

Progress of Landside Impermeable Wall freezing: the Second Stage



- The purpose of the Landside Impermeable Wall construction lies not in freezing soil to form an underground wall but in keeping groundwater from flowing into the reactor/turbine buildings and preventing new contaminated water from being generated.
- By closing part of unfrozen areas on the mountainside in the second stage following after the first stage, it is expected that the amount of groundwater flowing into the areas around the reactor/turbine buildings will be reduced. This will also keep groundwater from being contaminated.
- Throughout the second stage, how freezing of the Landside Impermeable Wall has progressed will be checked by monitoring the difference in groundwater levels inside and outside of the wall and the amount of groundwater pumped up by the Subdrain, groundwater drain, and the well point systems.

Changes in soil temperatures over time

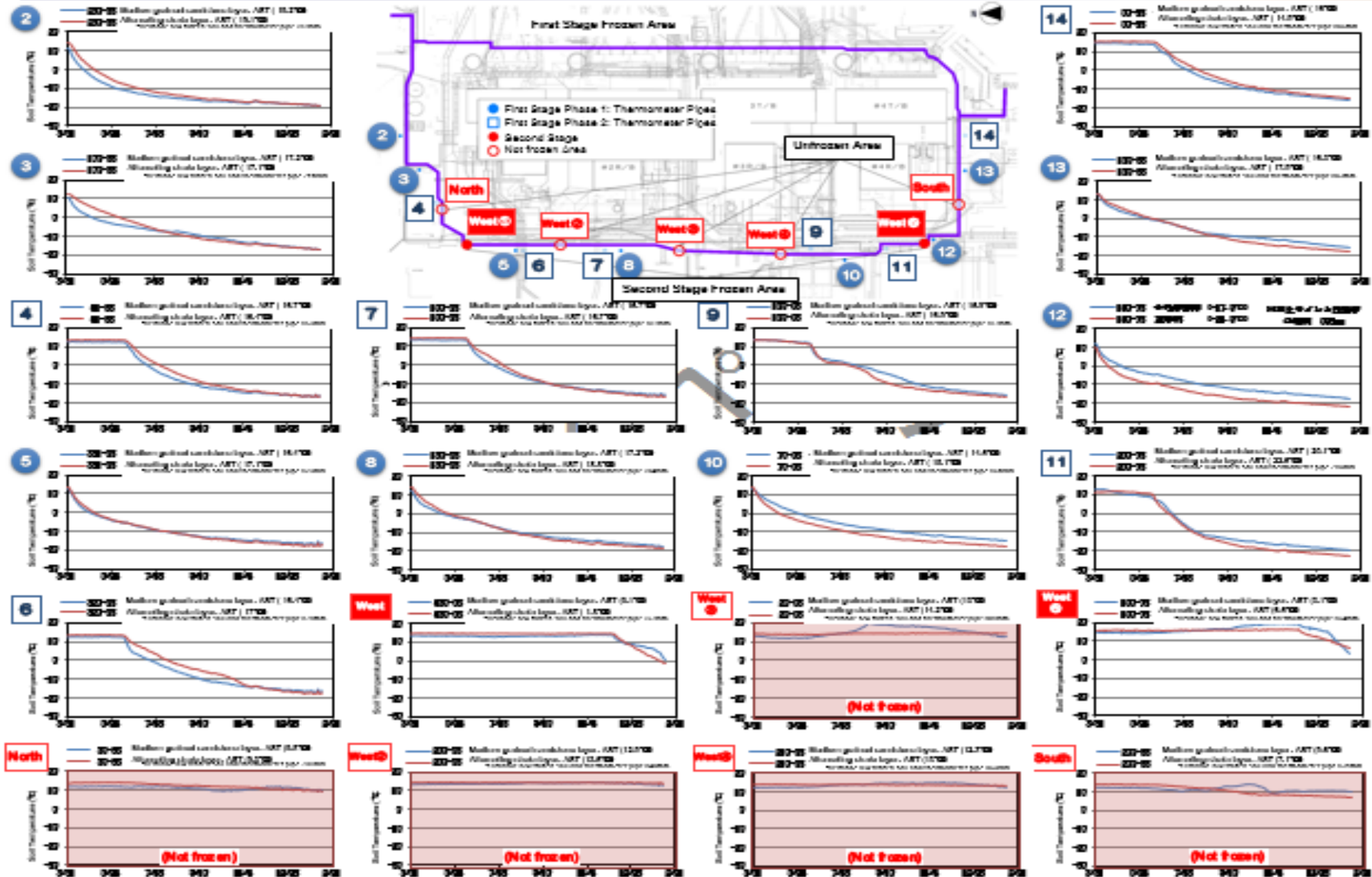
Note

- Average Soil Temperature (AST) of medium-grained sandstone layer (blue line): average value of thermometer temperatures measured at 1m intervals except for the areas between ground surface and Ground Level 2m and the areas around the first muddy layer boarder.
- Average Soil Temperature (AST) of alternating strata layer (red line): Average value of thermometer temperatures measured at 1m intervals except for the areas around the upper and lower parts of the alternating layer boarder.



Landslide Impermeable Wall Freezing Progress Report: Soil Temperatures (Temperatures in Thermometer Pipes) (as of 7 a.m., on February 7, 2017)

Stage Two

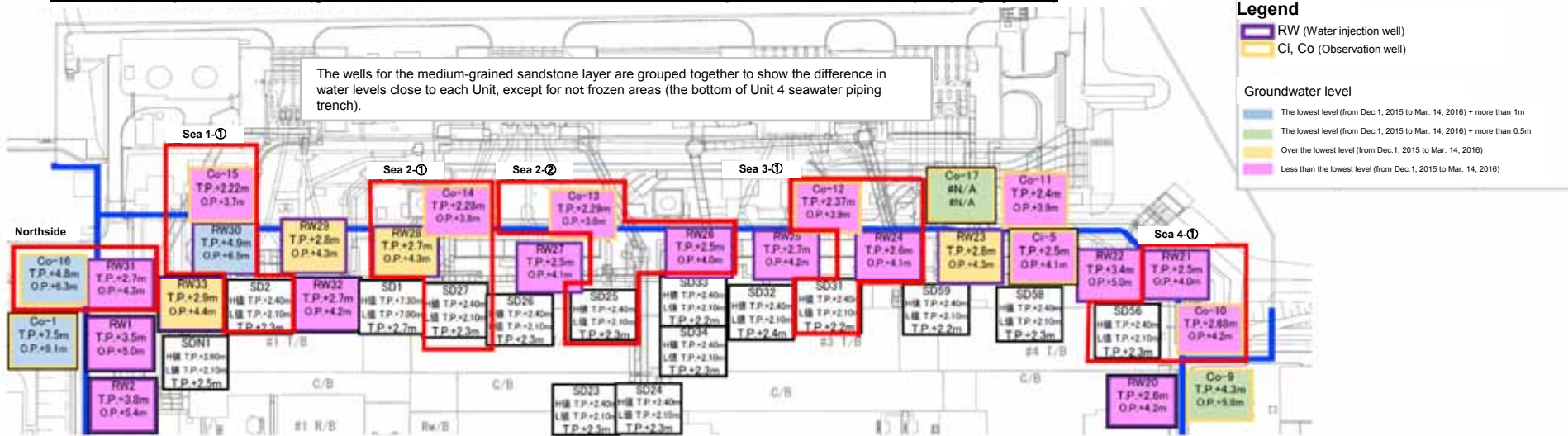


Groundwater levels and hydraulic heads (in the medium-grained sandstone layer 1 on the seaside)

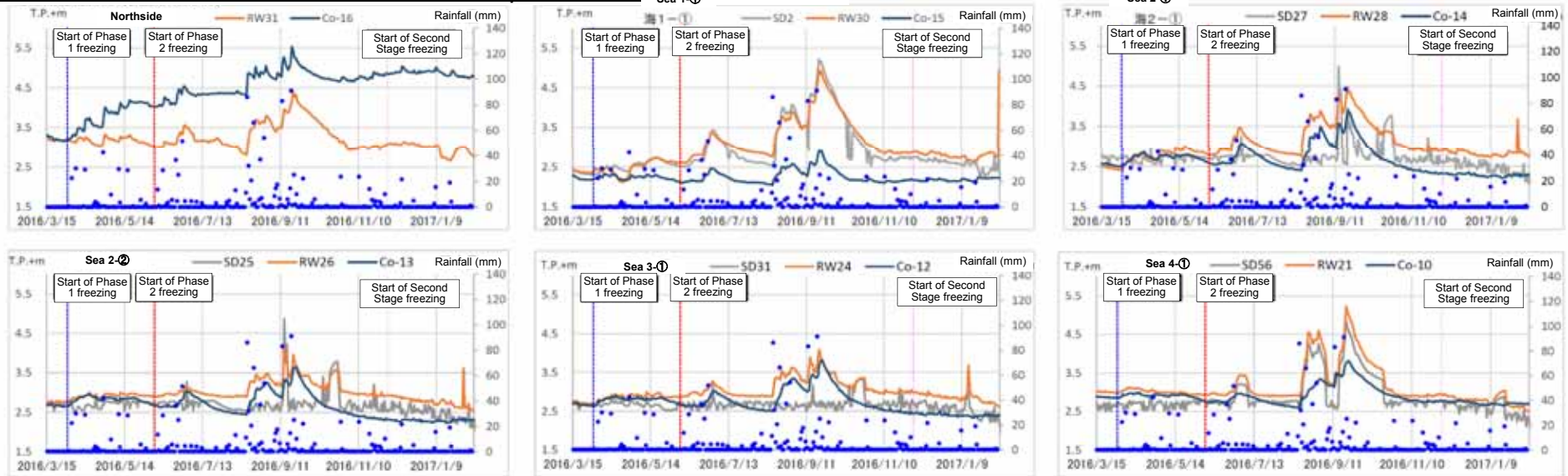


Monitoring items in an early stage of the ice wall freezing (Second Stage, seaside, water levels in the medium-grained sandstone layer)

1. Landside Impermeable Wall (groundwater levels around the seaside and the operations of Subdrain pumping system)



2. Groundwater levels inside and outside of the Landside Impermeable Wall



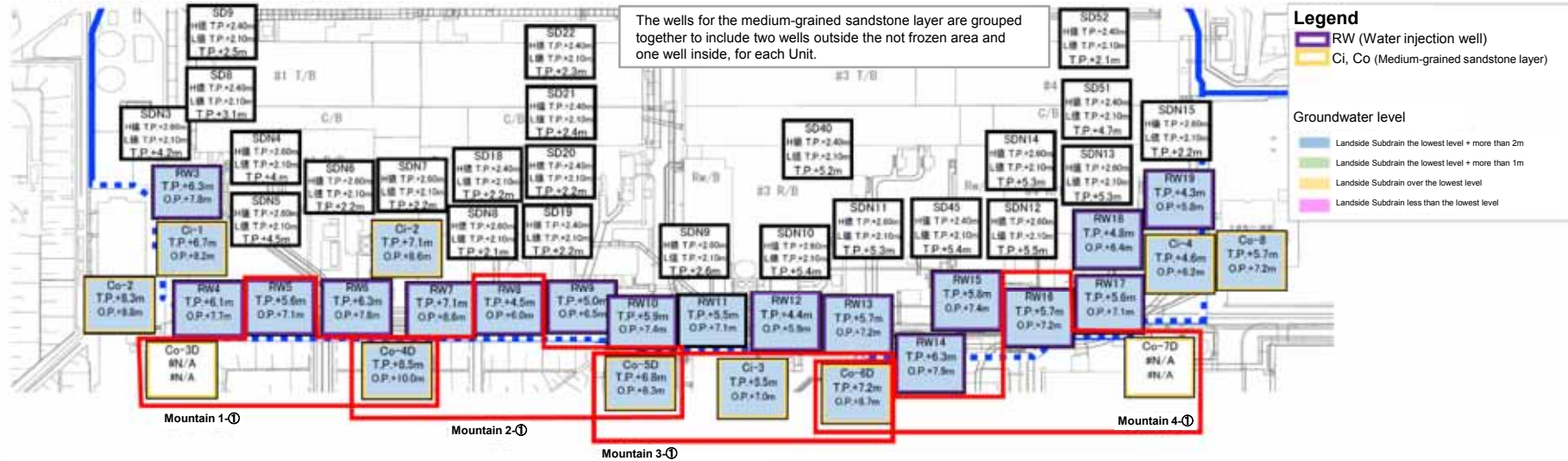
Data of groundwater levels as of 12 p.m. on February 7

Groundwater levels and hydraulic heads (in the medium-grained sandstone layer 2 on the landside)

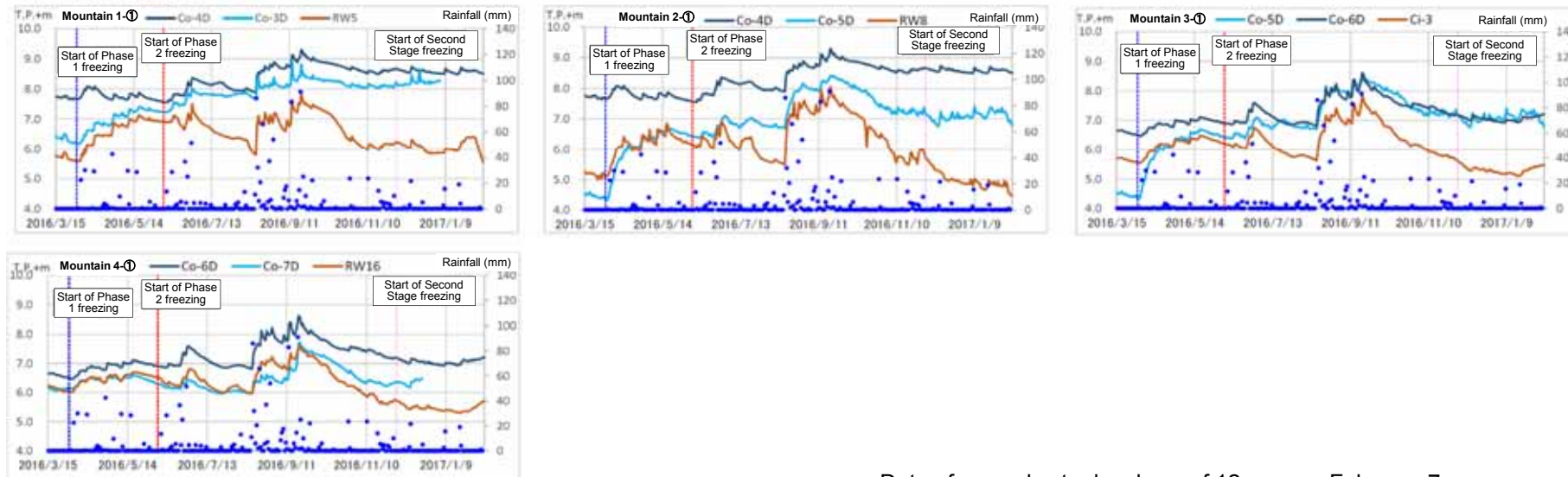


Monitoring items in an early stage of the ice wall freezing (Second Stage, seaside, water levels in the medium-grained sandstone layer)

3. Landside Impermeable Wall (groundwater levels around the seaside and the operations of Subdrain pumping system)



4. Groundwater levels inside and outside of the Landside Impermeable Wall



Data of groundwater levels as of 12 p.m. on February 7

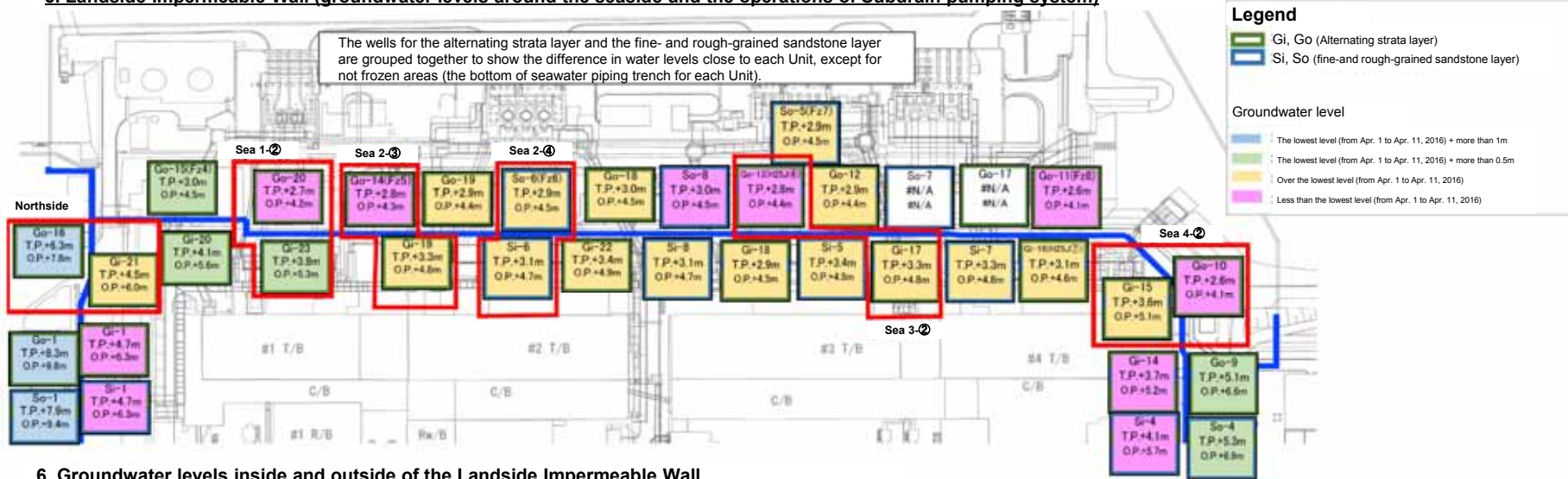
Groundwater levels and hydraulic heads

(in the alternating strata layer and the fine- and rough-grained sandstone layer 1 on the seaside)

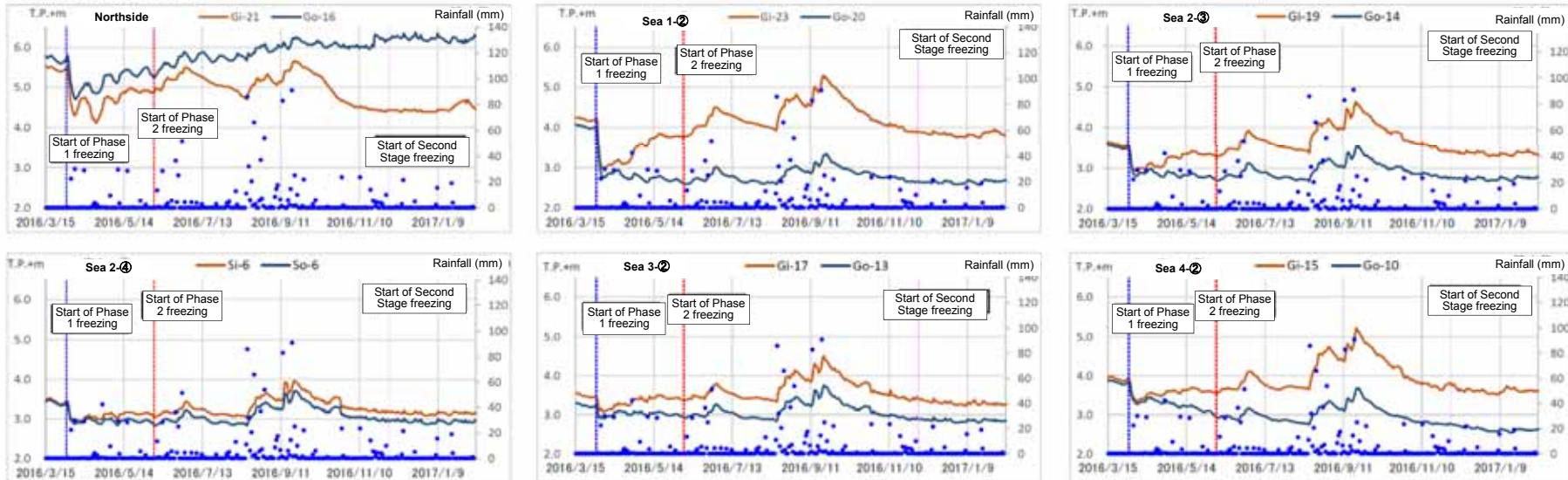


Monitoring items in an early stage of the ice wall freezing (Phase 1 Stage 1, seaside, water levels in the middle-grained sandstone layer)

5. Landside Impermeable Wall (groundwater levels around the seaside and the operations of Subdrain pumping system)



6. Groundwater levels inside and outside of the Landside Impermeable Wall



Data of groundwater levels as of 12 p.m. on February 7

Groundwater levels and hydraulic heads

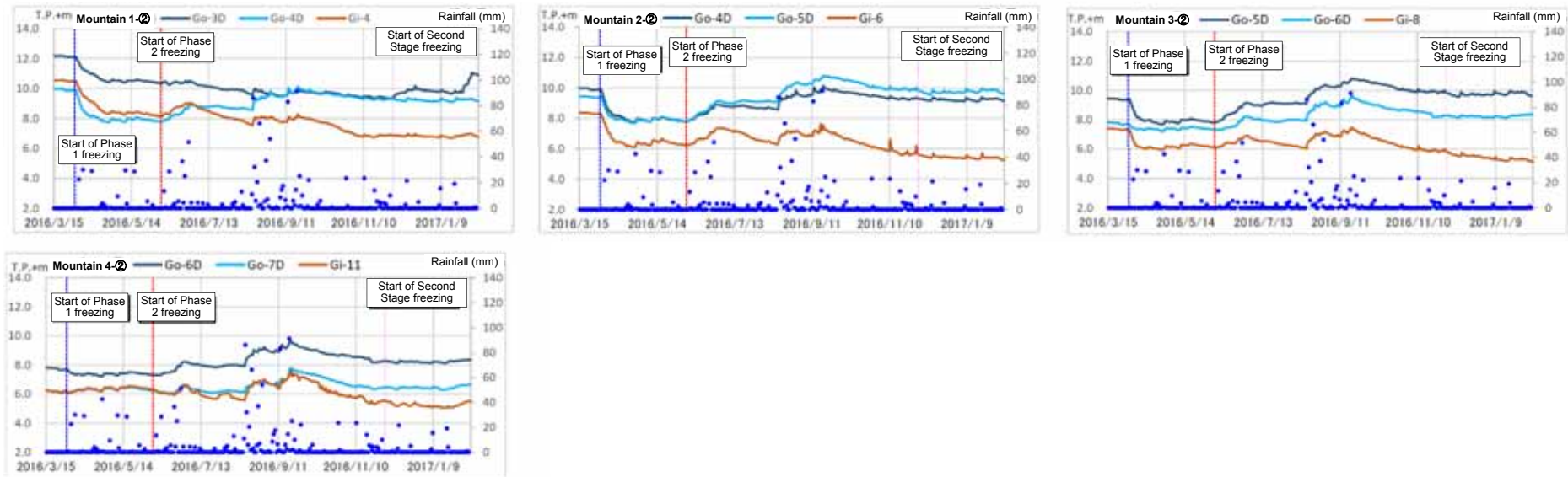
(in the alternating strata layer and the fine- and rough-grained sandstone layer 2 on the landside) **TEPCO**

Monitoring items in an early stage of the ice wall freezing (Phase 1 Stage 1, seaside, water levels in the middle-grained sandstone layer)

7. Landside Impermeable Wall (groundwater levels around the seaside and the operations of Subdrain pumping system)

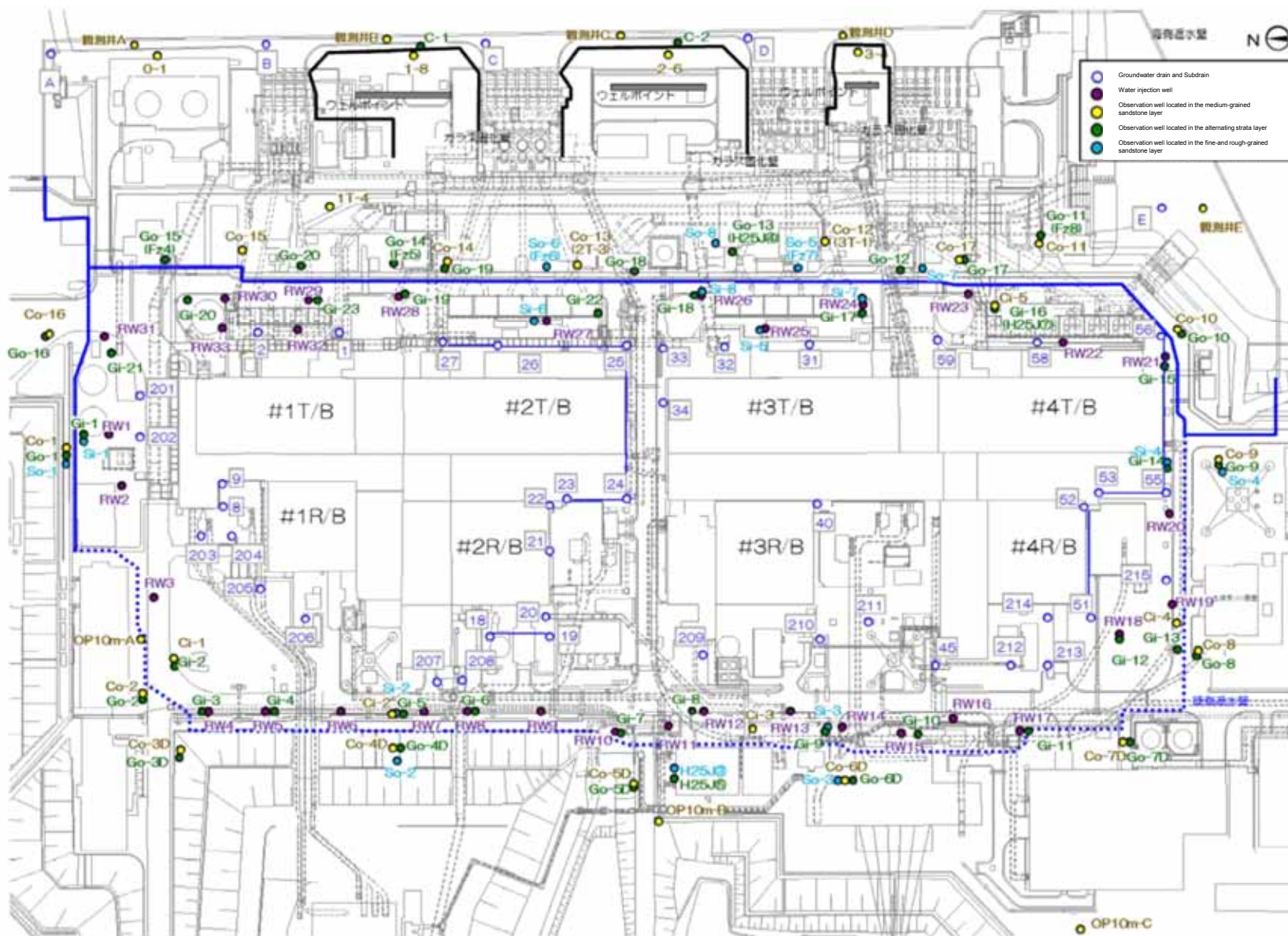


8. Groundwater levels inside and outside of the Landside Impermeable Wall



Data of groundwater levels as of 12 p.m. on February 7

For Reference: Location map of groundwater level observation wells **TEPCO**



For Reference: Distribution map of soil temperatures

(north side of Unit 1) **TEPCO**

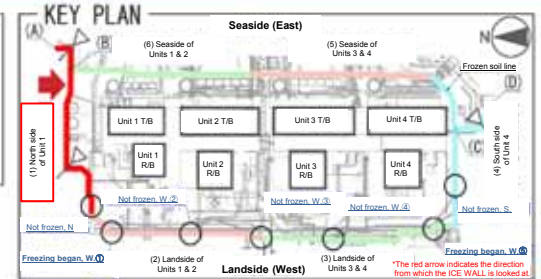
Distribution map of soil temperatures

(1) North side of Unit 1 (viewed from the north side)

(Temperature data as of 7 a.m. on February 7)

Legend

- Thermometer pipe for the outside of frozen soil line
- Thermometer pipe for the inside of frozen soil line
- Diagonally installed thermometer pipe for the soil freezing pipes installed on multiple line
- Thermometer pipe for not frozen areas
- Corner of frozen soil line
- RW (recharge well)
- CI (medium-grained sandstone layer on the inside of frozen soil line)
- Soil freezing pipes installed in a single line (advanced freezing)
- Soil freezing pipes installed on multiple lines (advanced freezing)
- Freezing areas for the seaside and a part of the north side



For Reference: Distribution map of soil temperatures

(west side of Units 1-2) **TEPCO**

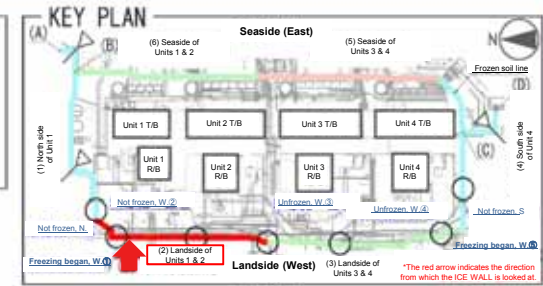
■ Distribution map of soil temperatures

(2) Landside of Units 1-2 (viewed from the west side)

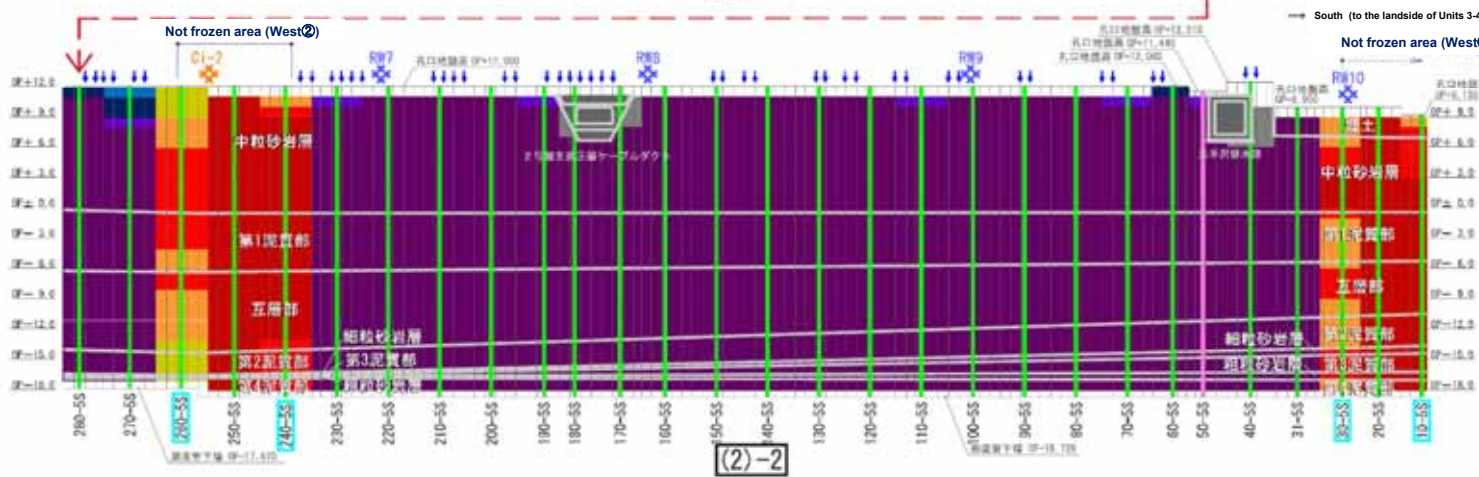
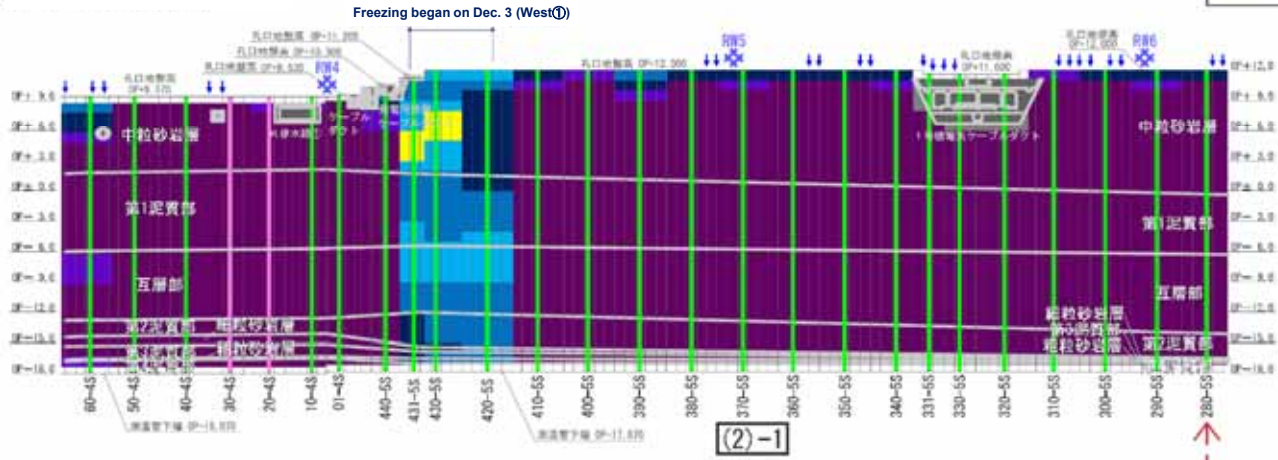
(Temperature data as of 7 a.m. on February 7)

Legend

- Thermometer pipe for the outside of frozen soil line
- Thermometer pipe for the inside of frozen soil line
- Diagonally installed thermometer pipe for the soil freezing pipes installed on multiple line
- Thermometer pipe for not frozen areas
- Corner of frozen soil line
- RW (recharge well)
- CI (medium-grained sandstone layer in the inside of frozen soil line)
- Soil freezing pipes installed on single line (advanced freezing)
- Soil freezing pipes installed on multiple lines (advanced freezing)
- Freezing areas for the seaside and a part of the north side



← North (to the north side of Unit 1 (1))



*No measurement: white
Buried part: grey

For Reference: Distribution map of soil temperatures

(west side of Units 3-4)



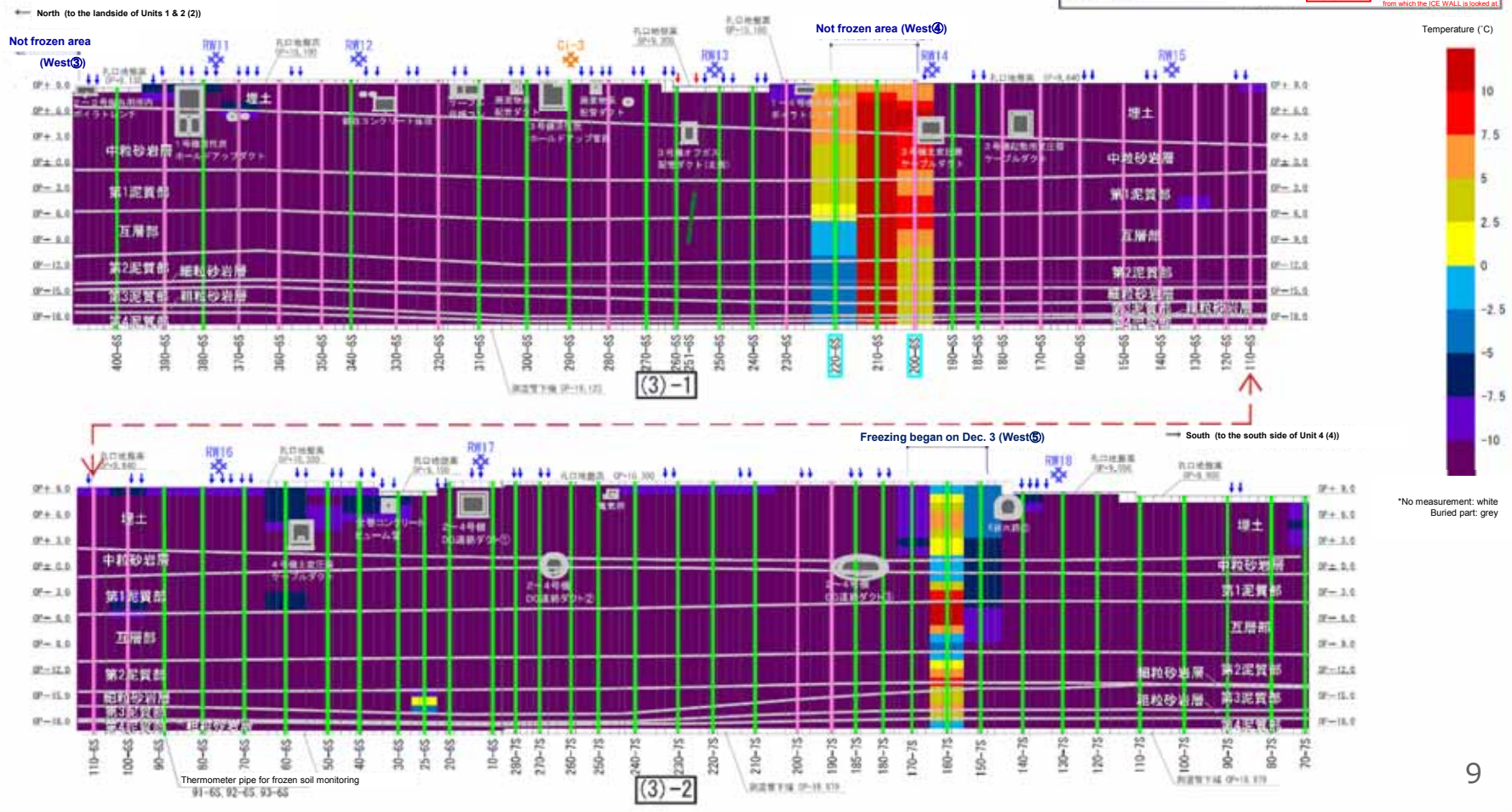
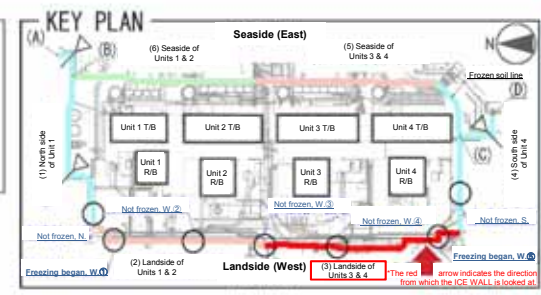
■ Distribution map of soil temperatures

(3) Landside of Units 3-4 (viewed from the west side)

(Temperature data as of 7 a.m. on February 7)

Legend

- Thermometer pipe for the outside of frozen soil line
- Thermometer pipe for the inside of frozen soil line
- Diagonally installed thermometer pipe for the soil freezing pipes installed on multiple line
- Thermometer pipe for no freezing areas
- Corner of frozen soil line
- RW (recharge well)
- CI (medium-grained sandstone layer on the inside of frozen soil line)
- Soil freezing pipes installed in a single line (advanced freezing)
- Soil freezing pipes installed on multiple lines (advanced freezing)
- Freezing areas for the seaside and a part of the north side



For Reference: Distribution map of soil temperatures

(south side of Unit 4) **TEPCO**

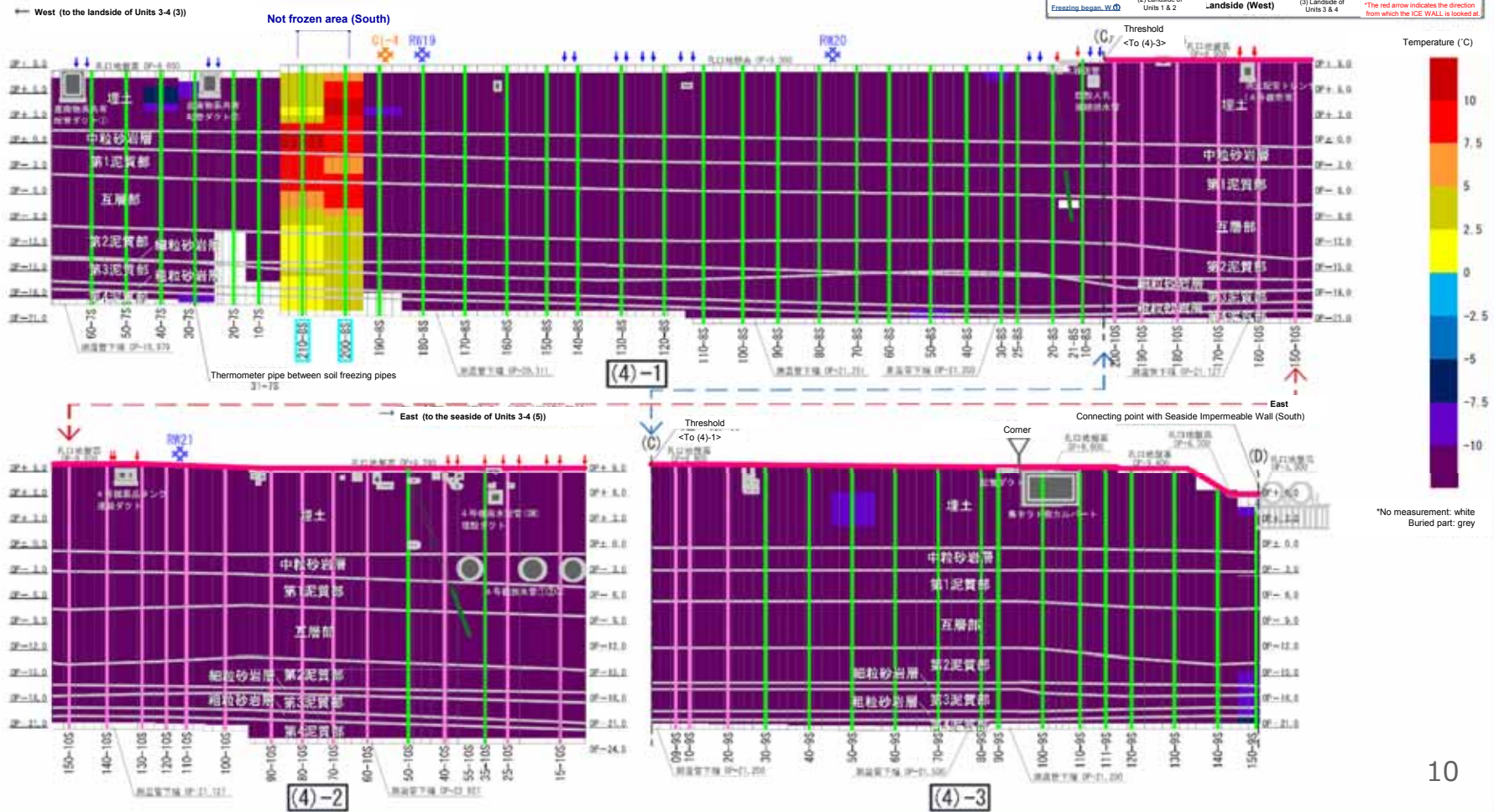
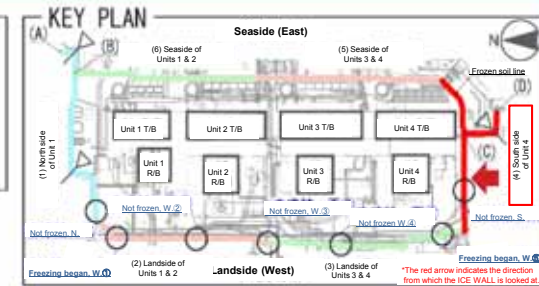
■ Distribution map of soil temperatures

(4) South side of Unit 4 (viewed from the south side)

(Temperature data as of 7 a.m. on February 7)

Legend

- : Thermometer pipe for the outside of frozen soil line
- : Thermometer pipe for the inside of frozen soil line
- ↗ : Diagonally installed thermometer pipe for the soil freezing pipes installed on multiple line (advanced freezing)
- : Thermometer pipe for no freezing areas
- ▽ : Corner of frozen soil line
- ⊗ : RW (recharge well)
- ⊗ : CI (medium grained sandstone layer in the inside of frozen soil line)
- ↓ : Soil freezing pipes installed on single line (advanced freezing)
- ↓ : Soil freezing pipes installed on multiple lines (advanced freezing)
- : Freezing areas for the seaside and a part of the north side



For Reference: Distribution map of soil temperatures

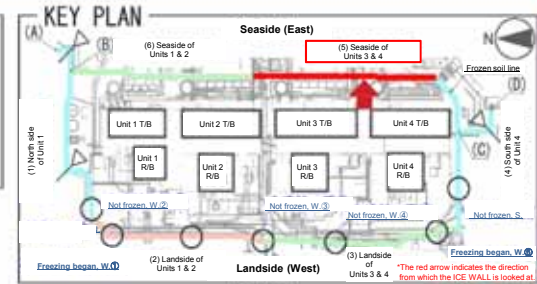
(east side of Units 3-4) **TEPCO**

■ Distribution map of soil temperatures

(5) Seaside of Units 3-4
(west side: viewed from the inside of frozen soil)
(Temperature data as of 7 a.m. on February 7)

Legend

- Thermometer pipe for the outside of frozen soil line
- Thermometer pipe for the inside of frozen soil line
- Diagonally installed thermometer pipe for the soil freezing pipes installed on multiple line
- Thermometer pipe for no freezing areas
- Corner of frozen soil line
- RW (recharge well)
- CI (medium-grained sandstone layer in the inside of frozen soil line)
- Soil freezing pipes installed on single line (advanced freezing)
- Soil freezing pipes installed on multiple lines (advanced freezing)
- Freezing areas for the seaside and a part of the north side



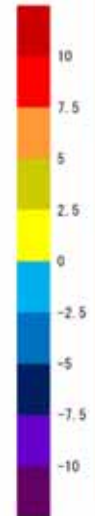
← North (to the seaside of Units 1-2 (6))



→ South (to the south side of Unit 4 (4))



Temperature (°C)



*No measurement: white
Buried part: gray

For Reference: Distribution map of soil temperature

(east side of Units 1-2) **TEPCO**

■ Distribution map of soil temperatures

(6) Seaside of Units 1-2
(west side: a view from the inside of frozen soil)

(Temperature data as of 7 a.m. on February 7)

Legend

- Thermometer pipe for the outside of frozen soil line
- Thermometer pipe for the inside of frozen soil line
- Diagonally installed thermometer pipe for the soil freezing pipes installed on multiple line
- Thermometer pipe for no freezing areas
- Corner of frozen soil line
- RE (recharge well)
- CI (medium-grained sandstone layer in the inside of frozen soil line)
- Soil freezing pipes installed on single line (advanced freezing)
- Soil freezing pipes installed on multiple lines (advanced freezing)
- Freezing areas for the seaside and a part of the north side

