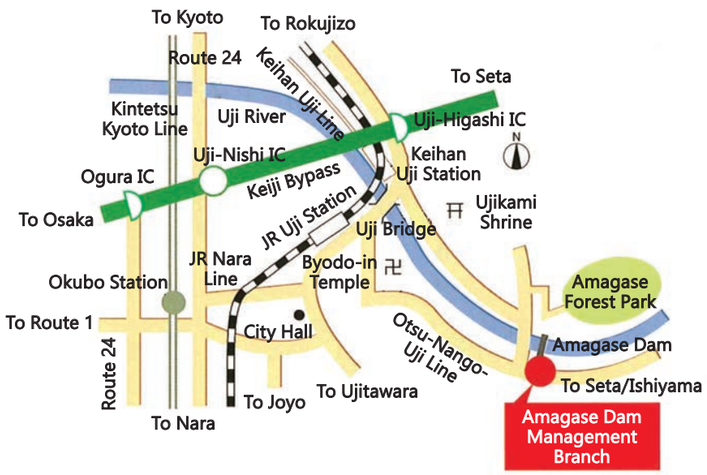
60th Anniversary Commemorative Painting of Amagase Dam

"Amagase Dam Beyond Time"

Art Club, Kyoto Art Senior High School
March 2025



Train access:
JR Nara Line, Uji Station → Approximately 10 minutes by taxi, 40 minutes on foot
Keihan Uji Line, Uji Station → Approximately 10 minutes by taxi, 40 minutes on foot

Real-time information on rainfall, water levels, and other data nationwide is available.

Ministry of Land, Infrastructure, Transport and Tourism Real-time

River Disaster Prevention Information

https://www.river.go.jp/

Yodogawa Integrated Dam and Reservoir Group Management Office Kinki Regional Development Bureau, Ministry of Land, Infrastructure, Transport and Tourism

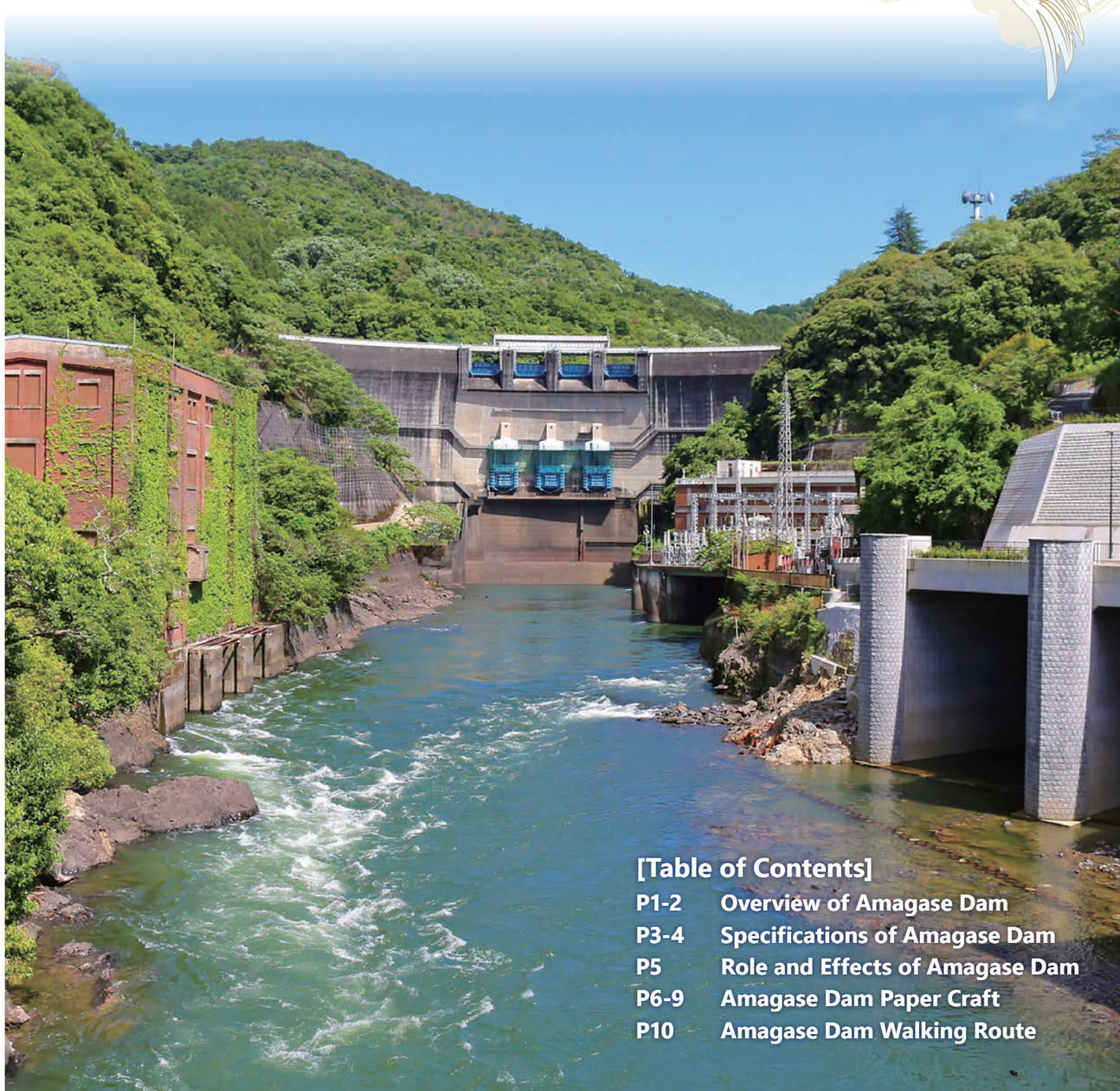
10-1 Yamadaike Kitamachi, Hirakata City, Osaka 573-0166
Tel +81-72-856-3131　Fax +81-72-866-0299
https://www.kkr.mlit.go.jp/yodoto/

Amagase Dam Management Branch

15 Kanaido, Uji City, Kyoto 611-0021
Tel +81-774-22-2188　Fax +81-774-24-1705
https://www.kkr.mlit.go.jp/yodoto/amagase/en/

Amagase Dam

– Protecting and Connecting the Region –



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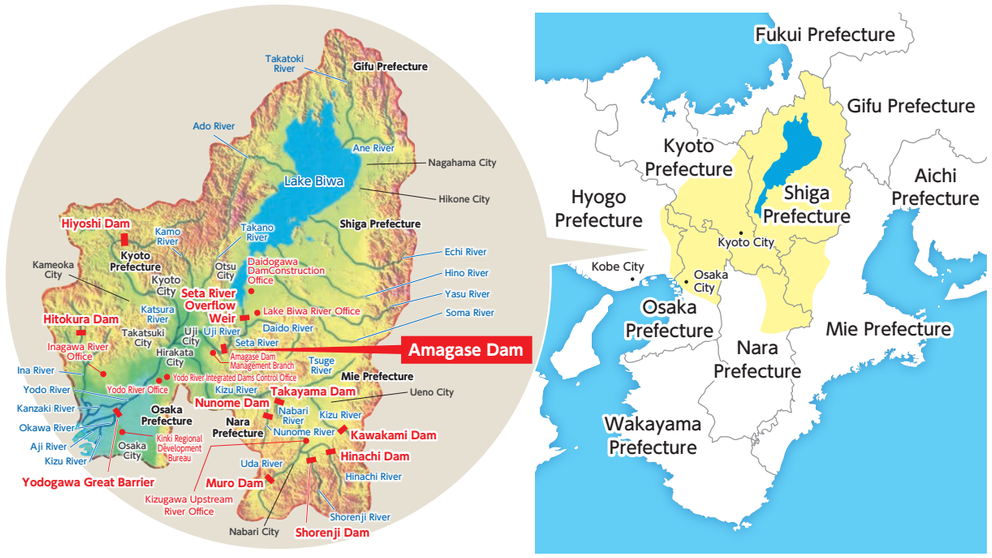
Overview of Amagase Dam

Yodo River System and Amagase Dam

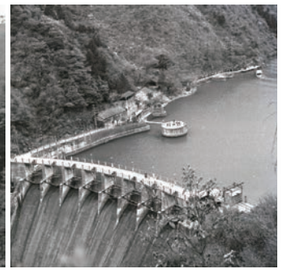
The Yodo River system is a major river system with a basin area of 8,240 km², located in the central part of the Kinki region. It originates from Lake Biwa, flowing through the Seta River and Uji River, merging with the Kizu River from the south and the Katsura River from the north to form the main Yodo River, which flows southwest across the Osaka Plain into Osaka Bay.
Amagase Dam is located on the Uji River, a tributary of the Yodo River system. The upper reaches of the Uji River are known as the Seta River, the only river that flows out of Lake Biwa, Japan's largest lake. This basin has long served as the foundation for social, economic, and cultural development in the Kinki region, including Kyoto. It has also been home to several historical capitals, playing a significant role in Japanese history.



State of the Uji River Before the Construction of Amagase Dam

Before Amagase Dam was built, Omine Dam was located 3 km upstream from the site of the current Amagase Dam. Kansai Electric Power used the water drawn from Omine Dam for power generation at Shizugawa Power Station, which was located on the right bank just downstream from the site of the current Amagase Dam, and at Omine Power Station, which was located directly below Omine Dam.
At that time, propeller boats traveled up the Uji River from Tono Island to Shizugawa Power Station. From there, a trolley train, known as the 'Otogi Train,' ran to Omine Dam. Additionally, sightseeing boats operated from Omine Dam to Sotobata in Otsu City, and then a bus service connected Sotobata to Ishiyama in Otsu City. A sightseeing ticket covering this entire route was also available.
After the completion of Amagase Dam, a sightseeing boat operated on the dam lake, and a bus service ran from Keihan Uji Station to Ishiyama Station in Otsu City. However, the sightseeing boat was discontinued due to significant water level fluctuations caused by the completion of the Kisenyama Power Station. Later, the bus service was also discontinued due to a decline in passengers.


Ujigawa Line and Otogi Train


Omine Dam


Otogi Train waiting for departure with Omine Dam in the background


Ujigawa Line Sightseeing Boat

Construction of Amagase Dam

In 1953, Typhoon Tess, known in Japan as Typhoon No. 13, struck, causing an unprecedented flood in the Yodo River. At the Yodo River's reference point (Hirakata), the peak flood discharge reached 7,800 m³/s, leading to a levee breach at Mukaijima on the Uji River. The coastal areas suffered extensive damage. As a result, the flood control plan for the Yodo River system was significantly revised, and the Basic Plan for the Improvement of the Yodo River System was established in 1954, leading to the decision to construct Amagase Dam on the Uji River. In 1959, the construction of Amagase Dam began with three primary objectives: 1. Flood prevention 2. Hydroelectric power generation 3. Stable water supply. The dam was completed in 1964.


Levee breach at Mukaijima on the Uji River caused by Typhoon No. 13 in 1953

Redevelopment of Amagase Dam

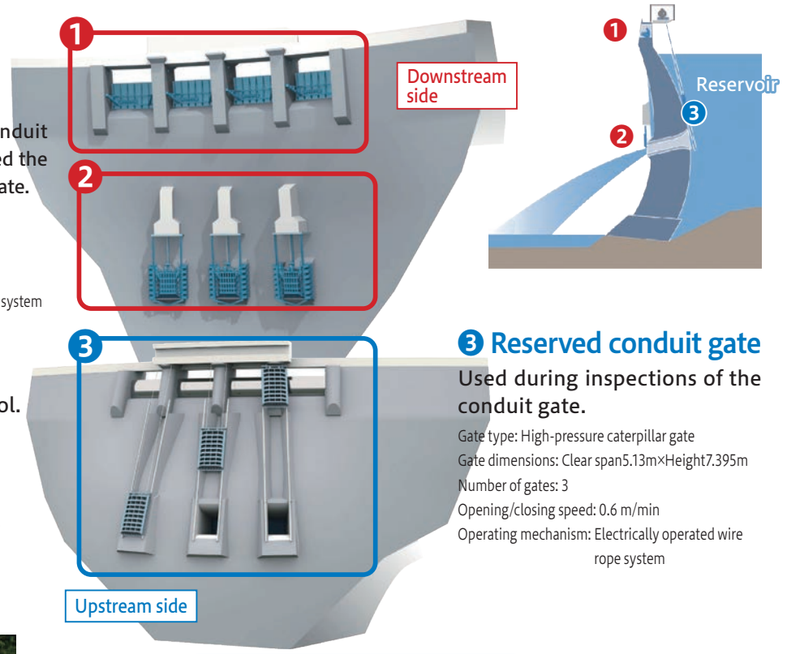
Even after the construction of Amagase Dam, Typhoon No. 24 in 1965 caused severe damage. This was due to the dam's limited discharge capacity (840 m³/s). When a typhoon or a stationary front brought heavy rainfall, the dam had to start storing water early in the flood stage due to its small inflow capacity. As a result, the reservoir would reach its limit, making it impossible to control further flooding.
Additionally, the population in Uji City and other areas drawing water from Amagase Dam increased, creating the need for a stable water supply for municipal use.
In 1971, the Basic Implementation Plan for Yodo River System Works was revised, and the planned maximum water flow of the Uji River was adjusted from 900 m³/s to 1500 m³/s. As a result, the redevelopment of the Amagase Dam became necessary.
A redevelopment project was launched to regulate floods in the Uji and Yodo Rivers, prevent flooding around Lake Biwa, and secure a stable water supply for Kyoto Prefecture. A preliminary survey began in 1975, followed by the commencement of construction in 1989.
The tunnel-type discharge facility underwent main construction in 2013 and was completed in 2023. It is one of the largest water tunnels in Japan and features an internal energy dissipation system to minimize environmental impact on downstream areas.


Completed tunnel-type discharge facility

Year	Chronology of Amagase Dam
1947	A construction plan was initiated to provide flood control for the Yodo River and power supply to the Kinki region.
1953	Typhoon No. 13 caused an unprecedented flood in the Yodo River.
1954	The Basic Plan of Improving Yodo River Water System was established.(1954-1971)
1955	Commencement of geological survey at the dam site
1957	Commencement of construction project; establishment of the Amagase Dam Construction Office
1959	Announcement of the Basic Plan on Constructing Amagase Dam for flood control and power generation
1961	Commencement of excavation work for the dam body
1962	First Change Announcement of the Revised Basic Plan on the Construction of Amagase Dam to include municipal water supply by decommissioning Shizugawa Power Station and expanding Amagase Power Station
1964	Second Change Announcement of the Revised Basic Plan on the Construction of Amagase Dam to amend the matters related to the costs and burdens required for the construction of the Amagase Dam." Completion of Amagase Dam and Amagase Power Station
1965	Establishment of Amagase Dam Branch Office and transition to management operations
	Severe damage caused by floods from Typhoon Trix, known in Japan as Typhoon No. 24, and other storms
1971	Revision of the Basic Implementation Plan for Yodo River System Works (1971-2007)
1975	Commencement of preliminary survey for the redevelopment of Amagase Dam
1989	Commencement of the redevelopment construction project for Amagase Dam
1995	Formulation of the Basic Plan on the Amagase Dam Redevelopment Project
1997	Amendment of the River Act
2007	Formulation of the Basic Policy for River Improvement in Yodo River System
2009	Formulation of the River Improvement Plan for Yodo River System
2013	Commencement of main tunnel construction for the Amagase Dam Redevelopment Project
2023	Completion of the tunnel-type discharge facility
2024	60th anniversary of the completion of Amagase Dam

Overview of Amagase Dam

Dam main facilities



❶ Crest gate

Used in combination with the conduit gate during large floods that exceed the discharge capacity of the conduit gate.

Gate type: Radial gate
Gate dimensions: Clear span10.0m×Height 4.357m
Number of gates: 4
Opening/closing speed: 0.3 m/min
Operating mechanism: Hydraulic cylinder wire rope system

❷ Conduit gate

Used for regular discharge control.

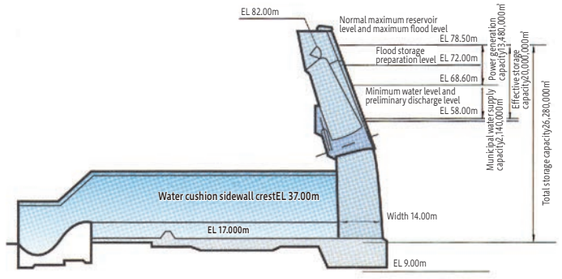
Gate type: High-pressure roller gate
Gate dimensions: Clear span3.42m×Height 4.56m
Number of gates: 3
Opening/closing speed: 0.3m/min
Sealing mechanism: Electrically operated eccentric lever system
Operating mechanism: Hydraulic cylinder

❸ Reserved conduit gate

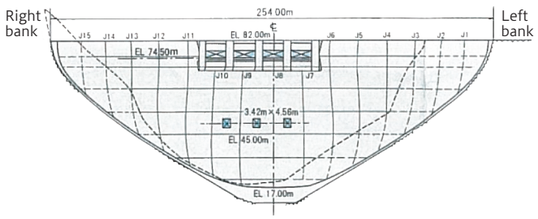
Used during inspections of the conduit gate.

Gate type: High-pressure caterpillar gate
Gate dimensions: Clear span5.13m×Height7.395m
Number of gates: 3
Opening/closing speed: 0.6 m/min
Operating mechanism: Electrically operated wire rope system

Longitudinal section view



Downstream front view

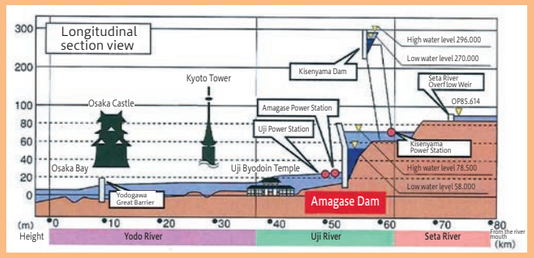


Catchment area of Amagase Dam

The watershed of Amagase Dam extends across Uji City and Ujitawara Town in Kyoto Prefecture, as well as the southern part of Otsu City and Koka City in Shiga Prefecture, covering the area around the Uji River between Amagase Dam and the Seta River Overflow Weir.
The watershed area of Amagase Dam is 352 ㎢, and when combined with the 3,848 km² watershed of Lake Biwa, the total catchment area amounts to 4,200 ㎢.

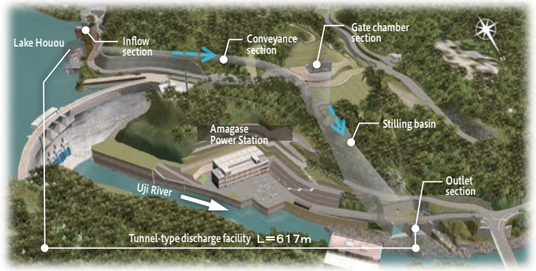
Size and type of the dam

The crest of Amagase Dam is approximately the same height as the main keep of Osaka Castle (elevation 80 m).
Structurally, it is classified as an “arch dam,” where the curved dam wall is designed to transfer the water pressure to the rock formations on both sides.

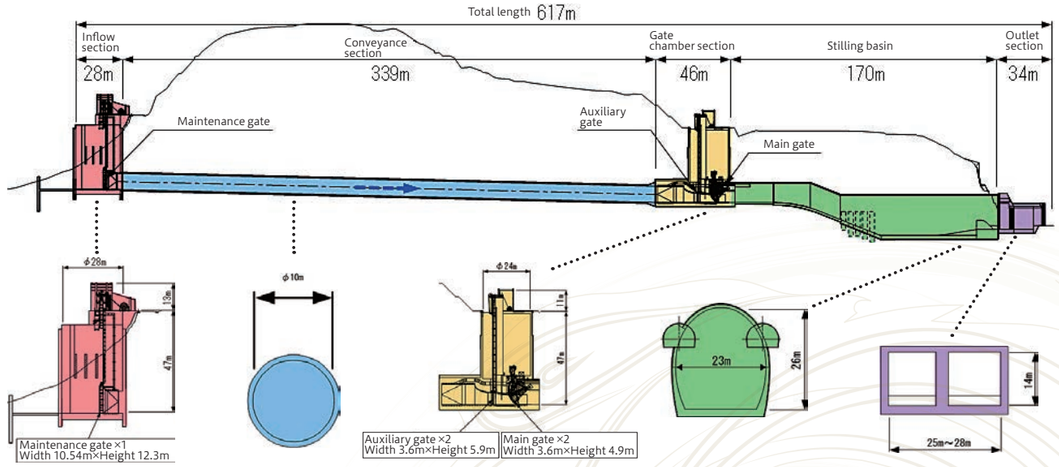


■Tunnel-type discharge facility

A tunnel spillway was constructed on the left bank to enhance the discharge capacity of the dam, and its management began on April 1, 2023.



■Tunnel-type discharge facility　Longitudinal section



■Specifications

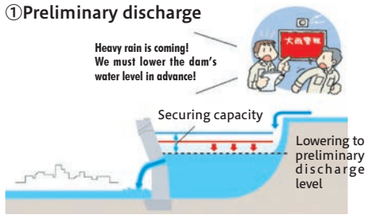
Dam type	Dome-shaped arch concrete dam/Tunnel-type discharge facility		
Dam height	73m	Crest length	254m
Tunnel-type discharge facility	Total length:617m　Conveyance section span:10m　Stilling basin section span:23m×Effective height:26m		
Volume	Dam body:121,500㎥　Auxiliary dam water cushion:42,500㎥　Total:164,000㎥		
Catchment area	Amagase Dam watershed:352㎢　Lake Biwa watershed:3,848㎢ (including lake surface area:680㎢) Total watershed:4,200㎢		
Reservoir area	1.88㎢		
Purpose	Flood control, municipal water supply, and power generation		
Total storage capacity	26,280,000㎥ (approximately 50 times the capacity of Koshien Stadium)		
Effective storage capacity	20,000,000㎥	Flood control capacity	20,000,000㎥
Water utilization capacity	Power generation capacity:13,480,000㎥/Municipal water supply capacity:2,140,000㎥		
Planned maximum flood discharge	2,080㎥/s	Flood volume	1,140㎥/s
Power generation	Maximum output　92,000kW (Amagase Power Station)　466,000kW (Kisenyama Power Station)		
Municipal water supply	Water intake:0.9㎥/s		
Amagase Dam	Conduit gate (Sealing-type high-pressure roller gate)	Span:3.42m×Effective height:4.56m×3gates	
	Emergency discharge gate (Radial gate)	Span:10.0m×Effective height:4.357m×4 gates	
	Reserved conduit gate (High-pressure caterpillar gate)	Span: 5.13m×Effective height:7.395m×3gates	
Tunnel-type discharge facility	Main gate (High-pressure radial gate)	Span:3.6m×Gate height:4.9m×2gates	
	Auxiliary gate (High-pressure slide gate)	Span:3.6m×Gate height:5.9m×2gates	
	Maintenance gate (High-pressure slide gate)	Span:10.54m×Gate height:12.3m×1gate	
	Small-capacity discharge facility main valve (Jet flow gate)	Diameter:1.3m×1gate	
	Small-capacity discharge facility auxiliary valve (High-pressure slide gate)	Diameter:1.3m×1gate	

Role and Effects of Amagase Dam

■Flood prevention

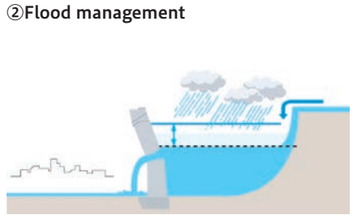
When heavy rainfall from a typhoon or other events increases the risk of flooding, the dam regulates the planned maximum flood discharge at the dam site from 2,080m³/s to 1,140m³/s, preventing flooding of the Uji River. Furthermore, during peak flow in the downstream Yodo River, it is adjusted to 250m³/s to prevent flooding in the lower reaches.

①Preliminary discharge



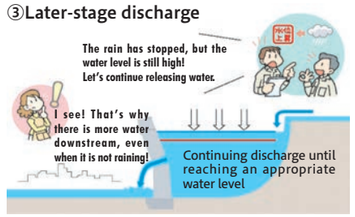
If the reservoir reaches full capacity, the dam will no longer be able to regulate floods. When a typhoon or heavy rainfall is expected, the dam preemptively releases water to lower the water level and secure sufficient capacity.

②Flood management



As a typhoon or heavy rainfall approaches and inflow to the dam increases, the dam utilizes the capacity secured through preliminary discharge to store part of the inflow in the reservoir, waiting for the peak flow downstream to subside.

③Later-stage discharge



Even after a typhoon or heavy rainfall has passed, a large amount of water remains stored in the dam. Therefore, in preparation for the next heavy rain, water continues to be discharged until the appropriate water level is restored.

■Generating electricity

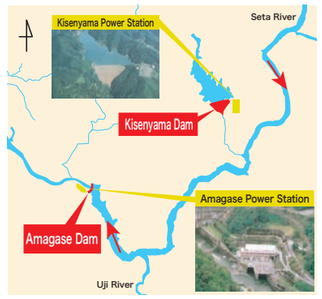
Kansai Electric Power's Amagase Power Station, located downstream of the dam, generates electricity using a maximum water intake of 186.14m³/s with a maximum output of 92,000kW, equivalent to the electricity consumption of approximately 100,000people. Additionally, Kisenyama Power Station, located upstream, utilizes Amagase Dam Lake (Lake Houou) as a lower regulating reservoir, generating up to 466,000kW through a pure pumped-storage system with a maximum water intake of 248m³/s, supplying electricity for approximately 500,000people.

Amagase Power Station

Power generation method	Dam-type
Power station location	Uji Kanaido, Uji City, Kyoto Prefecture
Intake location	Rokukoku, Makishima-cho, Uji City, Kyoto Prefecture
Permitted output	Maximum 92,000kW
Effective head	Maximum 57.1m
Water intake	Maximum 186.14 m³/s
Power generation start	1964

Kisenyama Power Station

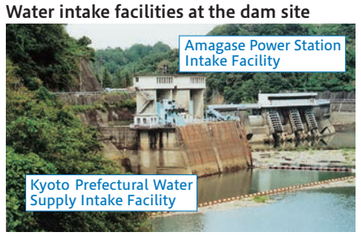
Power generation method	Pumped-storage power generation
Upper regulating reservoir	Kandani River, a tributary of the Uji River
Lower regulating reservoir	Uji River
Effective storage capacity of Kisenyama Dam	5,330,000㎥
Water usage	Maximum 248m³/s(during power generation)
Total head	227.4m
Power output	466,000kW
Power generation start	1970



■Producing drinking water

A maximum of 0.9m³/s is drawn from the reservoir for municipal water supply, serving Uji City, Joyo City, Yawata City, and Kumiyama Town as part of the Kyoto Prefectural Water Supply System.

Water intake facilities at the dam site



Water supply from the dam to the water purification plant

Uji Water Purification Plant

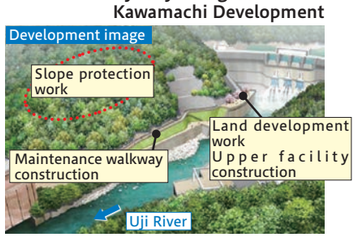
■Regional revitalization

The Ministry of Land, Infrastructure, Transport and Tourism is promoting the concept of Hybrid Dams, which integrate flood control enhancement, hydroelectric power generation, and regional development in collaboration with both the public and private sectors. Amagase Dam has also been operated as a Hybrid Dam since 2024, conducting tourism-oriented water releases in coordination with local events.

Uji City is also advancing the Uji City Amagase Dam Kawamachi Development Project, which aims to utilize Amagase Dam as a tourism resource. This project includes the development of a plaza directly below the dam and the enhancement of connectivity with the urban area to promote tourism.

Tourism-oriented water release conducted in conjunction with the E-Boat river descent event

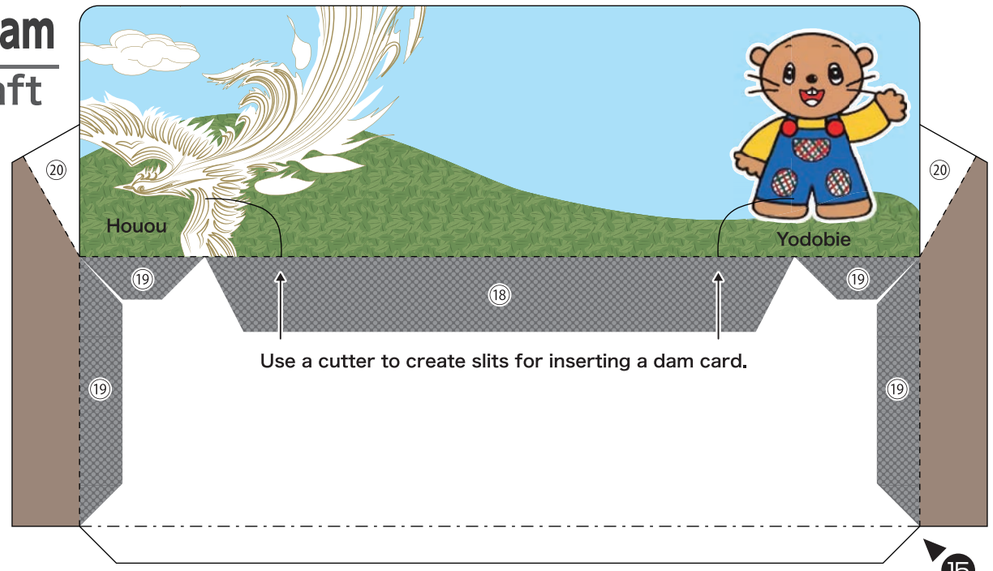
Conceptual image of the Uji City Amagase Dam Kawamachi Development

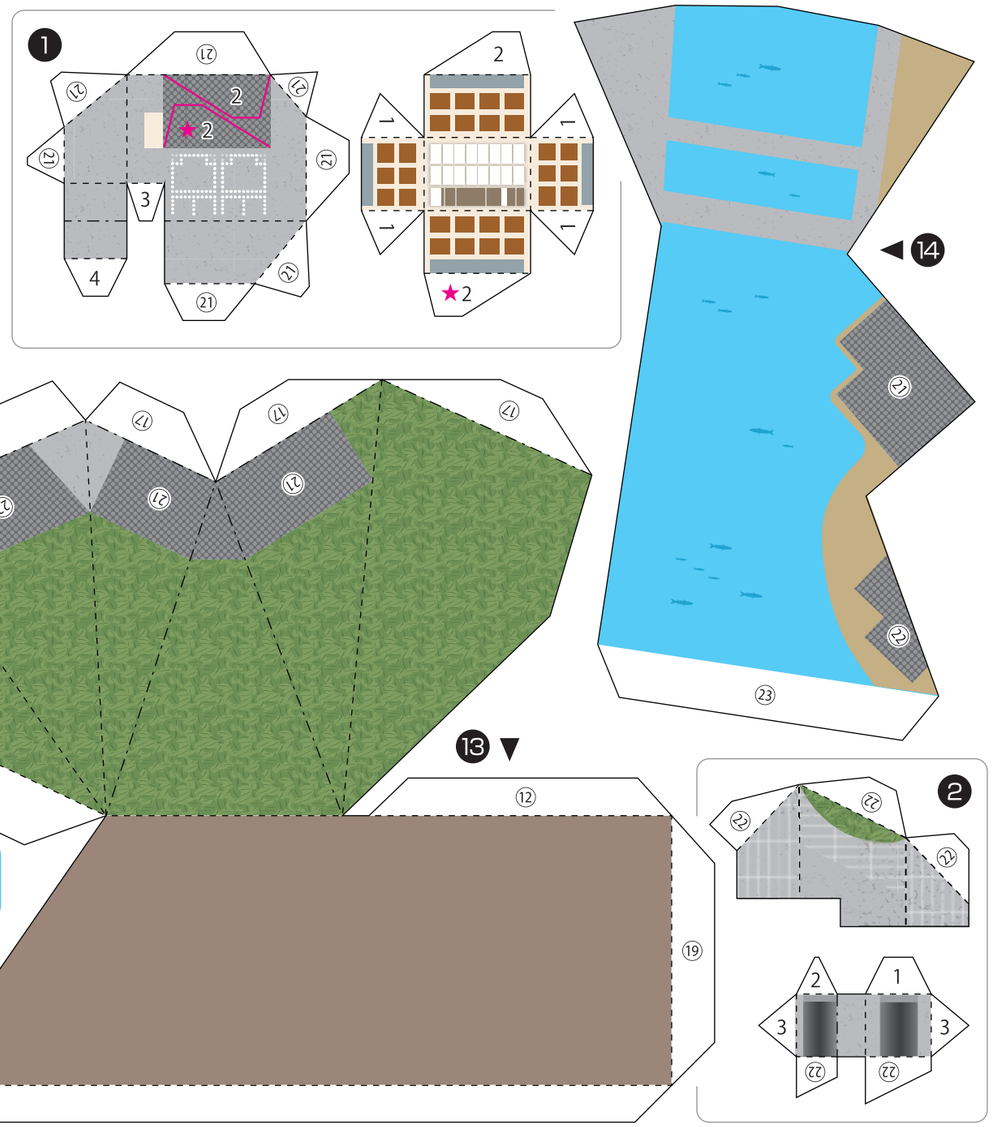


Amagase Dam
Paper Craft

Kinki Regional Development Bureau, Ministry of Land, Infrastructure, Transport and Tourism
Amagase Dam
Yodogawa Integrated Dam and Reservoir Group Management Office

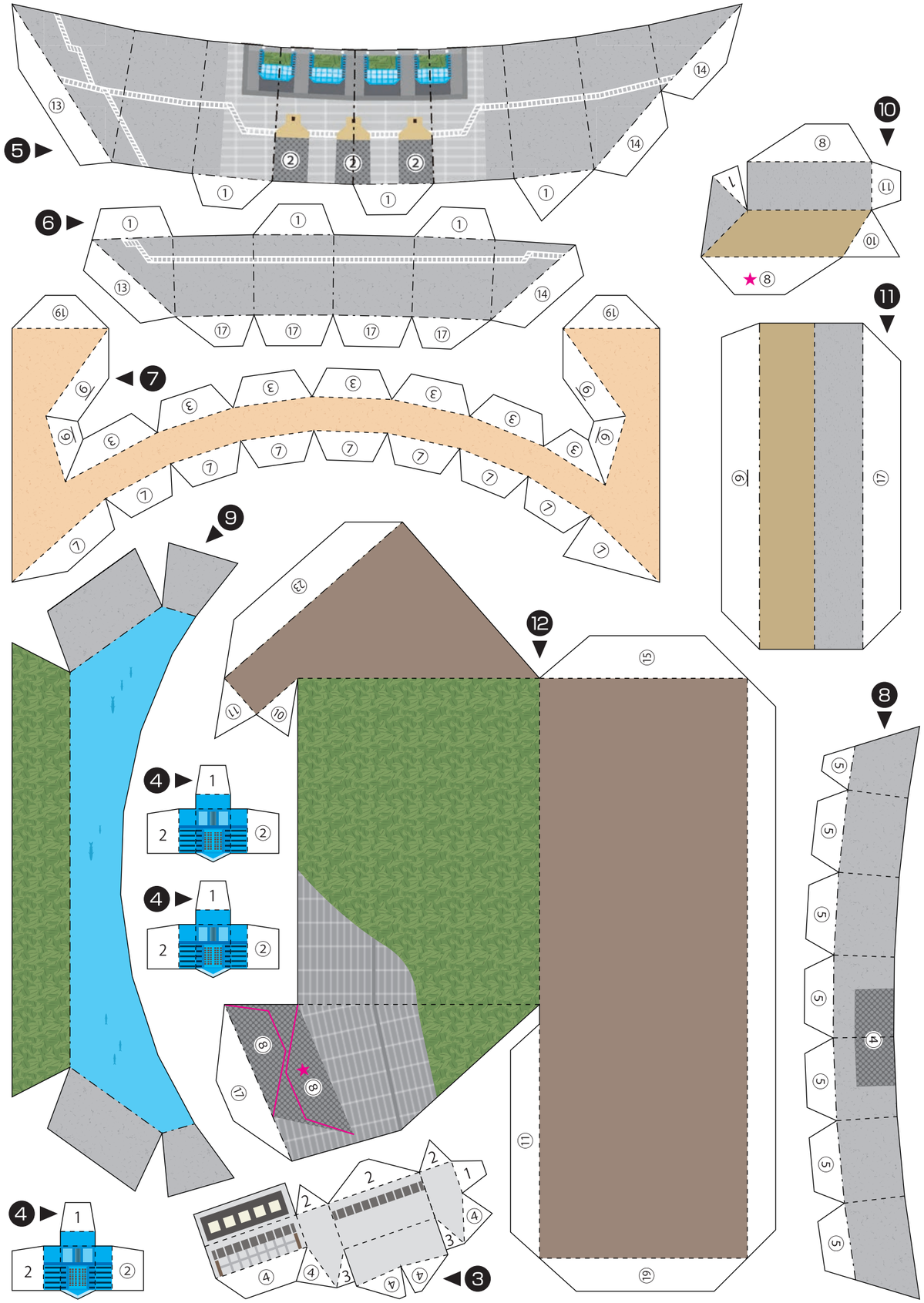
Type: Dome-shaped arch concrete dam, tunnel-type discharge facility
Gates(Dam) : Emergency discharge facility:Crest gate×4
Main discharge facility:High-pressure roller gate with sealing mechanism×3 (Reserved) High-pressure caterpillar gate×3
Gates(Tunnel) : Main discharge facility:High-pressure radial gate×2
Auxiliary gate:High-pressure slide gate×2 Maintenance gate:High-pressure slide gate×1
Small-capacity discharge valve×2 (including one reserved)
Dam height, crest length, and tunnel length : 73m,254m,and 617m
Total reservoir capacity : 26.28 million m³





How to read symbols
- - - - - - mountain fold
—·—·— valley fold

Cut out parts ❶ to ⓰ and fold along the lines. Attach in the order of 1–4, then assemble and attach each part in the order of ① to ㉓.



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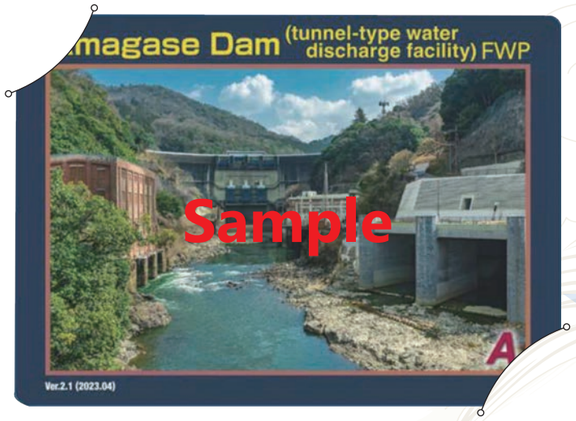
Amagase Dam Walking Route

©Byodoin Temple

Amagase Dam is located on the Uji River, which is home to many cultural assets, including Ujigami Shrine and Byodoin Temple, both of which are registered as World Heritage Sites. Along the Uji River, there are also sites such as Koshoji Temple, famous for its autumn foliage, and a forest park. When visiting Amagase Dam, why not take a walk from JR Uji Station or Keihan Uji Station and enjoy sightseeing and strolling around the area?

Get the Amagase Dam card and keep it here.



To promote awareness of Amagase Dam, dam cards are distributed to visitors. If you would like one, please request it at the reception located at the entrance of Amagase Dam. Distribution hours: 8:00 AM – 4:45 PM.

- ＊Dam cards are free of charge but are only distributed to visitors who come to the dam in person.
- ＊Each visitor may receive only one card.
- ＊Cards cannot be mailed.