Status of Progress of the installation of ALPS treated water dilution/discharge facility and related facilities

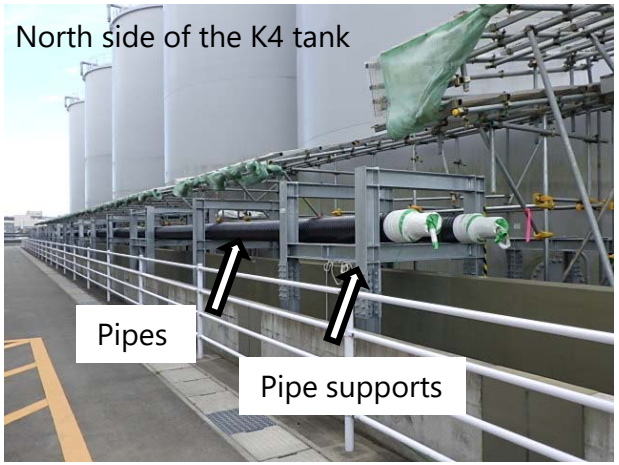
September 29, 2022

Tokyo Electric Power Company Holdings, Inc.

1. Status of construction

■ Measurement/confirmation facility and transfer facility

The installation of pipe supports and pipes for the measurement/confirmation facility and the transfer facility began on August 4 from the area aroud K4 tank area.



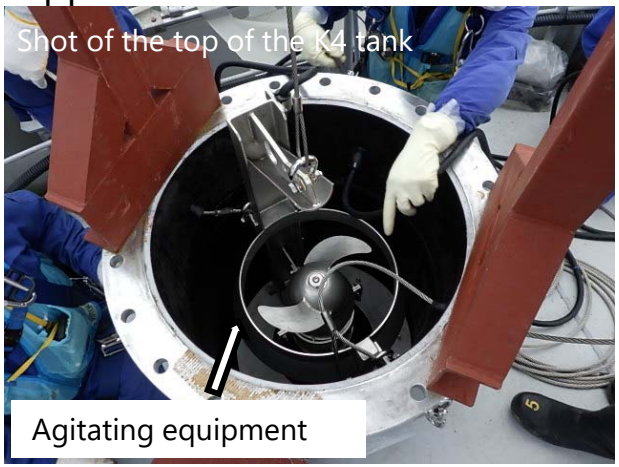
Installing circulation pipes and pipe supports

Installing the piping supports/pipes

【 Measurement/confirmation facility 】
- Supports
  Approx. 230 out of approx. 540m
- Pipes
  Approx. 203 out of approx. 1,000m

【Transfer facility】
- Supports
  Approx. 372 out of approx. 1,820m
- Pipes
  Approx. 51 out of approx. 1,820m

<As of September 27>



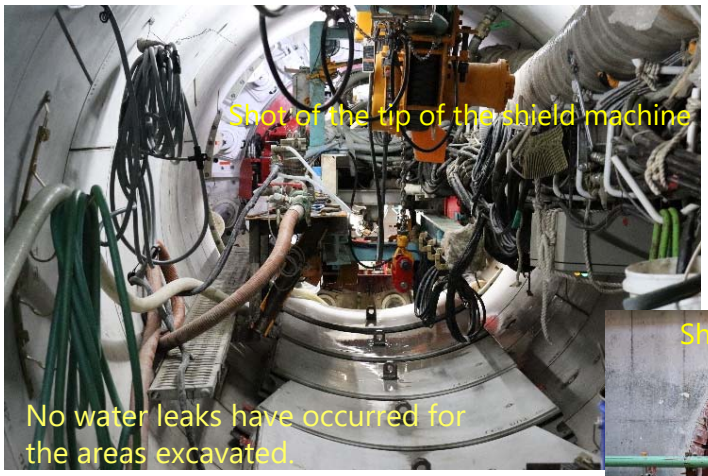
Installing agitating equipment

Installing agitating equipment

10 out of 30 units
（hung inside the tank）
<as of September 27>

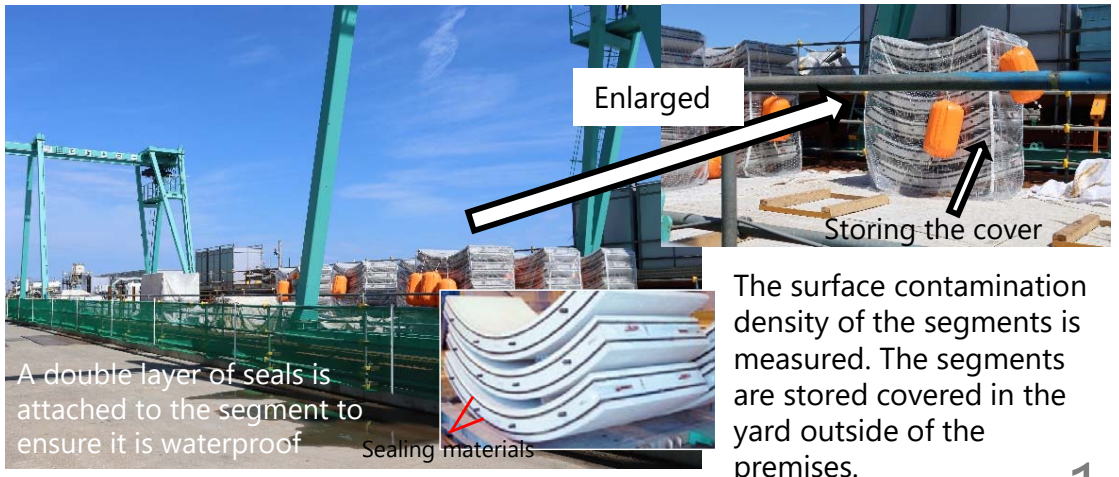
■ Discharge facility

On August 4, the shield machine began tunneling through the bedrock layer as construction of the discharge tunnel commenced.



Status of Excavation

A tunnel is being dug
（Initial excavation※1）
Approx. 112m out of Approx. 1,030m
<As of September 27>
※1 ※Since the initial excavation (approx. 150m) alternates with the work of connecting the equipment necessary for excavation, the progress of excavation is slower than after the equipment has been connected.

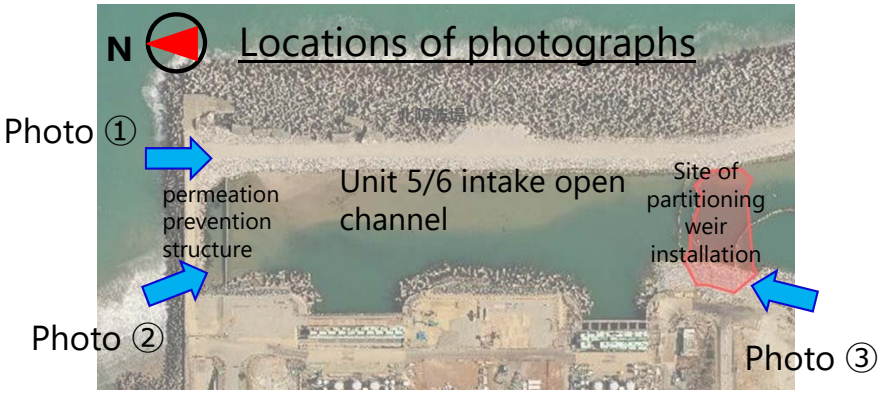


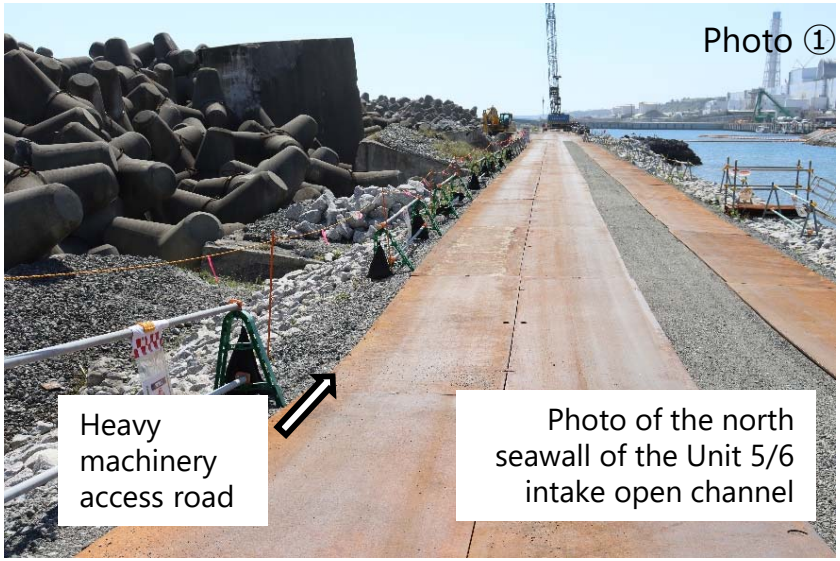
Stored segments

The surface contamination density of the segments is measured. The segments are stored covered in the yard outside of the premises.

1. Status of construction (cont.)

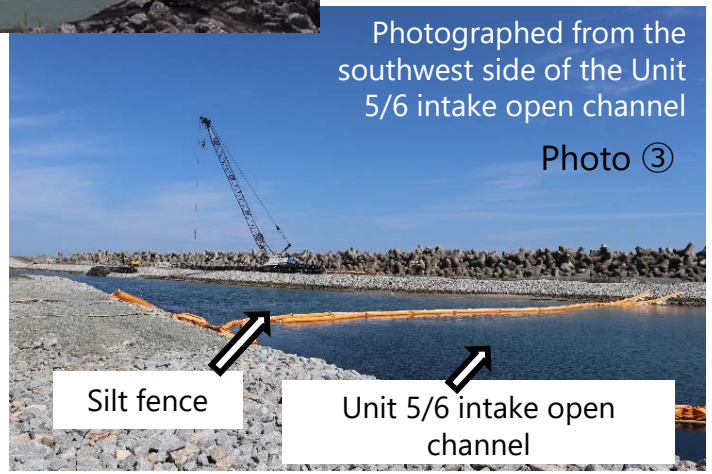
■ Other construction (building partitioning weir, etc.)
On August 4, construction began on the heavy machinery access road in preparation for the construction of partitioning weir. Going forward, this work will continue simultaneously with the removal of silt deposits from inside the intake open channel in the work area on the sea side of units 5/6. And, after construction of the partitioning weir, the permeation prevention structure will be removed.





Heavy machinery access road construction

※In the future, a portion of the north sea wall permeation prevention structure will be removed in order to enable seawater for dilution to be taken in from outside the harbor.



Work area on the sea side of Units 5/6

(Reference) Overview of the ALPS treated water dilution/discharge facility and related facilities

Secondary treatment facility（newly installed reverse osmosis membrane facility）

Secondary treatment of treated water to be re-purified (sum of the ratios of nuclides, excluding tritium, is between 1 and 10)

Secondary treatment facility（ALPS）

Secondary treatment of Treated water to be re-purified (sum of the ratios of nuclides, excluding tritium, is 1 or higher)

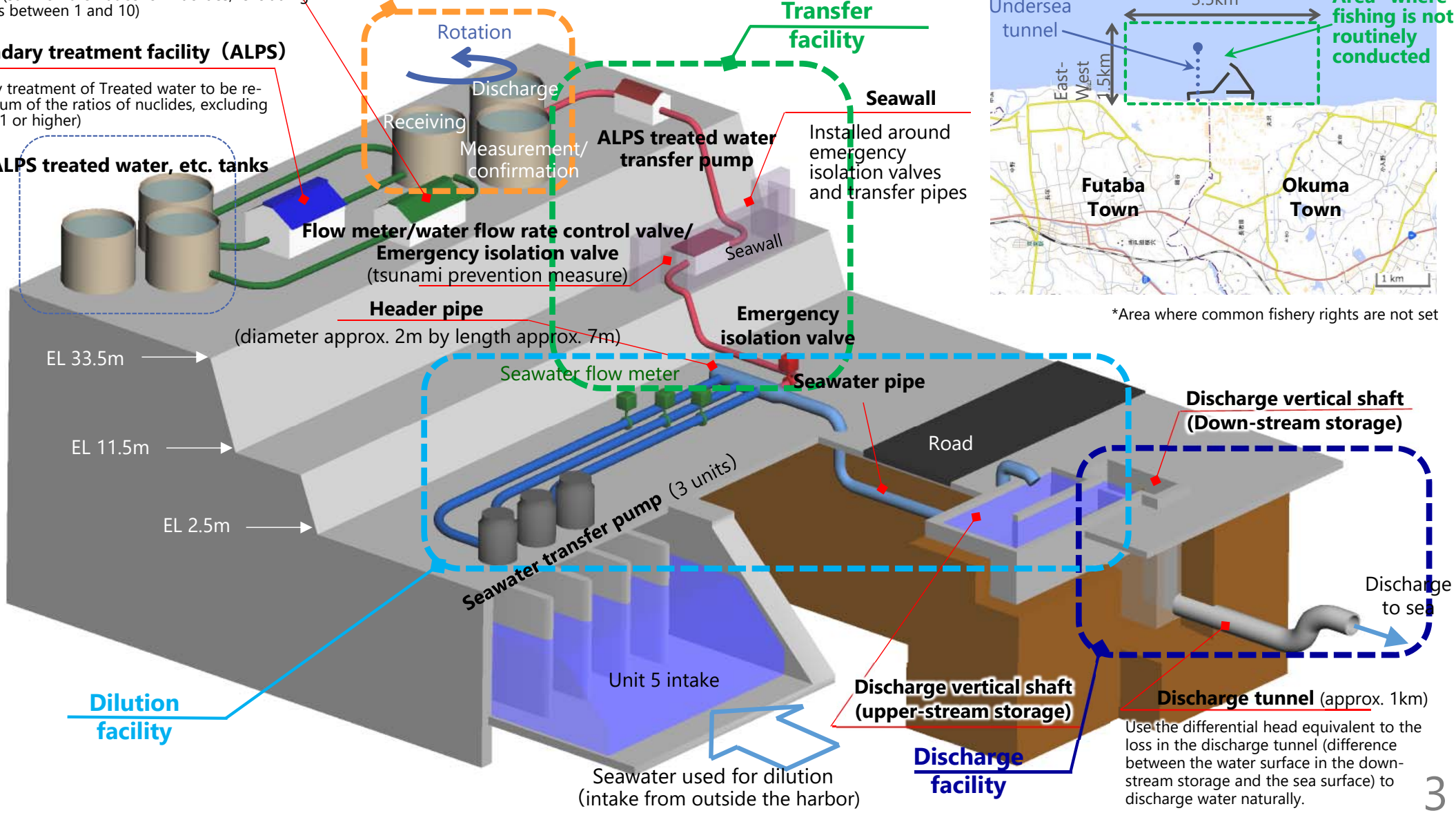
Measurement/confirmation facility (K4 tank group)

Comprised of three sets of tank groups each with the role of receiving, measurement/confirmation, and discharge. In the measurement/confirmation stage, water that has been made homogenized through circulation and agitating is sampled and analyzed (approx. 10,000m³ × 3 groups)

Transfer facility

Seawall

Installed around emergency isolation valves and transfer pipes



Use the differential head equivalent to the loss in the discharge tunnel (difference between the water surface in the down-stream storage and the sea surface) to discharge water naturally.

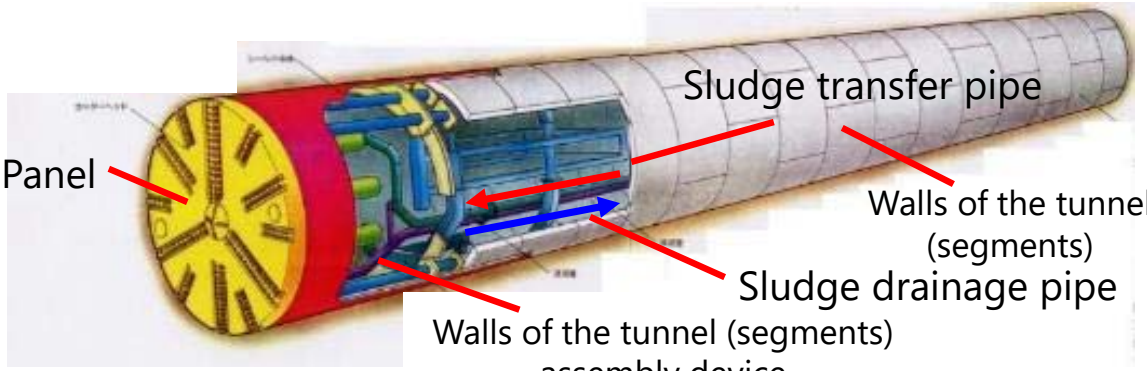
Source: Developed by Tokyo Electric Power Company Holdings, Inc. based on the map developed by the Geospatial Information Authority of Japan (electronic territory web)
https://maps.gsi.go.jp/#13/37.422730/141.044970/&base=std&ls=std&disp=1&vs=c1j0h0k0l0u0t0z0r0s0m0f1

*Area where common fishery rights are not set

(Reference) Waterproofing for the Discharge Tunnel

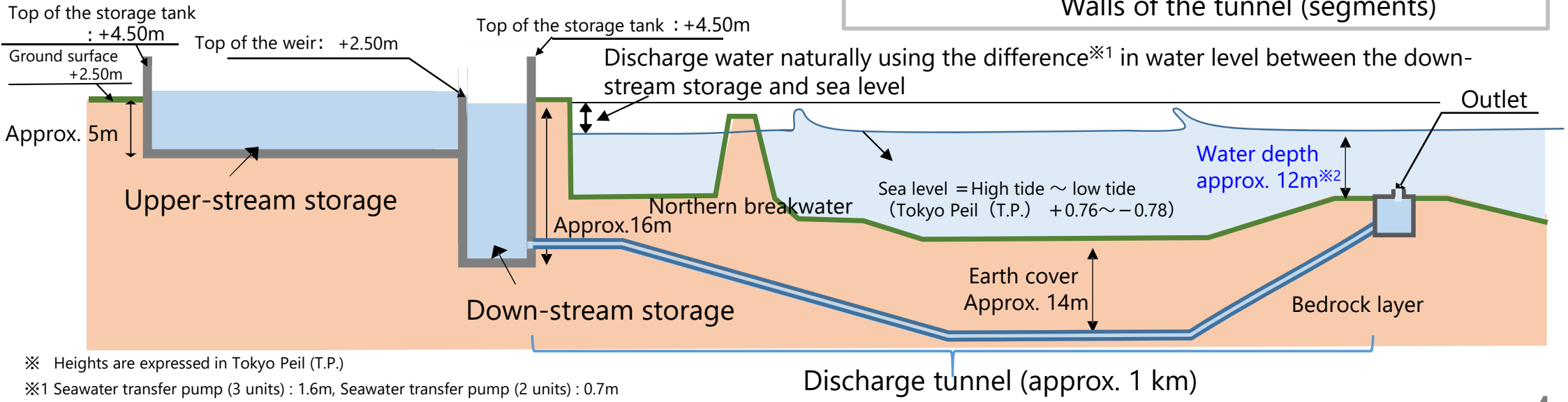
- The discharge tunnel has low leakage risk and is earthquake resistant※ because it goes through the bedrock layer. The design of the tunnel takes into account typhoons (high waves) and storm tides (increased sea levels). Furthermore, the tunnel is designed to use the differential head equivalent to the loss in the discharge tunnel (difference between the water surface in the down-stream storage and the sea surface) to discharge water naturally (taking into account the adhesion of shellfishes).
- A slurry shield tunneling method will be used, and the walls of the tunnel (segments) will be made of reinforced concrete combined with two layers of sealing material to prevent water from coming in.

※ Designed based on the quake-resistant design concept suggested by NRA.



Overview of shield machine

Walls of the tunnel (segments)



※ Heights are expressed in Tokyo Peil (T.P.)

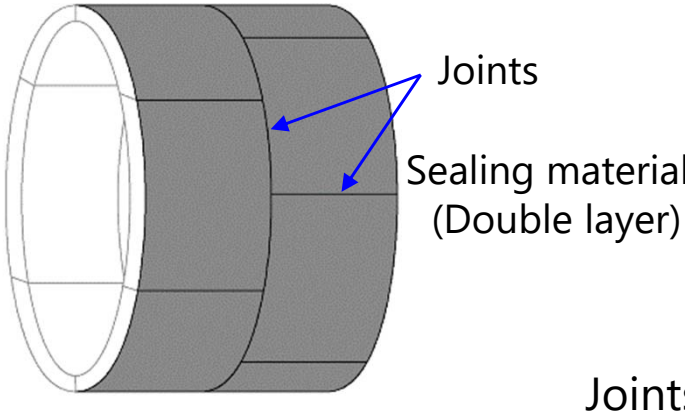
※1 Seawater transfer pump (3 units) : 1.6m, Seawater transfer pump (2 units) : 0.7m

※2 Based on the standard time tide level in Tokyo Peil (T.P.)

Discharge facility conceptual diagram

(Reference) Waterproofing for the Discharge Tunnel

- The walls of the discharge tunnel are comprised of segments. To prevent leaks from the joints, the segments are waterproofed with sealing materials (rubber that turns waterproof by expanding when it comes into contact with water.)
- Usually, only one layer of seals is installed but considering the inside and outside water pressure, two layers of seals were installed in the circumferential direction and lengthwise (all around) to ensure the tunnel is waterproof.

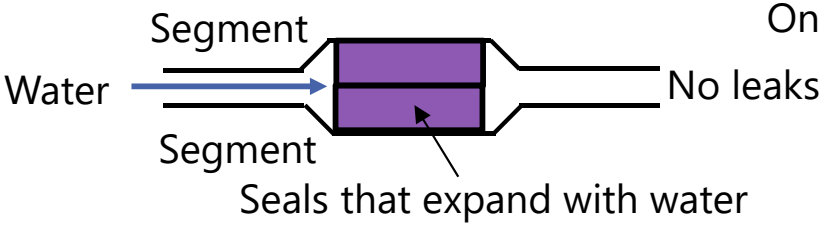


Discharge tunnel （3D diagram）

Reinforce concrete tunnel walls (segments)

Sealing materials	
Thickness	Approx. 4mm
Width	Approx. 17mm
Materials	Chloroprene Synthetic rubber-based

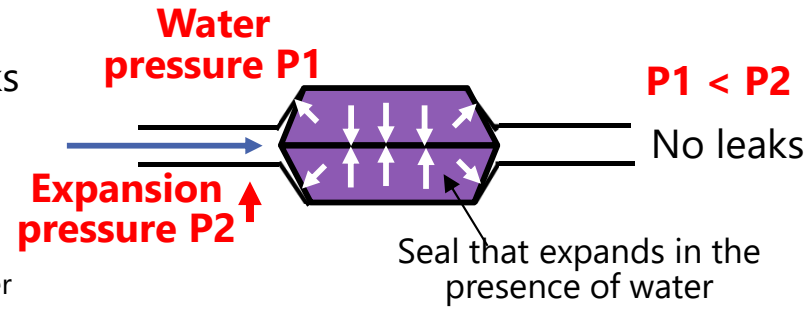
【How waterproofing works】



When assembling the segment

On the off chance that it leaks

Even if the segments grow apart due to changes in the ground foundation, the paths for the water to escape will be blocked with the expansion of the seals in the presence of water.



Waterproofed with the expansion of the seal in the presence of water