

Archaeological excavation report (A survey of the mouth of Pit at the Hashima Coal Mine remains)

As part of studies to record the current status of the site, a survey of the remains of mouth of Pit was conducted in 2015, and archaeological excavations in 2014 and 2015.

(1) Survey of remains of the mouth of Pit

A survey was conducted by taking photographs and creating drawings of the remains of three mouth of Pit at the Hashima Coal site, namely the remains of Mouth of Pit No. 1, Mouth of Pit No. 2, and Pit No. 3. At the two locations that are currently closed off, namely M No. 1 and No. 2, two 10-cm holes were drilled open on the concrete wall, and photographs were taken with digital cameras through these holes, and some of the drawings were created. As for Pit No. 3, investigators went underground through the existing opening, and took digital photographs and videos and created simple drawings (ground area and elevation plans) there.

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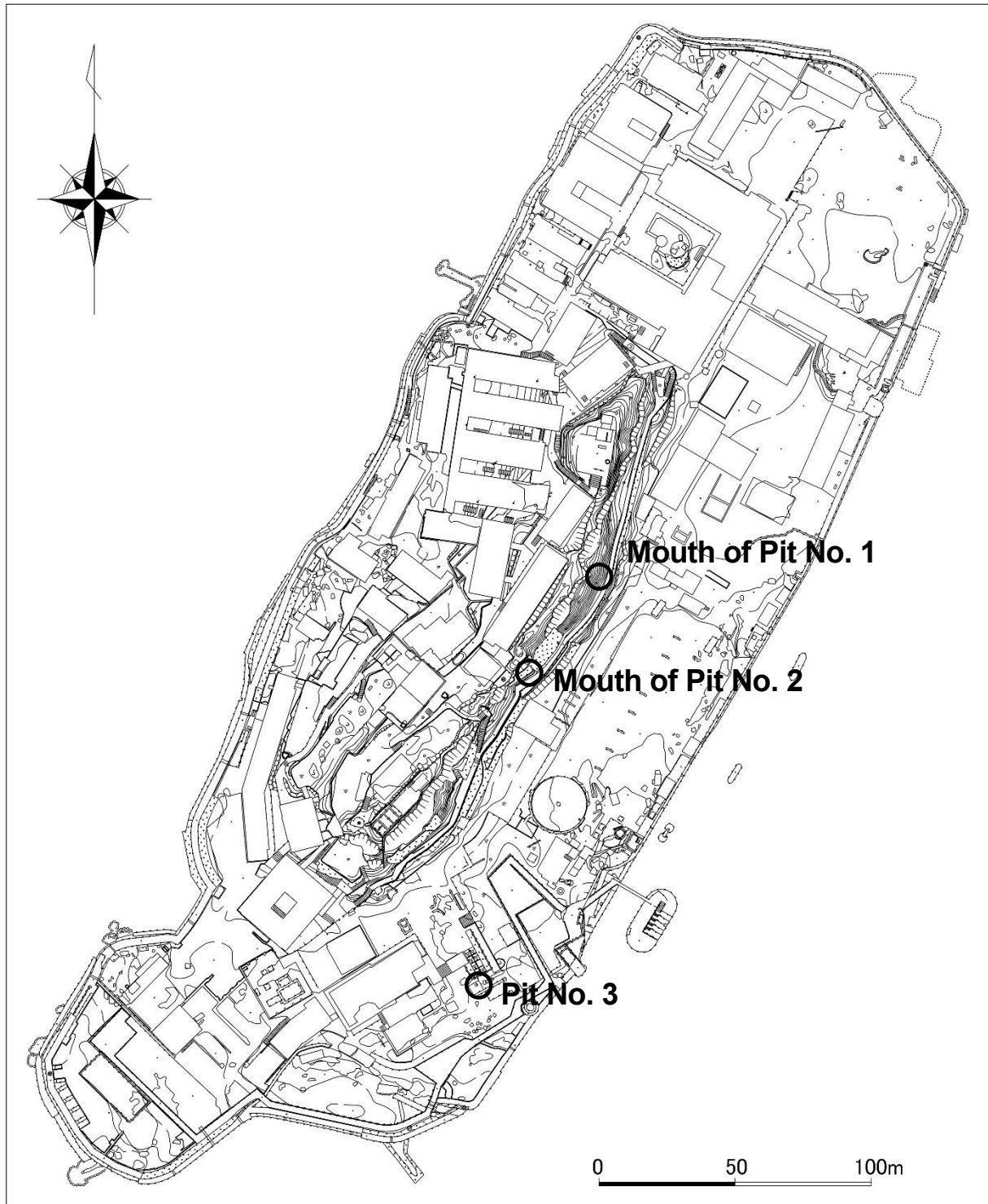


Figure 2-3-72. Locations for survey of mouth of Pit remains

1) Mouth of Pit No. 1

① Outline of survey

At the entry that was currently sealed off with a concrete wall, two 10-cm holes were drilled open. Through these holes, photographs were taken with digital cameras, at angles of 360 degrees longitudinally, and 180 degrees horizontally.

The inclined passage at Mouth of pit No. 1 is estimated to have been used as drainage following the opening of the mine in 1875. According to the statement of former miners working at Hashima, this pit was connected to

an underground pit (“debris tunnel”) in the island. No structure was observed outside the mouth of Pit.

Today, the entire mouth of pit is sealed off in concrete, covering an area of a semicircular shape, with a radius of 2.0 meters. It is likely that no rebar was used to seal off the entry, since none was found when two holes were opened using a core drill.

Photographs taken there were organized using the photo file names created in the following manner; they correspond to the identifiers in the diagram of photography points.

[File name (Example)]

1 - R 01

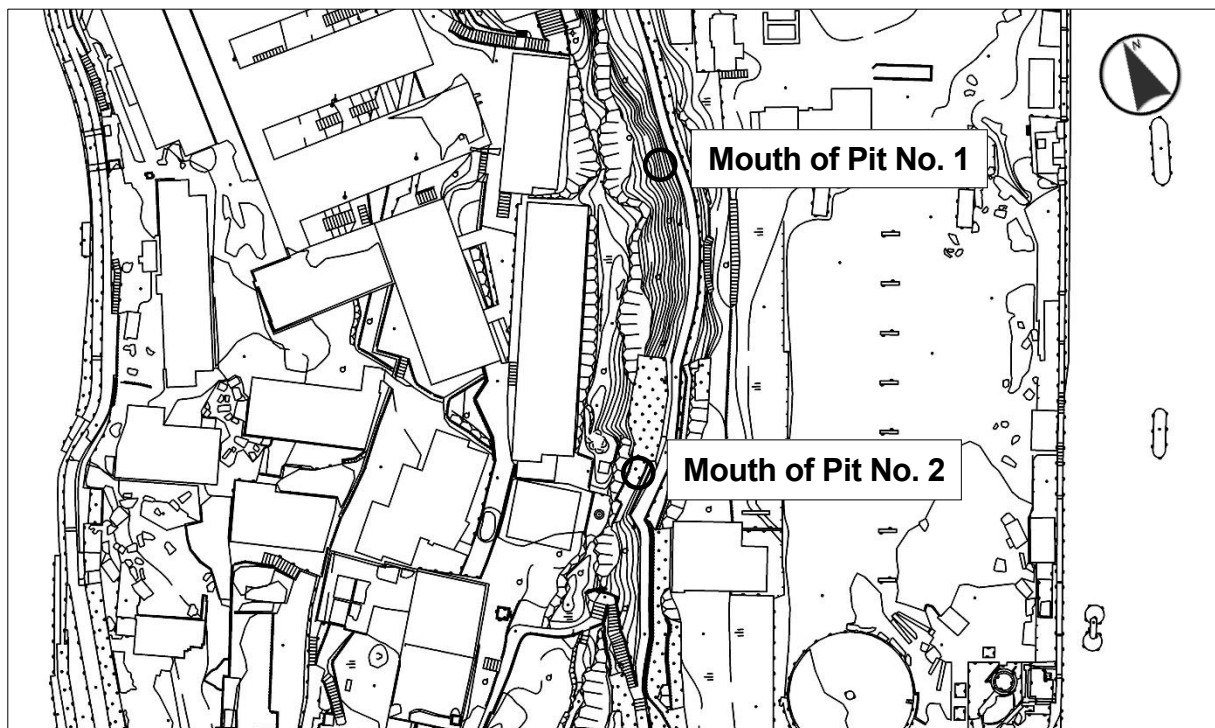
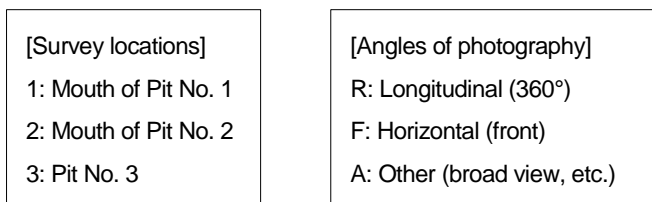


Figure 2-3-73. Diagram of survey locations

② Findings

The survey found that the inclined passage at Mouth of Pit No. 1 was covered in concrete on the walls, with the pit running slightly to the left (west) for a length of approximately 5 meters based on visual estimates. At the end of the pit, the walls were not covered in concrete but rocks were exposed (Photo 2-3-51).

The concrete walls showed clear signs of forms being used there (Photo 2-3-52). It is possible that the large quantity of lumber pieces scattered around near the entry may have been remnants of forms that had fallen off (Photo 2-3-53). Assuming that the pieces of lumber had been the material of forms, it would mean that the forms

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were left there at the time the business was opened. Since the scattered pieces of lumber were boards, rather than rods as those photographed in Photo 2-3-50, it is likely that they were used for forms. A pipe can be seen on the floor, what it was used for is unclear.

As mentioned above, the pit runs slightly to the left (west). This was clear based on a picture taken through a hole created at the center of the concrete wall that seal off the mouth of pit; it was a view straight in front of the camera, in which a portion of the right-hand side (eastern) wall of the mouth of Pit is visible (Photo 2-3-51). While the photo suggests that the walls of the rocks make the dead end of the pit, it is also possible that it may lead to underground parts. The fact that the end of the pit is walls of rocks seems to suggest it was not sealed off on purpose. Combined with statements made by former employees, this indicates a likelihood that the pit may lead underground near the apparent dead-end.



昭和31年6月撮影「坑口造り 追水跡」

Photo 2-3-50. June 1956; Structure of the mouth of Pit



Photo 2-3-51. 1-F100; Direct front view

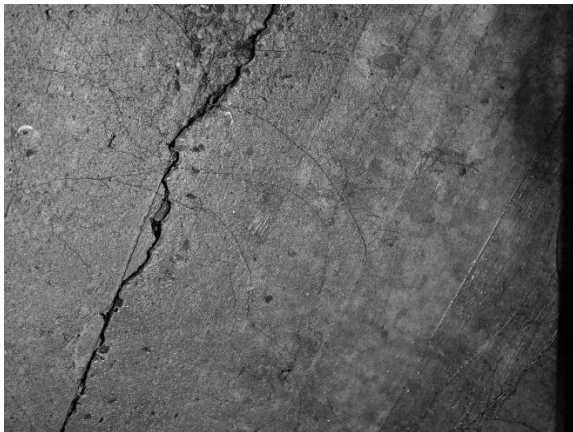


Photo 2-3-52. 1-R101; Ceiling



Photo 2-3-53. 1-R105; Floor

③ Conditions of surviving structures inside

Judging by the pictures taken during the survey, the area appeared to be in good condition, with no toxic gas, etc. identified although pieces of lumber and pipes were scattered. Likewise, the concrete walls that cover the rock walls beneath, although some cracks were observed, did not appear to be in an immediate danger of falling off (Photo 2-3-54).

If the scattering pieces of lumber and pipes are removed, it will not be difficult to look closely inside the pit to the rock walls at the end, meaning it should be possible to investigate to determine if the pit is designed to lead down to underground areas near the exposed rock walls.



Photo 2-3-54. 1-R107; Wall

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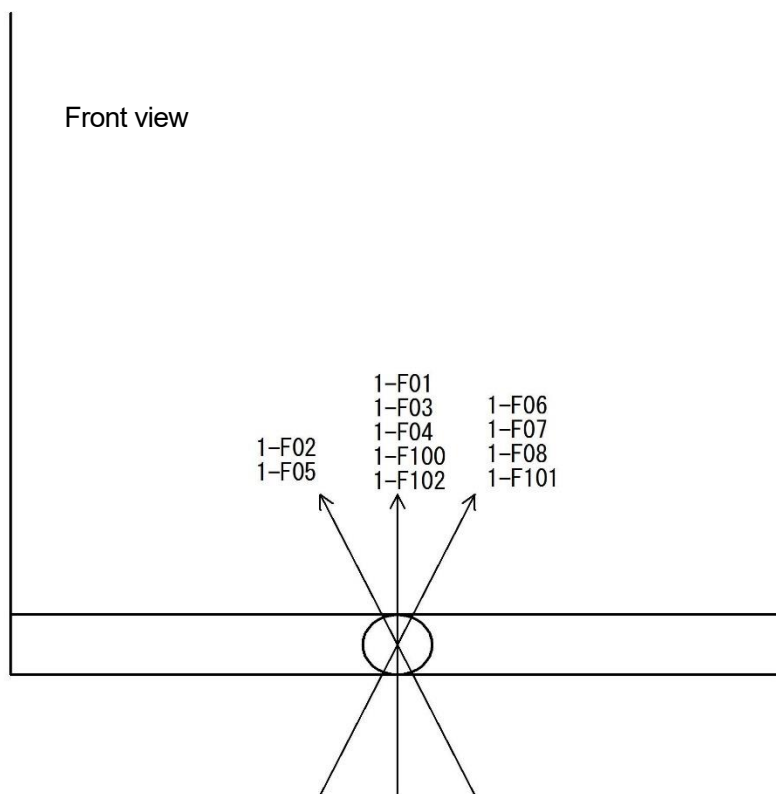
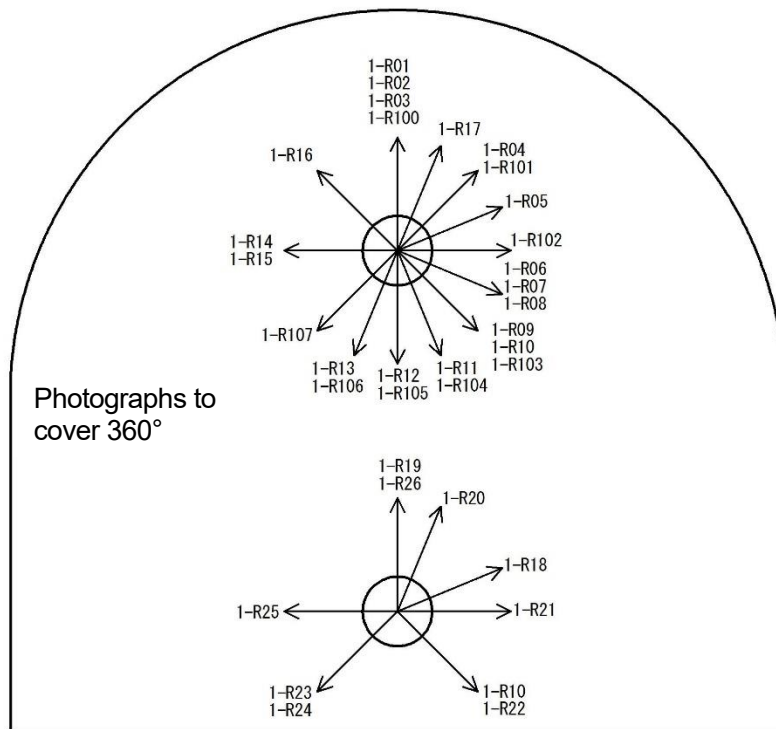
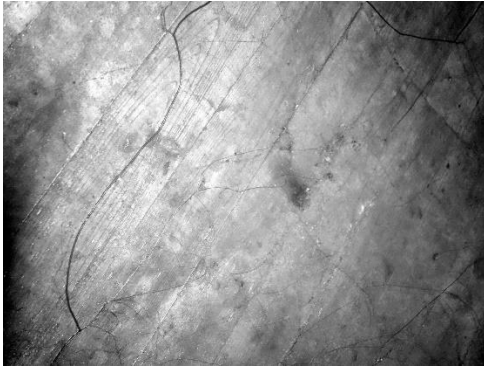


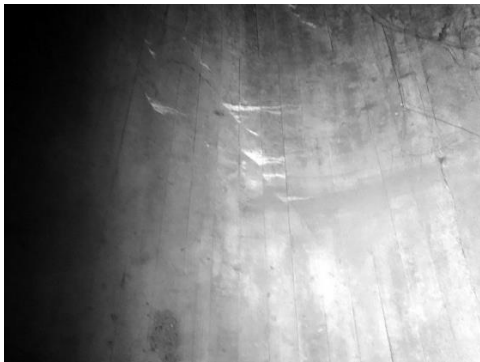
Figure 2-3-74. Diagram of photography points at Mouth of Pit No. 1



1-R01



1-R17



1-R25



1-R105



1-F05



1-F100



1-F101



1-F102

Photo 2-3-55. Pictures taken during survey at Mouth of Pit No. 1

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2) Mouth of Pit No. 2

① Outline of survey

At the entry that was currently sealed off with a concrete wall, two 10-cm holes were drilled open. Through these holes, photographs were taken with digital cameras, at angles of 360 degrees longitudinally, and 180 degrees horizontally.

The inclined passage at Mouth of Pit No. 2 is estimated to have been used as drainage, as was the case with the one at Mouth of Pit No. 1. Sections of tram tracks could be seen near the entry. Again, this pit was connected to an underground pit (“debris tunnels”) in the island, according to a statement of a former miner working at Hashima.

Today, the entire mouth of Pit is sealed off in concrete, covering an area of approximately 2 meters in height and 3 meters in width. It is likely that no rebar was used to seal off the entry, since none was found when two holes were opened using a core drill.

Photographs taken there were organized using the photo file names created in the following manner; they correspond to the identifiers in the diagram of photography points. A simplified drawing has also been created, which combines a front elevation with speculated structure inside.

[File name (Example)]

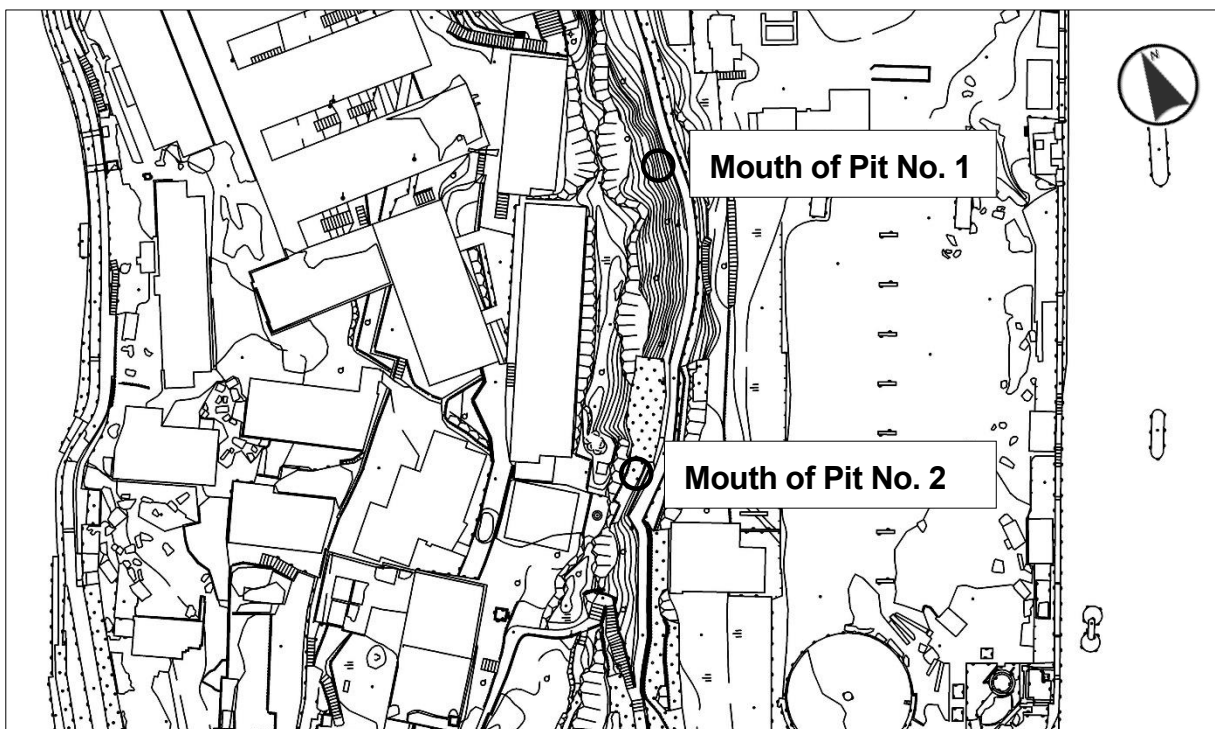
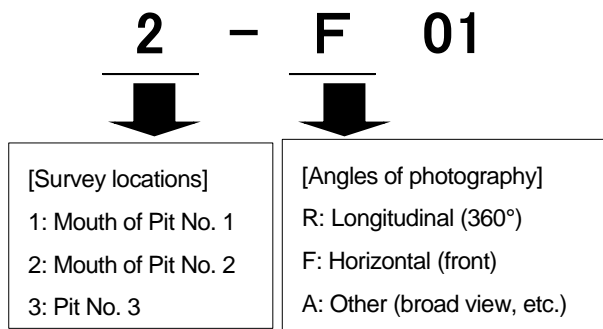


Figure 2-3-75. Diagram of survey locations

② Findings

The entrance of the mouth of Pit was sealed off in concrete, after the tram tracks had been buried with soil (Photo 2-3-56). Parts of the tracks still remain outside the entrance (Photo 2-3-57). While pictures taken in 1957 show four tram tracks inside the mine, only two could be confirmed through the views from the outside of the entrance (Photos 2-3-57, -58, and -59).

Review of the pictures taken through the holes drilled open revealed that the pit was forked into two at a few meters from the entry (Photos 2-3-60 and -61), that the walls were rocks exposed (Photo 2-3-62), and that the tram tracks, which had been found outside the mine, were not visible buried under pieces of wood and coal (Photo 2-3-63).

Unlike the inclined passage at Mouth of Pit No. 1, the walls inside Mouth of Pit No. 2 were not cast in concrete. The picture taken in 1957 (Photo 2-3-59) shows wood framings along the walls. While Photo 2-3-59 shows four tracks, or two pairs of tracks, they were not visible in the pictures taken during the present survey due to the buildup of wooden and coal pieces. Given the sections of tracks which still exist outside the entrance, however, it is likely that the tracks may be made visible if the pieces of wood are removed. Judging by the directions in which the remaining sections of tracks run, the tracks were considered to be leading to the right (northern) fork of the pit.

Although it is a matter of speculation, assuming that Photo 2-3-59 was a picture of the inside of the inclined passage at Mouth of Pit No. 2, it is possible that tracks were laid in each of the two forks of the pit, running deeper into the mine. That only two tracks, or one pair of tracks, remain outside the mine may be because the fork was inside of the pit, not outside (Figure 2-3-76).



Photo 2-3-56. Mouth of Pit survey 2; Full view



Photo 2-3-57. Mouth of Pit survey 2; Tram tracks



Photo 2-3-58. Mouth of Pit survey 2; Tram tracks



Photo 2-3-59. Mouth of Pit survey 2; Picture taken in 1957; Diagonal mouth of Pit in the bomb shelter

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Given the buildup of coal pieces inside the pit, and the fact that sections of tram tracks remain outside the pit, it is doubtful if the inclined passage at Mouth of Pit No. 2 was used as drainage. A possibility of it having been for coal mining cannot be ruled out, either.



Photo 2-3-60. 2-F01_Direct front view



Photo 2-3-61. 2-F03_Direct front view



Photo 2-3-62. 2-R01_Wall



Photo 2-3-63. 2-F03_Floor

③ Conditions of surviving structures inside

Other than the buildups of pieces of wood and coal on the floor inside the pit, no damage was observed on the walls of exposed rocks, and the area appeared to be in good condition. If the pieces of wood on the floor are removed, it will be possible to see any remaining sections of tracks inside the pit. Examining such tracks may also help offer clues to understanding how they may have been related to the pit fork, and what the inclined passage may have been used for.

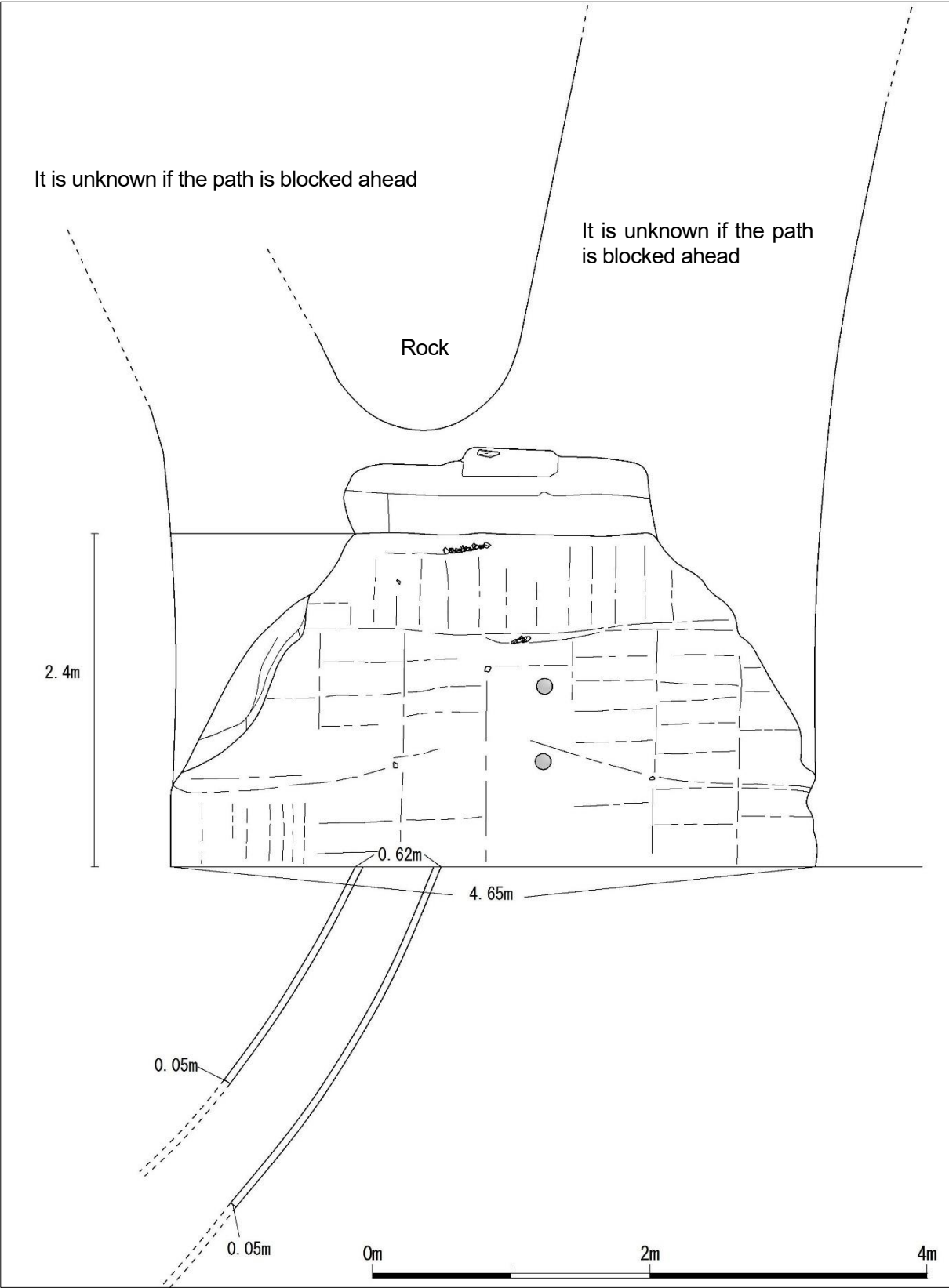


Figure 2-3-76. Simplified drawing of mouth of Pit

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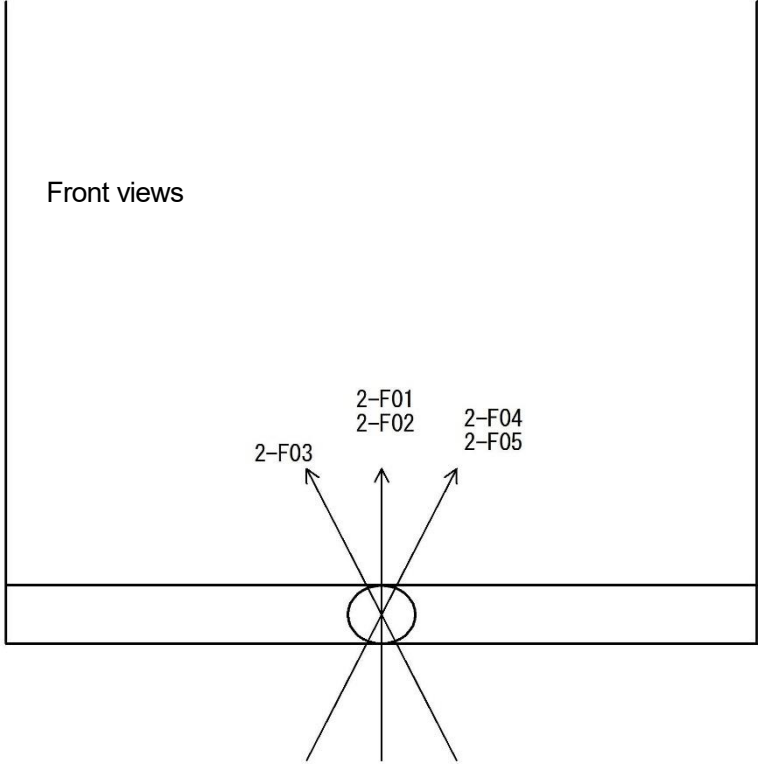
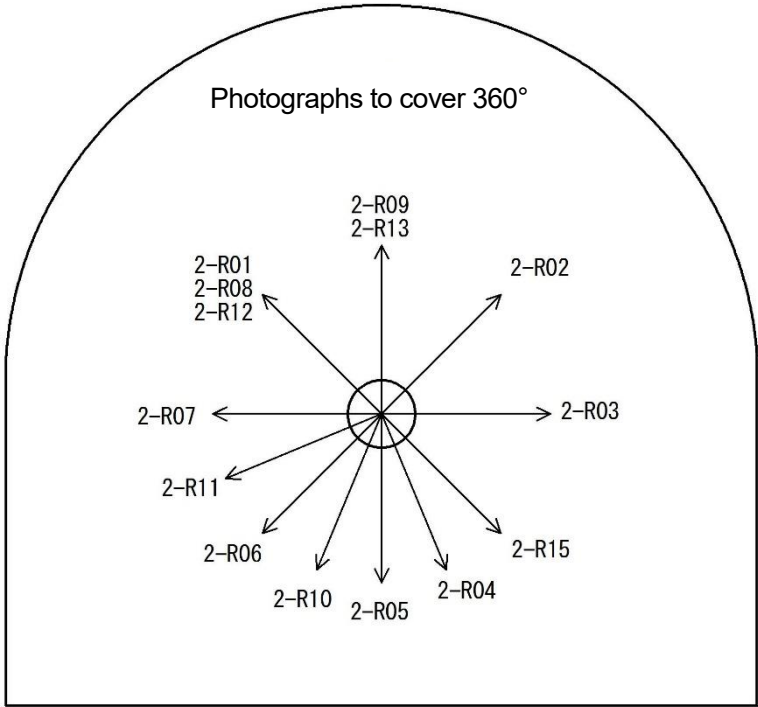


Figure 2-3-77. Diagram of photography points at Mouth of Pit No. 2



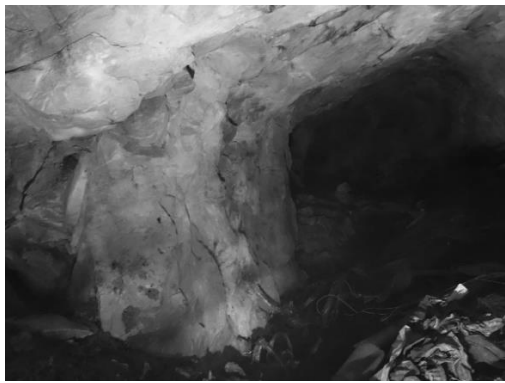
2-R09



2-R10



2-F01



2-F02



2-F03



2-A02



2-A21



2-A12

Photo 2-3-64. Pictures taken during survey at Mouth of Pit No. 2

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3) Pit No. 3

① Outline of survey

At the remains of the Pit No. 3 mouth of Pit, investigators measured the levels of oxygen through the existing opening to ensure safety, before going down underground to take digital photography and videos, and create simplified drawings (ground area and elevation plans). In creating the simplified drawings, measurements were taken either manually or using a ground type 3D laser scanner (Topcon GLS-2000) and a simplified laser rangefinder (TruPulse 360).

The Pit No. 3 mouth of Pit is believed to be the entry to Pit No. 3, which was first opened in 1894 and closed in 1936.

Today, it is closed off in concrete save for a 0.97-m × 0.93-m opening, with most of the pit filled. One may however go down to approximately 7.45 meters underground.

[File name (Example)]

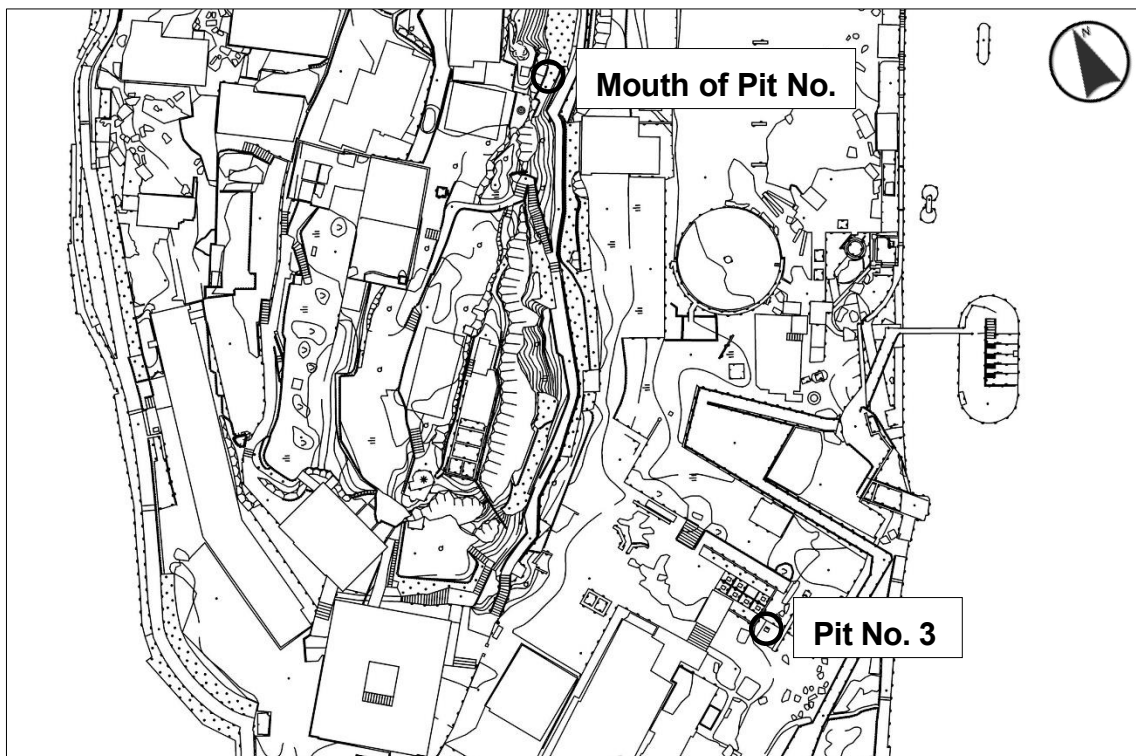
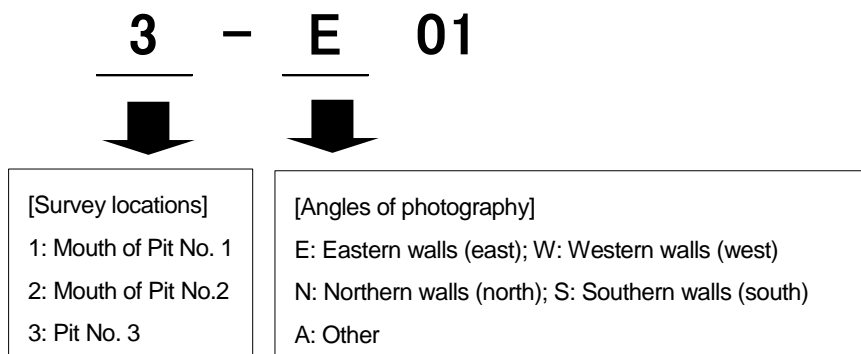


Figure 2-3-78. Diagram of survey locations

② Mouth of Pit survey

②-1 Overview of area inside mouth of Pit

At Pit No. 3, one could go approximately 7.45 meters below the opening (0.97 m × 0.93 m) to reach soiled surface, beneath which was filled. Inside the pit, there was spring water in part (Photos 2-3-65 and -66), and there was a 6.0-m × 3.81-m space observed. The walls surrounding this space were partly ashlar masonry of sandstone from the ground up to approximately 4-meter levels; the upper parts of the eastern, western, and southern walls above the masonry were cast in concrete with forms still remaining (Photo 2-3-68). The upper parts of the northern wall, meanwhile, were brickwork, laid to form an inverted arch, and above the brickwork the empty space continued further on (Photos 2-3-69 and -70).

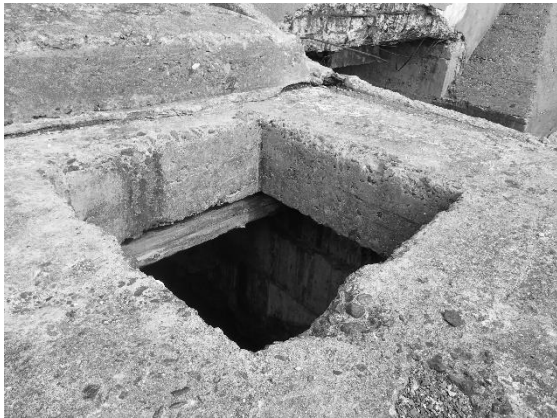


Photo 2-3-65. 3-A26_Opening



Photo 2-3-66. 3-A35_Underground



Photo 2-3-67. 3-E37_Eastern wall, lower parts



Photo 2-3-68. 3-A04_Eastern wall, upper parts



Photo 2-3-69. 3-N18_Nothern wall



Photo 2-3-70. 3-A32_Nothern wall

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②-2 Eastern wall

The lower parts of the eastern wall were masonry where cut blocks of sandstone were laid in mortar or Amakawa, and the upper parts were a protruding concrete wall, with the forms still remaining in them.

The ashlar masonry technique used here were the same as those observed in the masonry revetment and elsewhere on Hashima Island, namely the Nunozumi, which uses squared blocks of stone. What characterized these structures was the use of squared blocks of stones, rather than fieldstone. The blocks of stone used here had varying widths ranging from approximately 30 cm to 50 cm, while their height was all standardized to approximately 35 cm. It is noteworthy that the eastern wall had a hole in it at the southern parts (Photo 2-3-71) and that it was laid with bricks at the northern parts (Photo 2-3-72). While it is unclear why these were so, the hole in the southern parts of the eastern wall may have been used for tools to pass through, such as piping.



Photo 2-3-71. 3-E35



Photo 2-3-72. 3-E38

②-3 Western wall

The western wall had generally the same structure as that of the eastern wall. The western wall differed from the eastern wall in that the former did not have a hole such as the one observed in the latter, and that there were square concrete columns hanging from the ceiling at the southern and northern ends (Photos 2-3-73 and -74). The square concrete columns had forms remaining intact. While the column on the southern side was located on the corner, the northern column was located at some 0.5 meters from the corner. It is unclear as to their structures and purposes. As mentioned above, the western wall was also laid with bricks at the northern end, as were the eastern wall. These may be related to the bricks in the northern wall, but details were not clear.



Photo 2-3-73. 3-S25

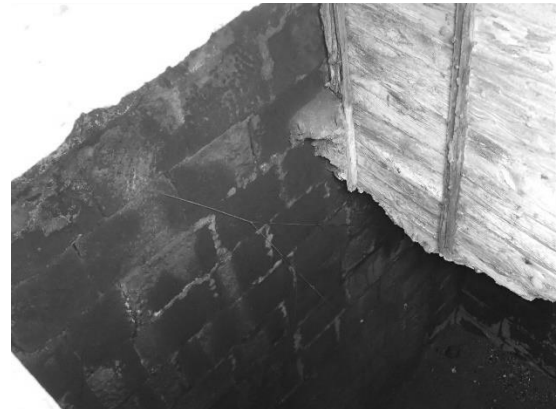


Photo 2-3-74. 3-A34

②-4 Southern wall

Similar to the other walls, the southern wall was also a Nunozumi masonry made of cut blocks of sandstone, and the protruding concrete portion of the eastern wall could be seen in the upper parts on the right (eastern) side, and the concrete column attached to the western wall in the upper parts on the left (western) side (Photo 2-3-75). It was not possible to investigate the southern wall up close, due to spring water observed around the wall (Photo 2-3-76).



Photo 2-3-75. 3-S02



Photo 2-3-76. 3-S10

②-5 Northern wall

The northern wall, in the lower parts, was a Nunozumi masonry made of cut blocks of sandstone similar to that of the other walls in the lower parts. The upper parts, on the other hand, were brickwork laid to form an inverted arch, with the empty space continuing further on above the brickwork.

While the stone masonry in the lower parts were in general done in the same manner as with the other walls, there were horizontally long remnants of metal observed in three locations at approximately 1.4 meters from the floor (Photo 2-3-77). It is speculated that these may have been connected to a tool or machinery, but no definite sign could be found nearby, and details are unknown. In the meantime, the bricks observed on the eastern and western walls were laid in such a manner that they were connected to the arch-shaped brickwork of the northern wall (Photo 2-3-78). This suggests the bricks were probably supposed to serve their roles when connected to something, but this, too, remains unknown.

As for the opening in the upper parts of the northern wall, portions of concrete with brick and gravels attached to them could be seen on the ceiling, and the floor (of the space beyond the masonry) was laid with bricks (Photos 2-3-79 and -80).



Photo 2-3-77. 3-N05



Photo 2-3-78. 3-N19

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Beyond the opening, a portion of brick wall could be seen on the western side, which showed that the area was closed off on the left (western) side. As for the center and right (eastern) side, it was unclear if it was closed off with a brick wall, too. Given this was a pit shaft, it would not be strange if it did not run further on, although it is also possible that it may be connected to other pits for air release or other purposes. Whatever the case may be, the purpose of the opening itself is unclear.



Photo 2-3-79. 3-A31



Photo 2-3-80. 3-A32

②-6 Pit entry

With respect to the dimensions of the pit shaft at the Pit No. 3 remains, *Mitsubishi Kogyo Shashi (History of Mitsubishi Mining Company)* had a reference to a “4.8-m × 3.0-m wooden frame,” which differs from the actual dimensions as measured in the present survey, namely 6.0 m × 3.81 m. It is difficult to form a specific conclusion as to this discrepancy in dimensions, since the interpretation for it may differ depending on a few factors, such as if this reference of a “4.8-m × 3.0-m wooden frame” in *Mitsubishi Kogyo Shashi* was made during the mine was still in operation, or at the time of its closure (1936), and whether the form of the shaft remained the same from when the mine was opened until it was closed.

Observing the other side of the existing opening, wooden beams could be seen running across the structure. While it is unknown if the form of the opening remained unchanged from when the mine was opened or it was altered to the current form after the mine closure, it is likely that the pit entry was larger than it is currently seen because the existing opening (0.97 m × 0.93 m) is too small to be used for the purpose of coal mining. It is unclear why an opening was created instead of the entry having been completely sealed off, but a possible explanation is that it was to be used for the purpose of ventilation even after the mine closure.



Photo 2-3-81. 3-S12



Photo 2-3-82. 3-S24

②-7 Conditions of surviving structures inside

The ashlar walls and the brickwork on the northern wall all remained in good condition, and the concrete portions in the upper parts of the walls and concrete columns were not in a danger of falling off, either. As for the floor, if it was in a danger of caving in could not be determined, although spring water appeared to be deep on the southern side. It will be dangerous to access the spring water.

As for the opening with bricks laid created in the upper parts of the northern wall, it will be possible to determine if the space beyond it is sealed off or continues further on if the floor is cleared of rubble.

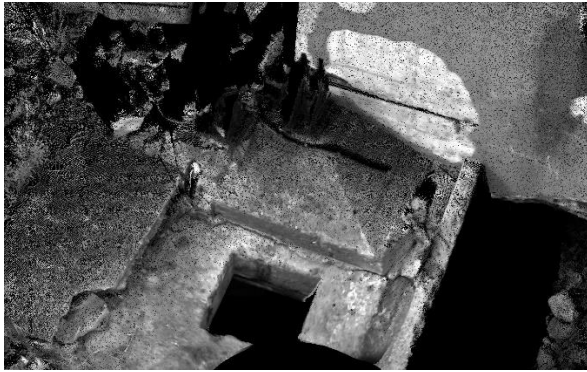


Photo 2-3-83. 3D laser measuring

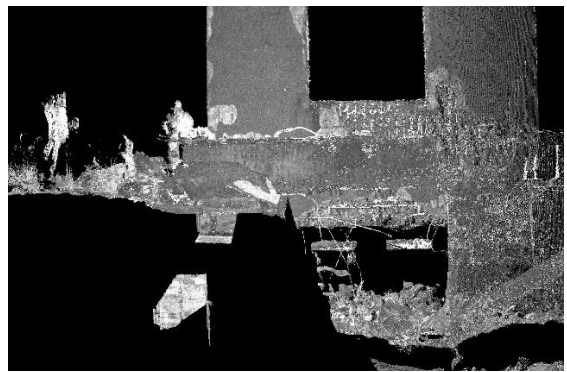


Photo 2-3-84. 3D laser measuring



Photo 2-3-85. Pit No. 3, eastern wall



Photo 2-3-86. Pit No. 3, western wall



Photo 2-3-87. Pit No. 3, southern wall



Photo 2-3-88. Pit No. 3, northern wall

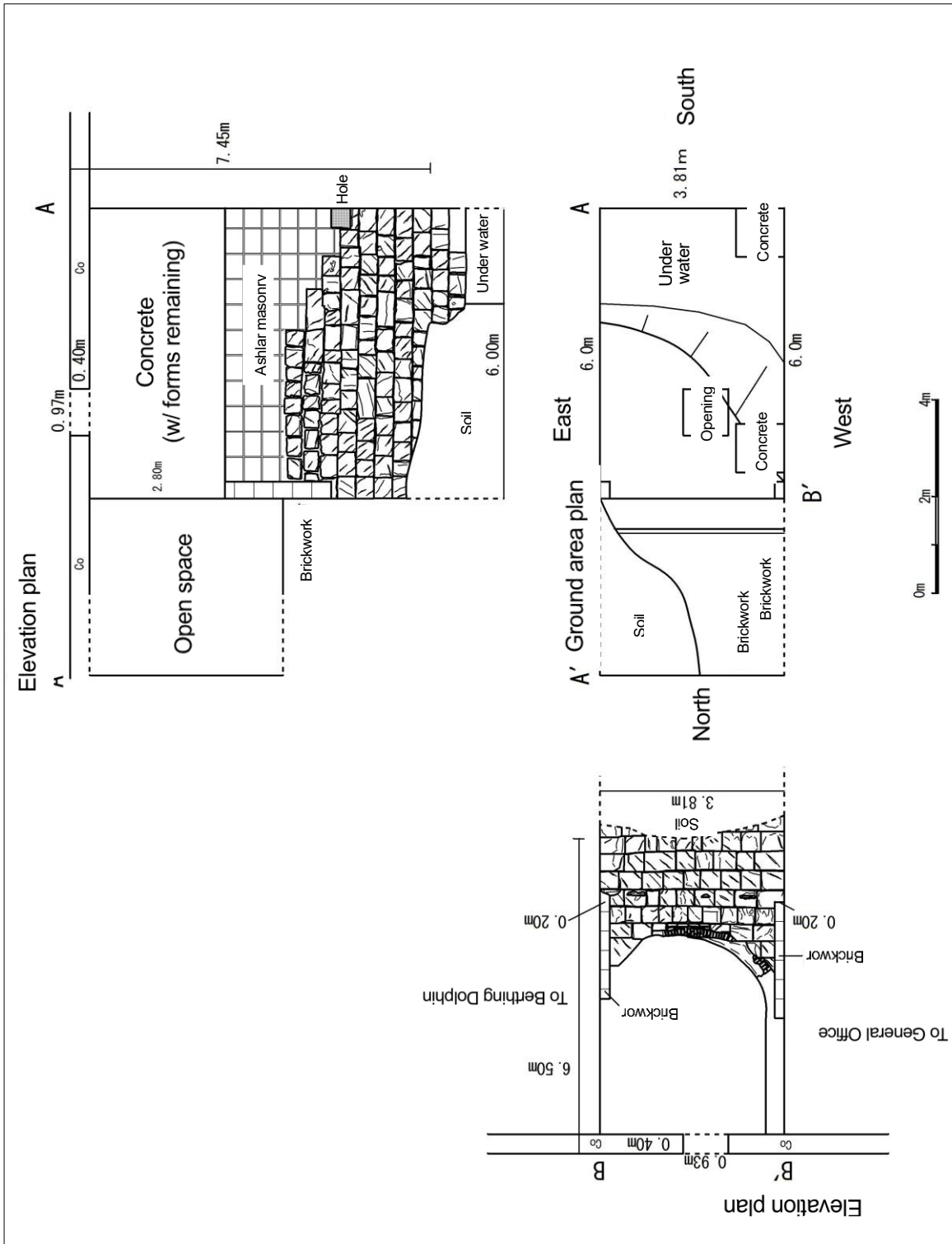


Figure 2-3-79. Diagram of Pit No. 3