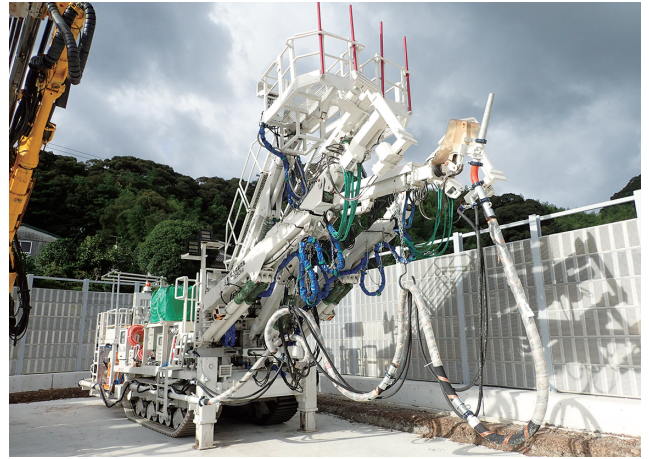


Tunnel Construction Machinery and Facility



Drill Jumbo

A drill jumbo is equipped with rock drill carriages to make a hole in the bedrock at the head of a tunnel.



Concrete Sprayer with Erector

A machine to build in a tunnel-shaped H steel, and spray and solidify concrete to the surroundings.



Wheel Loader

A machine to scoop and load the debris into a dump truck by horizontal movement after blasting the bedrock.



20-ton Dump Truck

A machine that can take out the debris twice as much as the ordinary dump truck at once.



Batcher Plant

A facility to make concrete and supply it to the working face of a tunnel around the clock.

Initiatives for Infrastructure Tourism in Japan

In addition to Kusaka River New Spillway, the Ministry of Land, Infrastructure, Transport, and Tourism is making a progressive approach toward developing more attractive internal tours of infrastructure facilities and construction sites throughout Japan.

For more information, please visit the Infrastructure Tourism Portal Website...Search by "infrastructure tourism"

Yanba Dam

Gunma



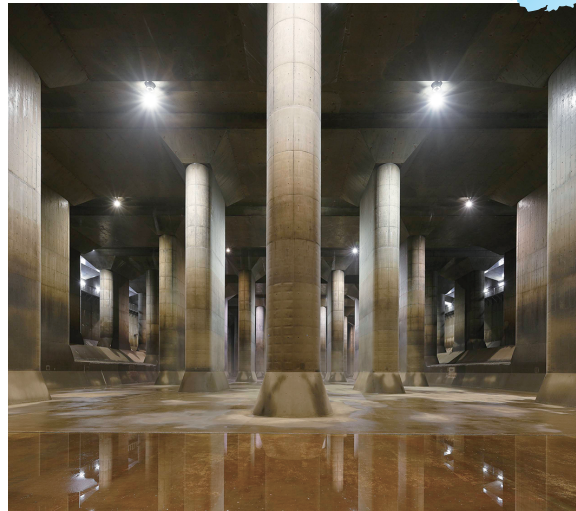
Yanba Dam is the latest dam that started operation in April, 2020. Amphibious buses, sightseeing boats, canoes, and SUP will be in service in the future.

(Contact)

Naganohara Town Hall: 0279-82-2244

Metropolitan Area Outer Underground Discharge Channel

Saitama



Three types of courses are available to see the interior of the gigantic "Disaster Prevention Underground Temple."

(Contact)

Tour Reception at Metropolitan Area Outer Underground Discharge Channel: 048-747-0281

Akashi Kaikyo Bridge

Hyogo



Experience a 360° panorama view of the world's longest suspension bridge from the 300-meter high main tower.

(Contact)

Bridge World Office: 078-784-3396

Yunishigawa Dam Amphibian Bus

Tochigi



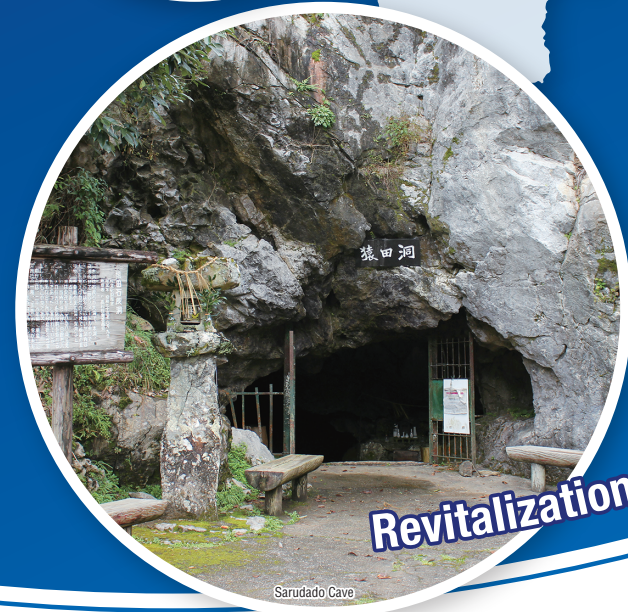
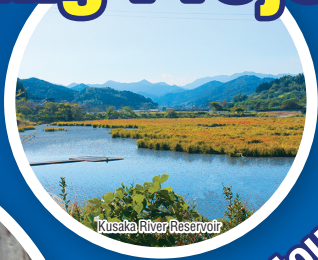
The open-air bus dives directly into the dam lake for sightseeing. You can also visit the inside of the dam.

(Contact)

Yunishigawa Duck Tour: 0288-78-0345



"Kusaka River New Spillway" in Hidaka Village, Takaoka District, Kochi Prefecture Attractiveness Boosting Project



Revitalization of new tourism in Kochi by infrastructure tourism



What is Infrastructure Tourism?

Infrastructure tourism enhances people's understanding of infrastructure by providing "extraordinary" tours to visit the interior of infrastructure facilities normally inaccessible or the scenes behind construction sites visible only momentarily. By doing so, it brings people to the region to revitalize the local community. We have been trying to connect various tourism resources all over Japan with infrastructure facilities and create new sightseeing tour routes. In infrastructure tourism, we will enhance the value of infrastructure facilities as a tourism resource together with local people by making a tour of infrastructure facilities more enjoyable and easier to understand. Why don't you step into the world of infrastructure tourism to have such an "extraordinary" experience?

Kusaka River New Spillway is taking on a challenge of "next-generation infrastructure tourism."

We are struggling to convey the appeal of infrastructure facilities by employing various devices.

Kusaka River New Spillway has been designated as a model facility of the "Infrastructure Tourism Attractiveness Boosting Project" of the Ministry of Land, Infrastructure, Transport and Tourism, and is among the first to research the ideal way of next-generation infrastructure tourism.

We are planning a tour to introduce and provide an opportunity to learn the process of transition from the construction stage to the management stage including the relationship between infrastructure facilities such as spillway and overflow pond, and flooding damage by visiting the construction site of one of Japan's largest aqueduct tunnels in concert with the tourism resources around the Niyodo River such as Niyodo Blue.

Aha! This and that about the Kusaka River New Spillway.

Q. Why was the Kusaka River New Spillway was planned?

A. Since the riverbed slope of the Kusaka River is very mild at about 1/3000, the rainwater does not flow down to the Niyodo River easily causing frequent floods. There have been two spillway tunnels already but in August of 2014, a series of typhoons hit the area, and the flood caused extensive damage. In the aftermath, a new spillway was planned in 2015.

Q. What's the plan?

A. **Scale:** Tunnel length 5130m, Intake channel 200m, Outfall
Content: <Tunnel> rock drilling, mine timbering, lining concrete, waterproofing work, pipe roof construction
 <Intake> channel works, regulating gate, screening, soil stabilization, etc.
 <Outfall> channel works, connecting work, soil stabilization, etc.

Q. When will it be completed?

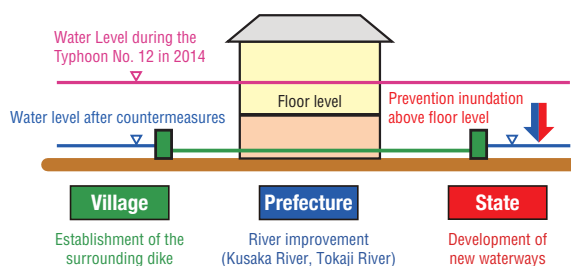
A. It will be completed in FY 2022.

Q. What will happen when it is completed?

A. We may prevent flood damage that is similar to the damage by inundation above floor level which was caused by the typhoons in August 2014.

In addition, when this spillway tunnel is completed, it will be the sixth in the Niyodo River basin. That makes the Niyodo River the No. 1 in Japan because it has more spillway tunnels than Tone River equipped with the Metropolitan Area Outer Underground Discharge Channel, and also it has the longest total extension of about 18.5 kilometers.

■ Illustration of effect after the countermeasure



Contact

**Shikoku Regional Development Bureau, MLIT
 Kochi Office of River and National Highway**

96-7, Rokusenjicho, Kochi City, Kochi, 780-8023
 TEL.088-833-7631 FAX.088-833-9309

Points of Interest near Kusaka River New Spillway

Sarudado Cave

Saruda-do

It is a limestone cavern with a total expansion of 1420 meters. The legend has it that this is a place for training for a famous ninja, Kusaka Mohei. Part of the cavern of about 200 meters is open for exploration, and guided tours are available.

It is thrilling to walk through the coolness of the cavern and observe the natural landform. Ask about a guided tour at the Hidakamura Tourism Association.



Sarudado Cave
Photo: Hidaka Village Board of Education

Contact

Address: 1619, Hidakamuraokina, Takaoka District, Kochi
TEL: 0889-24-5115 (Hidaka Village Board of Education)
0889-24-5888 (Hidakamura Tourism Association)

Niyodo River

Niyodo-gawa

It is a class A river that flows from Ehime Prefecture to Kochi Prefecture, and its source is on Mt. Ishizuchi, the highest peak in western Japan. In Ehime, the river is called Omogo River, and in Kochi, the Niyodo River. Because it is often ranked as No. 1 for the quality of the water and river utilization rate, and people call it a "River of Miracle," and its water has its own name, "Niyodo Blue" for the beautiful and mysterious blue color.

Today, Ayu fishing, camping, and other water activities such as canoeing, SUP, and rafting have become popular, and in Hidaka Village, people enjoy SUP and houseboat cruising, which is only available here.



Ejirikawahara
Photo: Hidakamura Tourism Association

Kusaka River Overflow Pond

Kusaka-gawa Chosei-ike

The Kusaka River Overflow Pond is one of the largest marshlands in Kochi Prefecture. You can observe seasonal flowers and wild birds in the marsh and near the water.

From January to March, many wild birds visit to spend the winter, so a long walk in winter is highly recommended. Guided tours of Medaka Pond are also available. For more information, please visit the Village Tourist Information Center HIDAKA.



Kusaka River Overflow Pond
Photo: Hidakamura Tourism Association

Contact

Address: 2646-2, Hidakamurahongo, Takaoka District, Kochi
(MEDAKASAN-NO-IE or House of Killifish)
TEL: 0889-24-5888 (Hidakamura Tourism Association)

Hidaka Village Omelet Rice Road

Hidaka-mura Omu-raisu Kaido

In Hidaka Village, nine restaurants serve omelet rice using fruit tomatoes made in the village.

If you participate in the Stamp Rally to collect stamps at the designated spots, you may get luxury benefits. (Held annually: June to March of the following year.) Why don't you join it and find your favorite?

Please visit the Omelet Rice Road website.
<https://www.hidaka-omuraisu.info/>



Green Feel
(Omelet-Rice with Fruit Tomato Sauce)
Photo: Hidakamura Tourism Association

Contact

Address: 1889-1, Hidakamurashimobun, Takaoka District, Kochi
TEL: 0889-39-2000

Village Station HIDAKA shop

Mura-no-eki HIDAKA

If you are looking for a perfect souvenir, this is the place you go! You will find many locally-grown vegetables and fruits of Hidaka Village and Kochi Prefecture. Also, there is a wide range of products such as bento lunch boxes, side dishes, souvenirs, sweets, and so on and so forth. From November to June, special fruit tomatoes and mini tomatoes will be ready for you.

Hours: 8:00-18:00 Closed: 31st December, afternoon to 2nd January
Parking available (also for coaches)



Village Station HIDAKA shop
Photo: Village Station HIDAKA Co., Ltd.

Contact

Address: 1478-9, Hidakamurahongo, Takaoka District, Kochi
TEL: 0889-24-5199

Omura Shrine

Omura Jinja

Omura shrine is positioned as a secondary shrine of the old state of Tosa after the Tosa Shrine located in Ichinomiya in Kochi City as the primary shrine. It was built in 587 and has a history of more than 1,400 years, and a national treasure called "Kondoso-kanto-tachi," meaning a gilt bronze sword with ring pommel is open to the public only at the annual grand festival on the 15th, November. Senbon-sugi (Thousand Cedars) stand along the entrance path to the shrine, and the area is known as a sacred place protected by a sacred tree.



Omura Shrine
Photo: Kochi Office of River and National Highway

Contact

Address: 1794, Hidakamurashimobun, Takaoka District, Kochi
TEL: 0889-24-7466

Nagoya Submersible Bridge

Nagoya Chinka-bashi

A bridge between Hidaka Village and Ino Town is essential for the residents as a community bridge. It is called a "submersible bridge" because the bridge sinks under the water when the river is flooded during a typhoon. It is the longest submersible bridge, and the downstream of the Niyodo River. It is also a popular photo spot.



Nagoya Submersible Bridge
Photo: Hidakamura Tourism Association

Contact

Address: Hidakamuranagoya, Takaoka District, Kochi
TEL: 0889-24-4647 (Hidaka Village Industry and Environment Section)

Hidaka Main Shop, IMOYA KINJIRO

IMOYA KINJIRO Hidaka Honten

The headquarters of a potato confectionery specialty store that runs retail shops directly all over Japan. The amount of the production of Imokenpi (sweet potato chips) accounts for about 50% of the national market. There are a variety of original potato sweets that can only be tasted at stores, such as freshly fried Imokenpi and freshly baked sweet potatoes.



Imokenpi
Photo: Hidaka Main Shop, IMOYA KINJIRO

Contact

Address: 573-1, Hidakamurahongo, Takaoka District, Kochi
TEL: 0889-24-7476

Accommodations

Eat & stay Tomatoto

Eat & stay Tomatoto

Eat & stay Tomatoto is a guest house located within an 8-minute walk from the Niyodo River of Kochi Prefecture, and all rooms are private rooms. There are four rooms and each accommodates a maximum of six persons. The minimum accommodation fee is 3,800 yen/person. It is a good idea to reserve the whole place for friends and family. There is a cafe on the first floor that offers all tomato dishes using tomatoes locally grown in the Hidaka Village.



Eat & stay Tomatoto
Photo: Eat & stay Tomatoto

Contact

Address: 1889-1, Hidakamurashimobun, Takaoka District, Kochi
TEL: 0889-39-2000

Kanpo-no-Yado Ino

Kanpo-no-Yado Ino

The hotel locates almost in the center of Kochi Prefecture, on a hill in Inocho, the birthplace of the Japanese paper of Tosa, and all the rooms have a good view of the beautiful Niyodo River. There are a variety of baths such as bubble bath, open-air bath, lie down bath, and cascading bath. People may get sentimental hearing the sound of a far-away train in the open-air bath. The murmuring sound of the river will make you feel at home.



Kanpo-no-Yado
Photo: Kanpo-no-Yado Ino

Contact

Address: 1569, Inochohakawa, Agawa District, Kochi
TEL: 088-892-1580

MLIT Japan Infrastructure Tourism Attractiveness Boosting Project
Transform the public infrastructures into new tourism resources



New Recommendation for Tourism in Japan
Kochi Tourism for Future Project



Green Feel Golf Club

Sho Tobari, a producer of golf tournaments designed this course. It is a full-fledged champion course rich in strategic characteristics that makes the most of the beautiful location of Mt. Makiyama. In autumn, the red leaves of Dodan-tsutsuji (*Enkianthus perulatus*) attract many golfers.

Contact: Green Feel Golf Club
 ☎ 0889-24-7711



Hidaka Sakagura Hall

A brewery that used to produce a sake called "Matsu no Midori (Green of Pinetree)" is now used as a hall that can be used for various events.

Contact: Hidakamura Tourism Association
 ☎ 0889-24-5888



Kusaka River Overflow Pond

Contact: Hidakamura Tourism Association
 ☎ 0889-24-5888



Mt. Ootaki

Mt. Ootaki is a small mountain whose altitude is 247 meters located southwest of the Kusaka River Overflow Pond. It is known as a place of Shugendo (mountaineering asceticism), and you find a lot of huge and strange-shaped rocks called Tainai-kuguri (a narrow sanctified cave), Kintaro's Power Rock, Mountain Witch's Cave, Goro's Waterfall, or Gotogoto Rock. Many Shugenja (mountain ascetic) used to come here for training. Now, people come to enjoy easy hiking.

Contact: Hidakamura Tourism Association
 ☎ 0889-24-5888



Village Station HIDAKA shop

Contact: Village Station HIDAKA shop
 ☎ 0889-24-5199



Sarudado Cave

Contact: Hidaka Village Board of Education
 ☎ 0889-24-5115
 Contact: Hidakamura Tourism Association
 ☎ 0889-24-5888

7



Houseboat on the Niyodo River

People call the river "Niyodo Blue" because of its extraordinary beauty. If you want to feel it closely, try a houseboat. Just stretch your arm, and you can touch the flowing water because you are so close to the water. You can enjoy the seasonal view of the sky, the mountains, and the river that is only seen from a boat. Cruising is subject to cancellation due to the condition of the river.

Contact Houseboat on the Niyodo River
☎ 0889-24-6988

8



Nishikiyama Park

Located near the Serpentinite Zone, there are many rare plants including Nishiki Akamatsu, an endemic species of Japanese red pine. The mountain is called "Nishikiyama (brocade mountain)" because it is covered with red leaves of Dodan-tsutsuji in autumn. The park is fully equipped with walking trails, a plaza, and a lavatory.

Contact Hidaka Village Industry and Environment Section
☎ 0889-24-4647

9



Kiriyama Tea Garden

Niyodo River is one of the best known for the clarity of the water. Nearby the river, there is Kiriyama Tea Garden covering an area of about 200,000 square meters. The tea leaves grown at a high altitude is called "Tosa Tea." It does not have much bitterness but has richer fragrance, and thick and mild taste. "Tosa Tea" is grown in a rich natural environment with good water, and the quality is higher compared with other tea brands produced in various areas of Japan. "My Tea Experience" provides opportunity to roast the tea leaves for yourself.

For more information, please call Kiriyama Tea Garden.

Contact Kiriyama Tea Garden
☎ 0889-24-4615

10



Nishikiyama Country Club

Nishikiyama Country Club opened in 1973. As the name shows, you can enjoy the course utilizing the hills, and the landscape with colorful flowers blooming in a natural setting.

Contact Nishikiyama Country Club
☎ 0889-24-5311

11



Omura Shrine

Contact Omura Shrine
☎ 0889-24-7466

12



Suggoi Sports Niyodo River SUP

Stand on a board, and row with a paddle, let's go for a walk on the water of the Niyodo River. Sheer beginners can have fun, too. We are a couple of minutes by car or 15 minutes on foot away from Omura Shrine.

Contact Suggoi Sports
☎ 0889-39-1868



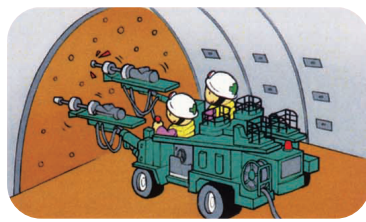
How a Tunnel is Made

1

Hole Drilling and Blasting

Make a hole by a drill jumbo in the bedrock, insert an explosive, and blast it to bits.

Machine used Drill Jumbo



2

Debris Removal

Remove the debris (blasted rocks) efficiently out of the tunnel using a loader and 20-ton dump truck.

Machine used Schaeff Loader, Wheel Loader



3

Chopping / Trimming

Clean the surface after drilling.

Machine used Hydraulic Hammer

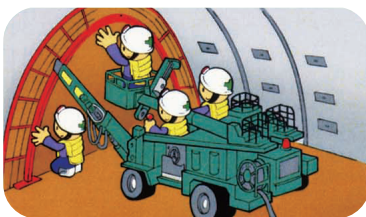


4

Concrete Spraying (First Spraying) and Steel Timbering Erection

Spray concrete onto the surface of the bedrock to prevent collapsing, and install a steel frame.

Machine used Concrete Sprayer with Erector

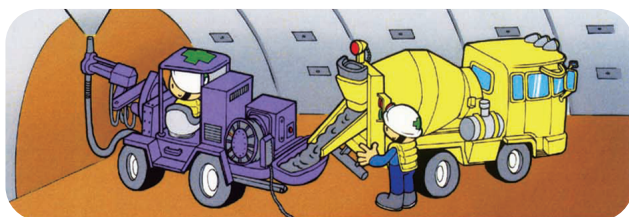


5

Second Concrete Spraying

Spray concrete and let it solidify to prevent the mountain from collapsing.

Machine used Concrete Sprayer

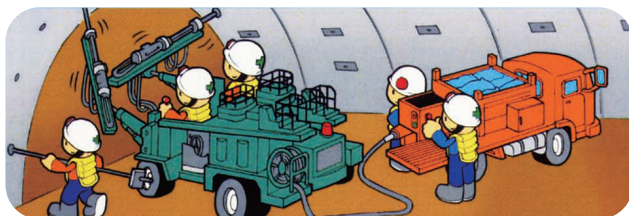


6

Rock Bolts Installation

After the drilling, set the rock bolts (iron bar) into the exterior and solidify them with mortar to stabilize the rock excavations in the tunnel.

Machine used Drill Jumbo, Mortar Injector



7

Tarpaulin Setting / Concrete Lining

Spread the tarpaulin to prevent water from entering the interior of the tunnel. Then install a slide center (steel frame), and pour concrete into it using mobile concrete pumps.

Machine used Slide Center, Mobile Concrete Pump

