Reference
September 15, 2016
Tokyo Electric Power Company Holdings, Inc.

# Progress of Landside Impermeable Wall freezing: Phase 2 of the first stage

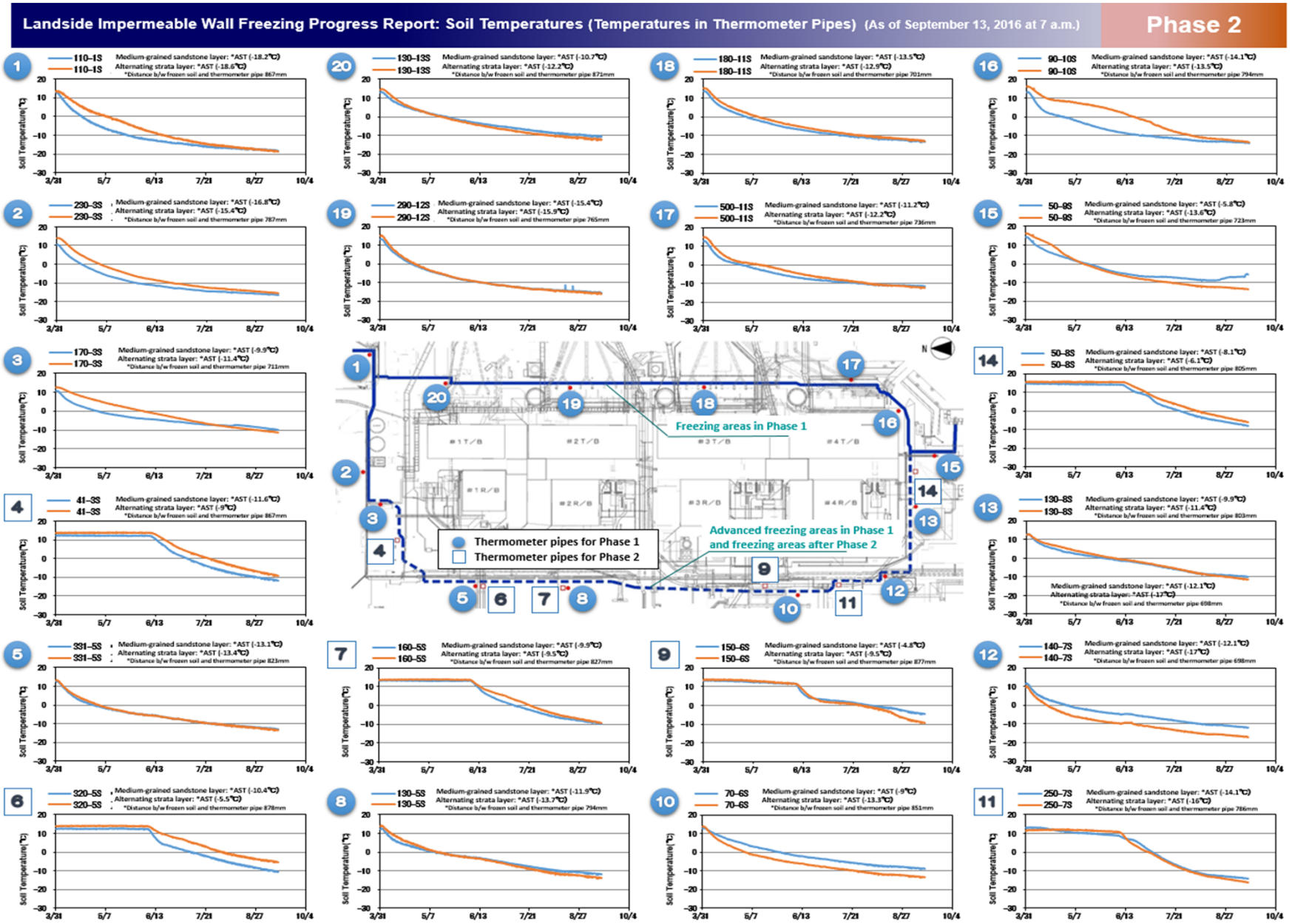
TEPCO

○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 less than 95 percent of the mountain side of the Landside Impermeable Wall in Phase 2 of 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 help keep groundwater from being contaminated during the first stage.
○Throughout the first 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 and groundwater drain systems and the well point system.

# 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.

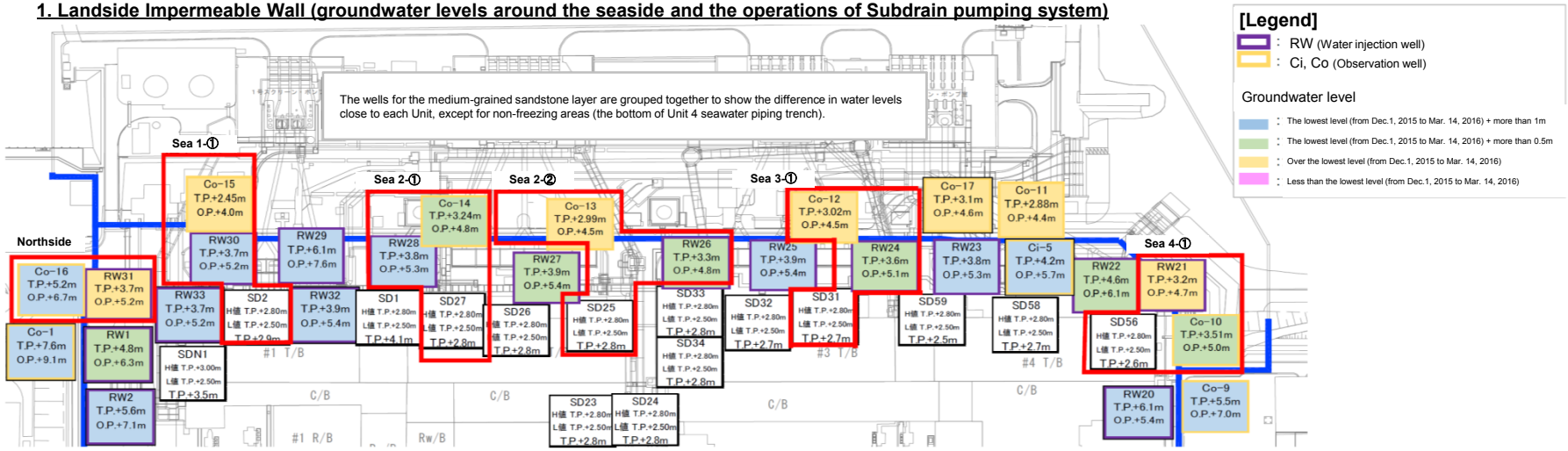
TEPCO



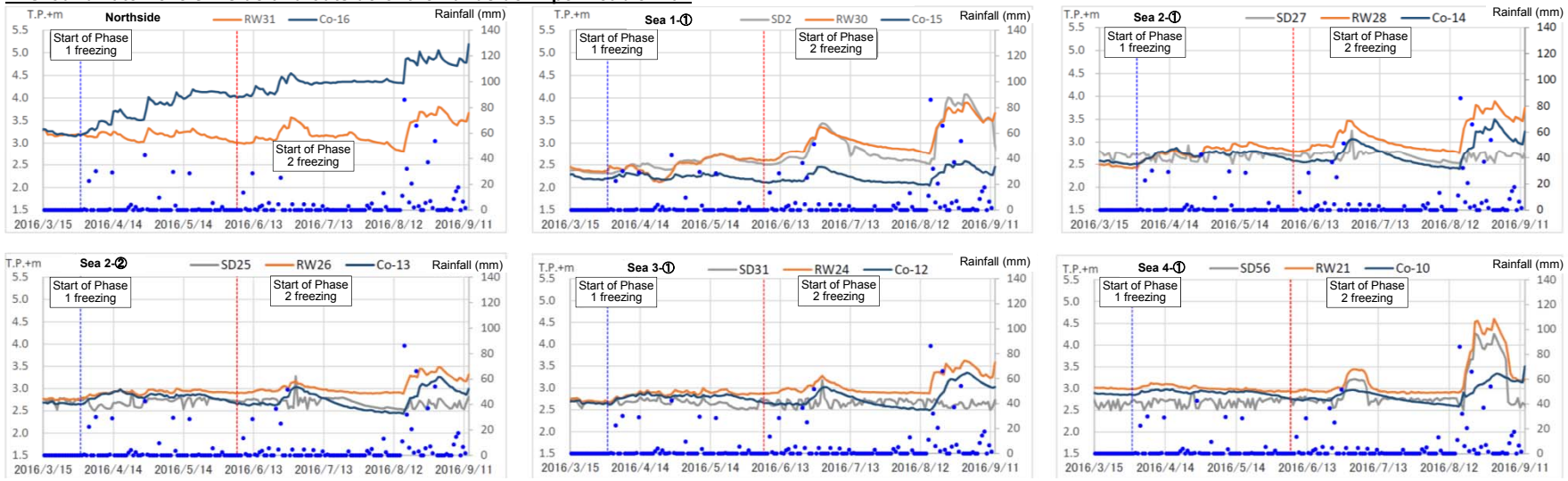
# Groundwater levels and hydraulic heads
## (in the medium-grained sandstone layer 1 on the seaside)

**Monitoring items at the beginning of ice wall freezing (Phase 1 Stage 1, seaside, water levels in the middle-grained sandstone layer)**

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



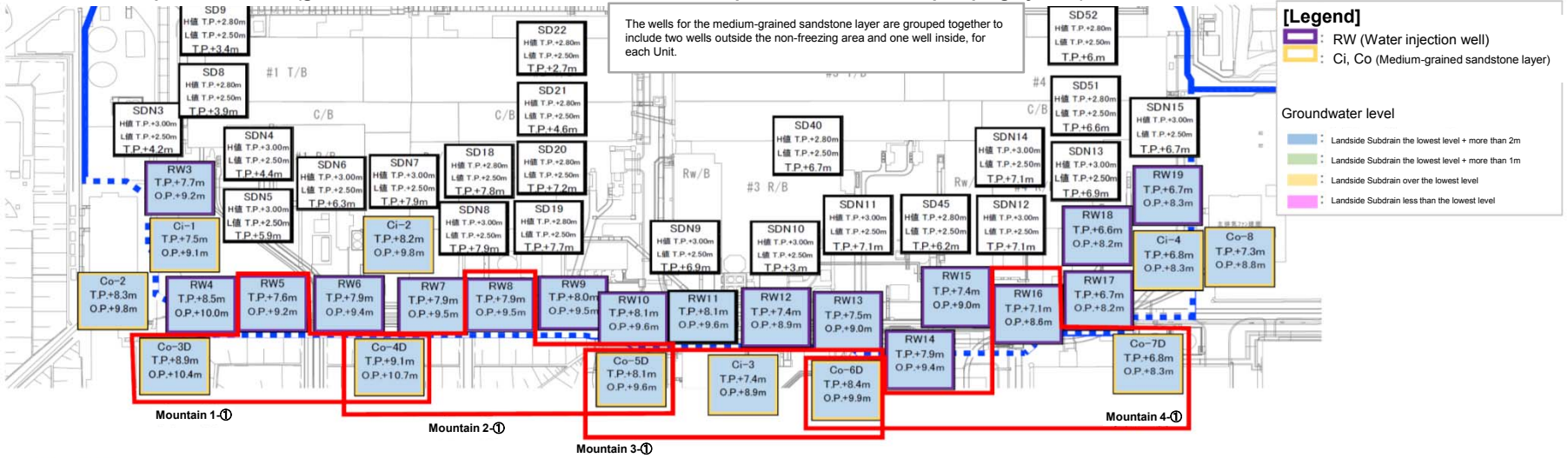

**2. Groundwater levels inside and outside of the Landside Impermeable Wall**



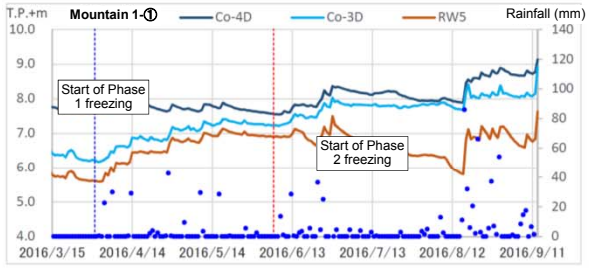
# Groundwater levels and hydraulic heads
## (in the medium-grained sandstone layer 2 on the landside)

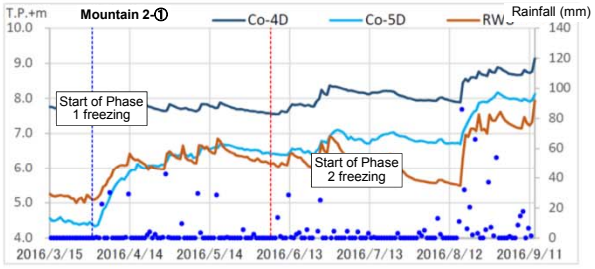
**Monitoring items at the beginning of ice wall freezing (Phase 1 Stage 1, seaside, water levels in the middle-grained sandstone layer)**

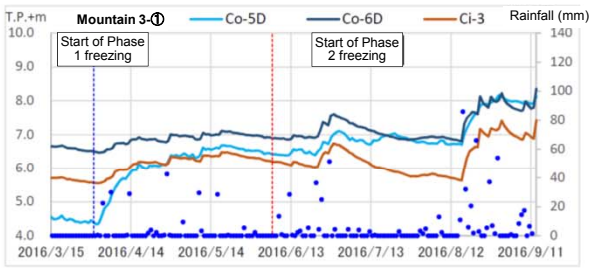
**3. Landside Impermeable Wall (groundwater levels around the seaside and the operations of Subdrain pumping system)**

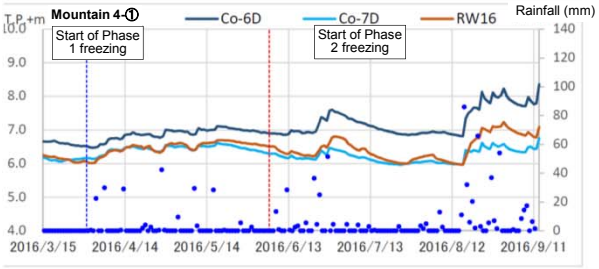



**4. Groundwater levels inside and outside of the Landside Impermeable Wall**



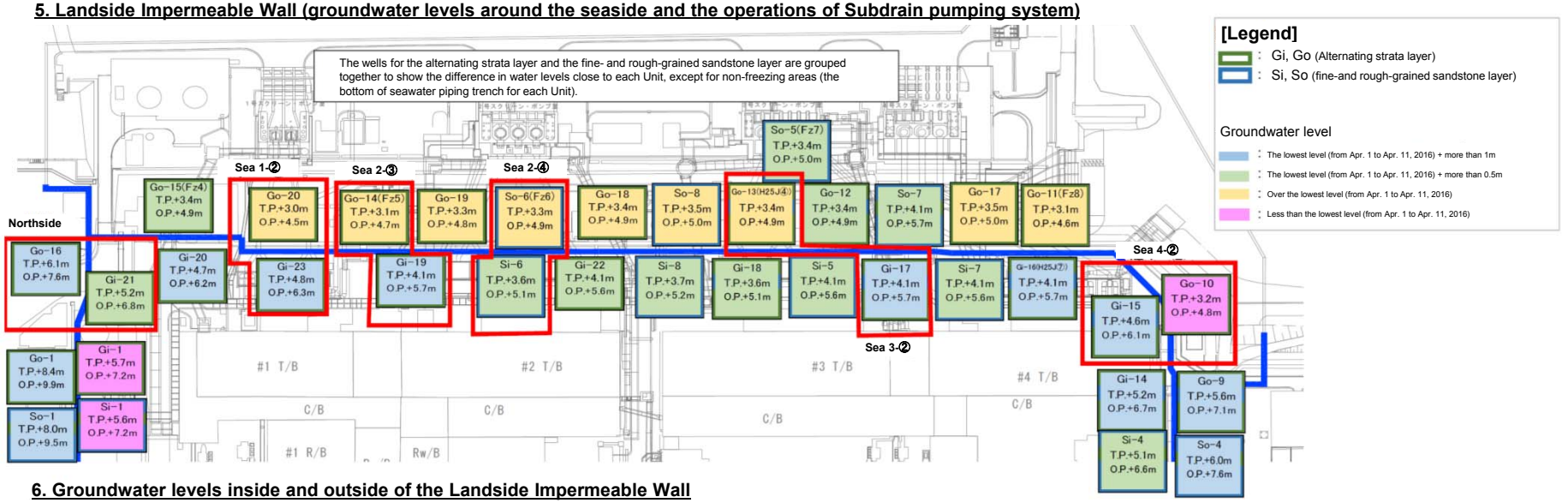




The data of groundwater levels as of 12 p.m. on September 13.

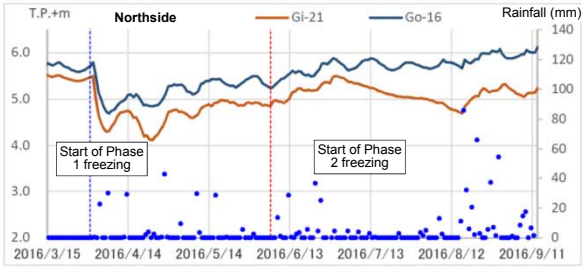
# Groundwater levels and hydraulic heads
## (in the alternating strata layer and the fine- and rough-grained sandstone layer 1 on the seaside)

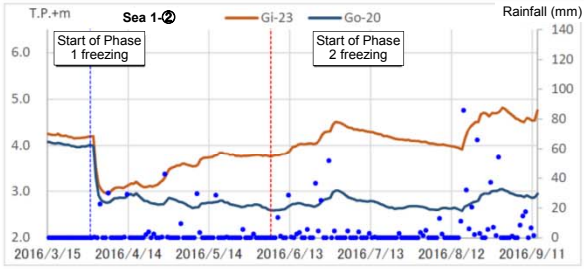
**Monitoring items at the beginning of ice wall freezing (Phase 1 Stage 1, seaside, water levels in the alternating strata layer and the fine- and rough-grained sandstone layer)**

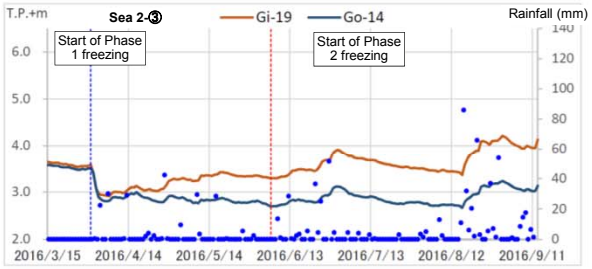
**5. Landside Impermeable Wall (groundwater levels around the seaside and the operations of Subdrain pumping system)**

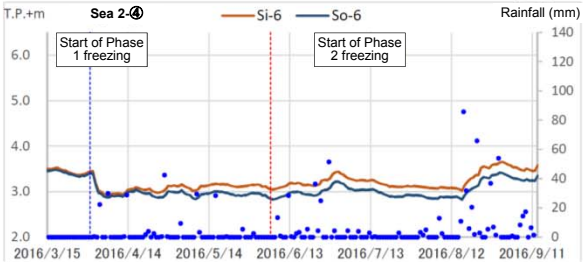


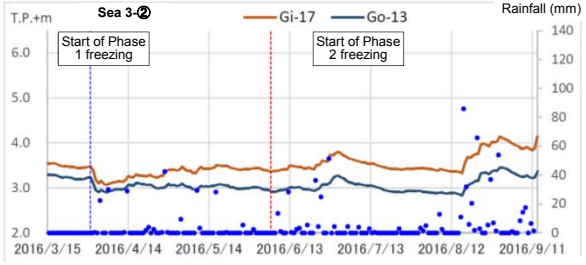

**6. Groundwater levels inside and outside of the Landside Impermeable Wall**

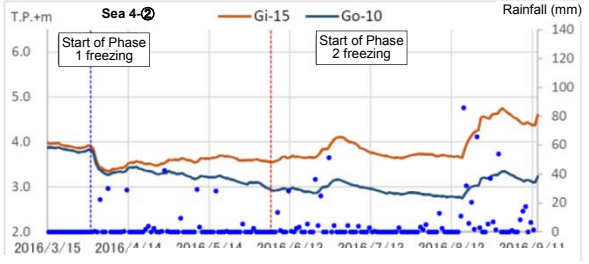


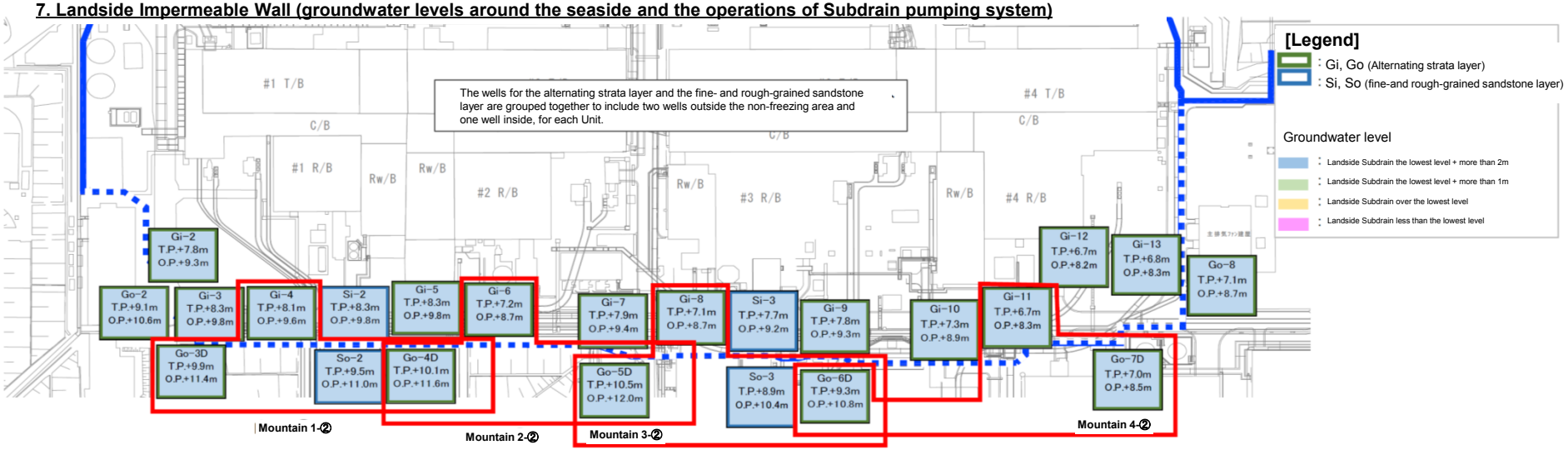




The data of groundwater levels as of 12 p.m. on September 13.

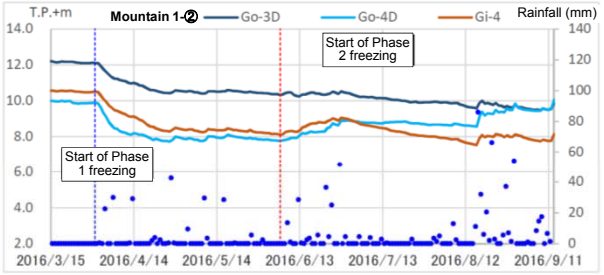
# Groundwater levels and hydraulic heads
## (in the alternating strata layer and the fine- and rough-grained sandstone layer 2 on the landside)

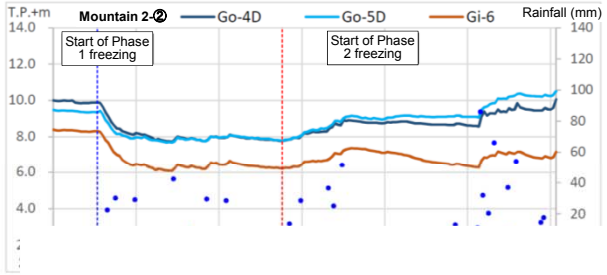
**Monitoring items at the beginning of ice wall freezing (Phase 1 Stage 1, seaside, water levels in the alternating strata layer and the fine- and rough-grained sandstone layer)**

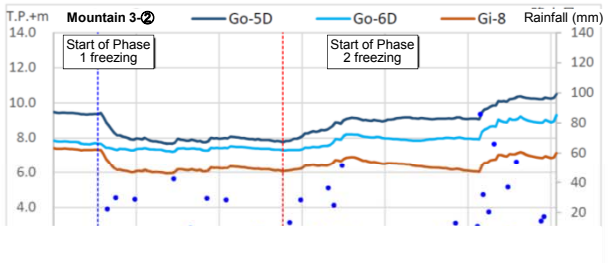
**7. Landside Impermeable Wall (groundwater levels around the seaside and the operations of Subdrain pumping system)**

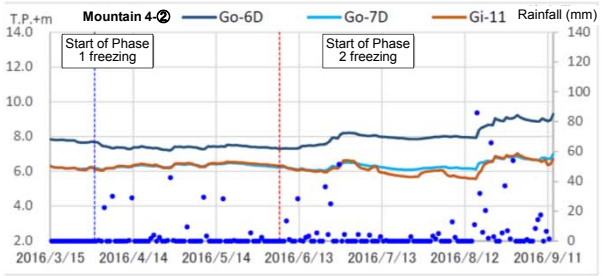



**8. Groundwater levels inside and outside of the Landside Impermeable Wall**



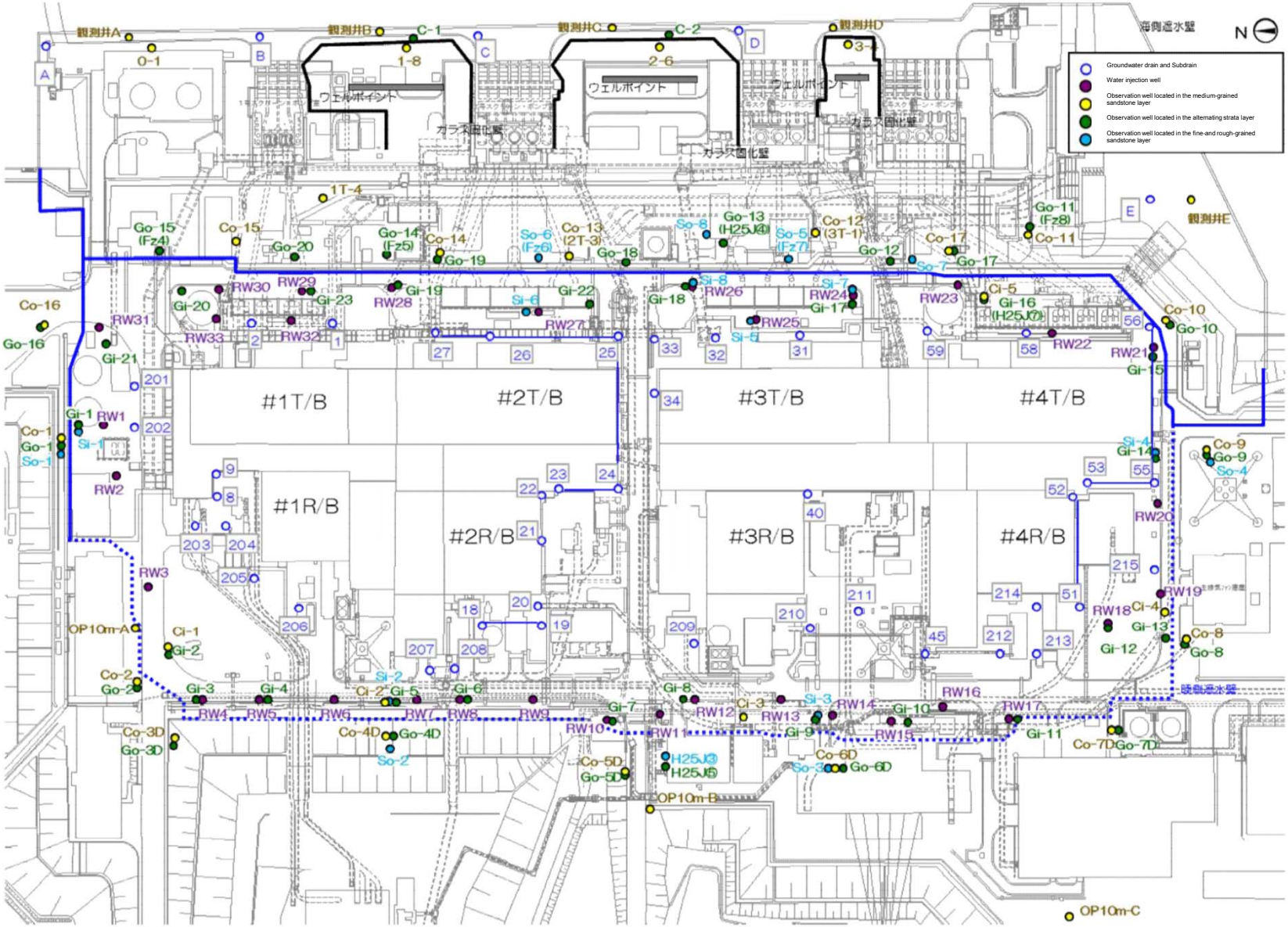




The data of groundwater levels as of 12 p.m. on September 13.

# [Reference] Location map of groundwater level observation wells (as of June 2016)

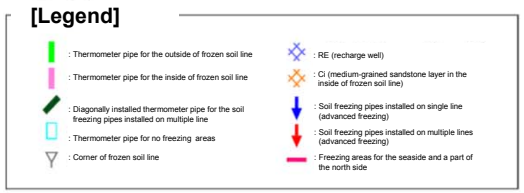


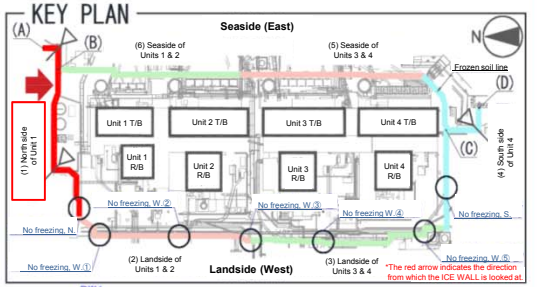
# [Reference] Distribution map of soil temperatures (north side of Unit 1)

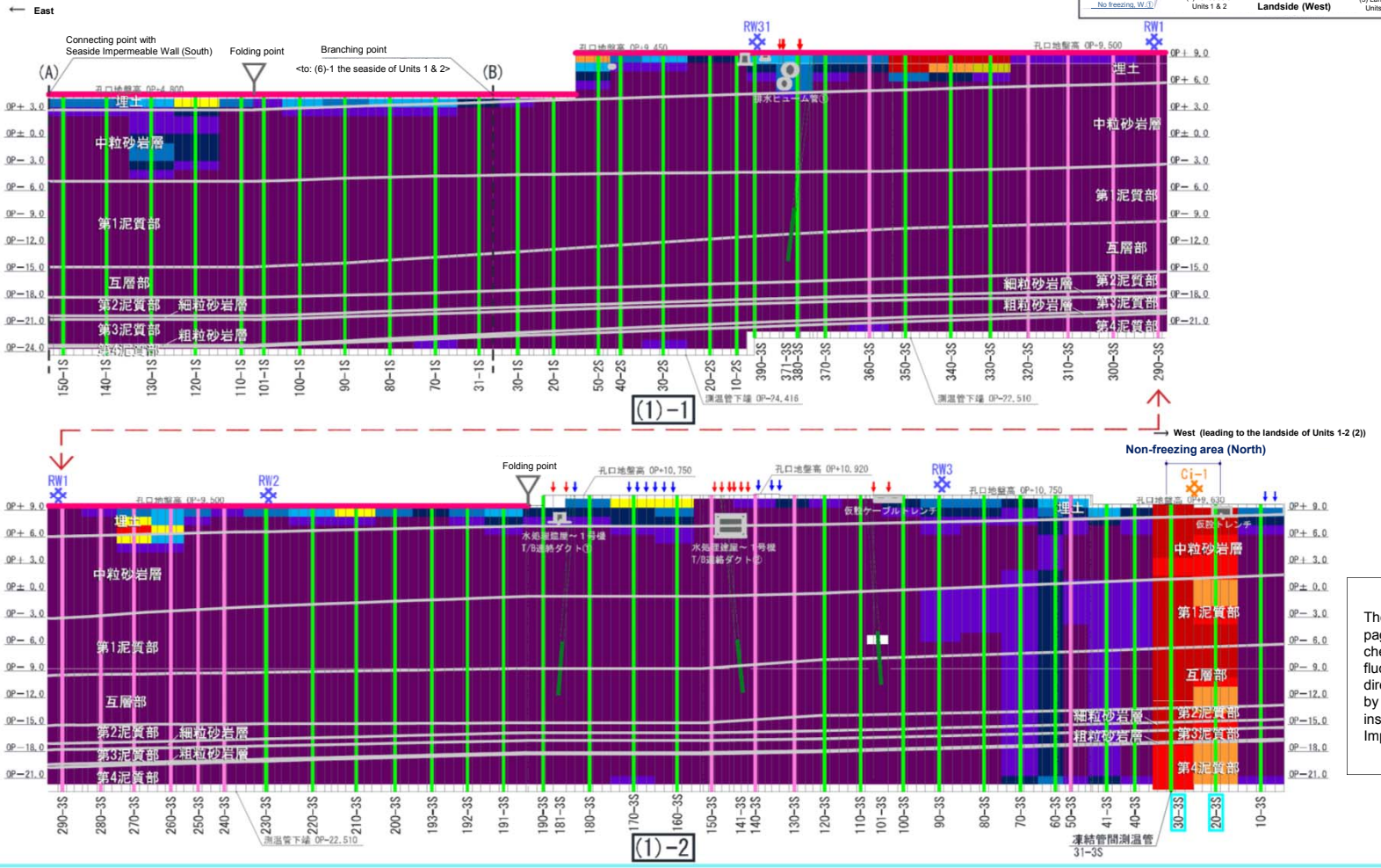
■ Distribution map of soil temperatures

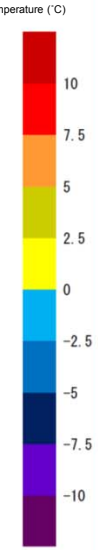
(1) North side of Unit 1 (a view from the north side)

(The temperature data as of 7 a.m. on September 13.)




*No measurement: white
Buried part: grey

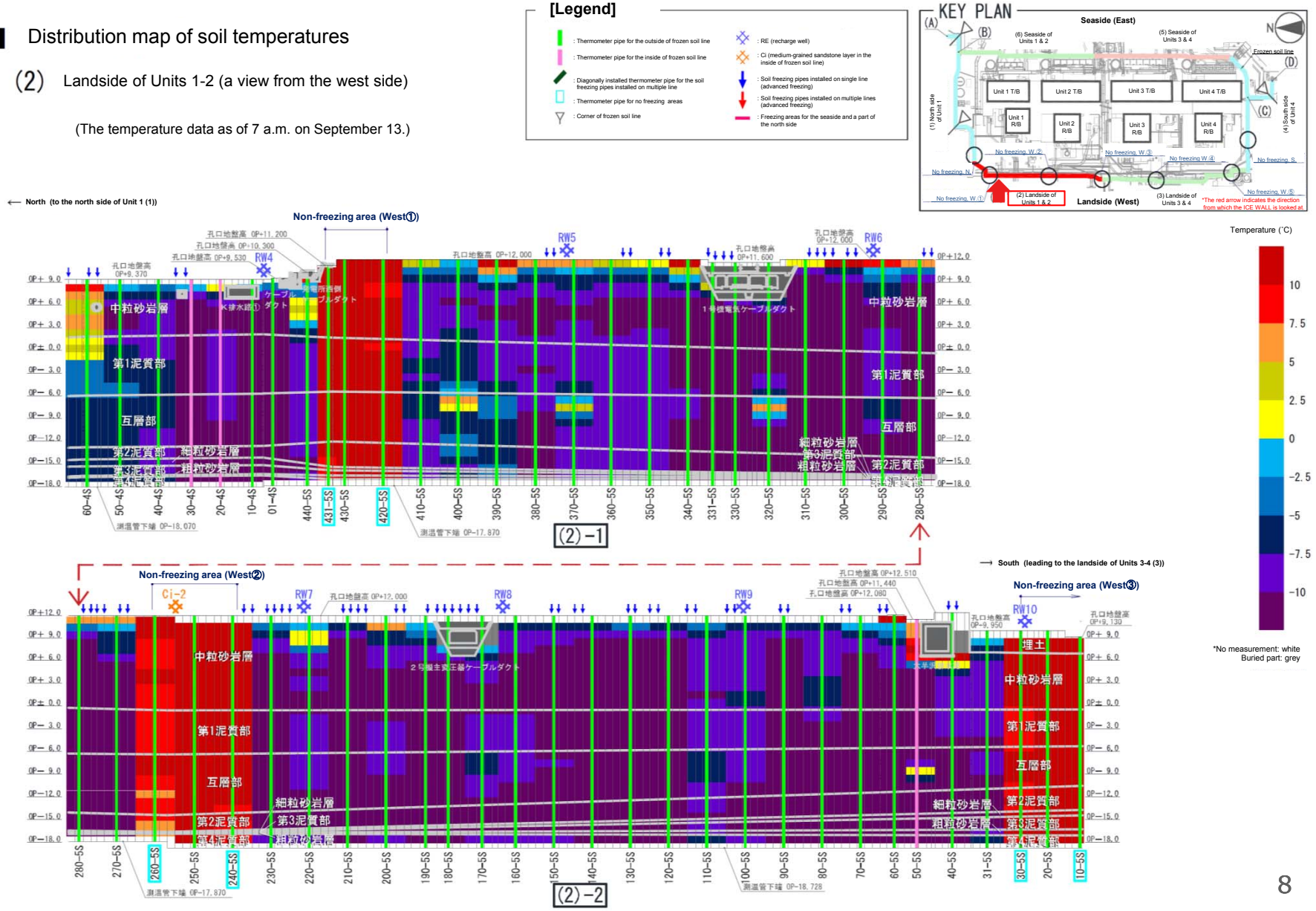
The distribution maps on pages 7-12 are for reference to check soil temperature fluctuations of the depth direction which are measured by the thermometer pipes installed around the Landside Impermeable Wall.

# [Reference] Distribution map of soil temperatures (west side of Units 1-2)

■ Distribution map of soil temperatures

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

(The temperature data as of 7 a.m. on September 13.)

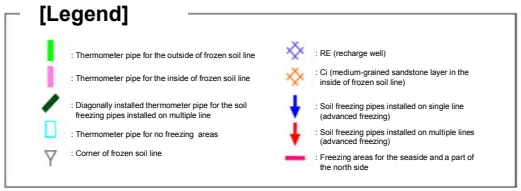


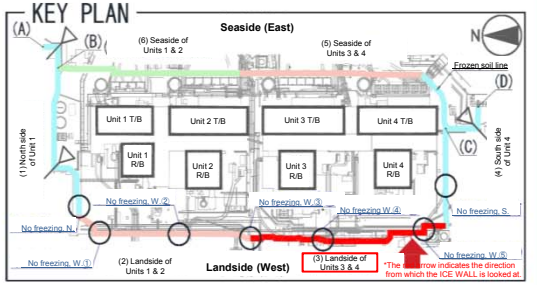
# [Reference] Distribution map of soil temperatures (west side of Units 3-4)

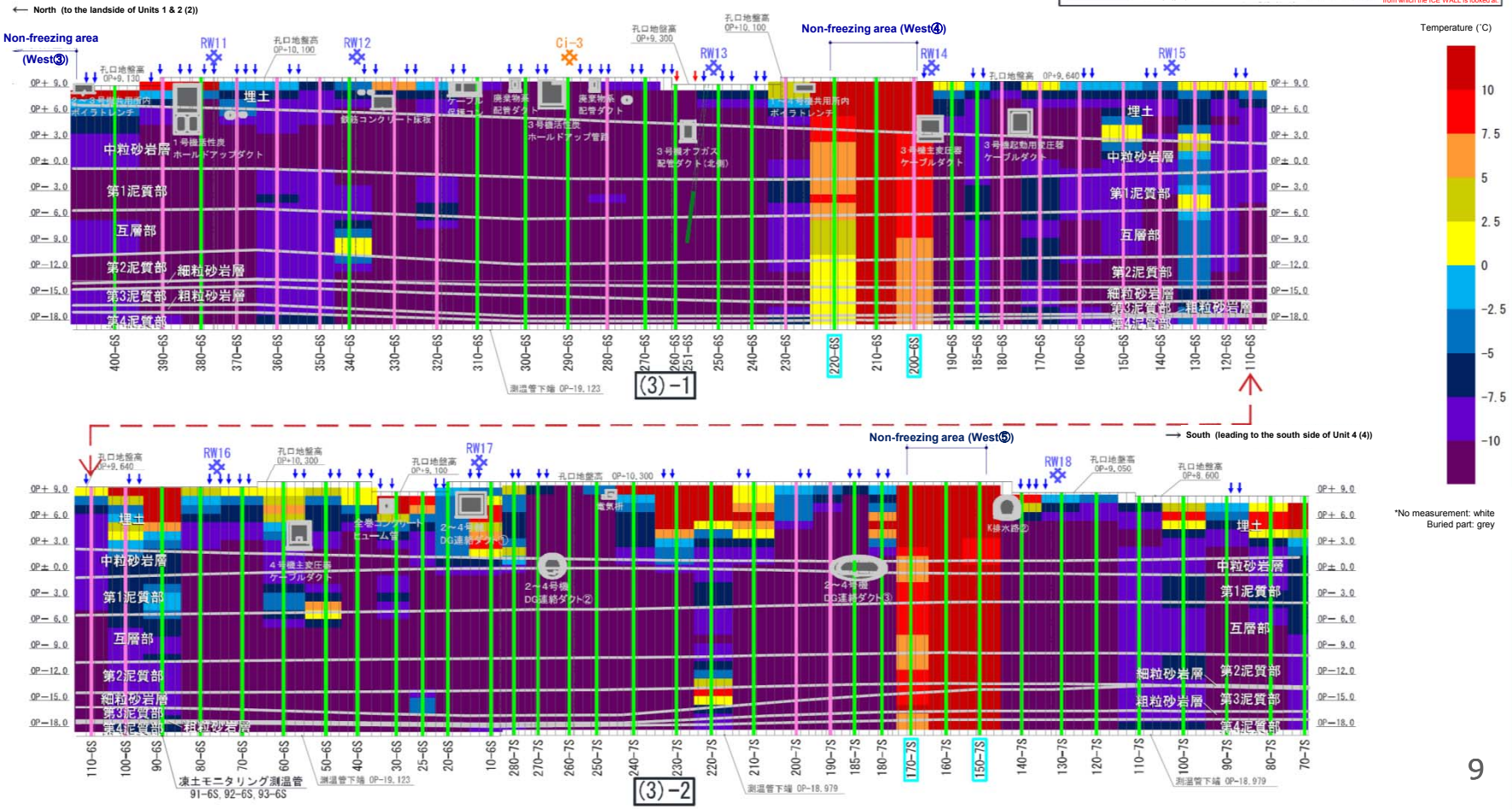
■ Distribution map of soil temperatures

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

(The temperature data as of 7 a.m. on September 13.)



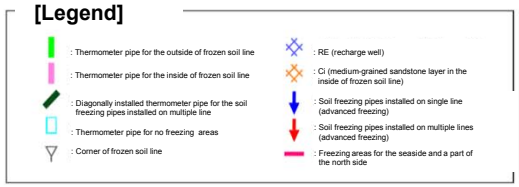



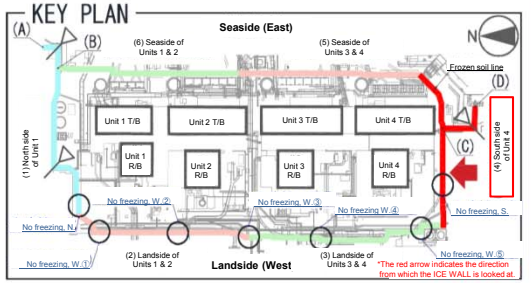
# [Reference] Distribution map of soil temperatures (south side of Unit 4)

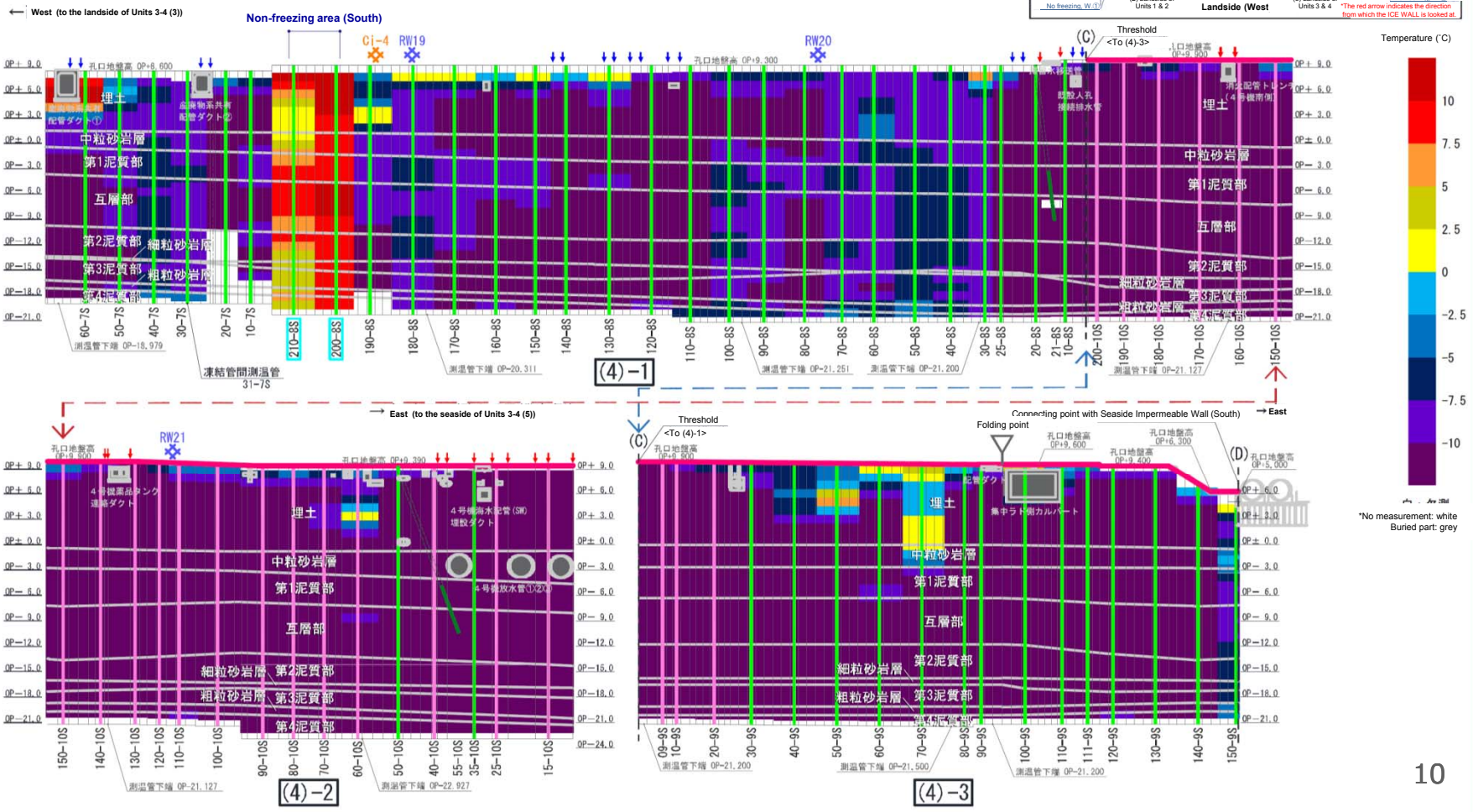
■ Distribution map of soil temperatures

(4) South side of Unit 4 (a view from the south side)

(The temperature data as of 7 a.m. on September 13.)



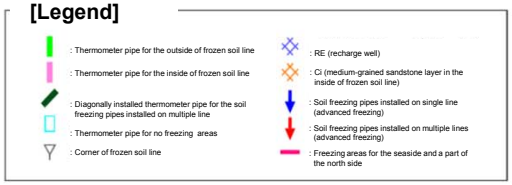



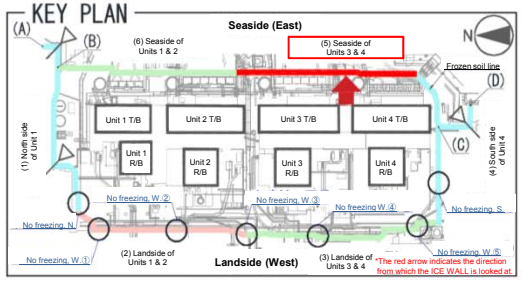
# [Reference] Distribution map of soil temperatures (east side of Units 3-4)

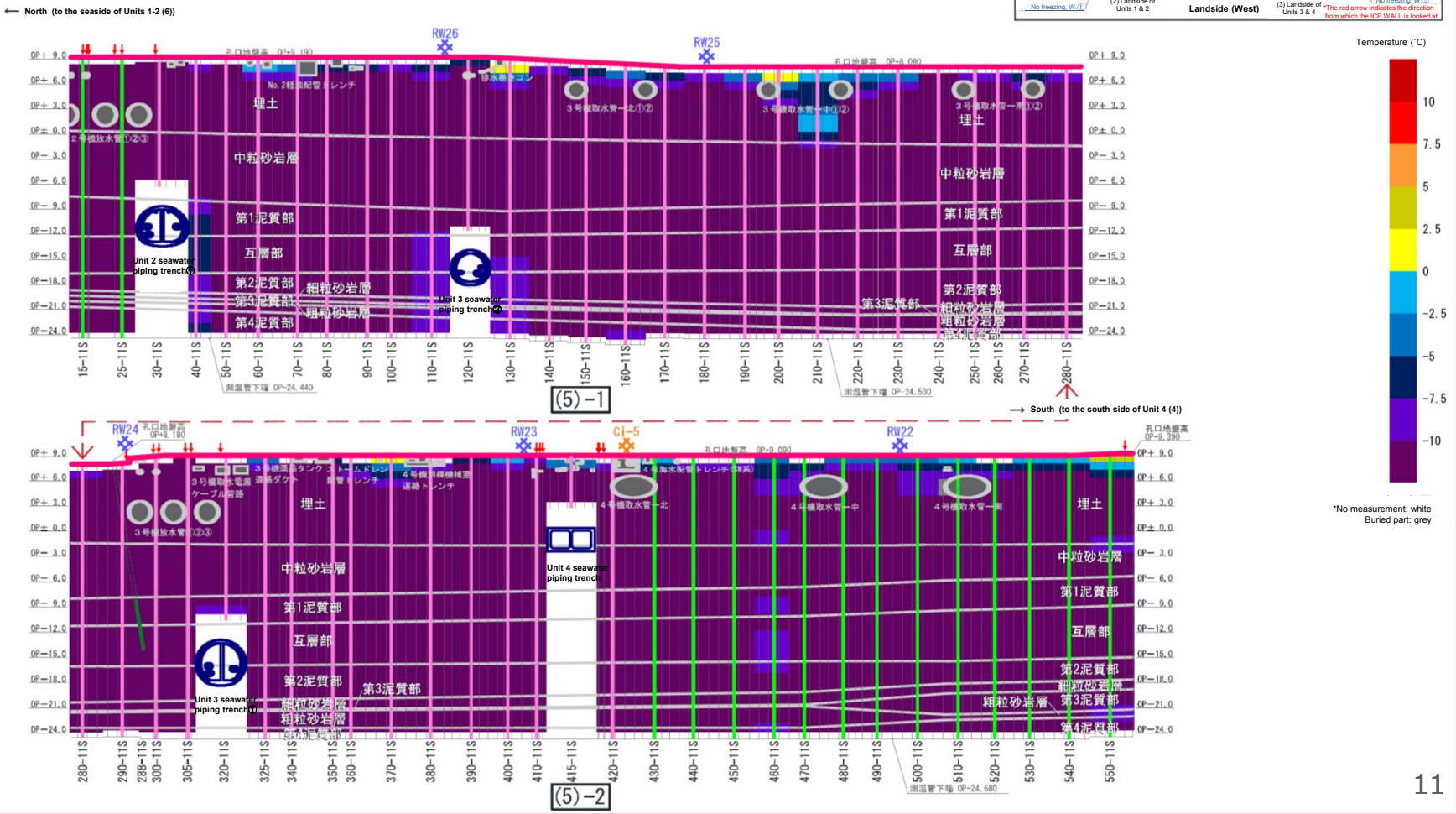
■ Distribution map of soil temperatures

(5) Seaside of Units 3-4
(west side: a view from the inside of frozen soil)

(The temperature data as of 7 a.m. on September 13.)



# [Reference] Distribution map of soil temperature (east side of Units 1-2)

■ Distribution map of soil temperatures

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

(The temperature data as of 7 a.m. on September 13.)