

# Outline of the Shinryu Head Works



**Midori Network**

Water and farmland protection

## Midori Network Shinryu

# 1. History

Land reclamation began in 1890 under the initiative of the Uryu Aristocratic Farm, headed by Prince Sanetomi Sanjo, who was an Imperial court noble and statesman, but the project ended with the prince's passing in early 1891.

Approximately 200 *tondenhei* farmer soldiers from the Fifth Company, who settled in the region in 1895 and 1896, reclaimed the uncultivated land returned from the aristocratic farm. At that time, locals had already succeeded in trial cultivation of paddy rice in Fukagawa and Kamui villages, and the local consensus was that paddy rice should be cultivated to ensure stability in farm management. To build necessary water-use facilities, two methods were available: a water storage and irrigation method and a method of conveying water from the Ishikari River. Unable to decide which method would be better, they requested the Hokkaido Government to research the matter and come up with a design for the facilities. Engineer Ushitaro Fuwa reported research results in May 1902, estimating the project cost at 375,000 yen. This price tag prompted them to give up the construction work.

However, several locals were inspired by the green ears of rice they saw turning into an undulating sea of gold in autumn in the neighboring Fukagawa District, and called on others to work together to establish an irrigation association on September 24, 1918. The establishment of the association was authorized on February 28, 1922.

The Hokkaido Government drew up an irrigation plan for the region in February 1924, and an overall implementation plan was finalized at a total project cost of 1.35 million yen. Specifically, the project covered a beneficial area of 2,632 *cho* (= approx. 2,610 ha) (including a beneficial area of 2,489 *cho* (= approx. 2,470 ha) that would draw water from the Ishikari River) and included a wicket gate, tunnels, underdrains and open channels, which stretched over 4,130 m, one siphon and eight main irrigation canals (53,900 m).

As a result of bidding on August 2, 1924, Usaburo Chizaki in Sapporo won the contract for the project, which was completed on May 5, 1927.

However, without levees, the intake facilities built failed to take in water as expected due to riverbed degradation. Various efforts were made such as the construction of a gabion coffer dam and the installation of concrete blocks. Even a gabion using grape ivy was invented during World War II. But all these structures were washed away. The huge sum of 8.49 million yen was invested in this unstable coffering. Furthermore, since the sand sluiceway was of a stop log type, it did not allow free opening and closing. As a result, sand was always deposited at the inlet, resulting in shortages of intake water.

To improve these situations, a government-operated irrigation and drainage project was implemented in the Shinryu District. The construction work that was started in 1952 included a head works 640 meters upstream of the old wicket gate, underdrainage (377 m), sand sluiceway (78 m), Harushinai River underdrainage (77 m) and a tunnel (150 m). The work was completed in 1962 (The Asahikawa Development and Construction Department took charge of the work from 1959).

Later, against the backdrop of increasing demands for the use of large machinery to achieve high productivity in paddy field management, the new Shinryu Head Works was completed in March 1990 after four years of work from 1986 to 1989 and at a cost of approximately 40.40 million yen in order to reorganize the unstable and complicated irrigation and drainage facilities and retrofit aged facilities in the region. Measures, such as the introduction of the deep ponding irrigation technique, were also taken to shorten the puddling period and modernize irrigation and drainage systems.

## 2. Irrigation Plan

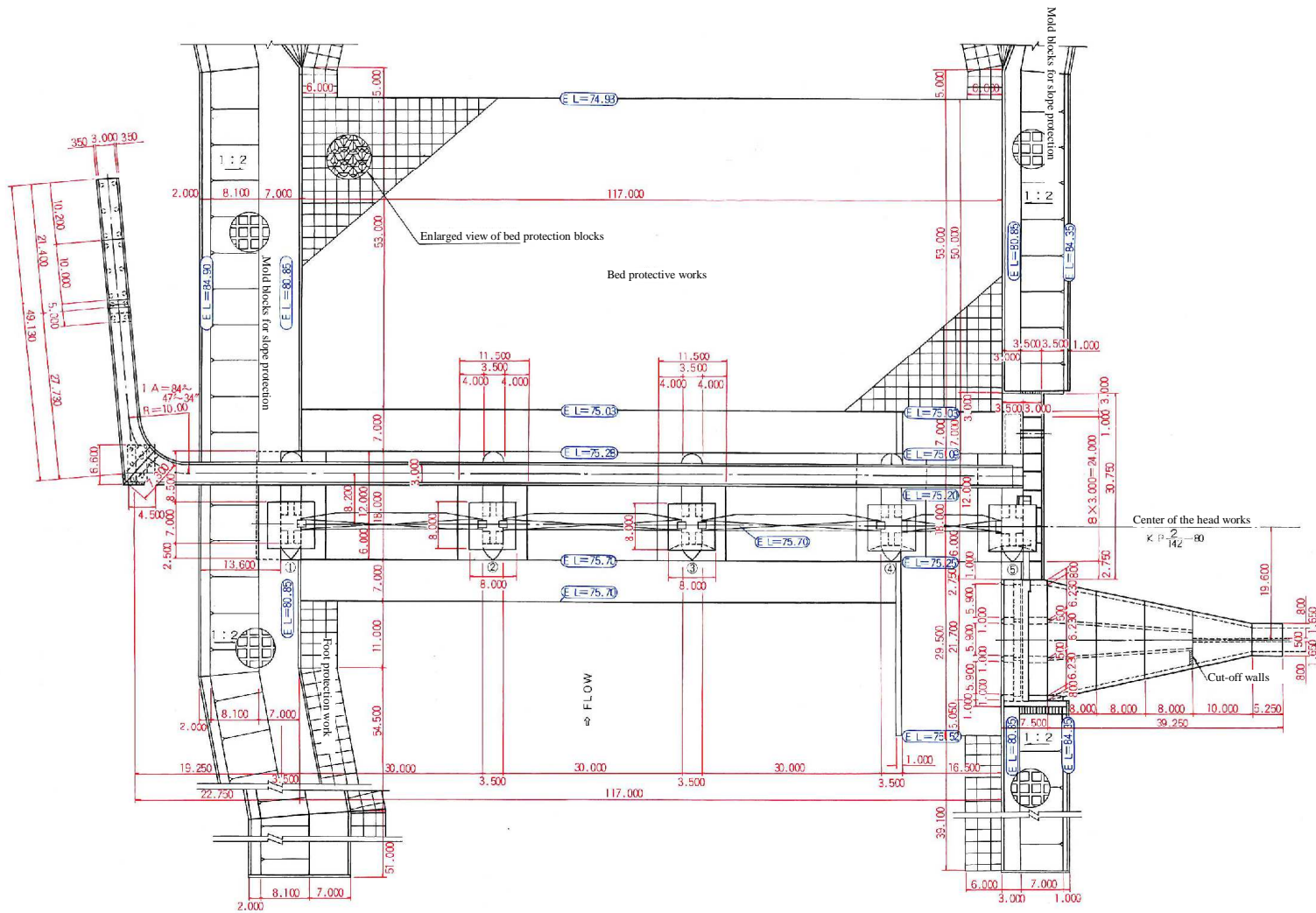
Municipalities	Current irrigation area (ha)	Current amount of irrigation water (m³/s)		Design irrigation area (ha)	Design amount of irrigation water (m³/s)					Remarks
		Puddling period	Ordinary period		Rice nursery period	Puddling period	Ordinary period	Deep ponding period	Ordinary period	
		May 10 - 25	May 26 - August30		April 21- May 5	May 6-20	May 21- June 30	July 1 - 10	July 11 - August 31	
Fukagawa City Asahikawa City Chippubetsu Town	2,422.2	13.700	12.500	2,972.2 (upland fields: 20.5)	11.527 (8.027) 【3.500】	11.527 (8.027) 【3.500】	11.527 (8.027) 【3.500】	11.527 (8.027) 【3.500】	11.527 (8.027) 【3.500】	Annual total water intake 130,530×1,000m³ (intake) 【For power】

## 3. Construction work outline

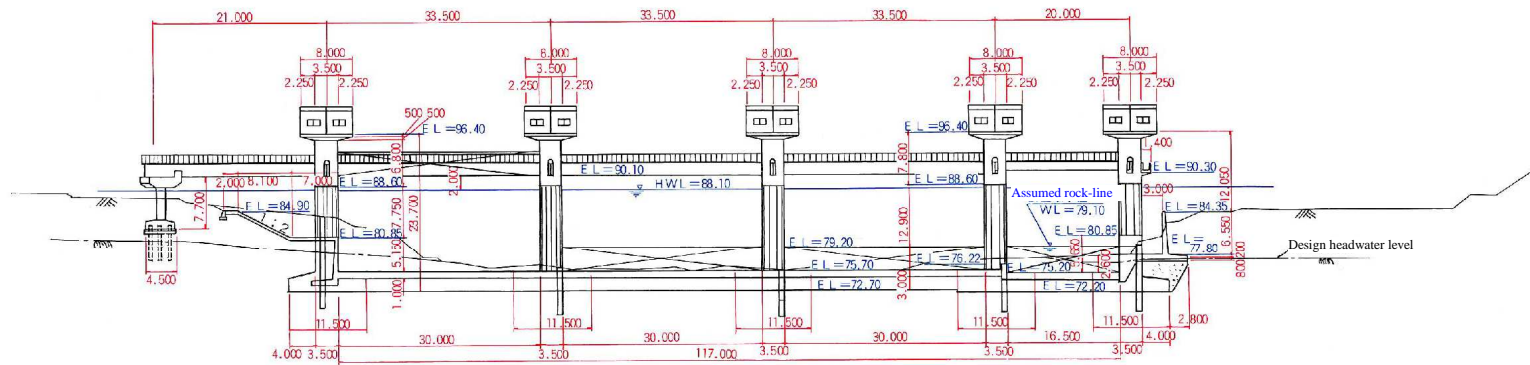
Place of construction	Category	River		Locations
		Name	Type	
	Head works	Ishikari River, Ishikari River System	Class A river (sections under direct control)	(Right bank) Kasuga 204 Banchisaki, Etanbetsu, Asahikawa, Hokkaido (Left bank) Kamikawa Chubu Forest Management Office 276 Rinpan I Shohan Chisaki, Harushinai, Kamui-cho, Asahikawa, Hokkaido
	Intake	As above (right bank)	As above	Kasuga 204 Banchisaki, Etanbetsu, Asahikawa, Hokkaido
	Presence or absence of basic planning for work implementation	<p>No improvement planning or embankment planning exists because this structure is situated in a narrow place. However, the design high-water level was calculated for the design high-water discharge based on the present cross section. The location where the head works is planned is a scenic spot known as Kamui Kotan and is connected to the Kamikawa Basin and the Ishikari Plain.</p> <p>It is a gorge with a rapid stream. A cycling road runs on the right bank of the river and National Route 12 stretches on the left bank.</p> <p>1) The river course from the intake is linear with stable foundation ground and a water route.</p> <p>2) Swellhead intake has no impact on upstream areas.</p> <p>3) Implementation, operation and maintenance are easy, work can be implemented during irrigation periods, and sufficient space is available for the forebay.</p>		
River channel planning	Design flood discharge, etc.	Flood discharge	Flood water level	River bed elevation
		6,000 m³/s	88.10 m	75.70 m
				River bed gradient
				1/320



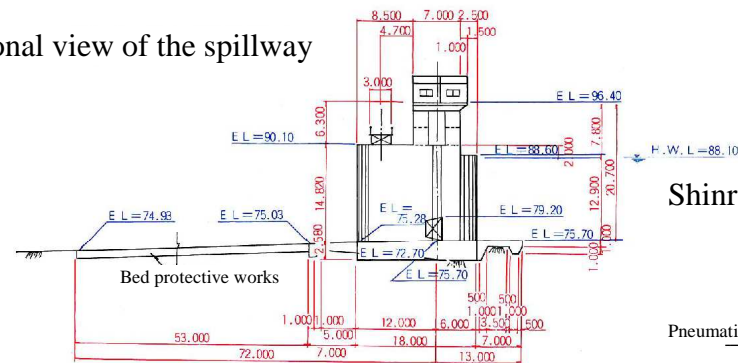
### Plan view of the head works



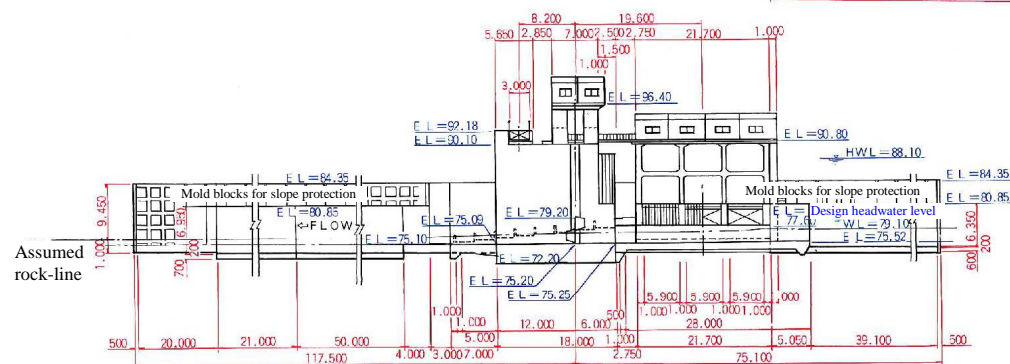
### Front view of the head works



### Sectional view of the spillway



Sectional view of the sand



Shinryu Main Head Race (tunnel section)

$$Q_{max} = 21.165 \text{ m}^3/\text{s}$$

$$L = 3.3 \text{ km}$$

