

Fukushima Daiichi Nuclear Power Station

Installation of Discharge Outlet Caisson

<Reference Material>

November 18, 2022

TEPCO Holdings

Fukushima Daiichi D&D Engineering Company

- Following the Japanese government's Basic Policy announced in April 2021, TEPCO had been reviewed the details of the design and operation of ALPS treated water dilution/discharge facility and related facilities. In December 2021, TEPCO submitted the "Application Documents for Approval to Amend the Implementation Plan for Fukushima Daiichi Nuclear Power Station Specified Nuclear Facility" for the basic design of ALPS treated water dilution/discharge facility and related facilities to the Nuclear Regulation Authority (NRA), and on July 22, 2022, these application documents were approved by the NRA.
- On August 4, the shield machine had started to drill at the vertical shaft (down-stream storage) in preparation for the discharge tunnel installation in addition to that laying pipes had commenced in preparation for the installation of the measurement /confirmation facility and transfer facility.
- As it appears that weather and ocean conditions will be suitable for the safe installation of the discharge outlet caisson today (November 18), ships set sail from Onahama Port last night towards the offshore of the Fukushima Daiichi Nuclear Power Station.
- After the installation of the outlet caisson is completed, a concrete plant ship will be brought to back fill the area around the discharge outlet caisson with mortar and concrete the following day as soon as weather and ocean conditions permit.

< Announced as of November 17 >

- After confirming suitable weather and ocean conditions, preparation works to install the discharge outlet caisson began at 6:15 AM this morning offshore of the Fukushima Daiichi Nuclear Power Station and installation of the caisson was completed at 0:20 PM.
- We will continue to work of back filling the area around the discharge outlet caisson, etc. prioritizing safety while considering weather and ocean conditions.

Construction of installing discharge outlet caisson

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Construction of installing discharge outlet caisson ①



Construction of installing discharge outlet caisson ③



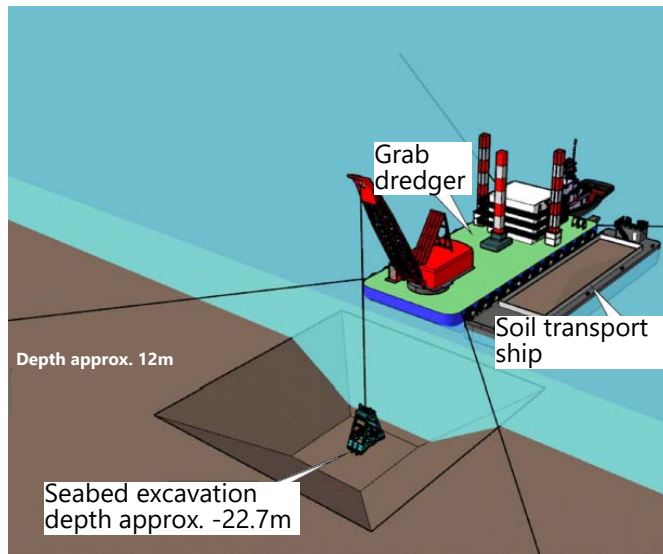
Construction of installing discharge outlet caisson ②



Construction of installing discharge outlet caisson ④

- Seafloor excavation and depositing/covering of rubble work at the discharge outlet of the discharge tunnel and its confirmation have been completed on July 22th. The caisson (a large concrete box) made of reinforced concrete will be installed on the seafloor using large crane ship while watching the weather and sea conditions. The area around the caisson will then be back filled with concrete.
- After the shield machine drilling the discharge tunnel reaches the caisson, a crane ship will be used to extract the shield arrival tube (containing the shield machine) from the outlet caisson.

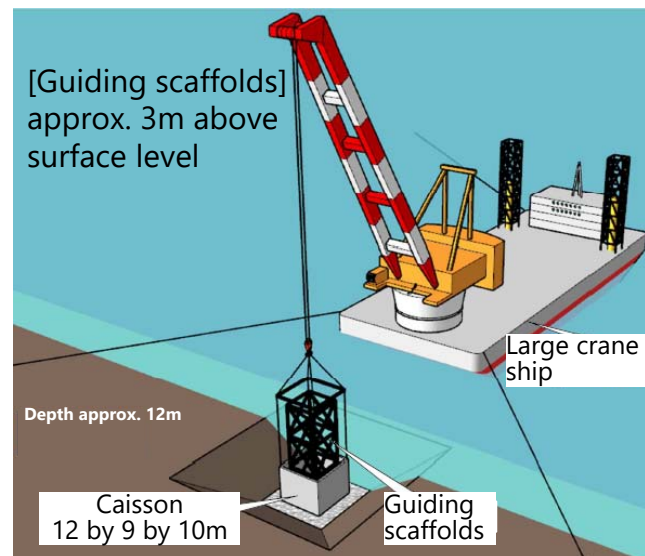
— Improvements in the Surroundings (completed) —



[Bedrock excavation, caisson fabrication]

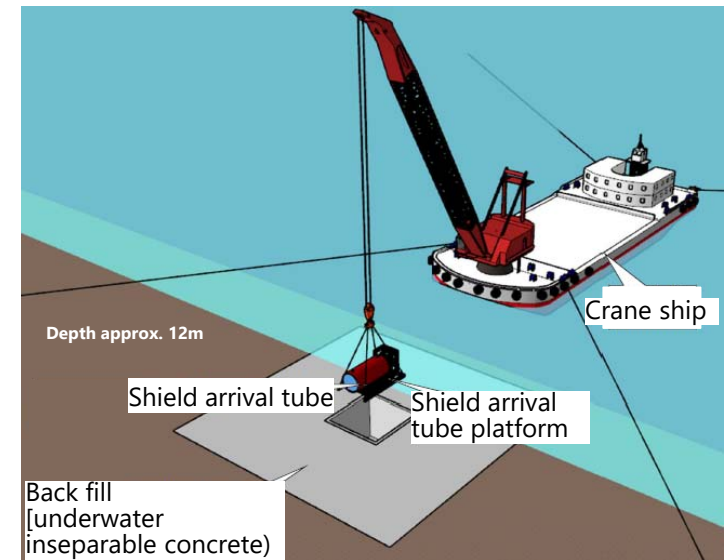
1. Use grab dredger (seafloor excavation ship) to excavate bedrock
2. Carry excavated soil to power station site
3. Deposit foundation rubble

— Project to install discharge outlet caisson —



[Install caisson]

1. The caisson transported by sea from outside the power station is installed using a large crane ship
2. Refill the area around the caisson with concrete
3. In preparation for the arrival of the shield machine, manage locational information of the discharge outlet by using the metal guiding scaffolds connected to the caisson



[Remove excavator, install lid]

1. After the shield machine arrives inside the shield arrival tube in the caisson, fill the tunnel interior with seawater
2. Separate the collector and the tunnel, and collect the shield machine from the vertical shaft using a crane ship
3. Finally, install the caisson lid

(Reference) Discharge Outlet Caisson (Installation of Discharge Outlet Caisson) **TEPCO**

- Fix crane ship to the pre-installed sinker blocks (110t) and anchors using mooring wire.
- Guide crane ship to the installation location using GPS installed on the crane ship and surveying the guiding scaffolds installed on the caisson from the ground side (from two locations on the South seawall and North seawall). Fine adjustments for the positioning of the subject crane ship will be performed by winding and releasing the mooring wire using the crane ship's winch. Discharge caisson will be installed after moving the ship to the point of installation.

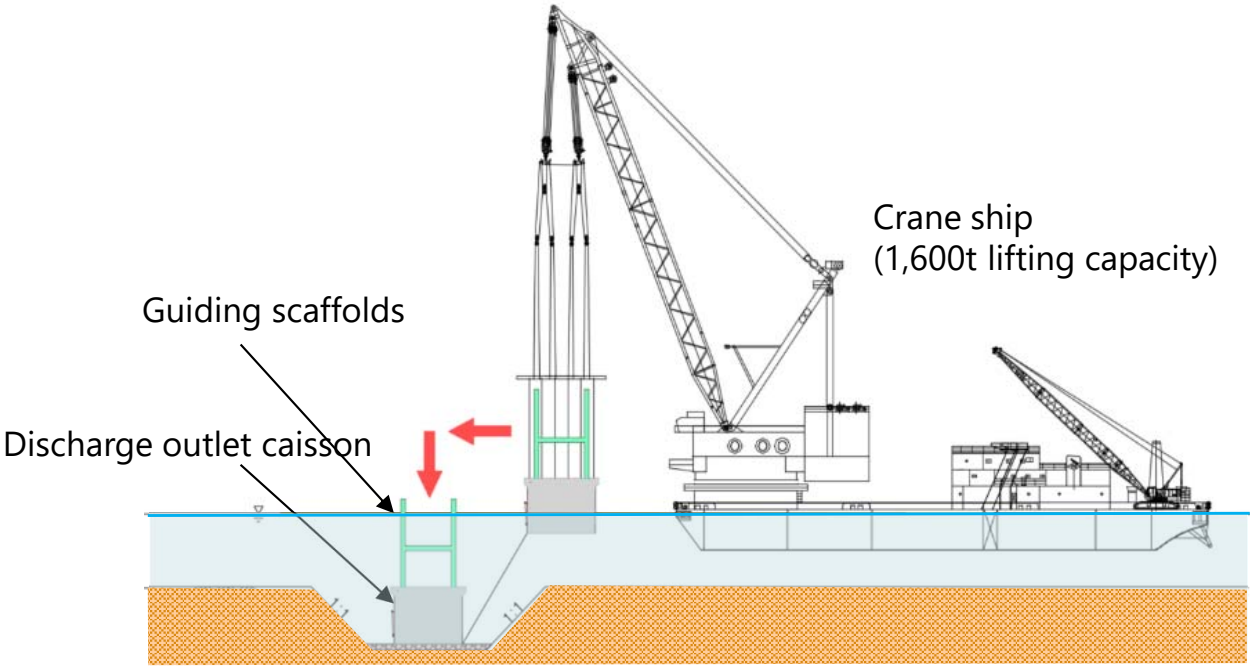
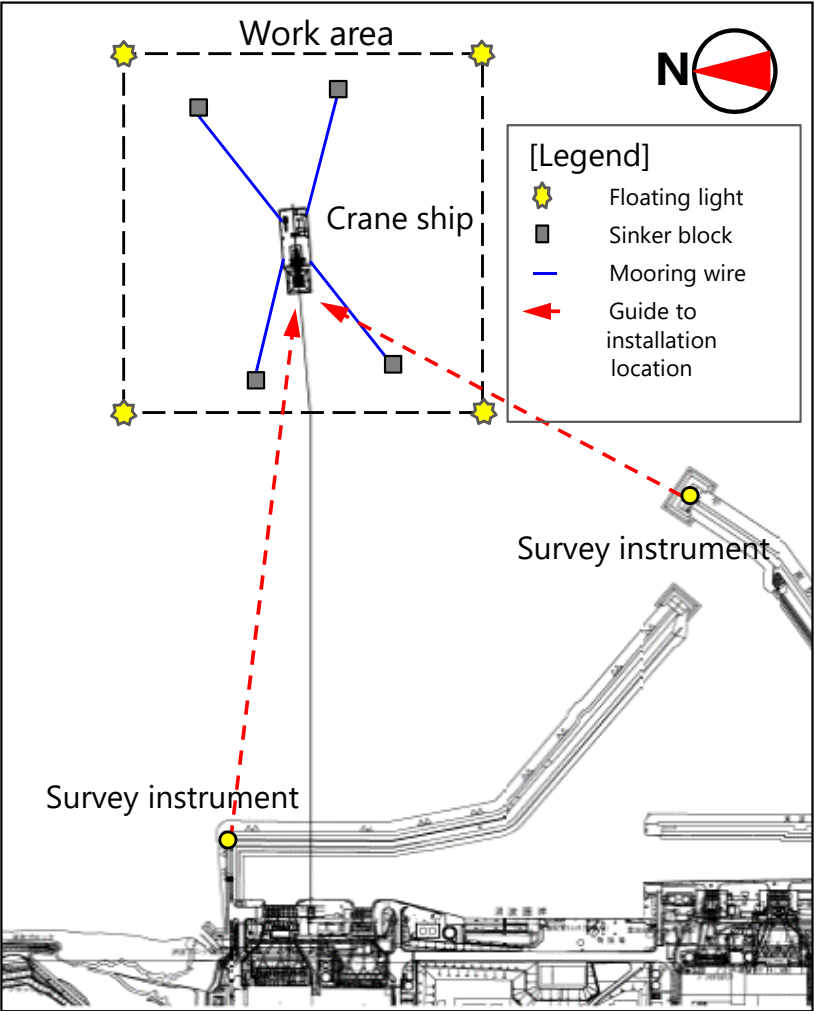
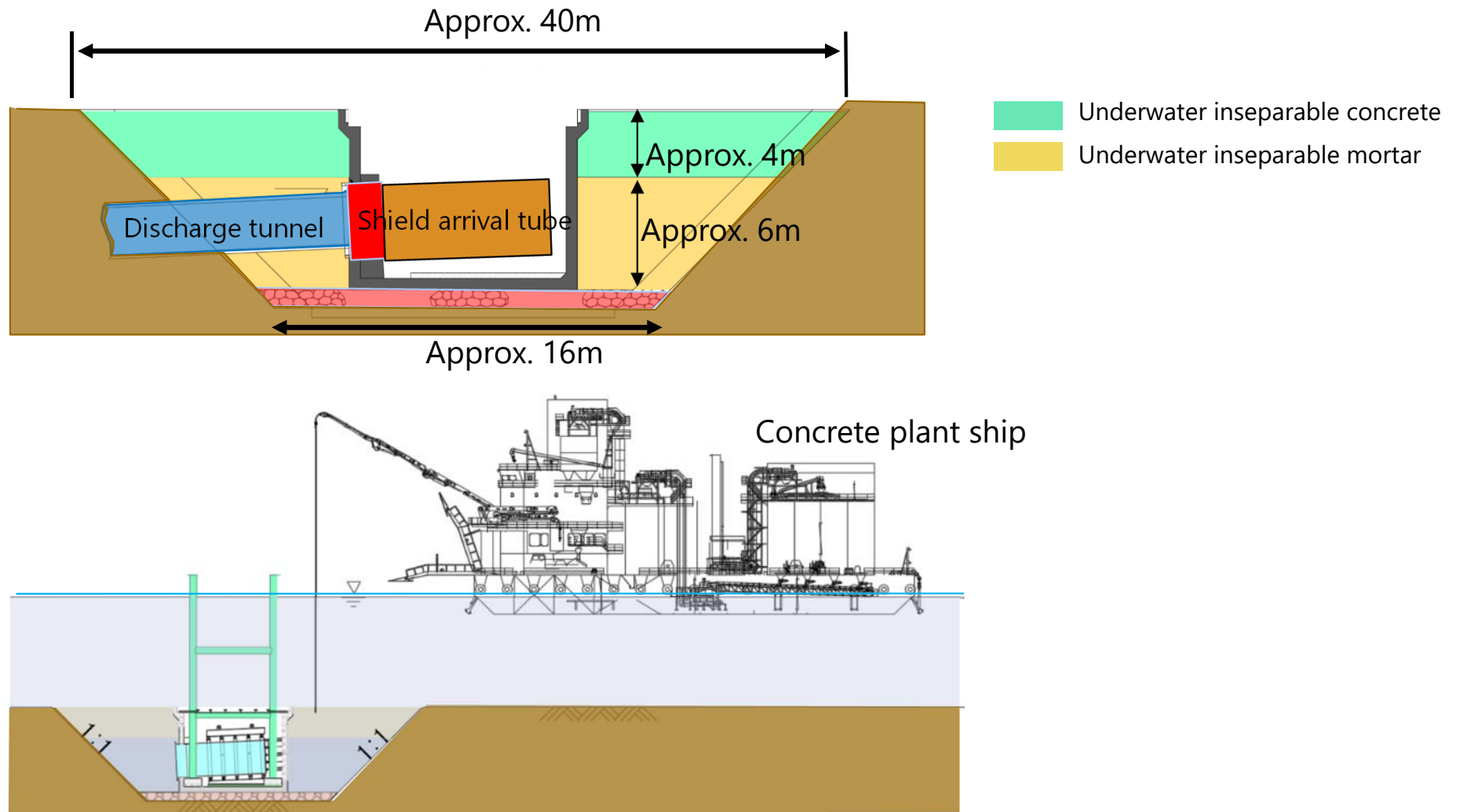


Figure of Work to Install Discharge outlet Caisson (cross section)

Figure of Work to Install Discharge outlet Caisson (plan view)

(Reference) Discharge Outlet Caisson (Back Fill)

- After installing the discharge outlet caisson, pour underwater inseparable mortar (area where the shield machine passes) and underwater inseparable concrete using a concrete plant ship for back filling.



Cross section figure for back filling work