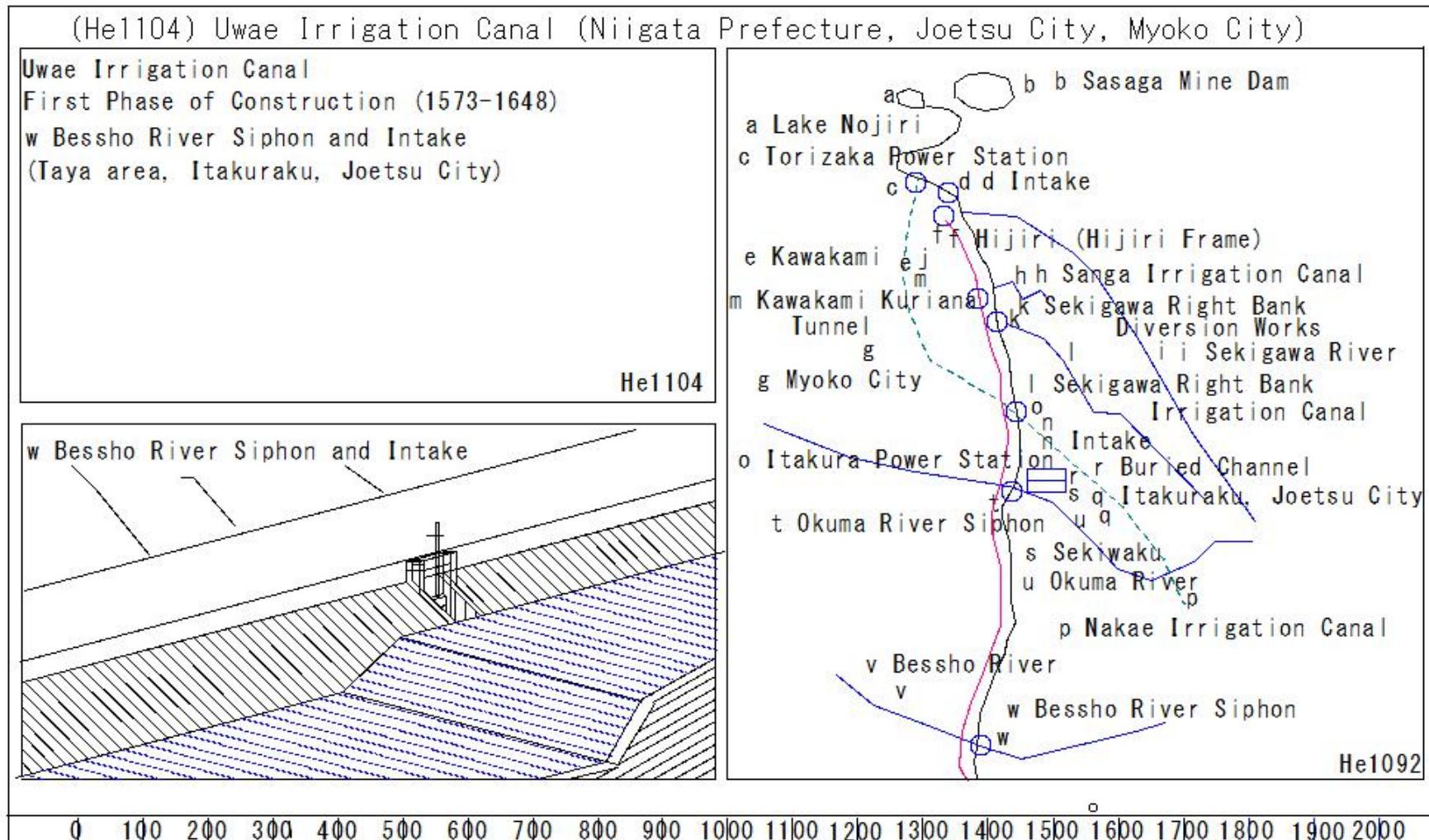
s Sekiwaku

He1103

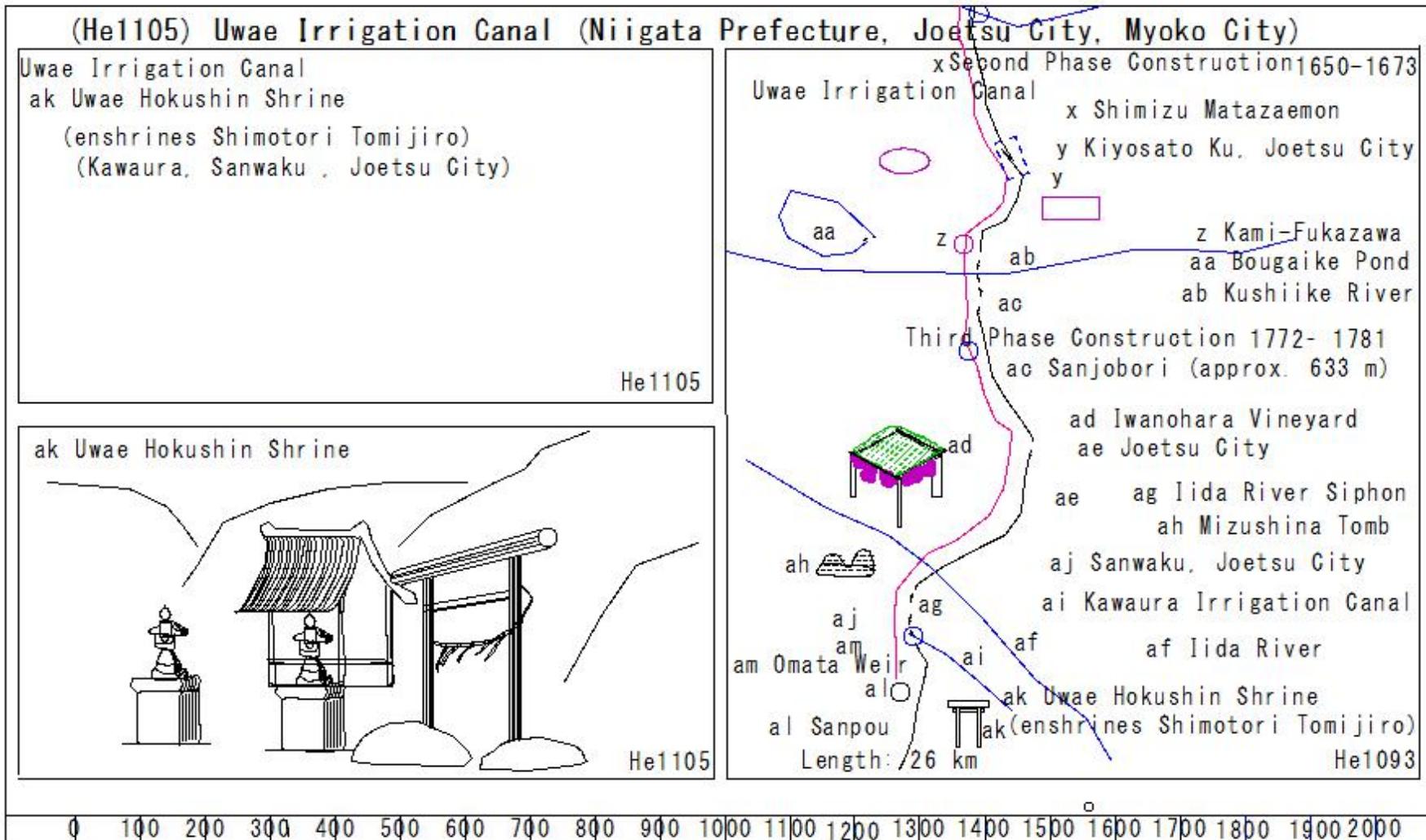


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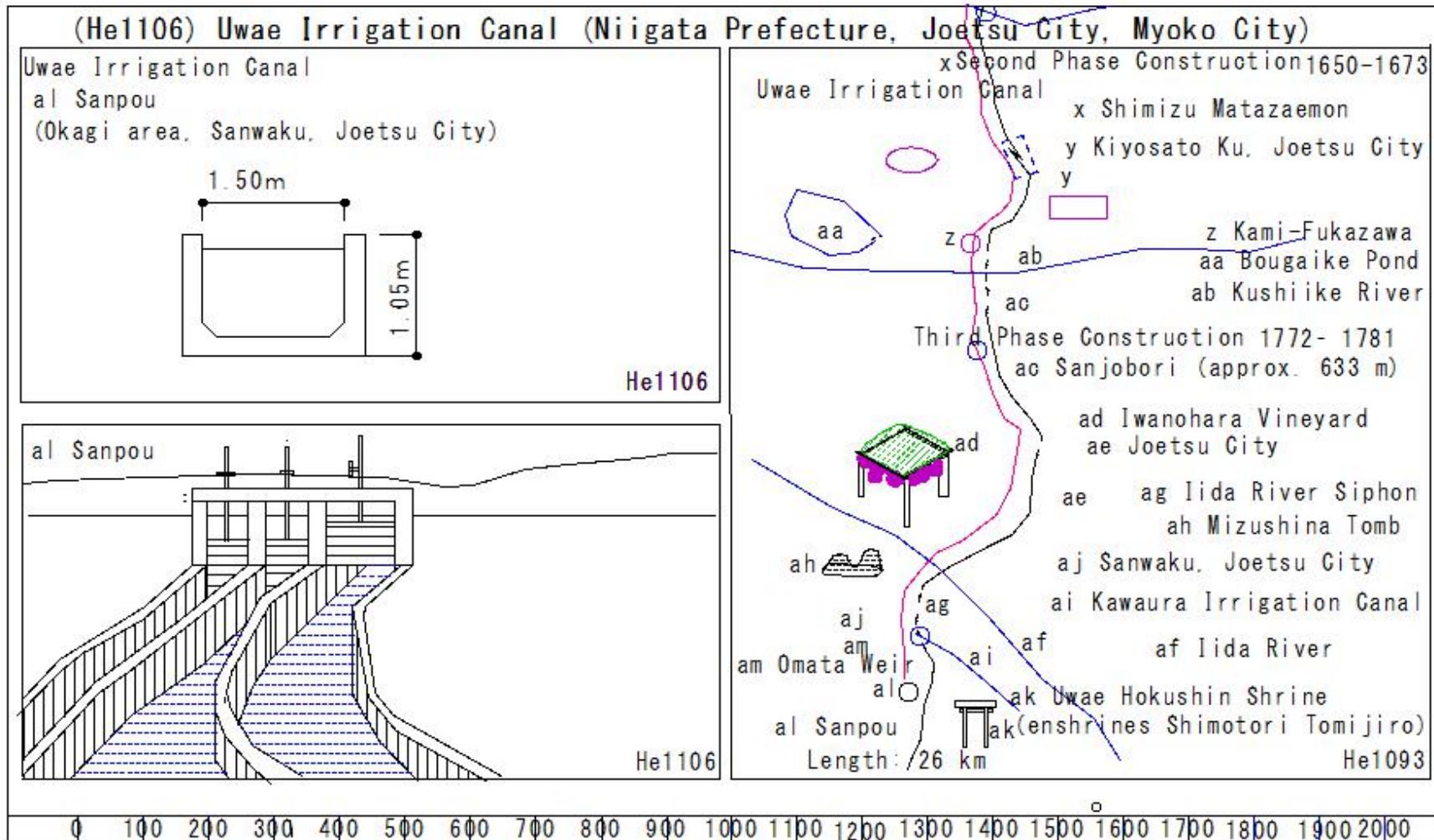
(He1104) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)



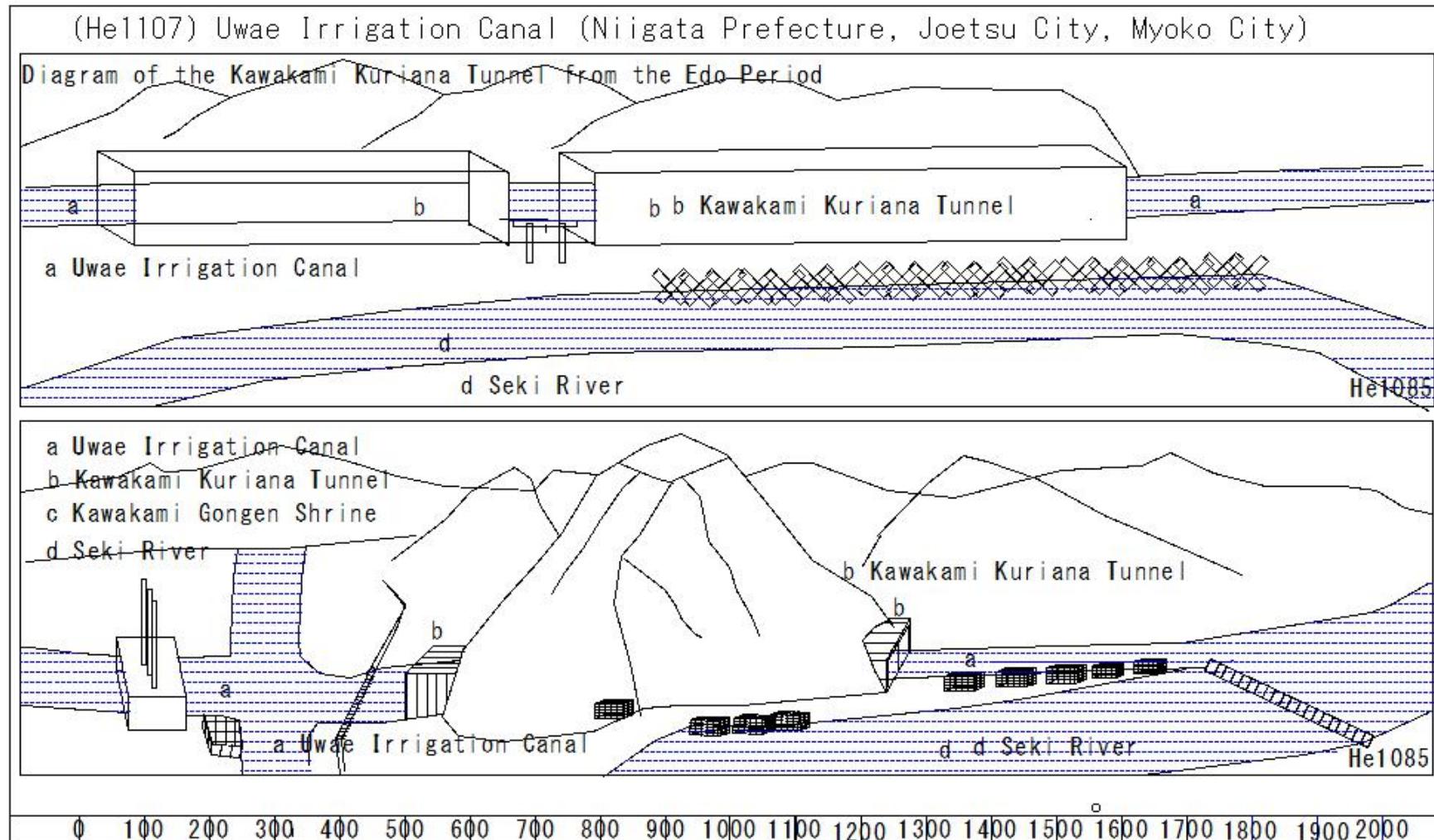
(He1105) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)



(He1106) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

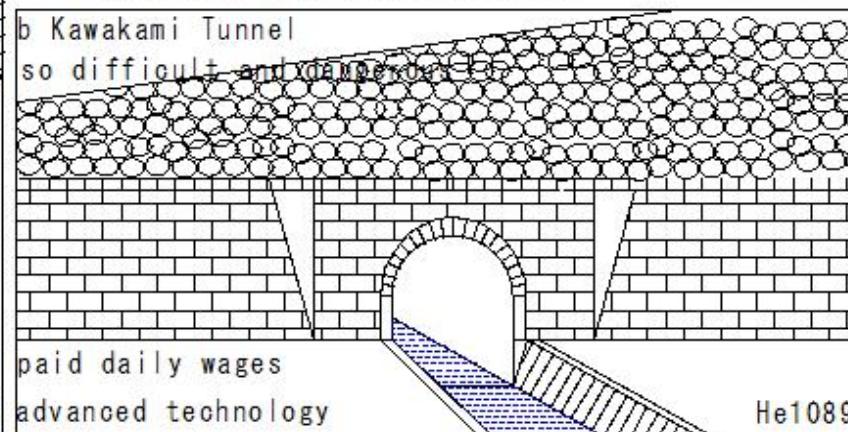
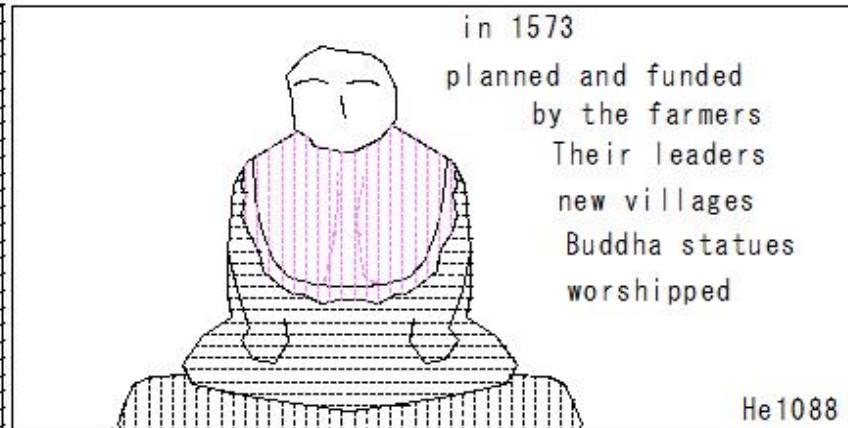
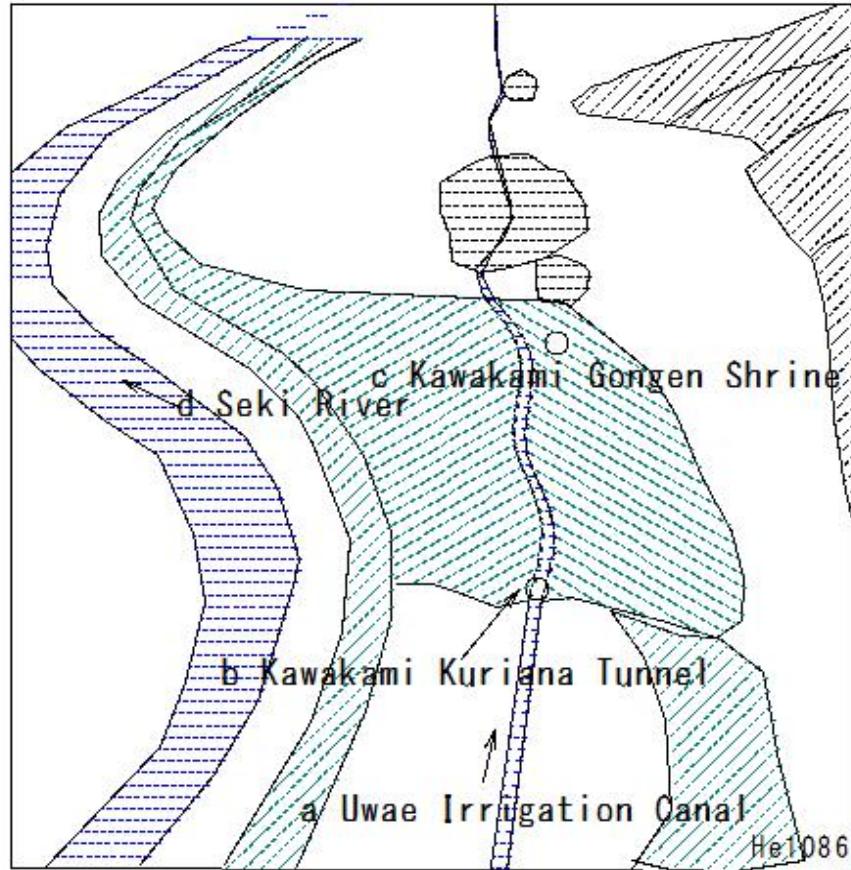


(He1107) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)



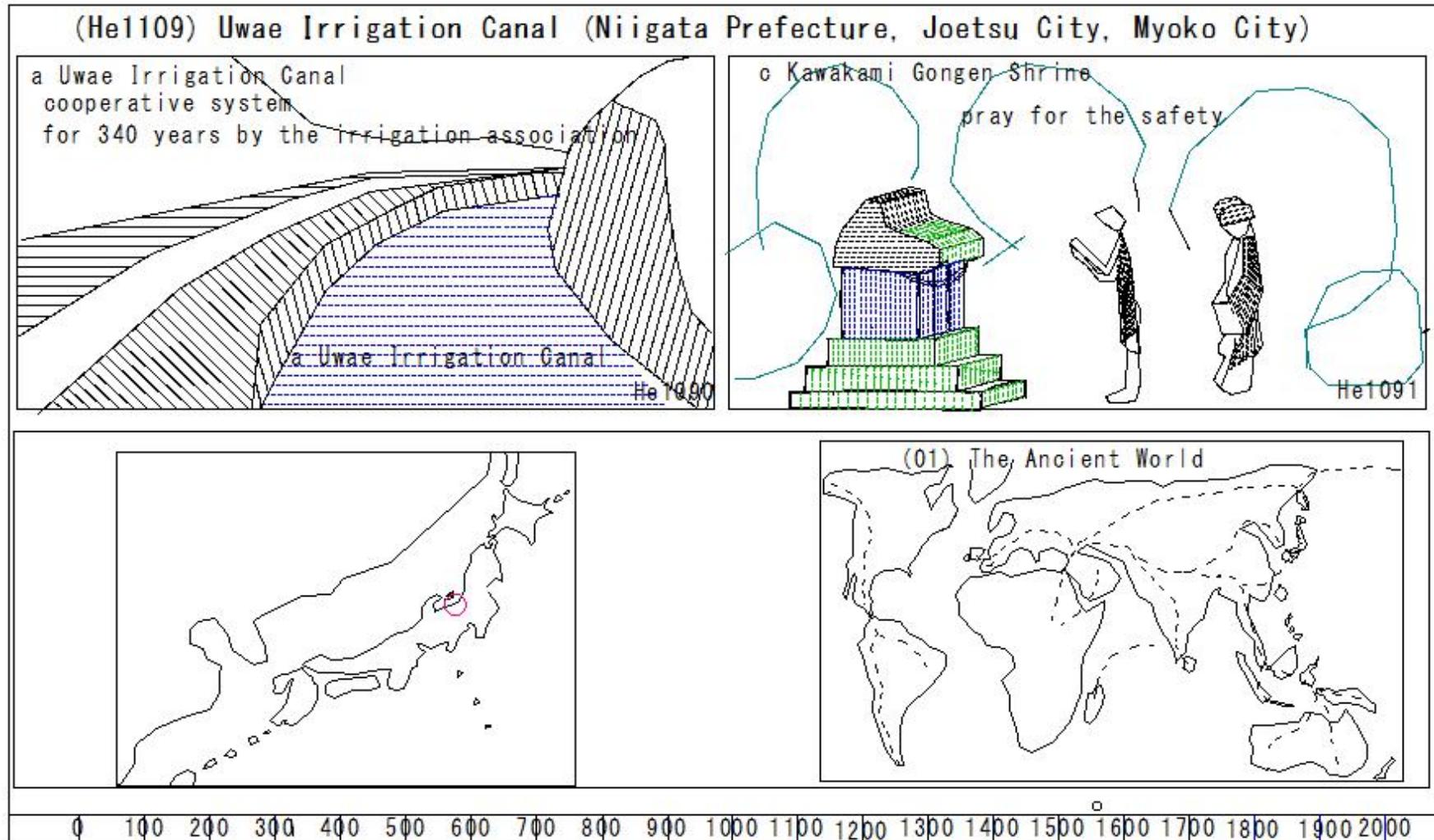
(He1108) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

(He1108) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

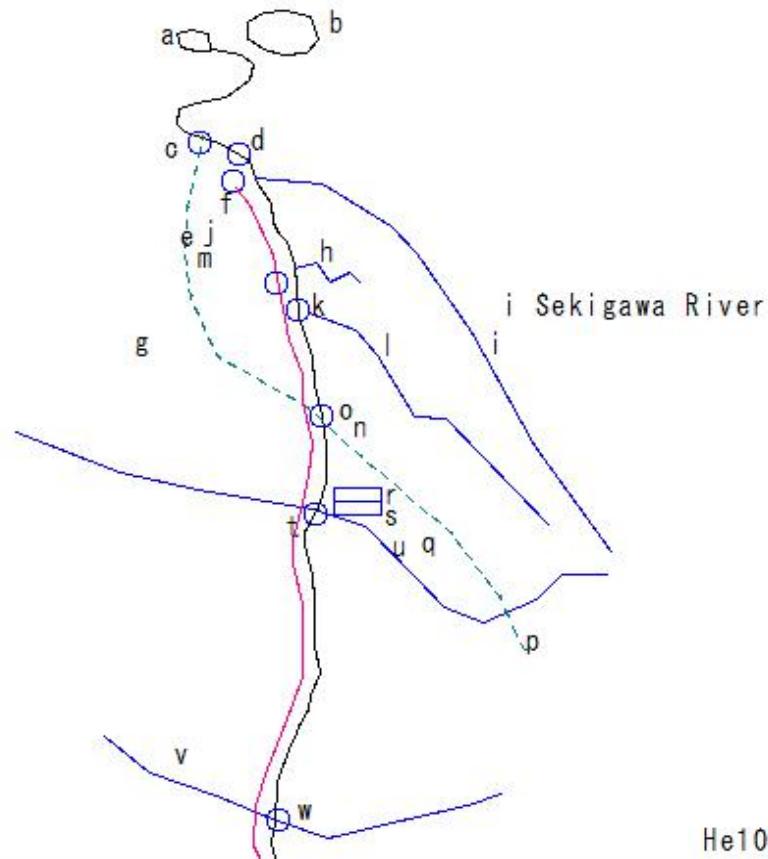
(He1109) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)



(He1110) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

(He1110) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

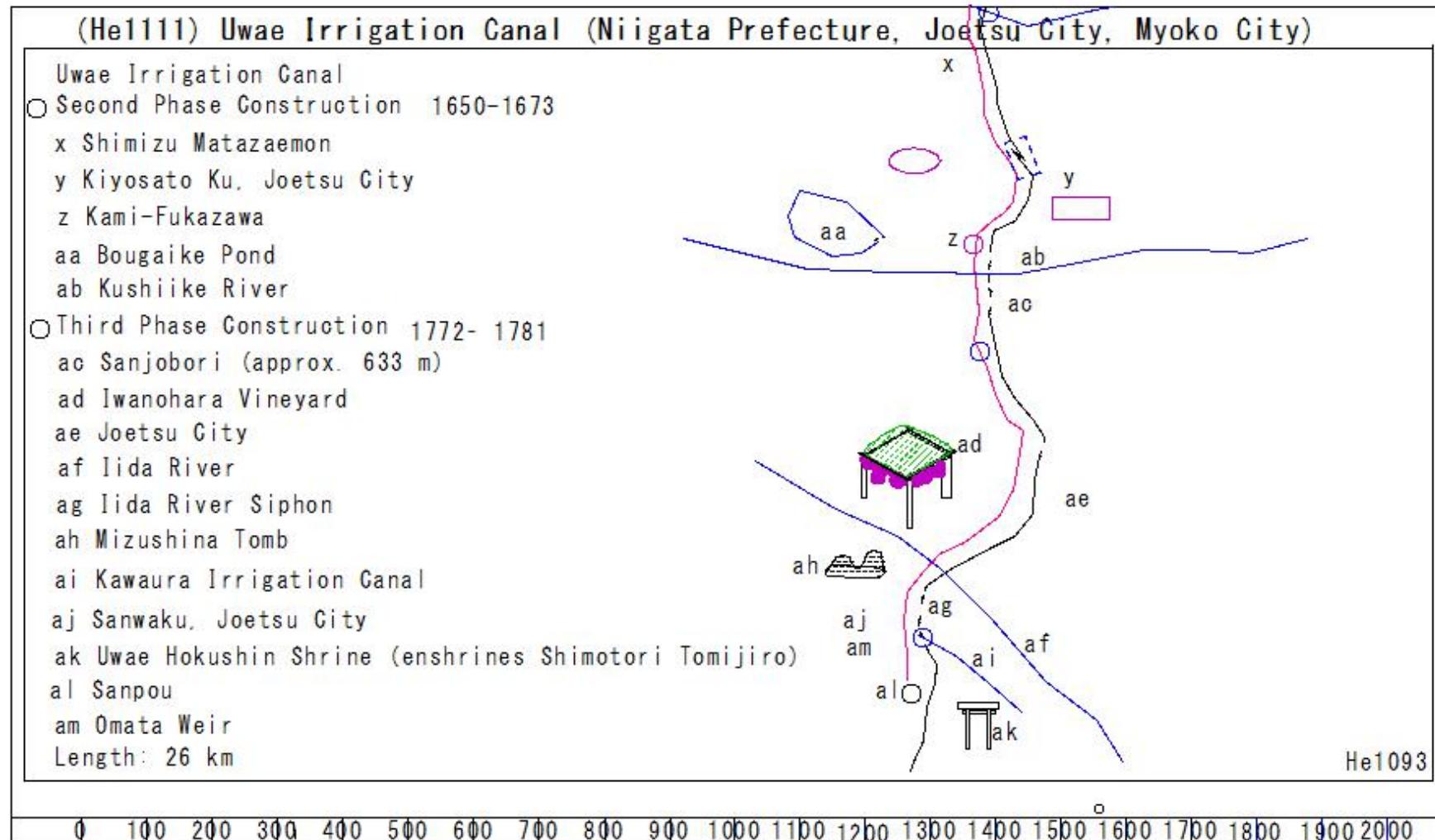
Uwae Irrigation Canal
 First Phase of Construction (1573-1648)
 a Lake Nojiri
 b Sasaga Mine Dam
 c Torizaka Power Station
 d Intake
 e Kawakami
 f Hijiri (Hijiri Frame)
 g Myoko City
 h Sanga Irrigation Canal
 i Sekigawa River
 j Kawakami Gongen Shrine
 k Sekigawa Right Bank Diversion Works
 l Sekigawa Right Bank Irrigation Canal
 m Kawakami Kuriana Tunnel
 n Intake
 o Itakura Power Station
 p Nakae Irrigation Canal
 q Itakuraku, Joetsu City
 r Buried Channel
 s Sekiwaku
 t Okuma River Siphon
 u Okuma River
 v Bessho River
 w Bessho River Siphon



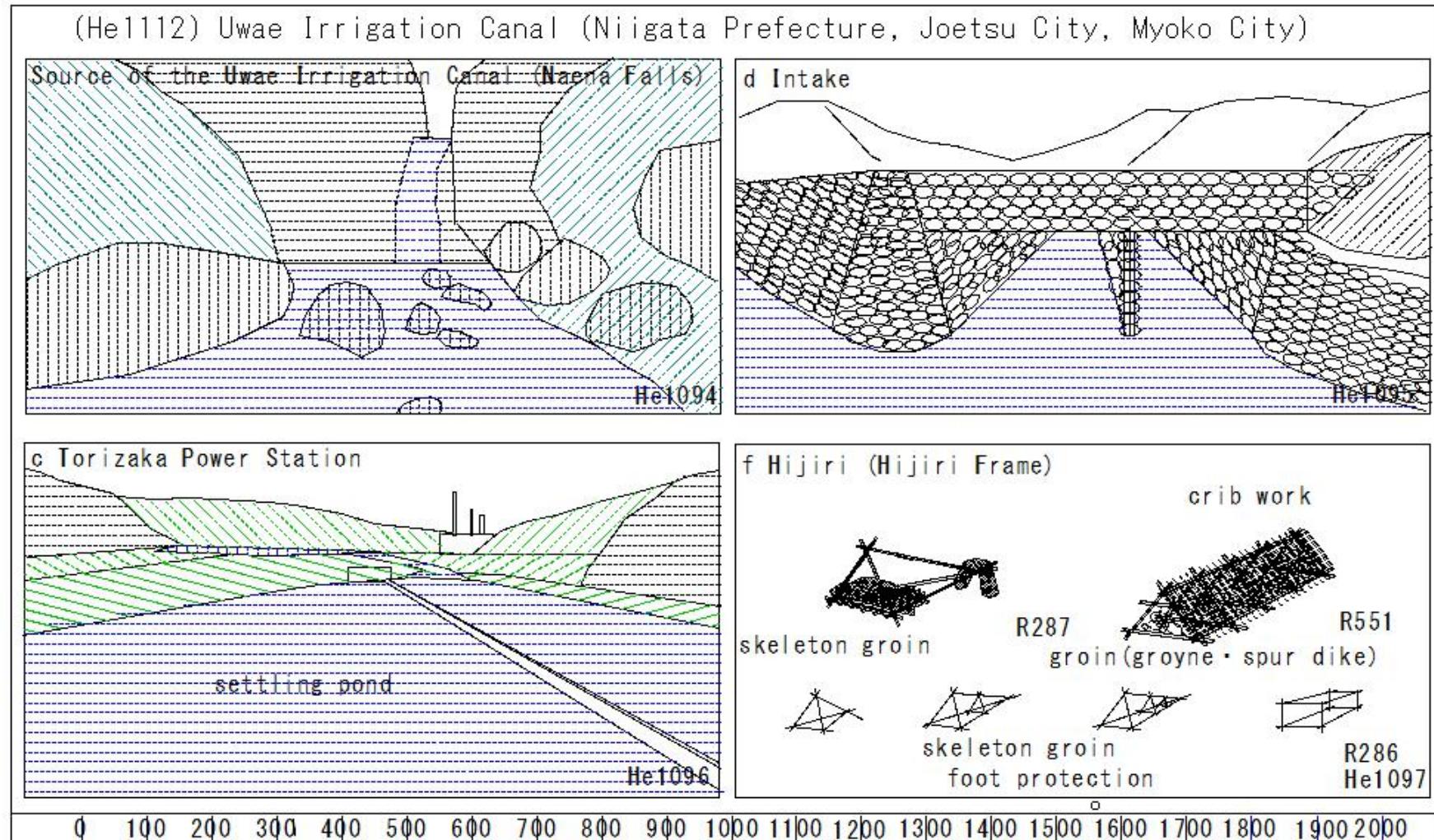
He1092

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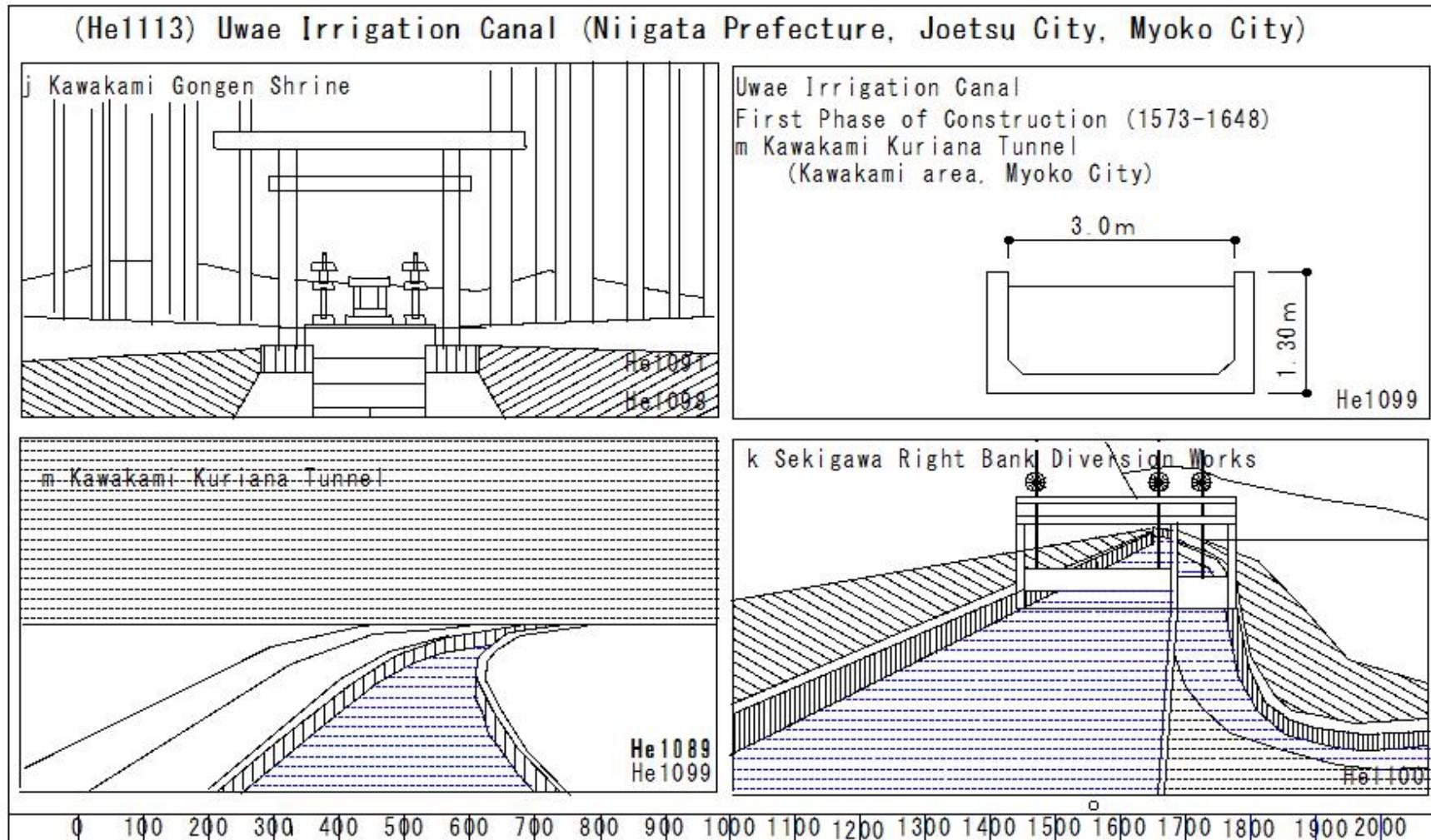
(He1111) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)



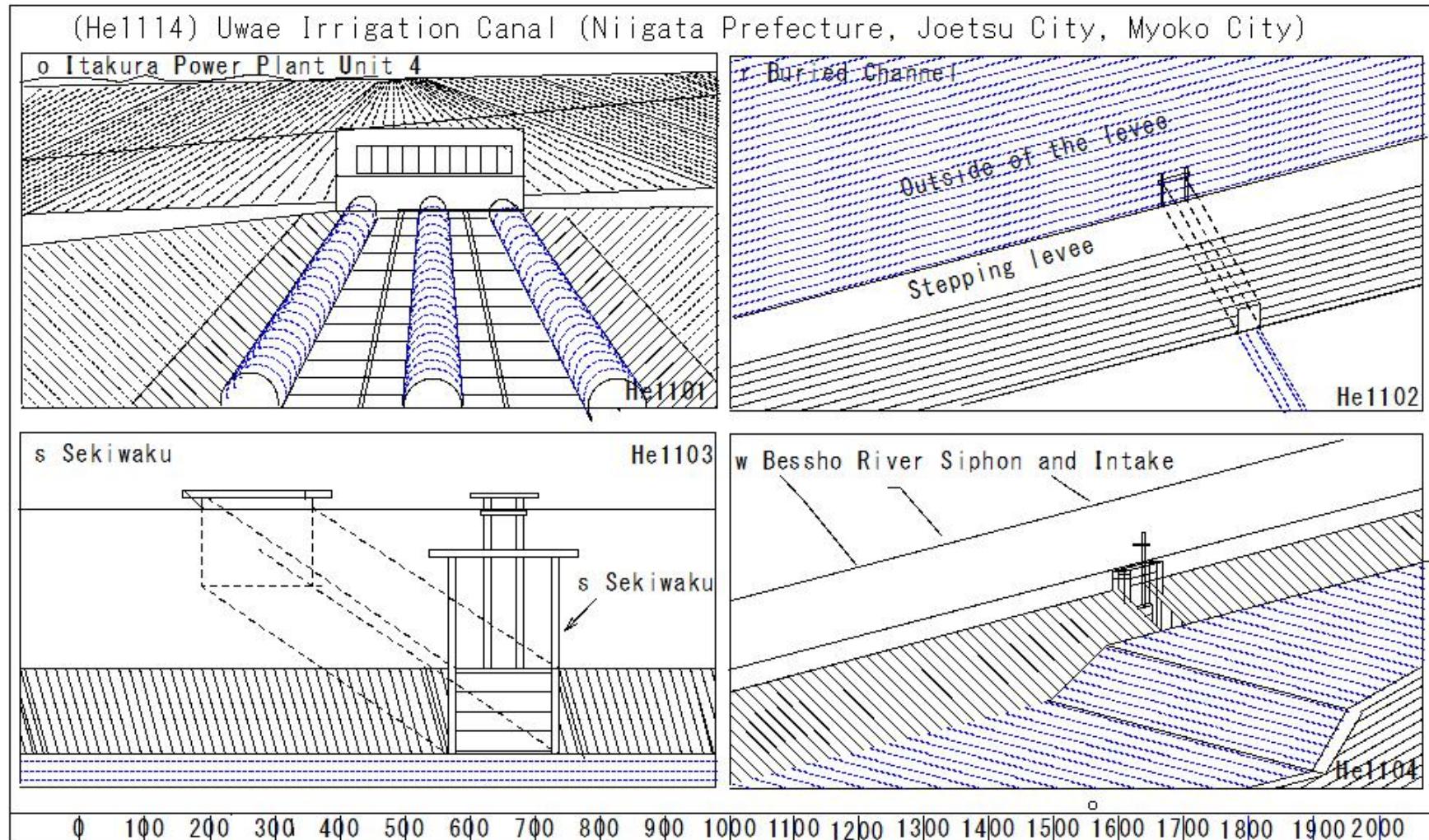
(He1112) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)



(He1113) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

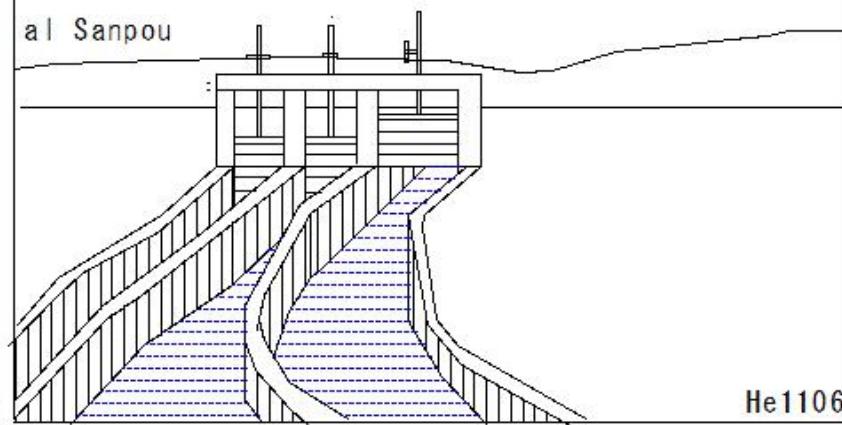
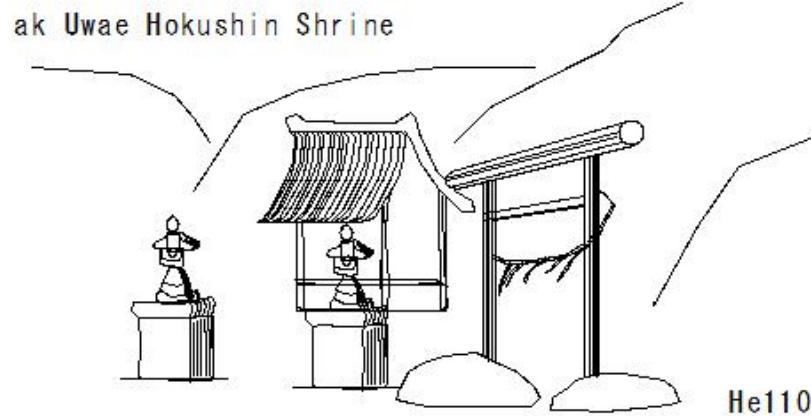


(He1114) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

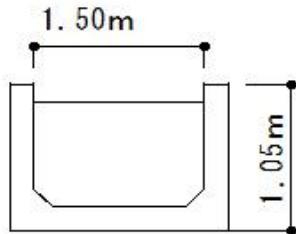


(He1115) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)

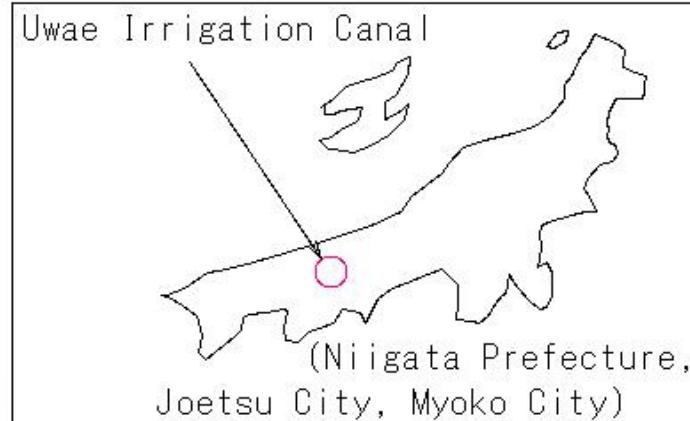
(He1115) Uwae Irrigation Canal (Niigata Prefecture, Joetsu City, Myoko City)



Uwae Irrigation Canal
al Sanpou
(Okagi area, Sanwaku, Joetsu City)



He1106



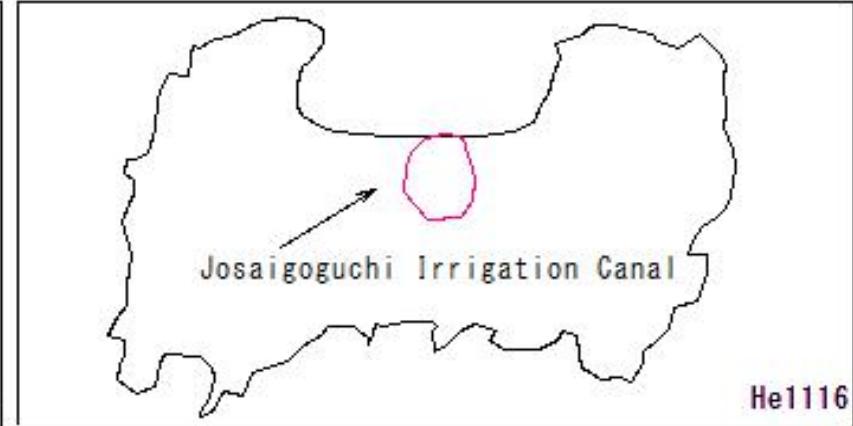
∅ 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1116) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

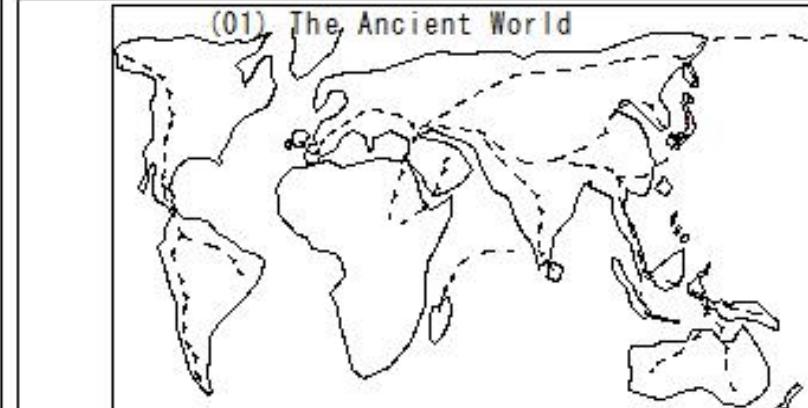
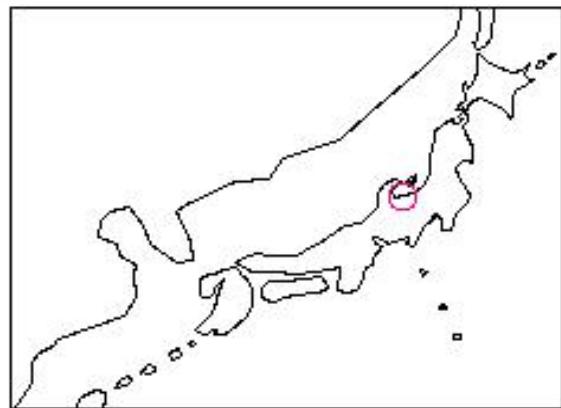
(He1116) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

- ① The Joganji River is known as one of the world's most rapid rivers.
- ② Large amounts of sediment and driftwood would wash into the intakes for agricultural water every time a flood occurred, damaging the intakes. This resulted in stable water intakes and even water disputes.

He1116



He1116



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1117) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

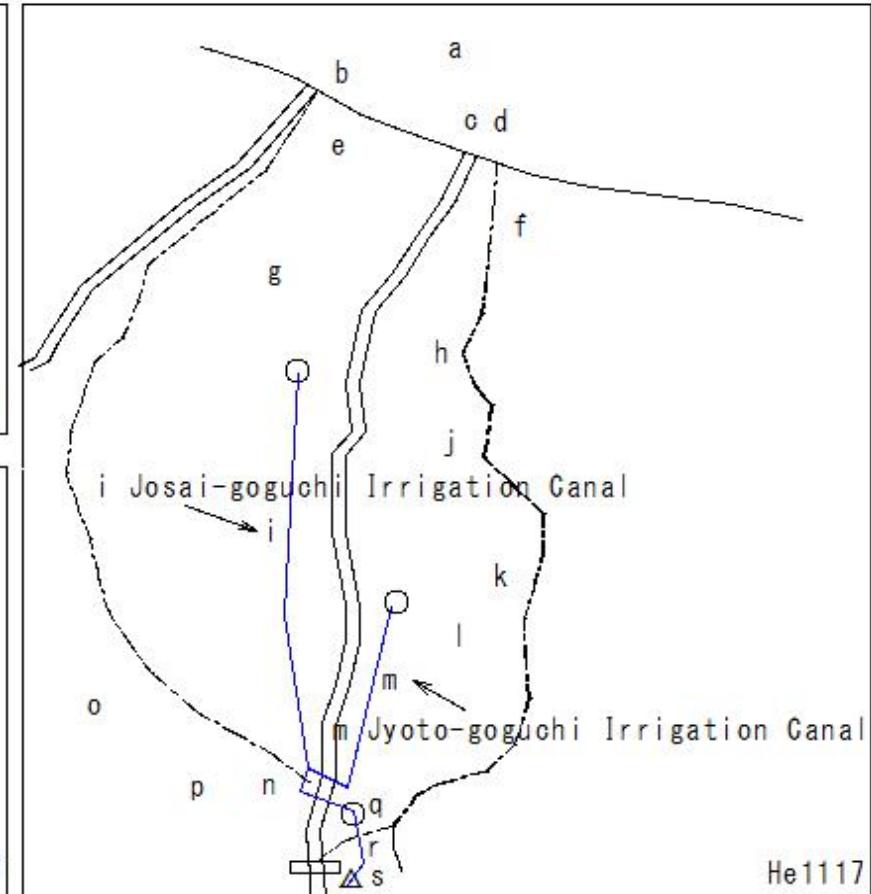
(He1117) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

a Toyama Bay
b Jinzu River
c Joganji River
d Shiraiwa River
e Higashiwase
f Mizuhashi
g Toyama City
h Funahashi Village
i Josai-goguchi Irrigation Canal

He1117

j Funahashi Village
k Tateyama Town
l Gohyakukoku
m Jyoto-goguchi Irrigation Canal
n Kamitaki Falls
o Kamishinkawa District
p Oyama Town
q Left and right bank water tanks
r Common Main Canal
s Yokoe Headworks

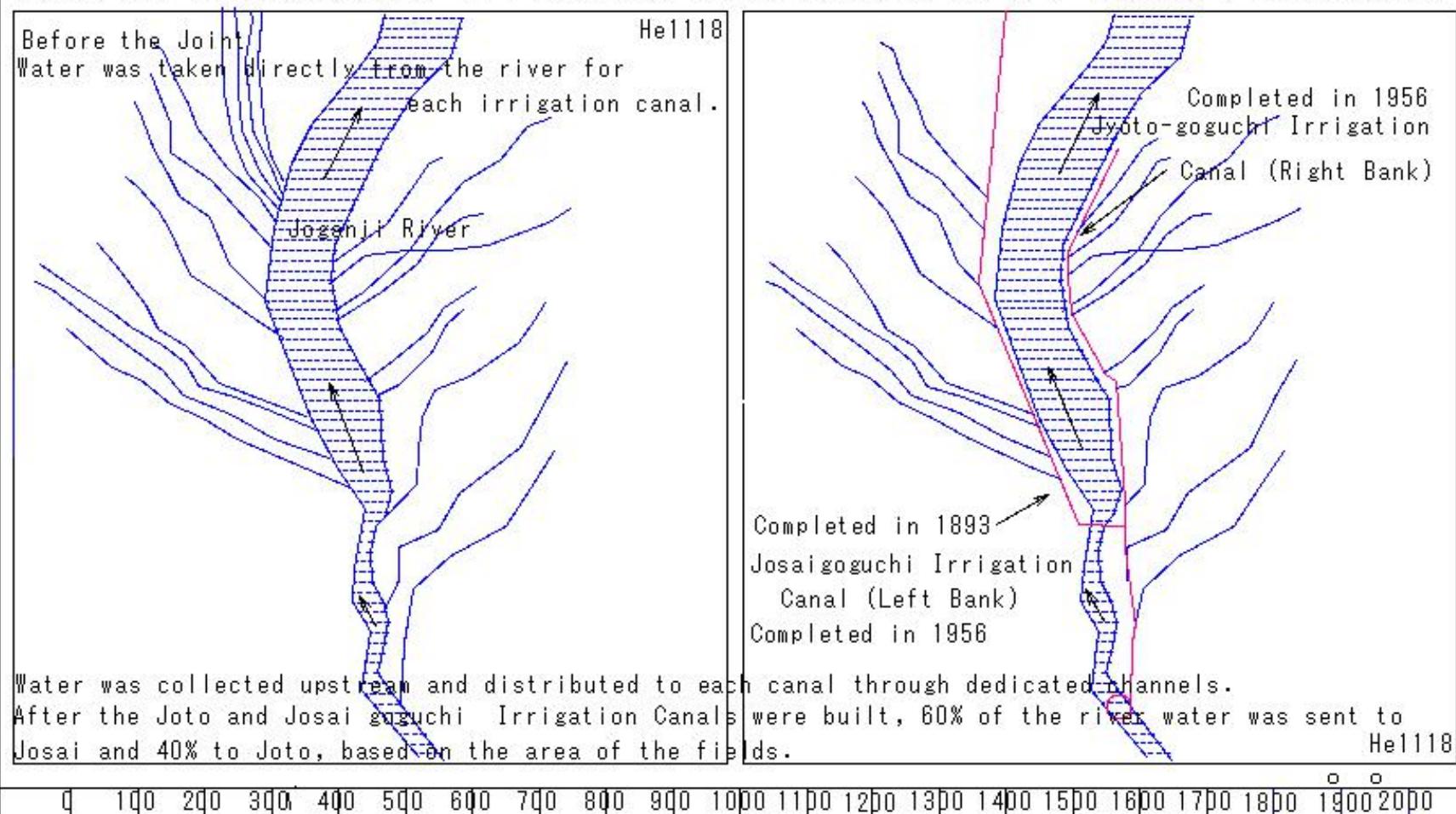
He1117



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1118) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

(He1118) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

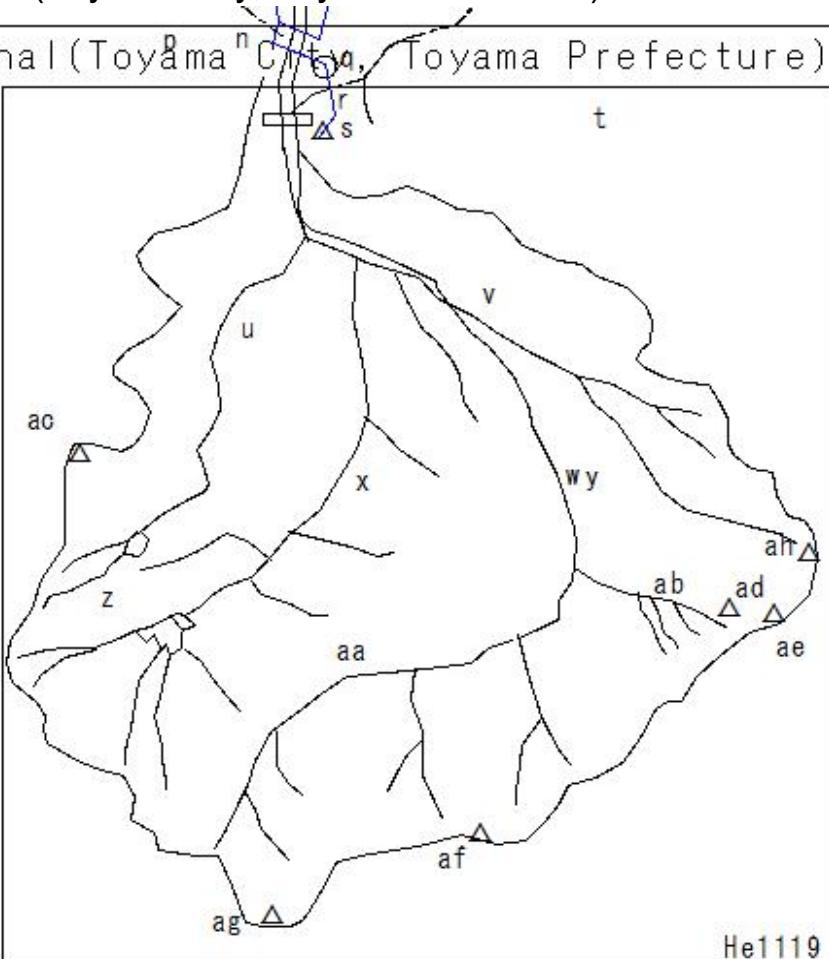


(He1119) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

(He1119) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

s Yokoe Headworks
t Nakaniikawa District
u Oguchi River
v Shomyo River
w Joganji River
x Wada River
y Joganji River
z Arimine Reservoir
aa Mt. Shinkawa

He119



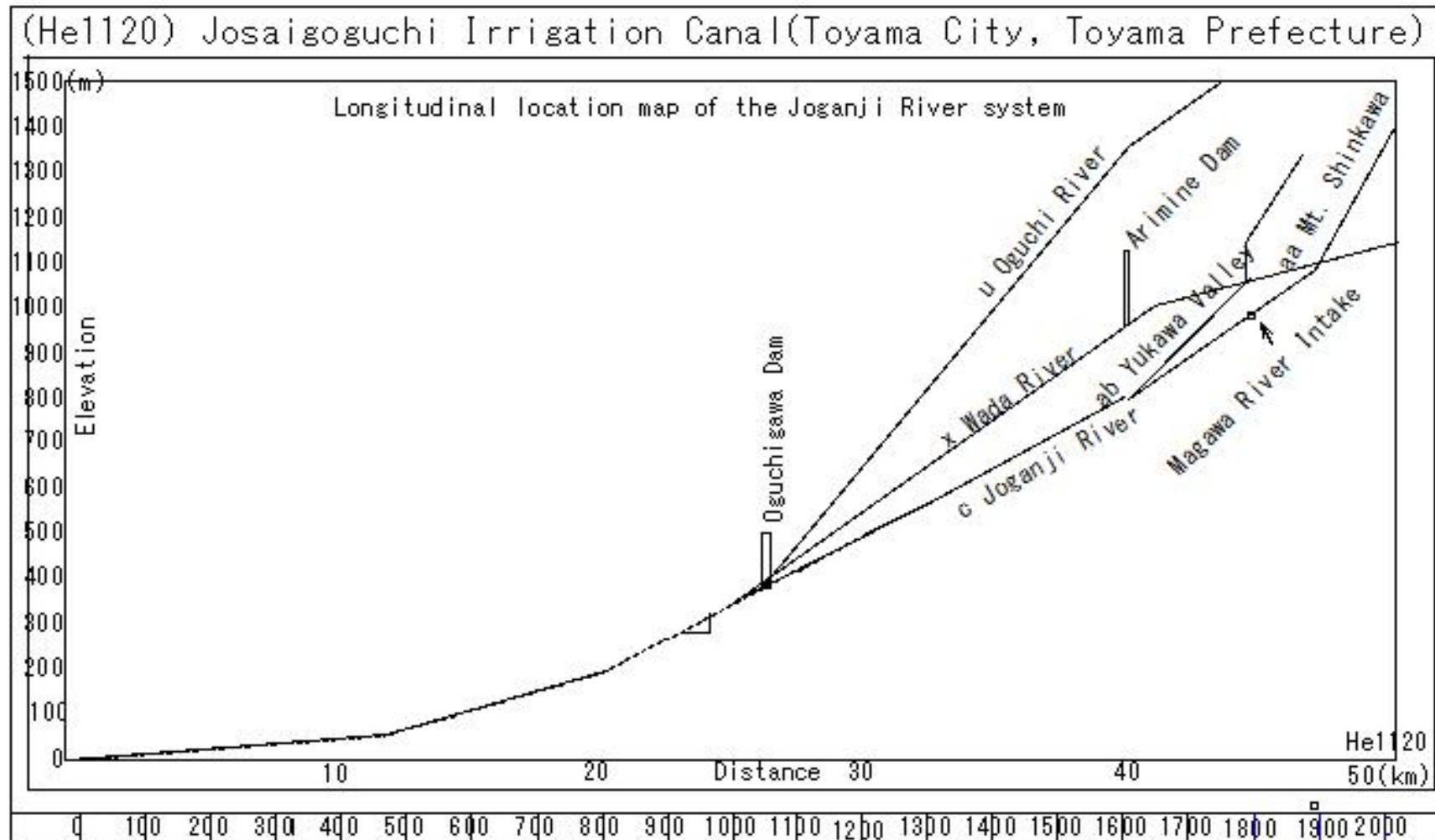
ab Yukawa Valley
ac Δ Nishikasayama
ad Δ Jodo Mountain
ae Δ Oyama
af Δ Yakushi Mountain
ag Δ Kitamata Mountain
ah Δ Onnaru Mountain

He119

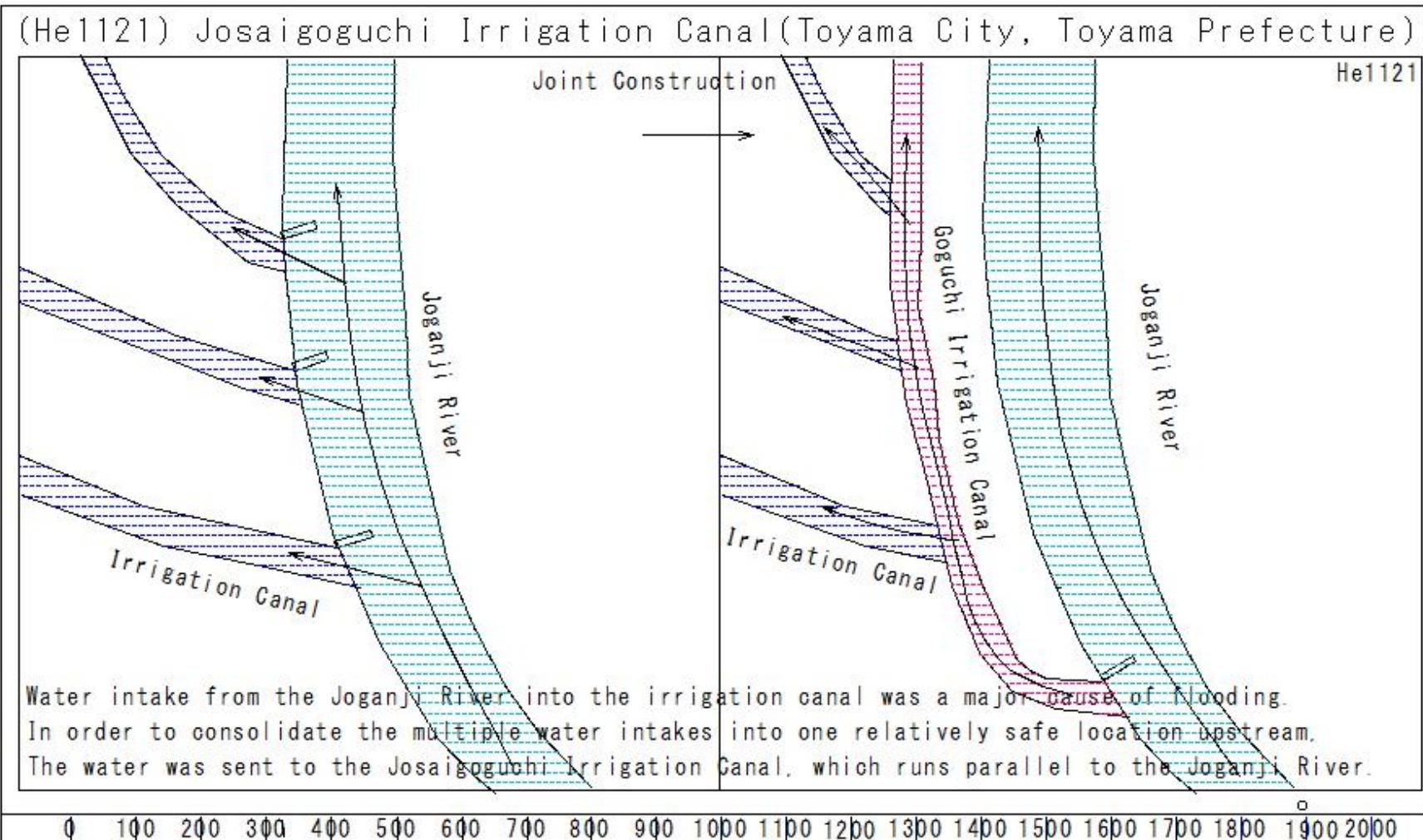
He1119

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1120) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)



(He1121) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)



Water intake from the Joganji River into the irrigation canal was a major cause of flooding.
In order to consolidate the multiple water intakes into one relatively safe location upstream.
The water was sent to the Josaigoguchi Irrigation Canal, which runs parallel to the Joganji River.

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1122) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

(He1122) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

Yokoe Headworks

Sediment sluice gate

20mx5mx1 gate

spillway gate

240mx3mx1 gate

Height: 14.1m

Embankment length: 144.3m (fixed part 84.3m,
movable part 60.0m)

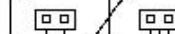
Maximum water intake 18.89m³/sec

He1122

Yokoe Headworks

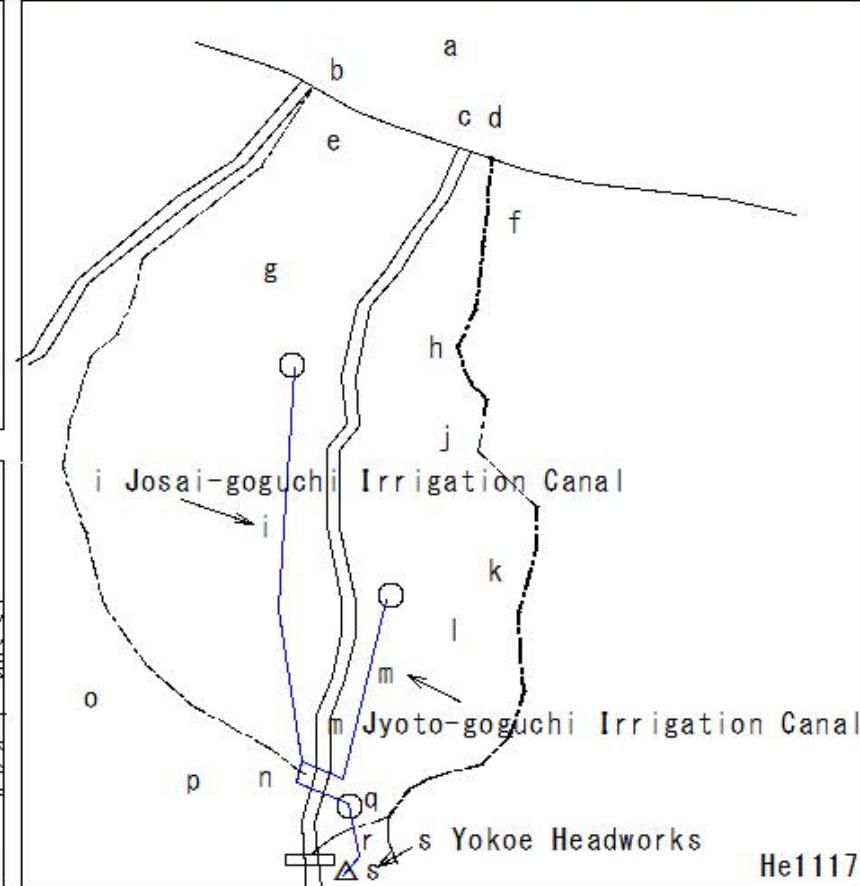
Sediment sluice gate

20mx5mx1 gate



spillway gate
240mx3mx1 gate

He1122



He1117

Ø 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1123) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

(He1123) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

Yokoe Headworks

Sediment sluice gate

20mx5mx1 gate

spillway gate

240mx3mx1 gate

Height: 14.1m

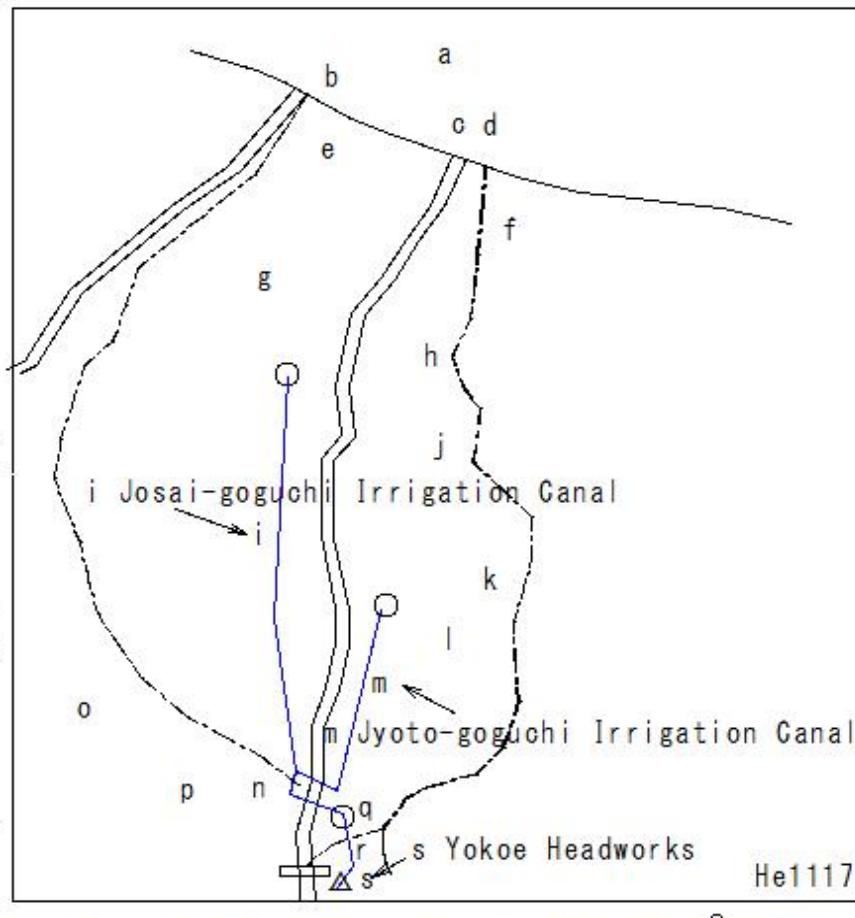
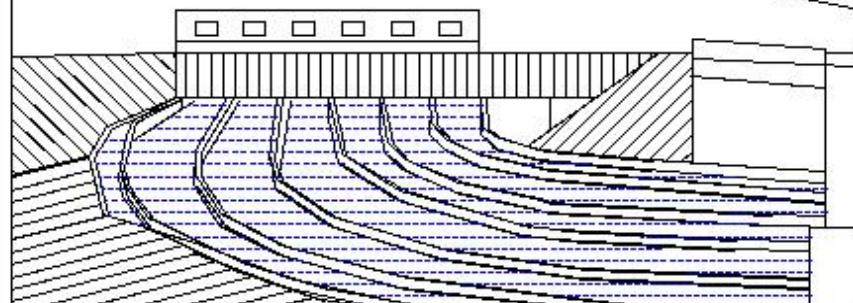
Embankment length: 144.3m (fixed part 84.3m,
movable part 60.0m)

Maximum water intake 18.89m³/sec

He1122

Water intake gate
3.6m x 2.6m x 6 gates

He1123



(He1124) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

(He1124) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

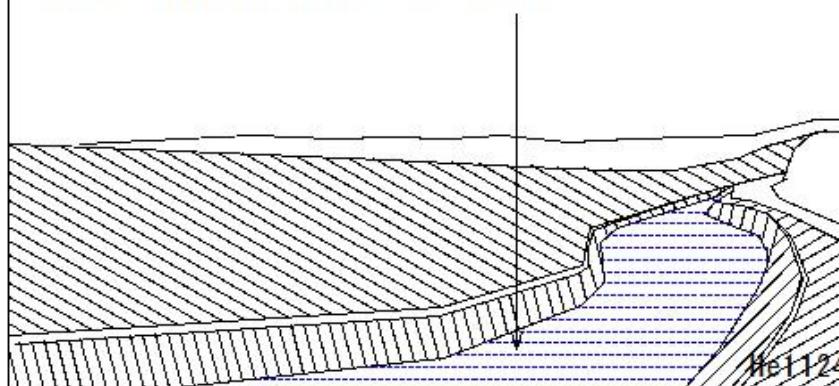
i Josai-goguchi Irrigation Canal

Water taken in from the Egashira Works flows through the Left Bank Bridge into the Jonishi-Aguchi Irrigation Canal.

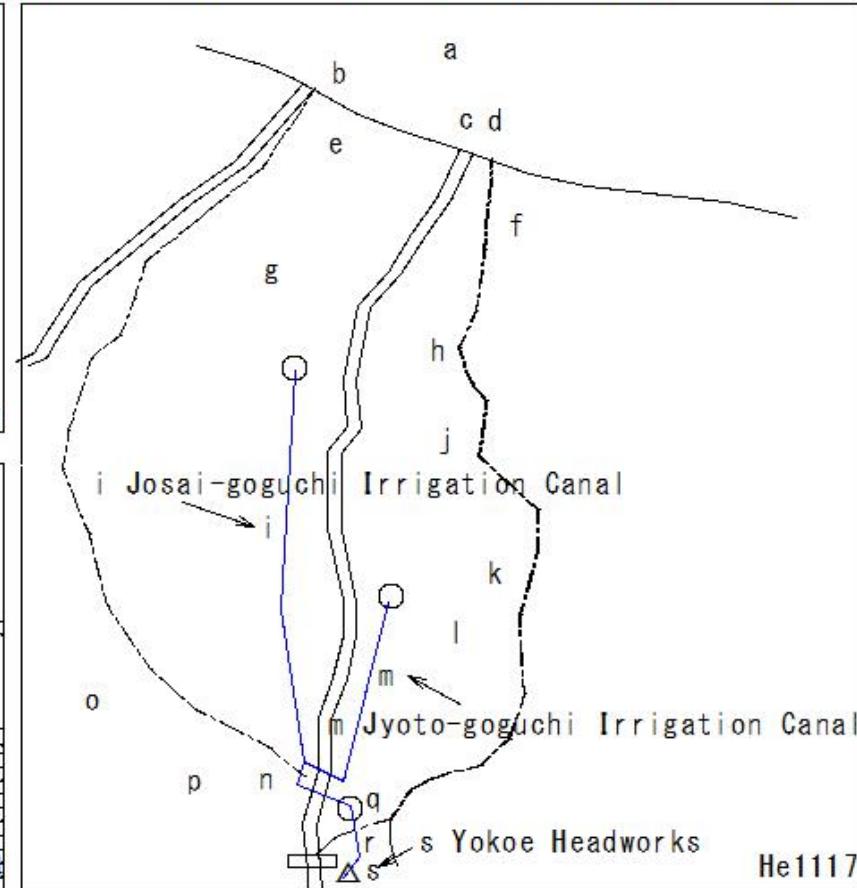
Then, from the diversion point, it is sent to the fields via a branch canal.

He1124

i Josai-goguchi Irrigation Canal



∅ 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000



He1117

(He1125) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

(He1125) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

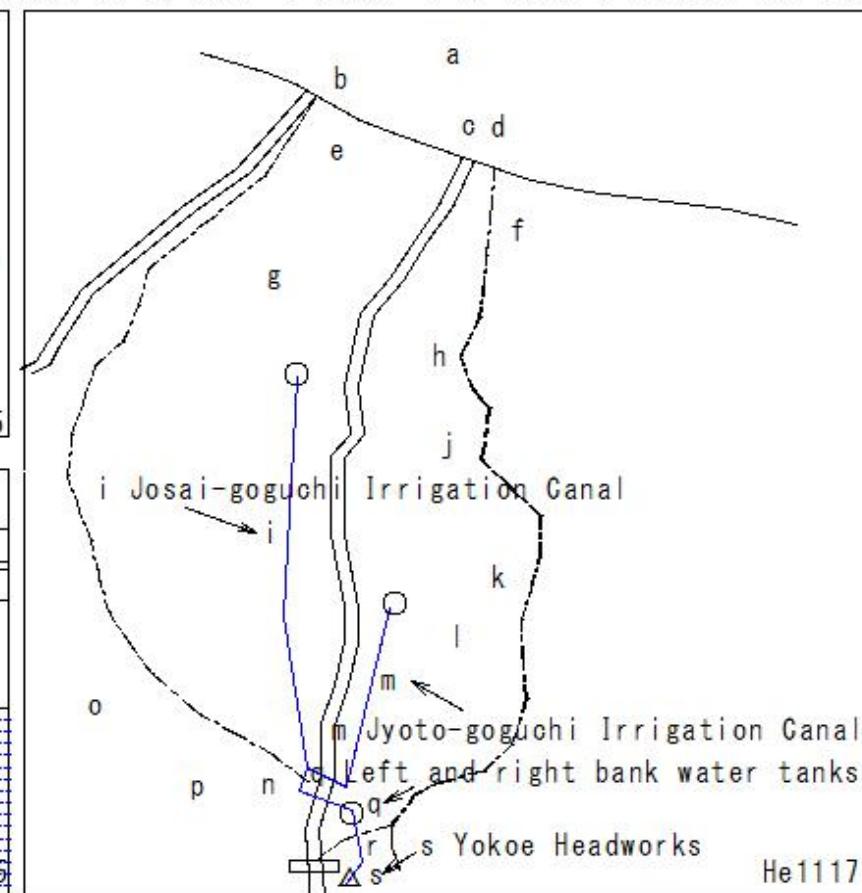
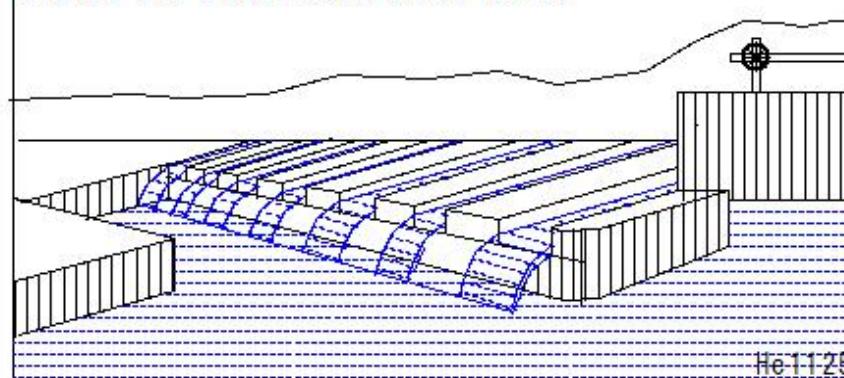
q Left and right bank water tanks

Water taken from the Yokoe headworks
is divided into the Josai Irrigation Canal and
the Johto Irrigation Canal by the diversion
works on both banks.

The intakes for the Josai Irrigation Canal and the
Johto Irrigation Canal are arranged alternately.
The Josai Irrigation Canal uses the Johganji
River Left Bank Link Aqueduct to channel water
to the left bank.

He1125

q Left and right bank water tanks



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1126) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

(He1126) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

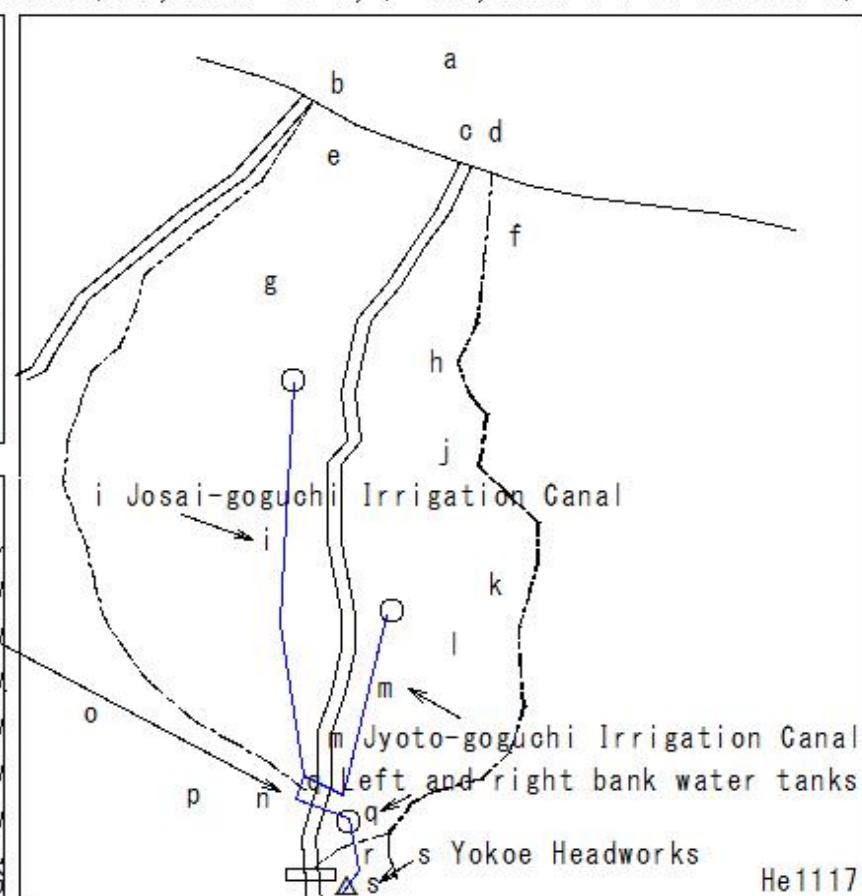
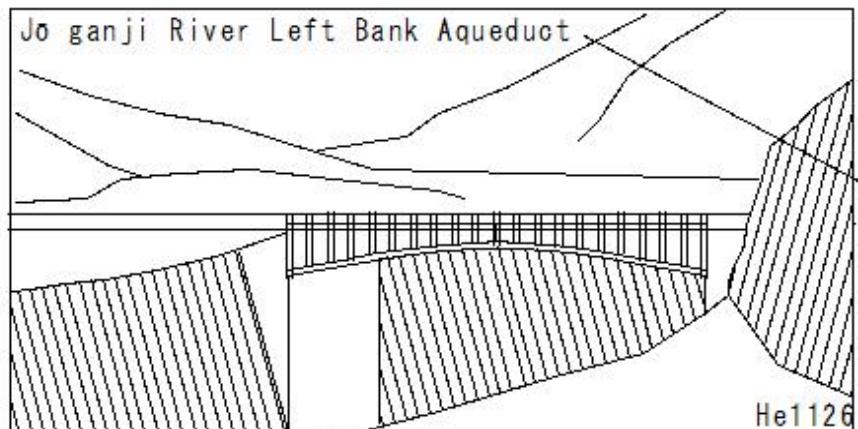
g Left and right bank water tanks

Water taken from the Yokoe headworks is divided into the Josai Irrigation Canal and the Johto Irrigation Canal by the diversion works on both banks.

The intakes for the Josai Irrigation Canal and the Johto Irrigation Canal are arranged alternately. The Josai Irrigation Canal uses the Johganji

River Left Bank Link Aqueduct to channel water to the left bank.

He1125



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1127) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

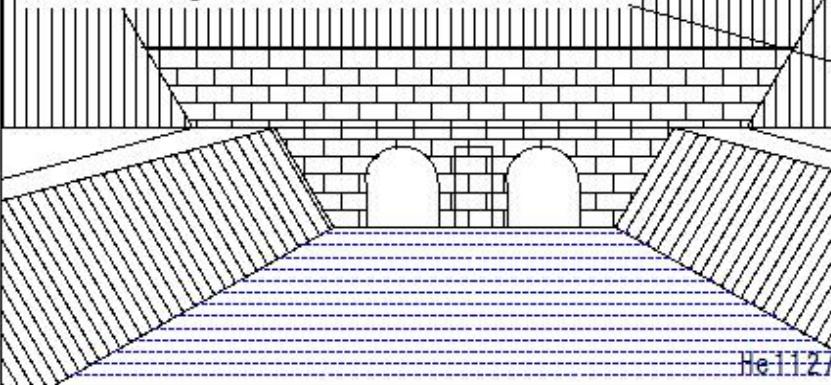
(He1127) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

Josai Irrigation Canal Third Tunnel

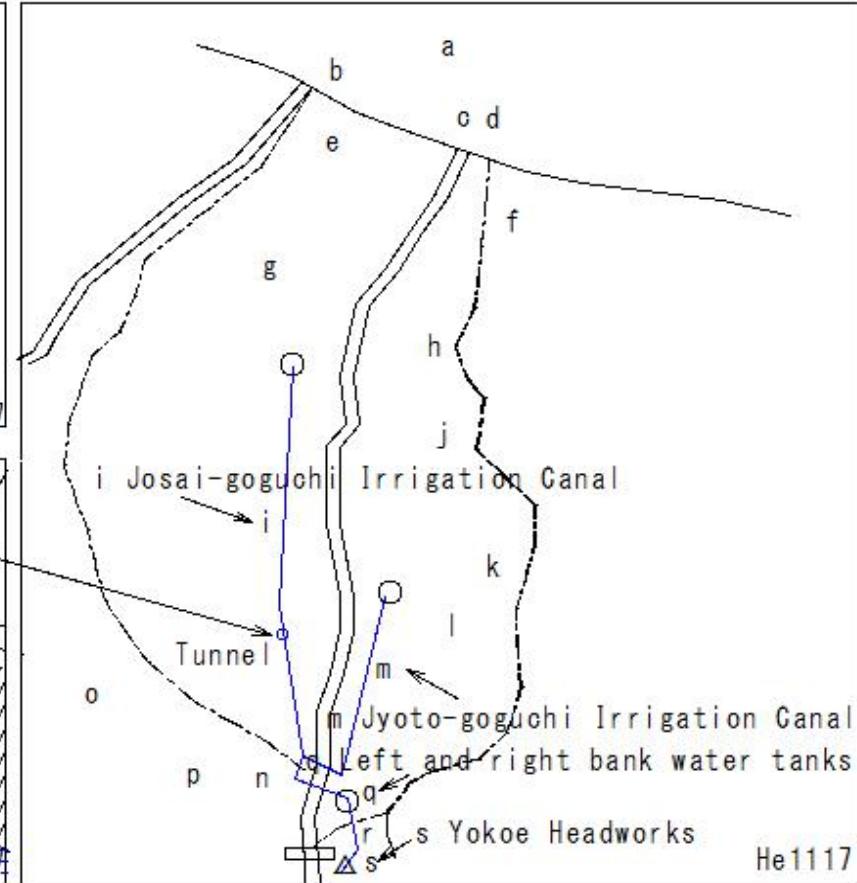
The Josai Irrigation Canal crosses the Johganji River on an aqueduct and then flows through a tunnel.

He1127

Josai Irrigation Canal Third Tunnel



He1127



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

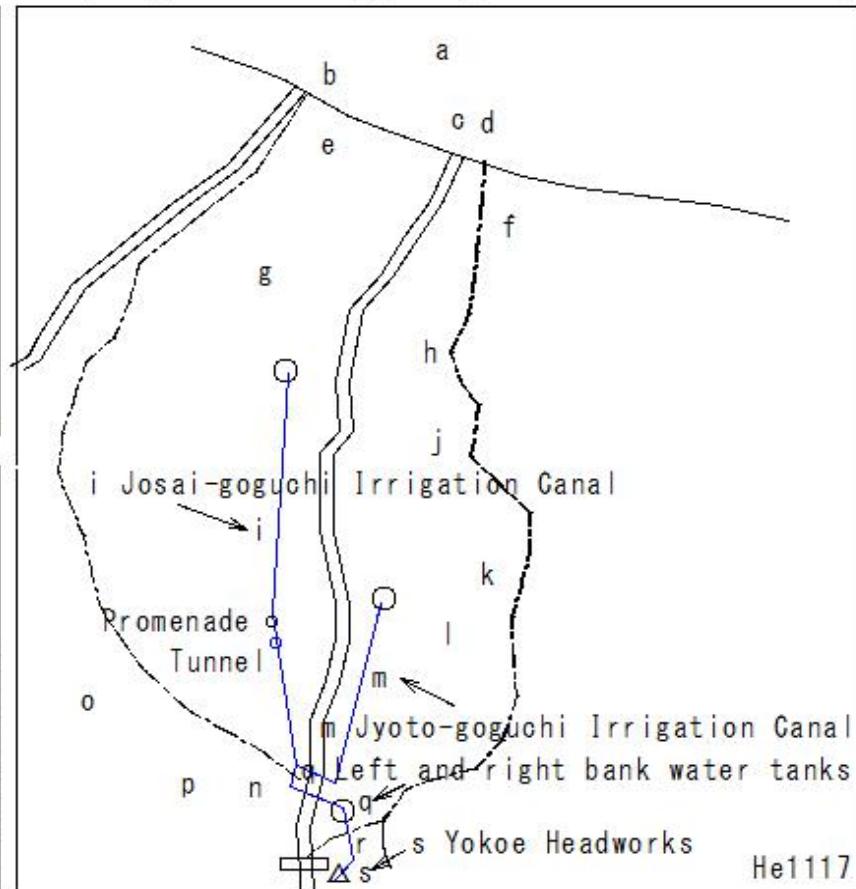
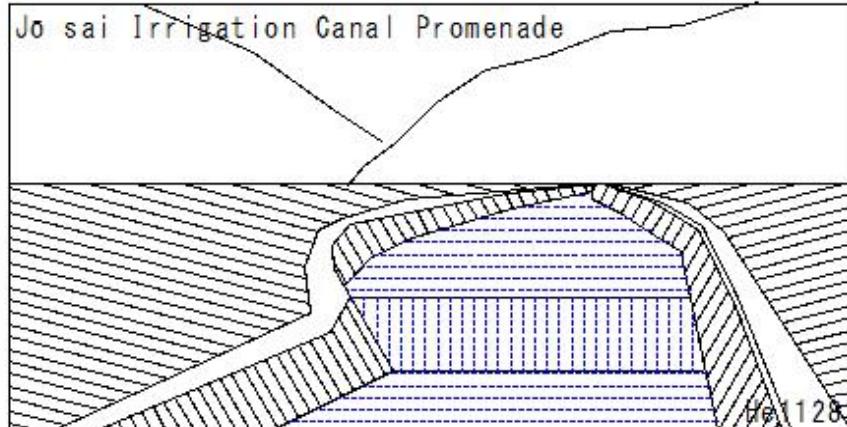
(He1128) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

(He1128) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

Jō sai Irrigation Canal Promenade

The Jō sai Irrigation Canal Promenade is a walking path along the Jō sai Irrigation Canal. The Jō ganji River has a long history of flood control.

He1128



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1129) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

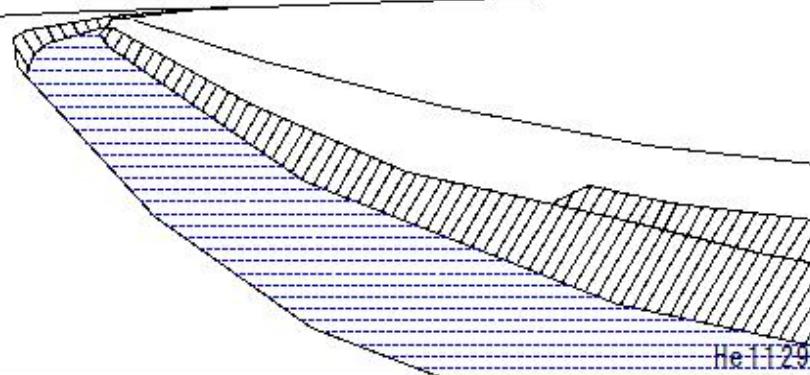
(He1129) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

Sasa Levee of the Josai Irrigation Canal

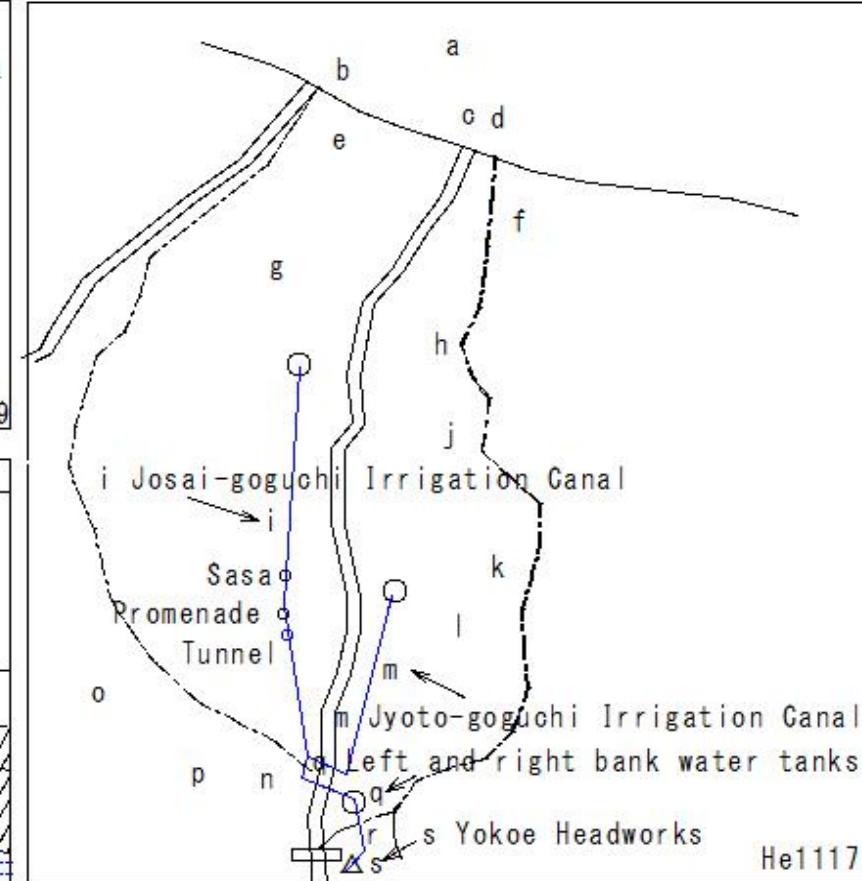
The remains of the kasumi levee built by Lord Sasa Narimasa can be seen at the bottom of the slanted Josai Irrigation Canal.

He1129

Sasa Levee of the Josai Irrigation Canal



He1129



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1130) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

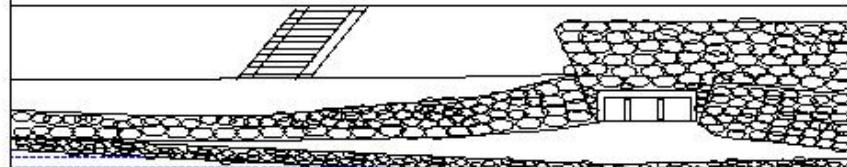
(He1130) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

Ota Lock of the Josai Irrigation Canal

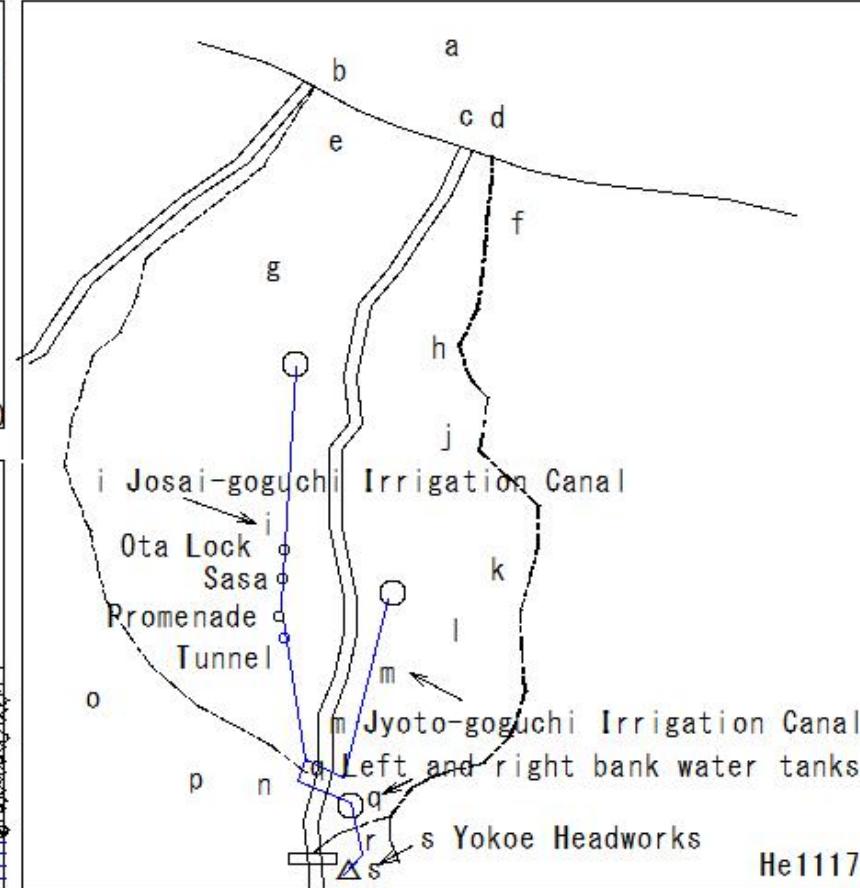
The remains of the kasumi levee built by Lord Sasa Narimasa can be seen at the bottom of the slanted Josai Irrigation Canal.

He1130

Ota Lock of the Josai Irrigation Canal



He1130



Ø 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

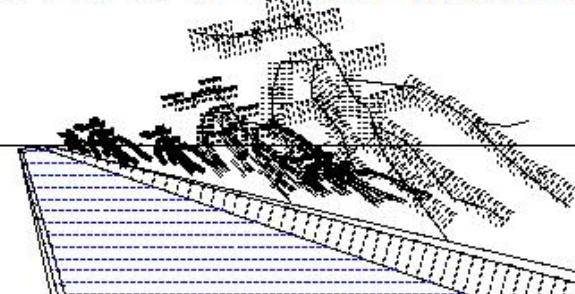
(He1131) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

(He1131) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

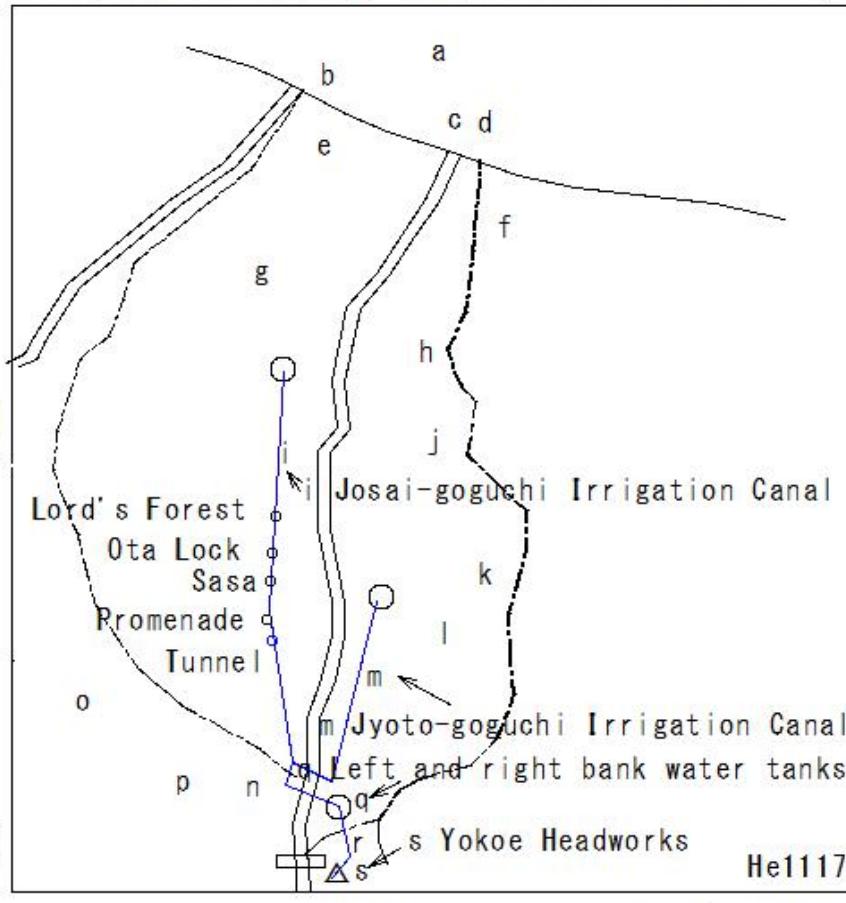
Lord's Forest of the Josai Irrigation Canal
The remains of the kasumi levee built by Lord Sasa
Narimasa can be seen at the bottom of
the slanted Josai Irrigation Canal.

He1131

Lord's Forest of the Josai Irrigation Canal



He1131



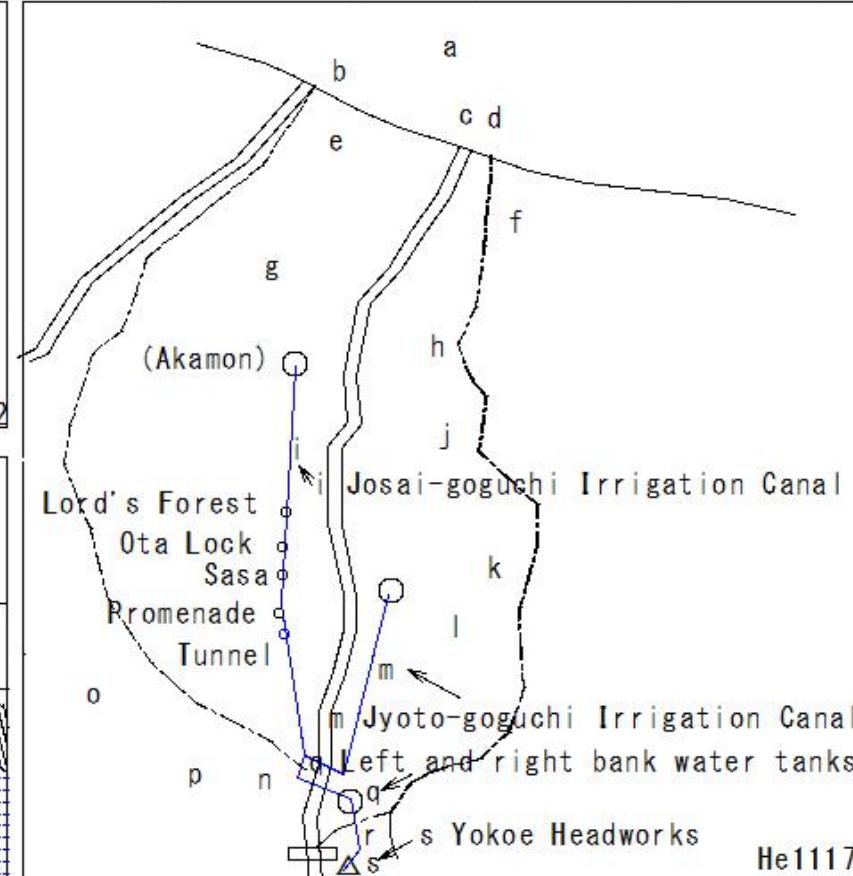
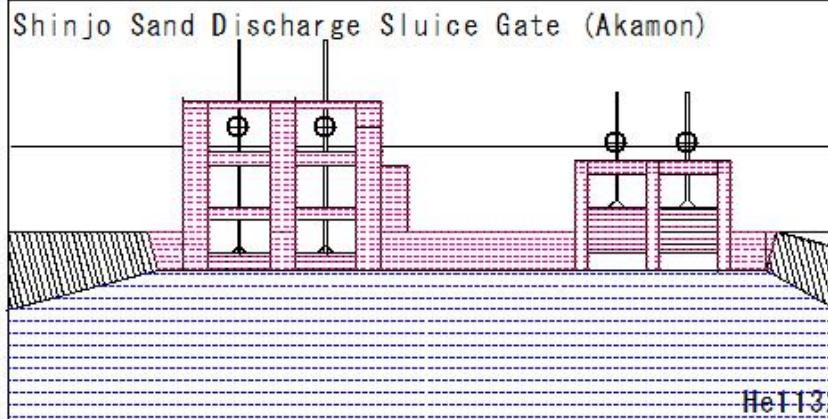
Ø 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1132) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

(He1132) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

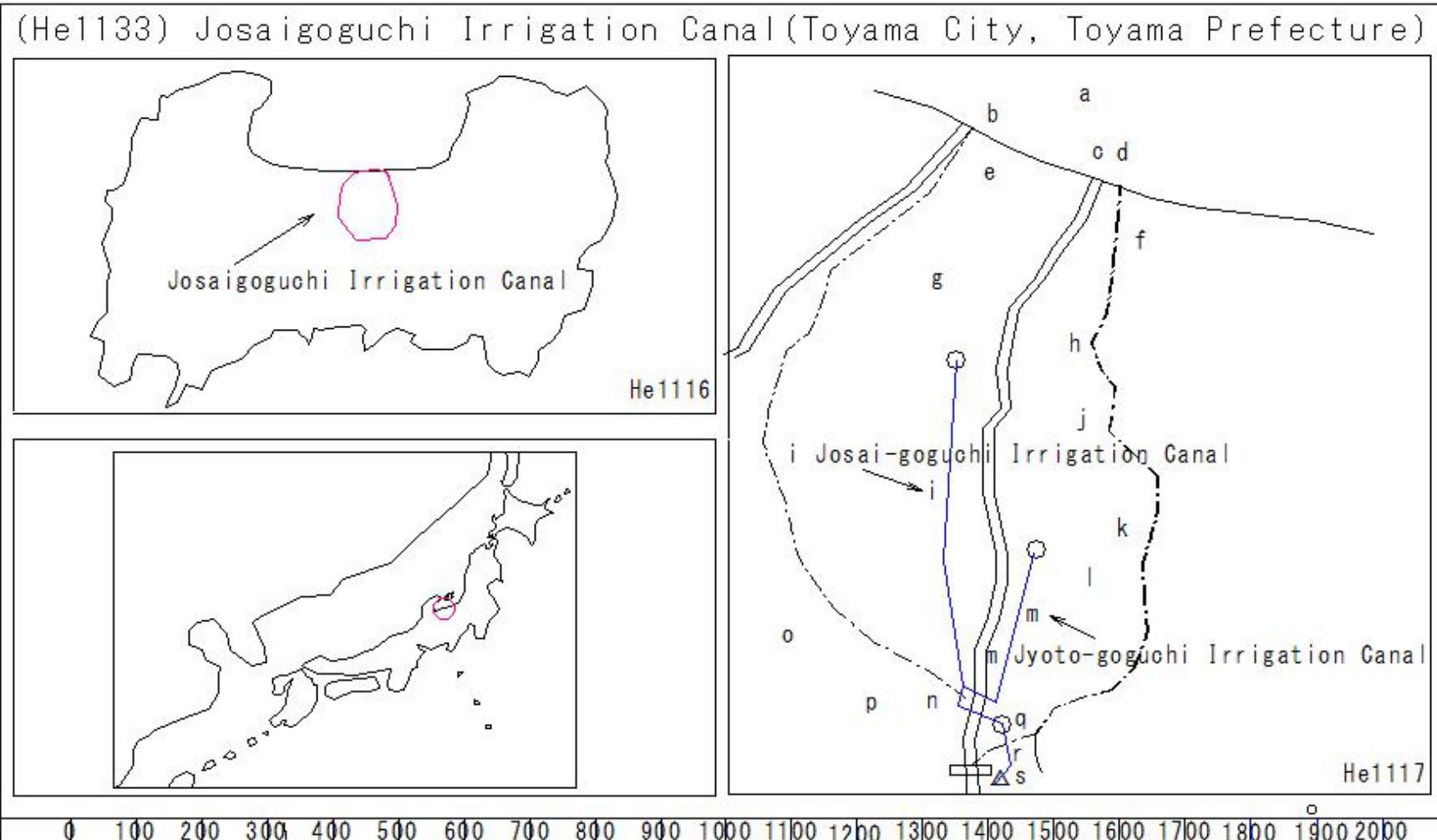
Shinjo Sand Discharge Sluice Gate (Akamon)
on the Josai Irrigation Canal
Shinjo, Toyama City, located at the downstream
end of the Josai Irrigation Canal
This sluice discharges sediment that has flowed
into the canal.
Made of red brick, the Shinjo Sand Discharge
Sluice Gate, also known as Shinjo's Akamon Gate

He1132

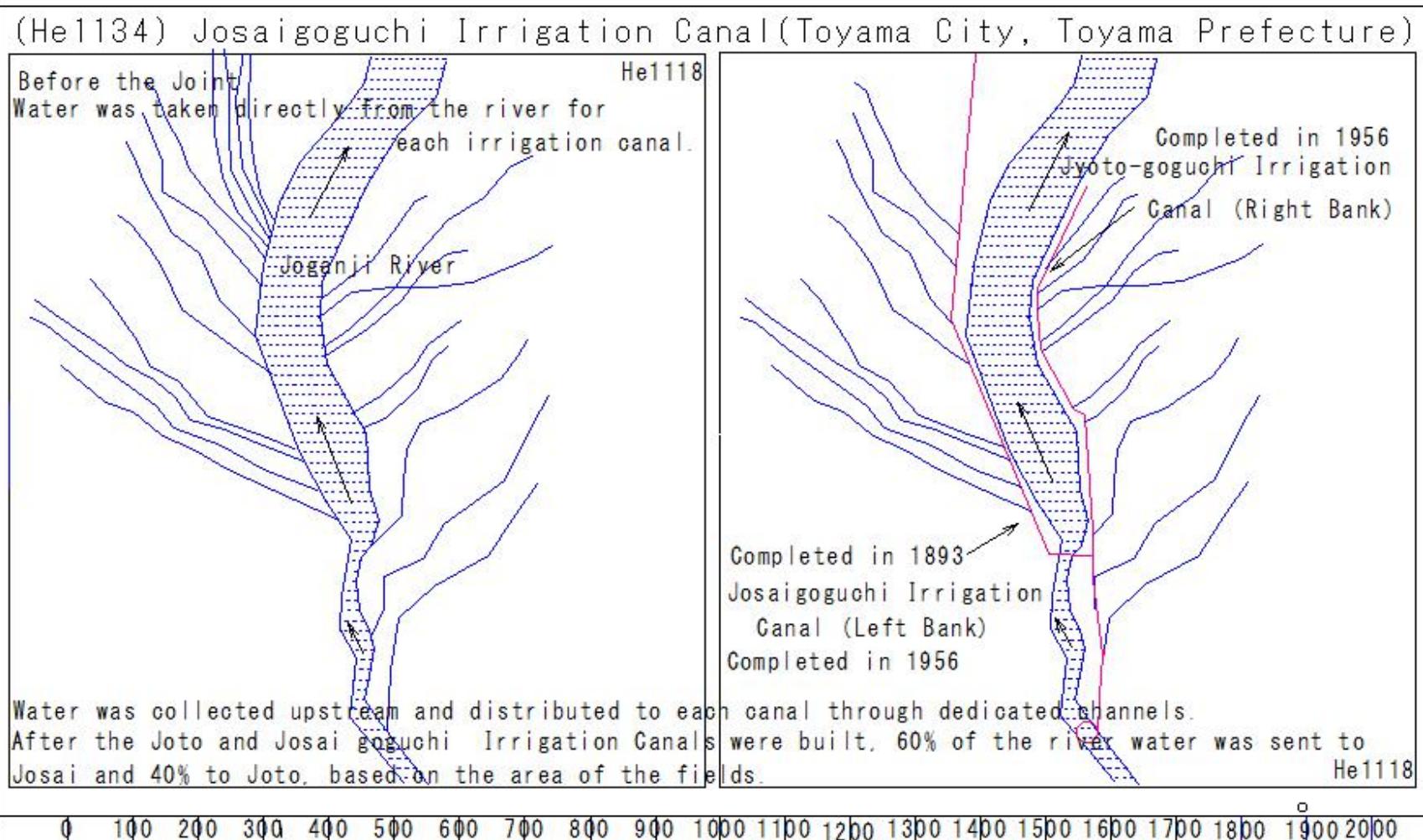


0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1133) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

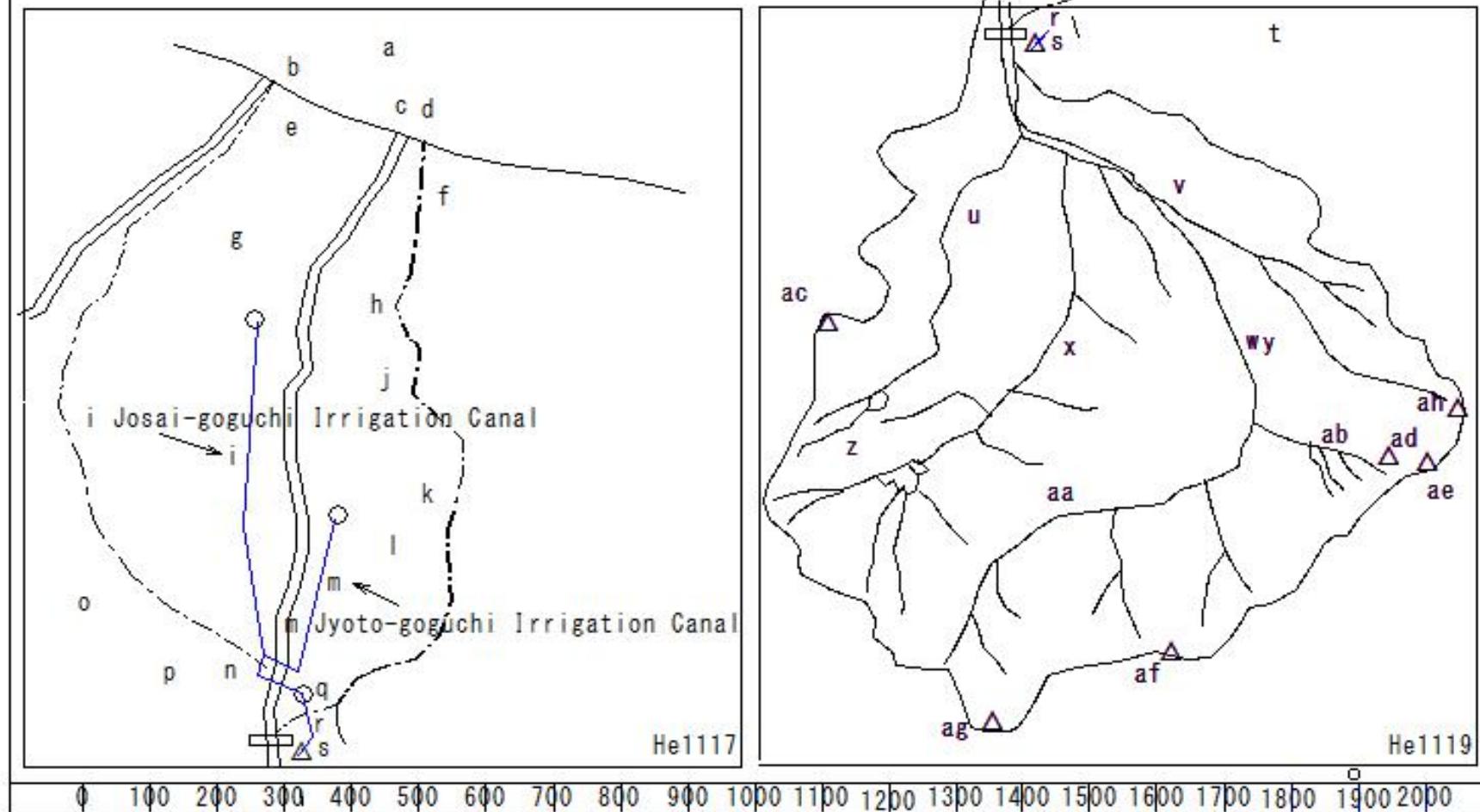


(He1134) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

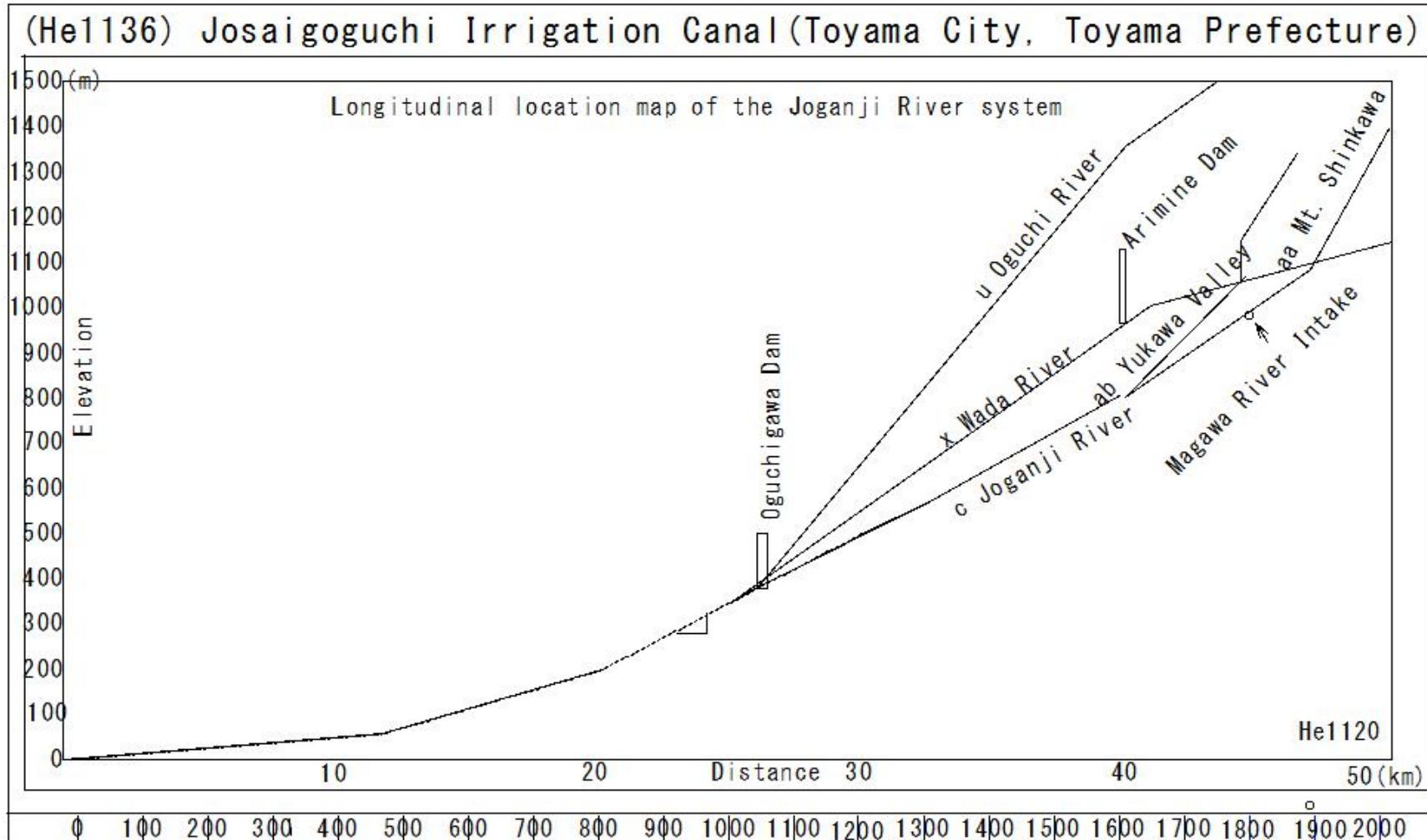


(He1135) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

(He1135) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

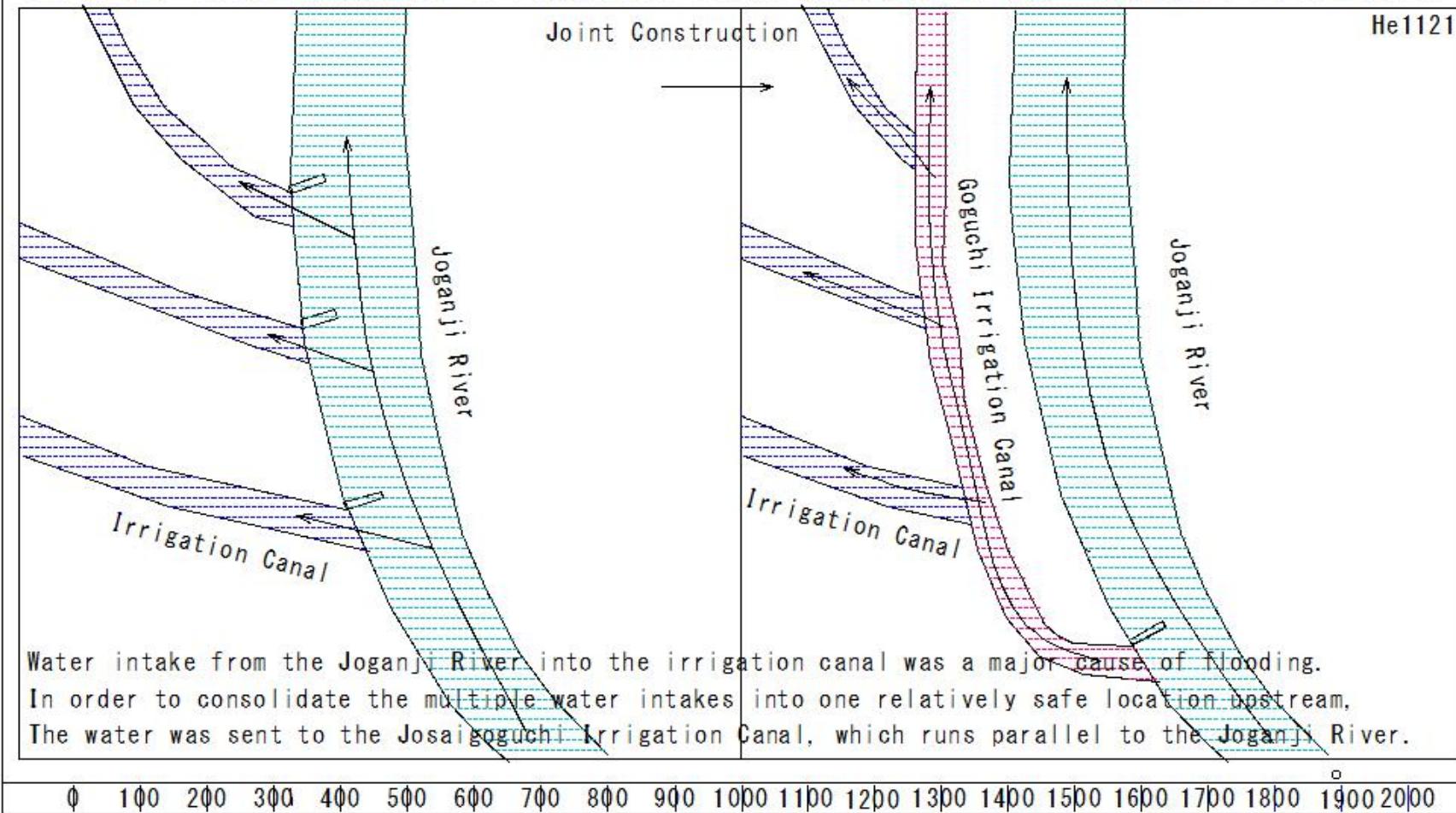


(He1136) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

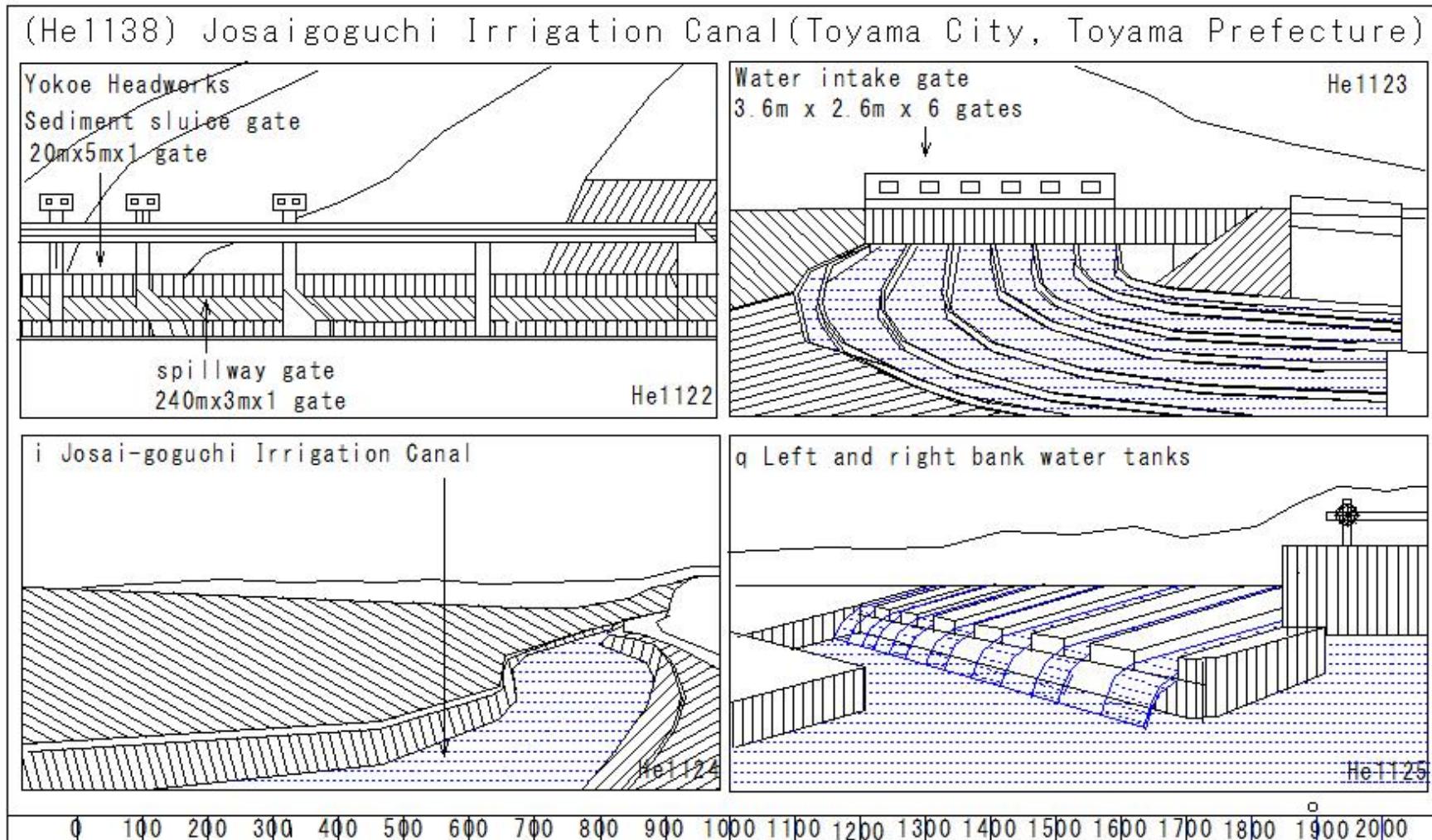


(He1137) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

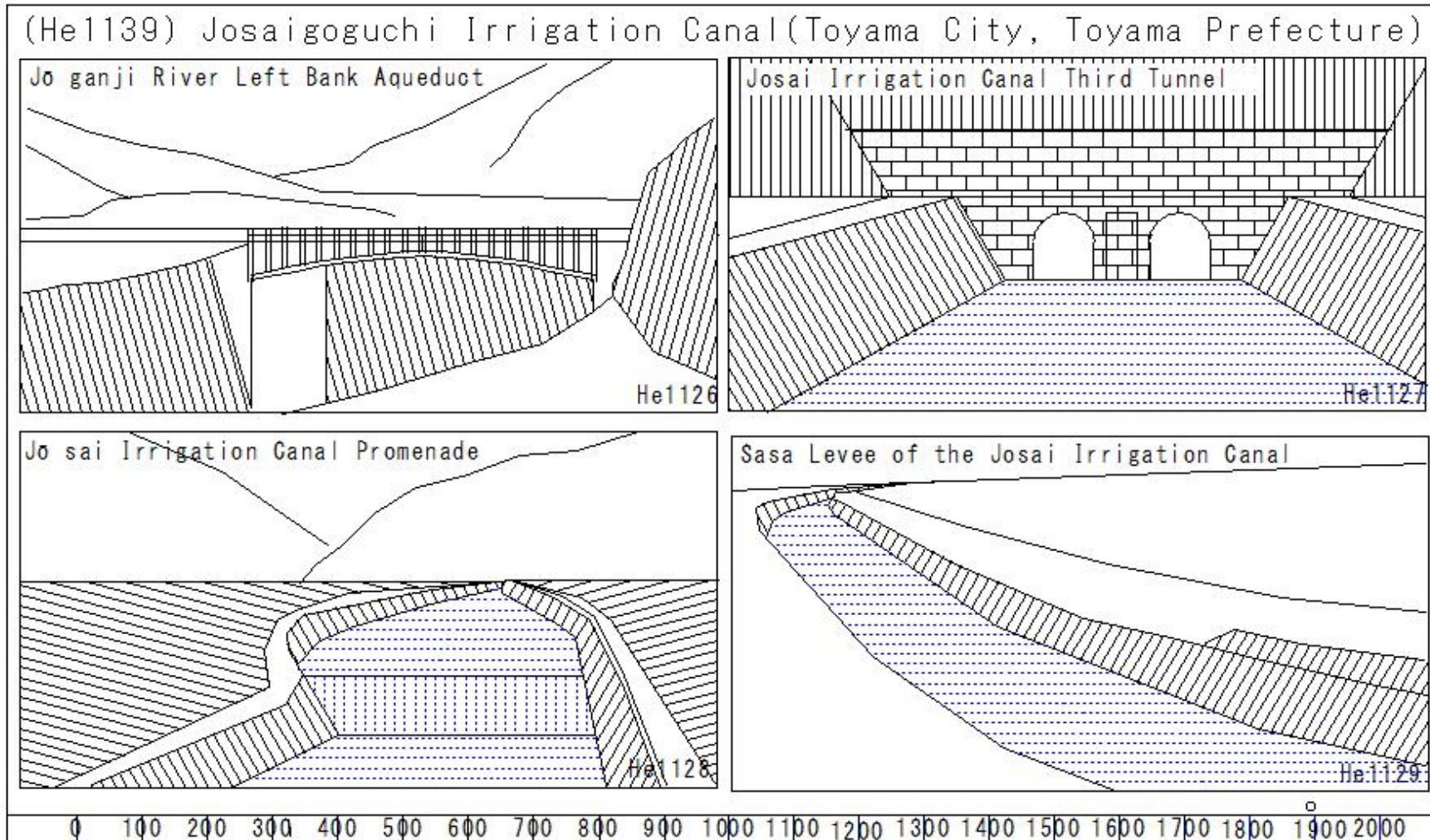
(He1137) Josaigoguchi Irrigation Canal (Toyama City, Toyama Prefecture)



(He1138) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)



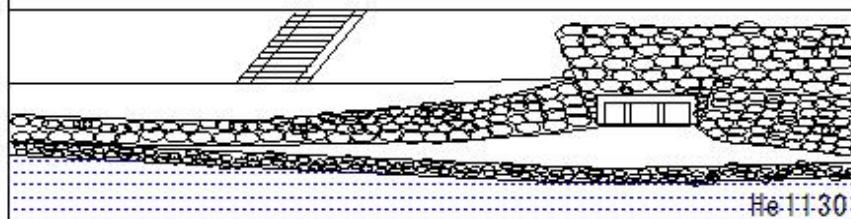
(He1139) Josaigouchi Irrigation Canal(Toyama City, Toyama Prefecture)



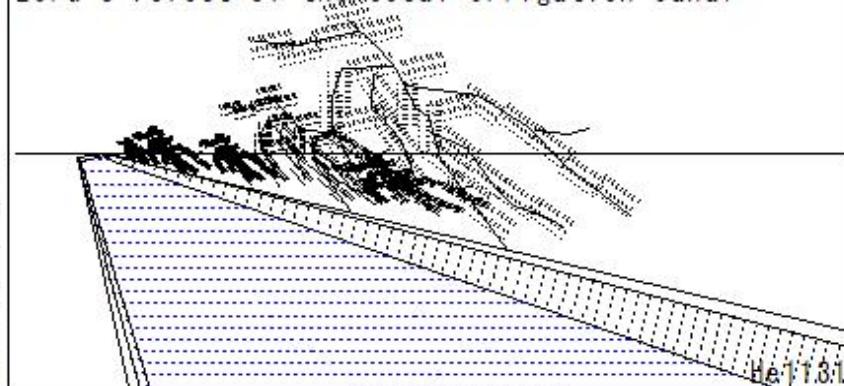
(He1140) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

(He1140) Josaigoguchi Irrigation Canal(Toyama City, Toyama Prefecture)

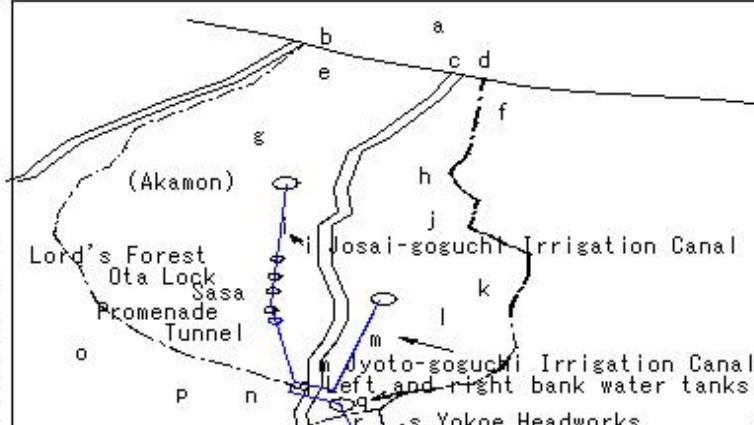
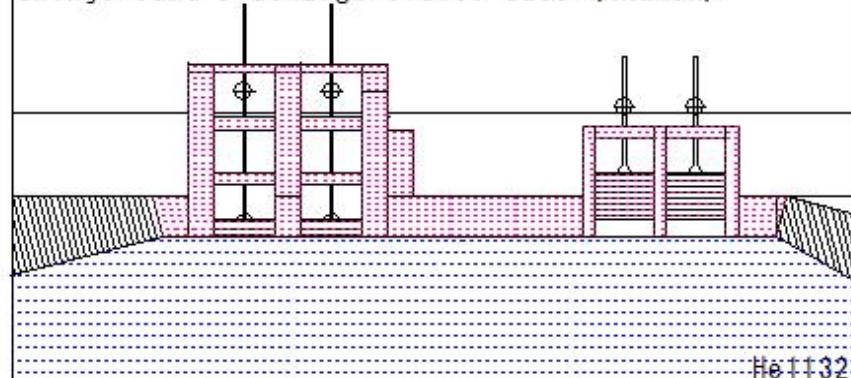
Ota Lock of the Josai Irrigation Canal



Lord's Forest of the Josai Irrigation Canal



Shinjo Sand Discharge Sluice Gate (Akamon)



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(1141) Shichikayousui Irrigation Canal (Hakusan City, Ishikawa Prefecture, etc.)

(1141) Shichikayousui Irrigation Canal (Hakusan City, Ishikawa Prefecture, etc.)

- ① The century's first water irrigation system combined the intakes of the seven systems, enabling stable and efficient water use.
- ② Prior to 1903, there were seven irrigation systems on the Tedori River, each drawing water from the river. This resulted in flooding and other damage, as well as water shortages and disputes over water due to inefficient water use.
- ③ As part of the modernization policy of the time, the "water irrigation system combined the intakes of the seven irrigation systems" and was completed in 1903.
- ④ A total of 100,000 people were involved in the construction of the Seven Irrigation Canals, resulting in an efficient and rational structure that allowed for repeated use of the water and the construction of waterways on solid ground.

He1141

Shichikayousui Irrigation Canal
(Hakusan City, Ishikawa Prefecture, etc.)



He1141

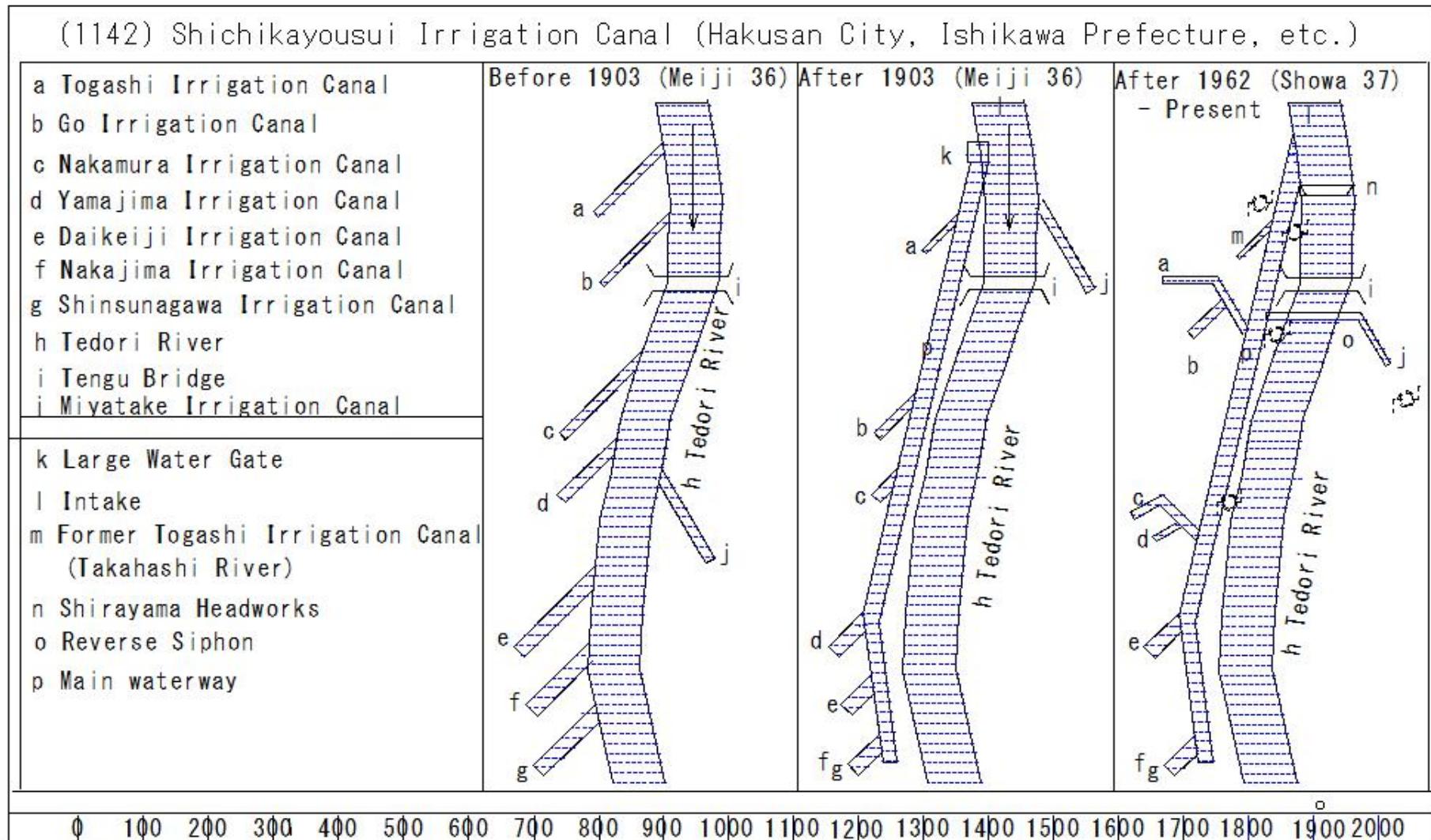
Shichikayousui Irrigation Canal
(Hakusan City, Ishikawa Prefecture, etc.)



He1141

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(1142) Shichikayousui Irrigation Canal (Hakusan City, Ishikawa Prefecture, etc.)

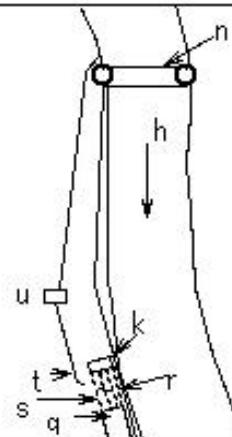


(1143) Shichikayousui Irrigation Canal (Hakusan City, Ishikawa Prefecture, etc.)

(He1143) Shichikayousui Irrigation Canal (Hakusan City, Ishikawa Prefecture, etc.)

- q Shichika Irrigation Water Supply Inlet
- r Edo Period Construction Tunnel (1)
- s Meiji Period Construction Tunnel (3)
- t Showa Period Construction Tunnel
(Connected to Existing Tunnel)
- u Large Water Gate
- v Hakusan Power Station
- w Tedori River
- x Hakusan Headworks

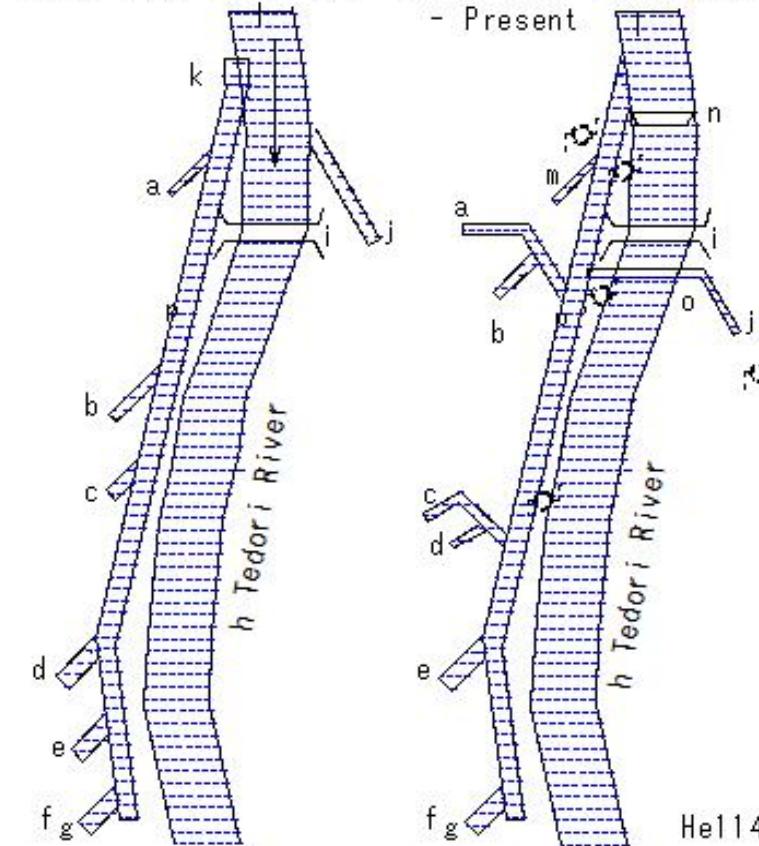
He1143



Map of the Shichika Irrigation Water Intake

He1143

After 1903 (Meiji 36) After 1962 (Showa 37)
- Present

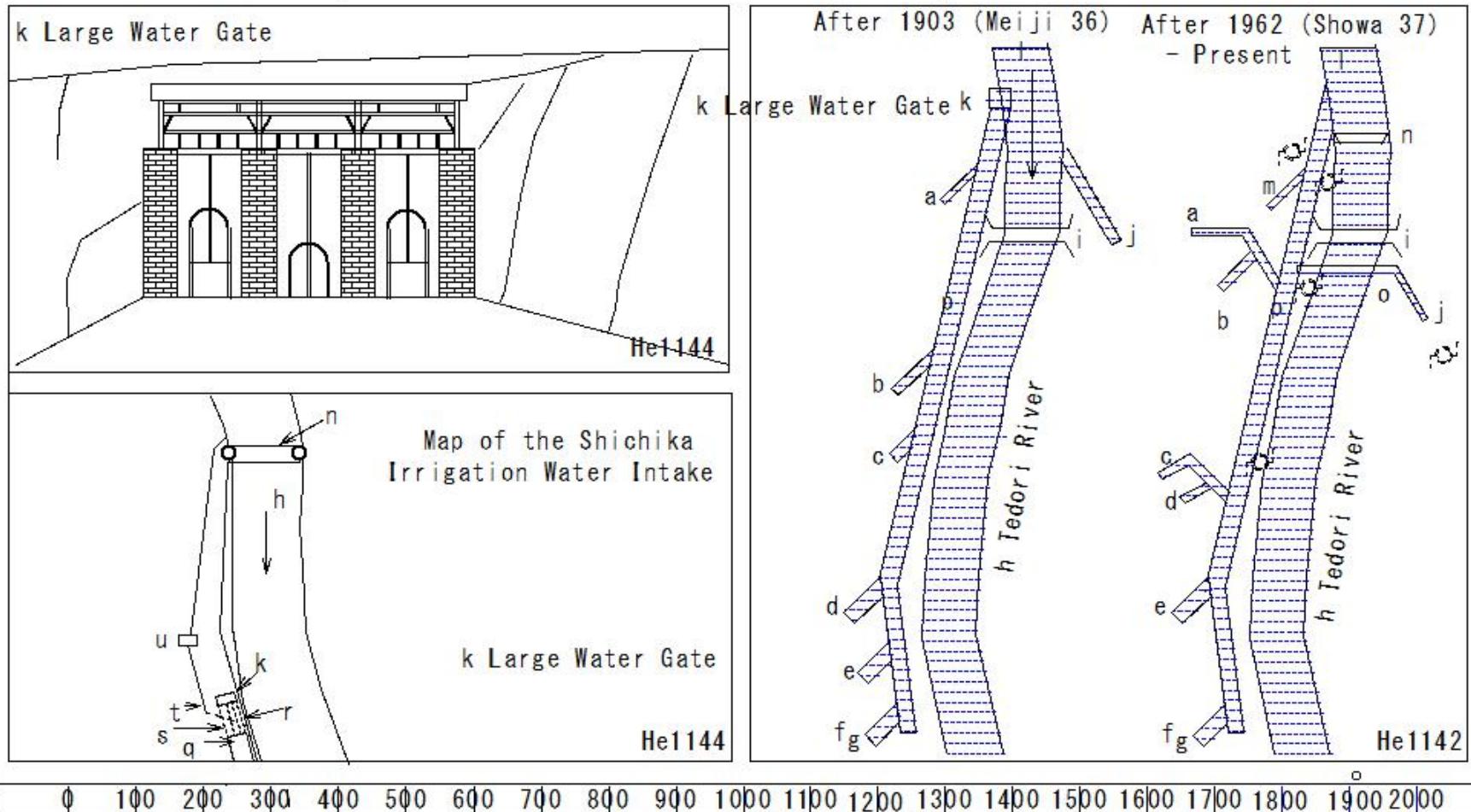


He1142

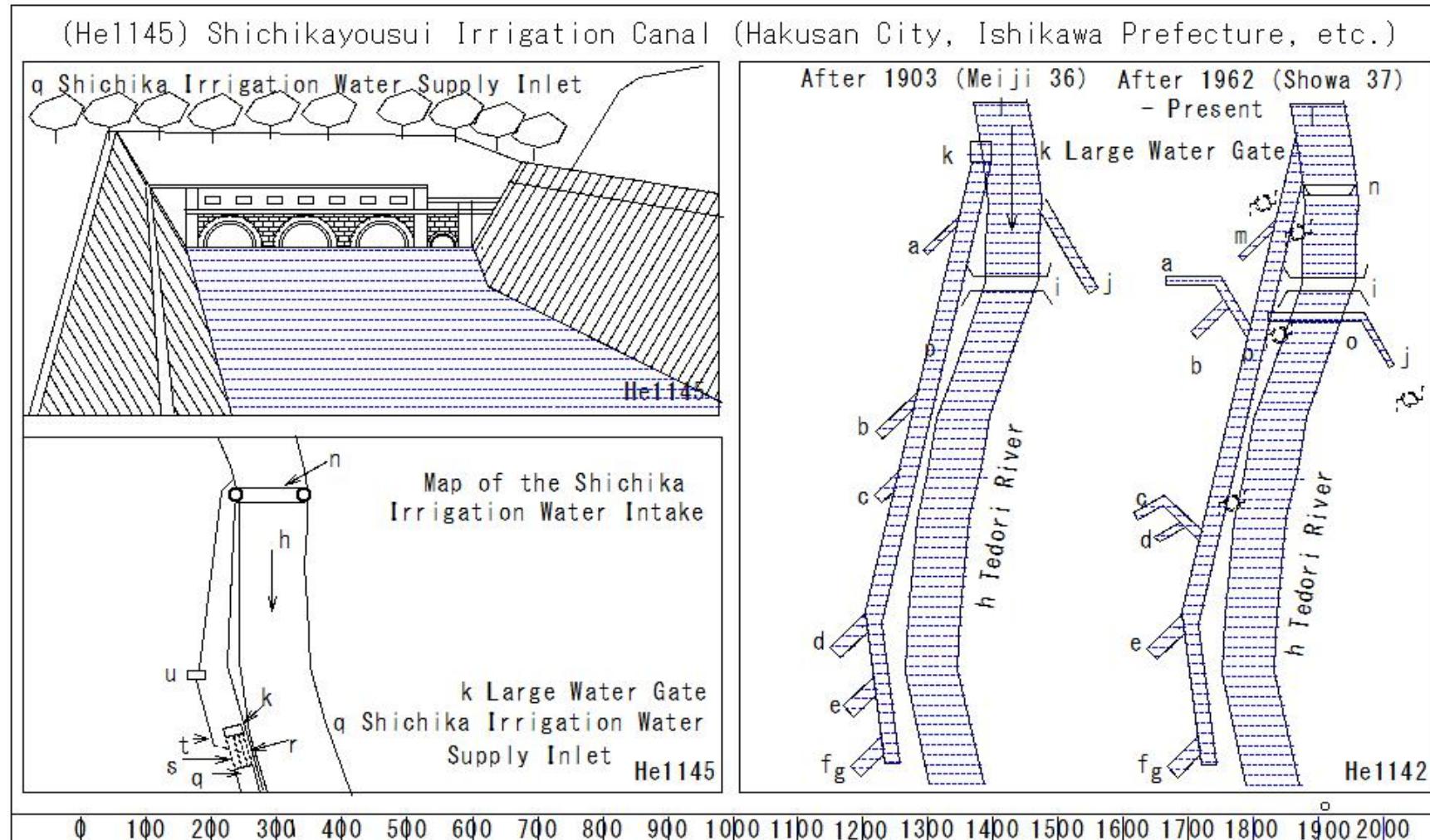
Q 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(1144) Shichikayousui Irrigation Canal (Hakusan City, Ishikawa Prefecture, etc.)

(He1144) Shichikayousui Irrigation Canal (Hakusan City, Ishikawa Prefecture, etc.)



(1145) Shichikayousui Irrigation Canal (Hakusan City, Ishikawa Prefecture, etc.)

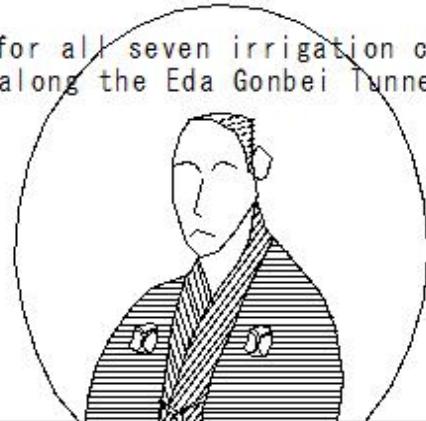


(1146) Shichikayousui Irrigation Canal (Hakusan City, Ishikawa Prefecture, etc.)

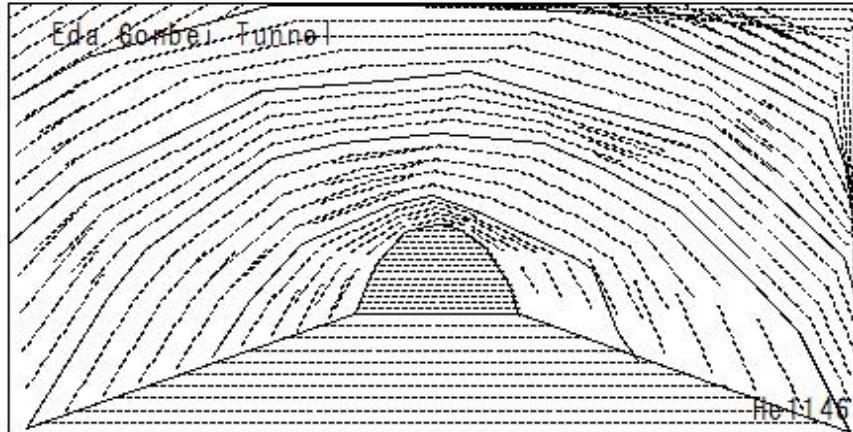
(He1146) Shichikayousui Irrigation Canal (Hakusan City, Ishikawa Prefecture, etc.)

Eda Gonbei

The intakes for all seven irrigation channels were constructed along the Eda Gonbei Tunnel.

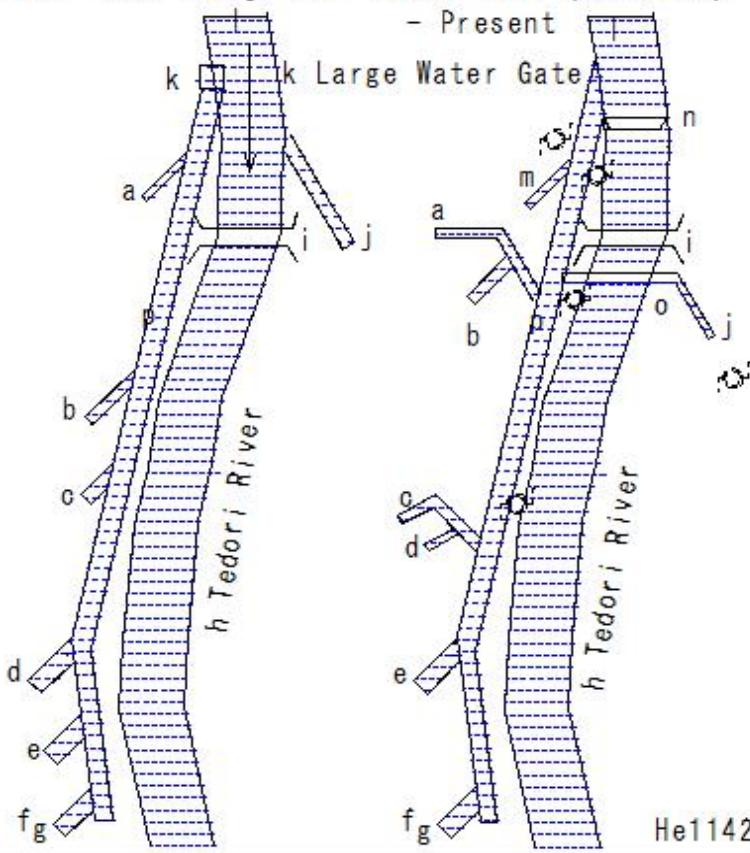


He1146



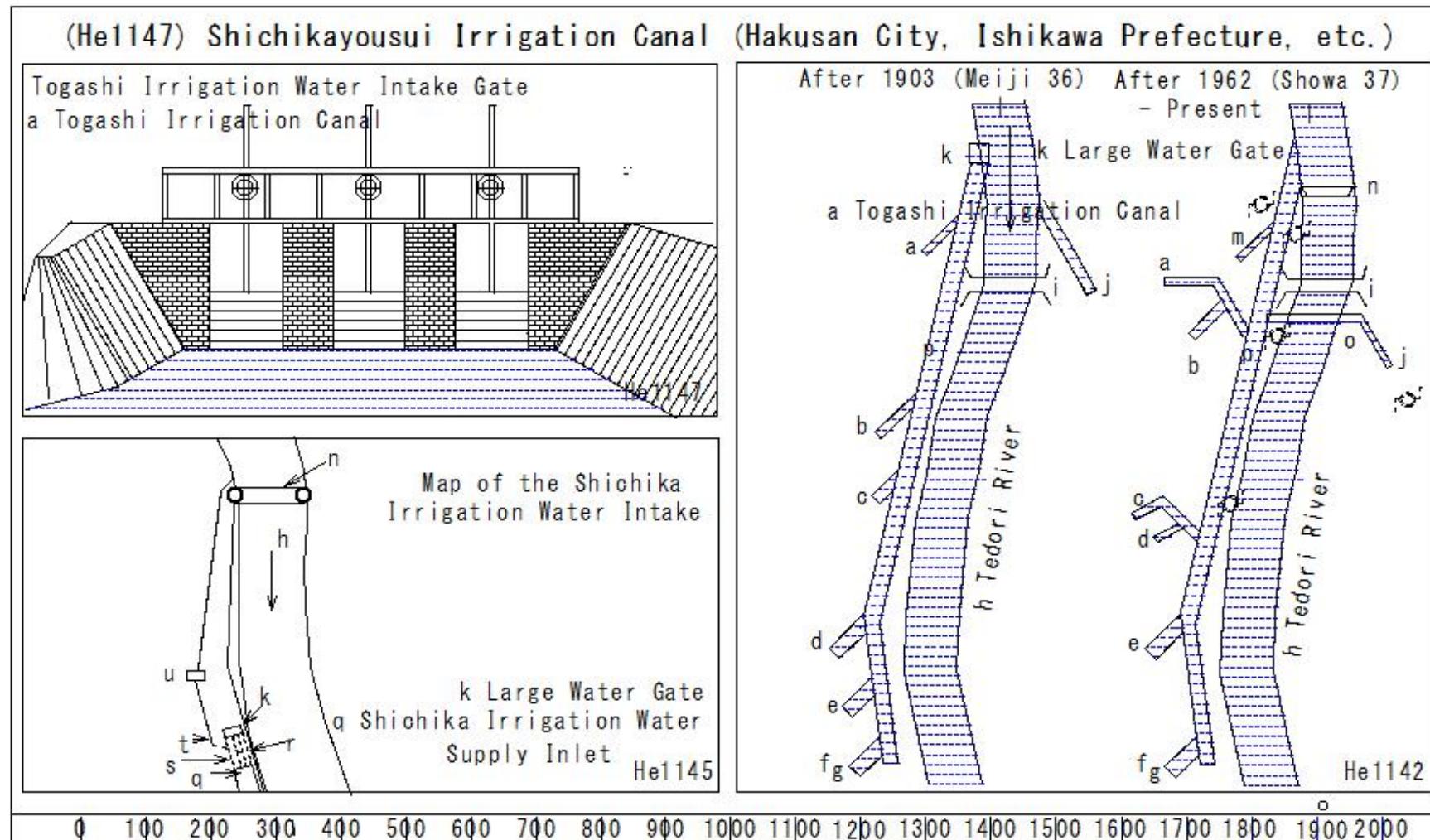
After 1903 (Meiji 36) After 1962 (Showa 37)

- Present

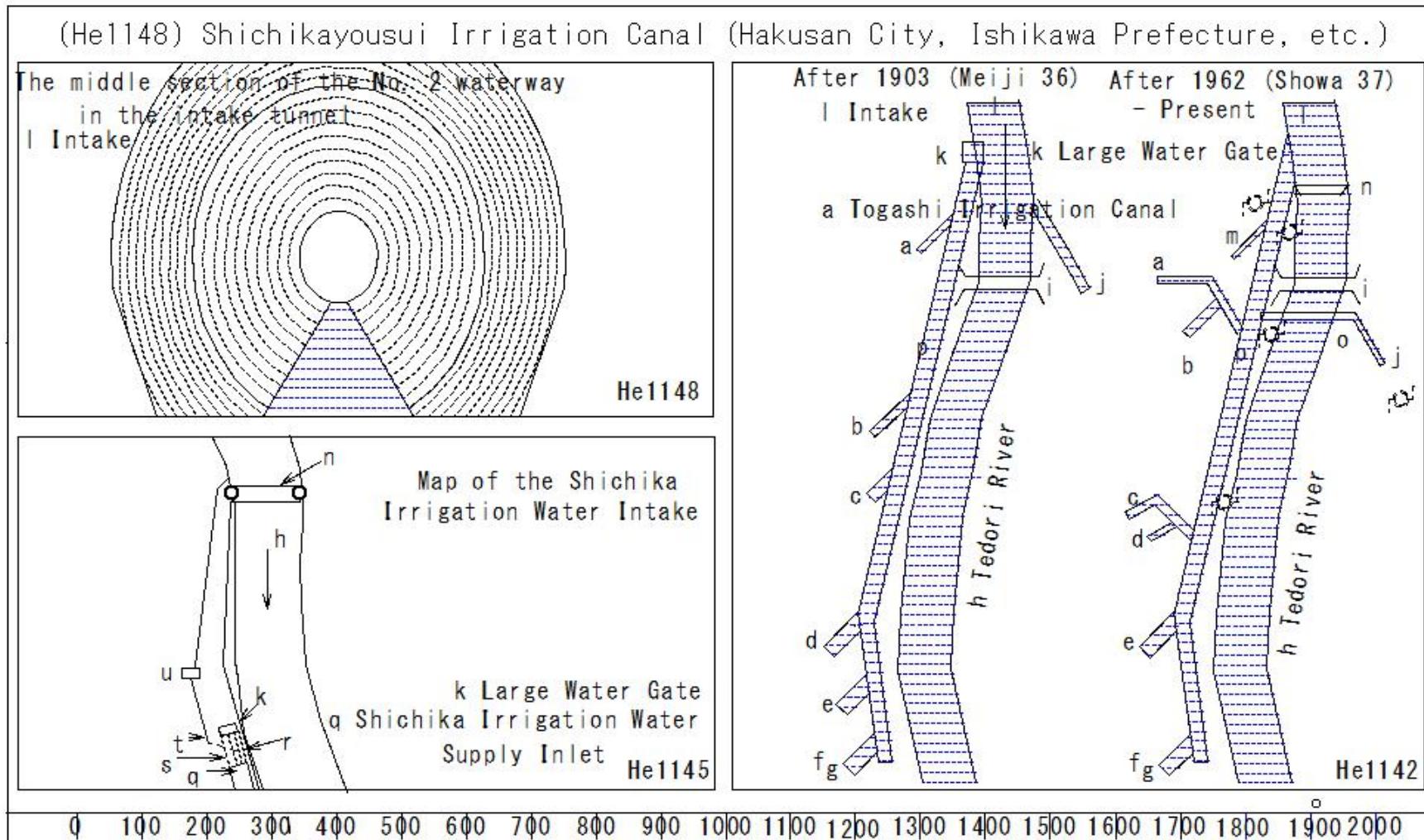


0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(1147) Shichikayousui Irrigation Canal (Hakusan City, Ishikawa Prefecture, etc.)



(1148) Shichikayousui Irrigation Canal (Hakusan City, Ishikawa Prefecture, etc.)



(1149) Shichikayousui Irrigation Canal (Hakusan City, Ishikawa Prefecture, etc.)

(1149) Shichikayousui Irrigation Canal (Hakusan City, Ishikawa Prefecture, etc.)

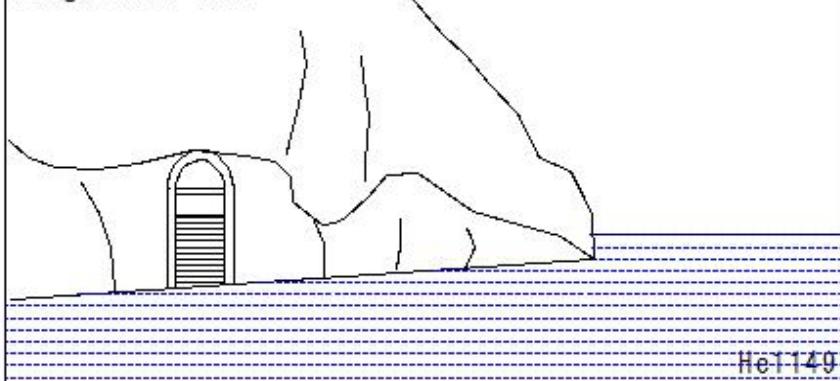
i Tengu Bridge

j Miyatake Irrigation Canal

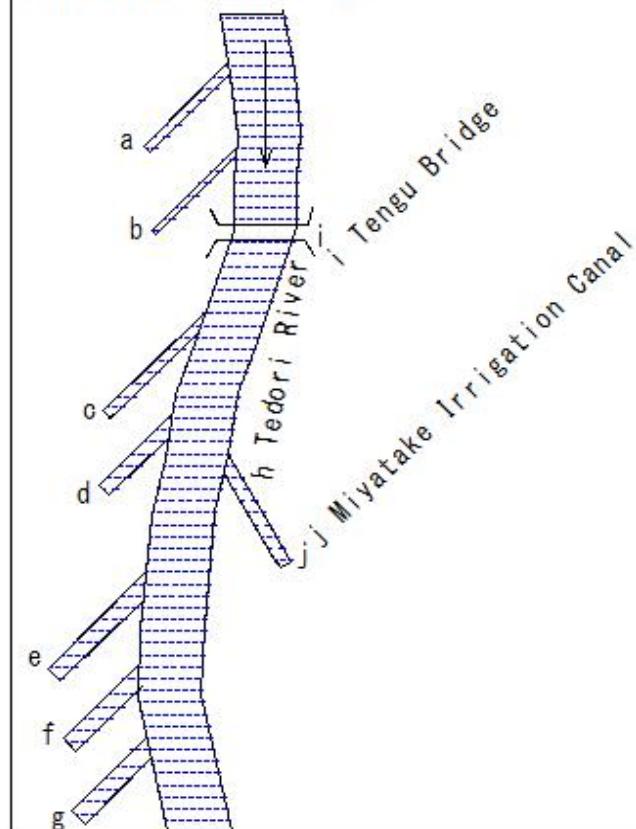
Tengu Wall Dam

During the early Meiji period, the Miyatake Irrigation Canal was divided into three water intake points within the current Todai Sasa, Dashino, and Miyatake-cho areas.

Tengu Wall Dam



Before 1903 (Meiji 36)



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(1150) Shichikayousui Irrigation Canal (Hakusan City, Ishikawa Prefecture, etc.)

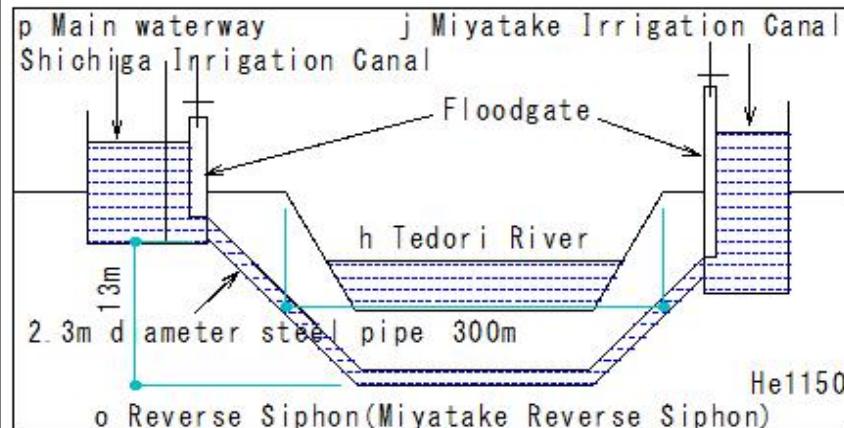
(He1150) Shichikayousui Irrigation Canal (Hakusan City, Ishikawa Prefecture, etc.)

j Miyatake Irrigation Canal

o Reverse Siphon(Miyatake Reverse Siphon)

The Miyatake Reverse Siphon transports water from the Shichiga Irrigation Canal to the Miyatake Irrigation Canal

He1150



After 1903 (Meiji 36) After 1962 (Showa 37)

l Intake

- Present

k Large Water Gate

a Togashi Irrigation Canal

b

c

d

e

f

g

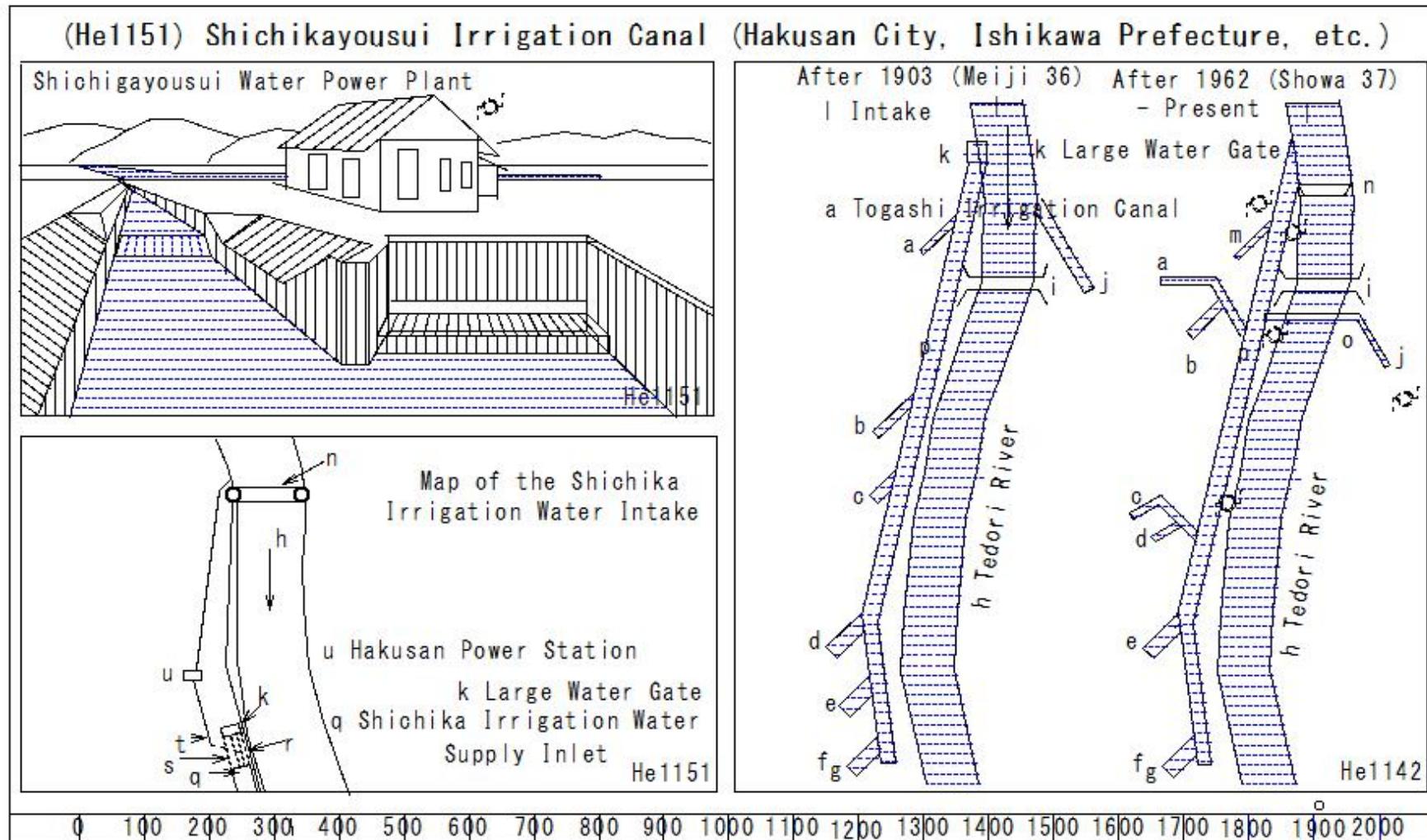
h Tedi River

h Tedi River

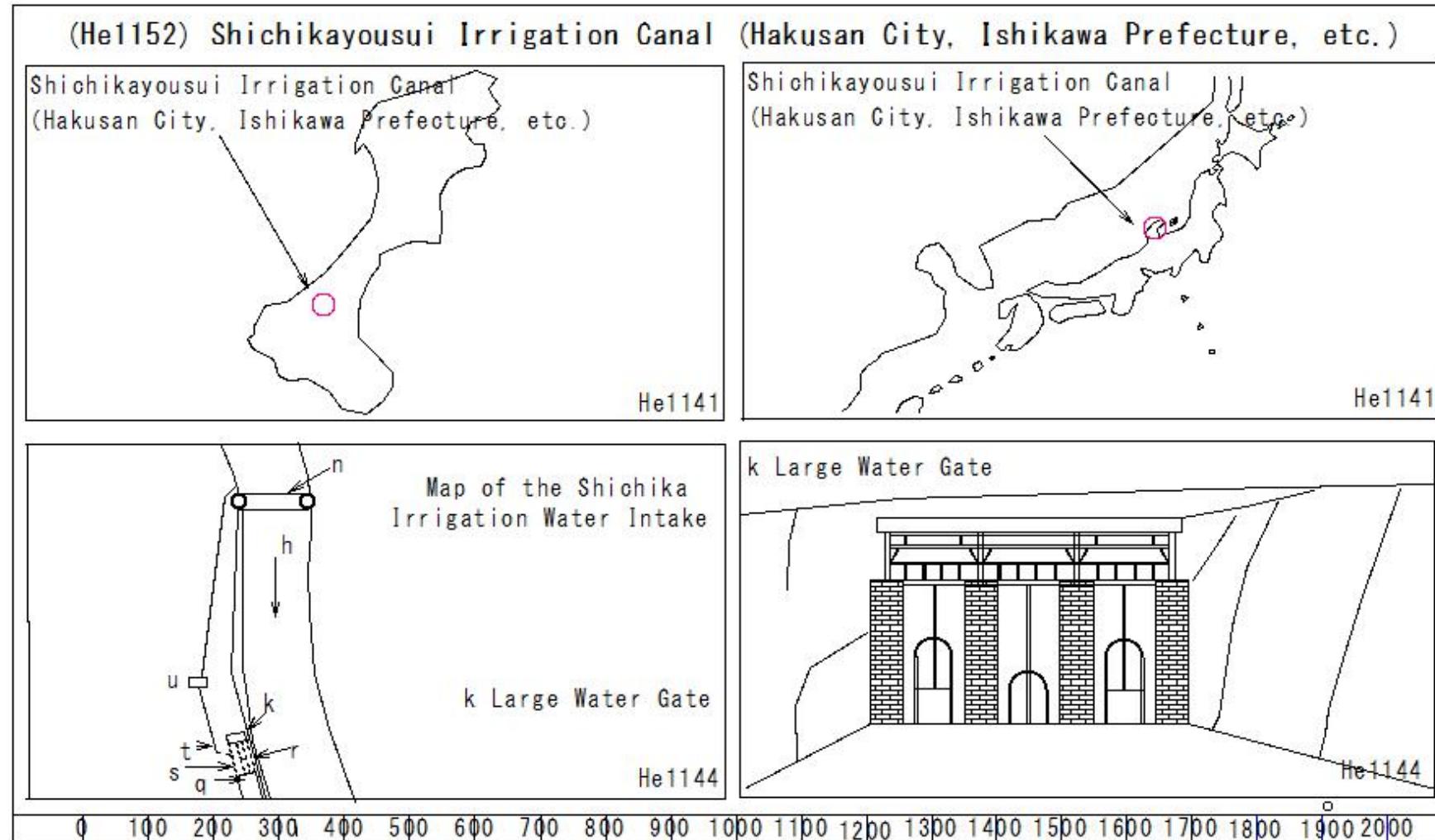
He1142

∅ 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

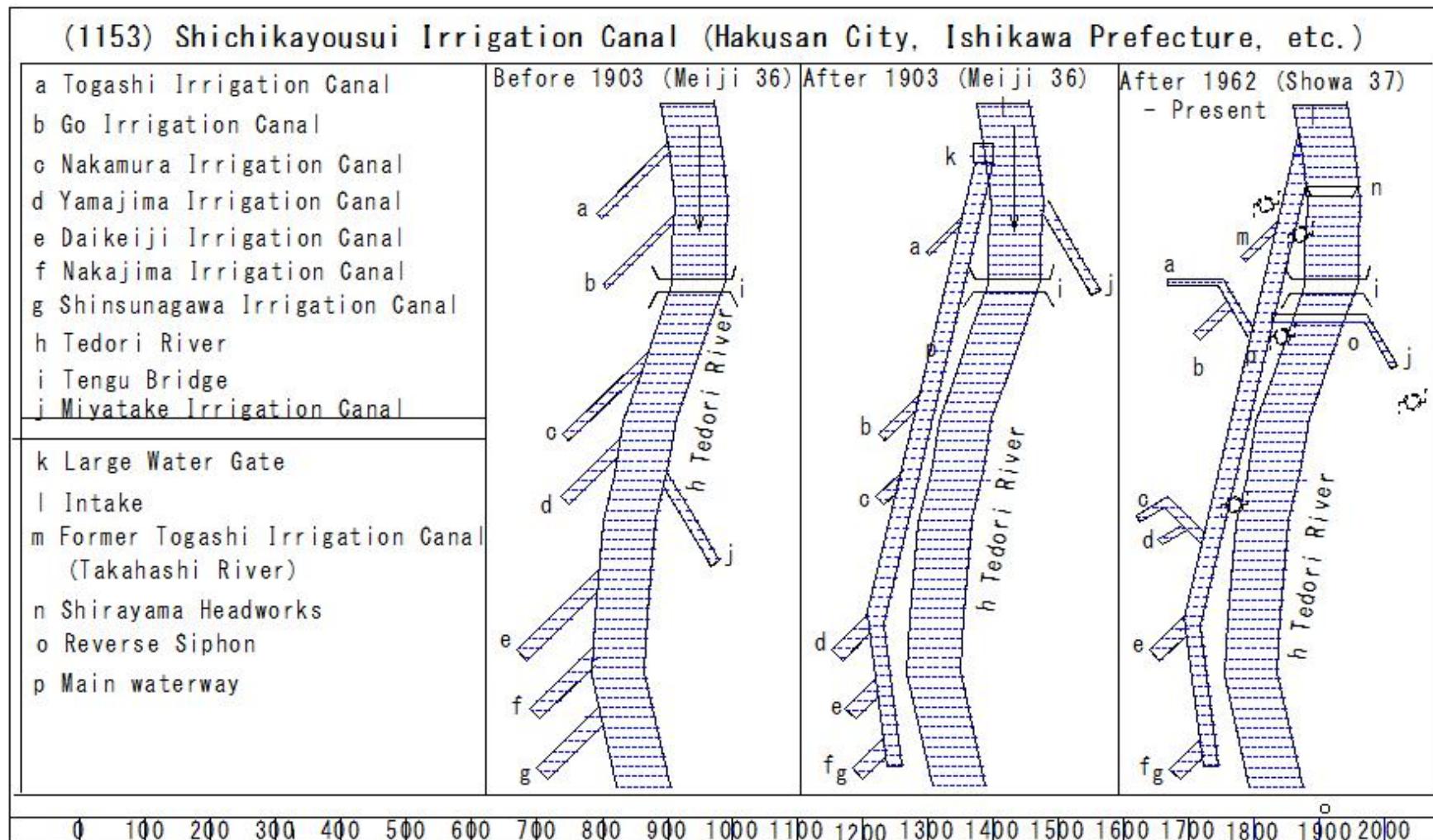
(1151) Shichikayousui Irrigation Canal (Hakusan City, Ishikawa Prefecture, etc.)



(1152) Shichikayousui Irrigation Canal (Hakusan City, Ishikawa Prefecture, etc.)

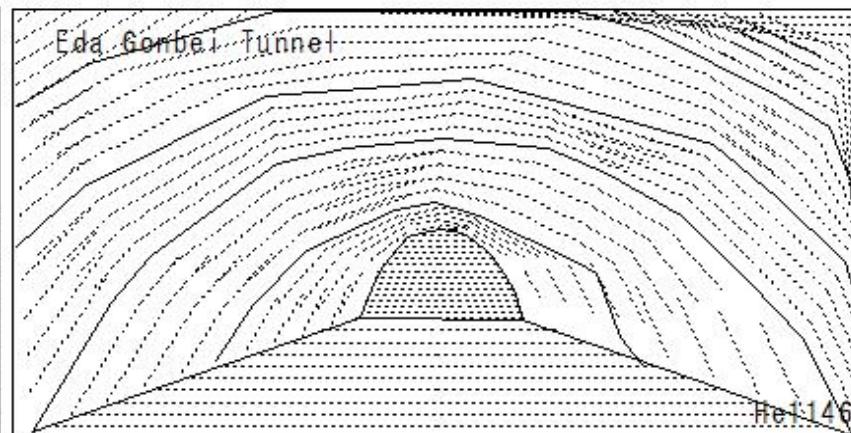
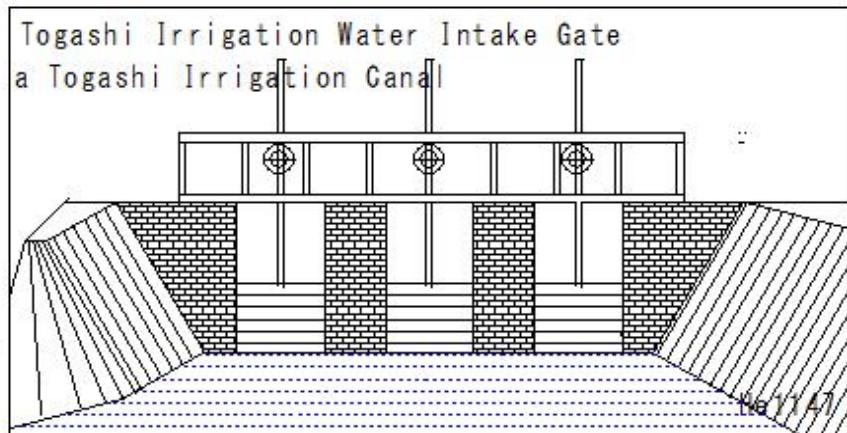
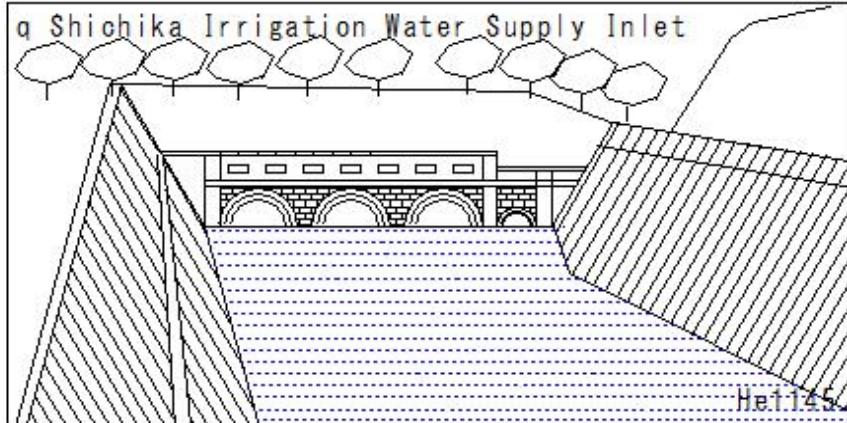


(1153) Shichikayousui Irrigation Canal (Hakusan City, Ishikawa Prefecture, etc.)



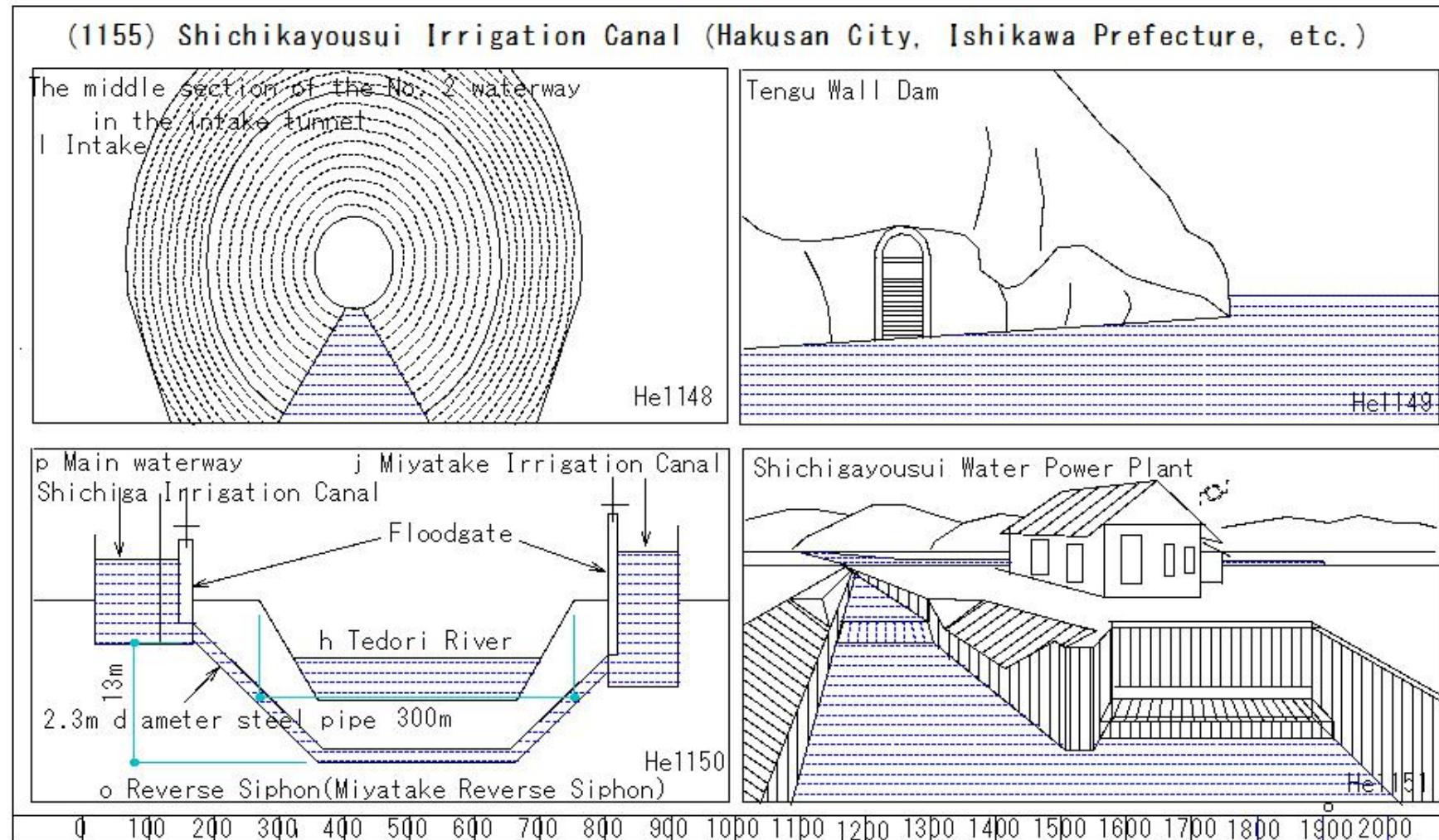
(1154) Shichikayousui Irrigation Canal (Hakusan City, Ishikawa Prefecture, etc.)

(1154) Shichikayousui Irrigation Canal (Hakusan City, Ishikawa Prefecture, etc.)



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(1155) Shichikayousui Irrigation Canal (Hakusan City, Ishikawa Prefecture, etc.)



(He1156)Asuwagawa Irrigation Canal (Fukui City, Fukui Prefecture)

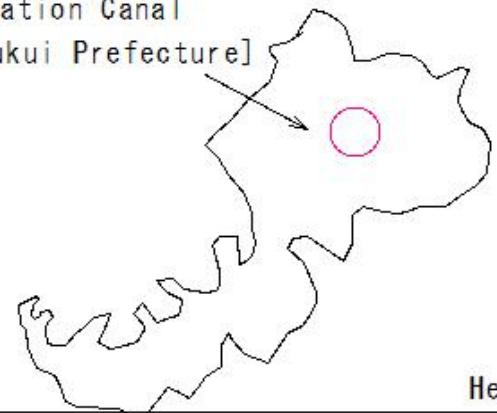
(He1156)Asuwagawa Irrigation Canal [Fukui City, Fukui Prefecture]

Advanced Edo-period technology continues to enrich vast farmland and the lives of local residents today.

- The Asuwa River Irrigation Canal is the collective name for the main canals (seven routes, totaling 22 km) that irrigate a vast 1,997 hectares of farmland. It was developed into its current form during the Hoei era of the Edo period (around 1710).
- Weirs were constructed at the watersheds, which were rare for the time, and fixed stones were laid at the waterway diversion points to alleviate water disputes. Existing documents from the Edo period reveal the high level of surveying technology and design at the time.

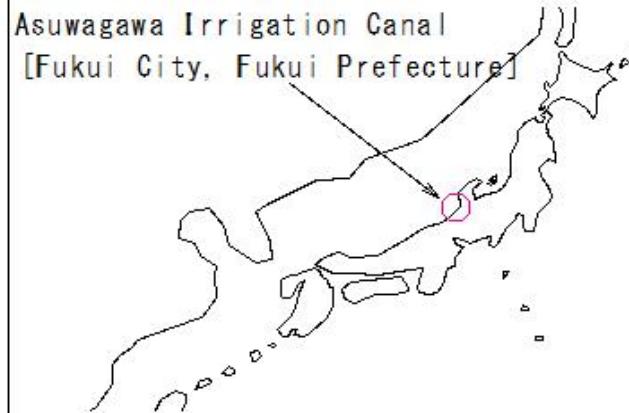
He1156

Asuwagawa Irrigation Canal
[Fukui City, Fukui Prefecture]



He1156

Asuwagawa Irrigation Canal
[Fukui City, Fukui Prefecture]



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Ø 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1157)Asuwagawa Irrigation Canal (Fukui City, Fukui Prefecture)

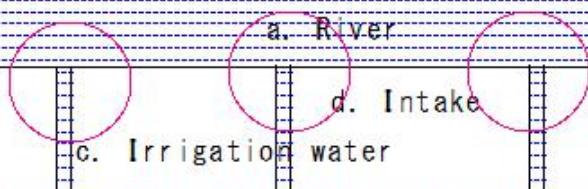
(He1157)Asuwagawa Irrigation Canal [Fukui City, Fukui Prefecture]

Goguchi

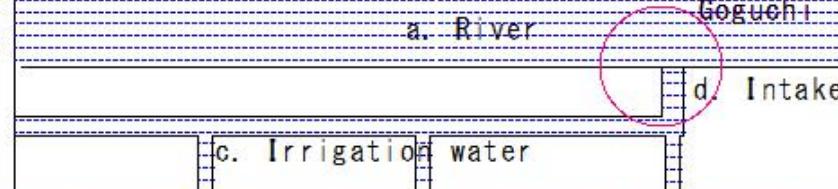
The irrigation water intakes that were previously taken from separate rivers were combined into one. Effects include stabilizing water intake, streamlining water use, and reducing maintenance costs.

He1157

Goguchi



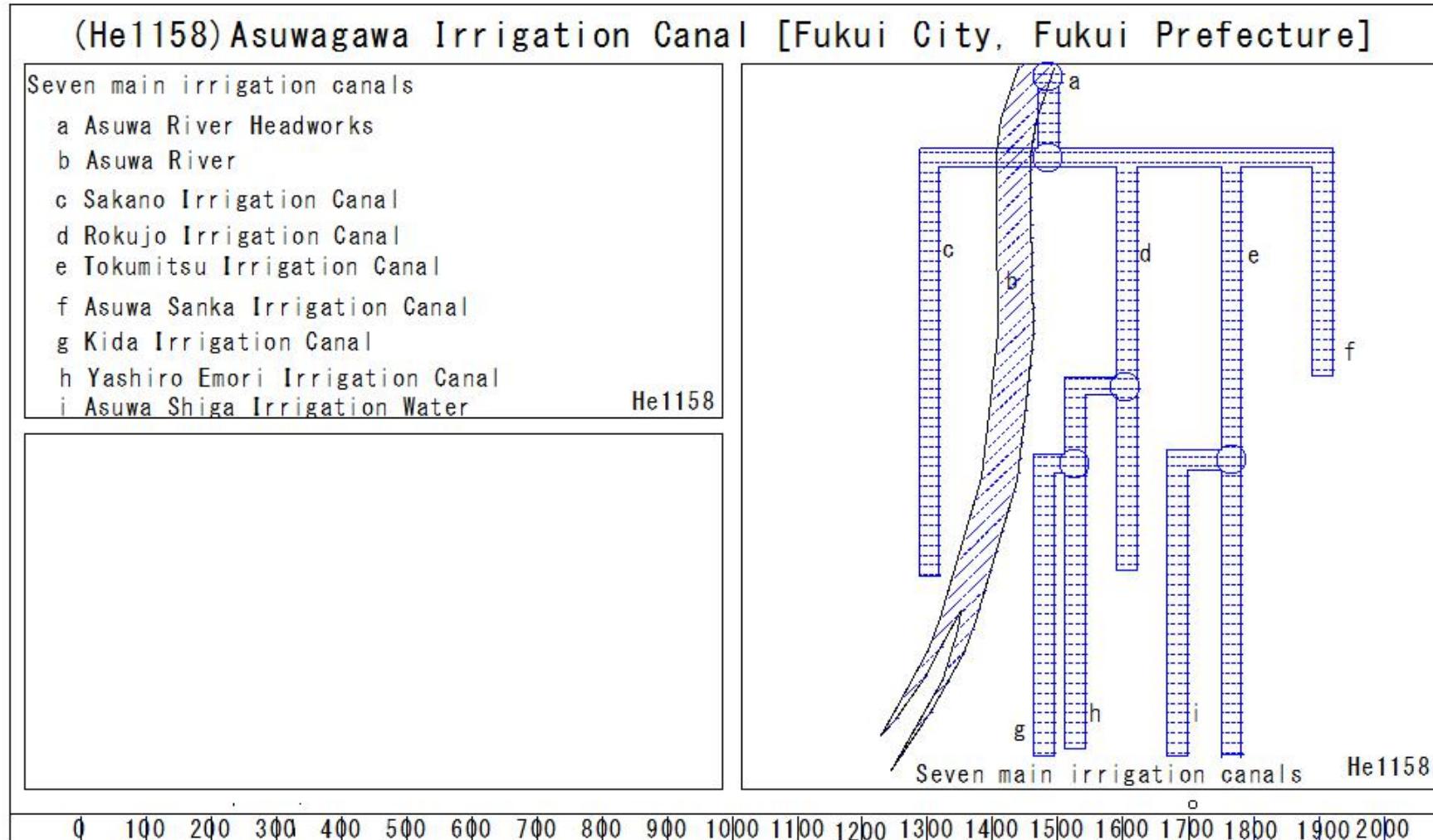
Goguchi



He1157

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1158)Asuwagawa Irrigation Canal (Fukui City, Fukui Prefecture)



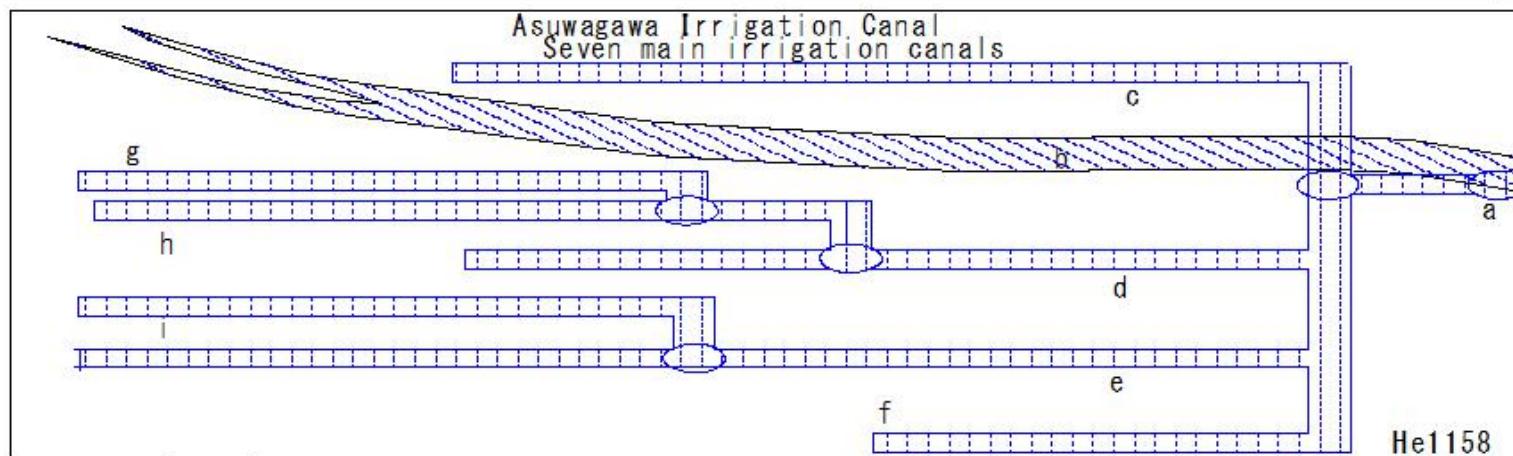
(He1159)Asuwagawa Irrigation Canal (Fukui City, Fukui Prefecture)

(He1159)Asuwagawa Irrigation Canal [Fukui City, Fukui Prefecture]

1. Overview of the Asuwa River Irrigation Canal

- ① The Asuwa River Irrigation Canal draws water from the Asuwa River Headworks in the southeastern part of Fukui City. It consists of seven main canals that irrigate
- ② The total length of the canals is 74 km.
- ③ The canals originated as primitive waterways within manors established during the Nara period (around the 7th century).
- ④ Each canal drew water directly from the Asuwa River.
- ⑤ However, water distribution was not equal, leading to fierce water disputes between upstream and downstream canals.

He1159



He1158

∅ 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

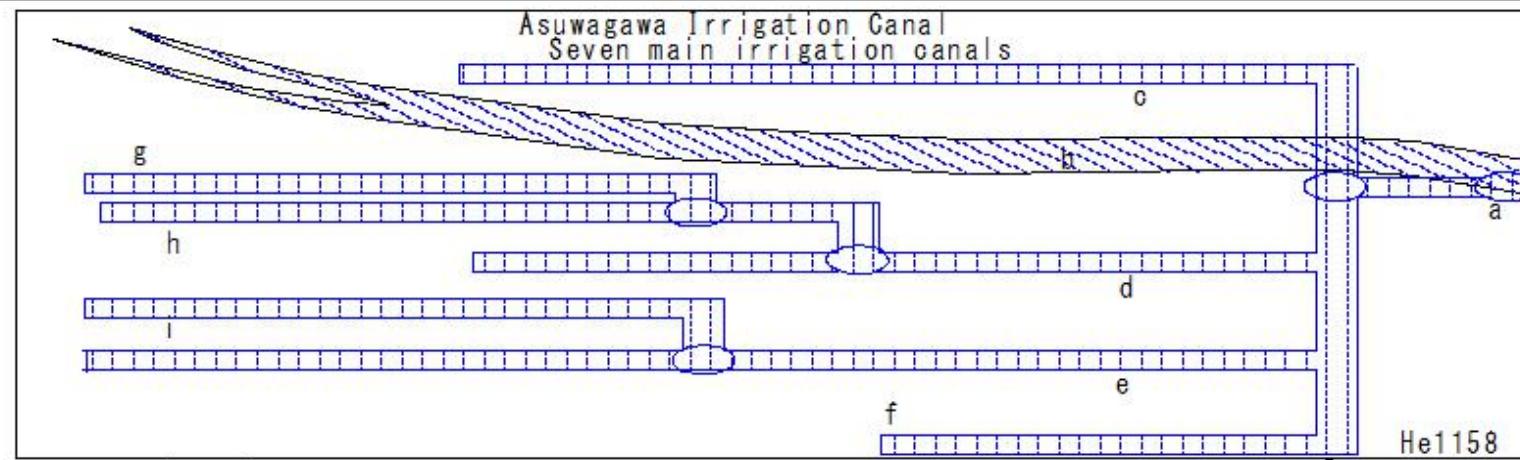
(He1160)Asuwagawa Irrigation Canal (Fukui City, Fukui Prefecture)

(He1160)Asuwagawa Irrigation Canal [Fukui City, Fukui Prefecture]

1. Overview of the Asuwa River Irrigation Canal

- ⑥ During the Edo period, multiple canal systems were integrated.
- ⑦ Wooden dams with matting were constructed for the "goguchi" (goguchi) joints, which were rare at the time.
- ⑧ To prevent excessive water withdrawals due to excavation of the canal bottom, "joseki" (fixed stones) were placed at the water division points to clearly define the water distribution.
- ⑨ It is said that these disputes have been alleviated.

He1160

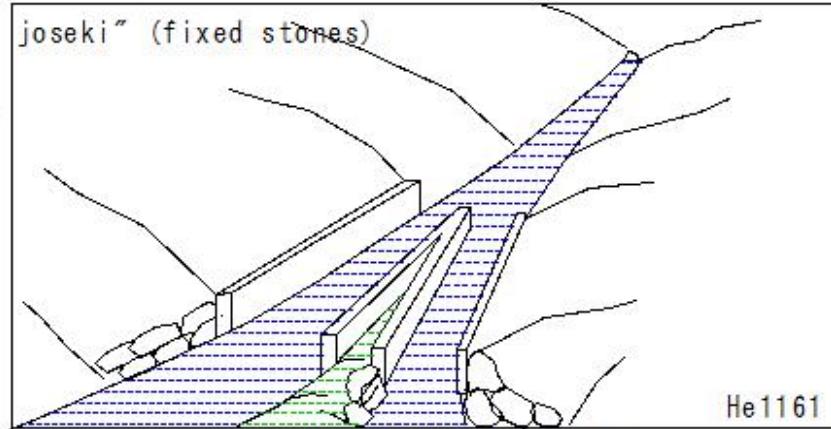


0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1161)Asuwagawa Irrigation Canal (Fukui City, Fukui Prefecture)

(He1161)Asuwagawa Irrigation Canal [Fukui City, Fukui Prefecture]

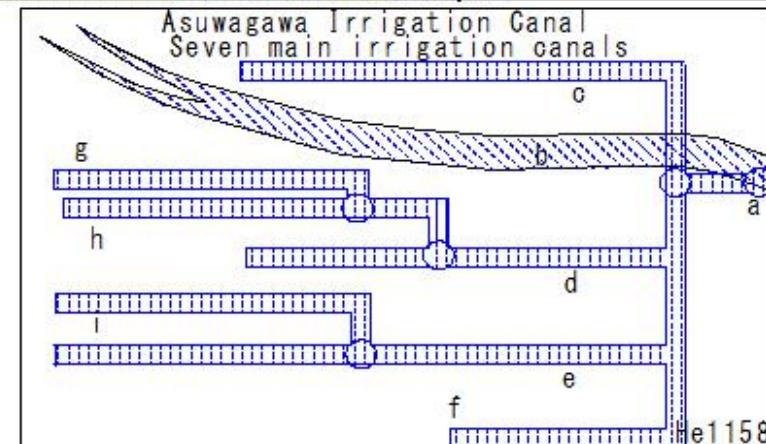
1. Overview of the Asuwa River Irrigation Canal
"joseki" (fixed stones)
⑧ To prevent excessive water withdrawals due to excavation of the canal bottom, "joseki" (fixed stones) were placed at the water division points to clearly define the water distribution.



Seven main irrigation canals

- a Asuwa River Headworks
- b Asuwa River
- c Sakano Irrigation Canal
- d Rokujo Irrigation Canal
- e Tokumitsu Irrigation Canal
- f Asuwa Sanka Irrigation Canal
- g Kida Irrigation Canal
- h Yashiro Emori Irrigation Canal
- i Asuwa Shiga Irrigation Water

He1158



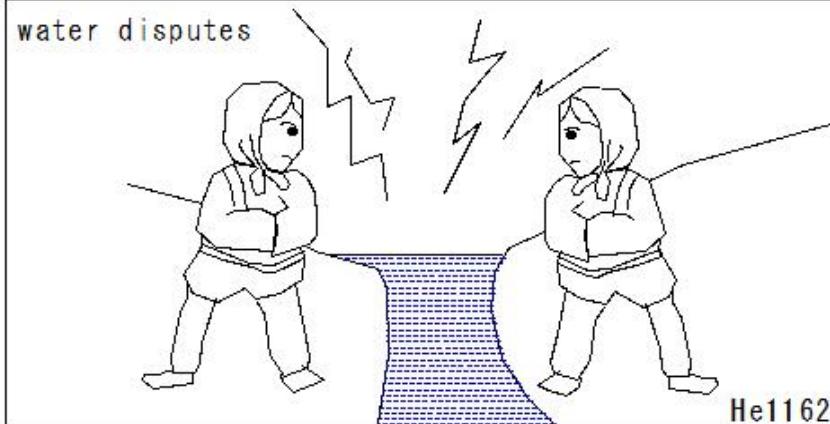
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1162)Asuwagawa Irrigation Canal (Fukui City, Fukui Prefecture)

(He1162) Asuwagawa Irrigation Canal [Fukui City, Fukui Prefecture]

1. Overview of the Asuwa River Irrigation Canal
water disputes

⑤ However, water distribution was not equal, leading to fierce water disputes between upstream and downstream canals.
⑨ It is said that these disputes have been alleviated.



He1162

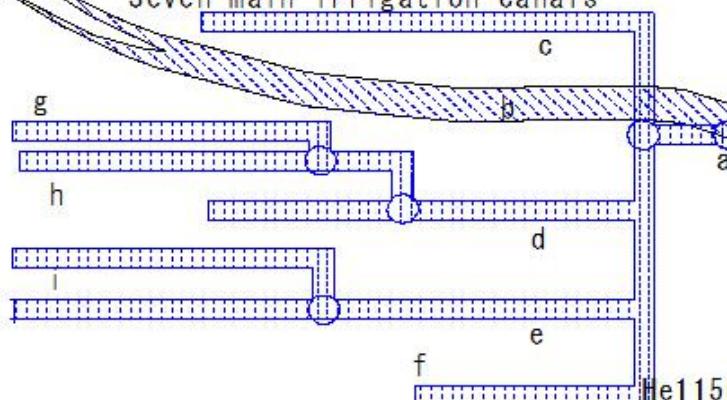
He1162

Seven main irrigation canals

- a Asuwa River Headworks
- b Asuwa River
- c Sakano Irrigation Canal
- d Rokujo Irrigation Canal
- e Tokumitsu Irrigation Canal
- f Asuwa Sanka Irrigation Canal
- g Kida Irrigation Canal
- h Yashiro Emori Irrigation Canal
- i Asuwa Shiga Irrigation Water

He1158

Asuwagawa Irrigation Canal
Seven main irrigation canals



He1158

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1163)Asuwagawa Irrigation Canal (Fukui City, Fukui Prefecture)

(He1163)Asuwagawa Irrigation Canal [Fukui City, Fukui Prefecture]

1. Overview of the Asuwa River Irrigation Canal

Goguchi (goguchi) joints.

④ Each canal drew water directly from the Asuwa River.

⑦ Wooden dams with matting were constructed for the "goguchi" (goguchi) joints, which were rare at the time.

He1163

Goguchi (goguchi) joints, crib work

R287 skeleton groin

R551 groin(groyne + spur dike)

skeleton groin foot protection

R286 He1097

He1163

Seven main irrigation canals

- a Asuwa River Headworks
- b Asuwa River
- c Sakano Irrigation Canal
- d Rokujo Irrigation Canal
- e Tokumitsu Irrigation Canal
- f Asuwa Sanka Irrigation Canal
- g Kida Irrigation Canal
- h Yashiro Emori Irrigation Canal
- i Asuwa Shiga Irrigation Water

He1158

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

Asuwagawa Irrigation Canal
Seven main irrigation canals

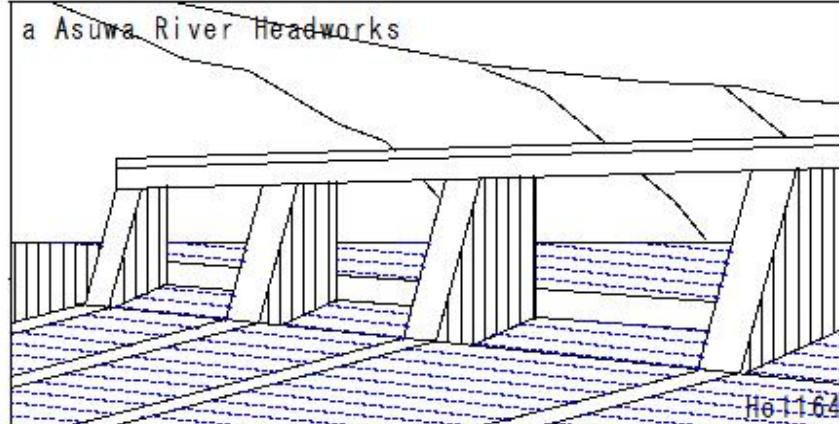
He1158

(He1164)Asuwagawa Irrigation Canal (Fukui City, Fukui Prefecture)

(He1164)Asuwagawa Irrigation Canal [Fukui City, Fukui Prefecture]

1. Overview of the Asuwa River Irrigation Canal a Asuwa River Headworks

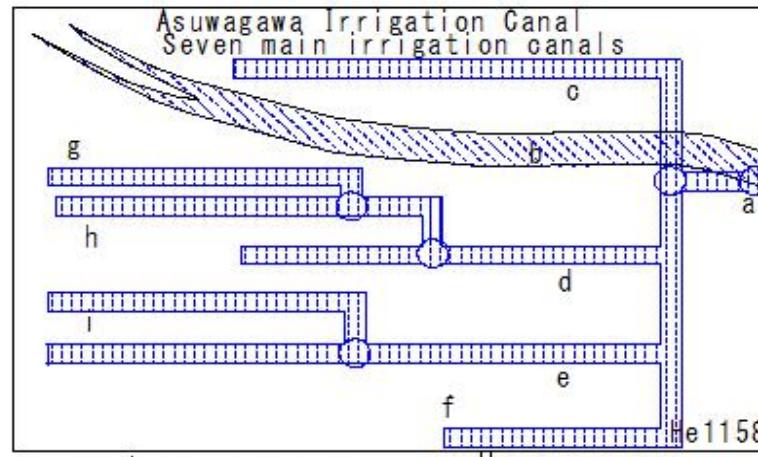
- ① The Asuwa River Irrigation Canal draws water from the Asuwa River Headworks in the southeastern part of Fukui City. It consists of seven main canals that irrigate
- ② The total length of the canals is 74 km.



Seven main irrigation canals

- a Asuwa River Headworks
- b Asuwa River
- c Sakano Irrigation Canal
- d Rokujo Irrigation Canal
- e Tokumitsu Irrigation Canal
- f Asuwa Sanka Irrigation Canal
- g Kida Irrigation Canal
- h Yashiro Emori Irrigation Canal
- i Asuwa Shiga Irrigation Water

He1158



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1165)Asuwagawa Irrigation Canal (Fukui City, Fukui Prefecture)

(He1165)Asuwagawa Irrigation Canal [Fukui City, Fukui Prefecture]

1. Overview of the Asuwa River Irrigation Canal

m Sakano Siphon

Sakano Irrigation Canal that delivers water to farmland on the right bank of the Asuwa River

a Asuwa River Headworks

o Tunnel

j Intake (Intake Gate)

q Open Channel

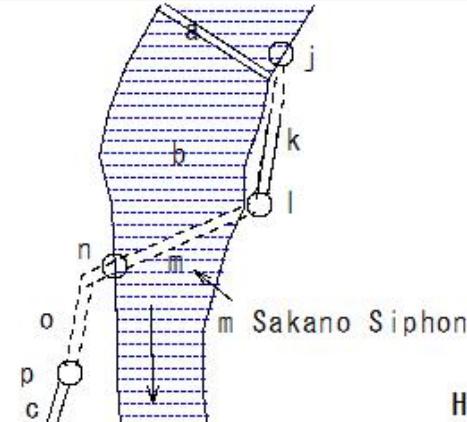
k Main Headrace Channel

l Inlet (Outlet) p Sakano Regulation Sluice Gate

n Outlet (Discharge Manhole)

c Sakano Irrigation Canal He1165

m Sakano Siphon



Seven main irrigation canals

a Asuwa River Headworks

b Asuwa River

c Sakano Irrigation Canal

d Rokujo Irrigation Canal

e Tokumitsu Irrigation Canal

f Asuwa Sanka Irrigation Canal

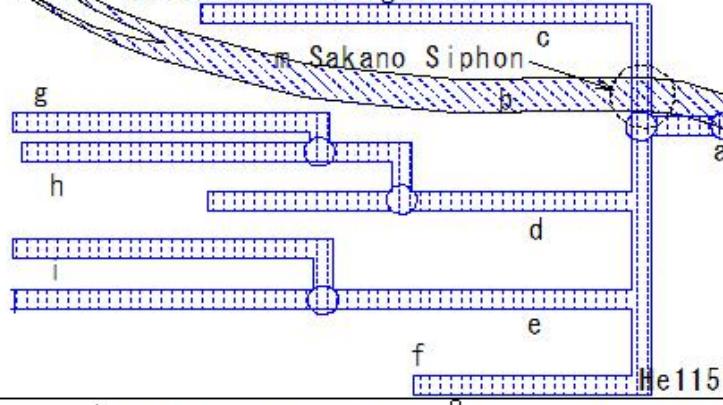
g Kida Irrigation Canal

h Yashiro Emori Irrigation Canal

i Asuwa Shiga Irrigation Water

He1158

Asuwagawa Irrigation Canal
Seven main irrigation canals



Ø 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1166)Asuwagawa Irrigation Canal (Fukui City, Fukui Prefecture)

(He1166) Asuwagawa Irrigation Canal [Fukui City, Fukui Prefecture]

1. Overview of the Asuwa River Irrigation Canal

m Sakano Siphon

Sakano Irrigation Canal that delivers water to farmland on the right bank of the Asuwa River

a Asuwa River Headworks

o Tunnel

j Intake (Intake Gate)

q Open Channel

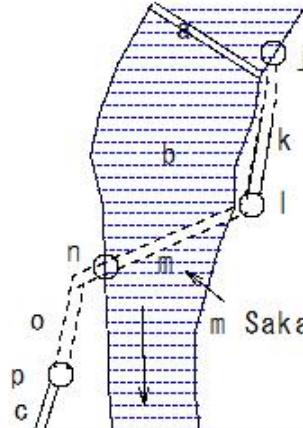
k Main Headrace Channel

l Inlet (Outlet) p Sakano Regulation Sluice Gate

n Outlet (Discharge Manhole)

c Sakano Irrigation Canal He1165

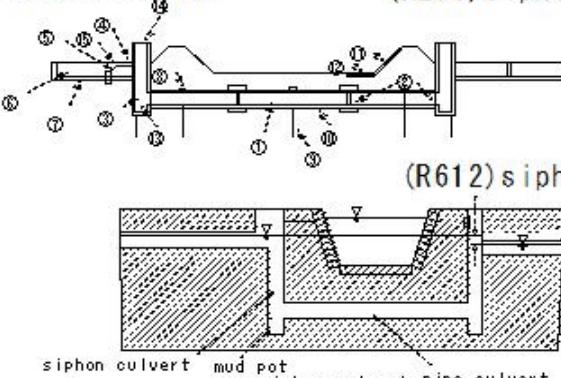
m Sakano Siphon



He1165

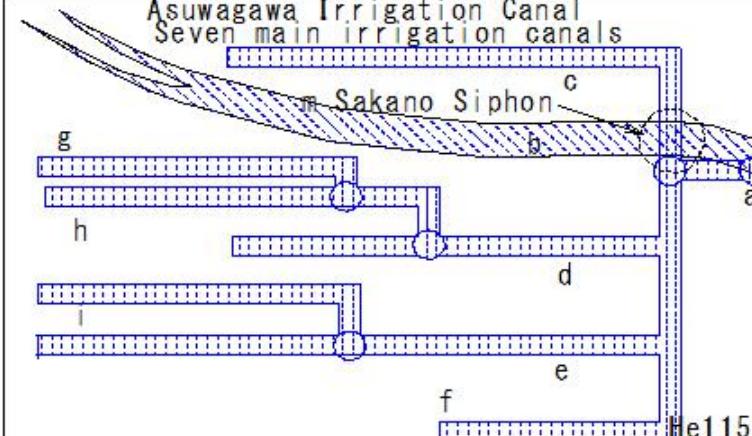
m Sakano Siphon

(R271)siphon culvert



He888
R271
R612
He1166

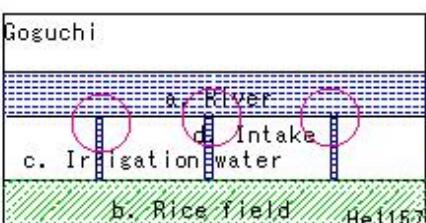
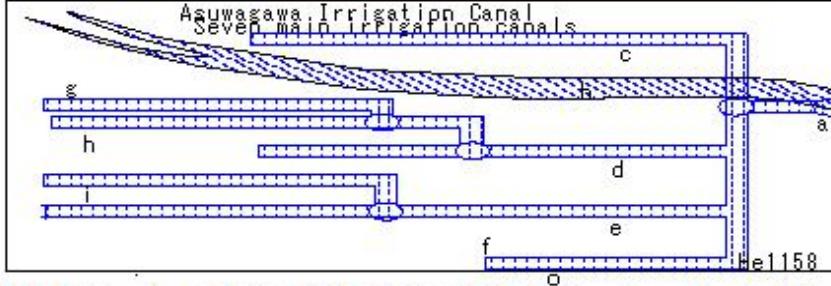
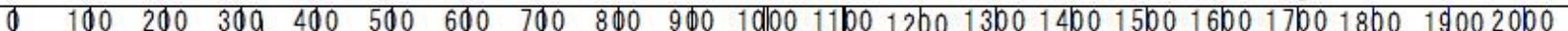
Asuwagawa Irrigation Canal
Seven main irrigation canals



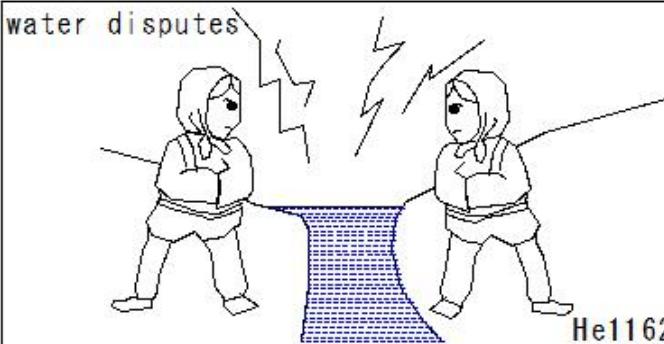
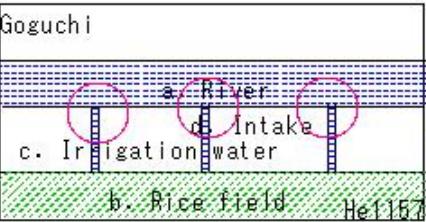
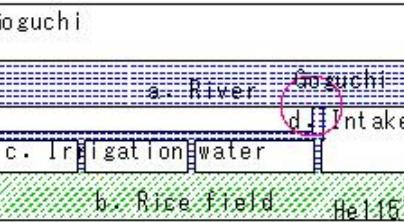
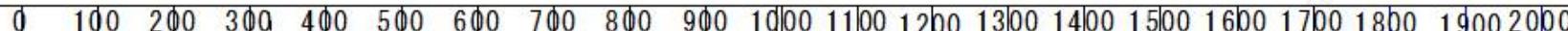
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Ø 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

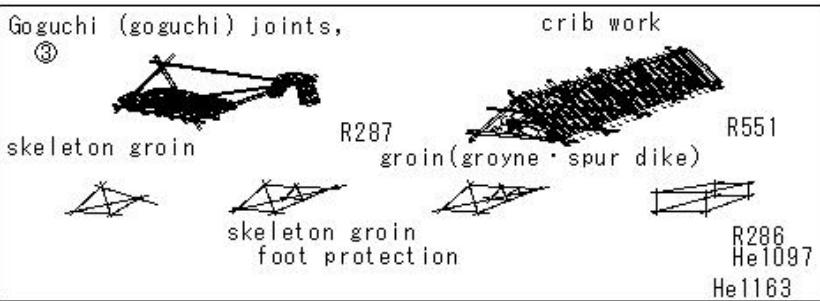
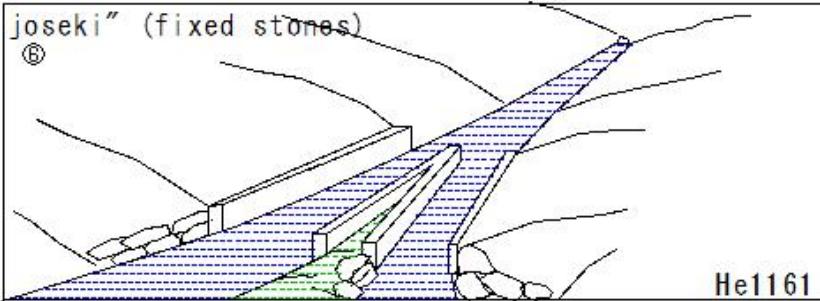
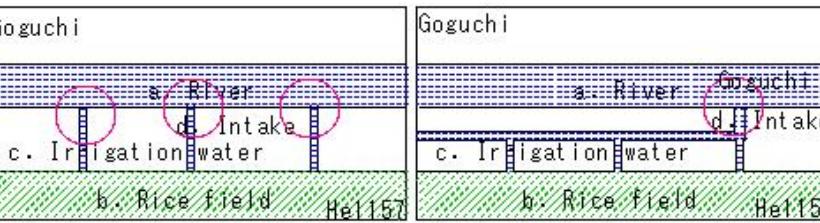
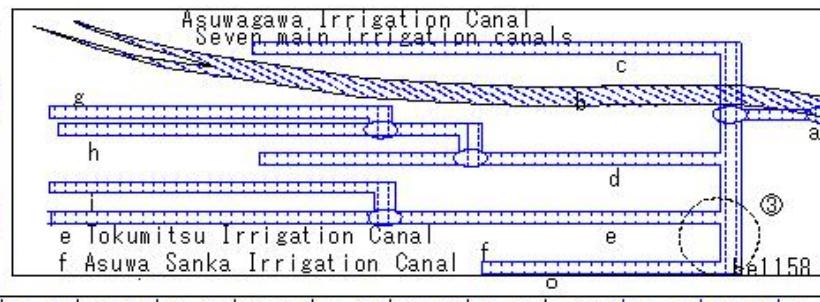
(He1167)Asuwagawa Irrigation Canal (Fukui City, Fukui Prefecture)

(He1167)Asuwagawa Irrigation Canal [Fukui City, Fukui Prefecture]	
Regarding water intake from the river	Water Supply to Rice Paddies
<p>① There are multiple intakes on the Asuwa River. Taking too much water upstream results in a lack of water downstream.</p> <p>② Damage to the weir due to floods, etc.</p>	<p>⑤ Water Supply via Earthen Canals</p> <p>When the water volume decreased, disputes arose at the junctions</p>
Countermeasures (around 1710)	Countermeasures (circa 1710)
<p>③ Intake joints and weir reinforcement</p> <ul style="list-style-type: none"> * The intakes of the Asuwa Sanka Irrigation Canal and the Tokumitsu Irrigation Canal were combined into the Tokumitsu Weir. * The intakes were constructed as wooden dams. 	<p>⑥ Water diversion standards were determined based on the width and depth of the irrigation canal</p> <ul style="list-style-type: none"> * Joseki (standard marks) were installed at the junctions
Present (2020)	Present (2020)
<p>④ All intakes are joined to the Asuwa Headworks.</p>	<p>⑦ Inheriting irrigation canal standards from 300 years ago</p>
	
	

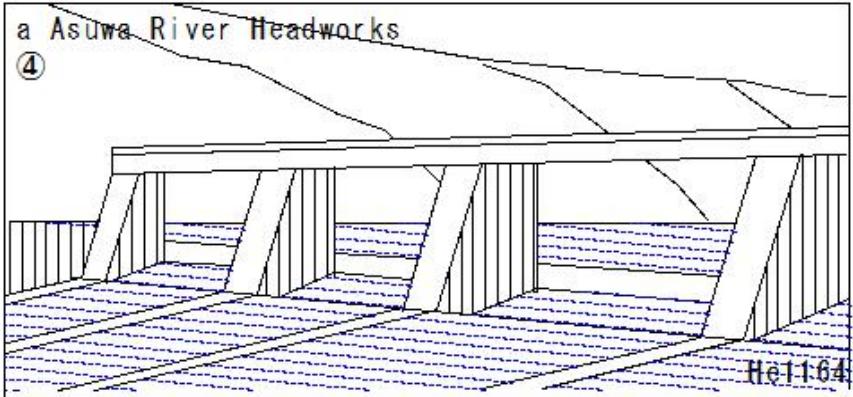
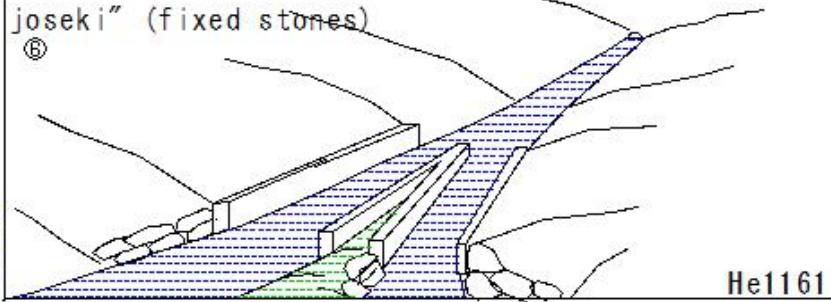
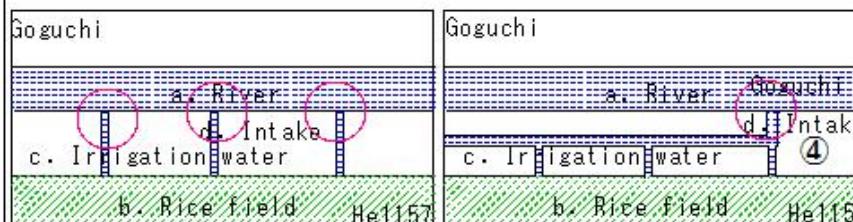
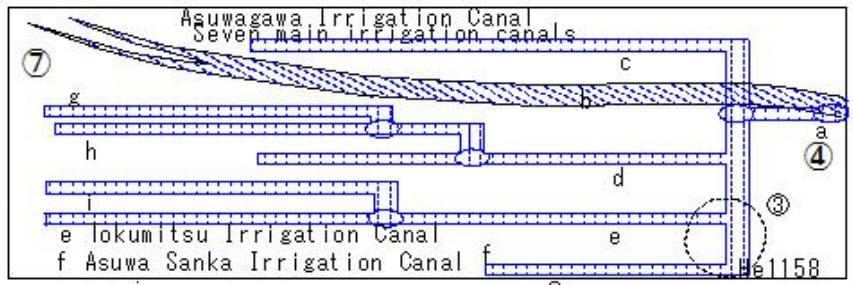
(He1168)Asuwagawa Irrigation Canal (Fukui City, Fukui Prefecture)

(He1168)Asuwagawa Irrigation Canal [Fukui City, Fukui Prefecture]	
Regarding water intake from the river	Water Supply to Rice Paddies
① There are multiple intakes on the Asuwa River. Taking too much water upstream results in a lack of water downstream.	⑤ Water Supply via Earthen Canals When the water volume decreased, disputes arose at the junctions
② Damage to the weir due to floods, etc.	
 <p>water disputes</p> <p>He1162</p>	
 <p>Goguchi</p> <p>a. River</p> <p>b. Intake</p> <p>c. Irrigation water</p> <p>b. Rice field</p> <p>He1167</p>	 <p>Goguchi</p> <p>a. River</p> <p>b. Intake</p> <p>c. Irrigation water</p> <p>b. Rice field</p> <p>He1158</p>
 <p>0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000</p>	

(He1169)Asuwagawa Irrigation Canal (Fukui City, Fukui Prefecture)

(He1169) Asuwagawa Irrigation Canal [Fukui City, Fukui Prefecture]	
Regarding water intake from the river	Water Supply to Rice Paddies
Countermeasures (around 1710) ③ Intake joints and weir reinforcement * The intakes of the Asuwa Sanka Irrigation Canal and the Tokumitsu Irrigation Canal were combined into the Tokumitsu Weir. * The intakes were constructed as wooden dams.	Countermeasures (circa 1710) ⑥ Water diversion standards were determined based on the width and depth of the irrigation canal * Joseki (standard marks) were installed at the junctions
 <p>Goguchi (goguchi) joints, crib work skeleton groin R287 skeleton groin R551 foot protection R286 He1097 He1163</p>	 <p>"joseki" (fixed stones) He1161</p>
 <p>Goguchi a. River b. Intake c. Irrigation water d. Rice field He1157</p> <p>Goguchi a. River b. Intake c. Irrigation water d. Rice field He1154</p>	 <p>Asuwagawa Irrigation Canal Seven main irrigation canals a. River b. Intake c. Irrigation water d. Rice field e. Tokumitsu Irrigation Canal f. Asuwa Sanka Irrigation Canal He1158</p> <p>0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000</p>

(He1170)Asuwagawa Irrigation Canal (Fukui City, Fukui Prefecture)

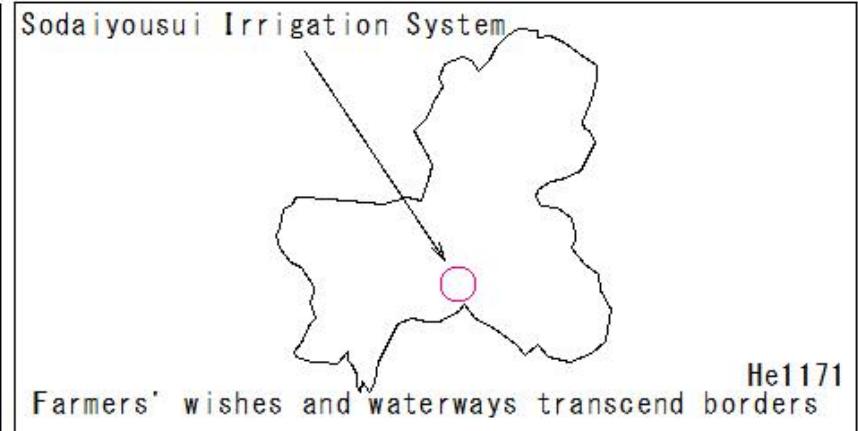
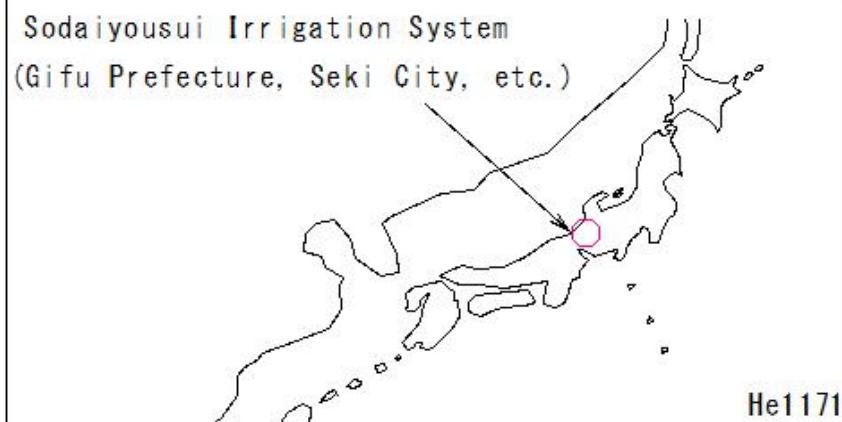
(He1170) Asuwagawa Irrigation Canal [Fukui City, Fukui Prefecture]	
Regarding water intake from the river	Water Supply to Rice Paddies
Present (2020)	Present (2020)
④ All intakes are joined to the Asuwa Headworks.	⑦ Inheriting irrigation canal standards from 300 years ago
 <p>a Asuwa River Headworks ④</p> <p>He1164</p>	 <p>joseki" (fixed stones) ⑥</p> <p>He1161</p>
 <p>Goguchi</p> <p>a. River</p> <p>b. Intake</p> <p>c. Irrigation water</p> <p>b. Rice field</p> <p>He1157</p>	 <p>Goguchi</p> <p>a. River</p> <p>b. Intake</p> <p>c. Irrigation water</p> <p>b. Rice field</p> <p>He1157</p> <p>Asuwagawa Irrigation Canal</p> <p>Seven main irrigation canals</p> <p>⑦</p> <p>g</p> <p>h</p> <p>i</p> <p>e Tokumitsu Irrigation Canal</p> <p>f Asuwa Sanka Irrigation Canal</p> <p>c</p> <p>b</p> <p>a</p> <p>d</p> <p>e</p> <p>f</p> <p>④</p> <p>③</p> <p>He1158</p>
<p>Ø 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000</p>	

(He1171) Sodaiyousui Irrigation System (Gifu Prefecture, Seki City, etc.)

(He1171) Sodaiyousui Irrigation System (Gifu Prefecture, Seki City, etc.)

Sodai Irrigation Canal

- ① This region is prone to drought, and due to the fragmented governance of the feudal domain system, there were no large-scale irrigation facilities. As a result, local farmers worked together to build a canal.
- ② The construction was a difficult undertaking, requiring only chisels and chisels to excavate the bedrock. However, it was completed in 1669, transforming the former barren land into beautiful, new rice paddies.
- ③ Efforts to repair the canal continue to this day, and its history is featured in school supplementary textbooks.



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1172) Sodaiyousui Irrigation System (Gifu Prefecture, Seki City, etc.)

(He1172) Sodaiyousui Irrigation System (Gifu Prefecture, Seki City, etc.)

Sodai Irrigation Canal

Nagara River

a Water Intake

b Sodai Park

c Kawaminato Park

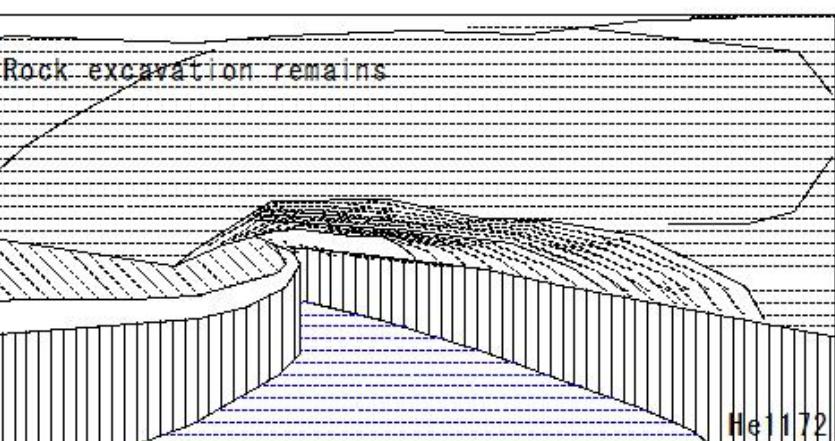
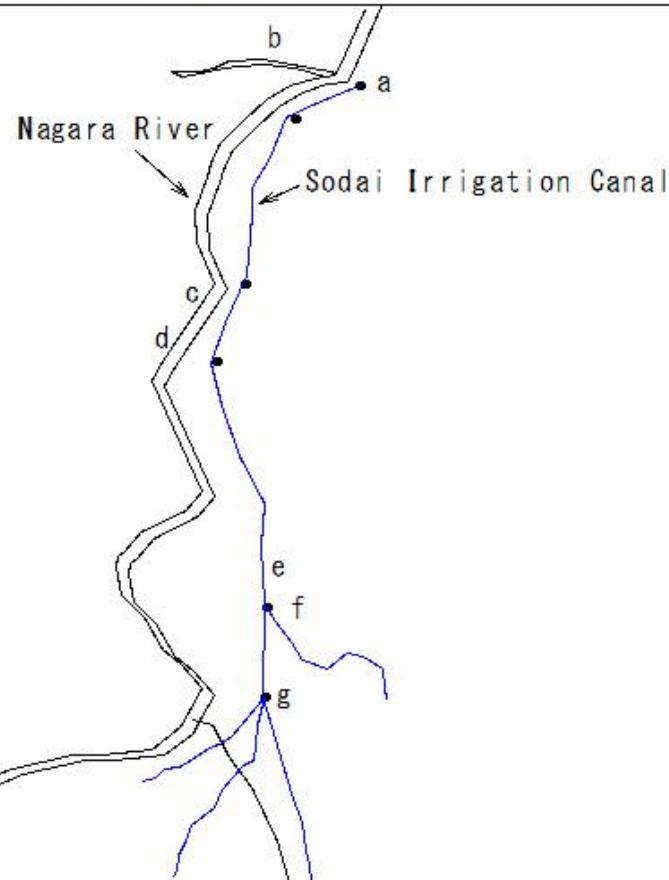
d Tachigaiwa Rock Excavation Site

e Stone Monument at Jinkoji Temple

f Igamisya (Shrine)

g Irinoto Water Diversion

He1172



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(He1173)Sodaiyousui Irrigation System(Gifu Prefecture, Seki City, etc.)

(He1173)Sodaiyousui Irrigation System(Gifu Prefecture, Seki City, etc.)

- ④ In 1663 (Kanbun 3), the area surrounding present-day Seki City suffered from poor water access and a water shortage.
- ⑤ Kida Kichiemon, a ronin from the Owari domain who had moved to the area, and his brother Hayashi Yukon, were concerned about this situation.
- ⑥ He consulted with Shibayama Ihei, a wealthy local farmer, and planned an irrigation system drawing water from the Nagara River.
- ⑦ At the time, there was no dynamite or machinery, and the excavation required hard bedrock.
- ⑧ The rocks were baked over charcoal and firewood to make them easier to break, and then excavated with chisels and hammers. This was a grueling project that lasted a year.
- ⑨ The construction cost a huge sum, approximately 5,500 ryo, and the three men spent all their personal funds.
- ⑩ Kida Kichiemon left, and Hayashi Yukon's whereabouts became unknown.
- ⑪ Shibayama Ihei persevered, living in a humble hut.
- ⑫ Ten years after construction began, the approximately 17-kilometer irrigation canal was completed, transforming the wasteland into beautiful rice fields.
- ⑬ To honor the achievements of the three men, the farmers built and enshrined Ii Shrine. Even today, an annual festival is held on August 1st to commemorate their virtues.
- ⑭ many people, including those involved with the Sodai Irrigation Canal Land Improvement District, offer prayers of gratitude.

(He1174)Sodaiyousui Irrigation System(Gifu Prefecture, Seki City, etc.)

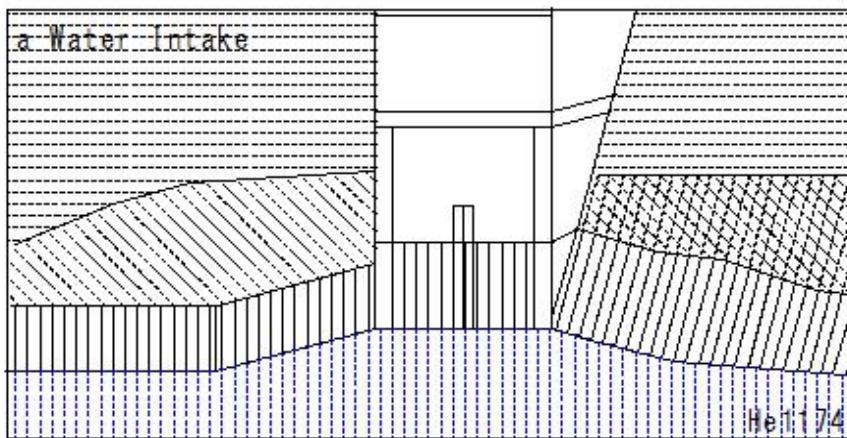
(He1174)Sodaiyousui Irrigation System(Gifu Prefecture, Seki City, etc.)

a Water Intake

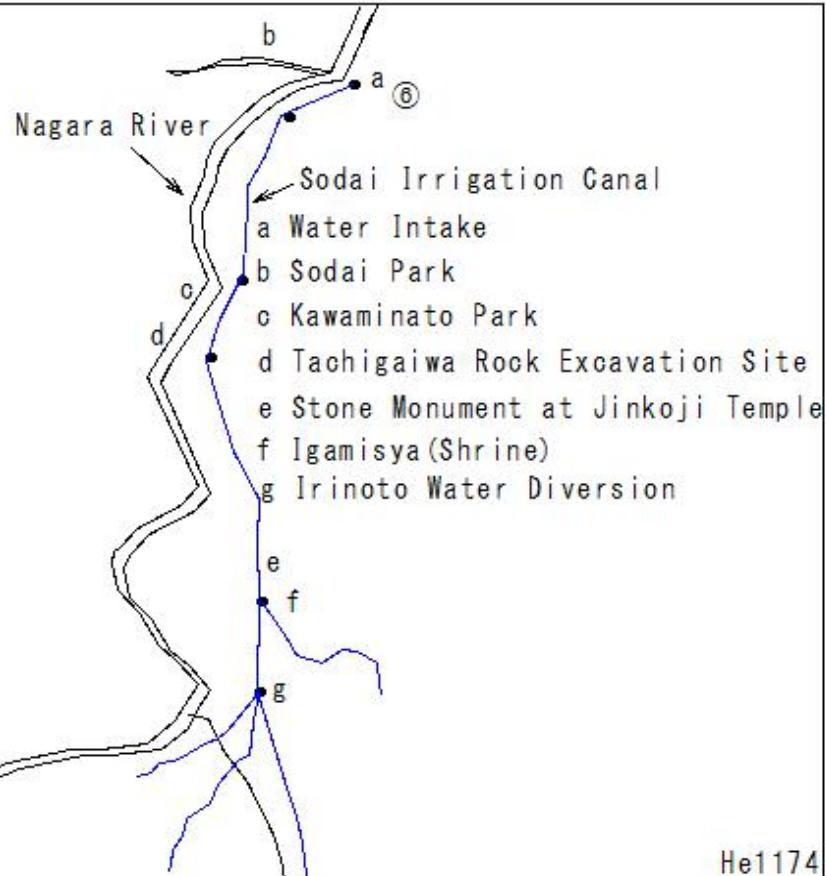
⑥ He consulted with Shibayama Ihei, a wealthy local farmer, and planned an irrigation system drawing water from the Nagara River.

He1174

a Water Intake



He1174



He1174

Φ 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1175) Sodaiyousui Irrigation System (Gifu Prefecture, Seki City, etc.)

(He1175) Sodaiyousui Irrigation System (Gifu Prefecture, Seki City, etc.)

e Stone Monument at Jinkoji Temple

Ihei Shibayama Kichiemon Kida Yukan Hayashi
 ⑤ Kida Kichiemon, a ronin from the Owari domain
 who had moved to the area, and his brother
 Hayashi Yukan, were concerned
 about this situation.

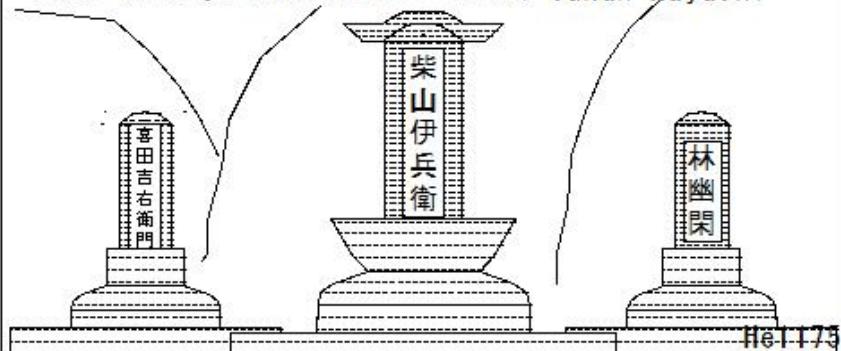
⑩ Kida Kichiemon left, and Hayashi Yukan's
 whereabouts became unknown.

⑪ Shibayama Ihei persevered,
 living in a humble hut.

He1175

e Stone Monument at Jinkoji Temple

Ihei Shibayama, Kichiemon Kida, Yukan Hayashi



Ø 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1176)Sodaiyousui Irrigation System(Gifu Prefecture, Seki City, etc.)

(He1176)Sodaiyousui Irrigation System(Gifu Prefecture, Seki City, etc.)

Sodai Irrigation Canal

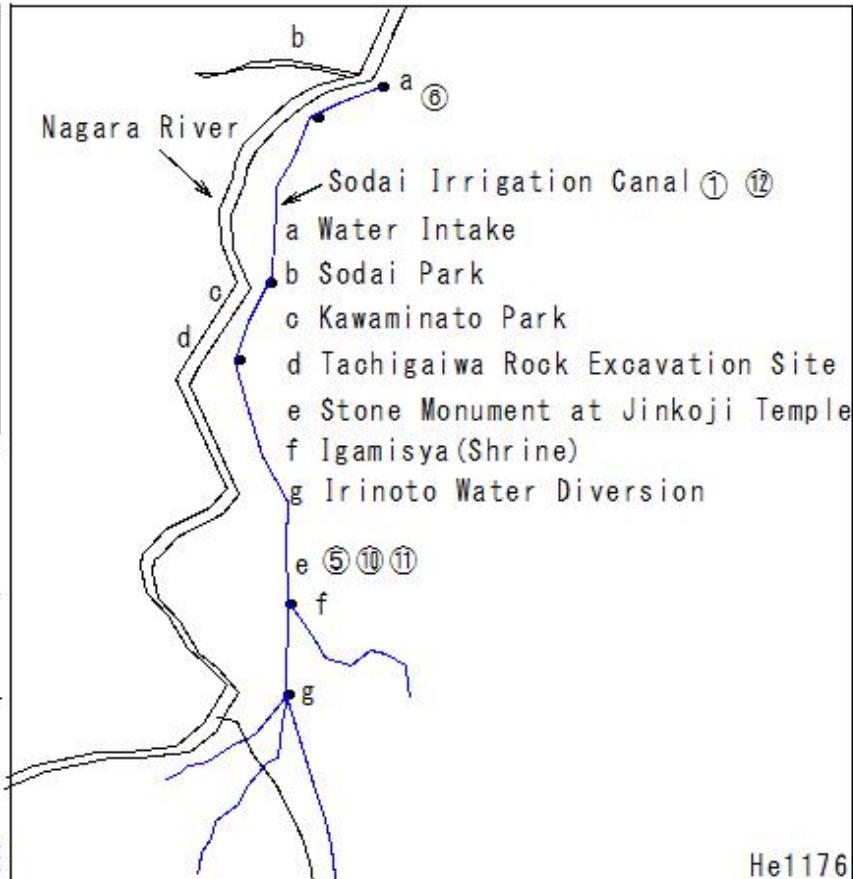
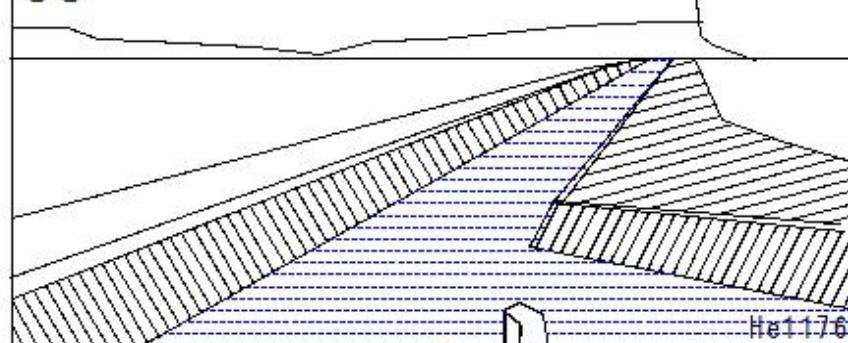
① This region is prone to drought, and due to the fragmented governance of the feudal domain system, there were no large-scale irrigation facilities.

⑫ Ten years after construction began, the approximately 17-kilometer irrigation canal was completed, transforming the wasteland into beautiful rice fields.

He1176

Sodai Irrigation Canal

①⑫



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(He1177)Sodaiyousui Irrigation System(Gifu Prefecture, Seki City, etc.)

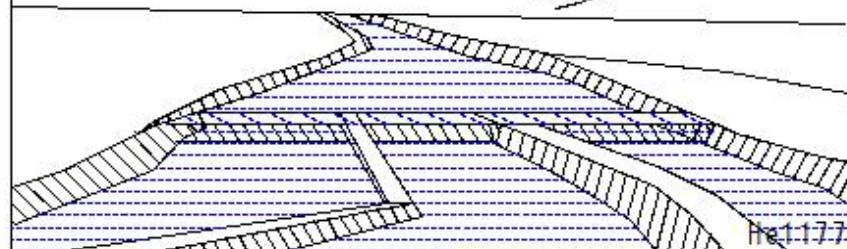
(He1177)Sodaiyousui Irrigation System(Gifu Prefecture, Seki City, etc.)

g Irinoto Water Diversion

A facility that distributes water to three areas

He1177

g Irinoto Water Diversion



∅ 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1178)Sodaiyousui Irrigation System(Gifu Prefecture, Seki City, etc.)

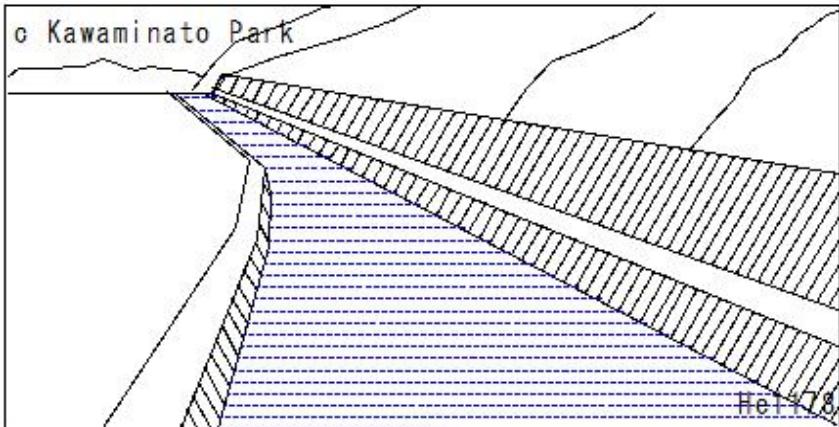
(He1178)Sodaiyousui Irrigation System(Gifu Prefecture, Seki City, etc.)

c Kawaminato Park

A river port that served as a gateway for transporting goods in the early Edo period

He1178

c Kawaminato Park



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1179) Sodaiyousui Irrigation System (Gifu Prefecture, Seki City, etc.)

(He1179) Sodaiyousui Irrigation System (Gifu Prefecture, Seki City, etc.)

d Tachigaiwa Rock Excavation Site

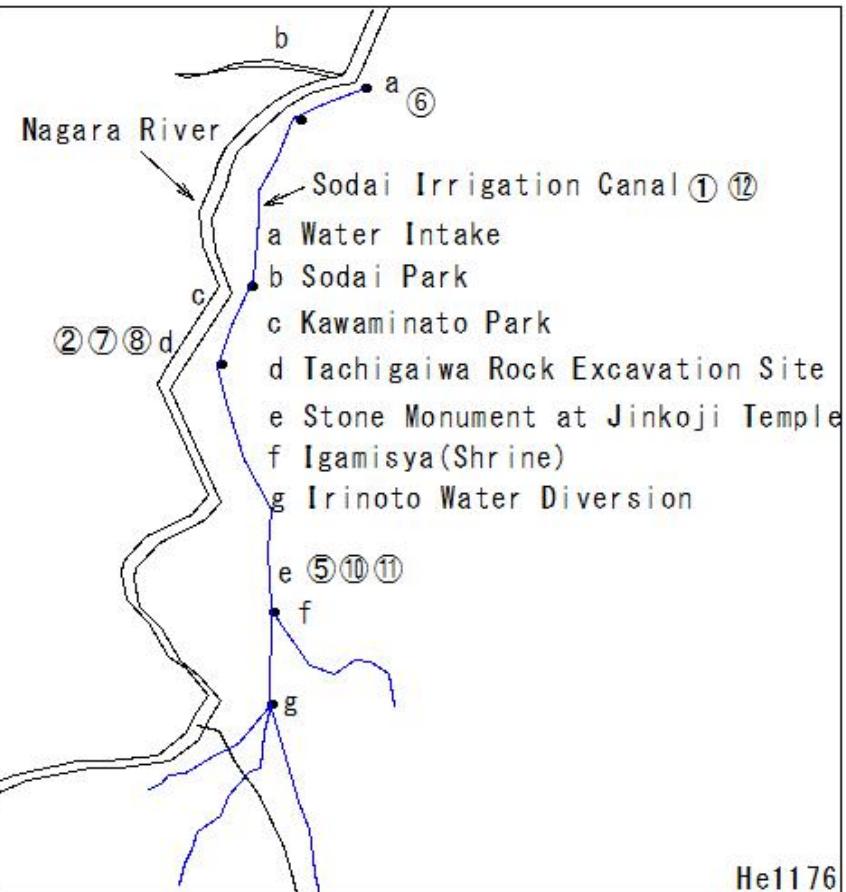
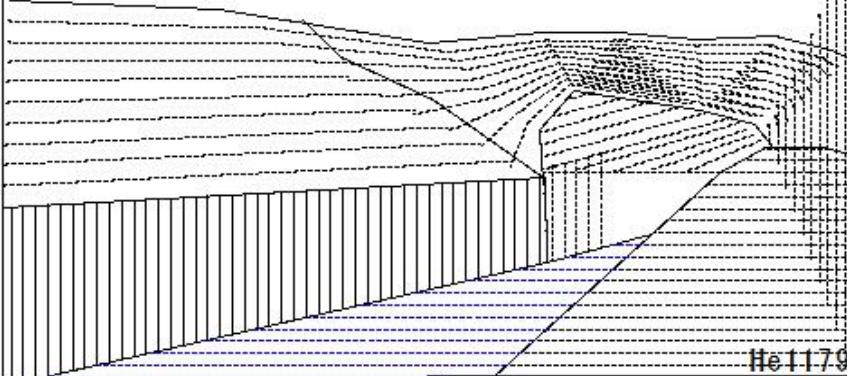
② The construction was a difficult undertaking, requiring only chisels and chisels to excavate the bedrock.

However, it was completed in 1669, transforming the former barren land into beautiful, new rice paddies.

⑦ At the time, there was no dynamite or machinery, and the excavation required hard bedrock.

He1179

d Tachigaiwa Rock Excavation Site



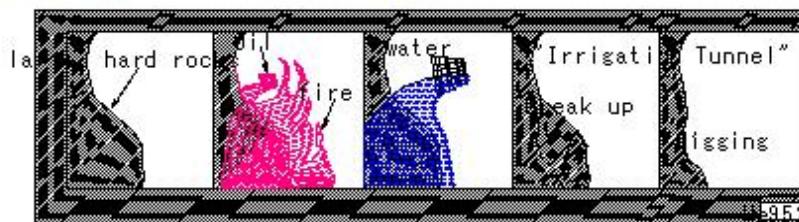
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(He1180)Sodaiyousui Irrigation System(Gifu Prefecture, Seki City, etc.)

(He1180)Sodaiyousui Irrigation System(Gifu Prefecture, Seki City, etc.)

d Tachigaiwa Rock Excavation Site

⑧The rocks were baked over charcoal and firewood to make them easier to break, and then excavated with chisels and hammers. This was a grueling project that lasted a year. He1180



Lantern used in excavation



Hand-digging chisel

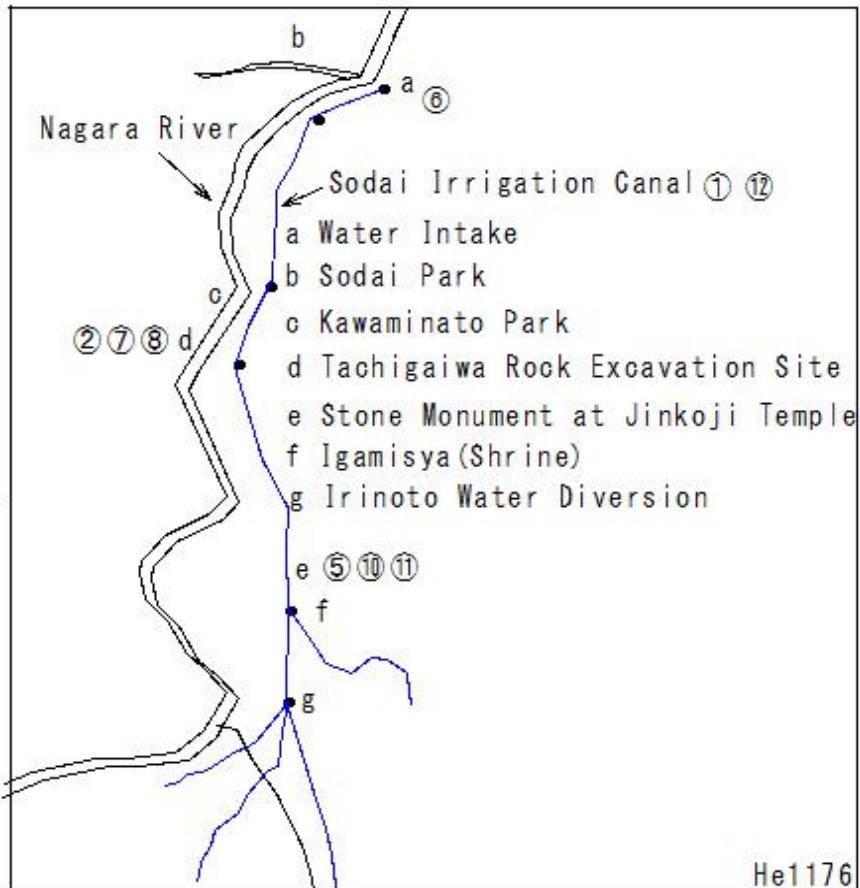


He954

He954



He842



Ø 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1181)Sodaiyousui Irrigation System(Gifu Prefecture, Seki City, etc.)

(He1181)Sodaiyousui Irrigation System(Gifu Prefecture, Seki City, etc.)

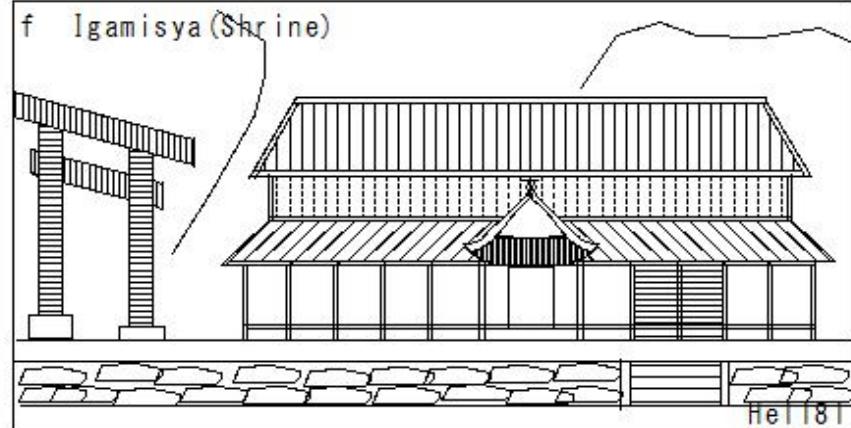
f Igamisya(Shrine)

⑬ To honor the achievements of the three men, the farmers built and enshrined Ii Shrine. Even today, an annual festival is held on August 1st to commemorate their virtues

⑭ many people, including those involved with the Sodai Irrigation Canal Land Improvement District, offer prayers of gratitude.

He1181

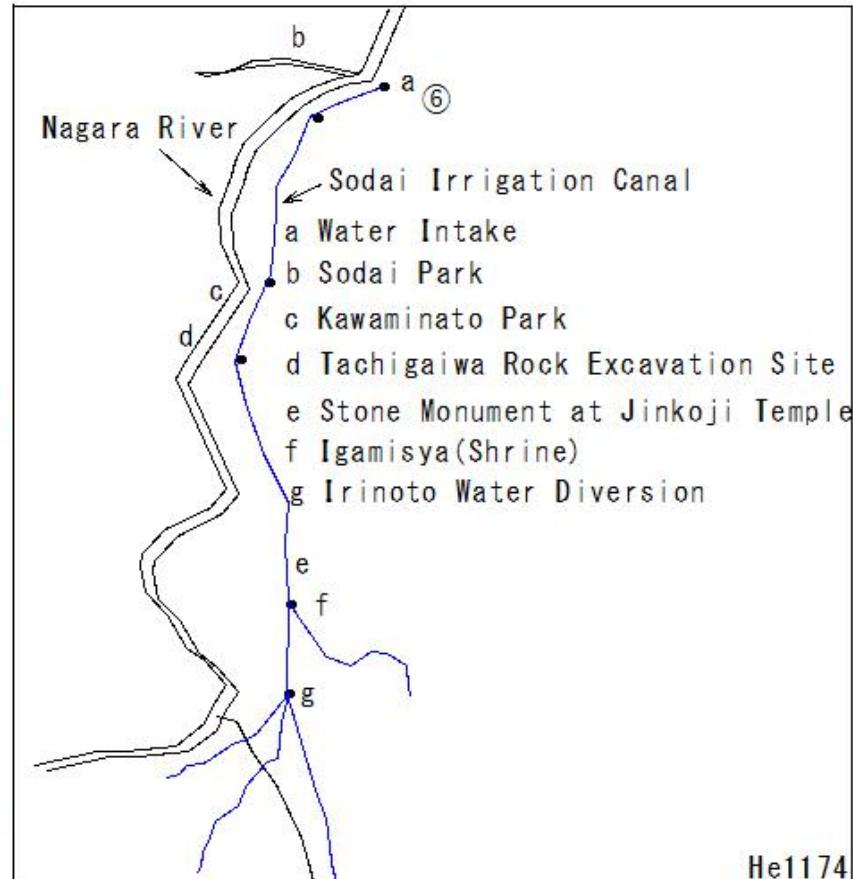
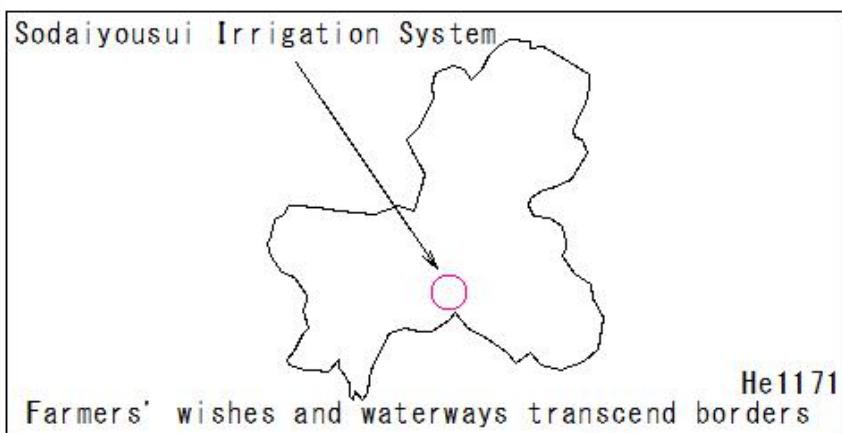
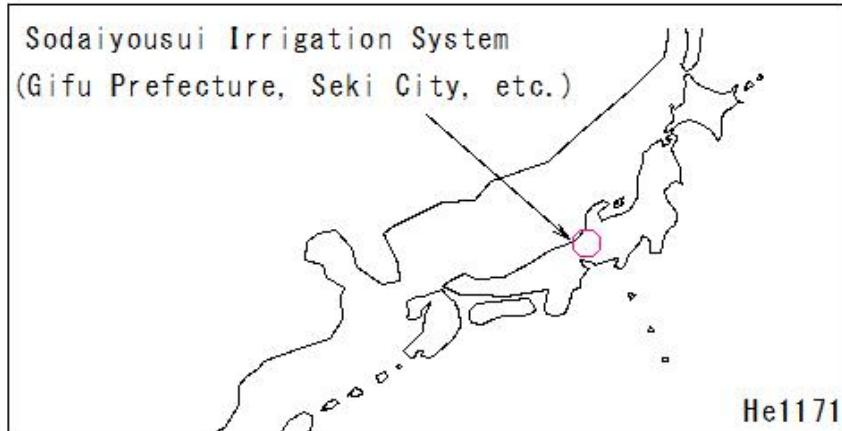
f Igamisya(Shrine)



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(He1182) Sodaiyousui Irrigation System(Gifu Prefecture, Seki City, etc.)

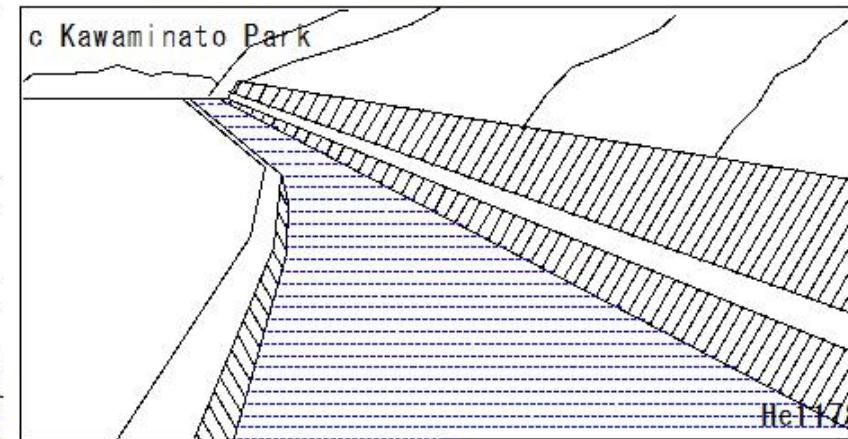
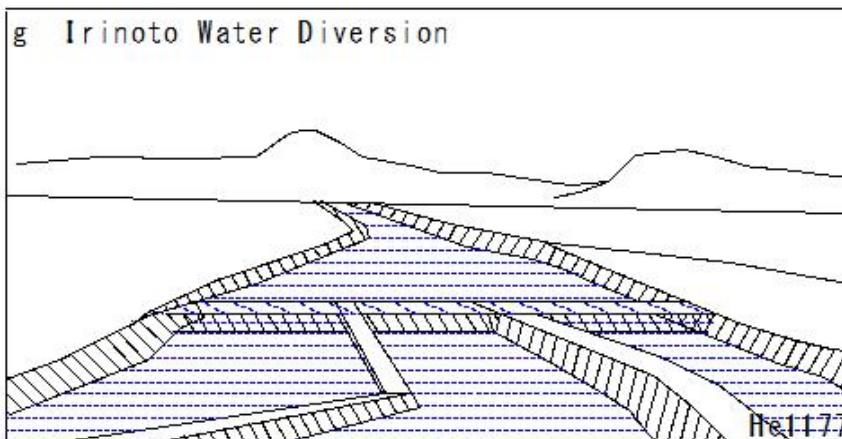
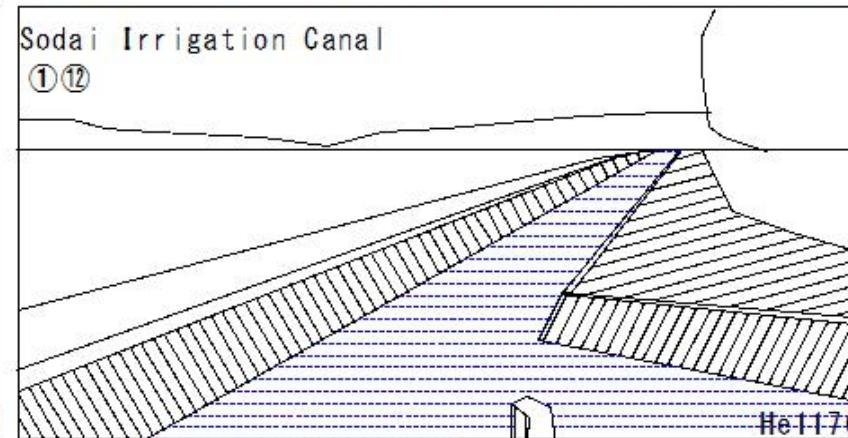
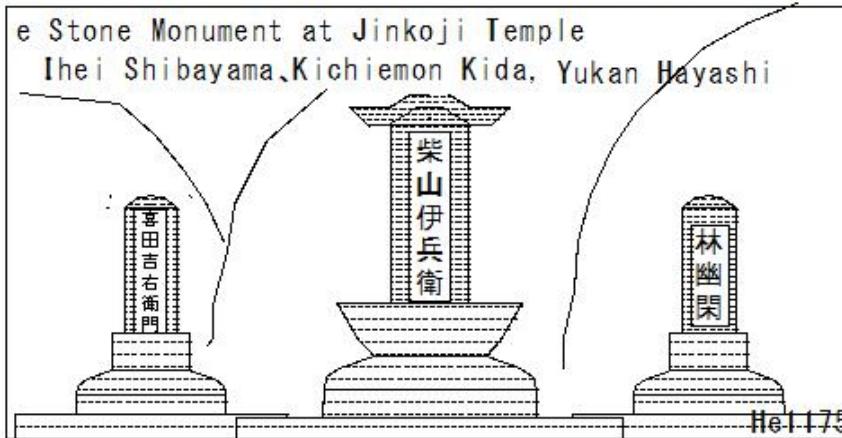
(He1182) Sodaiyousui Irrigation System(Gifu Prefecture, Seki City, etc.)



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(He1183) Sodaiyousui Irrigation System (Gifu Prefecture, Seki City, etc.)

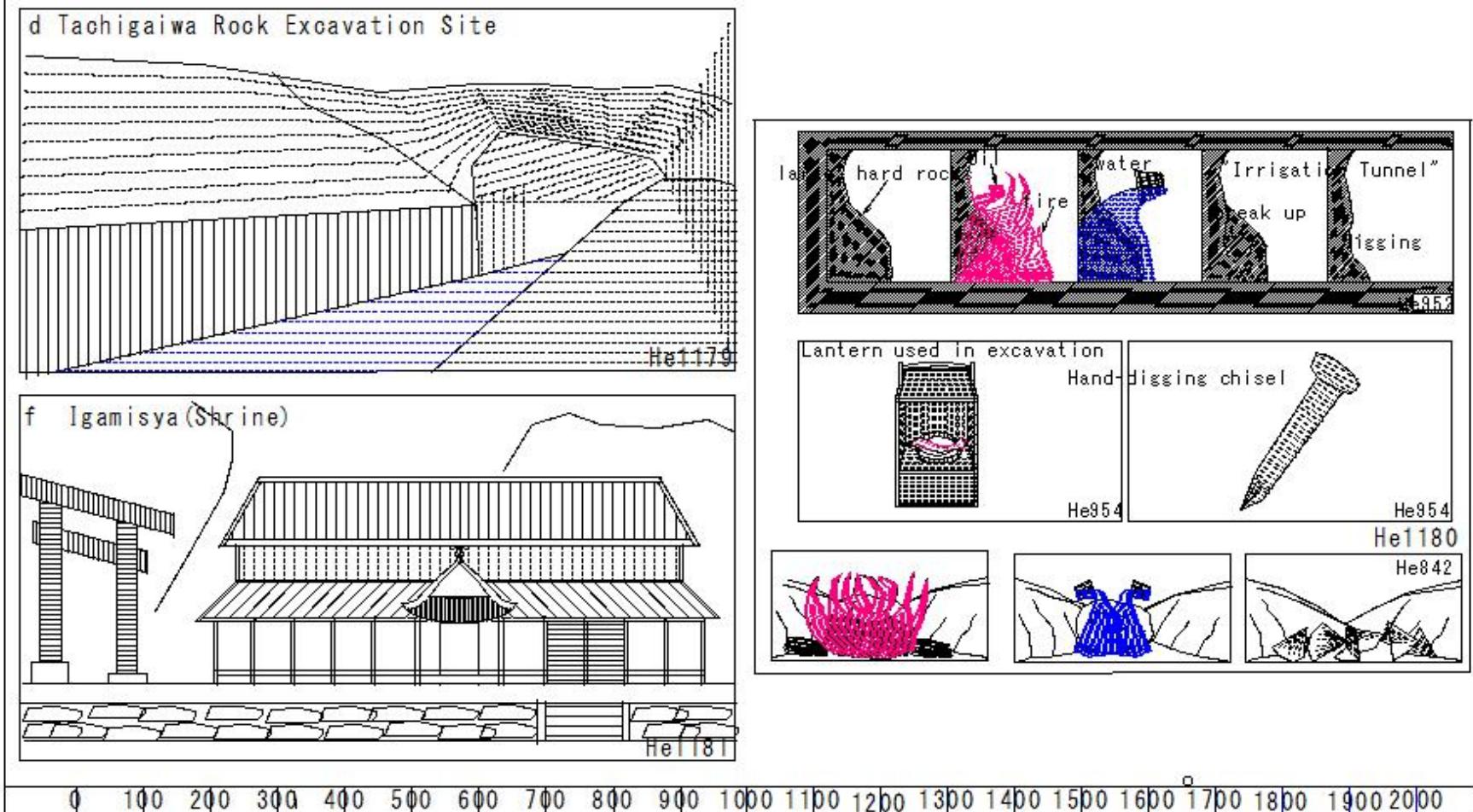
(He1183) Sodaiyousui Irrigation System (Gifu Prefecture, Seki City, etc.)



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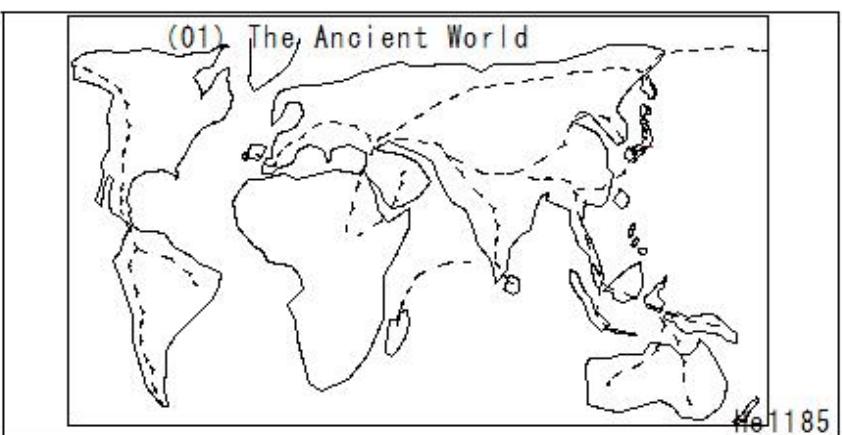
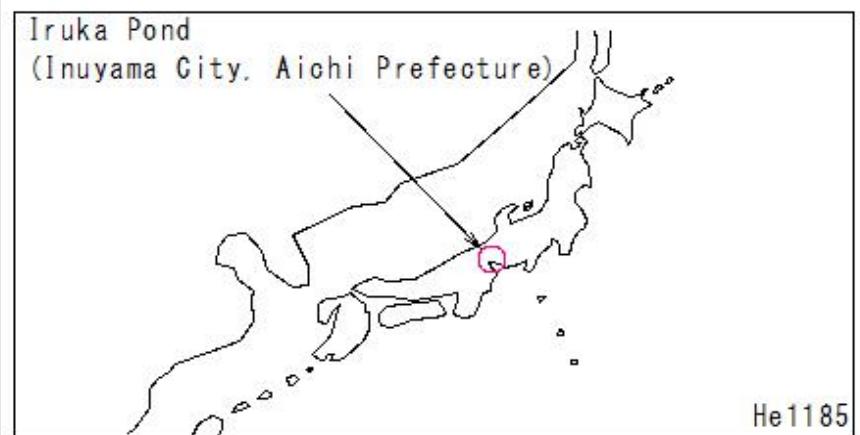
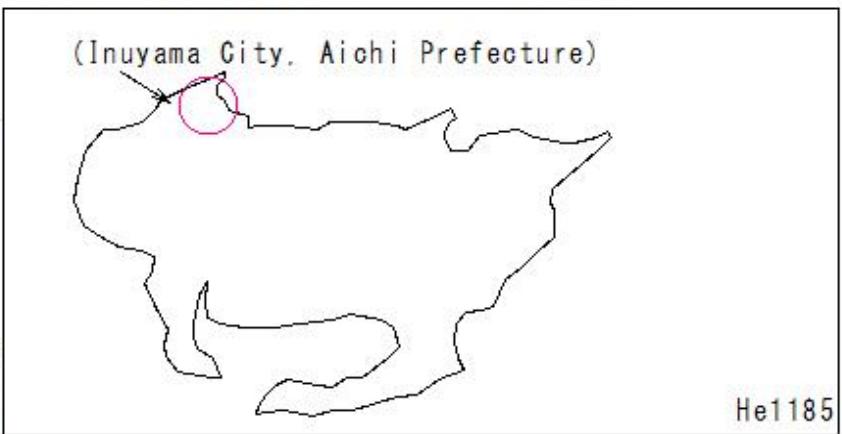
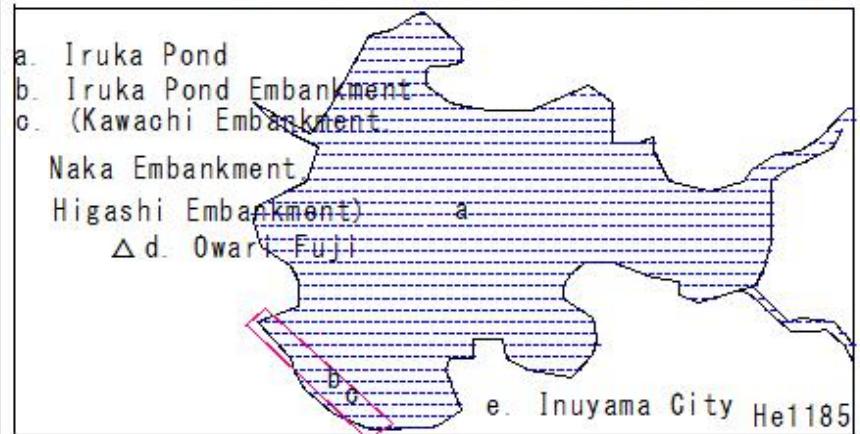
(He1184)Sodaiyousui Irrigation System(Gifu Prefecture, Seki City, etc.)

(He1184)Sodaiyousui Irrigation System(Gifu Prefecture, Seki City, etc.)



(He1185) Iruka Pond (Inuyama City, Aichi Prefecture)

(He1185) Iruka Pond (Inuyama City, Aichi Prefecture)

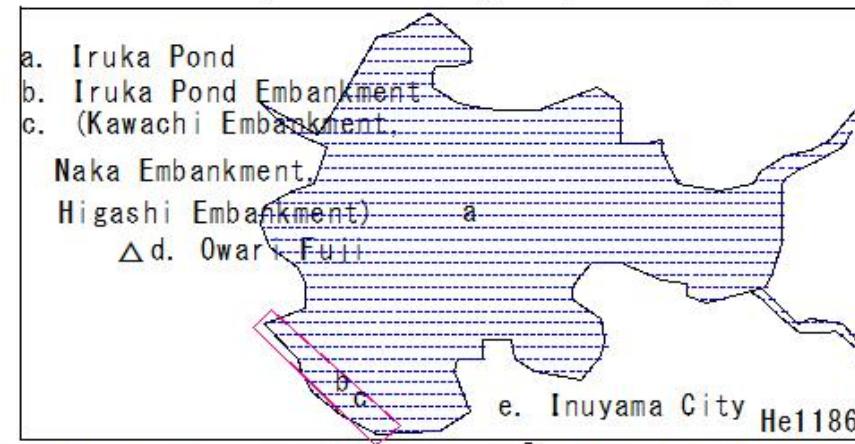


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(He1186)Iruka Pond (Inuyama City, Aichi Prefecture)

(He1186) Iruka Pond (Inuyama City, Aichi Prefecture)

- ① Iruka Pond has a 25.7m high, 724.1m long, and a reservoir capacity of approximately 15 million cubic meters.
- ② Along with Kagawa Prefecture's Mannoike Pond, it is one of Japan's two largest agricultural reservoirs, irrigating approximately 1,000 hectares of rice paddies across Inuyama City, Komaki City, Oguchi Town, and Fuso Town.
- ③ 368 years ago, in 1633, Ezaki Zenzaemon and the other members of the Iruka Six,
- ④ it was constructed as a project of the Owari Domain at the request of Tokugawa Yoshinao, the ninth son of Tokugawa Ieyasu and lord of the Owari Domain.
- ⑤ After its construction in 1663, it was hit by numerous heavy rains and earthquakes, including the Iruka Cut, which killed 1,000 people. However, thanks to local efforts, it was restored.
- ⑥ During the Tokai Heavy Rains of 1949, it served as a reservoir, contributing to preventing disasters downstream.

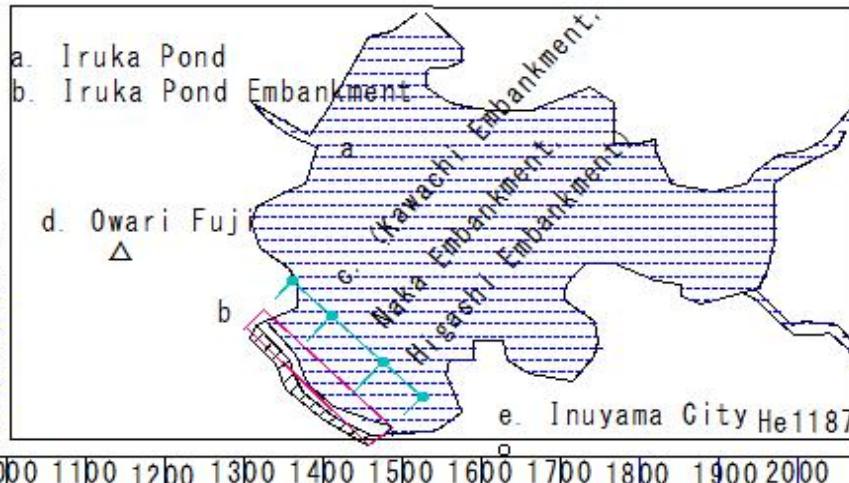
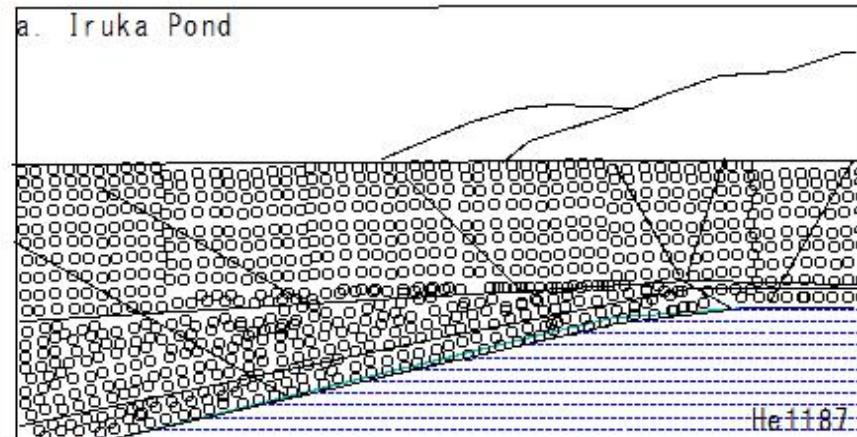
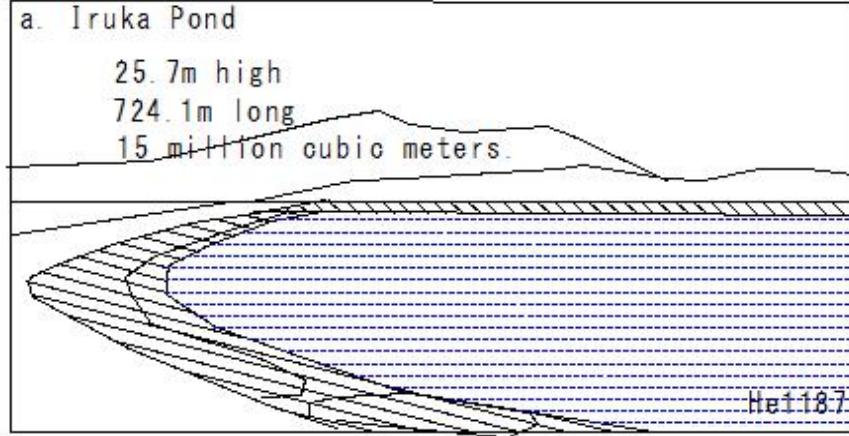


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(He1187)Iruka Pond (Inuyama City, Aichi Prefecture)

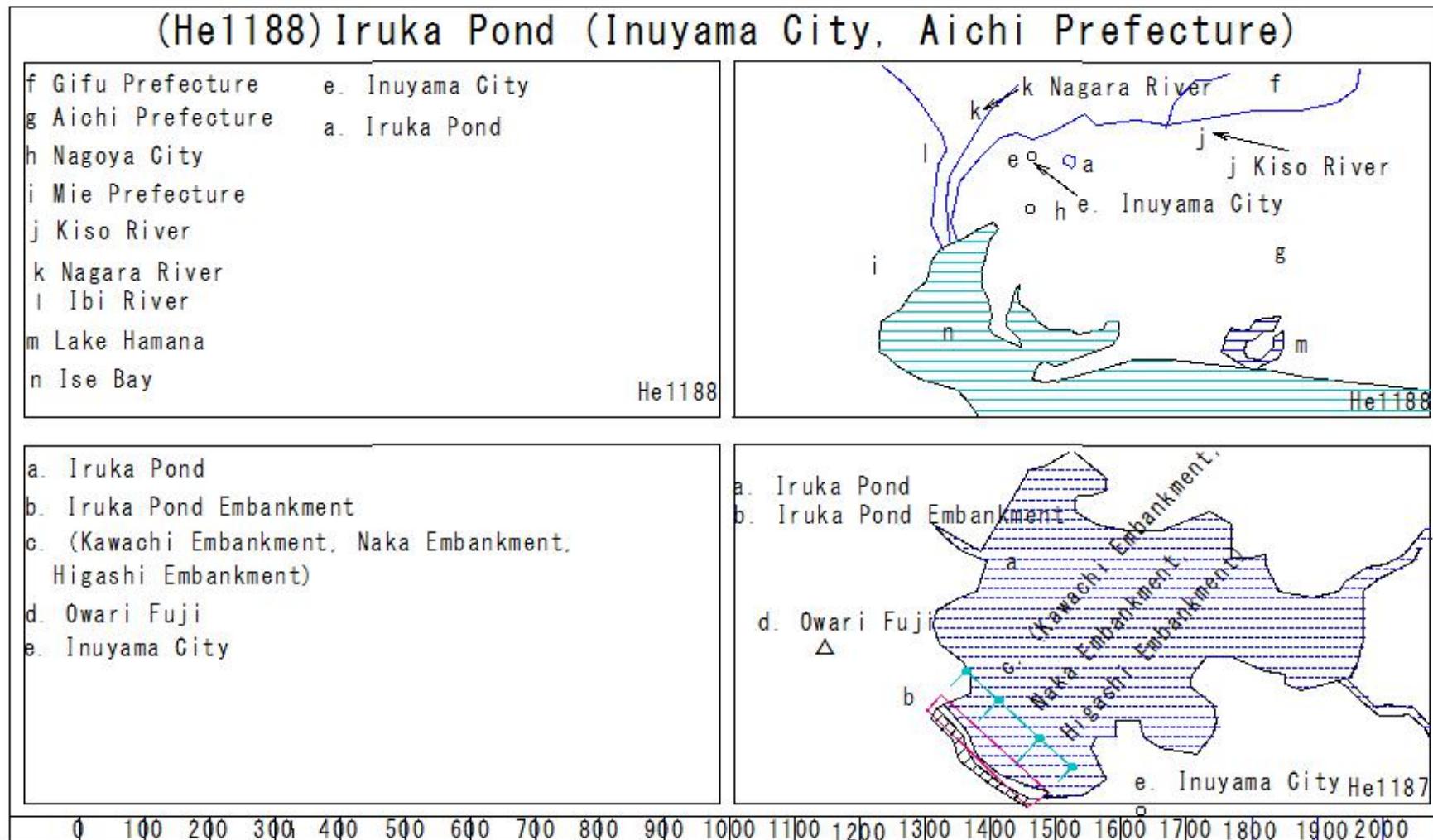
(He1187) Iruka Pond (Inuyama City, Aichi Prefecture)

①Iruka Pond has a 25.7m high, 724.1m long, and a reservoir capacity of approximately 15 million cubic meters.



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(He1188) Iruka Pond (Inuyama City, Aichi Prefecture)



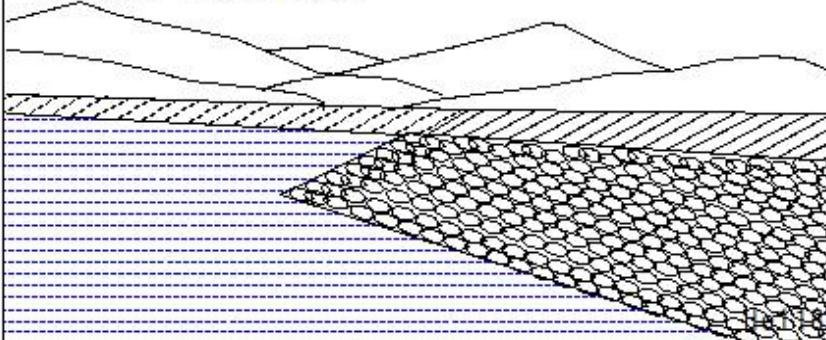
(He1189) Iruka Pond (Inuyama City, Aichi Prefecture)

(He1189) Iruka Pond (Inuyama City, Aichi Prefecture)

Hyakken-tsutsumi or Kawachiya-tsutsumi.
c. (Kawachi Embankment, Naka Embankment,
Higashi Embankment)

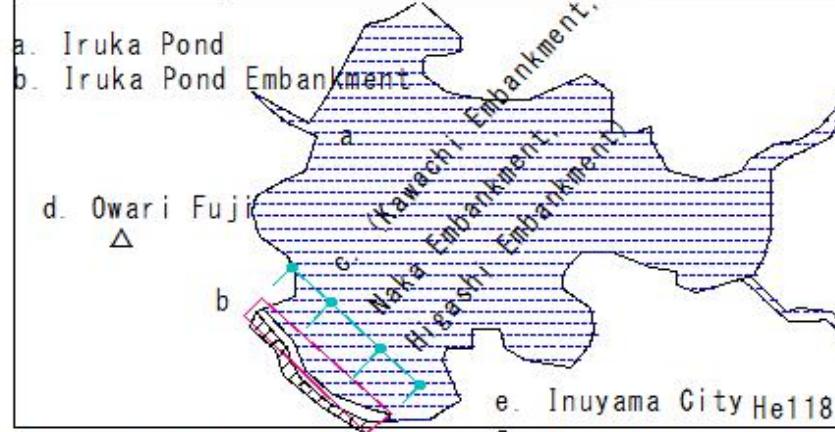
- ⑦ The dam of Iruka Pond, also known as Hyakken-tsutsumi or Kawachiya-tsutsumi.
- ⑧ Since the Meiji period, it has undergone renovation work to prevent flooding.
- ⑨ but its size has hardly changed since it was built about 400 years ago.

c. (Kawachi Embankment, Naka Embankment,
Higashi Embankment)



He1189

a. Iruka Pond
b. Iruka Pond Embankment
c. (Kawachi Embankment, Naka Embankment,
Higashi Embankment)
d. Owari Fuji
e. Inuyama City



He1187

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1190) Iruka Pond (Inuyama City, Aichi Prefecture)

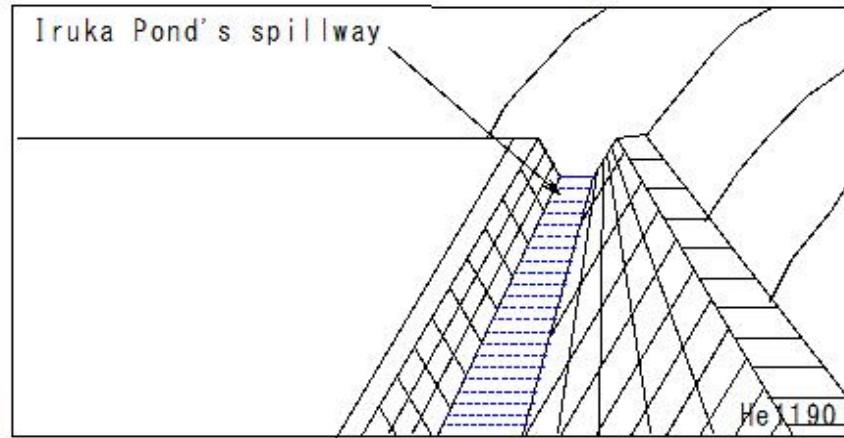
(He1190) Iruka Pond (Inuyama City, Aichi Prefecture)

Iruka Pond's spillway

- ⑩ Iruka Pond's spillway (discharge channel on the right).
- ⑪ It joins the Gojo River downstream.
- ⑫ Normally, only water from the overflowing pond flows through.

He1190

Iruka Pond's spillway



a. Iruka Pond

b. Iruka Pond Embankment

c. (Kawachi Embankment, Naka Embankment, Higashi Embankment)

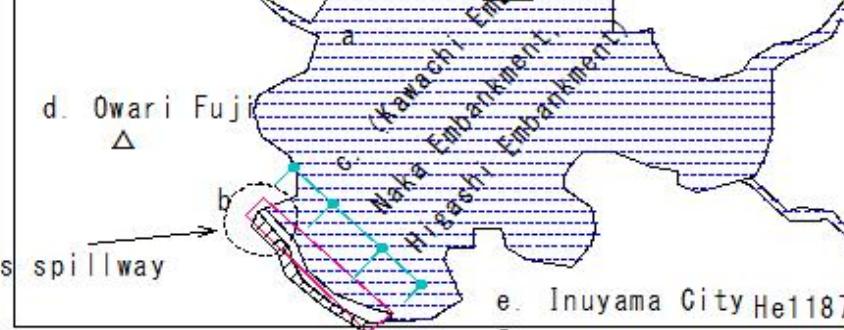
d. Owari Fuji

e. Inuyama City

Iruka Pond's
He1187

a. Iruka Pond

b. Iruka Pond Embankment



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1191) Iruka Pond (Inuyama City, Aichi Prefecture)

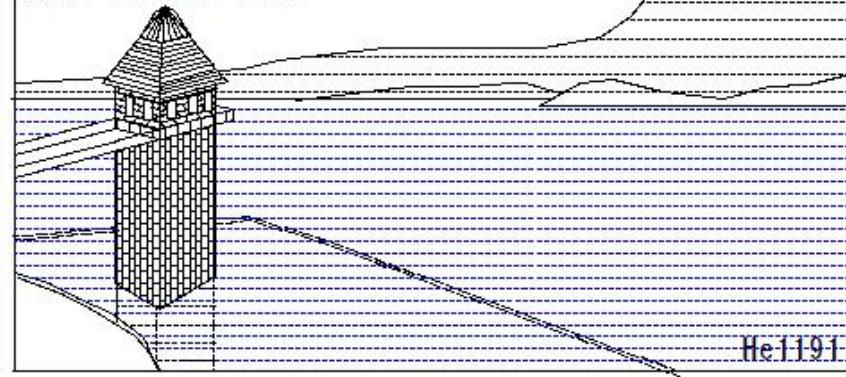
(He1191) Iruka Pond (Inuyama City, Aichi Prefecture)

a. Iruka Pond

Water Intake Tower

A water intake tower designed with Meiji Village in mind

a. Iruka Pond
Water Intake Tower



a. Iruka Pond

b. Iruka Pond Embankment

c. (Kawachi Embankment, Naka Embankment, Higashi Embankment)

d. Owari Fuji

e. Inuyama City

a. Iruka Pond

b. Iruka Pond Embankment

c. (Kawachi Embankment)

d. Owari Fuji

e. (Naka Embankment)

Water Intake Tower

Iruka Pond's
He1187

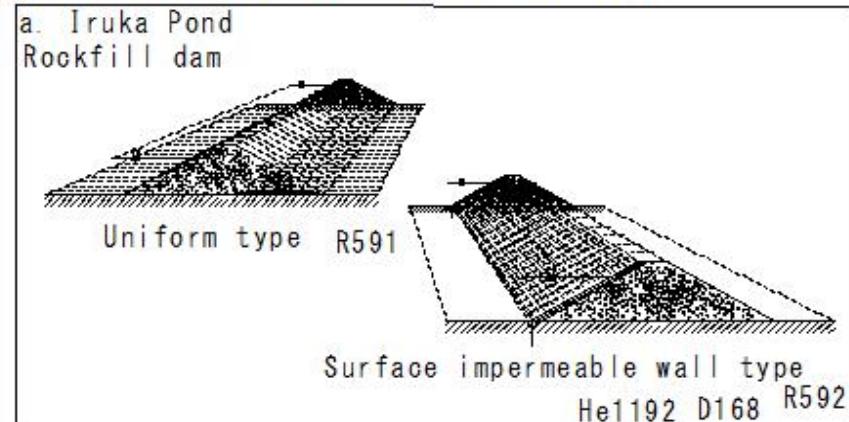
e. Inuyama City He1187

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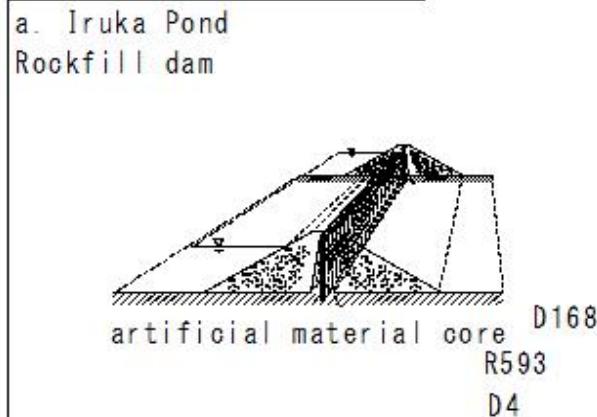
(He1192)Iruka Pond (Inuyama City, Aichi Prefecture)

(He1192) Iruka Pond (Inuyama City, Aichi Prefecture)

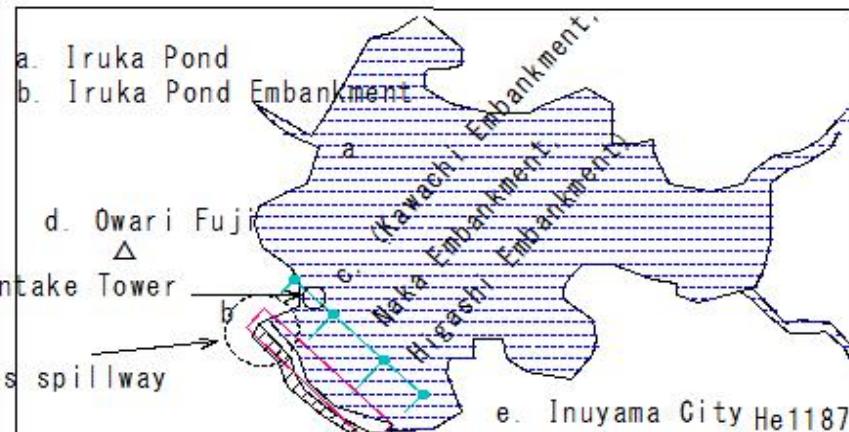
a. Iruka Pond
Renovating a reservoir
Rockfill dam
⑬ This was originally a reservoir built in 1633.
It was renovated and turned into a rockfill dam.



He1192



Water Intake Tower
Iruka Pond's spillway
He1192

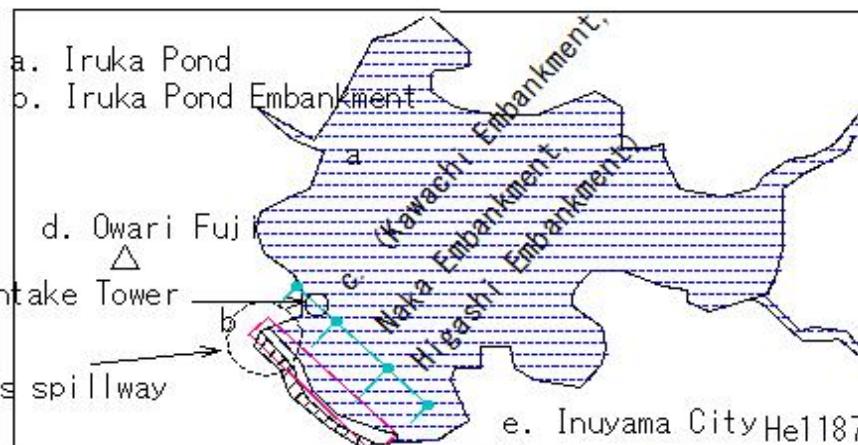
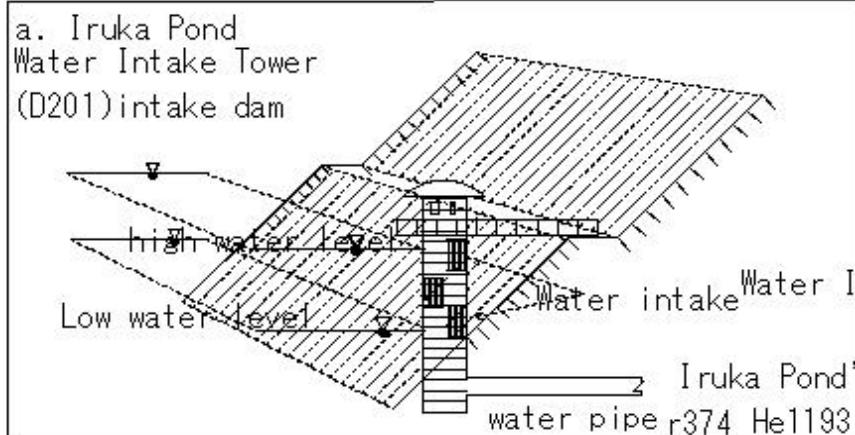
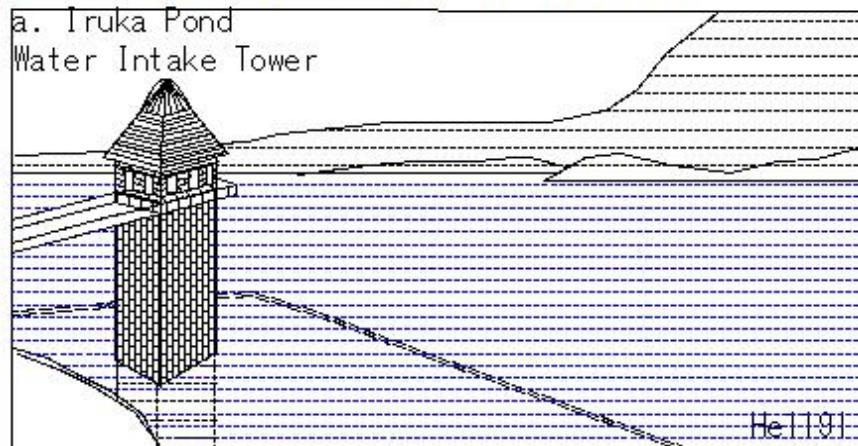


0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1193)Iruka Pond (Inuyama City, Aichi Prefecture)

(He1193) Iruka Pond (Inuyama City, Aichi Prefecture)

a. Iruka Pond
Water Intake Tower
A water intake tower designed
with Meiji Village in mind



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1194) Iruka Pond (Inuyama City, Aichi Prefecture)

(He1194) Iruka Pond (Inuyama City, Aichi Prefecture)

Iruka Pond's spillway

- ⑩ Iruka Pond's spillway (discharge channel on the right).
- ⑪ It joins the Gojo River downstream.
- ⑫ Normally, only water from the overflowing pond flows through.

He I 1190

He 1190

The map illustrates the complex embankment system of the Owari Fuji area. Key features labeled include:

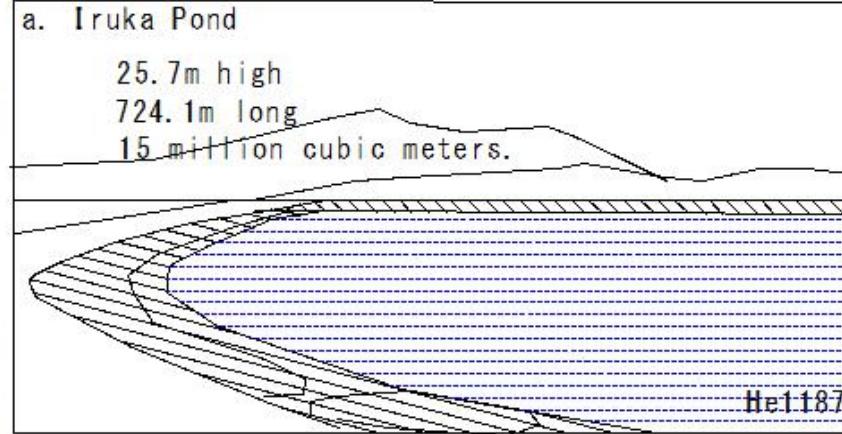
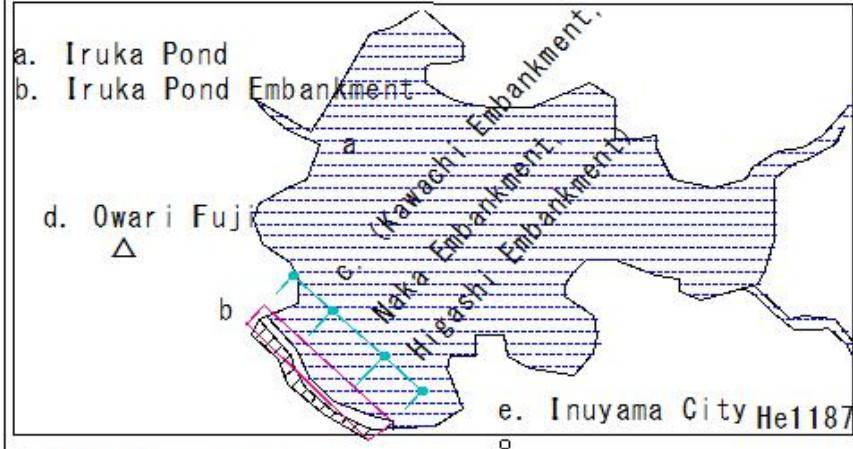
- a. Iruka Pond
- b. Iruka Pond Embankment
- c. Kawachi Embankment
- d. Owari Fuji
- e. Inuyama City He1187
- spillway

ne 194

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1195) Iruka Pond (Inuyama City, Aichi Prefecture)

(He1195) Iruka Pond (Inuyama City, Aichi Prefecture)



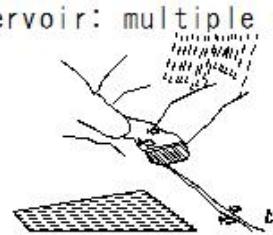
He1187

(I1381) Reservoir

a Hilly Reservoir: mountainous area, hilly region

b Flat Reservoir: flat area with dikes around it

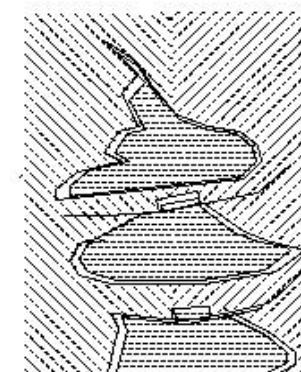
c Multiple Reservoir: multiple reservoirs on a site



a



b



c

I1381

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1196) Iruka Pond (Inuyama City, Aichi Prefecture)

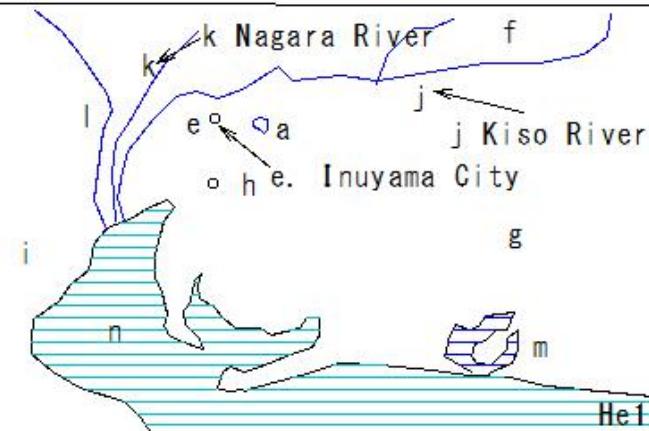
(He1196) Iruka Pond (Inuyama City, Aichi Prefecture)

a. Iruka Pond

Effective Use of Water and Iruka Pond

⑯ A biotope created at the mouth of the river flowing into Iruka Pond. Reeds have been planted to help purify the water.

He1196



He1188

a. Iruka Pond

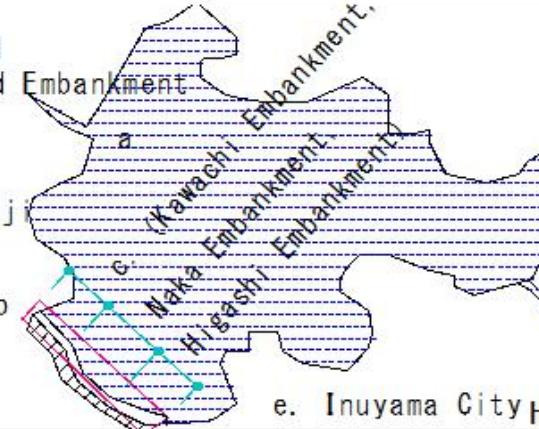
⑯ A biotope
Reeds
purify

He1196

a. Iruka Pond
b. Iruka Pond Embankment

d. Owari Fuji
△

b



e. Inuyama City He1187

∅ 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

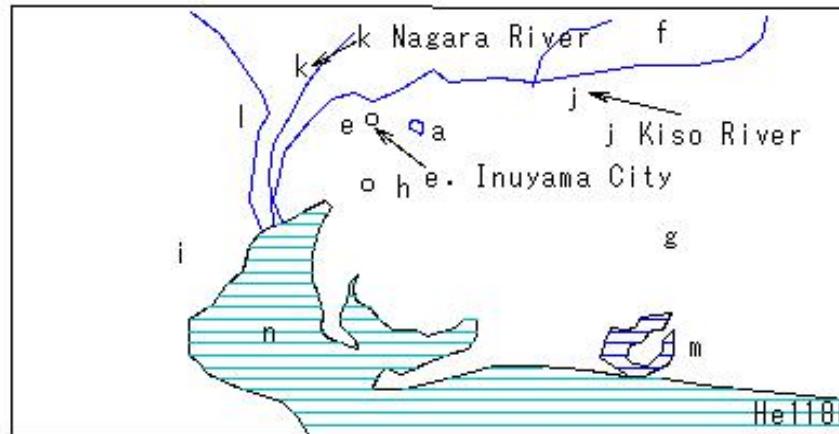
(He1197)Iruka Pond (Inuyama City, Aichi Prefecture)

(He1197)Iruka Pond (Inuyama City, Aichi Prefecture)

Rice paddies

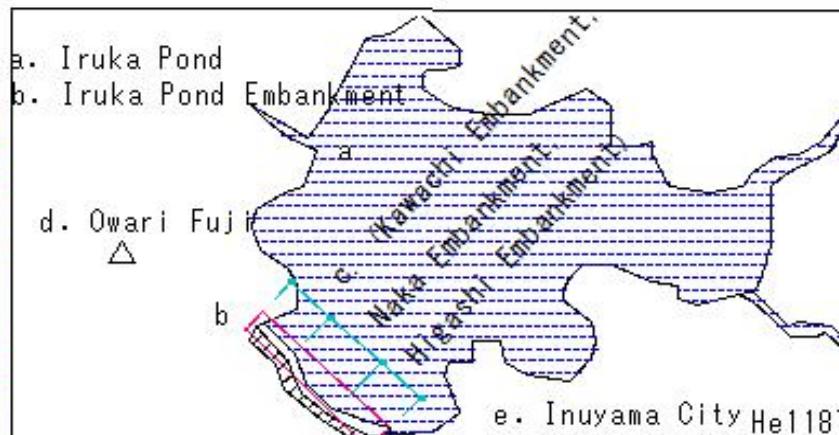
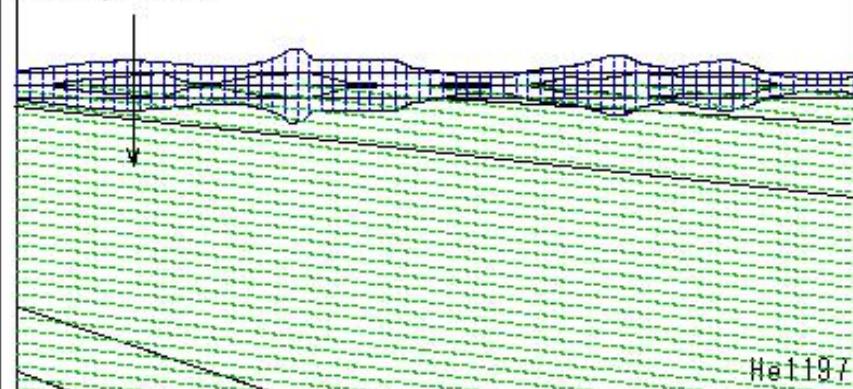
- ⑤Rice paddies were reclaimed thanks to Iruka Pond.
- ⑩Before the pond was built, this was a water-scarce wasteland.

He1197



He1100

Rice paddies



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

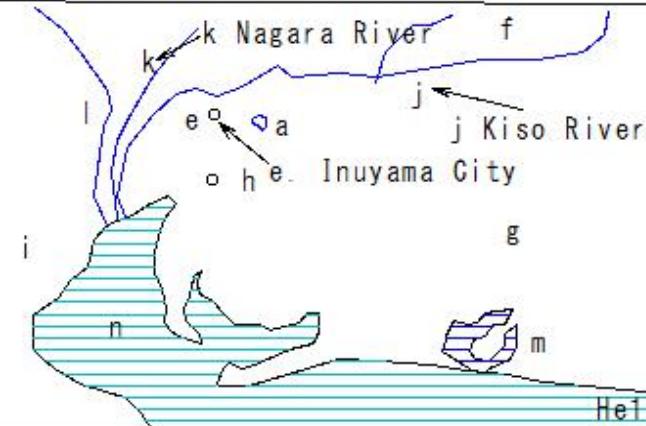
(He1198)Iruka Pond (Inuyama City, Aichi Prefecture)

(He1198) Iruka Pond (Inuyama City, Aichi Prefecture)

Inuyama Castle

⑯ Inuyama Castle was built using the Kiso River as a natural fortress.
⑯ Rather than the image of an impregnable castle from the Warring States period, the beauty of the castle, harmonizing with the gentle flow of the Kiso River, is what catches your eye.

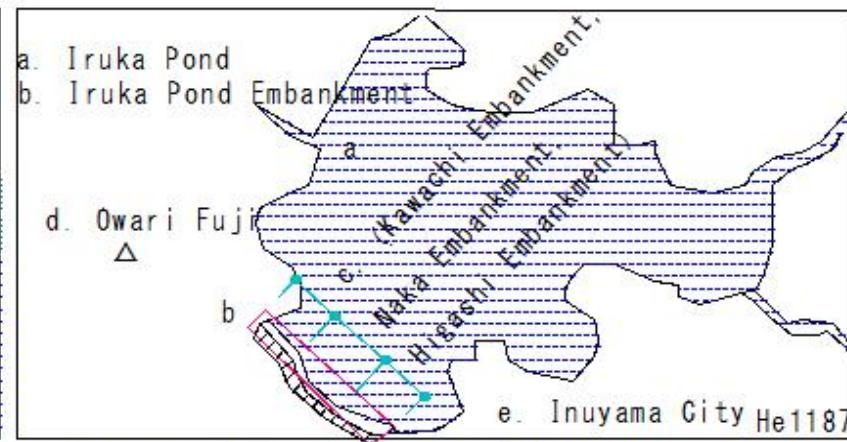
He1198



Inuyama Castle

j Kiso River

He1198



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

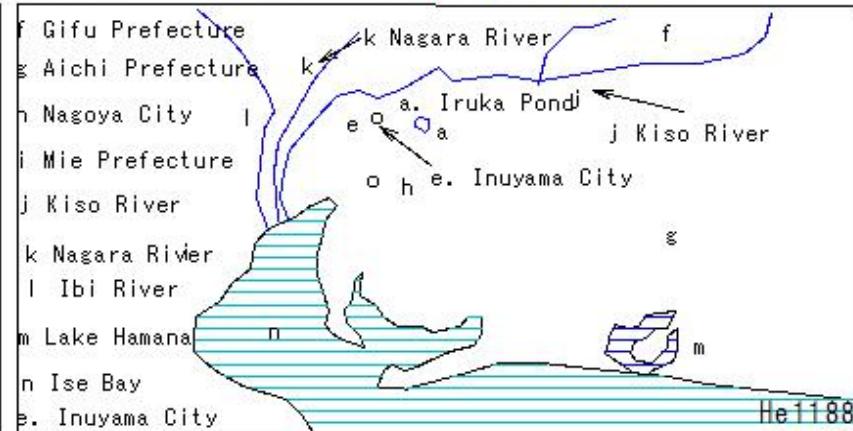
(He1199)Iruka Pond (Inuyama City, Aichi Prefecture)

(He1199) Iruka Pond (Inuyama City, Aichi Prefecture)

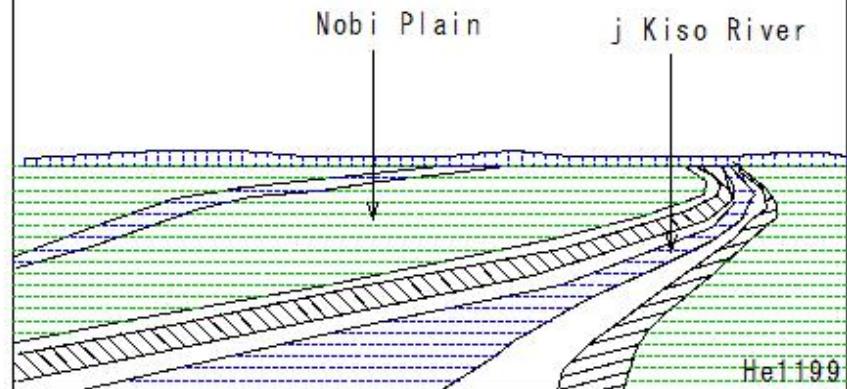
j Kiso River

㉑ The Nobi Plain, the second largest plain in Japan, was formed by the Kiso River.

㉒ The Kiso River was not once a single mighty river, but split into several streams.



Nobi Plain j Kiso River



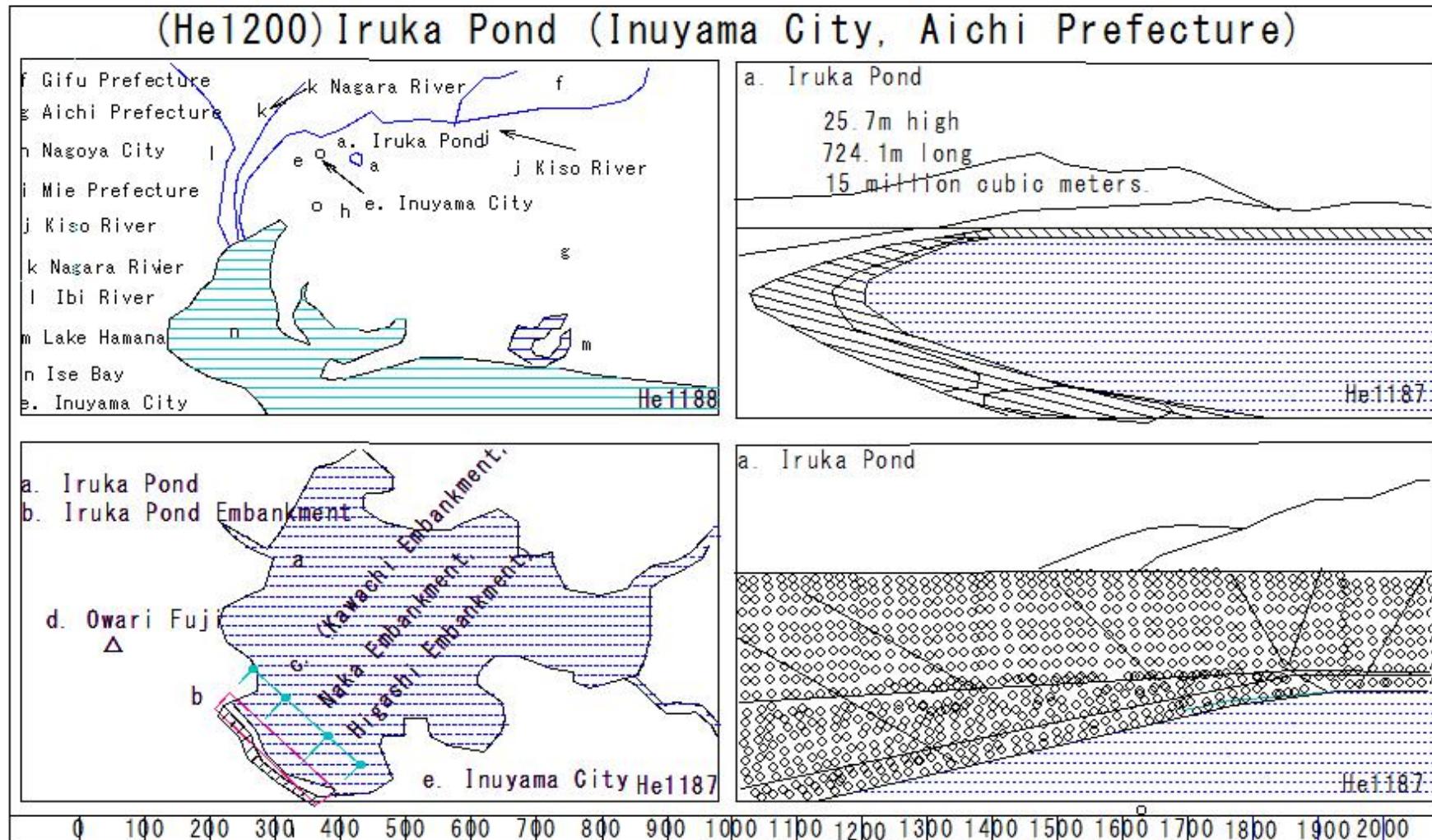
a. Iruka Pond
b. Iruka Pond Embankment

d. Owari Fuji

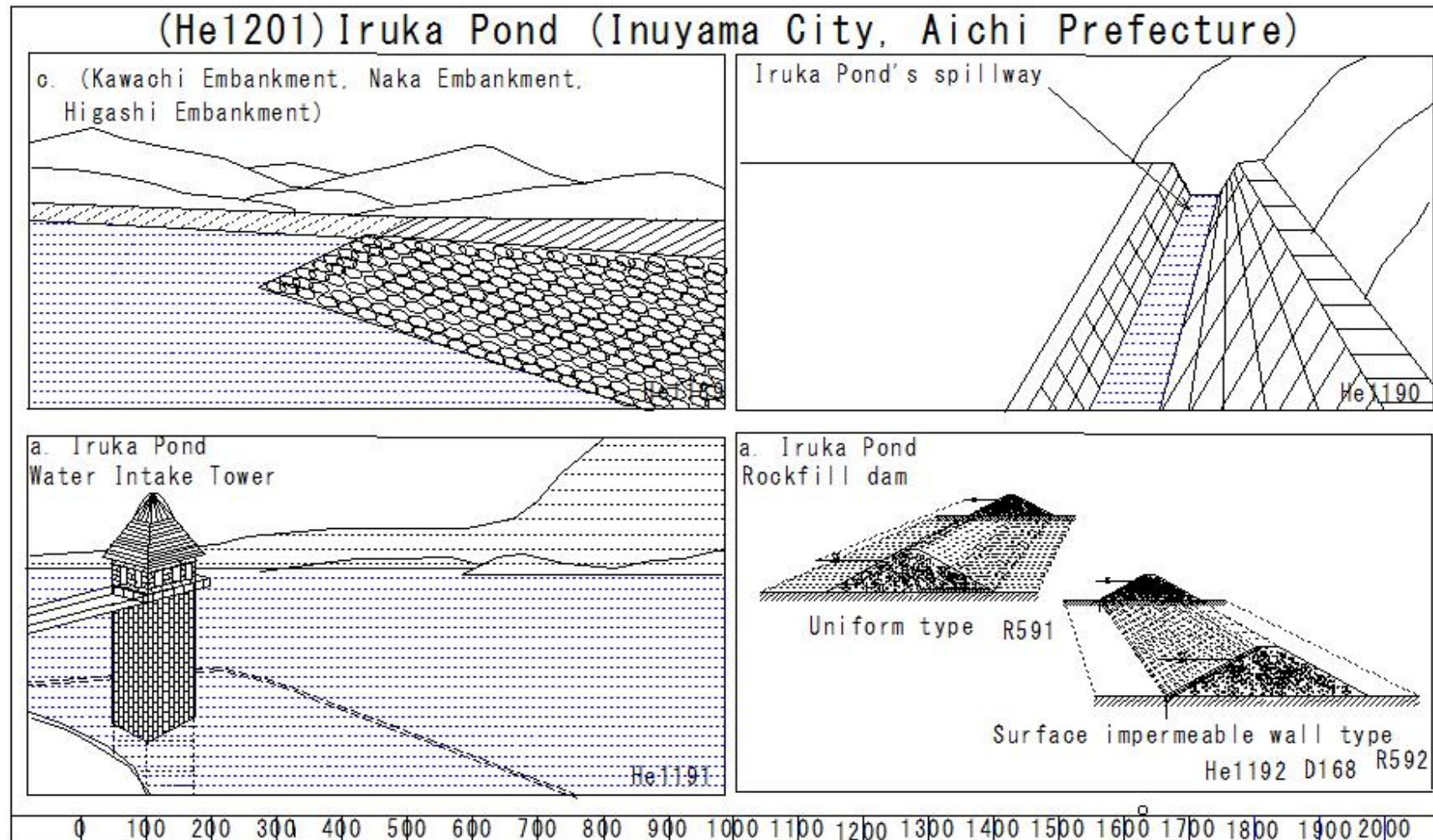
b



(He1200)Iruka Pond (Inuyama City, Aichi Prefecture)



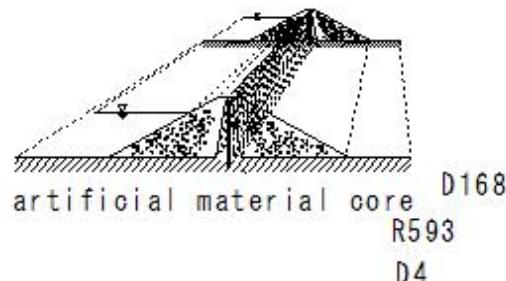
(He1201)Iruka Pond (Inuyama City, Aichi Prefecture)



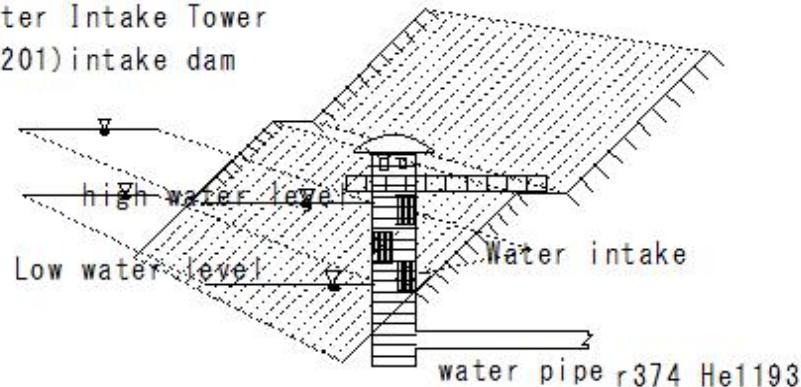
(He1202)Iruka Pond (Inuyama City, Aichi Prefecture)

(He1202) Iruka Pond (Inuyama City, Aichi Prefecture)

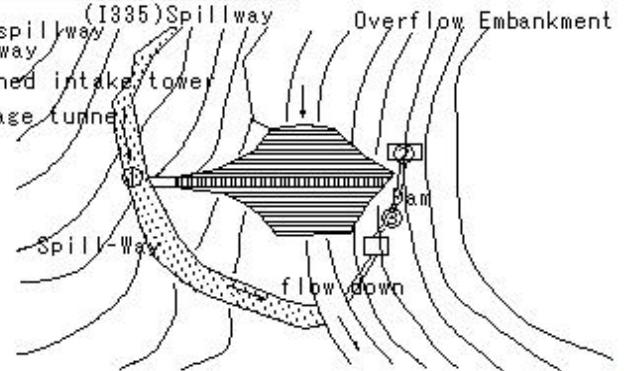
a. Iruka Pond
Rockfill dam



a. Iruka Pond
Water Intake Tower
(D201)intake dam

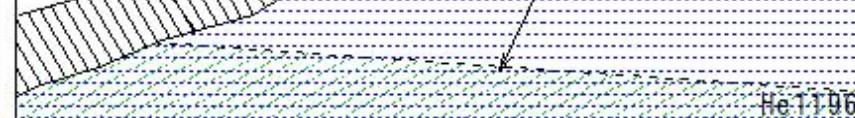


① Dam spillway
② Spillway
③ Inclined intake tower
④ Drainage tunnel
(I335)Spillway
Overflow Embankment



a. Iruka Pond

⑭ A biotope
Reeds
purify



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1203)Iruka Pond (Inuyama City, Aichi Prefecture)

(He1203) Iruka Pond (Inuyama City, Aichi Prefecture)

(I1381)Reservoir

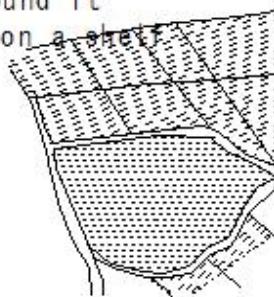
a Hilly Reservoir : mountainous area, hilly region

b Flat Reservoir: flat area with dikes around it

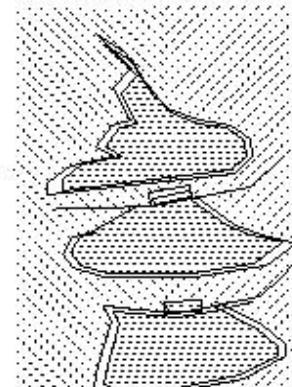
c Multiple Reservoir: multiple reservoirs on a shelf



a



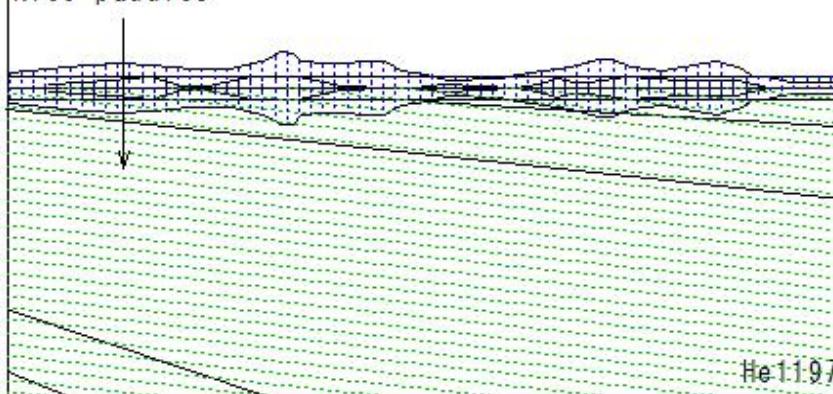
b



c

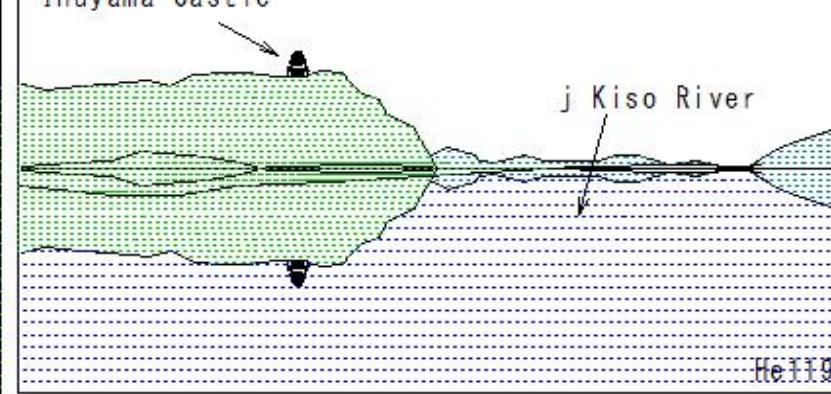
I1381

Rice paddies



He1197

Inuyama Castle

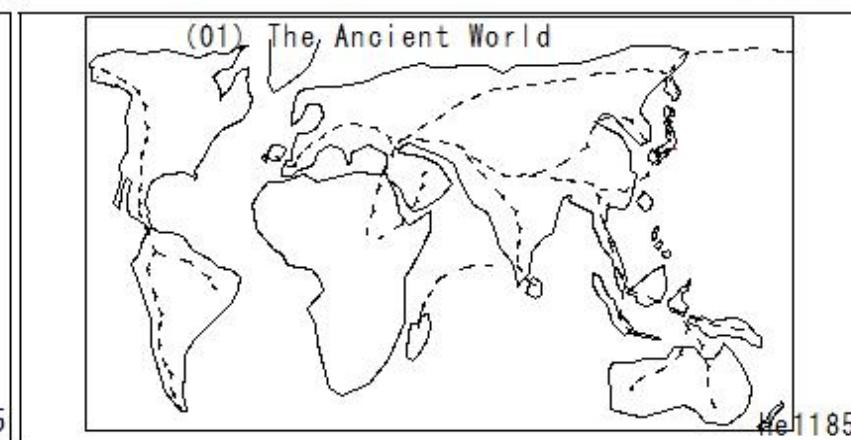
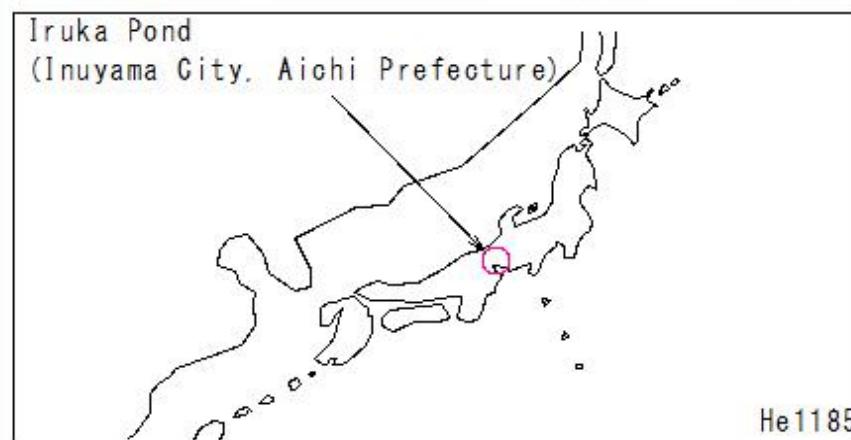
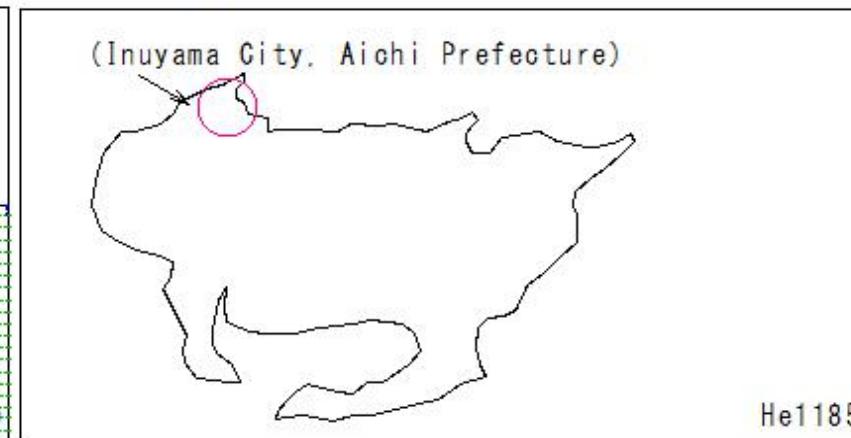
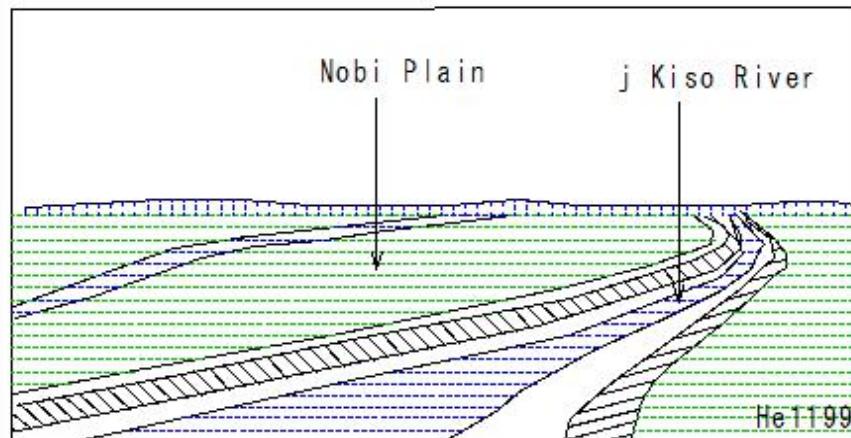


He1198

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

(He1204) Iruka Pond (Inuyama City, Aichi Prefecture)

(He1204) Iruka Pond (Inuyama City, Aichi Prefecture)



0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000