

SAFE-RELAXING YASURAGITEI EMBANKMENT

**BRINGING THE WATER'S EDGE
CLOSER TO YOU.**



**A Summary of
The Shinano River Main Downstream Improvement Project.**

Hokuriku Regional Development Bureau
Shinanogawa-Karyu Work Office

Introduction

The lower reaches of the mainstream Shinano River are located at the seaward section of the Shinano River basin area, flowing through the center of Niigata City, the largest city on the Sea of Japan.

Here at Shinanogawa-Karyu Work Office it is our aim to make improvements that protect the city of Niigata from flooding and also keep the river flowing smoothly and safely. With this aim in mind we commenced work on the downstream section of the river in 1983. While protecting the area from flood damage, the work on the downstream section also creates a pleasing waterside environment which features a gentle 5 degree sloping embankment, which is the first of its kind to be seen nationwide. From 1987, the left bank of the river began to be widely used by the citizens of Niigata and the name Yasuragitei was given to this recreational facility, across which the JR Echigo line passes.



* The expression Main Downstream refers to the area located in the section of the Shinano River between Sekiyabunsuiro (the Shinano River Flood Gate) and the estuary of the Shinano River. (Yasuragitei) has been constructed in the area between Bandai Bridge and the Shinano River Flood Gate.

Yasuragitei, Protecting The City Against Flooding Has Brought The Citizens Down To The Water's Edge.

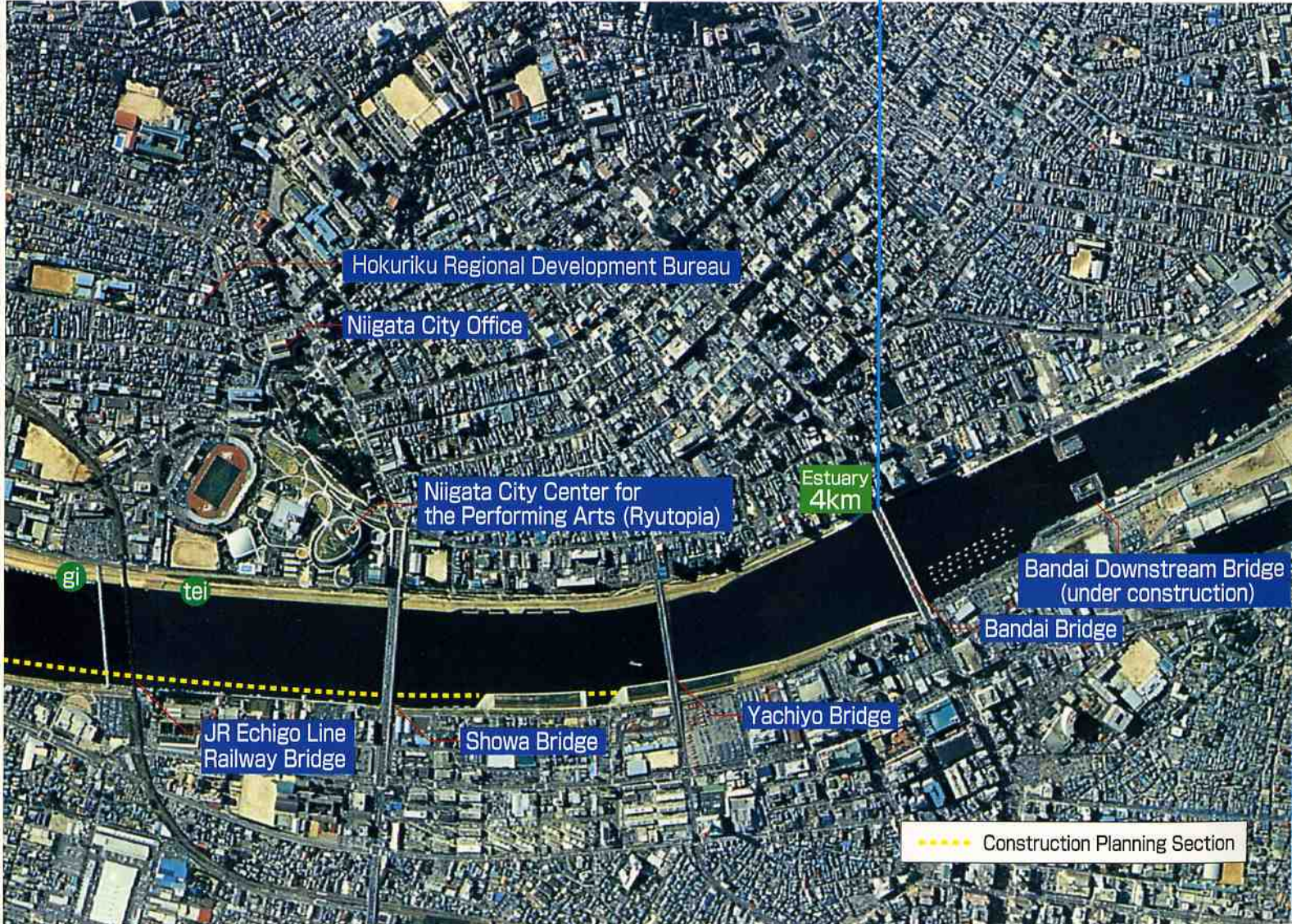


Pre-construction



Post-construction

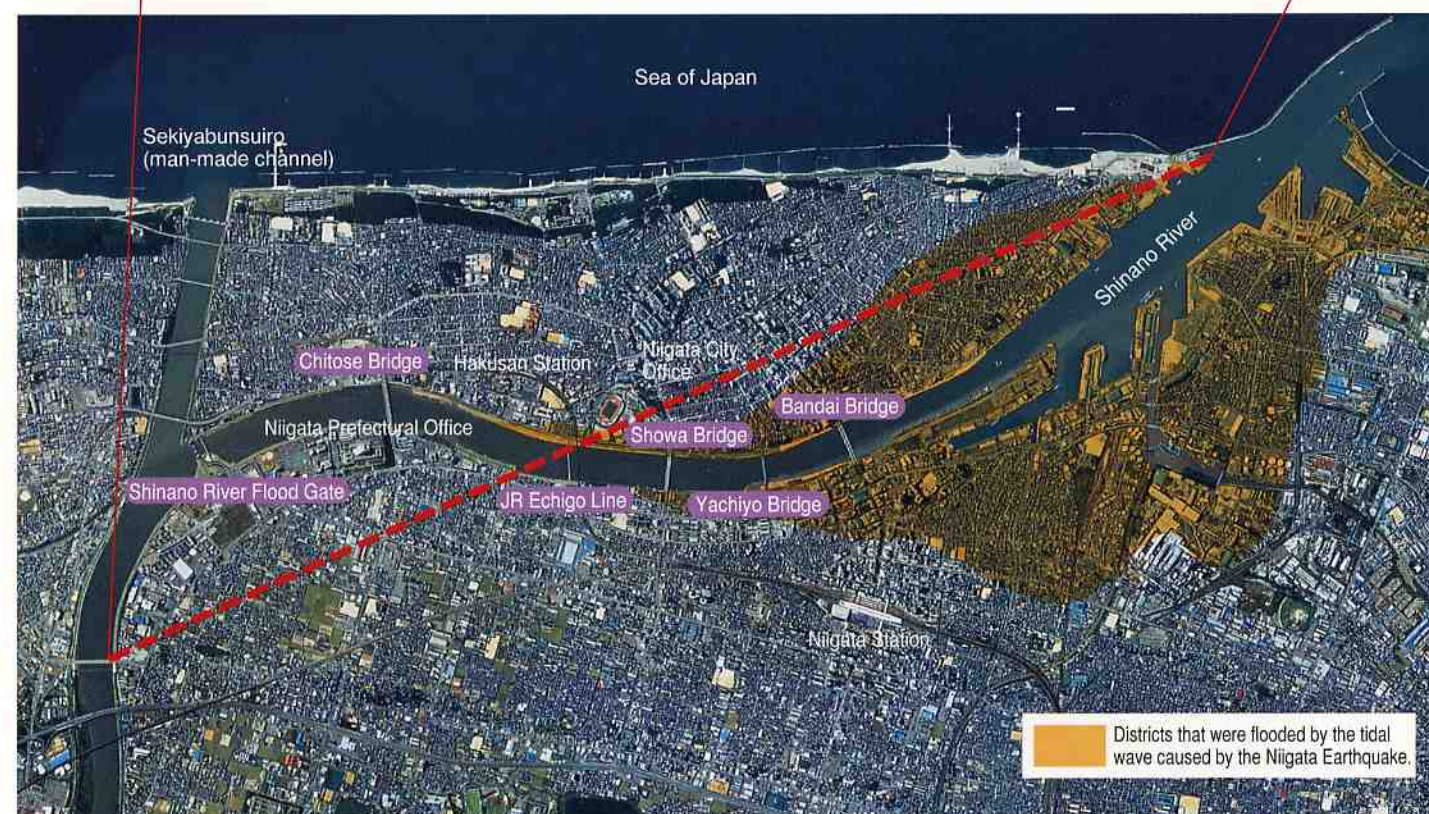
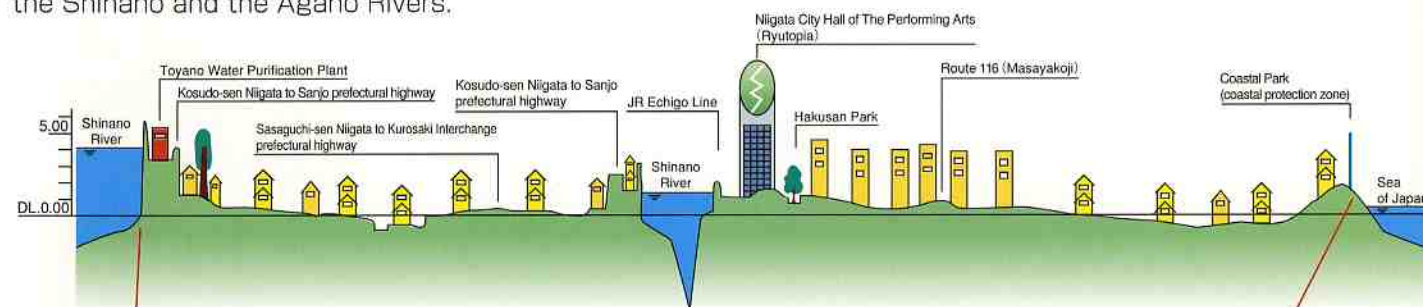
Main Downstream Improvement Area (length approximately 4.5km)



Yasuragitei Protecting the Region.

Special characteristics of the topography of Niigata City.

Added to the fact that the city of Niigata, through which the main downstream of the Shinano River flows, has always been a low lying district, between the years of 1955 and 1975 there was a great deal of land subsidence, sea levels rose and there are many areas where the land level lies below the water tables of both the Shinano and the Agano Rivers.



Looking Back at Niigata Earthquake.

In The Niigata Earthquake, which took place in 1964, river embankments and revetment were damaged by the earthquake and then assaulted by both a tidal wave and the reverse flowing of the Shinano River, the height of which also rose to flow over the dikes and inundate areas of the city.

In low lying areas the water did not recede for a period of about a month. This caused serious problems regarding transportation, business city facilities and the daily lives of the citizens.

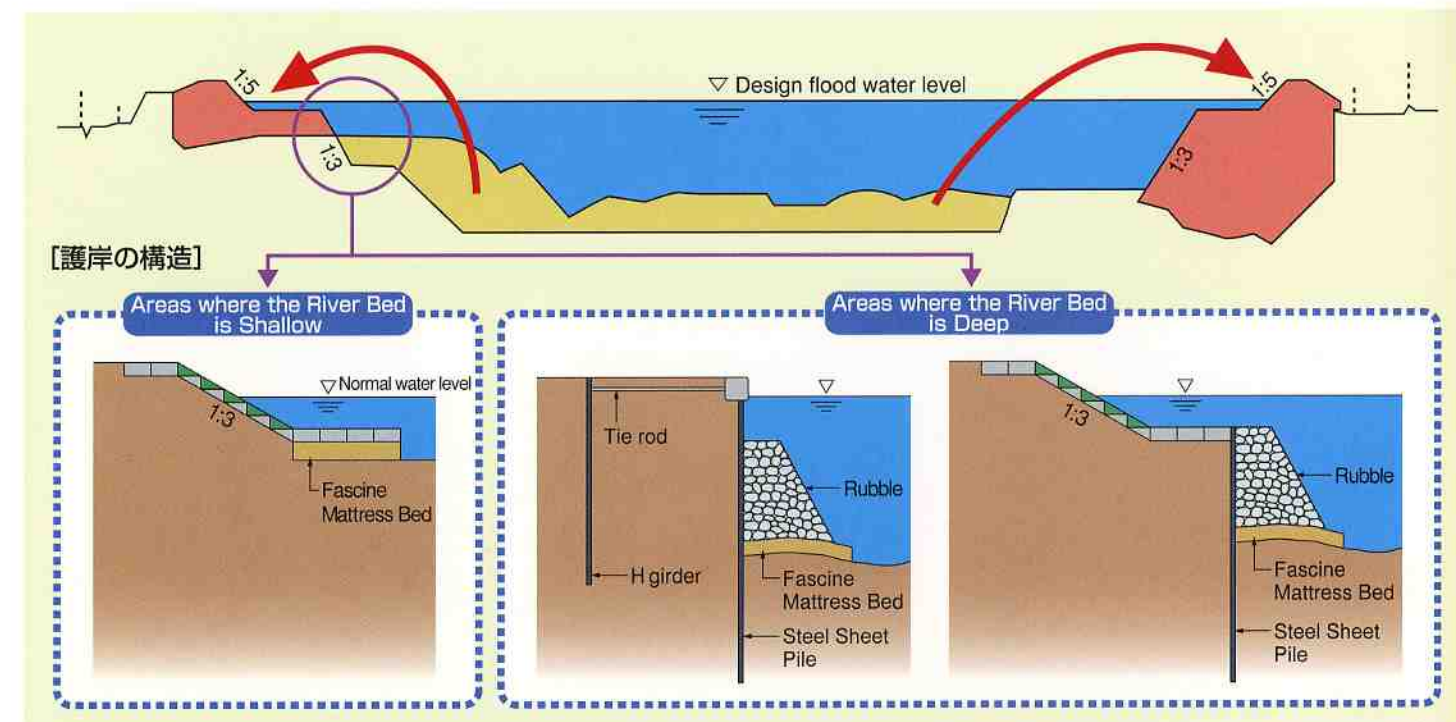


A scene of the tidal wave surging towards the city (courtesy: Niigata District Weather Center)

Flood Countermeasures.

The existing embankments and revetment of the main downstream of the Shinano River, were created during restoration measures implemented following the 1964 Niigata Earthquake. Coupled with the fact that the height and width of existing barriers was insufficient, was the danger of flooding caused by the natural erosion and aging of these barriers due to land subsidence.

A plan was put into operation by the Shinano River Main Downstream Improvement Project. This plan would raise the height of embankments and ensure that 1,000m³/s of design flood discharge could be safely channeled. In physical terms, this would mean dredging the river bed and using the silt to raise the level of the embankment, this improvement would serve to widen the flow of the river while also allowing it to flow more freely and safely.



Earthquake Countermeasures

At the time of the Niigata Earthquake almost all of the embankment along the main downstream area of the Shinano River suffered damage due to a phenomenon known as soil liquefaction. Because of this, we adopted the use of an embankment with a gentle slope of 1 in 5, which has been shown to be effective against earthquakes. We also carried out construction operations to counter the liquefaction phenomenon experienced at the time of the earthquake.

Furthermore, for effective earthquake resistant countermeasures and inspections, and to more fully understand the special characteristics of earthquakes we have established a seismograph with the aim of gathering fundamental information and earthquake observation.



Immediately following Niigata Earthquake, the embankment has been destroyed due to earthquake and tidal wave activity.



A scene of Yasuragitei, following improvement work.

Everyone's Yasuragitei

While Yasuragitei was created to perform the very important function of protection from damage caused by flooding, it also serves as a precious waterside park right in the center of the city. Structurally it is the first of its kind nationwide, which utilizes a gentle one in five slope that is almost imperceptible, this not only gives protection against rising water levels but also allows many possibilities for recreational use. At the water's edge such facilities as steps and stepping-stones have been provided to allow people to get closer to the water.

Furthermore, we took great care in asking the citizens of Niigata for input regarding the scenic aspects of Yasuragitei. Surrounding the embankment, prefectural and city authorities collaborated in providing such facilities as a cycling path and Yasuragitei Green Belt. Yasuragitei is continuing as the symbol to represent Niigata City as 'The City of Water'.



Against the backdrop of Bandai Bridge, revetment that is also easy on the eye.



Ryutopia a beautiful roof-top garden built by the river in the attractive surroundings of Yasuragitei.

As a Relaxation Spot



With Bandai Bridge in the background a mother takes a break with her children.



Children gather at the water's edge.

As an Event Venue.

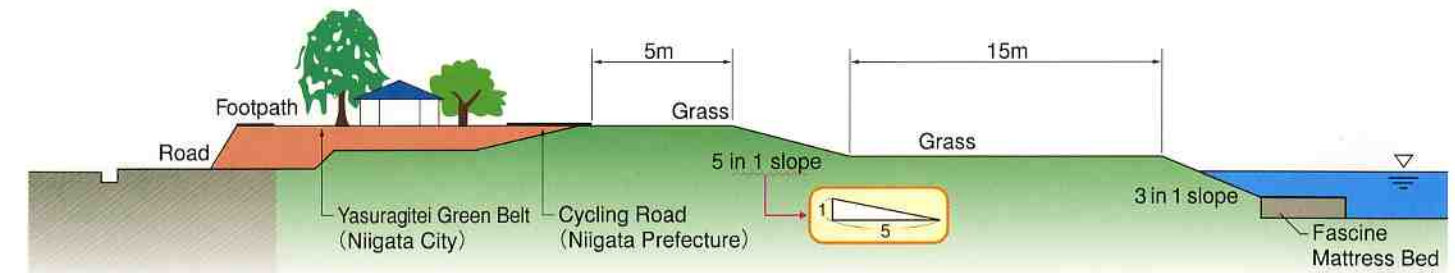


The Shinano River Festival, held in August of every year.



Thanks to the facilities provided by Yasuragitei the river has become an important and much used place of recreation.

A cross section of Yasuragitei



Winning the 1998 award for city sights, Yasuragitei is representative as one of the best local attractions.

Preservation of the River's Flora and Fauna.

● Preservation of the Nagoyasanae Dragonfly.

At Yasuragitei, we created an environment that also preserves the natural habitat of the creatures living in and around the river.

The Nagoyasanae Dragonfly is a dragonfly which makes its home in the lower reaches of large rivers. As it is a species of dragonfly that is rarely seen in flight it has earned the name of the 'Phantom Dragonfly'. Because the lower reaches of the Shinano River have been confirmed to be an important breeding habitat for the Nagoyasanae Dragonfly, we employed the use of fascine mattress fence in the construction of the embankment.



Nagoyasanae Dragonfly (courtesy of: Mr. Katsuhisa Hayashi)



A Nagoyasanae Dragonfly emerging from its cocoon on the fascine mattress fence.

● Construction of the Fascine Mattress Barriers.

The method of construction used in the making of the fascine mattress Bed is a traditional one used in waterways that strengthens the river's edge against the natural flow of the water. Because it creates an underwater environment, it is useful in creating a living environment for creatures which inhabit the river.



● Trials to Find Methods of creating a "nature-rich" River

Considering the problem of creating a harmonious environment with the lower reaches of the mainstream Shinano River, on the facing edge of the embankment we planted a species of reed known as "Himegama", one that is indigenous to the lower reaches of the Shinano River.





Supervision. Publication

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Published June 2000