

Ak-Beshim (Suyab) 2018

Edited by

Bakit AMANBAEVA
Kazuya YAMAUCHI

Research Institute of Cultural Properties, Teikyo University
The Institute of History and Cultural Heritage,
National Academy of Sciences of the Kyrgyz Republic

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Plate 1 The First Shahrstan with AKB-13 in the upper middle (from west)



Plate 3 Slag-paved road surface of MS1-1 in AKB-13



Plate 3 Excavation in progress at R2 in AKB-13



Plate 4 "Flower pattern" stone mosaic in AKB-15

Preface

Ak-Beshim, which was once called Suyab, was an agricultural center as well as an international city of commerce between the 5th to the 11th centuries, located in the north of the Kyrgyz Republic. The site was registered in 2014 as one of the constituent assets of the UNESCO World Heritage site “Silk Roads: the Routes Network of Chang'an-Tianshan Corridor”, and is one of the most famous sites in Central Asia.

The site is located in the east of Chu Valley, about 45 km east of Bishkek, the capital of the Kyrgyz Republic, and in the southwest of present town of Tokmok. It is recorded in “Great Tang Records on the Western Regions” and “Biography of the Tripitaka Master of Dacien Temple” that Xuanzang visited this place in 630 A.D. In the latter half of the 7th century, Tang dynasty built “Suyab Garrison 碎葉鎮城” as the military base to advance into the west. There is also a theory that the poet Li Bai was born here in the beginning of the 8th century.

The National Academy of Sciences of the Kyrgyz Republic and the Research Institute of Cultural Properties, Teikyo University have been implementing a joint research of Ak-Beshim based on the agreement signed in 2016. The First Investigation of 2018 (the 5th investigation since the beginning) was implemented for a total of 31 days from April 18 to May 18, 2018. Excavation was carried out at AKB-13 and AKB-16 in the First Shahristan, AKB-15 in the Second Shahristan, and AKB-18 in the area known as the 2nd Buddhist Temple. In parallel, we analyzed unearthed materials (earthenware, tile fragments, plant and animal remains). As for the Second Investigation (the 6th investigation since the beginning), we conducted analysis and created drawings of artifacts for 28 days from August 8th to September 4th, 2018. At the same time, we taught and trained the archaeology major students from Kyrgyz National University on how to analyze artifacts. This is the report on the results and new findings obtained from the joint research implemented in fiscal year 2018.

This joint research greatly owes to the cooperation and the support from the associated organizations, namely the National Academy of Sciences, the Ministry of Culture, Information and Tourism of the Kyrgyz Republic, Kyrgyz State Historical Museum, the Embassy of Japan in the Kyrgyz Republic, and the JICA Kyrgyz Republic Office. Here we express our sincere gratitude to them.

March 2021

Kazuya YAMAUCHI (Research Institute of Cultural Properties, Teikyo University)
Bakit AMANBAEVA (The National Academy of Sciences of the Kyrgyz Republic)

Foreword

1. This is the report of the joint research conducted by the Institute of History and Cultural Heritage of the National Academy of Sciences of the Kyrgyz Republic and the Research Institute of Cultural Properties, Teikyo University, in the fiscal year 2018.

The two institutes implemented excavation and also analysis of plant remains in April and May 2018, at Ak-Beshim (the First Investigation). In August and September at Bishkek, excavated artifacts and animal bones were investigated. Conservation works on some artifacts were also conducted (the Second Investigation). This is the report of the results of these investigations. As for the analysis of animal and plant remains, only brief reports are presented at this point, and official reports are to be published later.

2. Funding was provided from the budget of Teikyo University Silk Road Scientific Investigation Team and the research funding of Teikyo University. We sincerely express our gratitude to Teikyo University, the President Yoshihito OKINAGA, and the personnels from each department for their understanding and co-operation.
3. The creation of the feature illustrations by the photographic images were consigned to Techno Planning Co., Ltd. and the analysis of the radiocarbon dating to Paleo Labo Co., Ltd. The deciphering of the inscriptions on coins were instructed by Yutaka YOSHIDA (visiting professor, the Research Institute of Cultural Properties, Teikyo University). The visual recording of the investigation and the creation of DVD with subtitles (Japanese- Russian) was produced by Daisuke FUKUDA (AD-DESIGN Co., Ltd.).

4. Assignment of writing, diagram drawing, editing etc. of each chapters are as follows:

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5. Each district of Ak-Beshim was formerly called “Shahristan” or “Rabat”, but since 2016, Shahristan is called “the First Shahristan”(SH1), and Rabat (Suyab) is called “the Second Shahristan”(SH2).

Each excavation area is called “AKB-(number)” with the number of excavation area (area number that was assigned in the order of excavation). For example, the excavation area of the First Shahristan (Main Street Section) is “AKB-13”, and the center of the Second Shahristan is “AKB-15”.

6. For the investigation of Ak-Beshim and the preparation of this report, we were guided, instructed, and co-operated by the following. We would like to express our gratitude to them. (Omitting titles, in no particular

order):

Teikyo University, The National Academy of Sciences of the Kyrgyz Republic, the Ministry of Culture, Information and Tourism of the Kyrgyz Republic, the Embassy of Japan in the Kyrgyz Republic, Satoru IJITSU (The Embassy of Japan in the Kyrgyz Republic), Kyrgyz State Historical Museum, the JICA Kyrgyz Republic Office, the Teikyo University Museum, Mineyuki HORIKOSHI, Atsuro KODA (Above two: The Teikyo University Museum), Masatoshi YAMAFUJI (The Nara National Research Institute for Cultural Properties), Kotomi ASAYAMA (NH Tabi Company).

7. The unearthed materials from Ak-Beshim are archived and stored at the National Academy of Sciences of the Kyrgyz Republic. The drawings, photographs and other materials are archived in the Silk Road Academic Research Center, the Research Institute of Cultural Properties, Teikyo University.

8. The reduction scales of the features and artifacts on this report are as follows:

Pits: 1/40 Feature illustrations: 1/60, 1/100, etc.

Earthenware and tile drawings: 1/4 Small artifacts: 1/1, 1/2 Coins: 1/1

9. The abbreviations of features are as follows:

A: Alley B (Brick): Features made of burnt bricks (rain-permeable pavement, etc.)

D: Ditch MS: Main Street P: Pit (posthole, shaft, and pit) R: Room

Tr.: Trench W: Wall

10. The abbreviations added to the drawings stand for the following materials.

Bo: Bone artifacts Br: Bronze I: Iron P: Pottery (glazed/unglazed)

R: Rubbing surface S: Stone artifacts G: Glass

11. The coding system in drawings, plates, list of artifacts, and observation sheets of artifacts are indicated in the order of district, excavation year, and number of the artifact.

For example, “13-18-001” stands for district “AKB-13”, excavation year “2018”, number of the artifact “001”.

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1. Introduction

Ak-Beshim site (Fig.1.1), situated in the north of the Kyrgyz Republic, consists of two city ruins located next to each other. An outer wall with the total length of about 10.5km used to surround these cities. The trapezoidal city, located in the west, is now called the First Shahrستان (Shahrستان 1, SH1). It is said that the city were constructed by the Sogdians, the trading merchants of the Silk Road, around the 5th and 6th centuries CE, and prospered as the center of international trade until the 10th or 11th century. The Second Shahrستان (Shahrستان 2, SH2), located in the east, is “Suyab Garrison”, which was built by the Tang dynasty. This is the military base of the Tang built by 679 at the latest, and abandoned in the early 8th century. The Second Shahrستان was once called “Rabat” or Khitan district and considered to be a city belonging to the 11th and 12th centuries (Fig.1.2).

According to the aerial photograph taken in 1967 (Fig.1.3), traces of irregularly pentagonal peripheral wall, rectangular inner wall inside the peripheral wall and a structure inside the inner and outer walls are visible in the Second Shahrستان. However, because of the large-scale ground leveling of fields using bulldozer in the 1970’s, most of the traces were lost except for a part of the eastern wall and the southern wall.

The Second Shahrستان, or the Suyab Garrison, is one of the Four Garrisons of Anxi Protectorate (An-xi si-zhen), which were under the command of the Protectorate General to Pacify the West in order for the Tang dynasty to reign over the western regions and to advance into the west. Although An-xi si-zhen is generally considered to be Kucha, Khotan, Shule (Kashgar) and Yan-qi, Suyab was established as the westernmost base when the influence of the Tang expanded the most.

The accurate location has been unknown for a long time, but it was almost determined by “Du Huaibao stelaе 杜懷宝碑”, which was accidentally discovered in 1982, that Ak-Beshim was the former Suyab (碎葉). Additionally in 2017, further evidence to support that the Second Shahrستان was the Suyab garrison was obtained by the excavation of the accumulation of tile fragments of Tang dynasty (about 2m width × 25m length) in the Second Shahrستان.

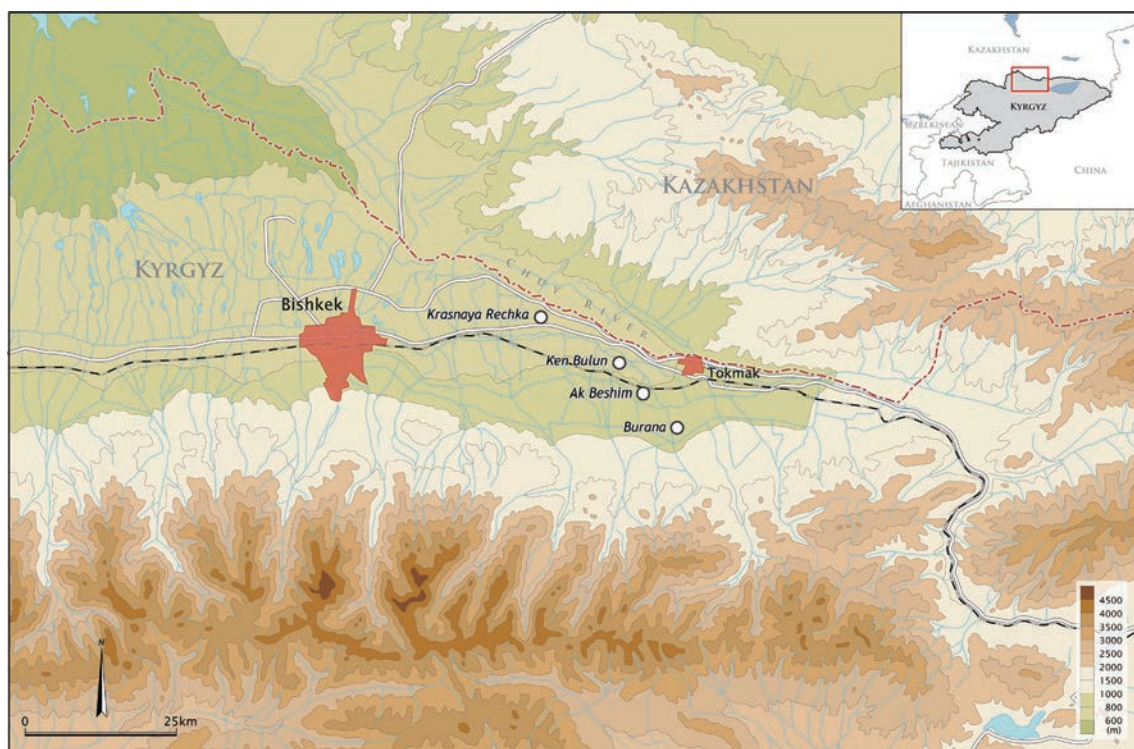


Fig.1.1 Ak-Beshim and the surrounding sites and their location



0 100 200 300 400 500 600 700 800 900 1000 m

Fig.1.2 Full view of Ak-Beshim (photographed in 2019), created in 2020



0 100 200 300 400 500 600 700 800 900 1000 m

Fig.1.3 Aerial photograph of Ak-Beshim (1966)

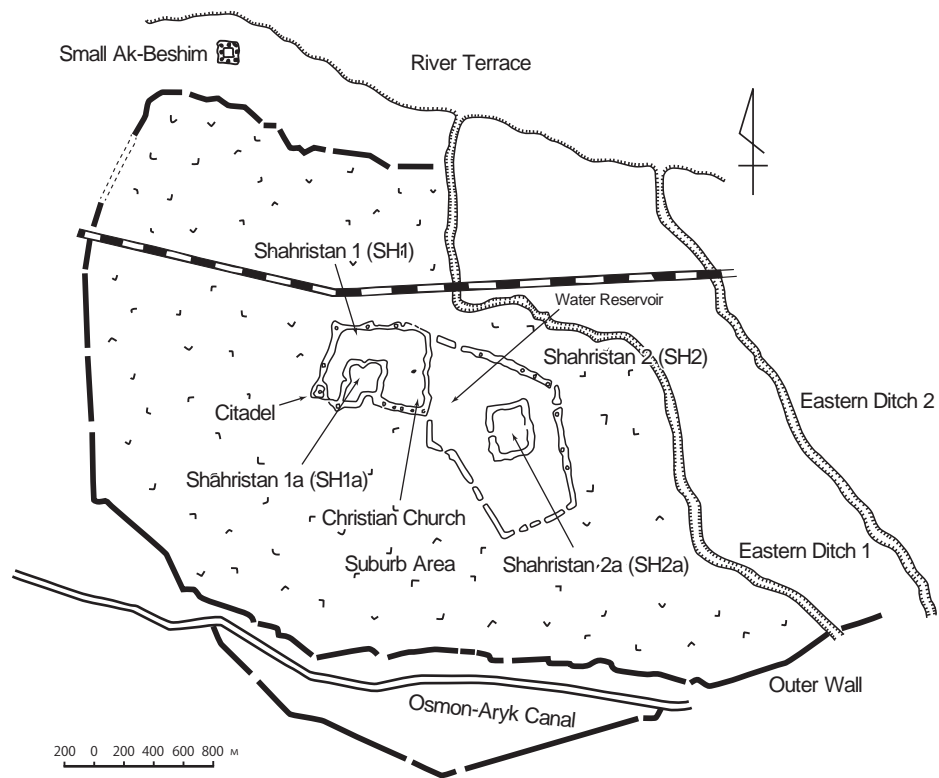


Fig.1.4 General view of Ak-Beshim and districts



Fig.1.5 Excavation location number of Ak-Beshim site

2. Investigations in 2018

2.1. The First Investigation

2.1.1. Investigation Period : April 18th (Wed) - May 18th (Fri), 2018

(Investigation team from Japan, April 17th: departure from Japan, May 19th: arrival in Japan)

2.1.2. Participants

- Japan: Kazuya YAMAUCHI, Koichi KUSHIHARA, Hidekazu MOCHIZUKI, Chie NAKAYAMA, Seiji NAKAYAMA (the Research Institute of Cultural Properties, Teikyo University), Nobuaki TAKAKI, Yu TSUTSUI (Teikyo University), Go SATO (Teikyo Heisei University), Koji YAGI (Yamagata University), Shunpei IWAI (Ryukoku University), Ikue OOTANI (Kyoto University), Tomoaki MIHASHI (Graduate student, Teikyo University), Tomoko ARAKI, Akira ARAKI, Mayumi KATO, Yuri TAKAHASHI (Volunteers), Daisuke FUKUDA (AD-DESIGN Co., Ltd.)
- Kyrgyz: Bakit AMANBAEVA, Askat JUMABAEV, Emil SULTANOV (The National Academy of Sciences of the Kyrgyz Republic)

2.1.3. Investigation Schedule (For details, see Addendum 1.)

April 17: Departure from Japan (Advance party from Japan)

April 20: Departure from Japan (Main group from Japan)

April 21: Arrival in Kyrgyz (Main group from Japan), moving to Tokmok

April 22 – May 15: Excavation

May 16: Moving to Bishkek

May 18: Departure from Bishkek

May 19: Arrival in Japan (Participants from Japan)

2.1.4. Investigation Items

- AKB-13 (SH1): Excavation of R1-R5 and MS1, and analysis of plant remains
- AKB-15 (SH2): Excavation of Tr.5-11
- AKB-18 (BT2): Excavation
- AKB-16 (SH1): Geological survey
- Investigation of surrounding terrain: Terrain observation from the sky by Cessna plane
- Human geography investigation: Investigation of urbanization in rural districts of Dungan people
- Washing, sorting, weighing and storage of unearthed artifacts
- Photographing and video recording
- Others: Restoration and maintenance of storage in the National Academy of Sciences of the Kyrgyz Republic, cooperation for TV program coverage (Tokyo Broadcasting System Television, Inc.: TBS “Discovery of the World’s Mysteries”)

2.1.5. Investigation Procedures

- Excavation: In AKB-13, scrutiny of R1-5 and MS1, investigation of pit and lower layers of MS1, R4 and R5 were conducted. In AKB-15, setting and investigation of Tr.5 and Tr.6 extended area trenches and Tr.8-11 trenches were conducted. In Tr.5, the stone paving with a flower pattern was found, and the pit that overlapped it was excavated. In AKB-18, the investigation area was set, confirmation surface exposed, and the stratigraphy of investigation area wall was investigated.
- Geological survey: In AKB-16, cracks in the east wall of SH1 was investigated.
- Recovery of artifacts: Context method was adopted, and serial numbers were given in order of

pick up to the groups of artifacts unearthed from areas, layers, and features. Then, the location and information were recorded on context sheets. As for important artifacts, the 3D position was recorded using a light-wave survey equipment whenever necessary.

- **Diagramming:** For surveying on site, a light-wave survey equipment (Leica, Topcon) and an archaeological site investigation software (“Iko-kun”) were used to set up the reference points and to measure the section points. As for an overall plane figure of the excavation area, points were included in photos and aerial photographs were taken using a drone and a pole. Then in Japan, an orthography was created, and the creation of plan view was consigned. Soil layer cross-sections were drawn based on the photo data taken with photo signal included, as well as measurement by hand.
- **Investigation of unearthed materials:** In parallel with the excavation, artifacts and animal remains were washed, classified, weighed and stored at the hotel. Artifacts to be illustrated were selected. The artifacts were classified into earthenware, glazed ware, bones, tiles (eave-end, concave, convex, and ridge tiles), greyish burnt bricks, bricks, stone tools, wall clay, etc. Then they were weighed in grams and stored in vinyl or net bags.
- **Plant remains:** Seed and other remains were recovered by water sieving from the samples collected from various excavation areas.

2.2. The Second Investigation

2.2.1 Investigation Period: August 8th (Wed) - September 4th (Tue), 2018

(Investigation team from Japan August 7th: departure from Japan, September 5th: arrival in Japan)

2.2.2. Participants

- **Japan:** Kazuya YAMAUCHI, Koichi KUSHIHARA, Chie NAKAYAMA, Osamu HIRANO, Masako IWASAKI, Makimi TANAKA (the Research Institute of Cultural Properties, Teikyo University), Tomoaki MIHASHI (Graduate student, Teikyo University), Yutaka YOSHIDA (Kyoto University), Michiyo MORI (Tokyo University of the Arts), Manabu UETSUKI (Hiroshima University)
- **Kyrgyz:** Bakit AMANBAEVA (The National Academy of Sciences of the Kyrgyz Republic), Moldokmatov Aibek OMORBEKOVICH, Aigerim AKJOLOVA, Marika KAMALIDINOV (Kyrgyz National University students)

2.2.3. Investigation Schedule

August 7: Departure from Japan (Participants from Japan)

August 8 - 14: Classification, weighing, jointing and restoration of artifacts and bones

August 15 - 29: Drawing of artifacts

August 16 - 26: Analysis of bones

August 24 - September 3: Photographing and making rubbed copy of artifacts

September 4: Departure from Bishkek

September 5: Arrival in Japan (Participants from Japan)

2.2.4. Investigation Items

- Investigation of unearthed artifacts in 2018: Jointing, drawing, photographing and recording of observation sheets
- Investigation of the Sogdian related historic documents in Kyrgyz State Historical Museum
- Investigation of stoneworks, tiles and other materials in Kyrgyz State Historical Museum
- Investigation of animal bones

- Others: Training in restoration and illustration of artifacts, and analysis of animal remains for Kyrgyz National University students. Maintenance of the storage at the National Academy of Sciences of the Kyrgyz Republic

2.2.5. Investigation Procedures

- Unearthed artifacts such as earthenware, tiles, etc.: Since classification and weighing of materials were not completed in the first investigation, this was conducted first, then the jointing of artifacts. The artifacts to be reported were also selected, and then drawings and rubbed copies were made. The annotation was only done for the drawn artifacts with black extra fine permanent markers. Photographs were taken and observation tables were recorded for these artifacts. They were then stored in vinyl bags in order of drawing number. These were then stored in plastic boxes and piled up by investigation year and area in the storage which had been restored on the premises of the National Academy of Sciences of the Kyrgyz Republic.
- Animal remains: Jointing, classification, identification, measurement and photographing were conducted. The investigation is not complete for all of the remains, and for those remaining, the investigation is to be continued.

3. Investigation of AKB-13

3.1. Location of the Excavation Area (Fig.1.5, 3-12, 3-13)

AKB-13 is an excavation area near the south gate of the First Shahristan, and is a 20×30m rectangular shaped area extending from east to west, set around the center when seen from the south gate side (in the east-west direction), and set to the south in the north-south direction. It is located on the south side of the intersection of north-south street that extends from the south gate and east-west street.

3.2. Objective of the Investigation

- To continue to investigate each feature and Rooms (R), clarify the structure and function of each feature, and elucidate the city structure and its transition.
- To excavate the second surface and lower surfaces of the main street (MS), digging down the first layer, and then partially exposing the second surface to clarify the layers of overlapping road surfaces and its stratigraphic relation to the surrounding building complex.
- To date each features and cultural layers by radiocarbon dating, and to reconstruct the environment by identification of wood species. To understand the diet through the analysis of animal and plant remains, and to study the relation with people such as cultivation, domestication, and cooking.

3.3. General Description of the Investigation

On AKB-13 of the First Shahristan, the National Academy of Sciences of the Kyrgyz Republic and National Research Institute for Cultural Properties, Tokyo started the investigation in 2011, and Teikyo University has been continuing the joint research since 2016. The excavation area is a 20×30m area located near the south gate. Rectangular sections (R) made of walls of sun dried brick are placed continuously on both the east and west side of the main street (MS1) in the north-south direction, and the street structure is gradually unraveled. Because repair and preservation measures were taken for the buildings east of MS1 in 2015, excavations after 2016 have been conducted mainly on the buildings on the west side of MS1 (R1 to R3).

This year, the excavation of MS1 and R1 to R5 were conducted. R1 to R3 are buildings on the west side of MS1, and R4 and R5 are on the northeast sections of MS1. In the upper layers of R4 and R5, traces of buildings and roads in the east-west direction were confirmed in the previous excavation. To summarize the results of excavations since 2011, three to four layers of building features or surfaces of features were detected; The second surface in 2016 and the third surface in 2017. In R3, there are two layers of feature surfaces between the lower layer of the first surface and the second surface (surface 1-2 upper half and lower half). According to the radiocarbon dating results, the first surface is estimated to date from the second half of the 10th century to the first half of the 11th century, the second surface from the second half of the 9th century to the first half of the 10th century, and the third surface from the second half of the 8th century to the first half of the 9th century.

As a result of excavation, a road surface with gravel paving was exposed just beneath the building feature of the second layer in R1. In R4 and R5, garbage and sludge were discarded to fill the area and large amount of earthenware and animal bones were unearthed. In MS1, the road surface of MS1-2, with gravel paving and a drain ditch in the center was revealed. In MS1-3, the lower layer of MS1-2, the road surface with gravel with the same road width was confirmed, and a pavement with sun dried brick was excavated from east and west sidewalk. On the east road sidewalk associated with MS-1, serial pits arranged linearly were also detected.

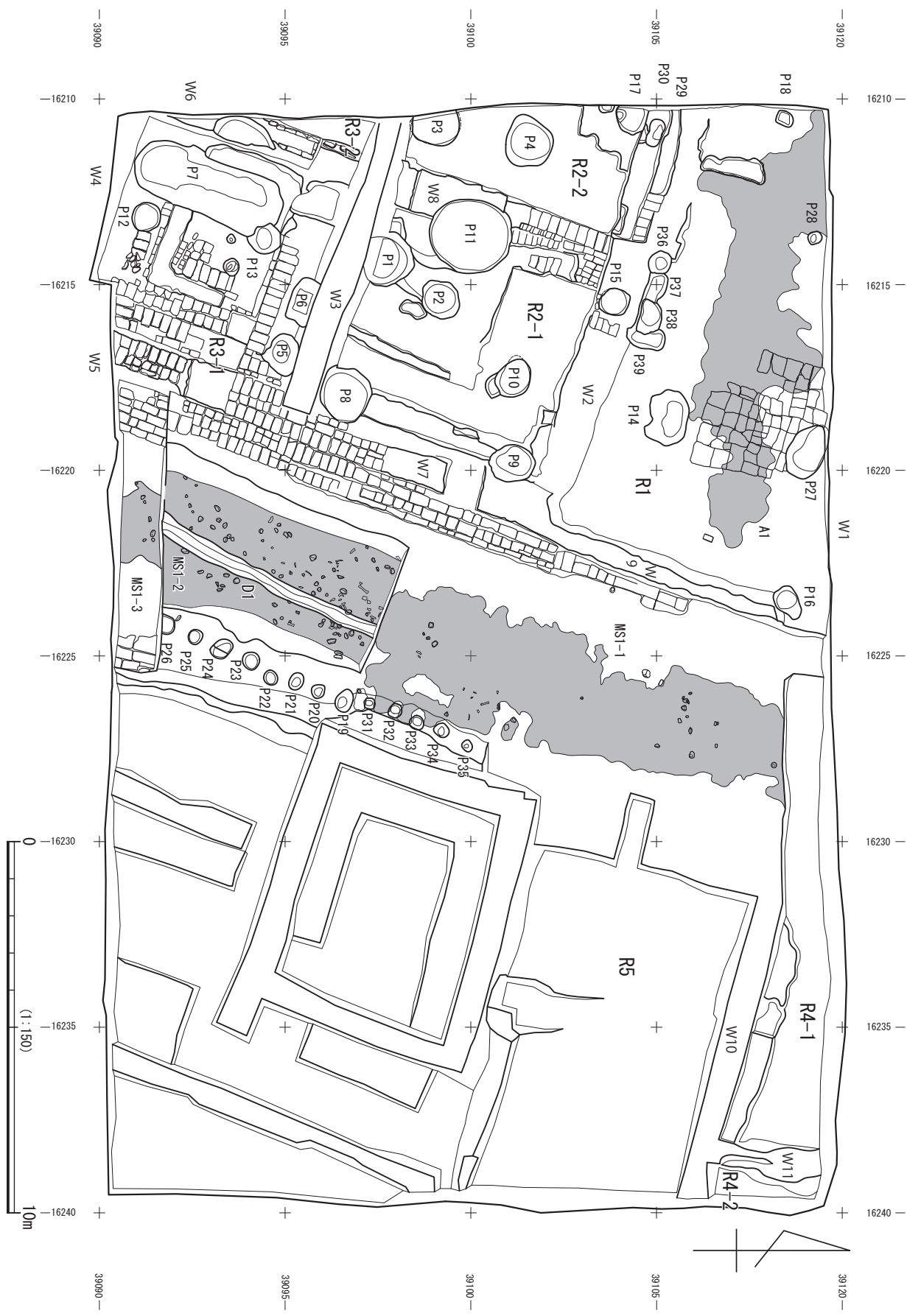


Fig.3.1 Full view of AKB-13

3.4. R1, A1, and Pits

3.4.1. R1 and Road Feature A1 (Fig3.1-3.3, 3.18, 3.30-3.40)

R1, located at the northern end of western buildings of MS1, is a 7×13m rectangular section, and upper layer indoor furnace and a stone mosaic were removed to confirm the features underneath. The furnace is a 1.5×2m rectangular shaped structure made with sun dried bricks. The formation of burnt soil is weak, with small amount of charcoal accumulation. From inside the furnace, we detected only two small pits with a diameter of about 30cm, the walls of which had turned red from heat. When the stones were removed from the stone mosaic surface extending to the northern wall of the excavation area to make a close investigation of the lower layers, a C-shaped dent(X1) was found. Because this dent was filled with charcoal, and considering its location, it is presumed to be related to the furnace. However, the function and the relation to stone arrangement of the upper layer is unknown. Furthermore, by removal and close investigation of features of the upper layer including the furnace, a floor structure that looked like sun dried bricks laid in the range of 3×3.5m in the easterly of the center was confirmed. Since such a structure also exists in R3, it is tentatively regarded as a floor structure. When the surface of sun dried bricks was removed, A1 was found in addition to P14, P27 and P36-39 from the lower layer. All pits are 0.7 to 1.5m in diameter, 0.4 to 0.5m in width and small-scale compared to the group of pits found in R2, and some of them contained earthenware. It seems that the stone mosaic and the furnace correspond to the second surface and A1 to the third surface.

Road feature A1 is a road whose surface was paved with small gravel. It was detected from about 15cm under the lower layer of sun dried brick surface, floor surface involved in the furnace. It was confirmed in the range of about 2 to 4m in width and 12m in length in the east-west direction in R1. Although A1 intersects with MS1-1, the gravel floor is partial and thin near the intersection. Animal bones, earthenware fragments, coins, etc. were unearthed from inside the fill of A1. The amount was small compared to MS1-1. In terms of the direction, A1 follows the road trace of the upper layer of R5 which was investigated before 2015, but is older. Although the intersection with MS1-2 or MS1-3 is presumed because both are paved with gravel, further excavation of lower road surface of MS1 is needed to confirm this. The gravel paving of A1 has a part that extends from the road surface in the east-west direction to the south like a branch road, and the branch road is heading to the center of the north walls of R2-2. A part of the gravel was removed in the course of excavation, but it is assumed that there was an entrance from the north to R2-2 at the end of this branch road. In addition, the gravel road surface has a slightly indistinct groove-shaped difference in level near the center, and it seems to have been the same structure as the central drain of MS1 serving as a drain ditch.

3.4.1.1. Artifacts from R1 and A1 (Fig.3.63, 3.64, 3.83-3.85 : 13-18-001–025)

• Earthenware

001-025 are earthenware, 001 and 002 are short-necked jars, 003 is a bowl shaped cooking pot, 004 is a bowl, and 005 is a jar. 006-018 are clay objects, 006 is a plate with three legs, and 007-014 are lids. 018 is an animal leg or a knob of lid, but the latter is more likely. Among these, artifacts associated with the stone mosaic are 002, 003, 006 and 018, and artifacts from around sun dried bricks of the upper layer of stone mosaic are 007-010, artifacts from R1 around A1 are 004, 005 and 012.

• Clay objects, stone artifacts, metal objects, bone artifacts

015 and 016 are clay discs, and 017 is a pierced disc. 016 was unearthed from stone mosaic surface of A1. 019 is a spindle base made of stone.

020-023 are coins. 020 and 021 are square-holed bronze coins which were excavated and

drawn with four and three coins adhered. They seem to have been unearthed from the same point and to have been originally seven coins, and they were excavated from the upper layer of stone mosaic surface. Each of them is a medium-sized coin of 1.8cm in diameter, with characters on the surface. 022 is a square-holed bronze coin that was unearthed from near the border between R1 and MS1 and is also a large coin of 2.5cm in diameter. 023 is a square-holed bronze coin that was unearthed from the upper layer of A1, and is also a large coin of 2.5cm in diameter. Both has characters on the surface and considered to be products of about the first half of the 8th century.

024 is a cowry, and 025 is a bone artifact. 024 was excavated from the surface right above stone mosaic and is associated with A1. 025 is a perforated astragalus of sheep, which is considered a chuko, a play equipment.

3.4.2. P14 (Fig.3.4)

An irregular oval pit of 1.5×1.1m and 0.56m deep, situated near the south wall in R1.

3.4.2.1. Artifacts from P14 (Fig.3.65, 3.85 : 13-18-026–028)

- Earthenware

026 is a bowl shaped cooking pot. 027 and 028 are the bottoms of long-necked jars.

3.4.3. P16 (Fig.3.4, 3.39)

An irregular oval pit of 0.9×0.6m and 0.44m deep, situated in the north of the east wall facing MS1 of R1. A large fragment of a jar-shaped earthenware was excavated.

3.4.3.1. Artifacts from P16 (Fig.3.65, 3.85 : 13-18-029)

- Earthenware

029, a long-necked jar, has two striae on the shoulder.

3.4.4. P27 (Fig.3.2, 3.3, 3.40)

An oval pit of 1.5×1.0m and 1.35m deep, situated near the north wall of the excavation area in R1. It seems to have been dug from the second surface because it is dug into the floor surface paved with sun dried brick.

3.4.4.1. Artifacts from P27 (Fig.3.65, 3.85 : 13-18-030)

- Earthenware

030 is a pot which seems to be a cylindrical pot with double clay band on the rim.

3.4.5. P36-39 (Fig.3.2)

P36-39 line up overlapping each other near the center, in the south wall of R1. P36 is a small pit with a diameter of 0.6m, located at the western end, partially extending to the south wall of excavation area. P37 is 0.8×0.5m, P38 is 1.0×0.7m, and P39 is 1.1×0.6m. All three are irregular oval.

3.5. R2 and Pit (Fig.3.2, 3.43-3.48)

R2 is a room structure situated at the center of western buildings. It is a 10.5×6m rectangular shaped and is divided into R2-1 and R2-2 by a partition wall. In R2-1, two floor surfaces were confirmed by observation of a soil layer of section belt of the upper layer, and because most of the floor surface of the upper layer (the third layer) was lost already from the excavation until the year before, the remaining belts were removed and close investigation was conducted for the floor surface of the lower layer (the fourth layer). As a result, several large and small pits including P11 were newly found.

3.5.1. P8 (Fig.3.5, 3.46)

The excavation of P8 was completed, which had remained in the course of investigation. This is a cylindrical pit detected before 2015, and it had been dug halfway and protected by a covering sheet. It seemed to be dug from the top layer (the first layer), and as a result of the completion of excavation, it is considered to be a garbage hole or a lavatory feature (toilet) with a diameter of 1.3m and 4.3m deep. Fill is accumulated soil that was discolored, and it is presumed that it was originally a toilet, converted into a garbage hole, and then was backfilled. On the wall of the pit, it was expected that we could confirm the stratigraphy of the feature surfaces in the lower layer. Although there was no surface that appeared to be a clear floor surface between 1.3m and 3.2m in depth, a layer that contained some artifacts were confirmed at a depth of about 4m.

3.5.1.1. Artifacts from P8 (Fig.3.66, 3.86 : 13-18-031–038)

- Earthenware

031 is a cup. 032 is a pot. 033 and 034 are narrow-necked jars and have ridge lines on the neck, a wavy pattern by rotating tool between bands of round impression on the shoulder of 033, and an impressions of floral stamp pattern between bands of C-shaped impression on the shoulder of 034. Though the design patterns are different, they have a common designing structure with three bands on the shoulder. 035 is the bottom of a pot. 036 is a lid.

- Metal objects and Bone artifacts

037 is a square-holed bronze coin.

038 is a bone artifact (chuko) using astragalus of sheep, and has an incised rectangular pattern on the side.

3.5.2. P1 (Fig.3.2)

P1 is dug into the south wall of R2 (W3). It appears to be dug from the second surface, and the investigation started in 2017 and was dug down further this time, but the bottom is still not reached. It is considered a bag-shaped deep pit.

3.5.3. P11 (Fig.3.6, 3.45)

P11 exists on the west side of R2-1 and it digs into the partition wall. It seems to be associated with the second surface, because its outline was confirmed in the investigation in 2017. It is a shallow cylindrical pit with a diameter of 2.2×2.0m and 0.4m deep.

3.5.4. P4 (Fig.3.2, 3.44)

A bag-shaped pit, situated in R2-2. The excavation was completed in 2017 but was resumed since the dig was found to be partially incomplete. Some artifacts were unearthed from collapsed interior wall.

3.5.4.1. Artifacts from P4 (Fig.3.67, 3.87 : 13-18-039–43)

- Earthenware

039 is a pot-shaped gray earthenware fired in an oxygen-reduction atmosphere with marks of a cushioning tool on the inside. The cushioning tool is considered an adjusting tool of inner surface on which about twenty patterns of round particle is carved, and round particles adhere slightly sparsely to the interior of the earthenware with positive patterns. Although tapping traces, corresponding to traces of a cushioning tool of the interior, should be left on the exterior, only an impression of a fingertip is left in a band shape, and there are no obvious tapping traces. It is a so-called Chinese-style earthenware, with hard firing, but the origin of the production technique is uncertain. 040 is a lid, and the surface has no patterns. In addition, the points from which 041-043 have been unearthed are not clear because of defectiveness at the time of excavation, but they are earthenware that were unearthed from the pit in R2-2, and it is highly likely that they

were unearthed from P4. 041 is a bowl-shaped earthenware. 042 is jar-shaped earthenware with Sogdian letters engraved vertically on one line by incised after firing on the exterior. 043 is a pot with continuous patterns of impression on the mouth edge.

3.5.5. P17 (Fig.3.6)

A shallow cylindrical pit with a diameter of 0.9m and 0.32m deep, situated in the northwest corner of R2-2, touching the wall that forms the border with R1.

3.5.5.1. Artifacts from P17 (Fig.3.68, 3.88 : 13-18-044, 045)

- Earthenware, Animal Bones

044 is a pot with no narrow part on the neck. 045 is a radius of horse with about eight short scratches considered cut marks on the ridge of the bone and with a symbolic incision on the side.

3.6. R3 (Fig.3.2, 3.49-3.52)

R3 is a 8×6m rectangular room-like structure, situated in the west of MS1, southwest corner of excavation area, and it is divided into R3-1 (east-west 5.7m×north-south 6m) on MS1 side and R3-2 on the inner side by a partition wall. The doorway from MS1 to R3-1 is an opening with 1.5m in width, located at the wall W5, which faces the street, and when entering from the doorway, there is a structure 0.8m in width which is one step lower. Although inside of the room is destructed by a large oblong garbage hole, there is a sufa (bench-shaped step) along the north wall (B2), and an L-shaped partition wall or sufa exists in the room (B1). The doorway to R3-2 is an opening of 1.5m between the north side of W6 and W3. An L-shaped structure, B1, was removed and the floor surface was investigated carefully again. As a result, two small pits (P12 and P13) were detected as well as a floor surface paved with sun dried bricks near the center of the room, in the space surrounded by B1 and B2.

3.6.1. Artifacts from R3 (Fig.3.68, 3.88 : 13-18-046)

- Bone artifacts

046 is a dice, a cube of 0.9cm on each sides. It is a white object made of either bone or horn. Pips are made by boring round hollows with a diameter of 2-3mm, which are painted black. The position of the pips are the same as modern ones, and they are correctly engraved.

3.6.2. P12 (Fig.3.7)

A round pit with a diameter of 0.76m and 0.36 deep. The cross-section is cylindrical. It was detected in the south of B2 in R3-1. The bottom layer contains charcoal and burnt soil, but the pit itself has no traces of being burnt.

3.6.2.1. Artifacts from P12 (Fig.3.68, 3.88 : 13-18-047-049)

- Earthenware

047 is a round table. 048 is a lid and has patterns on the surface. 049 is an animal-bone shaped clay object, and it seems to be a tripod of a jar or a dish-shaped earthenware.

3.6.3. P13 (Fig.3.7, 3.52)

A pit with a diameter of 0.45m and 0.46m deep, situated almost in the center of R3-1, slightly east of the space that is surrounded by B1 and B2.

3.7. R4, R5 (Fig.3.1, 3.10, 3.53-3.59)

R4 and R5 are situated on the west side of MS1, in the northeast part of the excavation area. By 2018, traces of building and road which had been detected in excavations up to 2015 had been

removed, and only a sub-trench established in the north-south direction existed in R5. According to observation of the cross-section of the sub-trench, it was confirmed that soil containing a large amount of discolored soil was accumulated. Therefore, it was decided to extend the existing sub-trench to north and south, to establish a orthogonal sub-trench in the east-west direction, and to dig down leaving the section belt crosswise. After observation of soil layers of the cross-section and the excavation area wall surface of on the east side, the whole area was dug down. As a result of the excavation, the east-west wall (W10) and the partition wall in R4 (W11) were detected between R4 and R5. Therefore, it was considered to be a section or a building that succeeds R4 and R5. The east-west wall (W10) was constructed in the fill that contains a large amount of garbage, and a relatively horizontal accumulation of soil layers was confirmed in the lower layer. Although it could be part of a square where east-west and north-south roads intersect, there is no conclusive evidence.

3.7.1. R4 (Fig.3.10, 3.11, 3.55-3.58)

This is a 8m wide section in the east-west direction situated in the northeast corner of the excavation area, on the east side of MS1. Because of the trench established along the north wall of excavation area, it is now difficult to clarify the wall between R5 or the structure of the side facing MS1. R4 has a slightly spacious room on the MS1 side (R4-1) and a small room (R4-2) across a partition wall on the east side in the back. Although the size of the room is unknown, R4-1 is 6.5m or more in width. The wall (W10), which borders R5, is built by arranging large cube pasha blocks in the accumulated soil. The structure of the wall is different from the pile up of sun dried bricks seen in other districts. Additionally, in the south wall of R4-1, sufa exists along W10. It is 0.35m high from the floor, 0.7 wide and 6m or more long.

3.7.1.1. Artifacts from R4 (Fig.3.69-3.71, 3.89-3.91 : 13-18-050-071)

- Earthenware

050 is a pot and has perforations after firing right under the rim. 051 is a stand with about 6 rows of “<”shaped continuous impressions in the horn-shaped carved back, and it has a dent near the bottom. 052 is a narrow-necked jug, and the spout sticks out diagonally upward. 053 is a bowl. 055 is a jar-shaped jug, and the cylindrical spout rises diagonally from the shoulder. 056 and 057 are cup shaped. 058 and 059 are bowls whose rims are shortly warped with outer edge shaved with a spatula and with traces of fingertip on the inside. 060 is a jar-shaped bottom. 061 is a pot. 062 and 063 are in the shape of bowl-shaped cooking pot, and 063 has a slightly fine clay string attached to the body in an inverted U shape and continuous impressions are added. 064-066 are lids and have decorative patterns that are combined radially on the surface. The knob of 065 has three-forked tip, and it has round impressions on the tip and the center. 067 is a leg in the shape of animal leg, and it is considered a leg of bowl-shaped cooking pot or bowl and has five incisions representing fingers. 068 is also a leg in the shape of animal leg and has four incisions. 069 is a horn-shaped stand with incised ridge lines on the back, and arrow-feather-shaped patterns of incisions are drawn around the ridge lines.

- Glass objects, Metal objects

054 is a glass bead with a diameter of 1.15cm.

070 and 071 are bronze products. 070 is in the shape of a ring, and 071 in the shape of a stick.

3.7.2. R5 (Fig.3.10, 3.11, 3.53-3.59)

R5 is an area of 10×6.3m. A large amount of earthenware, animal bones, etc. was unearthed from inside the fill. The amount is large compared to other areas as previously mentioned. Furthermore, because the accumulated soil layer which turned blue green stands out, it is considered to be the disposal place for household garbage including kitchen garbage. Although the floor surface is slightly

hardened near MS1, it is not flat and rises towards the wall. Therefore, it is difficult to regard it as a residential facility. However, because three earthenware were excavated near W10 as if though they were installed and were accompanied by layers of burnt soil and charcoal, there may have been a kitchen stove by the wall. On the south side, near W7, a sufa 5m long, 0.8m wide, and 0.4m high exists just in the east side. Therefore, there is a possibility that it is a room structure, but there is no feature such as a pit in this area, and the situation is different from that of the room structures on the west side of MS1. Moreover, it is hard to regard this as a residential facility, considering that there is no wall to separate the area and the space is large. It is assumed that the floor surface of R5 corresponds to MS1-2 or MS1-3 because it is one step lower than MS1-1 surface. Four charcoals which had been collected from inside the soil layers of east-west belt were radiocarbon dated. Although they were collected from different layers, all belonged to the estimated age and it seems that fill in R5 accumulated in a relatively short period of time.

3.7.2.1. Artifacts from R5 (Fig.3.71-3.80, 3.91-3.99 : 13-18-072–161)

• Earthenware, Clay objects, Stone Artifacts

072-074 are cup-shaped, and 073 has triangular patterns impressed on the neck. 163 is a small jar. 076 is the rim of jar, and lines of round decorations are formed on the exterior by pressing a stick-shaped tool from the interior. Furthermore, there are intersecting patterns of incision below them. 077 is a narrow-necked jar. 079-083 are short-necked jar, and some of them have quadrate rims and handles on the bodies. 084-086 are long-necked jar. They are different in size, but both have two incisions on the neck, and also are very similar in shape. Although 086 is cup-shaped with a handle on the body, the vessel shape is similar to long-necked jars and it is characterized by two incisions on the shoulder. 087 is a long-necked jar. 088 is cup shaped. 089-091 are bowls. 092 and 094 are pots. 094, 095 and 097 are the bottoms of long-necked jar or short-necked jar, and 096 is the bottom of a pot. 098-107 are bowl shaped cooking pots. 098 has a “horn” on the shoulder, some of the other vessels have narrow C-shaped ridge lines with continuous impressions attached. Of these, 100 and 102 were excavated together with 086 in the upright position from just beneath the burnt soil layer near the northern wall (W10). 108-135 are lids. 108-114 are knobs of lids and their shapes are; cylinders (108-110, 134), plates (111-114) and an arch (133). For cylinder shaped ones, some have no patterns, while others have impressions or have four branches at the tips (134). For plate-shaped ones, the tip is forked in some (112-114) while in another it is T-shaped (114). Patterns of the surfaces can be classified into; only incisions, incisions+nicks, nicks+ round impressions, incisions+nicks+ round impressions, and no patterns. They are the most decorative of the earthenwares. Since all are small fragments, the diameter was estimated. There are small examples of 16cm, large examples of 37cm, and middle-sized examples between them. 136 and 139 are table-shaped clay objects estimated to be round tables. The diameters are 44 to 54cm, and patterns of the surfaces are similar to those of the lids, but 139 has meandering incisions and continuous arc-shaped incisions. 137 is a dish seemed to have been excavated from R5, and 138 is a dish or the bottom of a jar with incision before firing on the bottom. 140-143 are stands, and 141 has continuous “<” shaped patterns and round impressions. 142 has only small round impressions, while 143 has only “<” shaped patterns. 143 also has face-like motif near the bottom. 144 is a leg of bowl shaped cooking pot. 145-147 are animal leg. 145 and 146 have incisions representing fingers. 148 is a spout of a vessel such as a jar and has representations of ears, eyes and nose by round impressions. 149 and 150 are discs diverted from fragments of earthenwares. 150 has circular holes. 151 is a stone disc with striations. 152 is a greyish burnt brick with rope-tapping trace on one side.

• Metal objects, Glass objects

153-160 are bronze coins and square-holed bronze coins. 155 is in the shape of irregular disc

and has no hole. 159 is a middle-sized square-holed bronze coin. 160 is also a square-holed bronze coin excavated from the floor surface of R5, unearthed with four coins stuck together due to rust.

161 is a spherical glass bead.

3.8. MS1 (Fig.3.2, 3.8, 3.9, 3.15-3.29)

MS1 is a road surface with a width of 7-7.5m and a length of about 20m. Slag is paved in the range of 2-4m in width. A shallow hollow groove is confirmed at the center of the road. Because paved slags are black glassy substance with fine copper particles adhered on the surface, they are estimated to be associated with copper smelting. It is estimated that these slags were paved on the road surface in place of small gravels presumably when the smelting furnace that existed around the area was abolished. The furnace excavated in R1 may have been one of these smelting furnaces. However, the amount from the entire road surface is too large to be seen as discharged from a single furnace. Furthermore, animal bones, earthenware fragments, etc. are scattered along with slag on the road surface, which indicates that household garbage including food residues were dumped and accumulated. These evidence suggest that household garbage was dumped in parallel with road surface repairing using slags for intentional reclamation and development of the road surface.

In the investigation in 2017, the sub-trench established at the south wall of the excavation area revealed that older road surface existed below the slag paved road surface. This year, the sub-trench was therefore extended in the direction of the western wall in order to dig down lower layers and to explore the transition of the road surface and the temporal relation between the building foundation and the road surface. As a result, the existence of three road surfaces were revealed. They were named MS1-1, MS1-2, MS1-3 from the top. By observation of the cross-section of the road surface, the correspondence between the floor surface accumulation of three building features that had been confirmed in R3 and MS1-1 to 3 were estimated. It is possible that the construction and renovation of buildings were carried out at the same time as the formation of the road surfaces. This presumption is interesting in considering the formation process of the city.

3.8.1. MS1-1 (Fig.3.2, 3.17, 3.22, 3.29)

MS1-1 is a road surface paved with slag 1.2m below present ground. The width is 7-7.5m, and there is a shallow groove in the center of the slag surface. The sidewalk on the east side of the road is like a sidewalk and is one step higher with twelve pits lined up in a row (P19-26, P31-35). The pit diameter is 0.4-0.5m. The depth is as shallow as 7-10cm. The interval is as close as about 0.3m. Although the arrangement is linear, there is disorder and it is hard to say if there is any regularity in width and arrangement. They may be a peristyle supporting the eaves or arcades, but it is not certain. Because there is no slag in the range of the pits and slag surrounds them, it seems that either the pits were dug into the road surface after slags were paved, or slags were paved afterwards avoiding columns that had been set up in the pits. On the other hand, serial pits are not found in the western sidewalk. It is highly likely, however, that the sidewalk had already been scraped in the course of past excavation, and the sun dried brick row from the lower layer is already exposed. The road surface of MS1-1 were also dug down for 7-8.5m from the south to expose gravel paved surface of MS1-2 from the lower layer. The aim was to promote the understanding of visitors by showing the accumulation of different surfaces.

3.8.2. MS1-2 (Fig.3.8, 3.15-3.17, 3.24, 3.26-3.28)

MS1-2 is a multilayered road surface about 0.35m below MS1-1. About 7m in the north-south direction near the south wall of the excavation area was investigated. The width of the road surface is

about 6m. A range of about 3.8m wide is paved with gravel. There is a drain ditch of 0.4-0.5m wide and about 0.25m deep in the center. A large amount of animal bones and earthenware fragments were mixed in the fill like MS1-1. Sidewalk is heightened by arranging about three rows of sun dried brick perpendicular to the road.

3.8.3. MS1-3 (Fig.3.8, 3.15, 3.19, 3.20, 3.23)

MS1-3 overlaps with MS1-2 0.4m below and was confirmed in the 1m wide sub-trench established in the south wall of the excavation area. The road width is 7.6m between the east and west buildings of MS1. It is paved with gravel in the width of about 2.3m near the center. A sidewalk paved with sun dried bricks was confirmed in the east and west. Sun dried bricks are arranged in three or more rows so that the major axis parallels the road. Bricks used for construction were slightly larger than bricks associated with MS1-1 and were characterized by the different arrangement method. Although there was no groove in the center of the road surface, it may not have been detected because of the limited area of excavation. Compared to the road surfaces of MS1-1 and MS1-2, there is no significant difference in the width between the walls of the buildings, but the road surface of MS1-3 is almost flat, while MS1-1 and MS1-2 have curved cross-sections that rise toward the sidewalks. At present, the date of MS1 is presumed to correspond to the first surface of the rooms (R), MS1-2 to the second surface, and MS1-3 to the third surface based on the observation of the cross-sections. However, radiocarbon dating from road surfaces are necessary to verify their dates in the future.

3.8.4. P19-26, P31-35 (Fig.3.1, 3.8, 3.15, 3.17, 3.21, 3.28)

These are shallow and round serial pits which are lined up at the position corresponding to the sidewalk (sidewalk) on the east side of the road accompanying MS1-1. Their scales in order from the southern end are; P26 is 50cm in diameter and 10cm in depth, P25 is 35cm in diameter and 7cm in depth, P24 is 60cm in diameter and 10cm in depth, and P23 is 48cm in diameter and 8cm in depth, P22 is 40cm in diameter and 6cm in depth, P21 is 50cm in diameter and 10cm in depth, P20 is 38cm in diameter and 12cm in depth, P19 is 65cm in diameter and 10cm in depth, P31 is 30cm in diameter, P32 is 35cm in diameter, P33 is 35cm in diameter, P34 is 40cm in diameter, and P35 is 10cm in diameter (the depth of P31-35 is unconfirmed). The distance between pits is 0.7-0.8m between the centers of the pits and 0.3-0.4m between the edges of the pits. Their arrangement is not linear, but slightly meandering. Pits on the north of P35 appear to have been lost because the parts corresponding to sidewalks had already been dug down, but it seems that they originally existed. Slag pavements extends to the vicinity of P31-34, but they are lacked in the shape of ellipse around the pits (Fig.3.21). The chronological order of the pits and slag pavements are as mentioned above.

3.8.5. Artifacts from MS1 (Fig.3.81, 3.82, 3.99, 100 : 13-18-162-179)

• Earthenware

162 is the body of the earthenware, possibly a jar, unearthed from MS1-3. It is divided by incisions, and herringbone-pattern is drawn inside by incision. 163 and 164 are cup-shaped. 163 was unearthed from inside the center groove of MS1-2 and 164 was unearthed from MS1-2. 165 is a small jar unearthed from MS1-1. 166 is a plate with legs, unearthed from the center groove of MS1-2. 167 and 168 are bowl-shaped-cooking-pot. 167 was unearthed from MS1-2-3 and 168 was unearthed from MS1-2. 169 is the bottom of a pot, with a perforation before firing on the side. 171 and 172 are knobs of lids, and the top surface of 171 has patterns with round and other impressions. 171 was unearthed from MS1-3, and 172 was unearthed from MS1-1. 170 is the bottom of a jar unearthed from the center groove of MS1-2.

- Clay objects, Stone artifacts, Metal objects, Glass objects

175 is a pierced clay disc, which is diverted from an earthenware fragment. It was unearthed from MS1-2.

173 and 174 are stone artifacts. 173 is spherical gravel with a perforation, 174 is a grinding stone with traces of use on the tip. Both were unearthed from MS1-2.

176 and 177 are bronze bracelets unearthed from the same point of MS1-1–2. These should have been reconstructed on the figure as C-shaped. According to the results of conservation works, brass string decoration is attached on the tip, and twisting is added. 178 is a stick-shaped bronze product unearthed from MS1-1.

179 is a conical glass object unearthed from MS1-2.

3.8.6. Other Artifacts (Fig.3.100 : 13-18-180–183)

- Earthenware

180 is a short-necked jar excavated from P30 of W2. 183 is a round table, and multiple round patterns with Renju (pearl-circle) are impressed on the surface.

- Metal objects

181 is a square-holed bronze coin. The exact excavated point is unclear, but it seems to have been excavated from R5. 182 is also a square-holed bronze coin that was surface collected around the excavation area.

R1, R2-1·2, R3

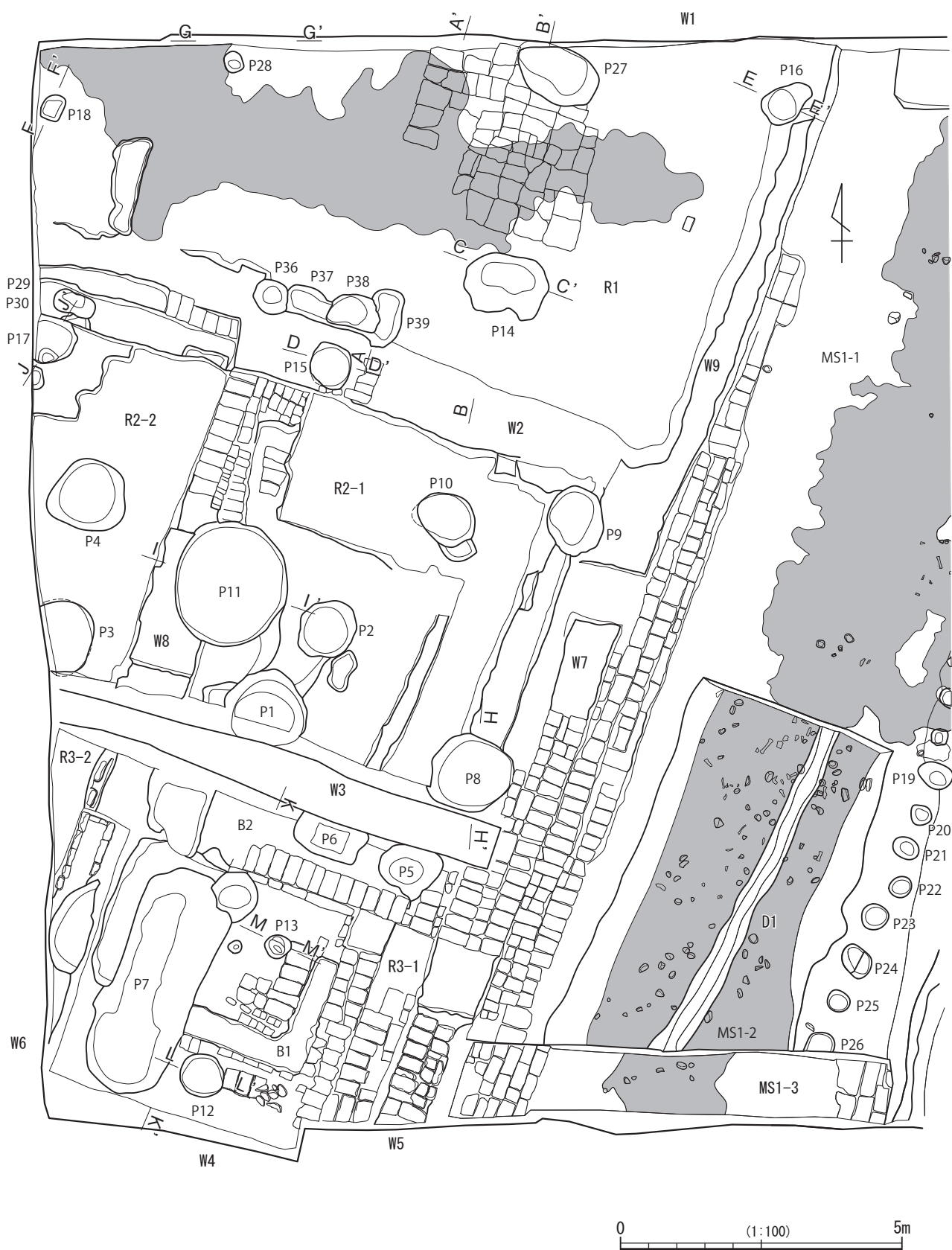
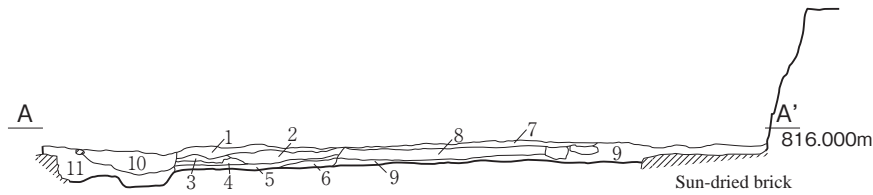
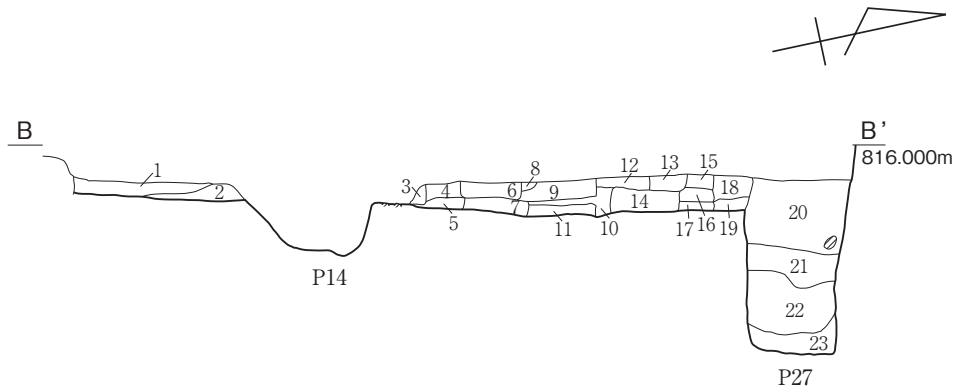


Fig.3.2 AKB-13 R1-R3

R1



- | | |
|--|--|
| 1 Grayish yellow brown soil: Very compact. Contains charcoal, burnt particles. | 7 Dull yellowish brown soil: Less compact. Contains layer of ash, charcoal. |
| 2 Grayish yellow brown soil: Very compact. Contains charcoal, burnt blocks, white particles. | 8 Grayish yellow brown soil: Less compact. Contains charcoal, fairly large amount of white particles, burnt particles. |
| 3 Dull yellowish brown soil: Loose. Accumulation of yellow soil. | 9 Grayish yellow brown soil: Less compact. No inclusions. Similar to layer 8. |
| 4 Burnt soil layer. Burnt blocks | 10 Grayish yellow brown soil: Less compact. Contains fairly large amount of charcoal, gravel. |
| 5 Olive black soil: Mainly ash layer. Less compact. Contains charcoal. | 11 Grayish yellow brown soil: Less compact. |
| 6 Grayish yellow brown soil: Very compact. Small white block | |



- | | |
|---|--|
| 1 Dull yellowish brown soil: Compact. Contains small amount of charcoal. | 13 Dull yellowish brown soil: Very compact. Sun dried bricks |
| 2 Grayish yellow brown soil: Loose. | 14 Dull yellowish brown soil: Very compact. Sun dried bricks |
| 3 Dark brown soil: Fairly compact. Contains small amount of plaster-like white particles. | 15 Dull yellowish brown soil: Very compact. Sun dried bricks |
| 4 Grayish yellow brown soil: Very compact. Sundried bricks | 16 Dull yellowish brown soil: Very compact. Contains charcoal. |
| 5 Grayish yellow brown soil: Very compact. Sundried bricks | 17 Brown soil: Very compact. |
| 6 Dull yellowish brown soil: Very compact. Contains small amount of charcoal. Sun dried bricks | 18 Dull yellowish brown soil: Less compact. Contains burnt particles, ash, charcoal. |
| 7 Dull yellowish brown soil: Contains charcoal, small amount of white particles. Sun dried bricks | 19 Dull yellowish brown soil: Very compact. Sun dried bricks |
| 8 Grayish yellow brown soil: Loose. Gap between bricks. | 20 Grayish yellow brown soil: Loose. |
| 9 Dull yellowish brown soil: Very compact. | 21 Brownish brown soil: Less compact. Contains fragment of earthenware, charcoal. |
| 10 Grayish yellow brown soil: Loose. Gap between bricks. | 22 Grayish olive soil: Sandy and loose. |
| 11 Dull yellowish brown soil: Very compact. | 23 Grayish yellow brown soil: Very compact. |
| 12 Dark brown soil: Contains fragments of earthenware, bone. Sun dried bricks | |

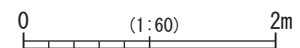
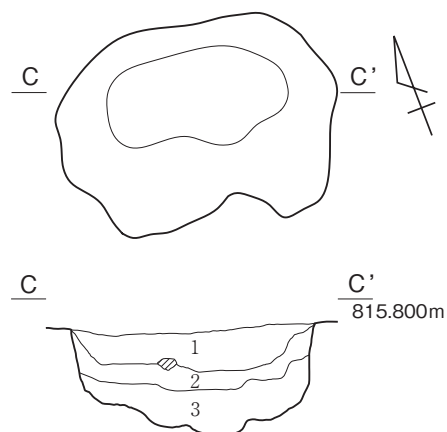


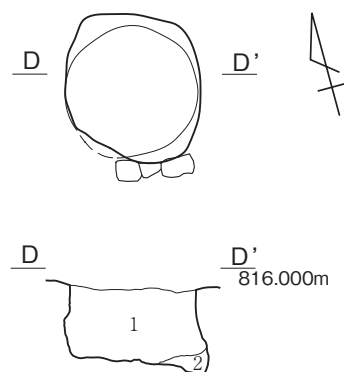
Fig.3.3 AKB-13 R1, Cross-section of top surface of stone mosaic

R1 P14



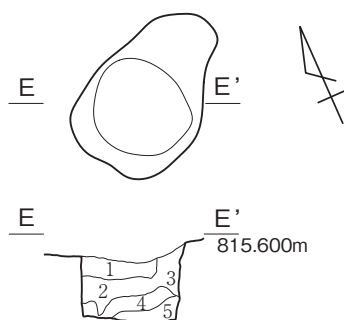
- 1 Brownish black soil: Loose. Contain plaster-like white particles.
- 2 Dark brown soil: Loose. Contains earthenware, animal bones, charcoal.
- 3 Dull yellowish brown soil: Compact. Contains soil blocks.

W2 P15



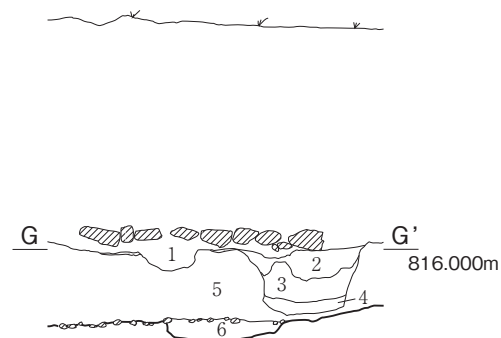
- 1 Dull yellowish brown soil: Less compact. Slightly coarse. Contains charcoal, white particles, earthenware, bluish gray blocks.
- 2 Dull yellowish brown soil: Fairly yellowish. Loose. Contains charcoal.

R1 P16



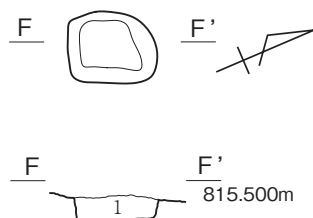
- 1 Dull yellowish brown soil: Fairly compact.
- 2 Brownish gray soil: Loose. Contains charcoal, ash.
- 3 Brownish gray soil: Compact. Contains charcoal.
- 4 Brownish gray soil: Loose.
- 5 Brownish black soil: Very compact.

R1 X1



- 1 Grayish yellow brown soil: Compact.
- 2 Charcoal. Loose. Slightly coarse charcoal.
- 3 Dull yellowish brown soil: Compact. Contains burnt particles.
- 4 Charcoal. Contains ash, fairly large amount of white particles, burnt particles.
- 5 Dull yellowish brown soil: Compact. Contains charcoal, burnt particles.
- 6 Dull yellowish brown soil: Compact. Covered by small gravel.

R1 P18



- 1 Dull yellowish brown soil: Less compact. Contains charcoal of about $\Phi 5\text{mm}$.

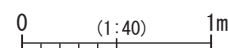
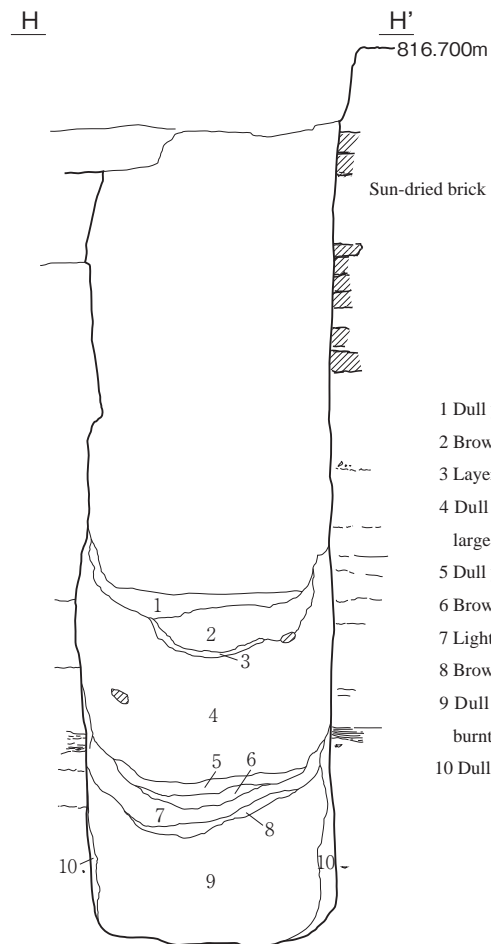
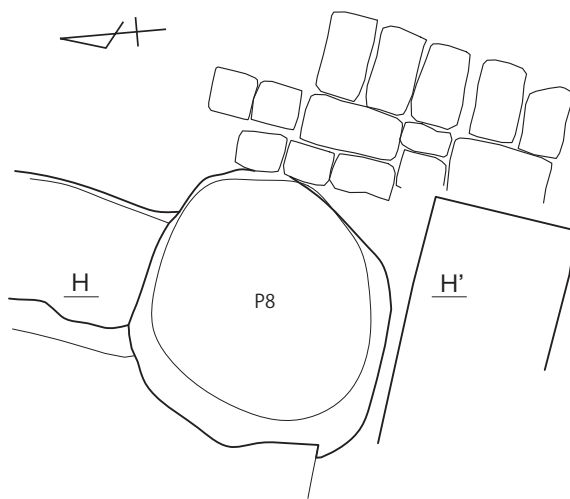


Fig.3.4 AKB-13 P14-16, 18, X1

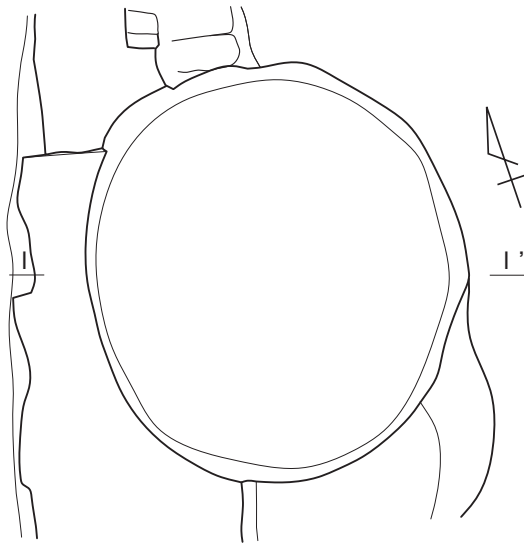
R2 P8



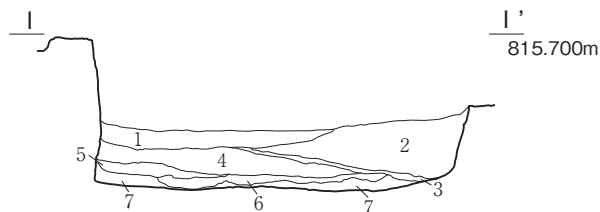
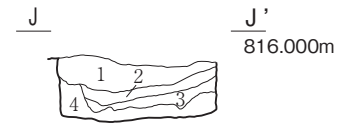
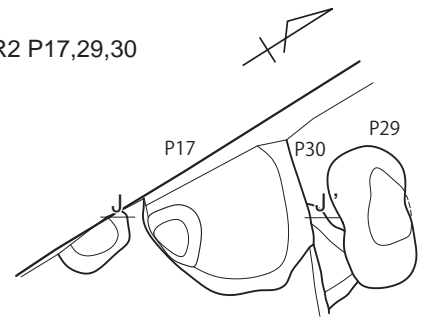
0 (1:40) 1m

Fig.3.5 AKB-13 P8

R2 P11



R2 P17,29,30



1 Upper: Brownish black soil: Less compact.

Lower: Light gray soil: Loose.

2 Dark brown soil: Contains small amount of charcoal of Φ 1-2cm.

3 Yellowish brown soil: Loose.

4 Dull yellowish brown soil: Less compact.

1 Grayish yellow brown soil: Contains large amount of ash, charcoal, burnt blocks.

2 Brown soil: Contains charred particles, burnt blocks.

3 Grayish yellow brown soil: Less compact. Contains large amount of ash, charcoal.

4 Brown soil: Contains charcoal.

5 Dark brown soil: Contains charcoal, burnt particles.

6 Brownish gray soil: Less compact. Contains large amount of ash, charcoal.

7 Brown soil: Similar to the lower layers.

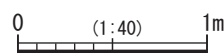
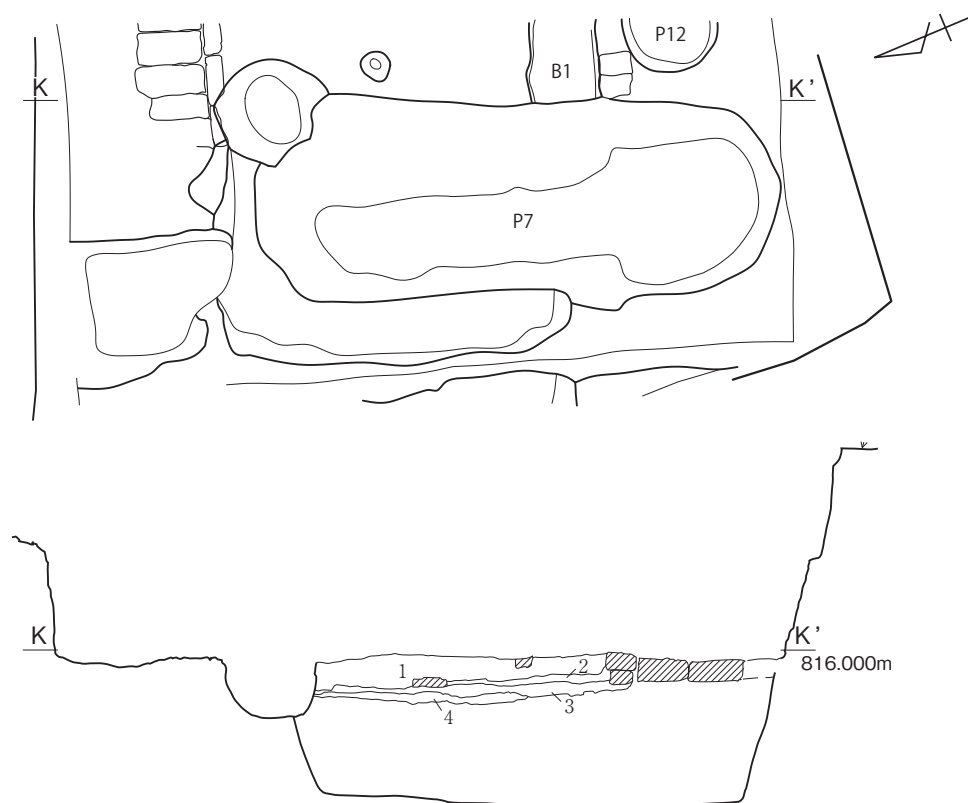


Fig.3.6 AKB-13 P11, 17, 29, 30

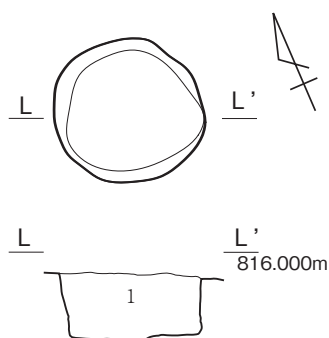
R3 P7



- 1 Dull yellowish brown soil + white particles: Dense, very compact. Contains charred particles.
- 2 Brownish gray soil: Dense, very compact. Contains charcoal (fine) (lightly black throughout).
- 3 Brown soil + white particles: Less compact. Large amount of charcoal, burnt particles, white particles (plaster).
- 4 Dull yellowish brown soil + charred particles: Fairly large amount of charcoal, charred particles.

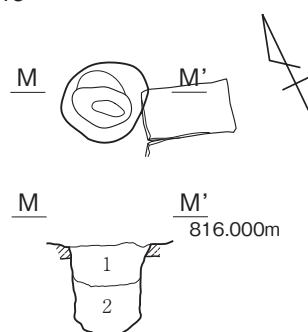
0 (1:60) 2m

R3 P12



- 1 Dull yellowish brown soil: Compact. Contains charcoal, burnt blocks on the bottom. Contains charcoal, burnt soil.

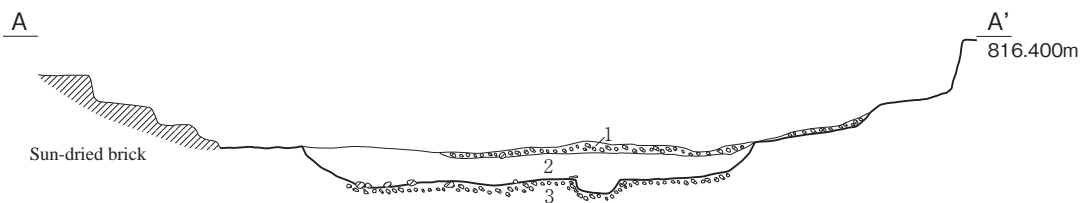
R3 P13



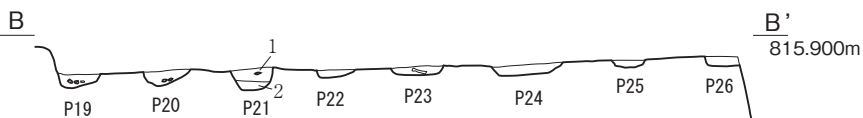
- 1 Brownish black soil: Loose. Slightly coarse. Contains charcoal.
- 2 Dark brown soil: Loose. Loose soil in blocks.

0 (1:40) 1m

Fig.3.7 AKB-13 P7, 12, 13



- 1 Iron slag pavement: Contains gravel, earthenware, bone.
- 2 Brown soil: Loose.
- 3 Gravel pavement: Top surface of MS1-2. Scattered earthenware, bones, etc.



- P19
 - 1 Dark brown soil: Loose. Contains large amount of gravel of Φ 2-3cm, fragments of earthenware, bone.
- P20
 - 1 Dark brown soil: Less compact. Contains large amount of gravel, fragments of earthenware.
- P21
 - 1 Dark brown soil: Moderately compact. Contains small amount of gravel of Φ 1-2cm.
 - 2 Brownish black soil: Moderately compact. Contains very small amount of charcoal of about Φ 5mm.
- P22
 - 1 Brownish black soil: Moderately compact.

- P23
 - 1 Dark brown soil: Less compact. Contains large amount of animal bone.
- P24
 - 1 Dark brown soil: Less compact. Contains large amount of fragments of earthenware, bone.
- P25
 - 1 Dark brown soil: Moderately compact. Contains fragments of earthenware, bone.
- P26
 - 1 Brown soil: Moderately compact. Contains fragments of earthenware, bone.

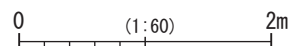


Fig.3.8 AKB-13 MS1

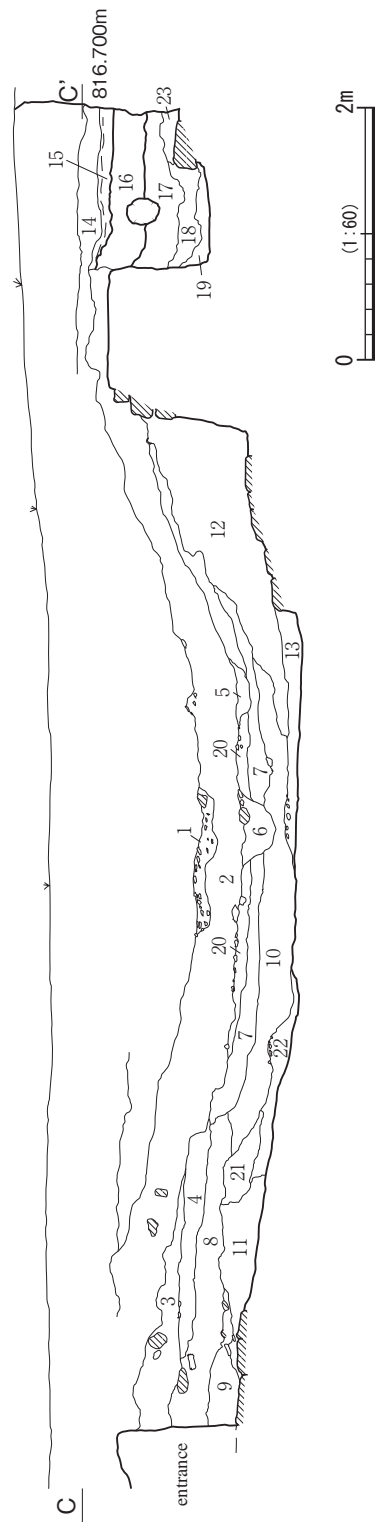
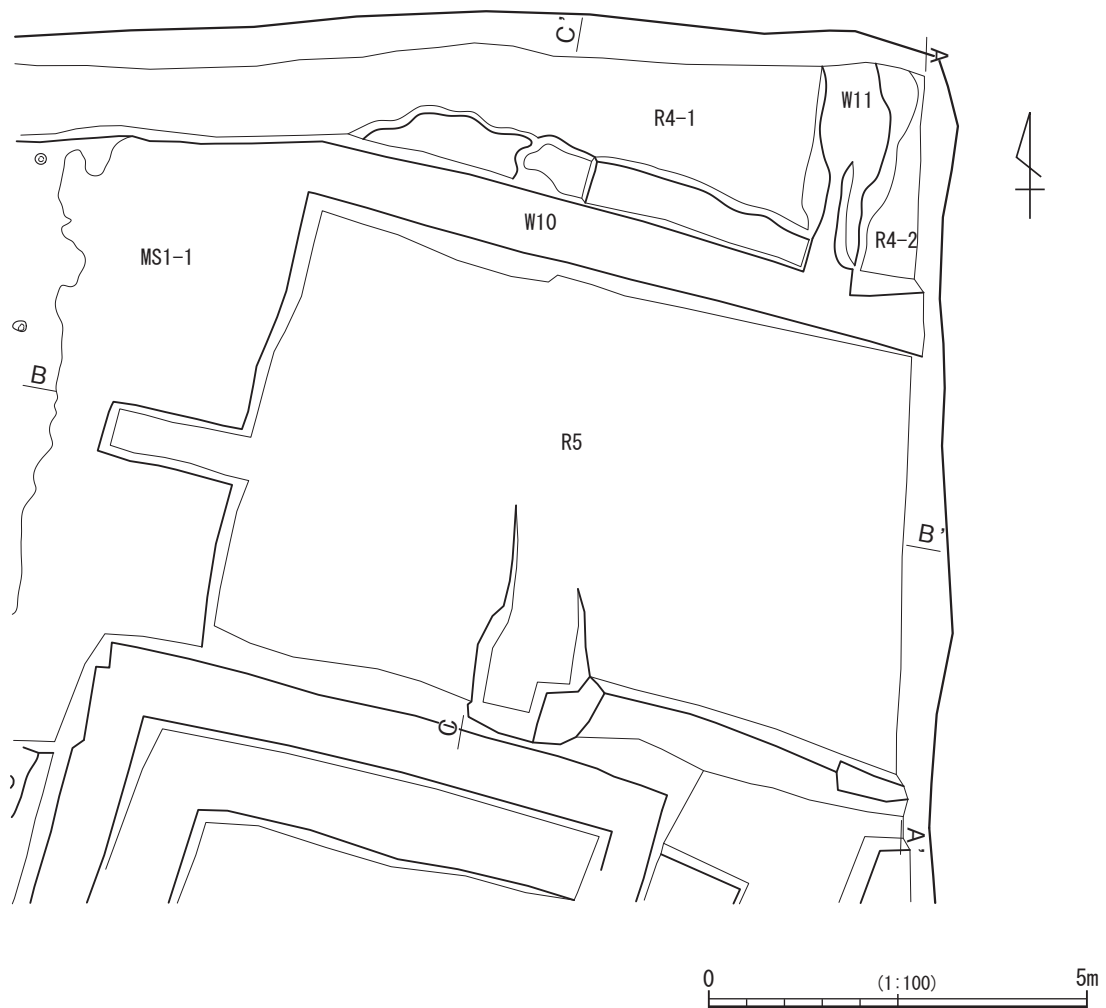


Fig.3.9 AKB-13 cross-section of MS1

- 1 Dull yellowish brown soil: Large amount of iron slag.
- 2 Dull yellowish brown soil: Contains gravel, charcoal, bone.
- 3 Dull yellowish brown soil: Loose. Contains earthenware, gravel, charcoal, white particles, burnt soil.
- 4 Orange soil: Very compact. Large amount of charcoal, white particles.
- 5 Brownish gray sandy soil: Loose. Mainly sand.
- 6 Dull yellowish brown soil: Less compact. Contains small gravel. Ditch in the center of the road surface. Fill.
- 7 Brown soil
- 8 Dull yellowish brown soil: Contains small gravel, bone, earthenware, charcoal, white particles.
- 9 Grayish olive soil: Less compact greenish gray soil layer. Contains large amount of ash, charcoal.
- 10 Dull yellowish brown soil: Very compact. Contains palsa, small gravel, charcoal.
- 11 Yellowish brown soil: Clay directly above sun dried bricks. Contains fairly large amount of charcoal, white particles.
- 12 Yellowish brown soil: Contains charcoal, white particles.
- 13 Dark brown soil: Compact. Contains charcoal.
- 14 Dull yellowish brown soil: Compact. Contains white particles. Directly under topsoil.
- 15 Dull yellowish brown soil: Loose. Contains charcoal. Contains 2-3 thin layers of white particles.
- 16 Dull yellowish brown soil: Very compact. The lower layer is less compact.
- 17 Dull yellowish brown soil: Very compact. Contains charcoal, white particles.
- 18 Dark brown soil: Loose.
- 19 Dark brown soil: Fairly compact.
- 20 Dull yellowish brown soil: Very compact.
- 21 Alternate layers of grayish olive soil and dull yellowish brown soil: Compact. Accumulation of lens-shaped layers of ash (containing charcoal) in the direction of inclination.
- 22 Grayish yellow soil: Loose. Fairly large amount of charred particles. Coarse. Contains small gravel.
- 23 Dark brown soil: Less compact. Contains fragments of sun dried bricks. Similar to layer 18.



- | | |
|---|---|
| 1 Dull brown soil: Loose. | 16 Dull yellowish brown soil: Fairly compact. |
| 2 Grayish yellow brown soil: Loose. Contains charcoal, burnt soil. | 17 Dark grayish yellow soil: Fairly compact. Contains charcoal in stripes. |
| 3 Dull yellowish brown soil: Fairly compact. | 18 Brown soil: Contains large amount of charcoal. |
| 4 Brown soil: Fairly compact. | 19 Grayish olive soil: Loose. Sandy and coarse. |
| 5 Grayish brown soil: Loose. Contains charcoal, white particles. | 20 Dark brown soil: Fairly compact. Contains charcoal. |
| 6 Brownish black soil: Loose. Contains white particles. | 21 Grayish olive soil: Loose. Contains charcoal, burnt soil. |
| 7 Dark brown soil: Fairly compact. Contains fragments of earthenware, charcoal. | 22 Dull yellowish brown soil: Contains blocks of gravel, ash, charcoal, clay. |
| 8 Dull brown soil: Layer of accumulation of sun dried bricks. | 23 Dull yellowish brown soil: Extremely compact. |
| 9 Brown soil: Fairly compact. Contains fragments of earthenware, charcoal. | 24 Dark grayish yellow soil: Loose. |
| 10 Dark brown soil: Fairly compact. Contains charcoal. | 25 Dark grayish yellow soil: Less compact. |
| 11 Yellowish brown soil: Loose. Contains charcoal. | 26 Dark grayish yellow soil: Very compact. |
| 12 Grayish olive soil: Loose. Striped accumulation of ash, charcoal. | 27 Olive soil: Fairly compact. Contains white particles. |
| 13 Dull brown soil: Very compact. | 28 Dull brown soil: Very compact. Clay of wall structure of the building. |
| 14 Grayish olive soil: Less compact. Contains charcoal. | 29 Dark reddish brown soil: Loose. Contains clay blocks. Contains charcoal, white particles. |
| 15 Grayish olive soil: Loose. Contains charcoal. | 30 Dull reddish brown soil: Top surface is road-shaped feature and forms the hard surface of road-like feature. |

Fig.3.10 AKB-13 R4, R5

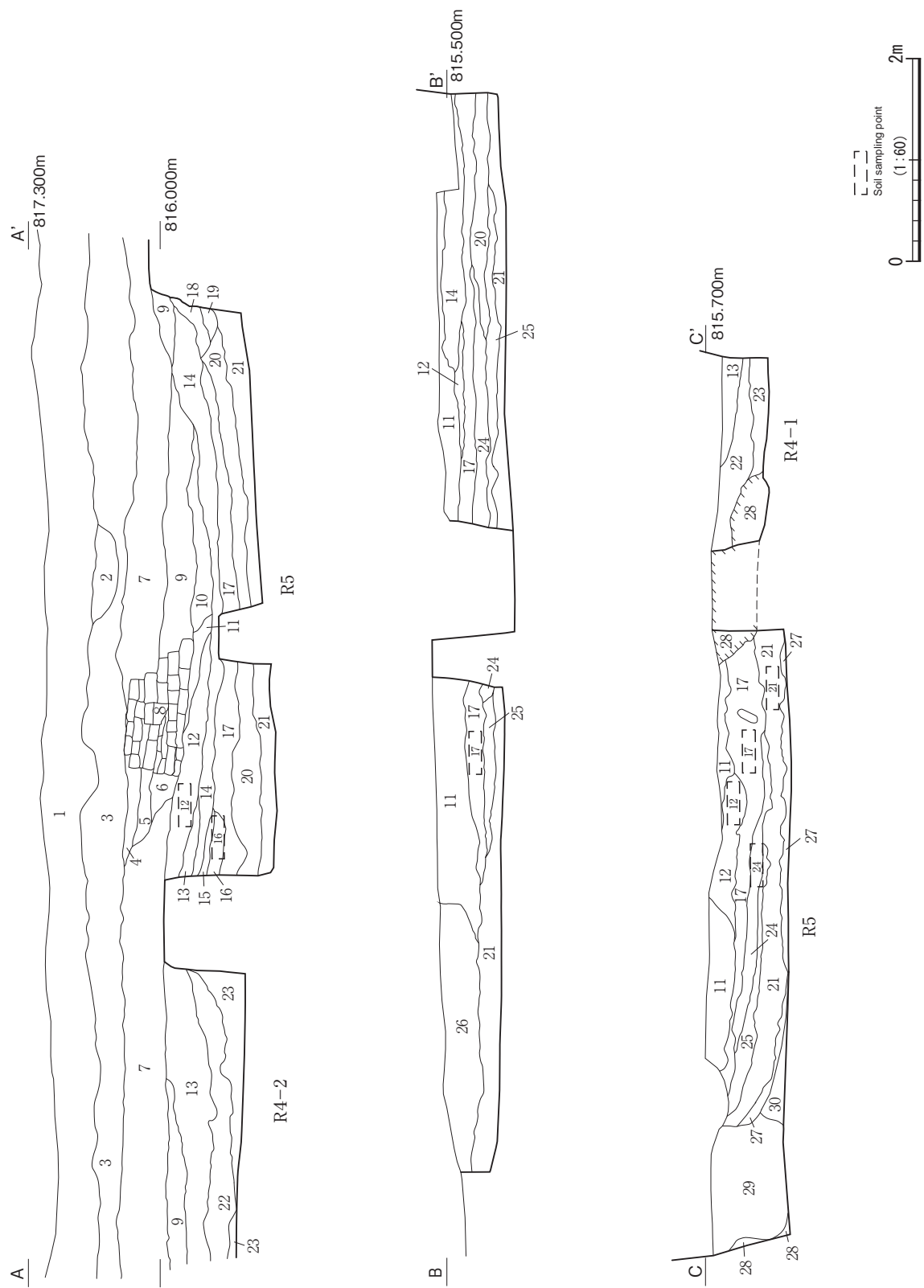


Fig.3.11 AKB-13 cross-section of R4 and R5



Fig.3.12 Distant view of the excavation area (view of the Tian Shan Mountains from north)



Fig.3.13 Distant view of the excavation area (full view of SH1 from south)



Fig.3.14 Full view of the excavation area of AKB-13



Fig.3.15 Overlap of the three road surfaces, MS1 (1)



Fig.3.16 Overlap of the three road surfaces, MS1 (2)



Fig.3.17 Road cross-section and MS-2 road surface



Fig.3.18 R1, A1 (stone pavement of the road surface)



Fig.3.19 Road cross-section, MS1



Fig.3.20 Road cross-section and sidewalk on the west side



Fig.3.21 Row of pits on the sidewalk



Fig.3.22 Slag-paved road surface of MS1-1



Fig.3.23 Sidewalk paved with sun-dried bricks in MS1-3



Fig.3.24 Road surface and central ditch of MS1-2



Fig.3.25 Investigation scene near MS1



Fig.3.26 Road surface and sidewalk of MS1-2 (fences set around the excavation area)



Fig.3.27 Soil accumulation between MS1-2 and MS1-1



Fig.3.28 Road surface and sidewalk of MS1-2



Fig.3.29 Slag-paved road surface of MS1-1



Fig.3.30 Clay pile from lower layer of stone mosaic in R1 (X1)



Fig.3.31 Excavation of clay pile from lower layer of stone mosaic in R1 (X1) completed



Fig.3.32 Full view of the stone pavement in R1



Fig.3.33 Full view of the stone pavement in R1 (from north)



Fig.3.34 Stone pavement surface between P14 and P27 in R1



Fig.3.35 Stone pavement surface in R1 (east side)



Fig.3.36 Stone pavement surface in R1 (west side)



Fig.3.37 Floor surface of sun-dried brick pavement in R1 (upper layer of stone pavement)



Fig.3.38 Stone pavement surface and cross-section of stone mosaic of A1 in R1 (upper layer)



Fig.3.39 Artifacts excavated from P16 in R1



Fig.3.40 P27 in R1



Fig.3.41 Scene of digging upper layer of R1



Fig.3.42 P29, P30 and surrounding area in W2 (wall)

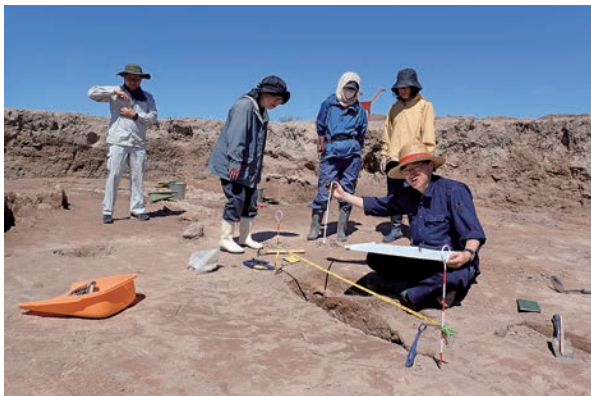


Fig.3.43 Scene of measurement in R1



Fig.3.44 P1~4, 11 in R2



Fig.3.45 Cross-section of P11 in R2



Fig.3.46 P8 in R2



Fig.3.47 P2 in R2



Fig.3.48 Investigation scene in R2 (from northeast)



Fig.3.49 R3 (from south)



Fig.3.50 R3 (overlooking)



Fig.3.51 R3 (from west)



Fig.3.52 P13 in R3



Fig.3.53 Scene of digging in R5



Fig.3.54 Earthenware excavated from R5



Fig.3.55 Cross-section of north-south belt in R4, R5 (from east)



Fig.3.56 Belt and wall surface of the excavation area in R4, R5 (from south)



Fig.3.57 Cross-section of belt in R5 (from east)



Fig.3.58 Cross-section of north-south belt in R4 (from east)



Fig.3.59 Investigation scene in R5 (from southeast)



Fig.3.60 Bakit Amanbaeva giving instructions to workers and researchers



Fig.3.61 Lunch in the yurta



Fig.3.62 Pole photographing for illustration

Tab.3.1 List of unearthed materials from AKB-13

No.	fig	Feature	Classification	Type
13-18-001	3.63	R1	Earthenware	Pot
002	3.63	R1	Earthenware	Cooking pot
003	3.63	R1-2	Earthenware	Jar
004	3.63	R1	Earthenware	Bowl
005	3.63	R1	Earthenware	Bottle
006	3.63	R1	Earthenware	Pot stand
007	3.63	R1	Earthenware	Lid
008	3.63	R1	Earthenware	Lid
009	3.63	R1	Earthenware	Lid
010	3.63	R1	Earthenware	Lid
011	3.63	R1	Earthenware	Lid
012	3.64	R1	Earthenware	Lid
013	3.64	R1	Earthenware	Lid
014	3.64	R1	Earthenware	Lid
015	3.64	Around R1 gravel surface	Clay object	Disc
016	3.64	R1	Clay object	Disc
017	3.64	R1	Clay object	Pierced disc
018	3.64	R1	Clay object	Leg
019	3.64	R1	Stone tool	Spindle base
020	3.65	R1	Copper	Coin
021	3.65	R1	Copper	Coin
022	3.65	R1	Copper	Coin
023	3.65	R1	Copper	Coin
024	3.65	R1	Shell	Cowry
025	3.65	R1	Animal bone	Chuko
026	3.65	R1 P14	Earthenware	Jar
027	3.65	R1 P14	Earthenware	Bottle
028	3.65	R1 P14	Earthenware	
029	3.65	R1 P16	Earthenware	
030	3.65	R1 P27	Earthenware	Pot
031	3.66	R2 P8	Earthenware	
032	3.66	R2 P8	Earthenware	Pot
033	3.66	R2 P8	Earthenware	
034	3.66	R2 P8	Earthenware	
035	3.66	R2 P8	Earthenware	Pot
036	3.66	R2 P8	Earthenware	Lid
037	3.66	R2 P8	Copper	Coin
038	3.66	R2 P8	Animal bone	Chuko
039	3.67	R2 P4	Earthenware	Pot
040	3.67	R2 P4	Earthenware	Lid
041	3.67	R2-2	Earthenware	Bowl
042	3.67	R2-2	Earthenware	Bottle
043	3.67	R2-2	Earthenware	Pot
044	3.68	P17	Earthenware	Pot
045	3.68	P17	Bone	Horse
046	3.68	Under R3 B2	Bone	Dice
047	3.68	R3 P12	Earthenware	Round table
048	3.68	R3 P12	Earthenware	Lid
049	3.68	R3 P12	Earthenware	Leg
050	3.69	R4	Earthenware	Pot
051	3.69	R4	Earthenware	Stand
052	3.69	R4	Earthenware	Jug
053	3.69	R4	Earthenware	Cooking pot
054	3.69	R4	Glass	Bead
055	3.69	R4	Earthenware	Jug
056	3.69	R4	Earthenware	Cup
057	3.69	R4	Earthenware	Cup
058	3.70	R4	Earthenware	Bowl
059	3.70	R4	Earthenware	Bowl
060	3.70	R4	Earthenware	Jar?
061	3.70	R4	Earthenware	Pot
062	3.70	R4	Earthenware	Cooking pot
063	3.70	R4	Earthenware	Cooking pot
064	3.70	R4	Earthenware	Lid
065	3.70	R4	Earthenware	Lid
066	3.70	R4	Earthenware	Lid
067	3.71	R4	Earthenware	Leg
068	3.71	R4	Earthenware	Leg
069	3.71	R4 Trench	Earthenware	Stand
070	3.71	R4	Copper	Ring
071	3.71	R4	Copper	
072	3.71	R5	Earthenware	Cup
073	3.71	R5	Earthenware	Cup
074	3.71	R5	Earthenware	Cup
075	3.71	R5	Earthenware	Small-sized jar
076	3.71	R5	Earthenware	Small-sized jar
077	3.71	R5	Earthenware	Jar
078	3.71	R5	Earthenware	Short-necked jar
079	3.71	R5	Earthenware	Short-necked jar
080	3.71	R5	Earthenware	Short-necked jar
081	3.71	R5	Earthenware	Short-necked jar
082	3.72	R5	Earthenware	Short-necked jar
083	3.72	R5	Earthenware	Short-necked jar
084	3.72	R5	Earthenware	Long-necked jar
085	3.72	R5	Earthenware	Long-necked jar
086	3.72	R5	Earthenware	Long-necked jar
087	3.72	R5	Earthenware	Long-necked jar
088	3.72	R5	Earthenware	Cup
089	3.73	R5	Earthenware	Bowl?
090	3.73	R5	Earthenware	Bowl
091	3.73	R5	Earthenware	Bowl
092	3.73	R5	Earthenware	Pot
093	3.73	R5	Earthenware	Bowl
094	3.73	R5	Earthenware	Pot
095	3.73	R5	Earthenware	Pot?
096	3.73	R5	Earthenware	Pot
097	3.73	R5	Earthenware	Pot?
098	3.73	R5	Earthenware	Cooking pot
099	3.73	R5	Earthenware	Cooking pot
100	3.73	R5	Earthenware	Cooking pot
101	3.74	R5	Earthenware	Cooking pot
102	3.74	R5	Earthenware	Cooking pot
103	3.74	R5	Earthenware	Cooking pot
104	3.74	R5	Earthenware	Cooking pot
105	3.74	R5	Earthenware	Cooking pot
106	3.74	R5	Earthenware	Cooking pot
107	3.74	R5	Earthenware	Cooking pot
108	3.74	R5	Earthenware	Lid
109	3.74	R5	Earthenware	Lid
110	3.74	R5	Earthenware	Lid
111	3.74	R5	Earthenware	Lid
112	3.74	R5	Earthenware	Lid
113	3.74	R5	Earthenware	Lid
114	3.74	R5	Earthenware	Lid
115	3.75	R5	Earthenware	Lid
116	3.75	R5	Earthenware	Lid
117	3.75	R5	Earthenware	Lid
118	3.75	R5	Earthenware	Lid
119	3.75	R5	Earthenware	Lid
120	3.75	R5	Earthenware	Lid
121	3.75	R5	Earthenware	Lid
122	3.75	R5	Earthenware	Lid
123	3.76	R5	Earthenware	Lid
124	3.76	R5	Earthenware	Lid
125	3.76	R5	Earthenware	Lid
126	3.76	R5	Earthenware	Lid
127	3.76	R5	Earthenware	Lid
128	3.76	R5	Earthenware	Lid
129	3.76	R5	Earthenware	Lid
130	3.76	R5	Earthenware	Lid
131	3.77	R5	Earthenware	Lid
132	3.77	R5	Earthenware	Lid
133	3.77	R5	Earthenware	Lid
134	3.77	R5	Earthenware	Lid
135	3.77	R5	Earthenware	Lid
136	3.77	R5	Earthenware	Round table
137	3.78	R5	Earthenware	Small dish
138	3.78	R5	Earthenware	Dish / Plate?
139	3.78	R5	Earthenware	Round table
140	3.78	R5	Earthenware	Stand
141	3.78	R5	Earthenware	Stand
142	3.78	R5	Earthenware	Stand
143	3.78	R5	Earthenware	Stand
144	3.79	R5	Earthenware	Leg
145	3.79	R5	Earthenware	Leg
146	3.79	R5	Earthenware	Leg
147	3.79	R5	Earthenware	Leg
148	3.79	R5	Earthenware	Jug
149	3.79	R5	Clay object	Pierced disc
150	3.79	R5	Clay object	Clay disc
151	3.79	R5	Stone tool	Grinding stone
152	3.79	R5	Clay object	Greyish burnt brick
153	3.80	R5	Copper	Coin
154	3.80	R5	Copper	Coin
155	3.80	R5	Copper	Coin
156	3.80	R5	Copper	Coin
157	3.80	R5	Copper	Coin
158	3.80	R5	Copper	Coin
159	3.80	R5	Copper	Coin
160	3.80	R5	Copper	Coin
161	3.80	R5	Glass	Bead
162	3.81	MS1 Trench	Earthenware	Jar?
163	3.81	MS1	Earthenware	Cup
164	3.81	MS1	Earthenware	Cup
165	3.81	MS1	Earthenware	Small jar
166	3.81	P26	Earthenware	Stand with a leg
167	3.81	MS1	Earthenware	Cooking pot
168	3.81	MS1	Earthenware	Cooking pot
169	3.81	MS1	Earthenware	Pot
170	3.81	MS1	Earthenware	Jar?
171	3.81	MS1	Earthenware	Lid
172	3.81	MS1 Trench	Earthenware	Lid
173	3.81	MS1-2	Stone tool	Pierced stone artifact
174	3.81	MS1	Stone tool	Hammer stone
175	3.82	MS1	Clay object	Pierced disc
176	3.82	MS1	Copper	Ring (Same as 177)
177	3.82	MS1	Copper	Ring
178	3.82	Directly above MS1-1	Copper	Unknown
179	3.82	MS1	Glass	Bead
180	3.82	P30	Earthenware	Cup
181	3.82	R5?	Copper	Coin
182	3.82	Surface collected	Copper	Coin
183	3.82	Surface collected	Earthenware	Round table

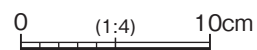
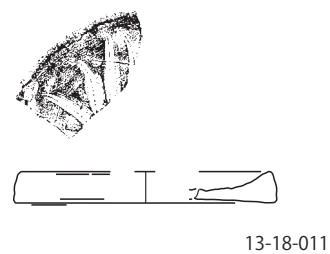
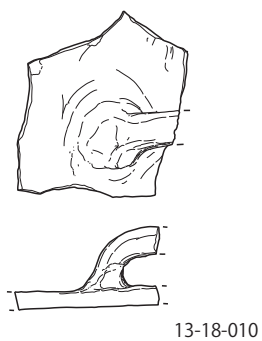
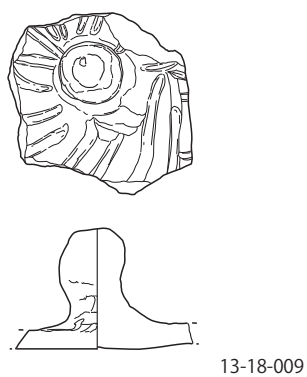
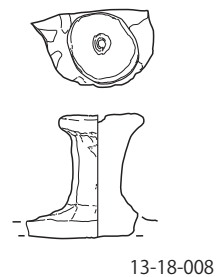
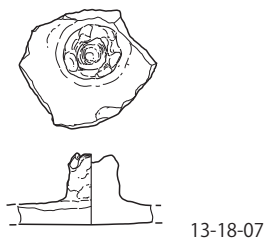
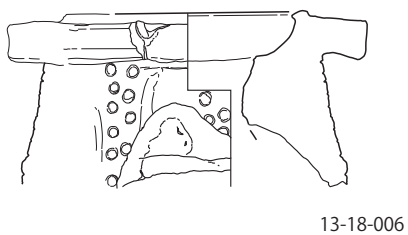
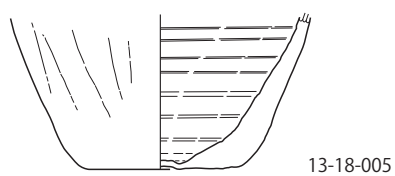
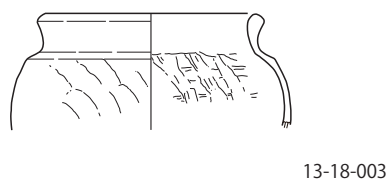
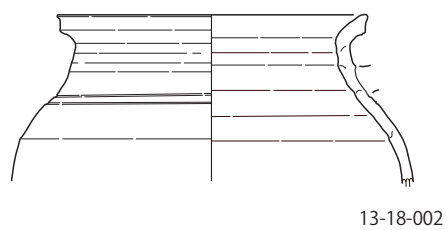
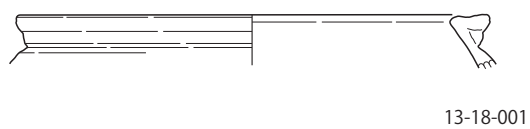


Fig.3.63 Artifacts from AKB-13(1) R1 (13-13-001 – 011)

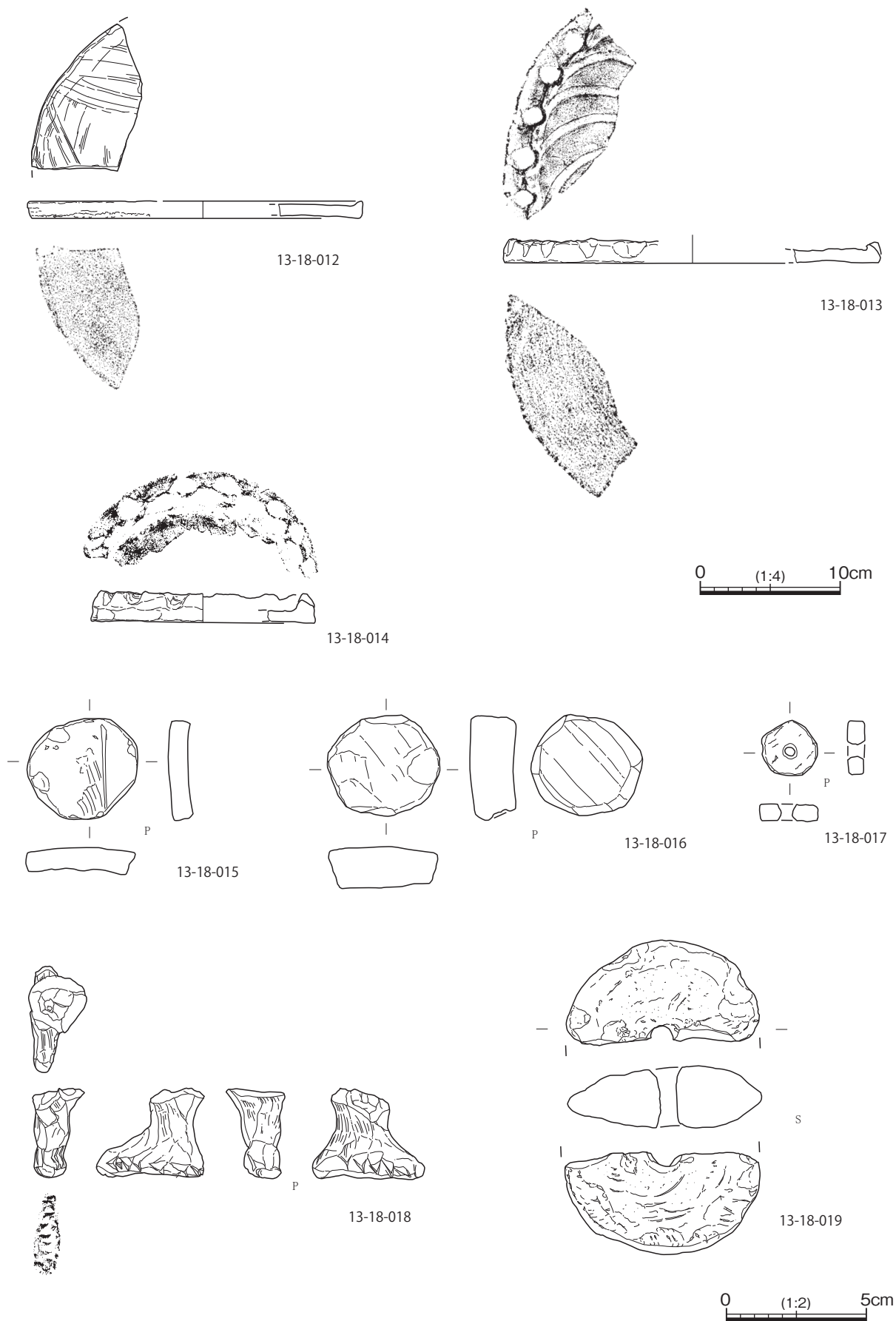


Fig.3.64 Artifacts from AKB-13(2) R1 (13-18-012 – 015)

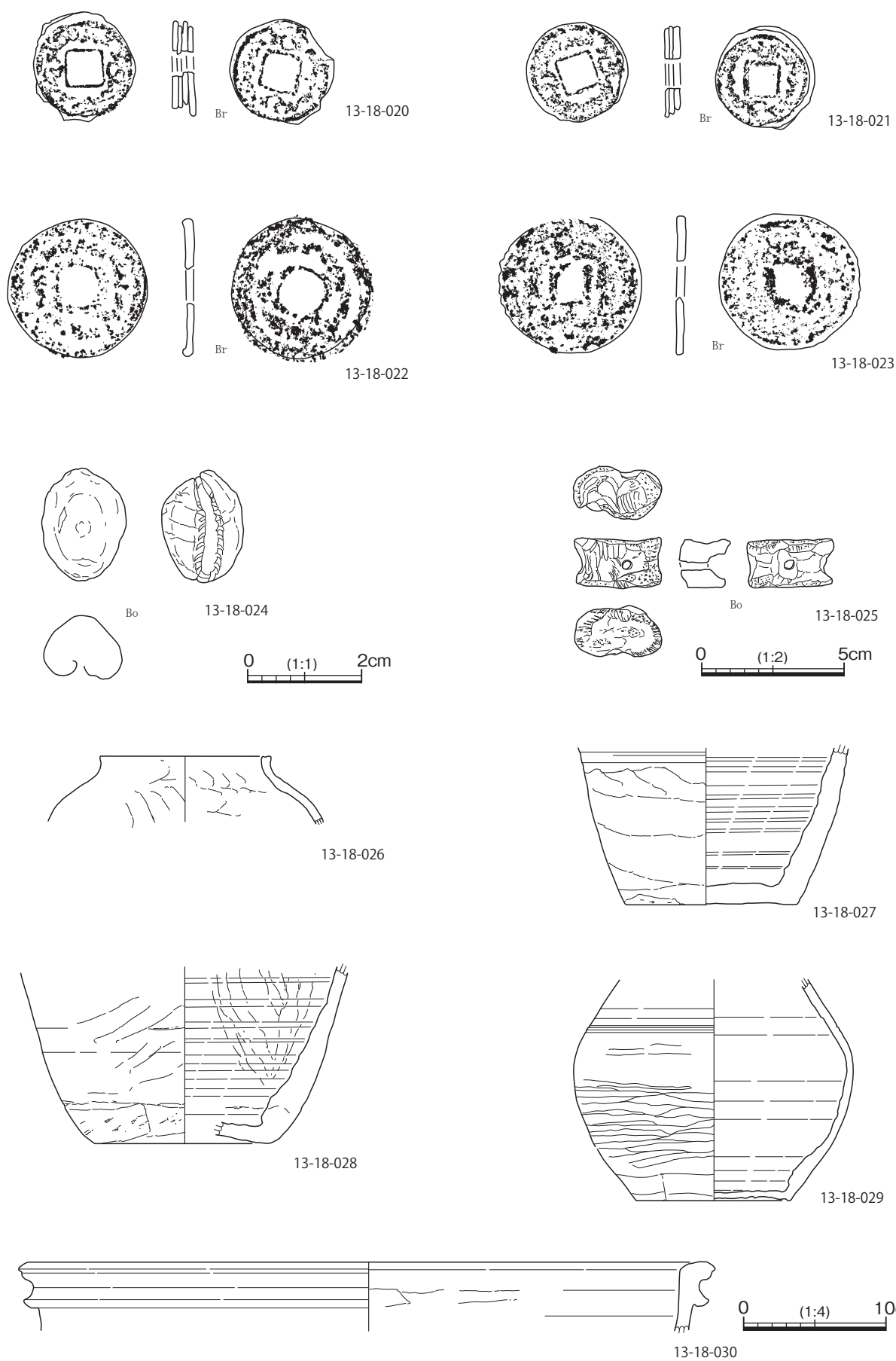


Fig.3.65 Artifacts from AKB-13(3) R1 (13-18-020 – 025), R1 P14 (13-18-028), R1 P16 (13-18-029), R1 P27 (13-18-030)

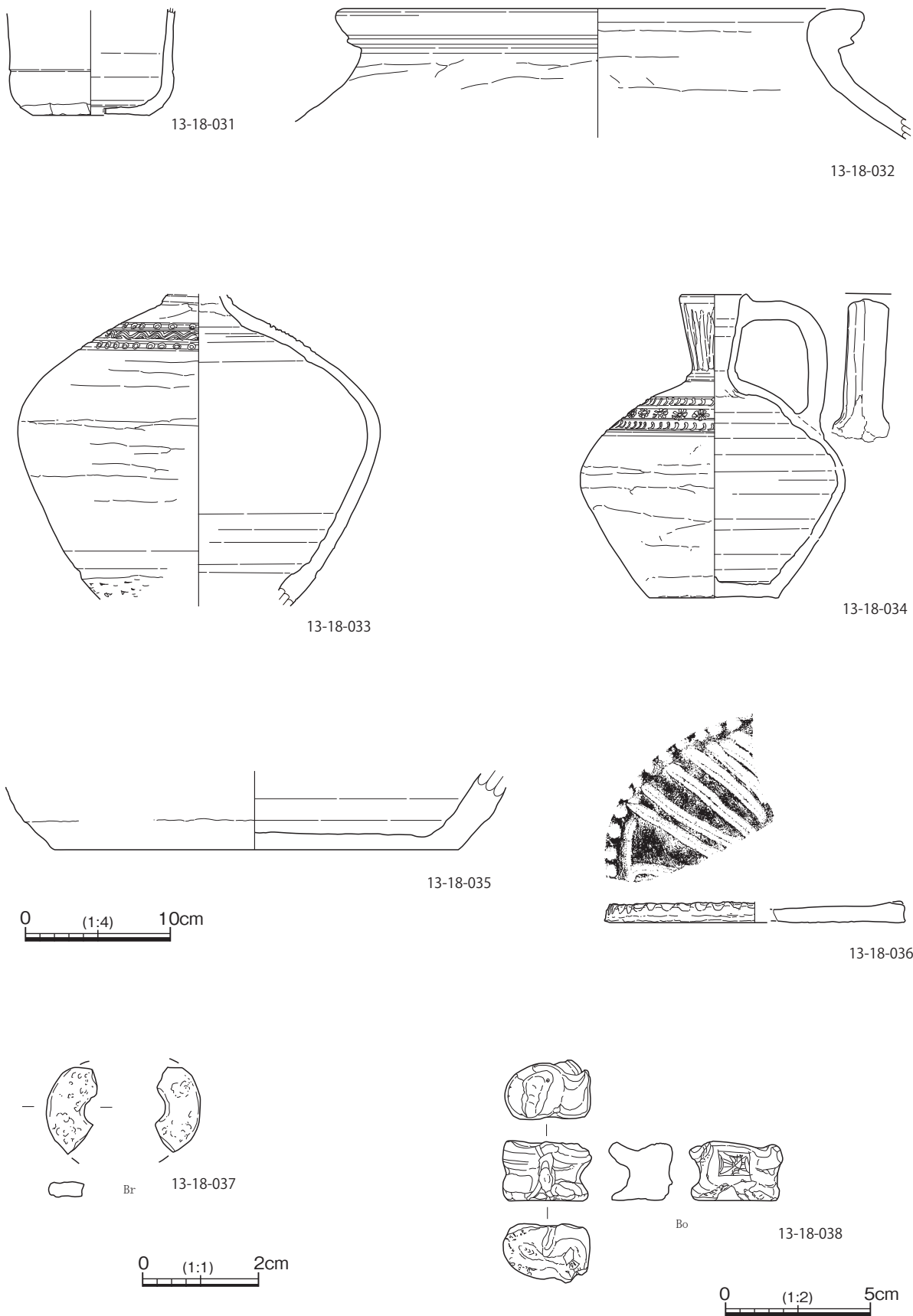
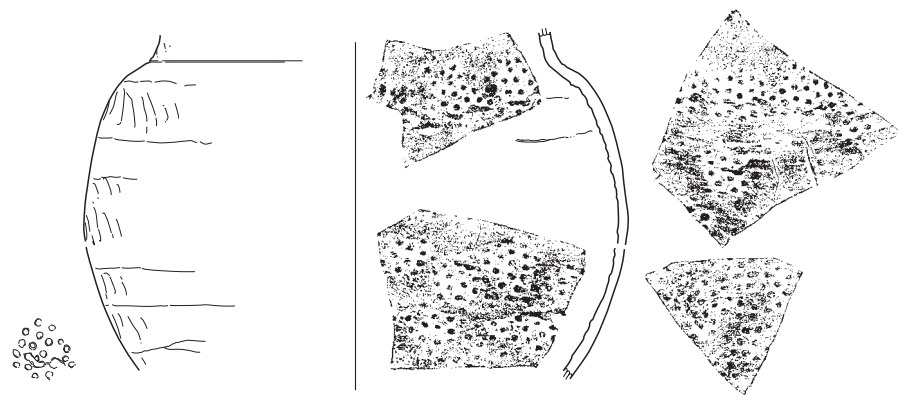


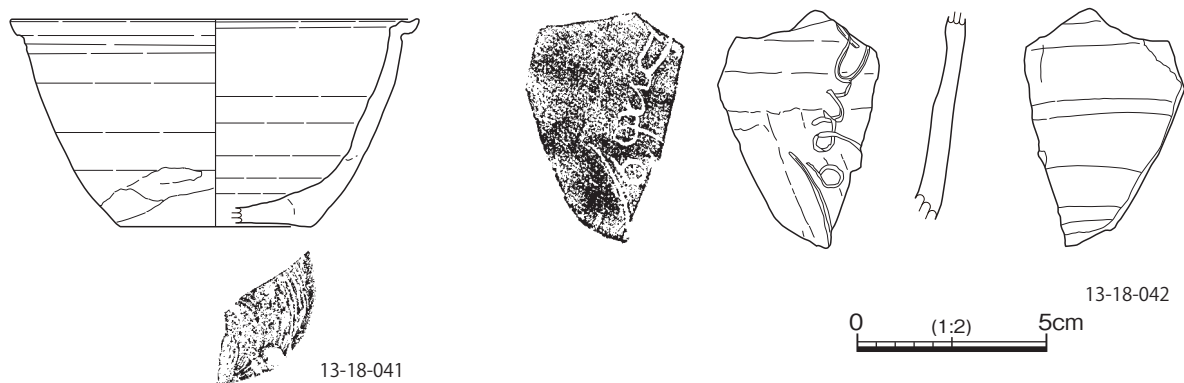
Fig.3.66 Artifacts from AKB-13(4) P8 (13-18-031 – 038)



13-18-039



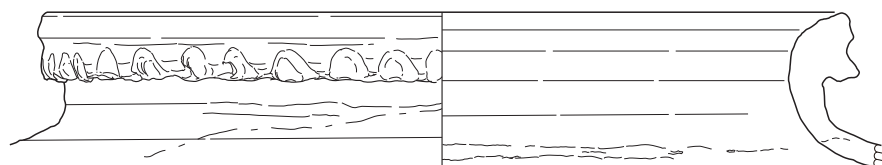
13-18-040



13-18-042

13-18-041

0 (1:2) 5cm



13-18-043

0 (1:4) 10cm

Fig.3.67 Artifacts from AKB-13(5) R2 P4 (13-18-039, 040), R2-2 (13-18-041 – 043)

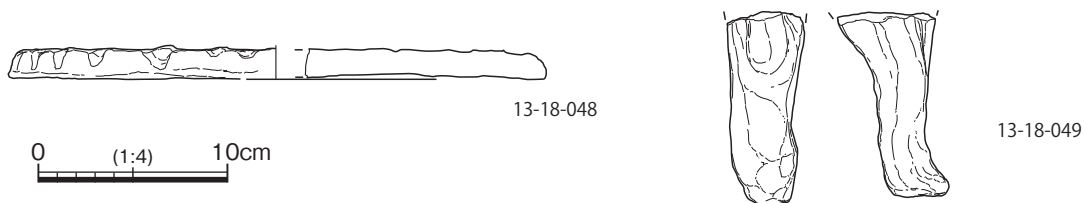
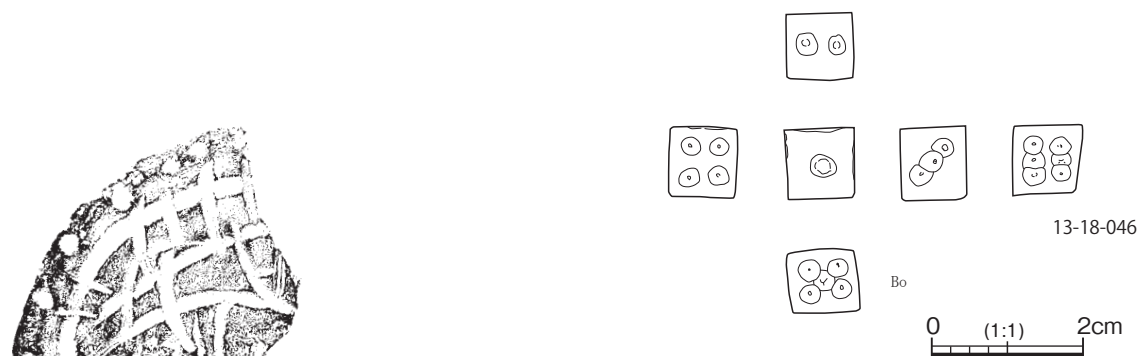
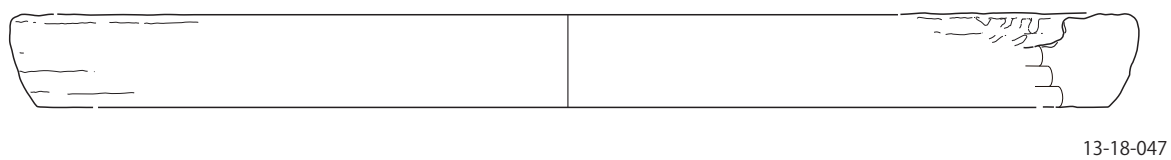
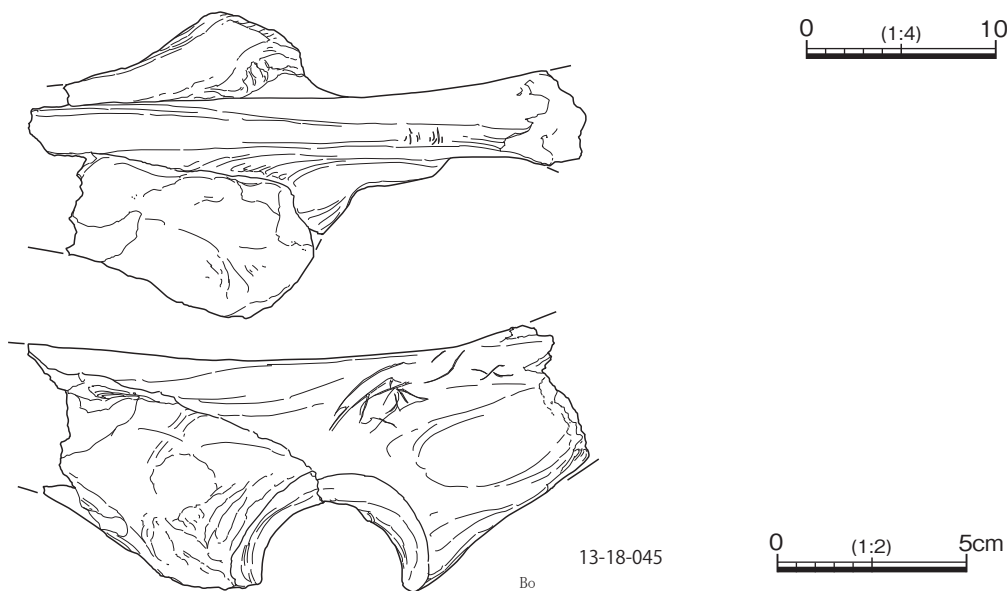
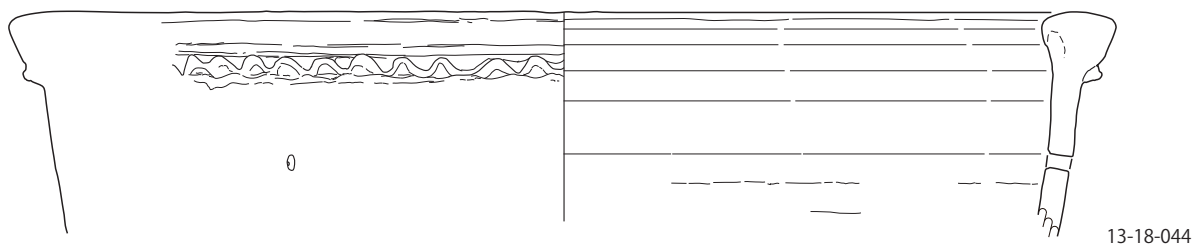


Fig.3.68 Artifacts from AKB-13(6) P17 (13-18-044, 045), R3 B2 (13-18-046), R3 P12 (13-18-047 – 049)

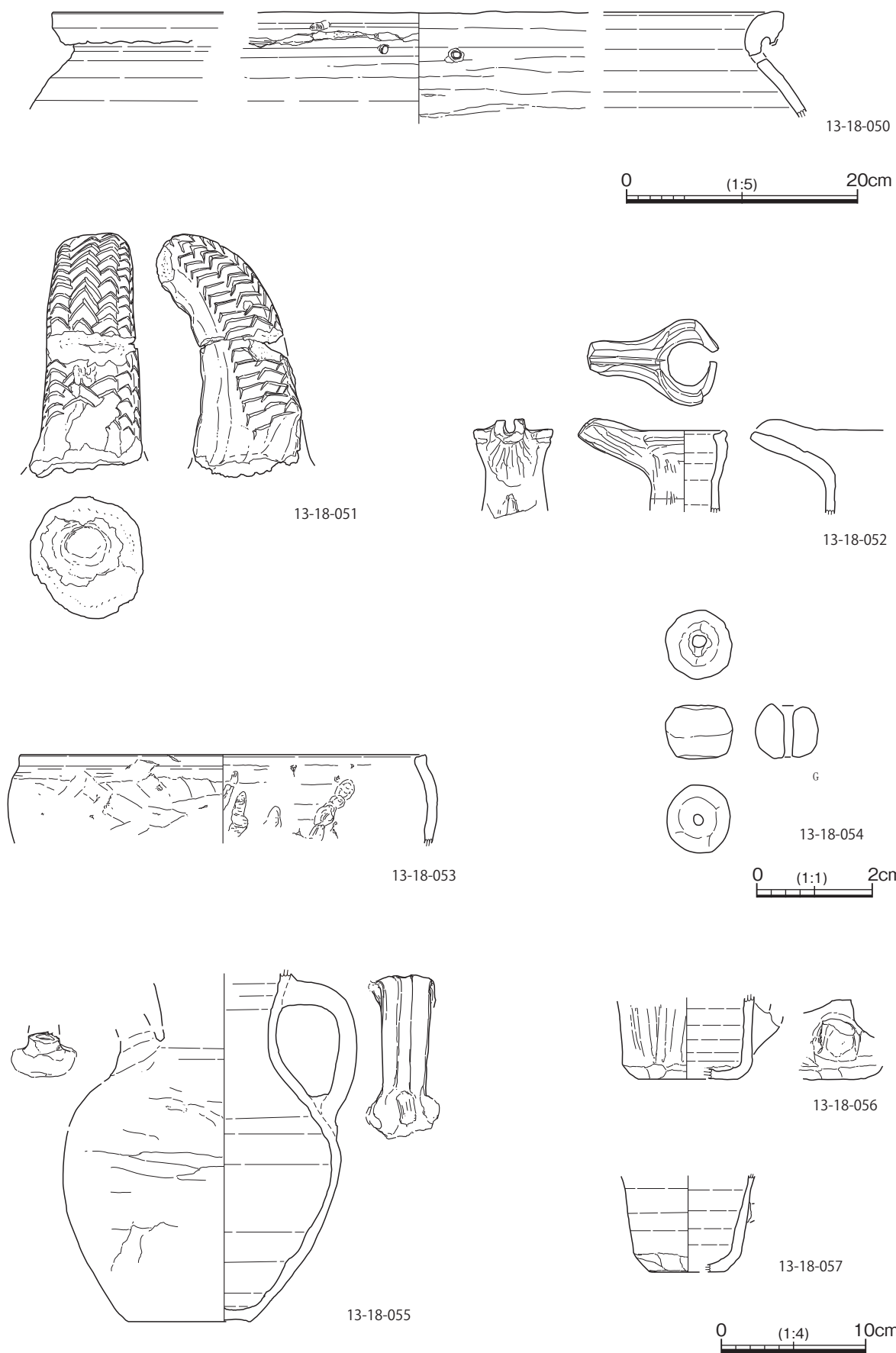
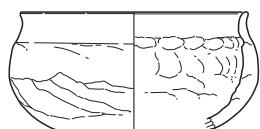
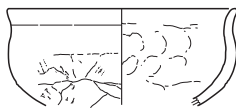


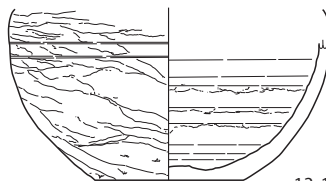
Fig.3.69 Artifacts from AKB-13(7) R4 (13-18-050 – 057)



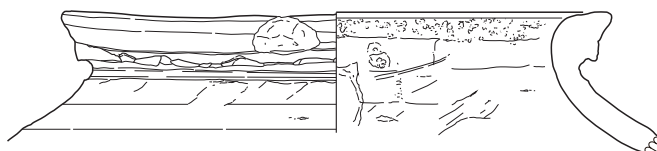
13-18-058



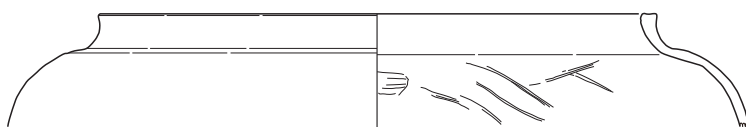
13-18-059



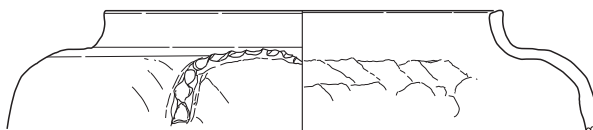
13-18-060



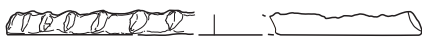
13-18-061



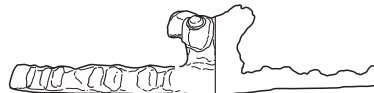
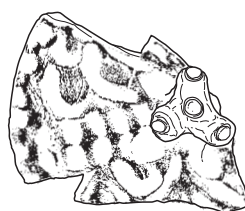
13-18-062



13-18-063



13-18-064



13-18-065



13-18-066

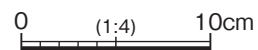


Fig.3.70 Artifacts from AKB-13(8) R4 (13-18-058 – 066)

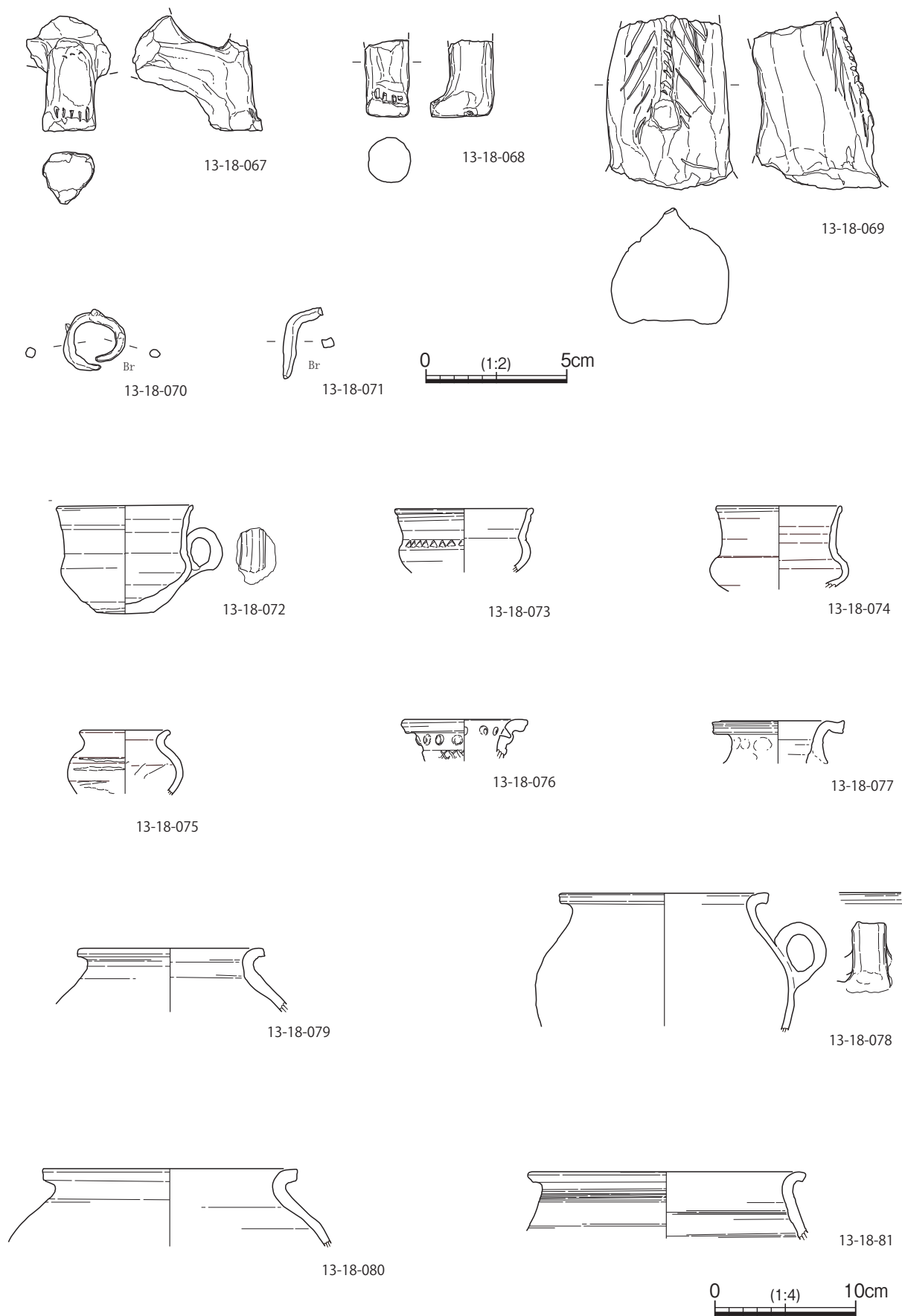
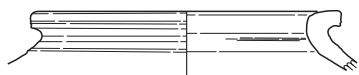
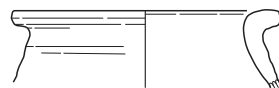


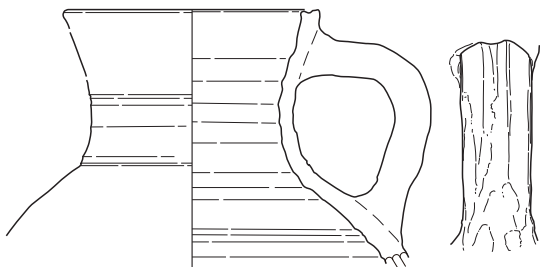
Fig.3.71 Artifacts from AKB-13(9) R4 (13-18-067 – 071), R5 (13-18-072 – 081)



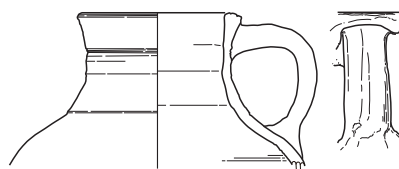
13-18-082



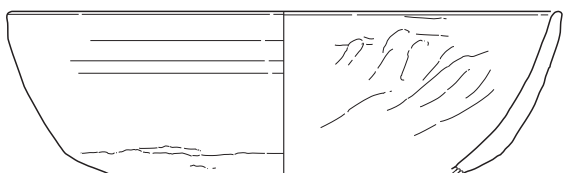
13-18-083



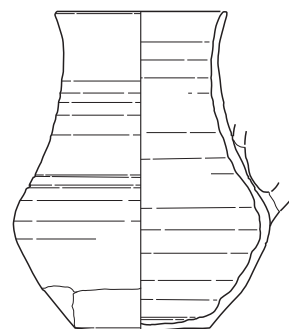
13-18-084



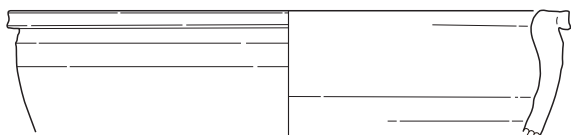
13-18-085



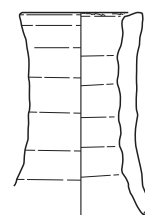
13-18-089



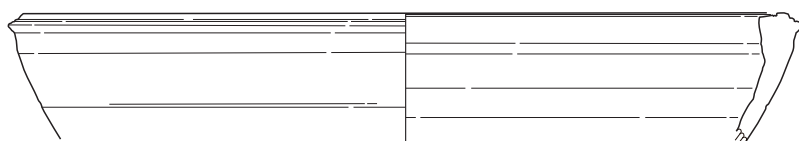
13-18-086



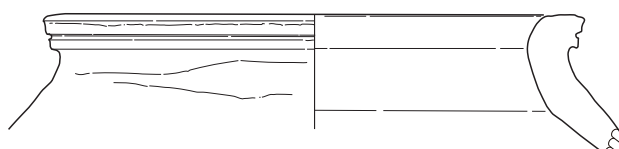
13-18-090



13-18-087



13-18-091



13-18-092



13-18-088

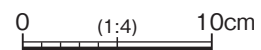
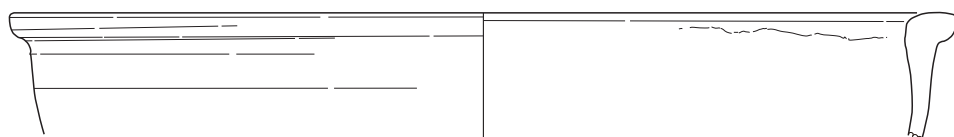
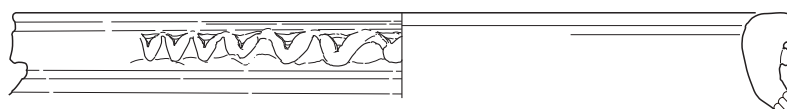


Fig.3.72 Artifacts from AKB-13(10) R5 (13-18-082 – 088)



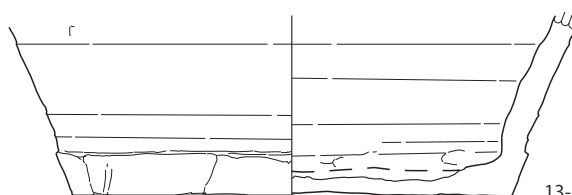
13-18-093



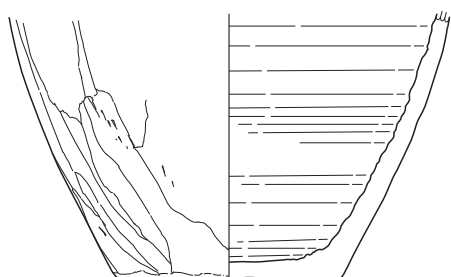
13-18-094



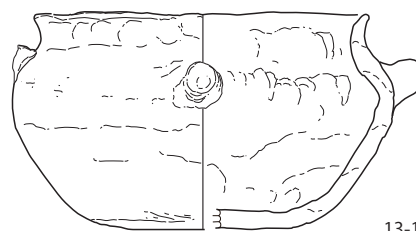
13-18-095



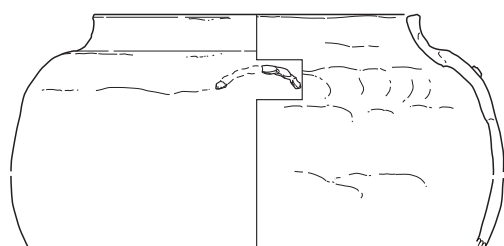
13-18-096



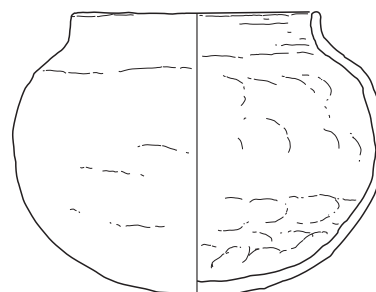
13-18-097



13-18-098



13-18-099



13-18-100

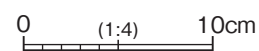


Fig.3.73 Artifacts from AKB-13(11) R5 (13-18-089 – 100)

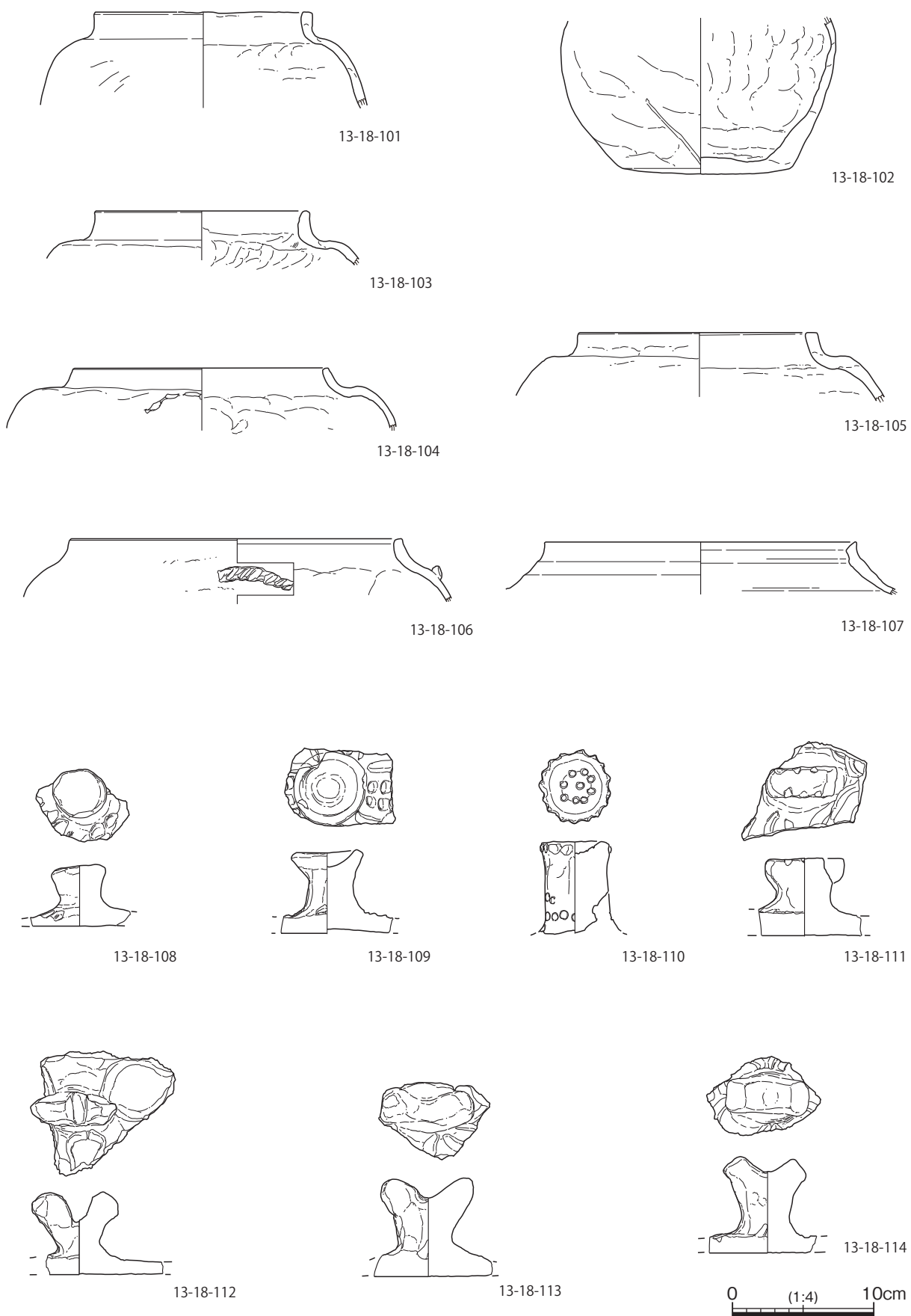


Fig.3.74 Artifacts from AKB-13(12) R5 (13-18-101 – 114)

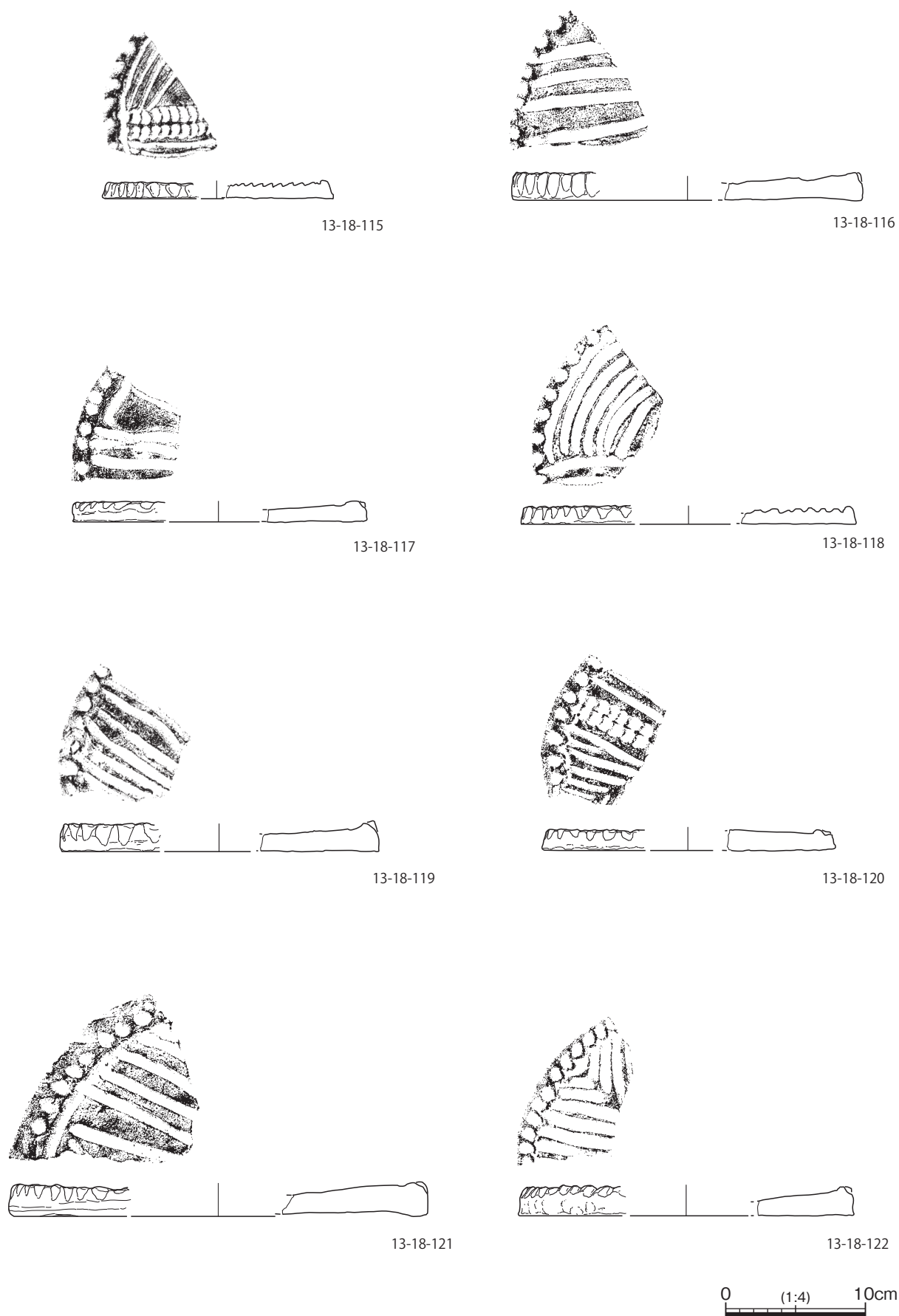
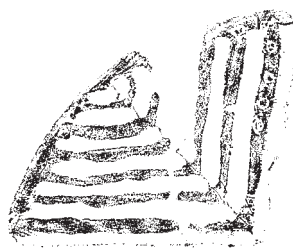


Fig.3.75 Artifacts from AKB-13(13) R5 (13-18-115 – 122)



13-18-123



13-18-124



13-18-125



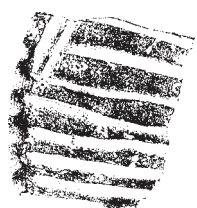
13-18-126



13-18-127



13-18-128



13-18-129



13-18-130

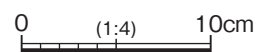
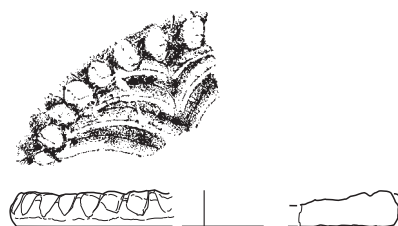


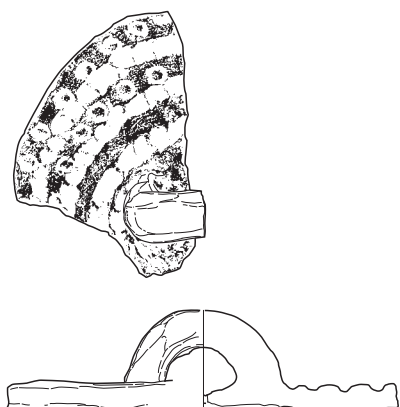
Fig.3.76 Artifacts from AKB-13(14) R5 (13-18-123 – 130)



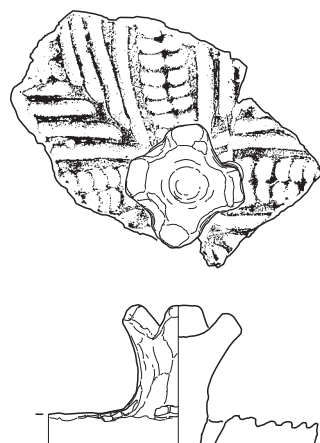
13-18-131



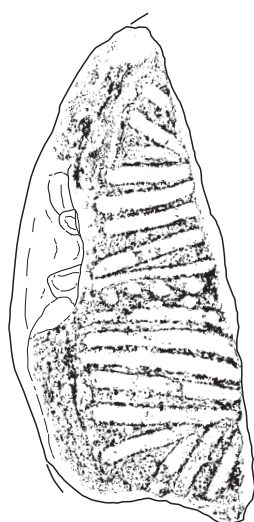
13-18-132



13-18-133



13-18-134



13-18-135



13-18-136



0 (1:4) 10cm

Fig.3.77 Artifacts from AKB-13(15) R5 (13-18-131 – 136)

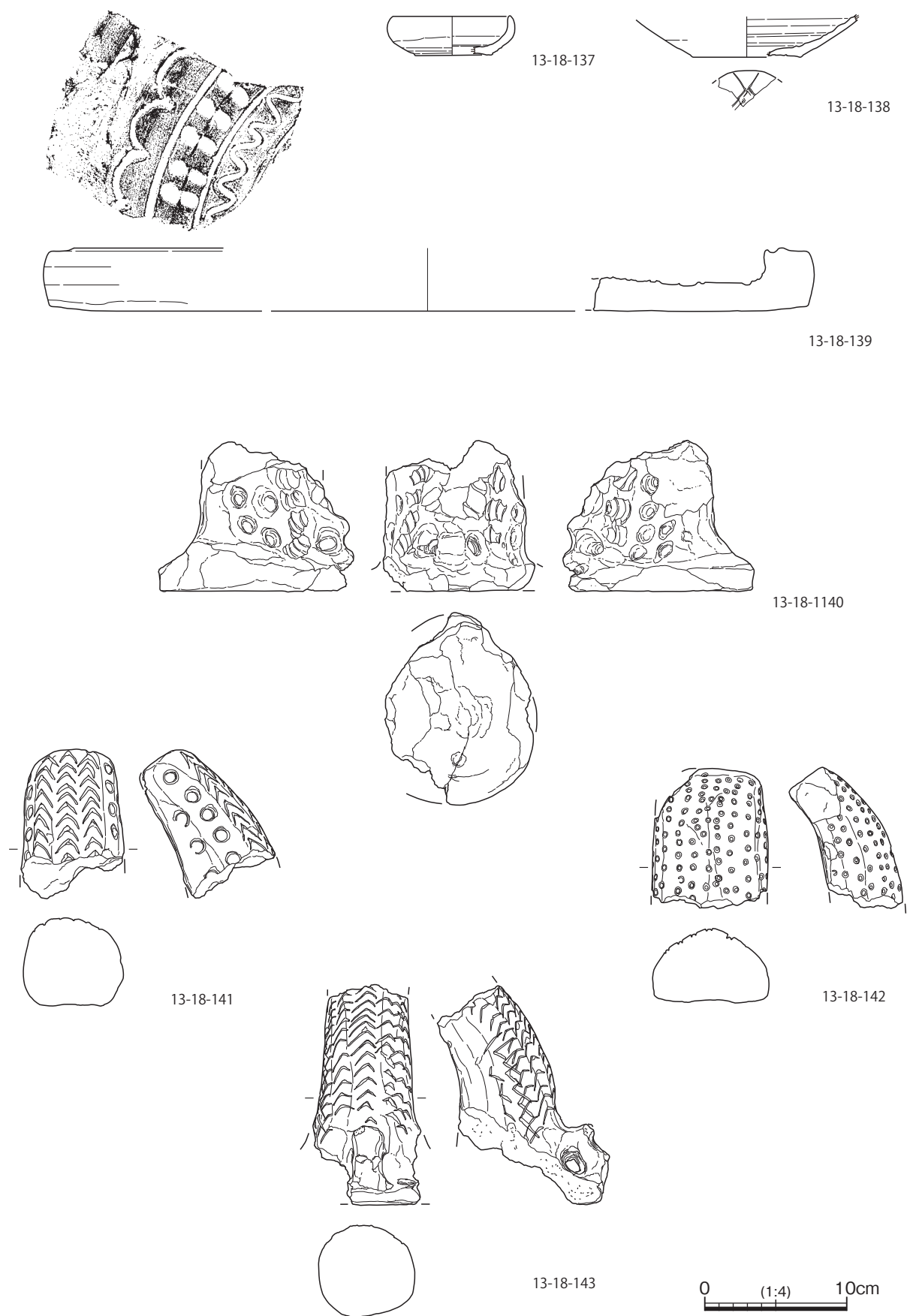


Fig.3.78 Artifacts from AKB-13(16) R5 (13-18-137 – 143)

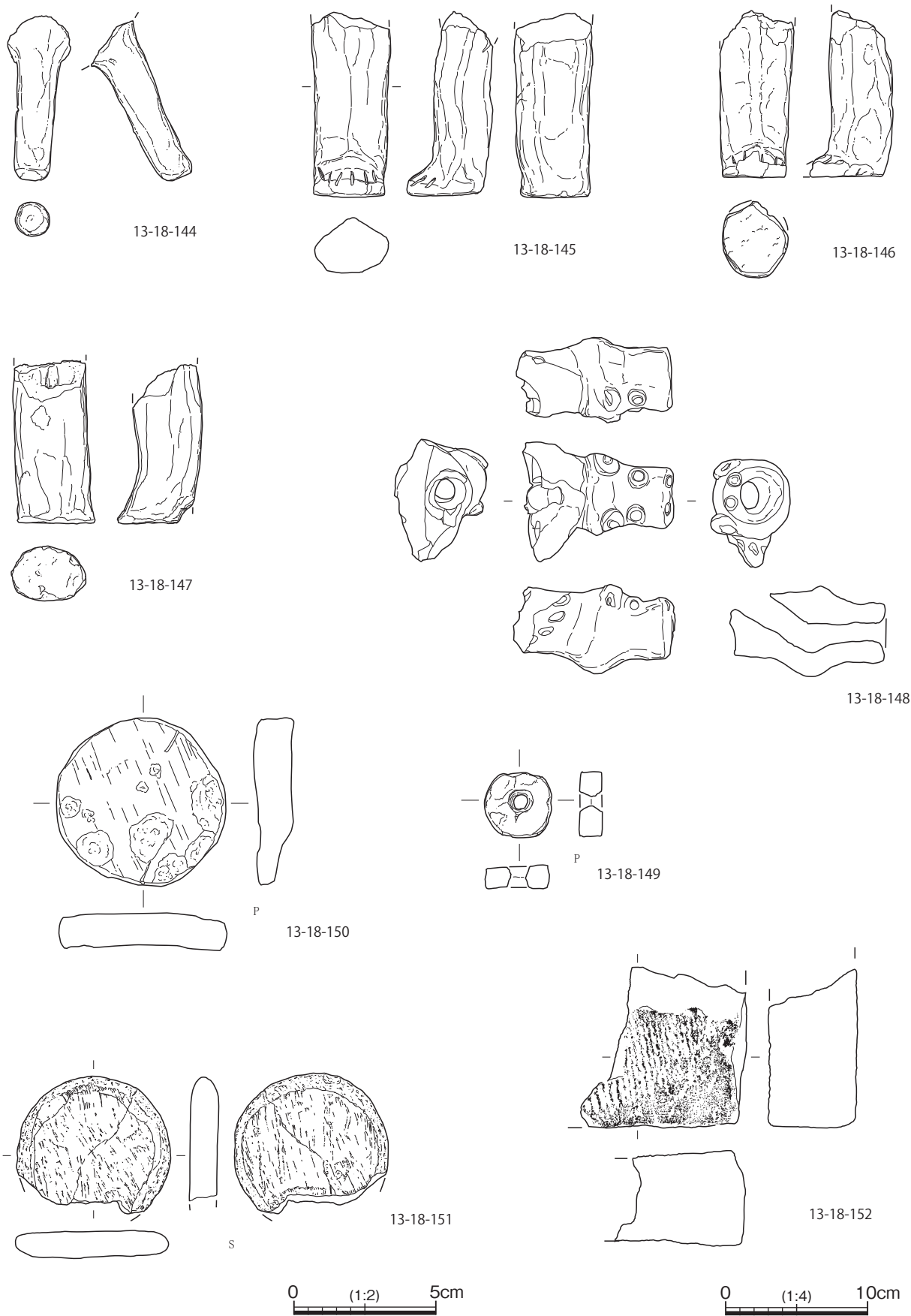
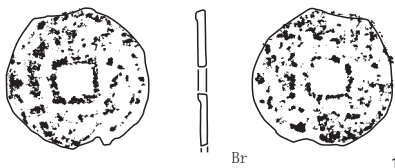
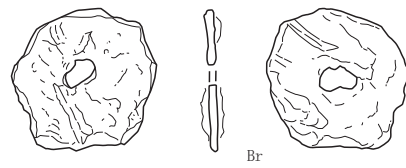


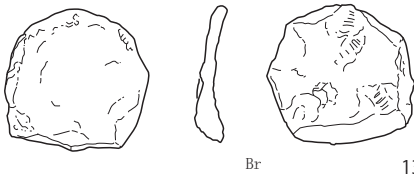
Fig.3.79 Artifacts from AKB-13(17) R5 (13-18-144 – 152)



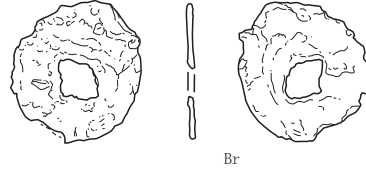
13-18-153



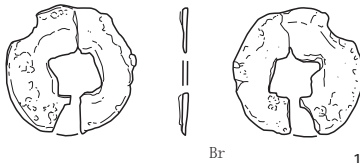
13-18-154



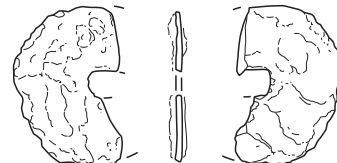
13-18-155



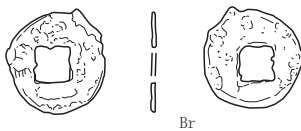
13-18-156



13-18-157



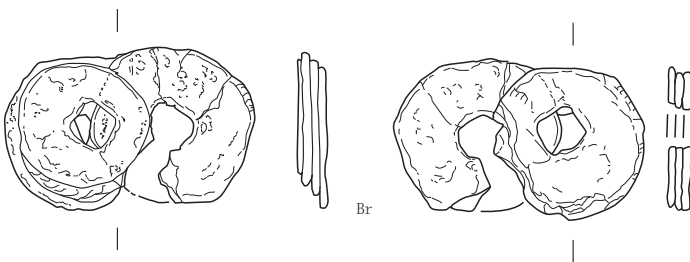
13-18-158



13-18-159



13-18-161



13-18-160

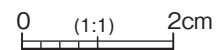


Fig.3.80 Artifacts from AKB-13(18) R5 (13-18-153 – 161)

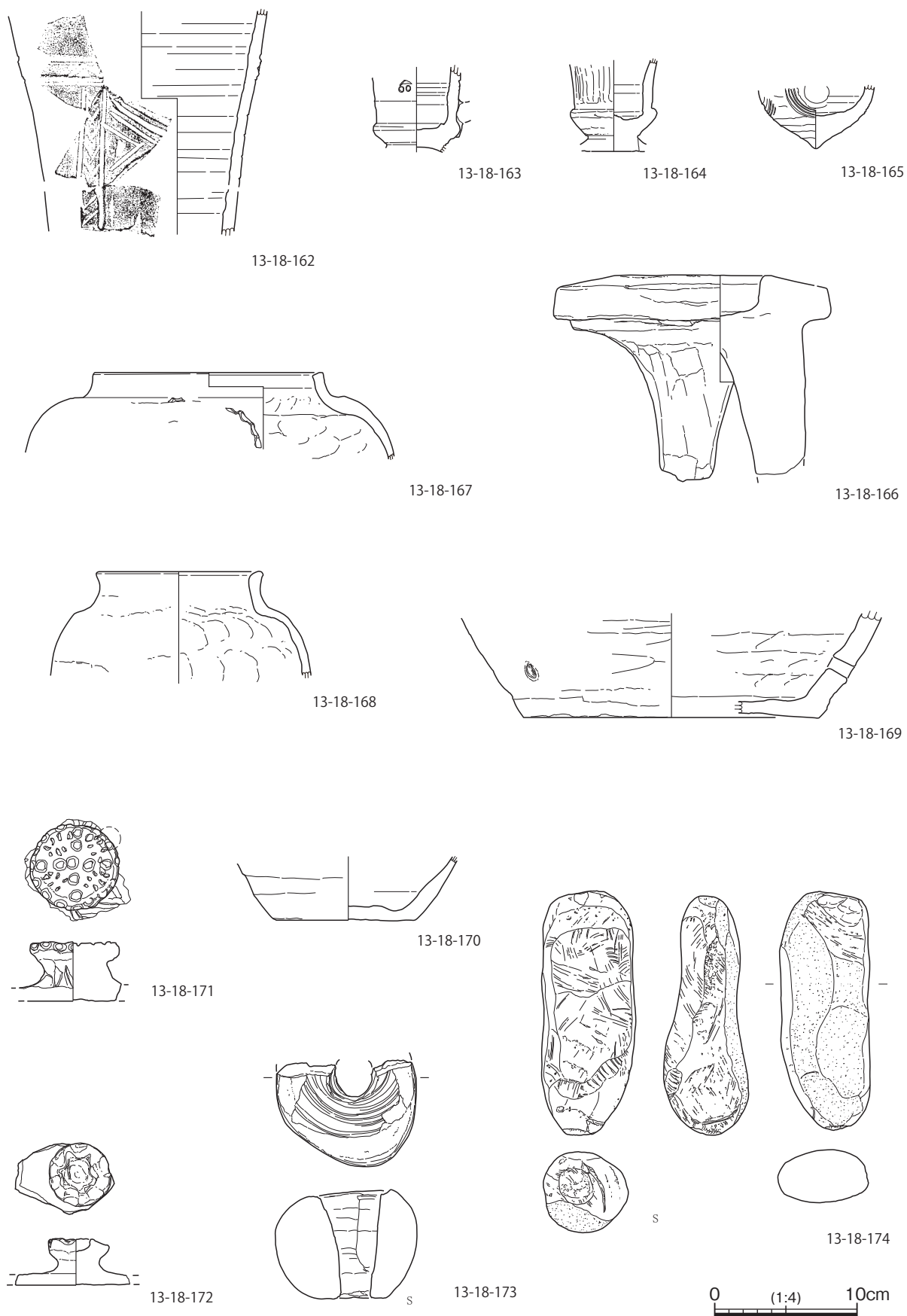


Fig.3.81 Artifacts from AKB-13(19) MS1 (13-18-162 – 174)

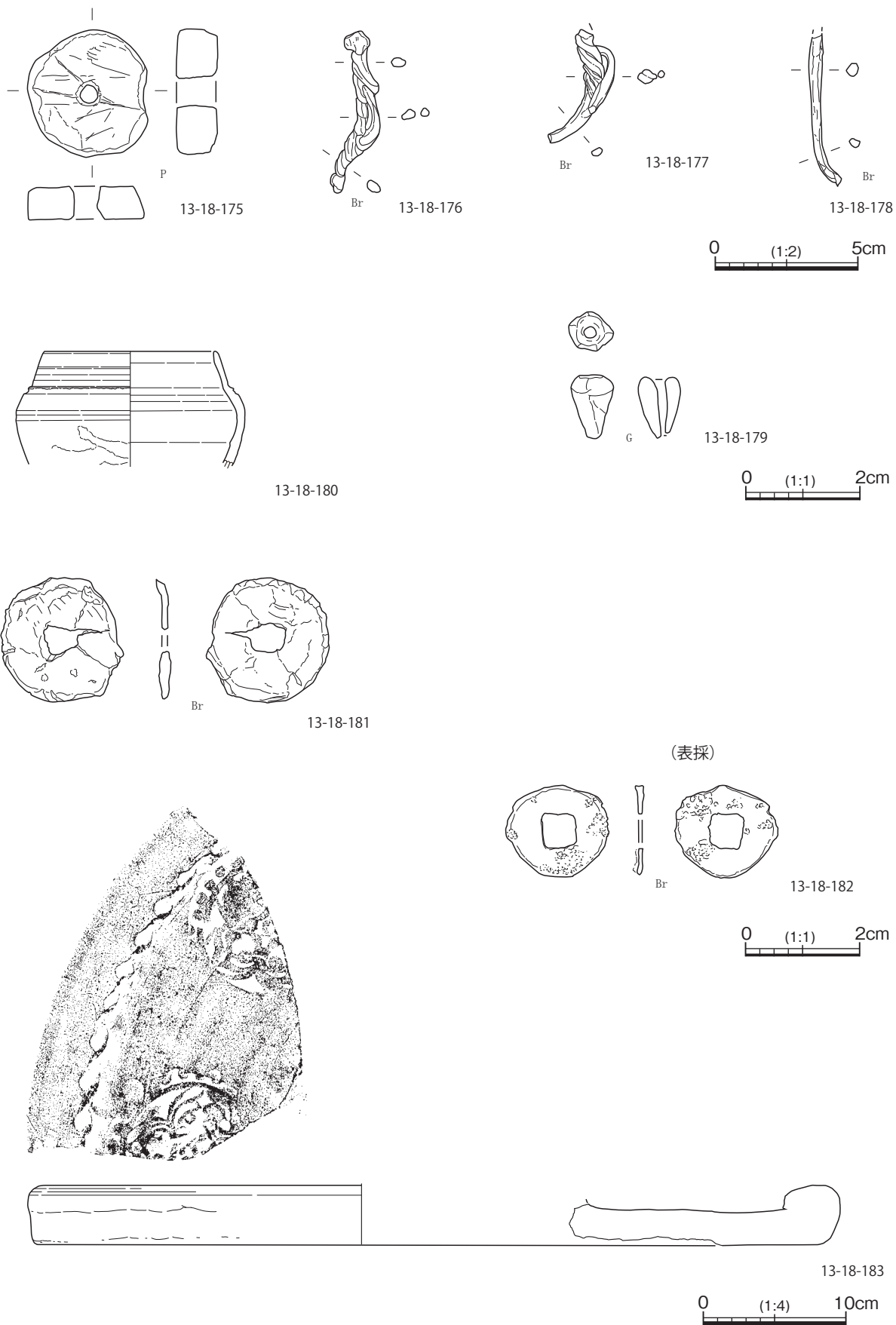


Fig.3.82 Artifacts from AKB-13(20) MS1 (13-18-175 – 179), P30 (13-18-180), R5? (13-18-181), surface collection (13-18-182, 183)



Fig.3.83 Artifacts from AKB-13(1) R1 (13-13-001 – 011)



13-18-012



13-18-013



13-18-014



13-18-015



13-18-016



13-18-017



13-18-018



13-18-019

Fig.3.84 Artifacts from AKB-13(2) R1 (13-13-012 – 019)



Fig.3.85 Artifacts from AKB-13(3) R1 (13-18-020 – 025), R1 P14 (13-18-026 – 028), R1 P16 (13-18-029), R1 P27 (13-18-030)



Fig.3.86 Artifacts from AKB-13(4) R2 P8 (13-18-031 – 038)



Fig.3.87 Artifacts from AKB-13(5) R2 P4 (13-18-039, 040), R2-2 (13-18-041 – 043)



Fig.3.88 Artifacts from AKB-13(6) R3 P17 (13-18-044, 045), below R3 B2 (13-18-046), R3 P12 (13-18-047 – 049)



Fig.3.89 Artifacts from AKB-13(7) R4 (13-18-050 – 057)



Fig.3.90 Artifacts from AKB-13(8) R4 (13-18-058 – 066)



Fig.3.91 Artifacts from AKB-13(9) R4 (13-18-067 – 071), R5 (13-18-072 – 081)



Fig.3.92 Artifacts from AKB-13(10) R5 (13-18-082 – 091)



Fig.3.93 Artifacts from AKB-13(11) R5 (13-18-092 – 100)



Fig.3.94 Artifacts from AKB-13(12) R5 (13-18-101 – 114)



Fig.3.95 Artifacts from AKB-13(13) R5 (13-18-115 – 125)



Fig.3.96 Artifacts from AKB-13(14) R5 (13-18-126 – 136)



Fig.3.97 Artifacts from AKB-13(15) R5 (13-18-137 – 145)



Fig.3.98 Artifacts from AKB-13(16) R5 (13-18-146 – 161)



Fig.3.99 Artifacts from AKB-13(17) MS1 (13-18-162 – 174)



Fig.3.100 Artifacts from AKB-13(18) MS1 (13-18-175 – 179), P30 (13-18-180), R5? (13-18-181), surface collection (13-18-182, 183)

Tab.3.2 Observation sheet of earthenware from AKB-13

Fig.	No.	Context	Feature	Classification	Vessel type	Rim ϕ /Bottom ϕ /Height	Fabric	Color (Exterior)	Color (Interior)	Notes
3.63	13-18-001	22	R1	Earthenware	Pot	(24.8)/-/-	Refined, no inclusions, good firing	Pale orange	Dull orange	
3.63	002	87	R1	Earthenware	Jar	(16.4)/-/-	Fairly large amount of feldspar etc., good firing	Light yellow	Orange	
3.63	003	69	R1-2	Earthenware	Cooking pot	(11.1)/-/-	Contains fairly large amount of black and white particles, good firing	Dull orange	Dull orange	
3.63	004	90	R1	Earthenware	Bowl	-(10.8)/-	Contains large amount of black particles etc., good firing	Orange	Orange	Bottom edge : attach clay and make alternating indentations
3.63	005	97	R1	Earthenware	Jar	-/8.6/-	Good firing	Dull orange	Orange	Exterior : scraped
3.63	006	28	R1	Earthenware	Dish with legs	(12.0)/-/-	Good firing	Light gray	Light reddish gray	Handle : flaking, sooted
3.63	007	44	R1	Earthenware	Lid	-/(3.7)	Large amount of feldspar etc., good firing	Light yellow orange	Grayish red	
3.63	008	92	R1	Earthenware	Lid	-/(6.4)	Large amount of feldspar etc., good firing	Dull orange	Dull orange	
3.63	009	44	R1	Earthenware	Lid	-/(6.3)	Large amount of feldspar etc., good firing	Dull orange	Dull orange	
3.63	010	93	R1	Earthenware	Lid	-/(Present Height 4.0)	Large amount of feldspar etc., good firing	Light yellow	Grayish red	
3.64	011	22	R1	Earthenware	Lid	(13.1)/(13.8)/(1.6)	Contains feldspar etc., good firing	Dull yellow orange	Dull reddish brown	
3.64	012	34	R1	Earthenware	Lid	(23.8)/(23.3)/(1.2)	Large amount of feldspar etc., good firing	Bright reddish brown	Dull orange	
3.64	013	28	R1	Earthenware	Lid	(25.9)/(26.6)/(1.0)	Contains large amount of feldspar etc., good firing	Dull orange	Grayish yellow brown	
3.64	014	22	R1	Earthenware	Lid	(14.6)/(16.1)/(2.0)	Large amount of feldspar etc., good firing	Orange	Dull orange	
3.65	018	120	R1	Clay object	Lid or Leg		Refined, contains white particles etc., good firing	Dull orange (white coating)	Orange	
3.65	026	56	R1P14	Earthenware	Jar	(12.0)/-/-	Refined, no inclusions, good firing	Dull orange	Orange	
3.65	027	56	R1P14	Earthenware	Jar	-/13/-	Contains large amount of black and white particles, almost refined	Dull orange	Orange	Vertically and horizontally : scraped with spatula
3.65	028	56	R1P14	Earthenware	Jar		Comparatively refined, contains white particles etc., good firing	Pale reddish orange	Orange	Interior and exterior : white coating
3.65	029	63	R1P16	Earthenware	Jar		Small amount of white and gold particles, sand, good firing	Orange	Orange	Exterior : polished
3.65	030	118	R1P27	Earthenware	Pot	(47.6)/-/-	Comparatively refined, contains small amount of white particles, good firing	Orange	Orange	
3.66	031	5	R2P8	Earthenware	Cup		Dense, refined, almost no sand, good firing	Light gray	Dull orange	
3.66	032	17	R2P8	Earthenware	Pot	(36.2)/-/-	Large amount of white and black particles etc., good firing	Light gray	Dull orange	White coating
3.66	033	4	R2P8	Earthenware	Narrow-mouthed jar		Contains small amount of sand, good firing	Orange - Light brownish gray	Orange	White coating
3.66	034	4	R2P8	Earthenware	Narrow-mouthed jar	4.5/8.9/21.0	Contains feldspar etc., good firing	Light gray	Orange	White coating
3.66	035	4	R2P8	Earthenware	Pot	-/28.2/-	Contains large amount of feldspar, small gravel, etc., good firing	Light gray 5YR8/1	Orange	White coating
3.66	036	176	R2P8	Earthenware	Lid		Fairly large amount of sand, good firing	Light gray	Light gray	Interior : sandy, scorched
3.67	039	20	R2P4	Earthenware	Pot		No sand, dense	Light brownish gray	Light brownish gray	Interior : pattern of oval particles
3.67	040	-	R2P4	Earthenware	Lid		Fairly large amount of brown particles, sand, etc., good firing	Orange	Orange	
3.67	041	57	R2-2	Earthenware	Bowl	(21.6)/(10.1)/(11.0)	Contains feldspar, small gravel, etc., good firing	Light gray	Dull reddish brown	
3.67	042	57	R2-2	Earthenware	Jar		Contains small amount of white particles, good firing	Orange	Orange	Exterior : inscription of Sogdian
3.67	043	57	R2-2	Earthenware	Pot	(42.4)/-/-	Contains large amount of sand, small gravel, good firing	Dull yellow orange	Orange	White coating
3.68	044	86	P17	Earthenware	Bowl		Dense, contains small amount of white particles, small gravel, good firing	Dull orange	Dull orange	Perforation
3.68	047	29	R3P12	Earthenware	Round table		Small amount of sand, good firing	Bright reddish brown	Bright reddish brown	White coating
3.68	048	29	R3P12	Earthenware	Lid		Large amount of feldspar, etc., good firing	Dull orange	Orange	Sooted especially prominent
3.68	049	29	R3P12	Earthenware	Leg		Contains feldspar, etc., good firing	Light gray	Light brownish gray	Accretion of ash entirely
3.69	050	187	R4	Earthenware	Pot	(75.2)/-/-	Refined, white particles, good firing	Light gray	Light gray	Contains white particles

Fig.	No.	Context	Feature	Classification	Vessel type	Rimφ/Bottom φ/Height	Fabric	Color (Exterior)	Color (Interior)	Notes
3.69	051	139	R4	Earthenware	Leg		Fairly large amount of sand (feldspar/quartz etc.), good firing	Dull orange		sooted
3.69	052	139	R4	Earthenware	Long-necked jar		Refined, good firing	Dull yellow orange	Orange	Exterior : accretion of ash
3.69	053	123	R4	Earthenware	Cooking pot	(28.0)/-/-	Coarse, contains large amount of white particles, small gravel	Orange	Orange	Vessel surface : change of color by heating
3.69	055	124	R4	Earthenware	Long-necked jar	-/8.5/-	Small amount of sand, good firing	Light yellow	Light yellow	Bottom : sandy
3.69	056	135	R4	Earthenware	Cup	-(7.0)/-	Refined, good firing	Orange	Orange	Bottom : scraped with spatula
3.69	057	135	R4	Earthenware	Cup	/(5.0)/-	Refined, good firing	Orange	Dull orange	Bottom : perforation (artificially from inside)
3.70	058	135	R4	Earthenware	Bowl	(15.0)/-/-	Contains large amount of white and black particles, good firing	Dull orange	Orange	Vertically and horizontally : smoothed, impression of molding by rolling up clay
3.70	059	135	R4	Earthenware	Bowl	(15.0)/-/-	Contains feldspar, white particles, slightly soft	Dull yellow orange	Orange	White coating? Horizontally smoothed, scraped with spatula
3.70	060	132	R4	Earthenware	Bottle	-/8.0/-	Refined, contains small amount of small gravel, good firing	Light gray	Orange	Horizontally and obliquely : polished, white coating
3.70	061	105	R4	Earthenware	Jar	(29.0)/-/-	Contains white and black particles, small gravel, good firing	Dull orange	Dull orange	
3.70	062	123	R4	Earthenware	Cooking pot	(29.5)/-/-	Coarse, contains white particles, small gravel, phlogopite, good firing	Dull orange	Orange	
3.70	063	157	R4	Earthenware	Cooking pot	(21.0)/-/-	Coarse, contains white particles, small gravel, good firing	Dull yellow orange	Orange	Interior and exterior : sooted
3.70	064	123	R4	Earthenware	Lid	(22.0)/-/-	Contains red particles, small gravel, etc., good firing	Dull orange	Light brownish gray	White coating
3.70	065	123	R4	Earthenware	Lid	(21.0)/-/-	Comparatively refined, good firing	Dull orange	Dull orange	Belt-shaped sooted
3.70	066	187	R4	Earthenware	Lid	(25.0)/-/-	Slightly coarse, contains white particles, small gravel, etc., good firing	Light yellow orange	Dull orange	Bottom : belt-shaped sooted, fingernail mark
3.71	067	172	R4	Earthenware	Leg		Contains fairly small amount of sand, nearly refined good firing	Dull orange		
3.71	068	135	R4	Earthenware	Leg		Refined, contains white particles, etc., good firing	Light gray		White coating except bottom leg
3.71	069	123	R4 Trench	Earthenware	Leg		Fairly large amount of sand (round gravel Φ2mm), good firing	Orange		Bottom : concave
3.71	072	125	R5	Earthenware	Cup	9.1/4.0/7.7	Refined, contains small amount of sand, good firing	Dull yellow orange	Brownish gray	Wheel thrown. Near the bottom : scraped with spatula. Whole interior : blackened
3.71	073	188	R5	Earthenware	Cup	(9.8)/-/-	Refined, contains small amount of sand, good firing	Grayish yellow	Dull orange	
3.71	074	163	R5	Earthenware	Cup	(8.7)/-/-	Refined, almost no sand, good firing	Orange	Orange	
3.71	075	163	R5	Earthenware	Small jar	(6.2)/-/-	Refined, almost no sand, good firing	Dull orange	Dull orange	Exterior : blackened, horizontally polished
3.71	076	161	R5	Earthenware	Small jar?	(8.7)/-/-	Refined, small amount of sand, good firing	Dull orange	Dull orange	Impression from interior surface
3.71	077	149	R5	Earthenware	Jar	9.4/-/-	Refined, almost no sand, good firing	Dull yellow orange	Dull yellow orange	Pedestal of leg?
3.71	078	163	R5	Earthenware	Jar	(15.0)/-/-	Contains brown particles, etc., good firing	Dull orange	Dull orange	
3.71	079	153	R5	Earthenware	Jar	(13.0)/-/-	Contains small amount of sand, good firing	Dull orange	Dull orange	
3.71	080	151	R5	Earthenware	Jar	(18.0)/-/-	Contains fairly small amount of sand, small brown gravel, good firing	Dull orange	Dull orange	Exterior : thinly flaking
3.71	081	159	R5	Earthenware	Jar	(19.6)/-/-	Contains fairly small amount of sand, small brown gravel Φ2mm, good firing	Dull orange	Dull orange	Small fragment
3.72	082	180	R5	Earthenware	Jar	(16.3)/-/-	Refined, almost no sand, good firing	Light yellow orange	Light yellow orange	Small fragment
3.72	083	161	R5	Earthenware	Jar	(14.0)/-/-	Contains small amount of sand, slightly soft	Dull orange	Dull orange	Exterior : flaking
3.72	084	125	R5	Earthenware	Long-necked jar	(13.5)/-/-	Fairly small amount of sand, good firing	Light gray	Dull orange	
3.72	085	133	R5	Earthenware	Long-necked jar	(7.7)/-/-	Small amount of sand, good firing	Bright reddish brown	Bright reddish brown	Interior : blackened. Exterior : partially blackened
3.72	086	129	R5	Earthenware	Long-necked jar	9.0/7.2/17.0	Contains feldspar etc., good firing	Dull orange	Dull orange	Scraped with spatula
3.72	087	158	R5	Earthenware	Long-necked jar	(6.5)/-/-	Small amount of small gravel good firing	Orange	Orange	
3.72	088	184	R5	Earthenware	Cup	-(4.2)/-	Small amount of sand, good firing	Light gray	Orange	Bottom : scraped

Fig.	No.	Context	Feature	Classification	Vessel type	RimØ/Bottom Ø/Height	Fabric	Color (Exterior)	Color (Interior)	Notes
3.73	089	173	R5	Earthenware	Bowl	(29.0)/-/-	Fairly large amount of large sand (feldspar Φ1-2mm), good firing	Orange	Orange	
3.73	090	125 - 137	R5	Earthenware	Bowl	(29.8)/-/-	Good firing	Dull orange	Orange	
3.73	091	125	R5	Earthenware	Bowl	(40.6)/-/-	Small amount of sand, good firing	Light yellow orange	Light yellow orange	Exterior : white coating
3.73	092	161	R5	Earthenware	Pot	(28.4)/-/-	Contains small amount of sand, good firing	Dull orange	Dull orange	Interior and exterior : reddish brown accretion
3.73	093	134	R5	Earthenware	Pot	(50.0)/-/-	Contains sand (Φ2mm), good firing	Pale reddish orange	Pale reddish orange	Interior : flaking
3.73	094	137	R5	Earthenware	Pot	(41.0)/-/-	Small amount of sand, good firing	Orange	Orange	
3.73	095	149	R5	Earthenware	Pot	-(13.0)/-	Small amount of sand, good firing	Dark reddish brown	Orange	Bottom : no finishing
3.73	096		R5	Earthenware	Pot	-(39.8)/-	Contains sand, good firing	Dull yellow orange	Dull yellow orange	Interior : flaking. Bottom : sandy
3.73	097	162	R5	Earthenware	Jar	-(11.8)/-	Contains small amount of sand, good firing	Orange, reddish	Orange	
3.73	098		R5	Earthenware	Cooking pot	(17.8)/-(11.4)	Contains feldspar (Φ2-3mm), brown particles, etc., good firing	Orange	Orange	Exterior : blackened
3.73	099	163	R5	Earthenware	Cooking pot	(17.2)/-/-	Contains fairly large amount of feldspar, mica, good firing	Light yellow orange	Orange	Exterior : sooted
3.73	100	128	R5	Earthenware	Cooking pot	(13.0)/-(15.0)	Fairly large amount of small gravel (Φ2mm), good firing	Orange	Orange	Exterior : sooted. Interior : scorched
3.74	101	125	R5	Earthenware	Cooking pot	(23.1)/-/-	Contains feldspar, brown particles, etc. (Φ3mm), good firing	Pale yellow	Orange	Exterior : accretion of ash, sooted
3.74	102	127	R5	Earthenware	Cooking pot	-(11.8)/-	Large amount of gravel Φ2-5mm (brown particles), good firing	Orange	Orange	Exterior : sooted
3.74	103	-	R5	Earthenware	Cooking pot	(15.0)/-/-	Contains feldspar, brown particles, good firing	Light yellow	Dull orange	Exterior : blackened, change of color
3.74	104	-	R5	Earthenware	Cooking pot	(18.0)/-/-	Contains feldspar, mica, etc., good firing	Dull orange	Dull orange	Interior and exterior : blackened by sooted and scorched
3.74	105	163	R5	Earthenware	Cooking pot	(17.0)/-/-	Good firing	Dull yellow orange	Dull orange	Exterior : slightly blackened
3.74	106	186	R5	Earthenware	Cooking pot	(23.4)/-/-	Fairly large amount of brown particles, feldspar, etc. (Φ3mm), good firing	Dull orange	Dull orange	Interior and exterior : slightly blackened
3.74	107	186	R5	Earthenware	Cooking pot	(22.0)/-/-	Fairly large amount of feldspar, etc., good firing	Light brownish gray	Orange	Exterior of the rim : sooted
3.74	108	188	R5	Earthenware	Lid	-/-/4.4	Small amount of sand (but fairly large amount of accretion on the interior), good firing	Orange	Orange	Interior : sandy
3.74	109	136	R5	Earthenware	Lid	-/-/(5.9)	Fairly large amount of sand, good firing	Pale yellow	Orange	
3.74	110	137	R5	Earthenware	Lid		Contains sand (feldspar, etc.), good firing	Dull orange		
3.74	111	163	R5	Earthenware	Lid	-/-/5.5	Contains sand of brown particles, etc., mica, good firing	Orange	Orange	Interior : slightly sooted, sandy
3.74	112	163	R5	Earthenware	Lid	-/-/5.8	Fairly large amount of small brown gravel (Φ4mm), good firing	Dull orange	Dull orange	Interior : sandy
3.74	113	152	R5	Earthenware	Lid	-/-/7.0	Contains sand, good firing	Light gray	Light gray (sooted)	Interior : smoothed, blackened
3.74	114	180	R5	Earthenware	Lid	-/-/6.8	Large amount of horn-shaped gravel (Φ4-5mm), good firing	Dull orange	Dull orange (sooted)	Interior : sandy, sooted. Exterior : slightly blackened
3.75	115	151	R5	Earthenware	Lid		Fairly small amount of sand, good firing	Light yellow orange	Light yellow orange	Sooted
3.75	116	151	R5	Earthenware	Lid		Contains sand	Dull orange	Dull orange	Interior : sandy, sooted
3.75	117	173	R5	Earthenware	Lid		Fairly large amount of sand, good firing	Light gray	Dull orange	Sooted
3.75	118	148	R5	Earthenware	Lid		Contains sand, good firing	Dull orange	Dull orange	Interior : sandy, fairly large amount of brown particles (Φ2mm)
3.75	119	125	R5	Earthenware	Lid		Contains large amount of chaff-like (especially on the interior), good firing	Light gray	Dull orange	Interior : slight change of color, scorched
3.75	120	158	R5	Earthenware	Lid		Contains sand, good firing	Dull yellow orange	Dull orange	Interior : sandy
3.75	121	169	R5	Earthenware	Lid		Fairly large amount of sand, good firing	Light gray	Black (sooted)	
3.75	122	109	R5	Earthenware	Lid		Contains sand, fairly large amount of feldspar, etc., good firing	Dull orange	Dull orange	Interior : sandy
3.76	123	173	R5	Earthenware	Lid		Fairly large amount of sand (Φ1-2mm), good firing	Dull orange	Brownish gray	Interior : smoothed, sooted, scorched
3.76	124	133	R5	Earthenware	Lid		Fairly large amount of sand (Φ1-2mm), good firing	Pale orange	Dull orange	Interior : sandy

Fig.	No.	Context	Feature	Classification	Vessel type	Rimφ/Bottom φ/Height	Fabric	Color (Exterior)	Color (Interior)	Notes
3.76	125	173	R5	Earthenware	Lid		Fairly large amount of sand, good firing	Light gray	Dull orange	Interior : sandy, gravel Φ4mm, scorched
3.76	126	137	R5	Earthenware	Lid	(30.0)/-/-	Coarse, contains white particles, phlogopite, small gravel, etc., good firing	Light brownish gray	Pale reddish orange	White coating, sooted
3.76	127	178	R5	Earthenware	Lid		Fairly large amount of sand, large amount of fiber-like inclusions, slightly good firing	Dull orange	Light brownish gray	
3.76	128	140	R5	Earthenware	Lid		Contains sand, good firing	Light yellow orange	Light yellow orange	sooted
3.76	129	-	R5	Earthenware	Lid		Fairly large amount of sand(contains feldspar Φ1-2mm, etc.), good firing	Orange	Brownish gray	Interior : sandy
3.76	130		R5	Earthenware	Lid		Fairly large amount of sand, good firing	Dull yellow orange	Brownish gray	Interior : sandy (1-4mm)
3.77	131	178	R5	Earthenware	Lid		Contains round gravel Φ1-5mm, etc., good firing	Orange	Orange	sooted
3.77	132	133	R5	Earthenware	Lid		Fairly large amount of sand such as feldspar, etc., good firing	Dull yellow orange	Orange	
3.77	133	173	R5	Earthenware	Lid	-/(5.4)	Contains round gravel, good firing	Light yellow orange	Light yellow orange	Interior : sandy, slightly scorched
3.77	134	158	R5	Earthenware	Lid	-/(7.5)	Fairly large amount of sand (Φ4mm), good firing	Dull orange	Dull orange	Interior : sandy
3.77	135	163	R5	Earthenware	Lid	(17.0)/-/-	Fairly small amount of sand, good firing	Light yellow orange	Dull orange	Interior : sandy, feldspar, mica, etc.
3.77	136	186	R5	Earthenware	Round table	(43.0)/-/-	Coarse, contains white particles, small gravel, etc., good firing	Light brownish gray	Light brownish gray	White coating
3.78	137		R5	Earthenware	Dish	(8.4)/-/(2.3)	Contains sand such as white particles, etc., good firing	Upper half : Light gray Lower half : Orange	Orange	Interior and exterior of the lip : sooted. The upper half of exterior : white coating. Bottom : string cutting
3.78	138	121	R5	Earthenware	Dish?		Contains sand (feldspar, etc.), good firing	Dull orange	Dull orange	Bottom : incized before firing
3.78	139	125	R5	Earthenware	Round table		Contains fairly small amount of round gravel Φ3-4mm, nearly refined good firing	Dull orange	Dull orange	Interior : good polished, not sooted
3.78	140	121	R5	Earthenware	Stand		Fairly large amount of brown gravel 3-4mm, good firing	Bright brown		
3.78	141	151	R5	Earthenware	Stand		Contains round gravel (Φ8mm), etc., good firing	Dull orange		
3.78	142	169	R5	Earthenware	Stand		Large amount of feldspar (3-4mm), mica, etc., good firing	Light yellow orange		Circle impression
3.78	143	161	R5	Earthenware	Stand		Fairly large amount of gravel Φ2-3mm, good firing	Grayish brown		
3.79	144	162	R5	Earthenware	Leg		Fairly large amount of sand (feldspar and others), good firing	Pale yellow-Orange		Entirely gray, accretion of ash?
3.79	145	137	R5	Earthenware	Leg		Refined, contains white particles, small gravel, good firing	Dull orange		White coating entirely
3.79	146	180	R5	Earthenware	Leg		Fairly large amount of feldspar (Φ3-4mm), good firing	Dull yellowish brown-Dull orange		Exterior : white coating
3.79	147	162	R5	Earthenware	Leg		fairly large amount of feldspar, etc., good firing	Bright brown-Orange		
3.79	148	137	R5	Earthenware	Spout		Refined, Contains very small amount of white particles, good firing	Orange		Exterior : scraped with spatula, polished, smoothed
3.81	162	36	MS1 Trench	Earthenware	Jar		Refined, good firing	Light yellow orange	Dull orange	
3.81	163	145	MS1	Earthenware	Cup		Small amount of sand (almost none), good firing	Dull orange	Dull orange	
3.81	164	93	MS1	Earthenware	Cup		Good firing	Orange	Orange	Polished
3.81	165	-	MS1	Earthenware	Small jar		Dense (reduction), good firing (hard)	Olive gray	Gray	
3.81	166	116	AKBSH1 p26	Earthenware	Dish with legs		Contains large amount of white and red particles, small gravel, good firing	Light gray	Light gray	White coating
3.81	167	60	MS1	Earthenware	Cooking pot		Fairly large amount of feldspar, etc., good firing	Dull orange	Dull orange	Exterior : sooted
3.81	168	82	MS1	Earthenware	Cooking pot	(11.4)/-/-	Small amount of gravel, good firing	Light yellow orange	Bright reddish brown	Exterior : sooted
3.81	169	81	MS1	Earthenware	Pot		Dense (almost no sand), good firing	Dull orange	Dull orange	
3.81	170	108	MS1	Earthenware	Jar		Contains sand, slightly bad firing	Dull orange	Dull orange	
3.81	171	195	MS1	Earthenware	Lid	-/(4.1)	Fairly large amount of sand, good firing	Orange	Dull reddish brown	Interior : sandy, slightly blackened
3.81	172	64	MS1 Trench	Earthenware	Lid		Contains sand, slightly bad firing	Light brownish gray	Light brownish gray	
3.82	180	197	P30	Earthenware	Jar?	(12.0)/-/-	Refined, contains very small amount of white particles, good firing	Pale orange	Orange	Polished, white coating
3.82	183		Surface collection	Earthenware	Round table		Fairly large amount of brown particles, etc., good firing	Dull yellowish brown		Exterior : white coating

Tab.3.3 Observation sheet of greyish burnt bricks from AKB-13

Fig.	No.	Context	Feature	Classification	Type	Fabric	Firing	Color (Front)	Color (Back)	Notes
3.79	13-18-152	163	R5	Clay object	Greyish burnt brick		Good	Light olive gray		Cord impression

Tab.3.4 Observation sheet of metal objects from AKB-13

Fig.	No.	Context	Feature	Classification	Type	L/W/D	Wt.(g)	Notes
3.65	13-18-020-1	33	R1	Copper (4-piece set)	Coin	1.5/-/-	4.4 (Average 1.1g per piece)	Poor quality imitation coins of Turgesh-qaghan, the second half of the 8th century?
3.65	020-2	33	R1	Copper (5-piece set)	Coin		Average 1.1g per piece	
3.65	020-3	33	R1	Copper (6-piece set)	Coin		Average 1.1g per piece	
3.65	020-4	33	R1	Copper (7-piece set)	Coin		Average 1.1g per piece	
3.65	021-1	33	R1	Copper (3-piece set)	Coin	1.5/-/-	3.7 (Average 1.2g per piece)	Poor quality imitation coins of Turgesh-qaghan, the second half of the 8th century?
3.65	021-2	33	R1	Copper (4-piece set)	Coin		Average 1.2g per piece	
3.65	021-3	33	R1	Copper (5-piece set)	Coin		Average 1.2g per piece	
3.65	022	99	R1	Copper	Coin	2.5/-/-	5.5~5.6	Front : Sogdian character. Back : bow-shaped tamgha. From the golden age of the Turgesh-qaghan Suluk era, around 730.
3.65	023	24	R1	Copper	Coin	2.3/-/-	2.7~2.8	Exterior : no character. Interior : Sogdian character, unreadable
3.66	037	5	R2 P5	Copper	Coin	1.5/-/-	0.4	Rust is so bad that inscription, etc. are unknown.
3.71	070	131	R4	Copper	Coin	2.1/-/-	1.2	
3.71	071	163	R4	Copper	Unknown	2.7/-/-	0.8	
3.80	153	104	R5	Copper	Coin	1.8/-/-	1.6~1.8	Front : Sogdian character. Back : Rust is so bad that it is unclear if there is any character. Poor quality imitation coins of Turgesh-qaghan, the second half of the 8th century?
3.80	154	122	R5	Copper	Coin	1.8/-/-	1.7	Rust is so bad that characters, etc. are completely unknown.
3.80	155	103	R5	Copper	Coin	2.0/-/-	1.6	Rust is so bad that square hole, inscription, etc. are unknown.
3.80	156	148	R5	Copper	Coin	1.5/-/-	0.9	Rust is so bad that characters, etc. are completely unknown.
3.80	157	155	R5	Copper	Coin	1.6/-/-	0.4	Slightly damaged. Rust is so bad that characters, etc. are completely unknown or non-existent.
3.80	158	152	R5	Copper	Coin	(1.2)/-/-	(1.8)	A square-holed bronze coin split in half. Rust is so bad that characters, etc. are completely unknown.
3.80	159	160	R5	Copper	Coin	1.3/-/-	0.4	Rust is so bad that characters, etc. are completely unknown.
3.80	160-1	177	R5	Copper (4-ply)	Coin	1.8~2.0/-/-	4.9	One of them is out and damaged. Rust is so bad that characters, etc. are unknown.
3.80	160-2	177	R5	Copper (4-ply)	Coin			One of them is out and damaged. Rust is so bad that characters, etc. are unknown.
3.80	160-3	177	R5	Copper (4-ply)	Coin			One of them is out and damaged. Rust is so bad that characters, etc. are unknown.
3.80	160-4	177	R5	Copper (4-ply)	Coin			One of them is out and damaged. Rust is so bad that characters, etc. are unknown.
3.82	176	65	MS1	Copper	Handle	5.7/-/-	7.0	
3.82	177	65	MS1	Copper	Handle	4/-/-	7.2	
3.82	178	73	Directly above MS1-1	Copper	Unknown	5.3/-/-	3.3	
3.82	181	191	R5?	Copper	Coin	2/-/-	1.6	Rust is so bad that characters, etc. are completely unknown.
3.82	182	168	Surface collection	Copper	Coin	1.6/-/-	0.8	Rust is so bad that characters, etc. are completely unknown or non-existent.

Tab.3.5 Observation sheet of clay objects from AKB-13

Fig.	No.	Context	Feature	Classification	Type	L/W/D	Wt.(g)	Fabric	Color (Exterior)	Color (Interior)	Notes
3.64	13-18-015	39	R1 and around the gravel surface (upper layer)	Clay object	Clay disc	3.9/3.5/0.8	13	Refined, contains small amount of white particles, mica, etc., good firing	Orange	Orange	Reuse of earthenware fragment
3.64	016	87	R1	Clay object	Clay disc			Good firing	Dull orange	Orange	Reuse of earthenware fragment
3.64	017	28	R1	Clay object	Pierced disc	2.0/2.0/0.6	3	Refined, contains very small amount of white particles, good firing	Orange	Orange	Produced as pierced disk from the beginning
3.79	149	188	R5	Clay object	Pierced disc			Refined (almost no sand), good firing	Dull orange		Reuse of earthenware fragment
3.79	150	164	R5	Clay object	Clay disc	6.0/5.9/0.4~1.2	57	Contains white particles, mica, etc., good firing	Bright reddish brown (partial reduction)	Dull orange	Reuse of earthenware fragment (both sides of vessel surface : weathered)
3.82	175	107	MS1	Clay object	Pierced disc	4.4/4.0/1.1	29	Contains white particles, mica, etc., good firing	Dull orange	Orange	Reuse of earthenware fragment

Tab.3.6 Observation sheet of bone artifacts from AKB-13

Fig.	No.	Context	Feature	Classification	Type	L/W/D	Wt.(g)	Notes
3.65	13-18-024	138	R1	Cowry			1.9	
3.65	025	28	R1	Animal bone	Chuko		6	Perforation
3.66	038	17	R2-P8	Animal bone	Chuko		10	Symbol-like incision
3.68	045	82	R2-P17	Horse	Radius (the left)			Incized, cut mark
3.68	046	11	Under R3-B2		Dice		1	

Tab.3.7 Observation sheet of stone artifacts from AKB-13

Fig.	No.	Context	Feature	Classification	Type	Stone Material	Diameter/Thickness(cm)	Wt.(g)	Color (Exterior)	Notes
3.65	13-18-024	88	R1	Stone tool	Spindle base		6.9/2.2	63.5		
3.79	151	125	R5	Stone tool	Grinding stone		10.8/1.9	376		
3.81	173	130	MS1-2	Stone tool					Dark grayish blue	
3.81	174	93	M1	Stone tool	Grinding stone		17.0/6.0	1031		

Tab.3.8 Observation sheet of glass objects from AKB-13

Fig.	No.	Context	Feature	Classification	Type	Diameter	Wt.(g)	Color	Notes
3.69	13-18-054	142	R4	Glass	Bead	1.1	0.8	Light gray	
3.80	161	165	R5	Glass	Bead	0.7	0.4	Light gray	
3.82	179	77	MS1-2	Glass	Bead	1.1	0.5	Light bluish gray	

Tab.3.9 Weight of unearthed materials from AKB-13 (g)

Area	Excavation area	Earthenware	Glazed ware	Convex tile	Concave tile	Eave-end tile	Ridge tile	Greyish burnt brick	Red brick	Bone	Stone artifact	Clay object	Metal	Slag	Wall clay	Charcoal
13	38735-17100	64		102	1734											
13	M1-T (3 faces)									230						
13	MS1	30054		46	1721			767	1132	17129	1033	31		63285	107	
13	MS1-1	3173						976	301	1497				10415		
13	MS1-2									1282						
13	MS1-T	11926			85					5112				14543		
13	MS1 (3 faces)	3595			101					1109						
13	P1	430								170						9
13	P2	98								2						
13	P4	1425								61						
13	P8	8431						1593		476						
13	P10	245								122						
13	P11	4704		30						819				35		
13	P12	1044							220	214						3
13	P13	190								36						
13	P14	3456								874						
13	P15	707								123						
13	P16	633														
13	P17	3137							228	25						
13	P18	127								34						
13	P19	177								334						
13	P2	98								2						
13	P20	357								63						
13	P21	553								193						
13	P22	44								46						
13	P23	225								162						
13	P24	429								190						
13	P25	429								123						
13	P26	1233								35						
13	P27	4654							1179	774						
13	P28	20								28						
13	P29	798													112	
13	P32	92								30						
13	P33	123								24						
13	P34	35								14						
13	P35	81														
13	R1	30512		43	337			415	42	8675	137	71		2895	382	
13	R1-2	1104								255				60		
13	R1-A1	5037								1920						
13	R2	2822							32	390						
13	R2-2	8571			41				129	1915			11	5	39	
13	R3	3182			13			151		718						
13	R4	45335						997	908	17274	88			242	149	
13	R4-5	268								158						
13	R5	178988	16		25			5690	1877	78401	2120			2557	802	
13	W6	1512							283	622				36		
13	W9	73								7						
13	X1													818		
13	X2	351								61						
13	Unknown	9904						583		1874				680		
Total		370446	16	221	4057	0	0	11172	6331	143603	3378	102	11	95571	1591	12

Tab.3.10 AKB-13 List of contexts

No.	Date	Feature	Discription
1	4/22	R3	-
2	4/22	R3 B1	Near indoor sufa
3	4/22	R3 B2	Near the north sufa in the room
4	4/22	R2 P8	Inside the deep pit in the southeast corner
5	4/22	R2 P8	coin; in the same pit as No.4
6	4/22	MS1	Trench
7	4/22	Surface collected	
8	4/22	R2 P1	Middle layer
9	4/23	R2 P9	Re-investigation
10	4/23	R2 P10	Re-investigation
11	4/23	R3 B2	Dice
12	4/23	R2 P2	
13	4/23	R2	In the central east-west section belt
14	4/23	R3 B2	
15	4/23	R3	Central space
16	4/23	R3	B1 and the south side
17	4/23	R2 P8	Same pit as No.4, chuko with pattern, etc.
18	4/23	(Missing)	
19	4/23	R2 P1	
20	4/23	R2-2 P4	
21	4/23	R1-2	-
22	4/23	R1-1	West half of R1-1
23	4/23	R1	-
24	4/23	R1-1	Coin unearthed from the western half
25	4/23	R3-1	Near the northwest corner
26	4/24	R2 P11	Unearthed during half-sectioning
27	4/24	W6	Inside the wall
28	4/24	R1	Pierced disc, etc.
29	4/24	R3 P12	
30	4/24	R3 P13	
31	4/24	R3	Central space
32	4/24	R3	Charcoal from the southeast corner
33	4/24	R1	Coins (7 pieces)
34	4/24	R1-1	Near sufa on the south wall side
35	4/24	R1 P14	Spherical earthenware
36	4/24	MS1 T1	East corner extention
37	4/24	R3-1	On the floor of the northwest corner, near the wall
38	4/24	R3-1	Near the south wall
39	4/25	R1	Upper layer of gravel surface, clay disc
40	4/27	MS1 T1	Layer 2, road surface
41	4/27	R1	Near stone mosaic
42	4/27	MS1 T1	Layer 3, road surface
43	4/27	R1	Copper fragment
44	4/27	R1	In the central north-south belt
45	4/27	R1	Stove pit, large amount of charcoal
46	4/27	R1	Stove pit, large amount of charcoal
47	4/27	R2 P11	Northern half
48	4/27	R1	-
49	4/27	W6 P15	Southern half
50	4/27	R1	Eastern half
51	4/27	R1	Fill from old trench
52	4/27	R1	Near the east wall
53	4/27	R2 Wall	Wall between R2-1 and R2-2
54	4/27	R1	Near the southeast corner wall
55	4/27	R2-2	Near the northeast
56	4/28	R1 P14	
57	4/28	R2-2	Fill of layer 4
58	4/28	W6 P15	
59	4/28	MS1	Layer 2-3 of the west side
60	4/28	MS1	Layer 2-3 of the west side
61	4/28	R1 P14	Sample of layer 1
62	4/28	R1 P14	Sample of layer 2
63	4/28	R1 P16	Earthenware
64	4/28	Layer 1 of MS1	Extention near trench
65	4/28	Layer 1,2 of MS1	Below road surface 1, copper product, etc.
66	4/28	W6	Inside the wall between R1-2 and R2-2
67	4/28	R2-2 P17	Pit of the northwest corner of R2-2
68	4/28	R1-2 P18	Pit of the northwest corner of R1-2
69	4/28	SS1 R1	Stone mosaic surface
70	4/28	R1 X1	
71	4/28	R1 W9	Near the wall
72	4/28	MS1	East end of T1, sidewalk area
73	4/29	MS1	On the road of surface 1, bronze pin
74	4/29	Layer 1 of MS1	On the road of surface 1
75	4/29	MS1	1m square sample collection point, slag with copper particles
76	4/29	MS1	Below surface 1, iron product
77	4/29	MS1	On surface 2, glass object
78	4/29	MS1	Below surface 1, copper product
79	4/29	MS1	On surface 2
80	4/29	MS1	Below surface 1, copper product
81	4/29	MS1	On surface 2
82	4/29	R2-2 P17	Soil sample
83	4/29	MS1	Below surface 1, near the east
84	4/29	W9	Near the wall
85	4/29	R1	Around the road
86	4/29	R2-2 P17	Artifacts
87	4/29	R1	Around stone mosaic
88	4/29	R1	Stone mosaic surface, spindle base
89	4/29	R1	Stone mosaic

No.	Date	Feature	Discription
90	4/29	R1	Sub-trench by the belt, south end
91	4/29	W6	Unearthed during removal of part of the wall on the R2-2 side
92	4/30	R1	Near the east brick pavement
93	4/30	MS1	On the surface 2, glass object
94	4/30	MS1	Around east side road
95	4/30	R3 P13	
96	4/30	R3 P12	
97	4/30	R1	Earthenware from west side of stone mosaic
98	4/30	R1	Earthenware
99	4/30	R1 W9	From north corner, coin, circle-holed coin
100	4/30	MS1	Sub-trench of W9 east side
101	4/30	R5	-
102	4/30	R3	-
103	5/1	R5	Copper coin
104	5/1	R5	Copper coin
105	5/1	R4	-
106	5/1	R1 SS1	Stone mosaic
107	5/2	Layer 2 of MS1	On surface 2, pierced disc
108	5/2	MS1 D1	Central ditch of surface 2
109	5/2	MS1 P19	Side road of MS1
110	5/2	MS1 P20	Side road of MS1
111	5/2	MS1 P21	Side road of MS1
112	5/2	MS1 P22	Side road of MS1
113	5/2	MS1 P23	Side road of MS1
114	5/2	MS1 P24	Side road of MS1
115	5/2	MS1 P25	Side road of MS1
116	5/2	MS1 P26	Side road of MS1
117	5/2	MS1	West side road of MS1
118	5/2	R1 P27	
119	5/2	R1 P27	
120	5/2	R1	Stone mosaic
121	5/2	R5 T	Sub-trench near the east wall
122	5/3	R5 T	Coin from sub-trench
123	5/3	R4 T	Sub-trench
124	5/3	R4 T	Earthenware from sub-trench
125	5/3	R5	East half, round gravel
126	5/3	R5	Near the south of the east half, copper fragment
127	5/3	R5	Earthenware
128	5/3	R5	Earthenware
129	5/3	R5	Earthenware
130	5/3	X2	Stove-like part where three earthenware were unearthed
131	5/3	R4	East corner, copper product, copper ring, etc.
132	5/3	R4	Eastern half
133	5/3	R5	Western half
134	5/3	R5 T	From the old trench
135	5/4	R4	East side, clay leg
136	5/4	R5	North side of the west half
137	5/4	R5	South side of the east half, clay leg, spout, etc.
138	5/4	R1	Coery, on top of stone mosaic
139	5/4	R4	Western half
140	5/4	R5	Northern half of the east side
141	5/4	R5	South side of the western half
142	5/4	R4	Western half, glass bead
143	5/4	R1 P27	
144	5/4	SS1	Stone mosaic
145	5/4	MS1 D1	Center ditch
146	5/4	MS1	Surface 2, near the east
147	5/5	R5	Northern half of the east side
148	5/5	R5	From the old trench, within the north extension, coin
149	5/5	R5	North side of old trench
150	5/5	R4	Western half
151	5/5	R5	From the east-west trench
152	5/5	R5	From the east-west trench, coin
153	5/5	R5	East-west trench, west side
154	5/5	R1 SS1	Stone mosaic surface
155	5/5	R5	Coin
156	5/5	R5 T	In old trench
157	5/5	R4	Eastern half
158	5/5	R5	South side of eastern half
159	5/5	R5	Southern half of the west side
160	5/7	R5	Southeast corner, 2 coins
161	5/7	R5	Southeast corner
162	5/7	R5	Northeast corner
163	5/7	R5	Southeast corner, copper pin
164	5/7	R5	Southeast corner, disc-shaped clay object
165	5/7	R5	Southeast corner, glass bead
166	5/7	R5	In east-west sub-trench, west side
167	5/7	MS1 T1	
168	5/7	(Surface collected)	Beside the tent
169	5/8	R5	North east area
170	5/8	R4	East side, bronze fragment
171	5/8	R4	
172	5/8	R4	East side
173	5/8	R5	Northwest area
174	5/8	MS1 T1	Surface 3
175	5/8	R1 P28	
176	5/10	R2 P8	Soil sample
177	5/10	R5	Northwest area, 2 coins

No.	Date	Feature	Discription
178	5/10	R5	Northwest area
179	5/10	R5	Southwest area
180	5/10	R5	East-west belt, east side
181	5/10	R5	North-south belt, north side
182	5/10	(Missing)	
183	5/10	R3	North-south belt
184	5/10	R5	South side of north-south belt
185	5/10	R5	West side of east-west belt
186	5/11	R5	South side of southwest area
187	5/11	R4	North-south belt
188	5/11	R5	Northeast area, floor surface, glass fragment, etc.
189	5/11	R5	North-south belt, seed? sample
190	5/11	W6 P29	Stove-shaped
191	5/11	R5	Coin

No.	Date	Feature	Discription
192	5/11	W6 P29	Soil sample
193	5/11	W6 P29	Earthenware
194	5/11	W6 P29	Soil sample
195	5/11	MS1 T1	Surface 3
196	5/11	R2-2	W6 dug partially
197	5/12	W6 P30	Earthenware
198	5/12	MS1 P32	
199	5/12	MS1 P33	
200	5/12	MS1 P34	
201	5/12	MS1 P35	
202	5/12	R1	Edge of sub-trench beside W6
203	5/12	R4, R5	
204	5/12	(Surface collection)	Fragment of earthenware

4. Investigation of AKB-15

4.1. Location of the Excavation Area (Fig.1.5)

AKB-15 is an excavation area set up inside the central part (SH2a) at the center of the Second Shahrستان (SH2) and is located 900m east of AKB-13. According to the 1967 aerial photograph, SH2 has a pentagonal outer wall, and an area surrounded by square wall (SH2a) can be recognized inside. Most of the features of SH2 were later cleared away by the development of agricultural fields from the 1960s onward, and today it is a flat and vast agricultural fields. However, part of the east and south walls of SH2 remains as earthen mounds, and the area around SH2a is slightly elevated.

4.2. Objective of the Investigation

- To grasp the entirety of the roof tile belt identified in 2017 and to elucidate its formation process. To confirm the platform of the building associated with the roof tile belt and to understand the scale of the platform. To establish the chronology.
- To identify the buildings in SH2a and to reveal the city structure (administrative complex).

4.3. General Description of the Investigation (Fig.4.1, 4.12)

In SH2, an excavation of trench was conducted on the east wall of SH2a in 2015. Then, a joint research by Teikyo University and the National Academy of Sciences of the Kyrgyz Republic has been conducted in AKB-15 since fiscal year 2017. In fiscal year 2017, a ground penetrating radar survey was conducted within SH2a, and based on the data, a north-south trench was set up and the investigation was initiated. During the fiscal year 2017 investigation, features and artifacts thought to be from the Kara-khanid Khanate (10th-12th century) were detected in Tr. 3-5. A large number of tile fragments belonging to the Tang dynasty were also found in a belt on the south side of Tr.5 and Tr.6 (roof tile belt). The roof tile belt consists of tile fragments accumulated in a strip more than 25m north to south and about 2m wide. Its main axis deflected 6 degrees west from true north, which is almost the same as the main axis of SH2a. When a sub-trench in the east-west direction in this roof tile belt was set up and cut open, it was confirmed that the east side of the roof tile belt has a platform shape and it slopes downward towards the west. A tile marked "□ 懷" was also excavated. On the east side of Tr. 6, an east-west trench (Tr. 8) was set up and topsoil was removed to investigate the opposite side of the roof tile belt.

In fiscal year 2018, Tr.5 was extended to the west to confirm the extent of the roof tile belt. In addition to scrutinizing the feature detecting surface of Tr.8, Tr.9 and Tr.10 were set up to the north and south of Tr.8 and they were investigated for features. As a result, on the north side of the roof tile belt, a rain-permeable ditch of the building consisting of greyish burnt bricks and a floral stone mosaic were excavated, and a building complex was assumed to exist in the surrounding area. In Tr.9 and Tr.10, an accumulation of tiles and a gravel paved surface which appeared to be a road surface was confirmed.

4.4. Tr.5 and Extended Area (Fig.4.2, 4.13)

Tr.5 is a 25×4m trench in the north-south direction. Since the roof tile belt about 13 m in length was found in the trench in the fiscal year 2017, a trench of the same width and length was set up and widened on the west side of Tr. 5 to confirm the entire distribution of the roof tile belt. Additionally, when we dug down the lower layer of the northern end of the roof tile belt, a floral stone mosaic and a rain-permeable ditch made with greyish burnt brick were detected. The stone mosaic exists in an L shape, 4m east-west, and 4m north-south. It is placed on the outside edge of the rain-permeable

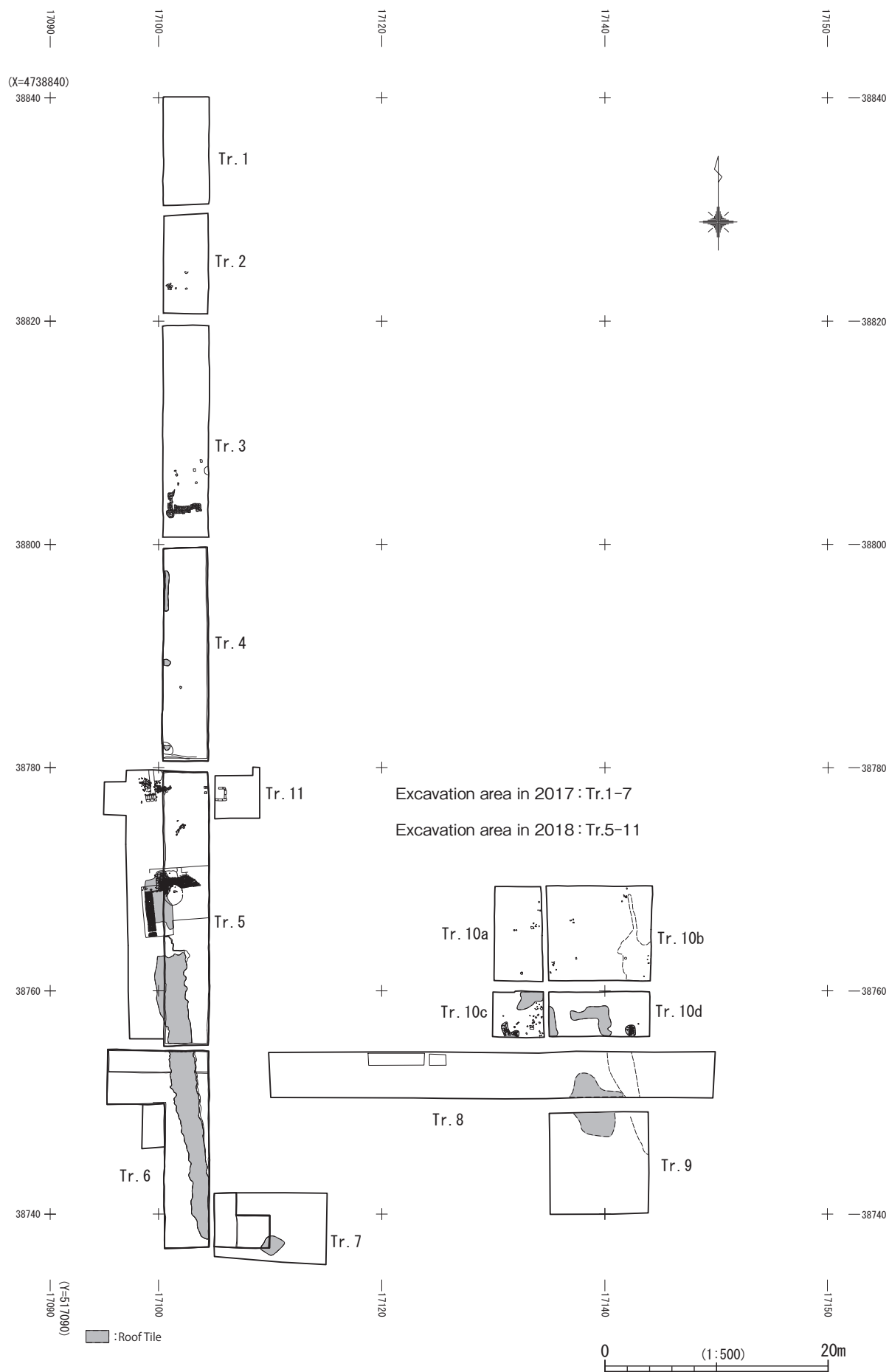


Fig.4.1 Full view of AKB-15

ditch. A 0.9-meter-long rain-permeable ditch was found near the north wall of the trench, and an accumulation of tile fragments was found on the north side of the trench. Therefore, building features with a width of 0.5m seem to have existed between two rain-permeable ditches in the north and south. Furthermore, the arrangement of the stone mosaic in conjunction with the rain-permeable ditch on the south side suggests that there was a courtyard or passage on the south side of the building, and that the outdoor decoration with floral stone mosaic was installed to surround the courtyard or passage. The stone mosaic in the north-south direction is separated by greyish burnt bricks in the middle. It was observed to extend further to the south, but the excavation had ceased in the middle. The stone mosaic in the east-west direction was cut and interrupted by well-like pits and disturbance-like pit (garbage pit), and gravels used for stone mosaic was excavated from the upper layer of the pits. The design pattern of the stone mosaic and the types and proportions of gravels will be described later. Reddish brown, blue (green), and white round gravel which can be collected from the surface of alluvial fan where the site is located was used to create the floral motifs. The colors become more vivid when wet. It was located beside the rain-permeable ditch and is thought to have had the effect of making a gorgeous atmosphere.

4.4.1. Building Features (Fig.4.4, 4.13-4.19)

Two rows of greyish burnt bricks being flatly laid in the shape of crank were found near the north wall of Tr.5 and along the east-west stone mosaic (rain-permeable ditch). Because these rows of greyish burnt bricks is presumed to mark the eave line of the building, the building is assumed to be located between these two rows of greyish burnt bricks.

The structure of the rain-permeable ditch associated with the stone mosaic on the south side is as follows. On the outside, one layer of greyish burnt bricks is laid out with their stretcher face facing up. On the inside, they are laid out in a stretcher bond. One more layer of bricks are laid out slightly inside in a stretcher bond. To prevent brick row from shifting, bricks are embedded vertically with their corners facing up between the outer brick joints.

The rain permeable ditch on the north side, closer to the north wall of the excavation area, is 0.9 m long and is assumed to be a rainfall on the north side of the building. It consists of four rows of greyish burnt bricks. The first row from the inside is laid out in a stretcher bond of greyish burnt bricks with chipped corners. The second row is laid out orthogonally and slightly lower than the first row, with their frog facing up. The third row is laid out in a stretcher bond in the same height as the first row. In the fourth row, bricks are embedded vertically with their corners facing up between the brick joints of the third row. This rain permeable ditch runs from east to west, but the greyish burnt bricks were removed in later times, and its extent could not be confirmed.

As for the layout of the buildings, the main axes of the north and south rain permeable ditches and the east-west stone mosaic coincide, suggesting that the stone mosaic and rain permeable ditch were integral and that a long building to the east and west with a width of 6.5 m existed between the stone mosaic and the rain-permeable ditch. It is presumed to be a building with the southeast corner at the corner of the east-west and north-south stone mosaic, or a U-shaped building extending further to the west, but this is unknown at this time. As for the space between the rain permeable ditches, it is thought that there was originally a platform on which a foundation stone was placed and a building was built. There are no traces of a foundation stone, although dry accumulated soil in the shape of rammed earth was found.

4.4.2. Stone Mosaic with Flower Pattern (Fig.4.4, 4.13-4.36, 4.47)

Directly beneath the accumulation of tiles near the northern end of the roof tile belt, a rain permeable ditch made of greyish burnt bricks and a flower pattern stone mosaic were found. Red-

dish-brown, blue, green, and white round gravel were embedded in a dense relief to create concentric circles with a floral pattern. The stone mosaic is arranged in an L-shape, east-west direction in the north and north-south direction in the west.

The stone mosaic in the east-west direction on the north side is 3.5 m long and 1.1 m wide, with the west end bordering the greyish burnt bricks that form the curb stone of the rain permeable ditch. The east end is destroyed by a later garbage pit, and the middle is destroyed by a well-like pit. The stones used for the stone mosaic are slightly long round gravels, 5-12 cm long and 3-5 cm wide. They express in two tiers radiating floral pattern of six flowers, approximately 50-80 cm in diameter. The cross-section of the stone mosaic in the long axis is slightly raised at the center, and the cross-section in the short axis is a weak convex. Around the pit, the stone mosaic is missing in an arc along the edge of the pit, but the stones at the edge are neatly lined up. In the stone mosaic on the north side of the pit, there are two slightly sunken depressions on the gravel surface, in the width of a person's open foot.

The stone mosaic in the north-south direction on the west side is 3.5 m long and 0.6 m wide. The gravels used are round gravels 3-10 cm long and 2-6 cm wide, representing six floral patterns about 50 cm in diameter. As with the stone mosaic on the north side, the central part is slightly raised along the long axis, and the surface is convex in the short axis. In the middle, it is partitioned by a ditch about 10 cm wide made of greyish burnt bricks, which is laid out with their stretchers facing up in parallel rows. The stone mosaic extended further to the south, but its extension seemed to be destroyed by a ditch-like depression on the western side of the platform associated with the roof tile belt.

4.4.2.1. Composition of the Stone Mosaic (Fig.4.5)

In order to understand the composition of stone mosaic patterns with floral patterns (hereinafter referred to as motifs), the percentage of occupancy area was calculated, along with the number of individual stone mosaic pieces by color. The analysis method was based on the graphical data from the photogrammetry and the analyzed orthoimage, and the area of the stone material was calculated by reading the color on the display, counting the number of pieces, and using the plug-in "Hakariya" of Adobe Illustrator CS5. However, in consideration of the preservation of the stone mosaic during the photogrammetry, this was carried out without completely removing the soil accumulated between the stones. Therefore, the size, area, and occupancy of the stone materials are estimated values.

4.4.2.2. Number of Pieces by Each Color and Occupancy Area of Stone Mosaic (Fig.4.6, 4.7)

The colors of the stones used were roughly four systems: 748 white, 588 reddish brown, 326 green, and 192 blue. As for the number of stones by color, white is the most common, accounting for 40% of the total. On the other hand, it is the smallest in terms of the size (area) of the stones per piece: green 27.3 cm², blue 23.4 cm², reddish brown 19.4 cm², and white 19.2 cm². Looking at the difference in color occupancy (area by color/area of stone layout) between the north and west sides, the difference between white, reddish brown, and blue is within 5%, but for green, the difference is 16.7%, and there is a clear tendency of green gravel being used more frequently in the north side.

4.4.2.3. Trends in the Composition and Arrangement of Stone Mosaic (Fig.4.8, 4.9)

1)Floral motifs: Six units can be seen in the stone mosaic on the north side and six units can be seen in the stone mosaic on the west side. The size of the stones is about 50-80 cm in diameter on the north side and about 50 cm in diameter on the west side.

As for the composition of the floral motif, a slightly larger stone material is placed in the center and surrounded by a circular arrangement of stones of the same color (different color from the center stone), forming a triple or quadruple concentric circle. There are three types of concentric circles: one with white stones, one with reddish-brown stones, and one with green and blue stones.

For each circle of stones, a color different from its neighboring circle is always used in one motif, so the motif is composed with an awareness of color. In the stone mosaic on the north side, a stone with a diameter of about 6-13 cm is placed in the center, with the long axis of the stone aligned radially from the center. It also consists of two levels, north and south. The motif on the north side is a complete triple circle, and the motif on the south side is a triple concentric circle with a part of the circle broken off and attached to the circle on the north side. In view of the composition of the motif, we can assume that the stone mosaic was laid from the north side, that is, from the platform side of the building.

On the western stone mosaic, the floral motifs are aligned to a diameter of about 50 cm. A stone with a diameter of about 12 cm is placed in the center, and round gravels with less difference in the length of the axis than on the north side are used and arranged in a radial direction from the center.

2) Division: There is a linear arrangement at the edge of the stone mosaic and between the floral motifs. In the stone mosaic on the north side, there is a north-south arrangement that divides the space between the floral motifs arranged in two layers into east and west, and in the area where the well-like features overlap, there are arrangements in the east-west and north-south directions lined with greenish stones. On the west side of the stone mosaic, although somewhat ambiguous, north-south arrangements separating east and west are seen between the floral motifs.

3) Filling sections: On the outside of the floral motifs, a few short-arc-shaped arrangements can be seen, and they are randomly arranged to fill in the spaces between the motifs. Most of the green and blue stones are used for composing floral motifs and divisions, while the white and red stones tend to be used for filling the sections.

4.4.3. Well-like Pit (Fig.4.4, 4.35, 4.36)

It is a pit of about 1.8m in diameter that exists to cut the stone mosaic with flower pattern on the north side. This year, the south side was cut in half and surveyed to a depth of about 1.1 m. It is believed to be a deeper shaft-like pit. At present, it is a well-like feature excavated without timbering, and does not have walls built with bricks, etc. Earthenware from the Kara-khanid period was excavated from the top layer. In the upper layer, the tile fragments falling into the pit, overlapping diagonally was observed. These circumstances suggest that the feature was backfilled at the time of the disposal, but as the soil in the feature sank, depressions were created, and earthenware from the Kara-khanid period flowed into the depressions. Therefore, the burial period of the feature is thought to be as late as the Kara-khanid period, but the construction period may be older. The age and character of the feature will be clarified in the next year's investigation.

4.5. Tr.6 and Extended Area (Fig.4.2, 4.40-4.42)

According to the observation of soil layers in the northern cross-section of Tr. 6, which was cut off during the 2017 investigation, the accumulation of tiles was slightly higher on the eastern side and sloped toward the west. A large amount of charcoal and burnt soil was mixed in between the tile fragments, and a hard and well compacted soil was accumulated on the eastern side of the roof tile belt, which was presumed to be the feature of a building platform. In FY 2018, we reexamined the southern cross-section of that east-west trench and conducted the observation of a cross-section of the roof tile belt.

The southern cross-section can be divided into 11 layers, excluding the topsoil and cultivated soil layers (Fig.4.2 cross-section diagram). According to the observation of the soil layers on the south side, especially in layer 7, finely crushed animal bones were contained. In addition, small fragments of tiles were contained in the soil layer that is considered to be the platform layer, suggesting that the tile fragments may have been mixed in during the renovation and reconstruction of the platform

or the construction of the platform before the formation of this roof tile belt. Furthermore, the presence of post hole that appear to have been dug into the platform layer was noted.

4.6. Tr.7 and Extended Area (Fig.4.1, 4.42)

Tr.7 is an excavation area set at the southern end of Tr.1-6, which runs north-south, and at the eastern side of Tr.6. Since an accumulation of tiles was observed at the southeastern corner of the excavation area in 2017, the area was extended to 10×7 m to investigate the condition of the accumulation of tiles. As a result, a 1×1 m accumulation of tiles (discarding pit) was detected at the southern end of the tile belt bent to the east, but it did not appear to form an east-west roof tile belt toward the east, and was a partial and discontinuous accumulation of tiles.

4.7. Tr.8 (Fig.4.3, 4.13, 4.45)

Tr.8 is an east-west trench of 40m east-west and 4m north-south, set orthogonally to the east of Tr.6. The belt-shaped tile accumulation identified in the 2017 investigation included a sub-trench for a cutoff on the north wall side, and this trench is an extension to the east side. This trench was set to ascertain whether the roof tile belt detected in Tr. 5 and Tr. 6 was present on the corresponding eastern side of the site, assuming that it was the western row, and to understand the extent of the features.

The topsoil was removed during the summer 2017 investigation. During the 2018 investigation, it was excavated to about 20 cm below the ground surface, and a distribution of tiles was detected in the eastern part of Tr. 8 (near coordinates X38750 and Y17140). Most of the tiles were found on the south wall side, about 2m north of the south wall. In addition, a layer of small gravel about 3 m wide extending north-south was detected about 2 m east of this accumulation of tiles. This layer of small gravel was cut along the southern wall of Tr.8 and the status of the accumulation was confirmed, and this layer was assumed to be a road-like feature. It also turned out that there were several layers of small gravel pavement and tile accumulation. A continuation of the layer of small gravel is also found in the northeast corner of Tr. 9, which is more than 10 m long in a straight line tilted 18° to the west.

A 7 m sub-trench was also set along the north wall at 9 m from the west of Tr. 8 to investigate the lower layers. As a result, three layers of tiles were found in the lower layer 50 cm below the upper confirmation surface. If this location is within the building platform associated with the roof tile belt, it is presumed to be an accumulation of tiles used as the base of the foundation stone or mixed into rammed earth. It may also indicate that there may have been more than one building surface of the platform.

4.8. Tr.9 (Fig.4.3)

Tr.9 is a 9 x 9 m square excavation area set to the south of Tr.8. A continuation of the distribution of tiles detected in Tr.8 was found in the trench within an area of 2 m north-south and 4 m east-west near the north wall. The distribution is denser close to the north wall. In the northeast corner, as mentioned above, a layer of small gravel presumed to be a road feature was detected. The distribution continued outside the east wall at 4 m south of the north wall of this excavation area.

4.9. Tr.10 (Fig.4.3, 4.43, 4.44)

An excavation area of 14m east-west and 13m north-south was set up on the north and east side of Tr.8, and four sections were investigated leaving a cross section belt (Tr.10a, Tr.10b, Tr.10c, Tr.10d).

The distribution of tiles found in the eastern part of Tr.8 did not show any signs of continuation to

the north. However, as in the east-west trench, when we first dug down about 20 cm from the surface, we found a layer containing a large amount of small gravel continued in the shape of a belt up to around the coordinate X38760. Tiles were also diffusely confirmed at that level. When we continued digging down more carefully since slightly large tile fragments were found in some places, a belt-shaped row of relatively large tile fragments was confirmed in Tr. 10d. A distribution of tiles curving in the shape of a belt from the south wall toward this belt-shaped features was also confirmed. Tr.10c also shows a similar belt-shaped distribution of tiles, but near the southern belt of the cross section belt of this section, a slightly large amount of burnt soil and slag were found during the excavation.

The sections north of the coordinate X38760 (Tr.10a and Tr.10b) were also dug down about 20cm below the surface to confirm the features. However, although tile fragments were unearthed during the excavation, we were not able to detect any features with the tile fragments spreading over certain area. However, in Tr.10b, a belt-shaped feature of silt with a width of about 20 cm and a westward deflection of 5 degrees was detected.

As for the L-shaped accumulation that seems to be paved with tile fragments, we are assuming that it is the foundation of a building at this point. It is thought to have been constructed by laying down tile fragments and then building a clay wall on top of it, but no superstructure such as sun-dried bricks has been detected.

4.10. Tr.11 (Fig.4.2, 4.15)

An excavation area of 4×4 m was set up on the east side of Tr. 5 to see if the rain-permeable ditch detected on the north side of Tr. 5 continued to the east. As a result, a 1×1.2m square feature surrounded by greyish burnt bricks was detected at a depth of about 0.3m on the western side of the excavation area. As the greyish burnt bricks themselves are identical to those used in the construction of the rain-permeable ditch, it seems to be a feature with the greyish burnt bricks removed, and reused in later periods. There were no other features, and no accumulation of tiles associated with the rain-permeable ditches was found.

4.11. Artifacts from SH2 (Fig.4.48-4.105 : 15-18-001–125)

001-010 are earthenware, 011-013 are clay objects, 014-017, 019 and 020 are metal objects, 018 is a bone artifact, 021-033 are decorative caps of eave-end tile, 034-042 are convex tile parts of eave-end tile, 043-077 are concave tiles, 078-089 are convex tile, 090-115 are ridge tiles, 116-123 are greyish burnt bricks, and 124 and 125 are foundation stones.

- Earthenware

001 is oval-particle earthenware decorated with oval clay excavated from Tr. 6, which is gray in color and fired in a reducing flame. 002 is a bowl excavated from the upper layer of a well-like pit, with a large wavy comb pattern on the lip. 003 is a pot excavated from Tr.10a. 004 is a plate of glazed ware excavated from near the stone mosaic of Tr.5. 005 is a bowl shaped cooking pot excavated from Tr.8. 006 is a pot excavated from the southern end of Tr.6. 007 is a bowl excavated from Tr.5. 008 is a large bowl excavated from Tr.7. 009 is a long-necked jar excavated from the western extended area of Tr.6. 010 is a lid excavated from Tr.5.

- Clay objects, stone artifacts, metal objects, and bone artifacts

011 is an earthenware fragment with striations on the surface, excavated from Tr.5. 012 and 013 are pierced clay discs, 012 uses earthenware fragment 014 is a pierced stone disc.

015 is a board-shaped stone artifact excavated from Tr.5.

016 is a bronze ring excavated from Tr.5. 017 is a bronze ornament (belt end tip) excavated from the well-like pit. 019 and 020 are bronze plates excavated in the roof tile belt accumulated

on the floral stone mosaic.

018 is a button-shaped stone artifact with six swirl patterns engraved on the side.

- **Decorative caps of eave-end tile**

021-033 are decorative caps. 021 is an eave-end tile at the top of the ridge, with a narrow plain band and a large bead pattern. The pattern of the lotus flower is unknown. 022-024 are double-petaled four-petaled lotus flower pattern, with slightly large bead patterns. 029 is probably the same pattern. 025-028 are six- to seven-petaled lotus flower patterns with a circle line running between the plain band and bead bands, and 030 and 031 are considered to be the same patterns. 033 has a similar pattern with a lotus flower pattern, but it does not have a circle line between the plain band and bead bands. 032 seems to be a fine petal lotus flower pattern, and the bead patterns are small and numerous.

The above four types, Type 1A (six- to seven petaled lotus flower patterns [heavy circle type]), Type 1B (six to seven petaled lotus flower patterns [no heavy circle type]), Type 2 (double-petaled four-petaled lotus flower pattern), and Type 3 (fine petal lotus flower pattern), were confirmed. As for 021, there is a possibility that it is Type 2, but we would have to say that the pattern of the inner part is unknown, and it is presumed that there may be another type.

Among these, 024, 025, 027, 031, and 033 are materials that show the joining technique of the back of the eaves tile section with the convex tile section. Type 1A, 025, 027, has striations. Type 1B, 033, and Type 2, 024, have continuous incisions.

- **Convex tile parts of eave-end tile**

034-042 are materials that have positive continuous incisions at the edge of convex tile. Since the edges are perpendicular to the convex tile section, they are all convex tile sections that connect to the eave-end tile. The continuous incisions at the edge of the convex tile section are transcripts of the incisions on the back of the eave-end tile. 041 has imitation bone traces on the inner surface of the convex tile section.

- **Concave tile**

043-077 are concave tiles, 043-064 are large materials whose widths or lengths can be determined, and 065-077 are small fragments that show the production techniques in the cloth marks and tub-shaped marks.

Concave tile is made by rolling around a tub : to cover the mold of a tub, which appears to be almost cylindrical, with cloth, and according to the observation of its front and back surfaces, we can see horizontal wrinkles and find accumulation marks about 4cm wide, indicating that it is formed by the rolling-up or coiling. It is then cut from the inside and divided into four sections. According to the observations on both sides, a dividing line (incision) was made vertically from the inside to one-third to one-half of the cross-sectional thickness, and then it was split. Therefore, the outer two-thirds to one-half of the cross-sectional thickness (convex side) becomes a dividing surface and remains unadjusted. The lower end surface is adjusted by scraping obliquely, and the upper end surface is adjusted by smoothing to give a round cross-sectional shape. The outer surface is tapped longitudinally without pattern and then smoothed horizontally, and the inner surface is left with cloth marks.

The standard size after firing is 24 cm in width and 39 cm in height (length). Assuming that the size is reduced by about 10% due to firing, one concave tile can be estimated to be 26 cm wide and 43 cm high before firing. The mold of tub is made by connecting thin plates of about 2 cm in width to form a round tub shape, and it seems that the size of the tub is about 32 cm in diameter at the bottom, 30 cm in diameter at the top, and 43 cm in height, making it almost cylindrical in shape. On the inner side edge of the concave tiles, there are dents on the top and bottom of the tiles that look as if they have been pressed with a finger over a cloth. The tiles are divided

vertically through the center of the dents, which is thought to be a division mark. Based on the above production techniques, the production procedure can be organized as follows. (1) Cover the cylindrical mold of tub with a cloth bag. (2) Roll up the clay coil from the bottom. (3) Tap the surface with a tapping board to make it smooth. (4) Adjust the top edge surface by smoothing the outside surface horizontally. (5) Turn it over and scrape the bottom surface. (6) Remove the tub mold, place a dividing point on the inner surface, and remove the cloth bag. (7) Make four division lines on the inner surface and let it dry. (8) Divide into four parts and dry.

043 is a concave tile with a width of 23.5-24.5 cm that retains its bottom surface and has a dividing point at a height of 8 cm from the bottom edge. The outer surface has nine longitudinal tapping traces made by an elongated tapping plate. 044 has cloth marks with two vertical seams, and leaves traces of coiling 3.5-4.5 cm wide, and this material is 24.5-25.5 cm wide. The lower end surface remains, and there is a dividing point at a height of 6.5 to 8 cm from the lower end surface. 045 is a material that retains the top surface, with a width of 24cm. On the inner surface, wrinkles from the coiling remain in the horizontal direction, indicating the clay coil of 4 to 5.5 cm wide. The inner surface has about ten tub-shaped traces, and the outer surface has slightly inclined tapping traces and is horizontally smoothed. 046 is 24 cm wide, and the lower end surface remains. 047 is a material that retains the top and bottom end surfaces, and is 39 cm high. The lower end surface is scraped, and the upper end surface is smoothed and rounded. It has a dividing point at a height of 9 cm from the lower end surface. The outer surface is tapped vertically and then smoothed horizontally. 48 is a material that retains its upper end surface, 23 cm wide, with an coiling of 4-6 cm wide. The dividing point is located 15cm from the upper end surface. 049 is 24 cm wide and leaves a bottom edge surface, and cloth binding traces vertically on the inner surface. The cross section has traces of coiling, and there is a dividing point at a height of 9.5 cm from the lower end surface. 050 is 23.5 cm wide, with the top end surface remaining, vertical binding traces on the inner surface, and a dividing point 3 cm below the top end surface. 051 is 23 cm wide and 39 cm high, with dividing points 6 cm above the bottom end surface and 6 cm below the top end surface. The outer surface has four traces of deep horizontally smoothed, and the inner surface has vertical binding traces. 052 is 25 cm wide and the lower end surface remains. The dividing point is located 6-7 cm above the lower end surface. On the inner surface of the lower end, there are adjustment traces made by continuous pressure from above the cloth. 053 is 23.5 cm wide and 38 cm high, and because the cloth did not cover 4 cm from the bottom edge surface, the traces of tub mold remain directly on it. The tub mold is made of thin boards about 2cm wide joined together. 054 is 24 cm wide and is made by coiling. There is a dividing point 8.5 cm above the bottom end surface, and the lower edge of the inner surface has continuous pressures similar to 052. 055 is 23 cm wide and 38.5 cm high, with several adjustments by longitudinally smoothed or fingertip pressing-like traces in the center of the inner surface. The dividing points are located 8 cm above the lower end surface and 4 cm below the upper end surface. 056 is 23.0-24.5 cm wide with a dividing point 10 cm above the lower end surface. 057 is 23.5 cm wide with a coiling trace. 058 is 24 cm wide with a dividing point 9 cm above the lower end surface. 059 is 24cm wide. 060 is 24cm wide with a dividing point 7 cm above the lower end surface. 061 is 22 cm wide on the top end surface side and has a dividing point 5 cm below the top end surface. 062 is 23cm wide with a trace of coiling, and there is a dividing point 2.5cm below the top end surface. 063 is 23cm wide. 064 is narrow with a width of 16.5cm and has a vertically dividing incision in the center of the inner surface. It seems that this has been made by dividing an ordinary concave tile vertically into three pieces and planning to produce three ridge tiles of about 8 cm in width, and two of the three ridge tiles have been made into concave tiles without being divided. The dividing point remains at 8 cm above the lower end surface. 065 has a

trace of tub mold with a width of 4 cm at the lower end, and the width of the tub plate is about 2 cm. 067 and 072 are similar materials. 068 is a material that retains vertical division lines on the inner surface. 070, 074, and 076 are similar artifacts, but 076 contains three incisions on the outer surface in the horizontal and oblique directions. 071 is a material that has a pressing with square cloth marks on the outer surface. The cause of the cloth marks on the outer surface is unclear, although it may be related to the large number of fingertip marks around it. 073 is a L-shaped binding trace on the inner surface. 077 has an impression of snail on the outer surface.

- **Convex tile**

078-089 are convex tiles. These are the tiles with the widths remaining and upper or lower ends visible. 078-080, 083, 084, 088, and 089 are the ones with the upper ends (on jewelled edge sides) remaining, and 081, 082, 085, and 087 are the ones with lower ends remaining. Since they are all fragmentary materials, there is no example with a known length (height).

The convex tiles are all of the jewelled edge type, with cloth marks on the inner surface and faint vertical rope-tapping traces on the outer surface, which are then smoothed. There are several variations of the jewelled edge part: some are smoothed roundly on the top end surface, some are adjusted to be flat, and some have a short or slightly long jewelled edge. Observing the cross-section of the jewelled edge section, the clay coil is wrapped around the cone section of a wooden mold corresponding to the jewelled edge section, and then the convex tile section is rolled up. As in the case of concave tiles, the sides are divided into two parts by placing vertical dividing lines on the inner surface. On the sides, a dividing line is placed from the inner side to a depth of one-third to one-half, and because the tile is divided, a divided surface remains on the outer side, which is left unadjusted.

In summary, the production techniques of convex tiles can be summarized as follows. (1) A cylindrical wooden mold with a conical upper end is covered with a cloth bag. (2) Wrap the clay coil around the cone section and then the convex tile section. (3) The outer surface is tapped with a rope vertically and adjusted by smoothed horizontally. (4) Adjust the jewelled edge of the tile by smoothing. (5) Pull out the wooden mold, flip it over and scrape the bottom end surface. (6) Put a dividing line on the inner surface and let it dry. 7) Divide into two parts and dry.

- **Ridge tile**

090-115 are ridge tiles. These are long, narrow tiles made by dividing a concave tile vertically into two or three sections. The outer surfaces are shaped by smoothing, and the inner surfaces have cloth marks. Since all of them are fragments and there are no materials that reveal the full shape, the length of the tiles is unknown, but if these were made using the same tub mold as the concave tile, the vertical length is estimated to be originally about 38 cm. The breadth is 5 to 8 cm, and the thickness is 1.3 to 2 cm. The curve of the arc of the horizontal cross-section is about the same as that of a concave tile. As for the end surfaces, there are examples that are adjusted roundly by smoothing (093, 095, 096, 098, 100, 103, 106, 108, 109, 111, 112, 115), and examples that are adjusted flatly by scraping (090, 091, 094, 097, 099, 101, 102, 104, 105, 107, 110, 113, 114). Furthermore, there are examples with dividing points closer to the sides of the inner surface (090, 092, 095, 103, 106, 107, 108), and examples that leave roll-up traces on the cross-section (100). Therefore, it can be assumed that the production technique is similar to that of the concave tiles made by rolling around a tub with the bottom end surface scraped and the top end surface smoothed, and that the tub mold used is the same as that used to make concave tiles. A ridge tile is a long, narrow tile made by dividing a convex tile in this way into four parts by rolling around a tub and then dividing each of the four parts into two or three more parts. Therefore, it is highly likely that the vertical length was the same as that of the convex tile, and it is estimated that the original length was about 39 cm. However, the inclusion of products that are clearly thinner than

convex tiles suggests that the tiles were made thin from the beginning with the intention of making ridge tiles. The sides are left with a divided surface that have been created by dividing either the right or left side of the tile by placing a dividing line on the inner surface, and a smoothing adjustment is added to the divided surface on one side. The most distinctive feature of these tiles is that only one side is adjusted by smoothing. This is thought to be because when the ridge tiles are placed over a ridge tile, only the side that is visible on the front is adjusted, while the side that is hidden on the back is left unadjusted. As for the side to be adjusted, according to the examples with the top edge and the bottom edge remaining, 090, 091, 096, 097, 101, 105, and 111 are examples adjusting the right side when the inner surface is up, and 093, 094, 095, 098, 099, 100, 102, 103, 104, 106, 107, 108, and 109 are examples adjusting the left side, and although there tends to be slightly more examples of adjustment by smoothing on the left side than on the right side, the difference is not prominent.

The techniques used to make ridge tiles can be summarized as follows. (1) Cover the tub mold with a cloth bag and roll up the clay. (2) Adjust the top edge by smoothing and scrape the bottom edge. (3) Remove the tub mold and draw a dividing line connecting the dividing points on the inner surface and divide the tile into four pieces. (4) In addition, one or two dividing lines are placed vertically on the inner surface of one concave tile, and the tile is divided into two or three pieces. (5) Smoothing is applied to the divided surface on one side only.

- Greyish burnt brick

106-123 are greyish burnt brick. They are blocks that are fired in a reducing flame, grayish or grayish brown in color. There are no complete examples, and their length is unknown. However, they are rectangular with a length of more than 27 cm, a width of about 16 cm, and a thickness of about 5-6 cm, and their size is standardized. The sides all have no pattern, and while the front and back sides are unclear, there are examples with cord impressions on both sides (122), on one side (119, 123), and a smoothened example (121). The cord impression seems to be left by the tapping technique, and it is assumed that the production technique is to fill the mold with clay and adjust one or both sides by tapping a rope. As for the cord impressions, they are thought to be caused by the densely wound ropes on a tapping board, but the continuity of the cord impressions at a certain angle to the long axis of the greyish burnt brick suggests that the cord was wound diagonally around the tapping board. However, there is not enough evidence to reconstruct the production technique, such as how the rope was wound around the tapping board and the direction of the tapping, or the tapping movement, which are issues for the future.

- Foundation stone

124 is a foundation stone collected in SH2, near the intersection of the three-way street near the northwest corner of SH2a. It is thought to have been a foundation stone for a platform building that may have originally existed in the central part of SH2, but it was moved to a corner of the field during leveling after 1967. It is a kind of grayish brown granite, 47 cm square and 12-22 cm thick. On the surface, traces of flattening by chiseling remain in a series of parallel lines, and the size and quality of the stones are similar to those of the foundation stones collected near the site of the second Buddhist temple, suggesting that there was a standardization in size. In SH2, besides the illustrated material, there is a foundation stone collected in 2017 within the SH2 central area, northwest of the AKB-15. It is an irregular pentagonal reddish granitic rock, 75cm x 72cm, 17cm thick, and is thought to have originally been a 75cm square. It leaves traces of chiseling on the surface and sides. This material is now stored in the city of Tokmok.

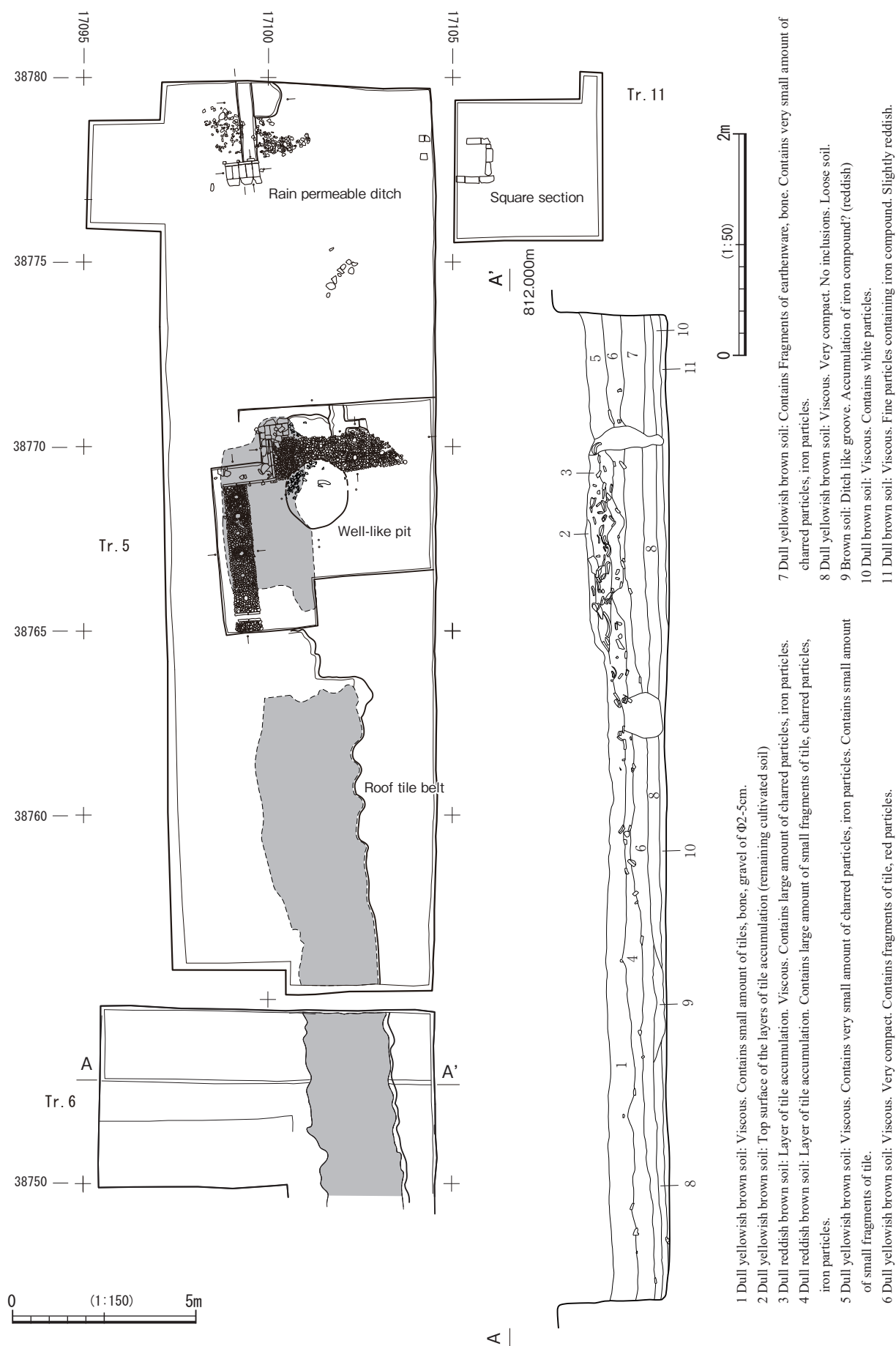


Fig.4.2 Tr.5, 6, 11 in AKB-15

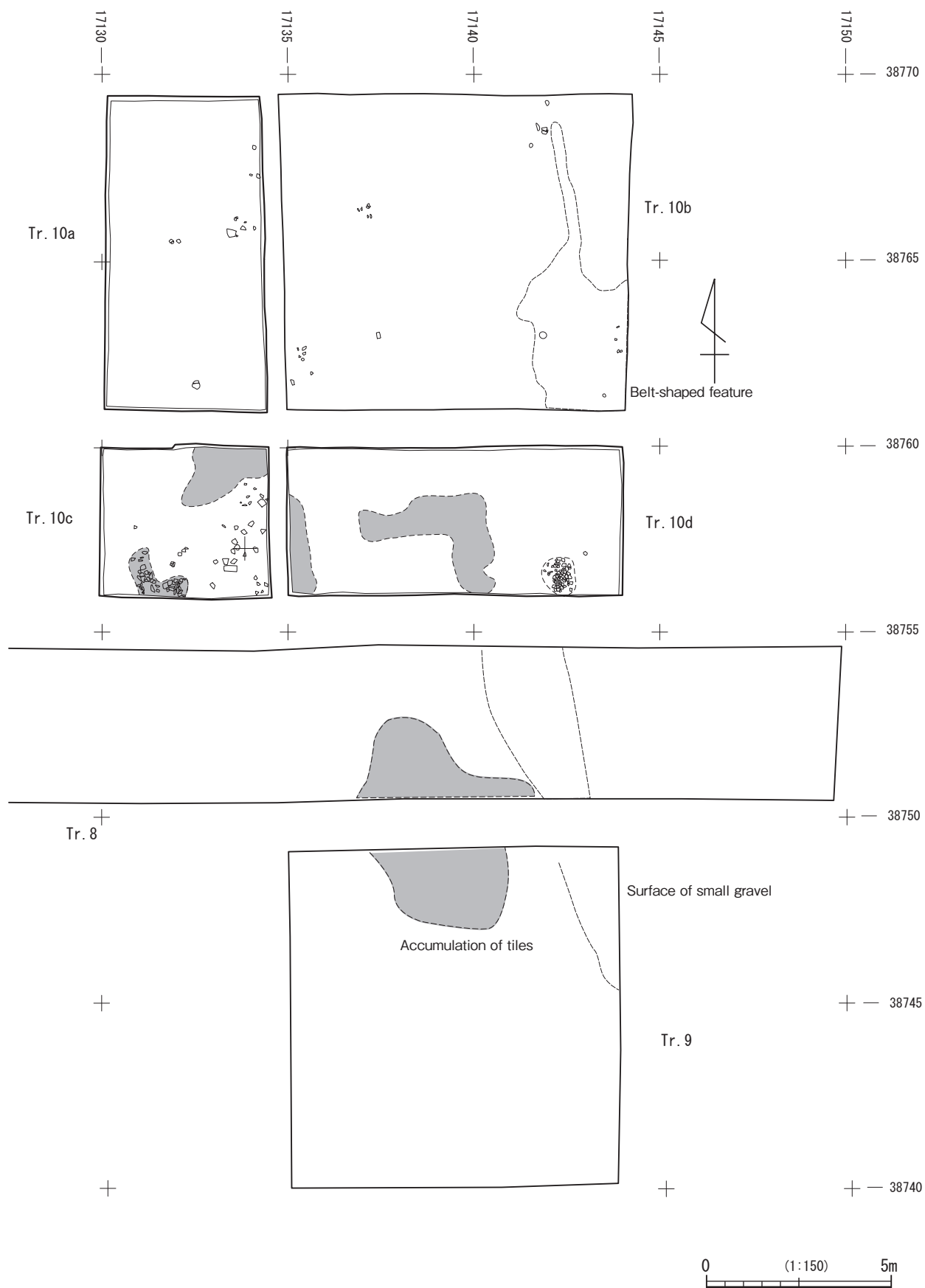


Fig.4.3 Tr.8-10 in AKB-15

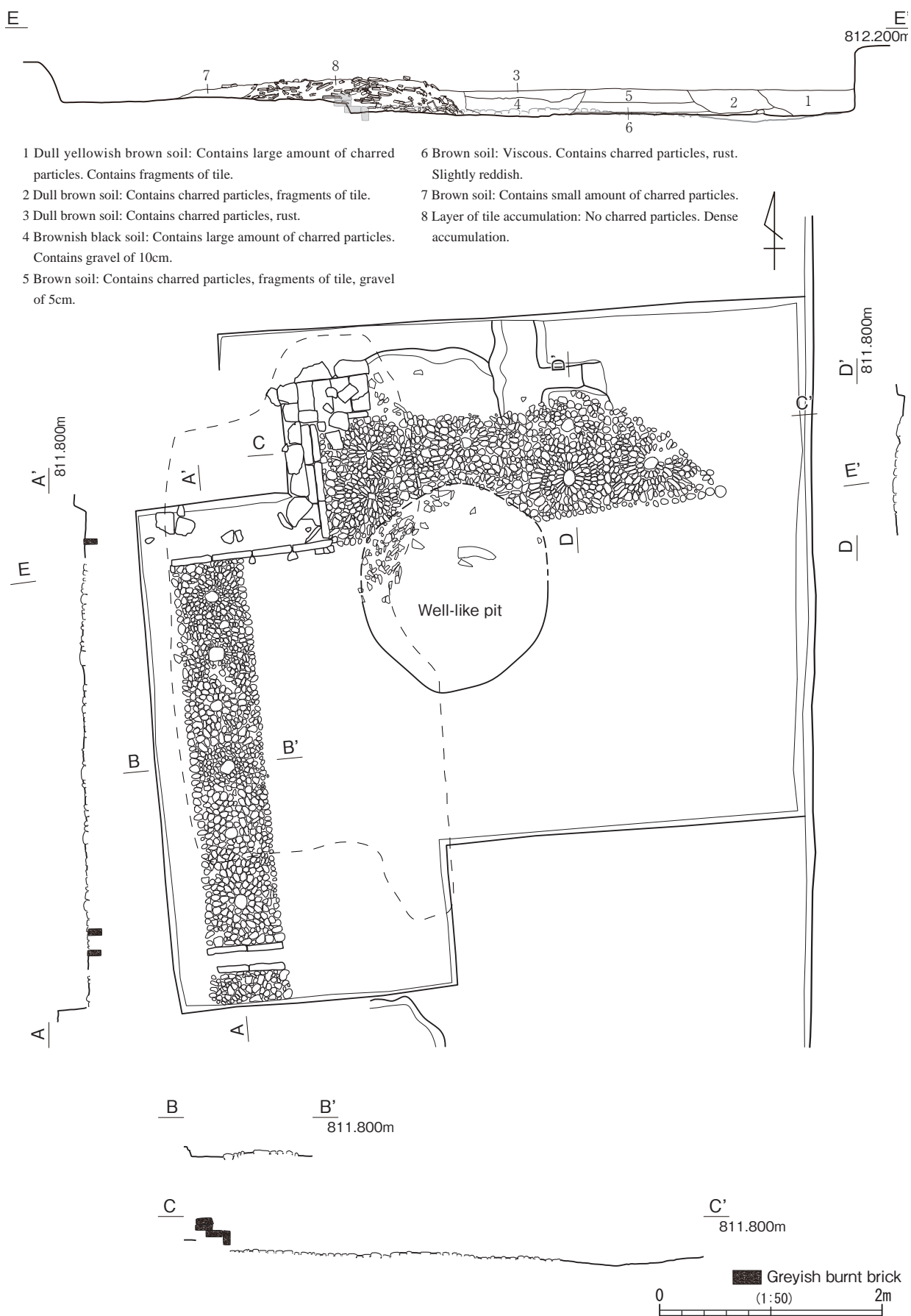


Fig.4.4 Floral stone mosaic, well-like pit in AKB-15

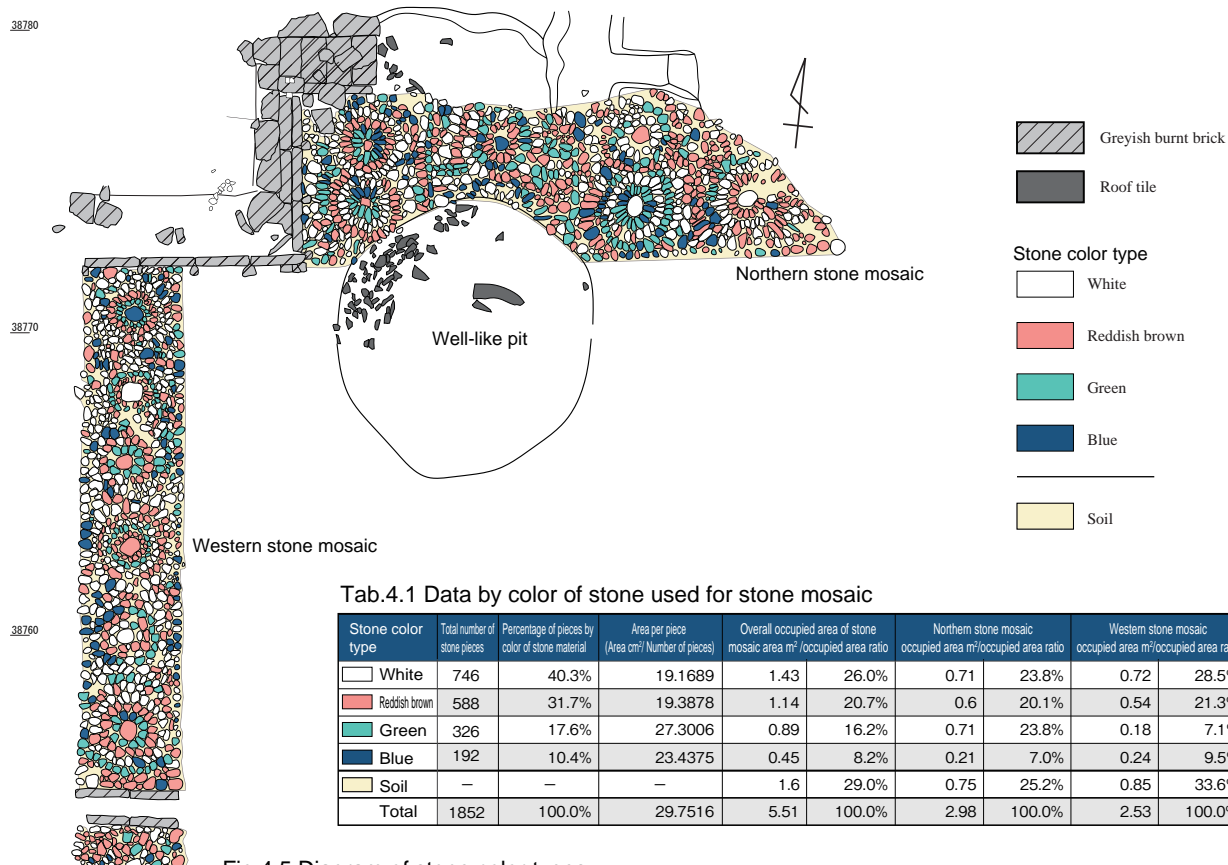


Fig.4.5 Diagram of stone color types

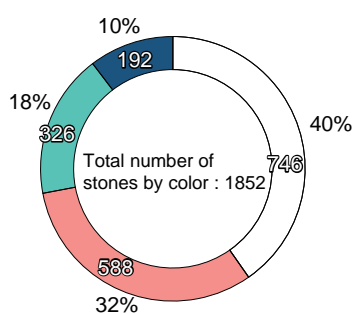
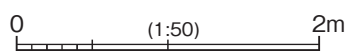


Fig.4.6 Composition of the stone mosaic (percentage of number of pieces by color)

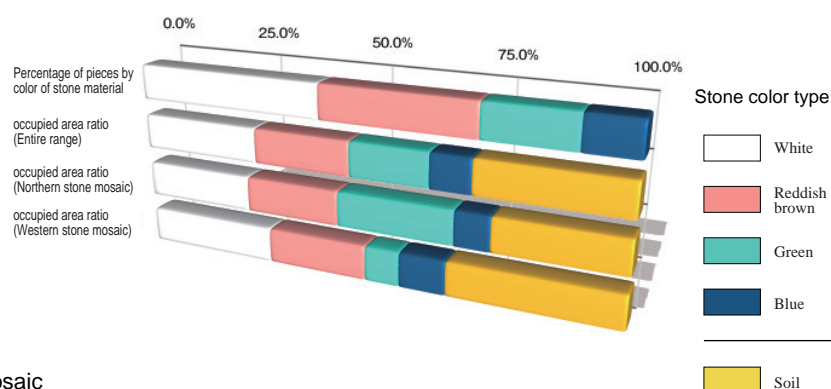
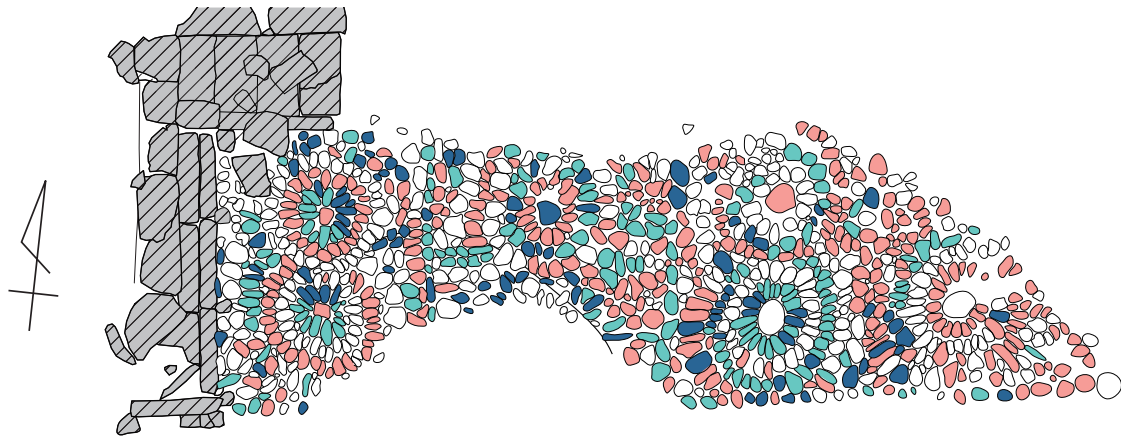


Fig.4.7 Composition of the stone mosaic (number of pieces by color and occupied area ratio)



- Flower motifs : Central stone material
- Arrangement of stones



Fig.4.8 Arrangement tendency of north side stone mosaic

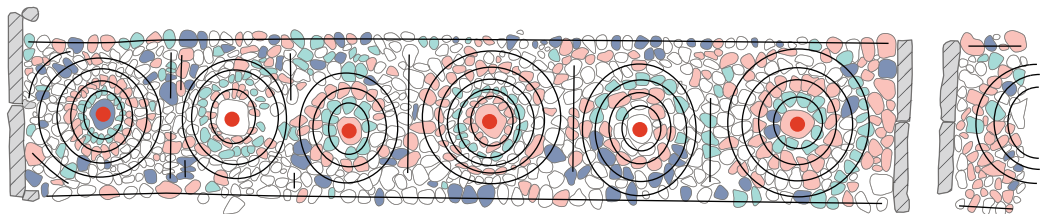
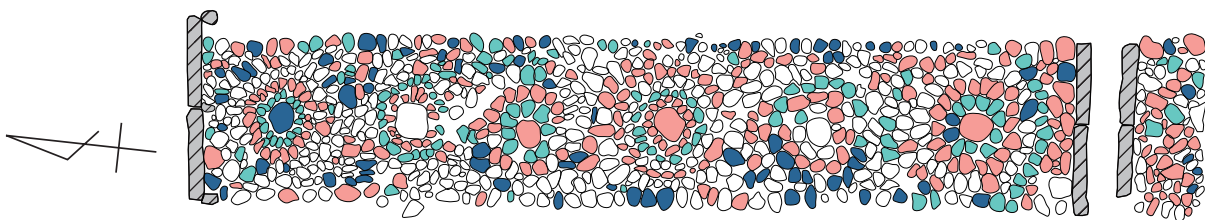
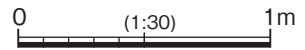
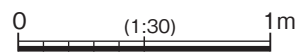
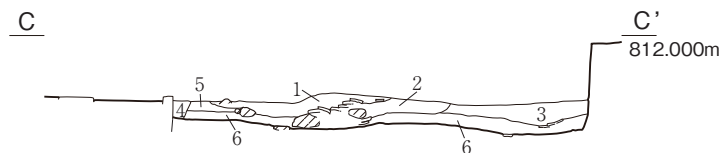
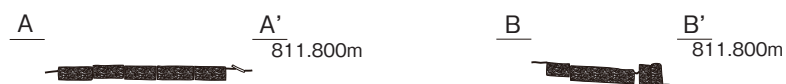
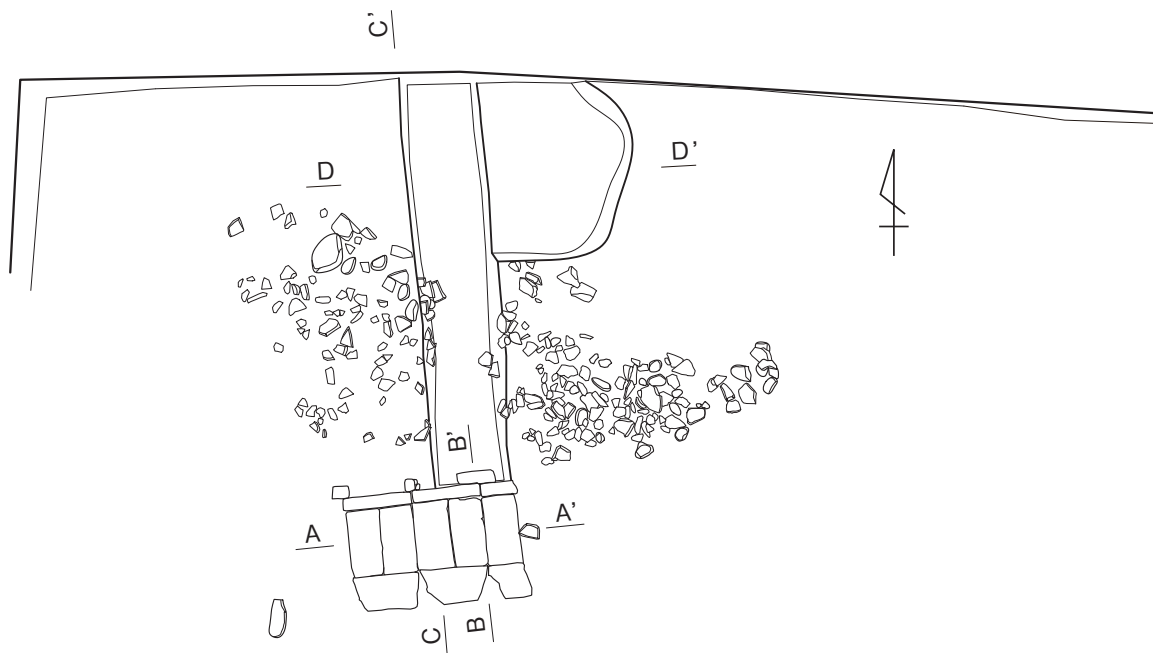


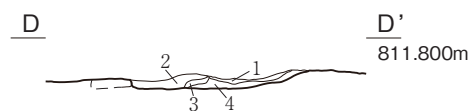
Fig.4.9 Arrangement tendency of west side stone mosaic





- 1 Brown soil: Very viscous.
- 2 Brown soil: Very viscous. Contains charred particles, burnt particles.
- 3 Brown soil: Contains white clay particles.
- 4 Brown soil: Way of digging.
- 5 Brown soil: Similar to layer 3.
- 6 Brown soil: Contains charred particles.

furnace



- 1 Brownish black soil: Contains brown particles, charred particles, burnt particles.
- 2 Dull yellowish brown soil: Contains sand, clay particles, charred particles.
- 3 Brown soil: Contains small amount of sand, small amount of charred particles, burnt particles.
- 4 Brown soil: Fine particles. Contains small amount of rust, very small amount of charred particles.

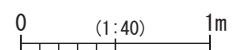


Fig.4.10 Rain-permeable ditch in Tr.5, AKB-15



Fig.4.11 Distant view of the excavation area of AKB-15 and SH2 (from east)



Fig.4.12 Full view of the excavation area



Fig.4.13 Tr.5 and its vicinity



Fig.4.14 Floral stone mosaic in AKB-15



Fig.4.15 Rectangular section with the diversion of greyish burnt bricks in Tr.11



Fig.4.16 Roof tile belt after expansion of Tr.5



Fig.4.17 Platform-shaped feature and rain-permeable ditch made of greyish burnt brick in Tr.5 (from north)



Fig.4.18 Rain-permeable ditch made of greyish burnt brick (from north)



Fig.4.19 Rain-permeable ditch in Tr.5 during excavation (from north)



Fig.4.20 Stone mosaic unearthed from the lower layer of the roof tile belt in Tr. 5 (from north)



Fig.4.21 Stone mosaic unearthed from the lower layer of the roof tile belt in Tr. 5 (from north)



Fig.4.22 Cross-section of tile accumulation in roof tile belt and stone mosaic (from north)



Fig.4.23 Investigation scene near the stone mosaic in Tr.5



Fig.4.24 Floral stone mosaic in Tr.5 (from northeast)



Fig.4.25 Floral stone mosaic in Tr.5 (west side stone mosaic, from east)



Fig.4.26 Floral stone mosaic in Tr.5 (corner part, from northwest)



Fig.4.27 Floral stone mosaic in Tr.5 (north side stone mosaic, from south)



Fig.4.28 Floral stone mosaic in Tr.5 (west side stone mosaic, close up)



Fig.4.29 Floral stone mosaic in Tr.5 (west side stone mosaic, close up)



Fig.4.30 Floral stone mosaic in Tr.5 (near the corner, close up)



Fig.4.31 Floral stone mosaic in Tr.5 (near the north side stone mosaic, from north)



Fig.4.32 Floral stone mosaic in Tr.5 (west side stone mosaic, close up)



Fig.4.33 Floral stone mosaic in Tr.5 (west side stone mosaic, close up)



Fig.4.34 Floral stone mosaic in Tr.5 (north side stone mosaic, close up)



Fig.4.35 Well-like pit in Tr.5 during excavation (from north)



Fig.4.36 Cross-section of upper layer of well-like pit in Tr.5 (from north)



Fig.4.37 Backfilling of the floral stone mosaic with sand for conservation



Fig.4.38 Installation of fences around AKB-15 (from south)



Fig.4.39 Excavation of the lower layer of the roof tile belt



Fig.4.40 Roof tile belt in Tr.6 (from north)



Fig.4.41 Cross-section of roof tile belt in Tr.6 (from north)



Fig.4.42 Roof tile belt near Tr.6 and Tr.7



Fig.4.43 L-shaped roof tile belt in Tr.10 d



Fig.4.44 L-shaped roof tile belt in Tr.10 d
(from southwest)



Fig.4.45 Tile accumulation in sub-trench within Tr.8



Fig.4.46 Sorting artifacts at the hotel

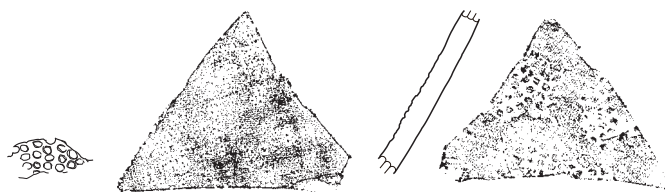


Fig.4.47 Top surface and cross-section of floral stone mosaic in Tr.5

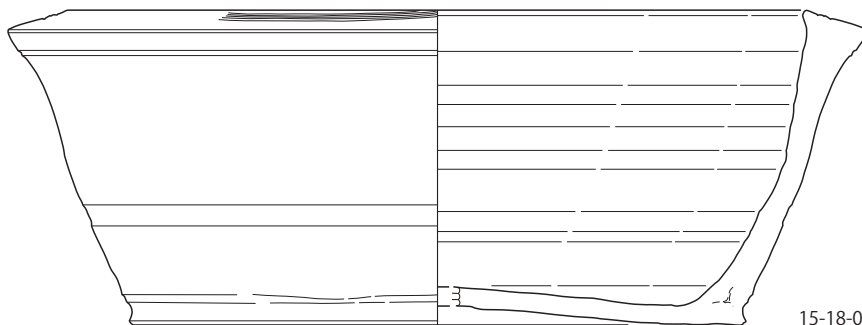
Tab.4.2 List of unearthed materials from AKB-15

No.	fig	Feature	Classification	Type
15-18-001	4.41	Trash pit of Tr.7	Earthenware	Pot
002	4.41	Well-like pit of Tr.5	Earthenware	Bowl
003	4.41	Tr.10a	Earthenware	Pot
004	4.41	Top surface of Tr.5 stone mosaic	Glazed ware	Dish
005	4.41	Tr.8	Earthenware	Cooking pot
006	4.41	Tr.6.7	Earthenware	Pot?
007	4.41	Tr.5	Earthenware	Bowl
008	4.42	Tr.7	Earthenware	Bowl
009	4.42	Tr.6	Earthenware	Long-necked jar
010	4.42	Tr.5	Earthenware	Lid
011	4.42	Tr.6	Earthenware	
012	4.42	Tr.10a	Clay object	Clay disc
013	4.42	Tr.9	Clay object	Clay disc
014	4.42		Stone artifact	Pierced disc
015	4.42	Tr.5	Stone artifact	Unknown stone artifact
016	4.42	Tr.5	Copper	Ring
017	4.42	Well-like pit of Tr.5	Copper	Stud
018	4.42	East side of the top surface of Tr.5 stone mosaic	Animal bone	Button
019	4.42	Tr.5	Copper	
020	4.42	East side of the top surface of Tr.5 stone mosaic	Copper	
021	4.43	Top surface of Tr.5 stone mosaic	Roof tile	Eave-end tile
022	4.43	Tr.5	Roof tile	Eave-end tile
023	4.43	Top surface of Tr.5 stone mosaic	Roof tile	Eave-end tile
024	4.43	Tr.5	Roof tile	Eave-end tile
025	4.43	Tr.6	Roof tile	Eave-end tile
026	4.43	Tr.8	Roof tile	Eave-end tile
027	4.43	Top surface of Tr.5 stone mosaic	Roof tile	Eave-end tile
028	4.43	Tr.5	Roof tile	Eave-end tile
029	4.43	Tr.6	Roof tile	Eave-end tile
030	4.44	Tr.6	Roof tile	Eave-end tile
031	4.44	Tr.5	Roof tile	Eave-end tile
032	4.44	Top surface of Tr.5 stone mosaic	Roof tile	Eave-end tile
033	4.44	Tr.5	Roof tile	Eave-end tile
034	4.44	Top surface of Tr.5 stone mosaic	Roof tile	Eave-end tile
035	4.44	Top surface of Tr.5 stone mosaic	Roof tile	Eave-end tile
036	4.44	Top surface of Tr.5 stone mosaic	Roof tile	Eave-end tile
037	4.45	Top surface of Tr.5 stone mosaic	Roof tile	Eave-end tile
038	4.45	Tr.6	Roof tile	Eave-end tile
039	4.45	Top surface of Tr.5 stone mosaic	Roof tile	Eave-end tile
040	4.45	Top surface of Tr.5 stone mosaic	Roof tile	Eave-end tile
041	4.45	Top surface of Tr.5 stone mosaic	Roof tile	Eave-end tile
042	4.45	Top surface of Tr.5 stone mosaic	Roof tile	Eave-end tile
043	4.46	Tr.6	Roof tile	Concave tile
044	4.47	Tr.6	Roof tile	Concave tile
045	4.48	Tr.6	Roof tile	Concave tile
046	4.48	Tr.6	Roof tile	Concave tile
047	4.49	Tr.6	Roof tile	Concave tile
048	4.49	Tr.6	Roof tile	Concave tile
049	4.50	Tr.6	Roof tile	Concave tile
050	4.50	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile
051	4.51	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile
052	4.51	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile
053	4.52	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile
054	4.52	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile
055	4.53	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile
056	4.54	Tr.6	Roof tile	Concave tile
057	4.54	Tr.6	Roof tile	Concave tile
058	4.55	Tr.6	Roof tile	Concave tile
059	4.55	Tr.6	Roof tile	Concave tile
060	4.56	Well-like pit of Tr.5	Roof tile	Concave tile
061	4.56	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile

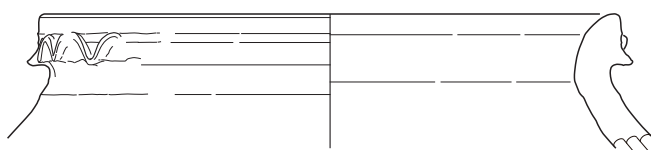
No.	fig	Feature	Classification	Type
062	4.57	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile
063	4.57	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile
064	4.57	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile
065	4.58	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile
066	4.58	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile
067	4.58	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile
068	4.58	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile
069	4.58	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile
070	4.59	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile
071	4.59	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile
072	4.59	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile
073	4.59	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile
074	4.60	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile
075	4.60	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile
076	4.60	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile
077	4.60	Trash pit of Tr.7	Roof tile	Concave tile
078	4.61	Tr.6	Roof tile	Convex tile
079	4.61	Tr.6	Roof tile	Convex tile
080	4.61	Tr.6	Roof tile	Convex tile
081	4.62	Tr.6	Roof tile	Convex tile
082	4.62	Tr.6	Roof tile	Convex tile
083	4.62	Tr.6	Roof tile	Convex tile
084	4.63	Tr.6	Roof tile	Convex tile
085	4.63	Tr.6	Roof tile	Convex tile
086	4.63	Tr.6	Roof tile	Convex tile
087	4.64	Tr.6	Roof tile	Convex tile
088	4.64	Trash pit of Tr.7	Roof tile	Convex tile
089	4.64	Tr.7	Roof tile	Convex tile
090	4.65	Tr.6	Roof tile	Ridge tile
091	4.65	Tr.6	Roof tile	Ridge tile
092	4.65	Tr.6	Roof tile	Ridge tile
093	4.65	Tr.6	Roof tile	Ridge tile
094	4.65	Tr.6	Roof tile	Ridge tile
095	4.65	Tr.6	Roof tile	Ridge tile
096	4.66	Tr.6	Roof tile	Ridge tile
097	4.66	Tr.6	Roof tile	Ridge tile
098	4.66	Tr.6	Roof tile	Ridge tile
099	4.66	Tr.6	Roof tile	Ridge tile
100	4.66	Tr.6	Roof tile	Ridge tile
101	4.66	Tr.6	Roof tile	Ridge tile
102	4.66	Tr.6	Roof tile	Ridge tile
103	4.67	Tr.6	Roof tile	Ridge tile
104	4.67	Tr.6	Roof tile	Ridge tile
105	4.67	Tr.6	Roof tile	Ridge tile
106	4.67	Tr.6	Roof tile	Ridge tile
107	4.67	Tr.6	Roof tile	Ridge tile
108	4.67	Tr.6	Roof tile	Ridge tile
109	4.67	Trash pit of Tr.7	Roof tile	Ridge tile
110	4.68	Trash pit of Tr.7	Roof tile	Ridge tile
111	4.68	Trash pit of Tr.7	Roof tile	Ridge tile
112	4.68	Trash pit of Tr.7	Roof tile	Ridge tile
113	4.68	Trash pit of Tr.7	Roof tile	Ridge tile
114	4.68	Trash pit of Tr.7	Roof tile	Ridge tile
115	4.68	Trash pit of Tr.7	Roof tile	Ridge tile
116	4.69	Top surface of Tr.5 stone mosaic	Clay object	Greyish burnt brick
117	4.69	Top surface of Tr.5 stone mosaic	Clay object	Greyish burnt brick
118	4.69	Trash pit of Tr.7	Clay object	Greyish burnt brick
119	4.69	Tr.5	Clay object	Greyish burnt brick
120	4.69	Tr.7	Clay object	Greyish burnt brick
121	4.69	Trash pit of Tr.7	Clay object	Greyish burnt brick
122	4.70	Clay object	Clay object	Greyish burnt brick
123	4.70	Tr.5	Clay object	Greyish burnt brick
124	4.71	Surface collection	Stone artifact	Foundation stone
125	4.71	Surface collection	Stone artifact	Foundation stone



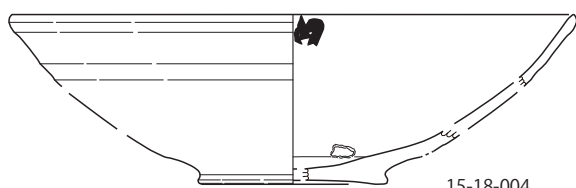
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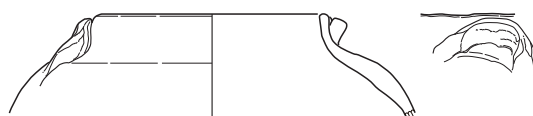
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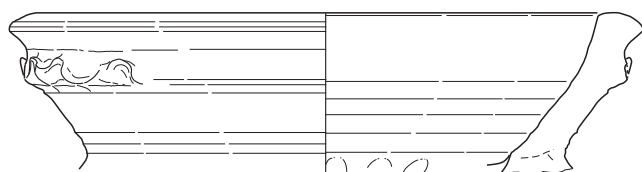
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15-18-004



15-18-005



15-18-006



15-18-007

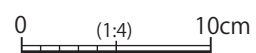


Fig.4.48 Artifacts from AKB-15(1) trash pit in Tr.7 (15-18-001), well-like pit in Tr.5 (15-18-002), Tr.10a (15-18-003), top surface of stone mosaic in Tr.5 (15-18-004), Tr.8 (15-18-005), Tr.6.7 (15-18-006), Tr.5 (15-18-007)

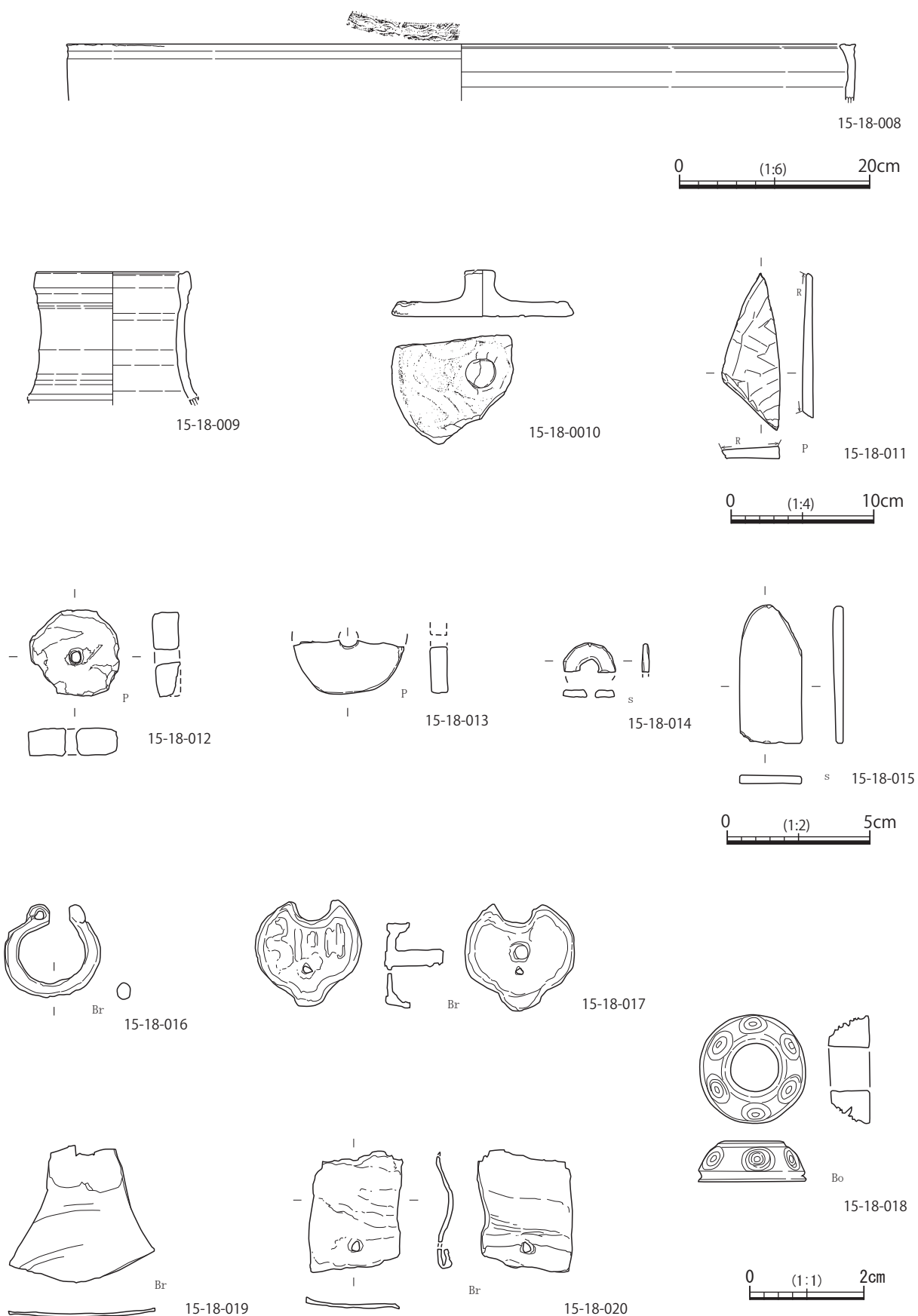


Fig.4.49 Artifacts from AKB-15(2) Tr.7 (15-18-008), Tr.6 (15-18-009, 011), Tr.5 (15-18-010), Tr.10a (15-18-012), Tr.9 (15-18-013), Tr.5 (15-18-015, 016, 019), well-like pit in Tr.5 (15-18-017), east side of the top surface in Tr.5 stone mosaic (15-18-018), east side of the top surface in Tr.5 stone mosaic (15-18-020)

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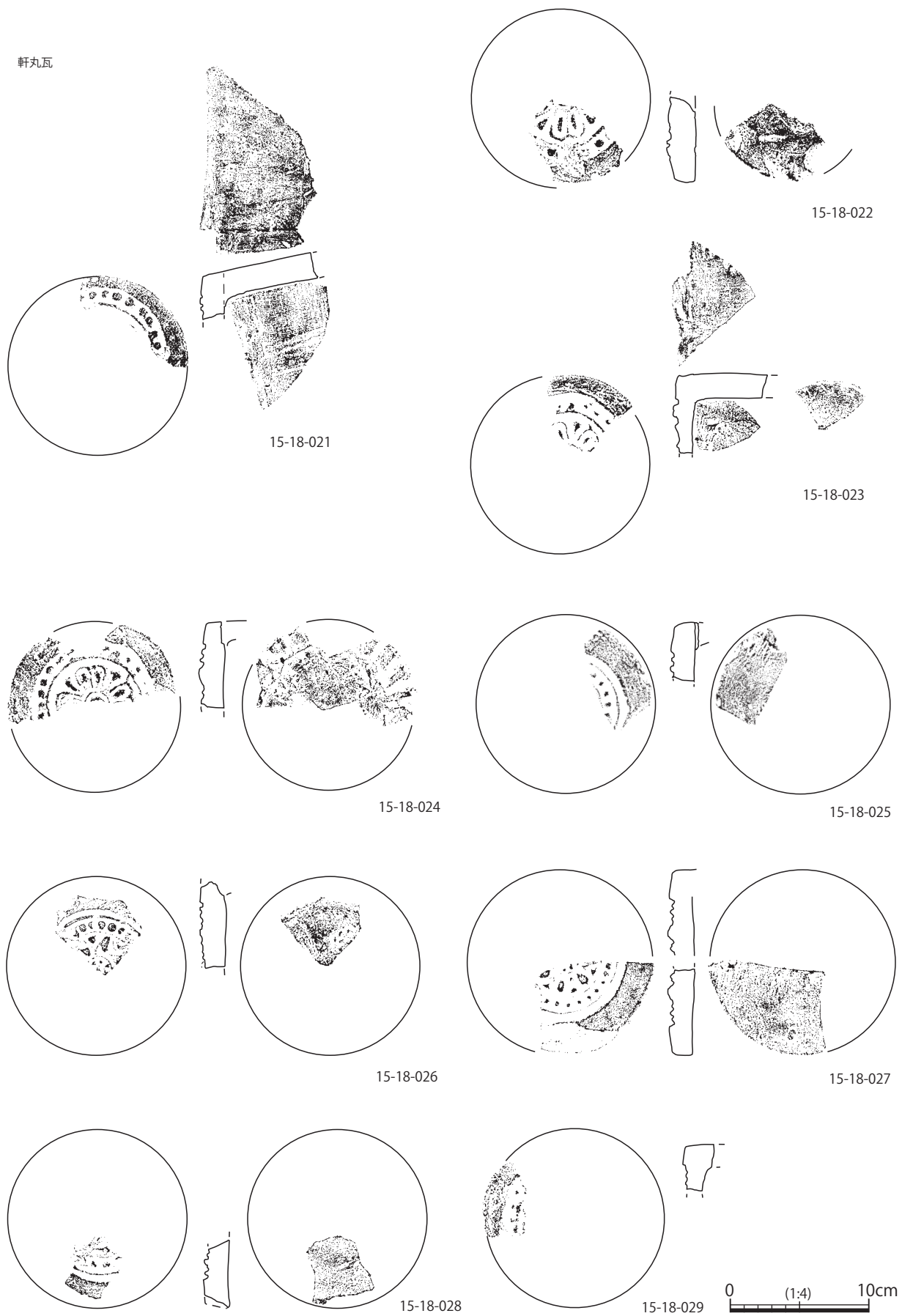


Fig.4.50 Artifacts from AKB-15(3) top surface of stone mosaic in Tr.5 (15-18-021, 023, 027), Tr.5 (15-18-022, 024, 028), Tr.6 (15-18-025, 029), Tr.8 (15-18-026)

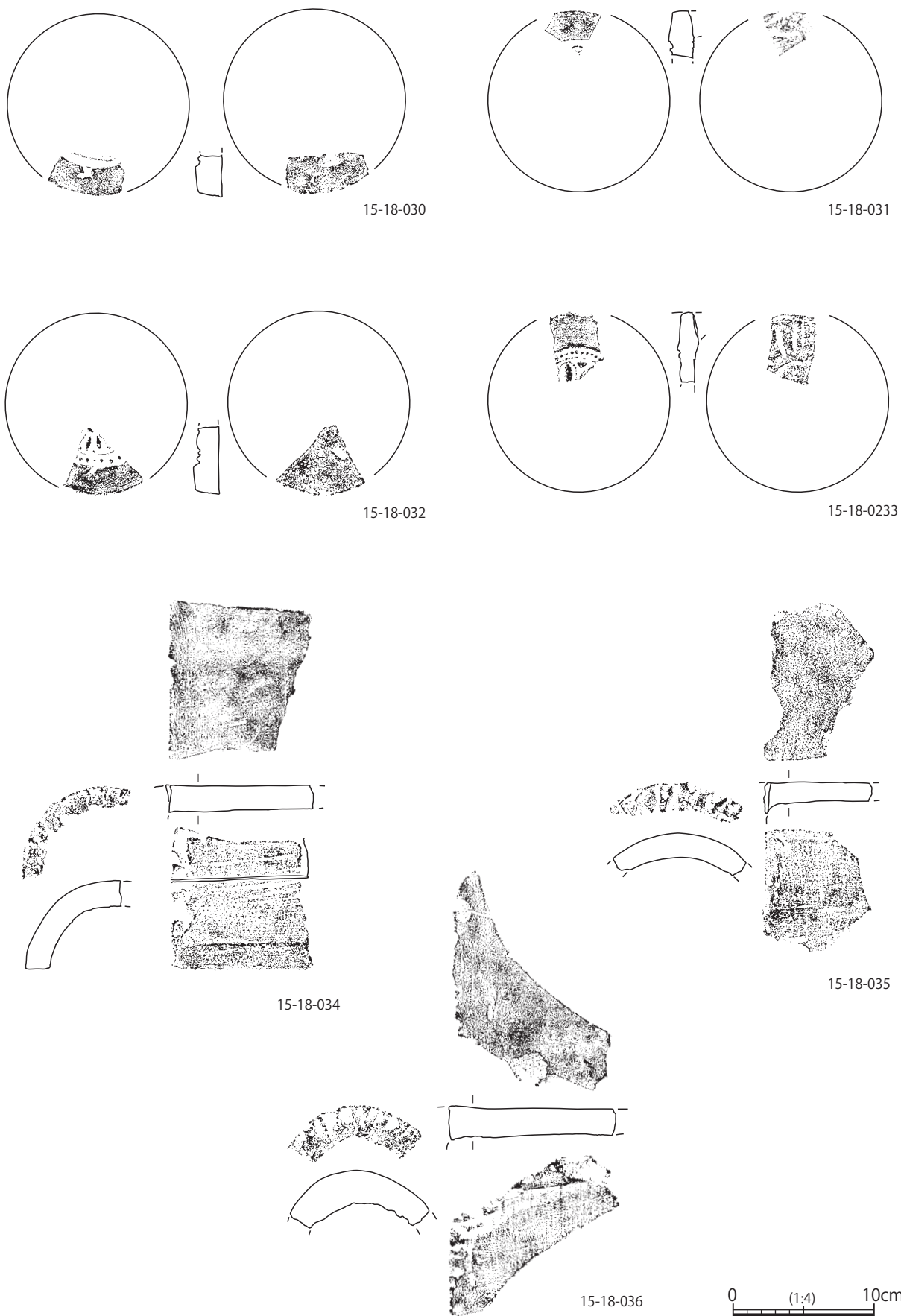


Fig.4.51 Artifacts from AKB-15(4) Tr.6 (15-18-030), Tr.5 (15-18-031, 033), top surface of stone mosaic in Tr.5 (15-18-032, 034 – 036)

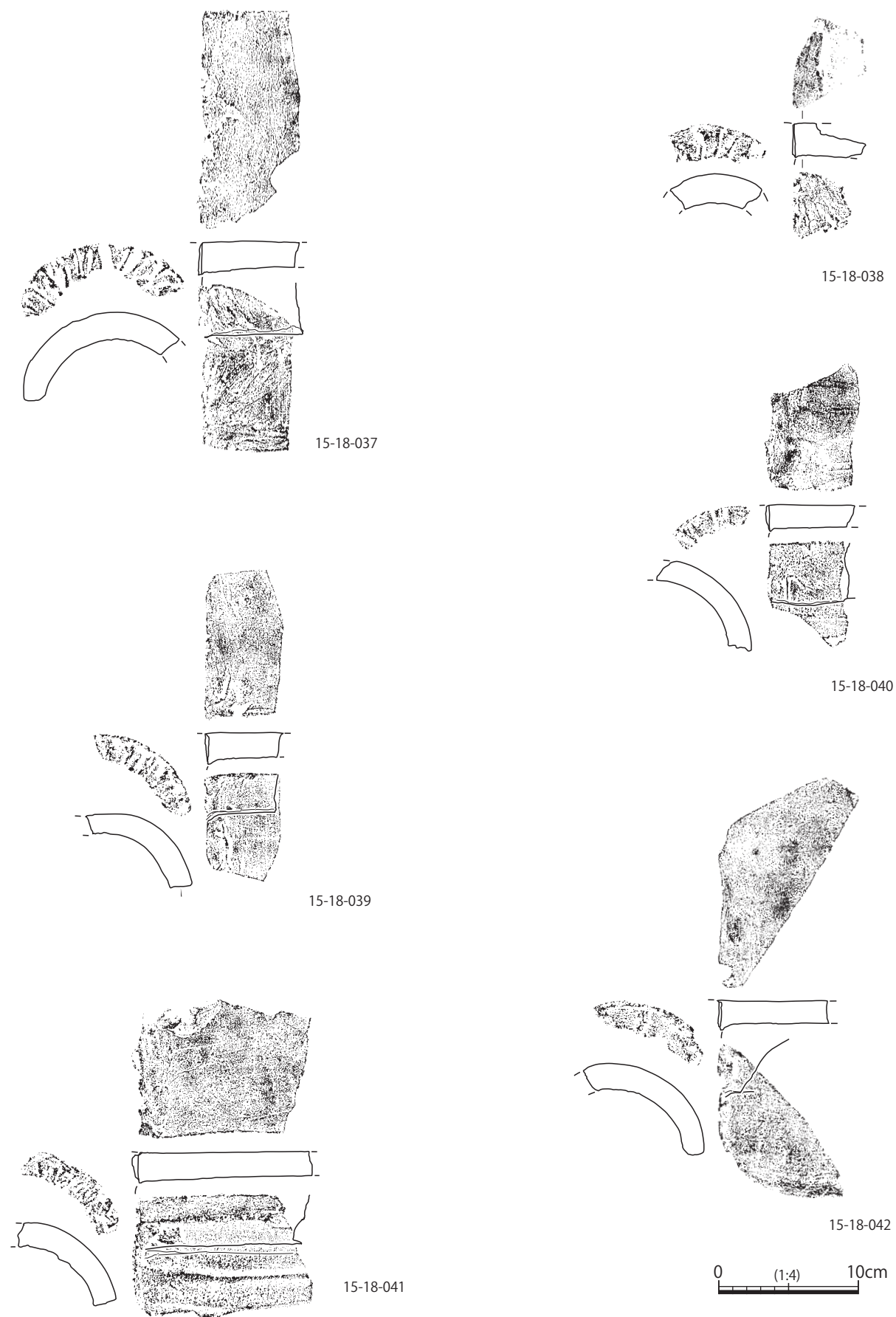
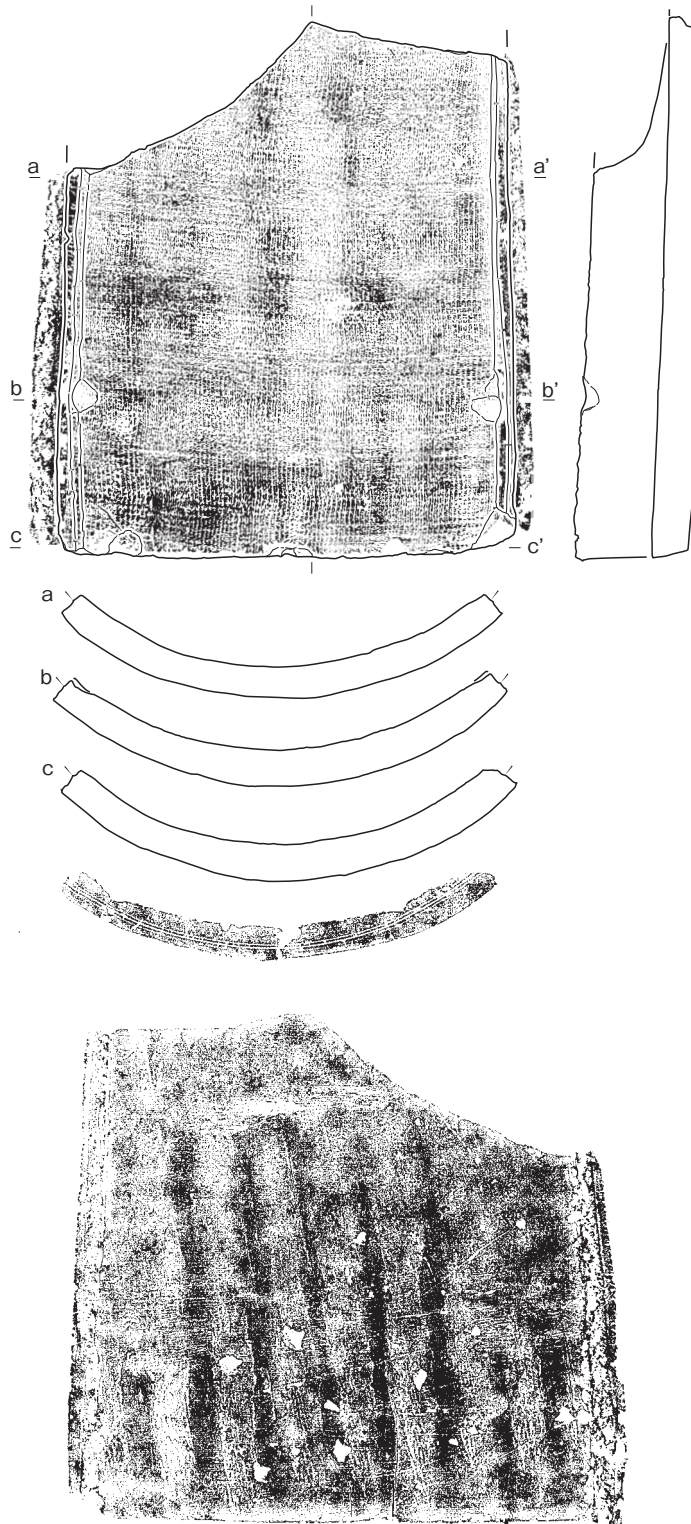


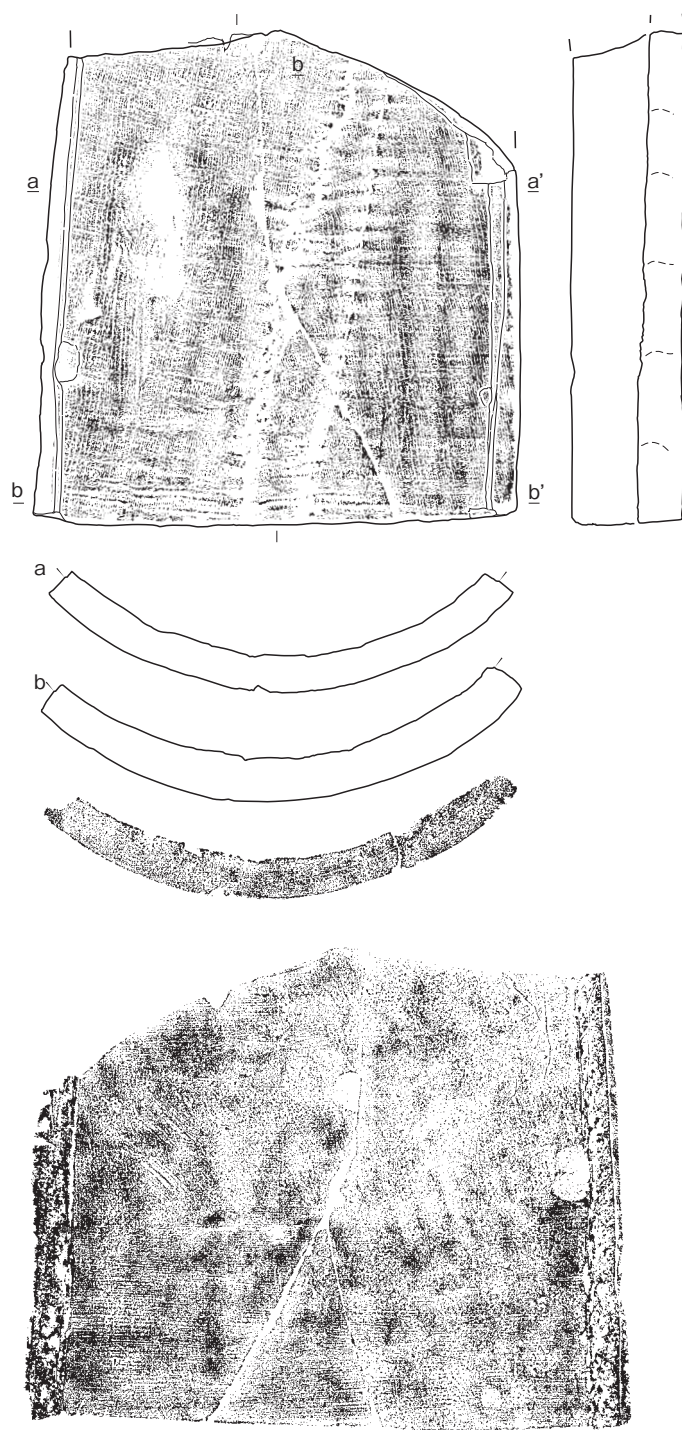
Fig.4.52 Artifacts from AKB-15(5) Top surface of stone mosaic in Tr.5 (15-18-037, 039 – 042), Tr.6 (15-18-038)



15-18-043

0 (1:4) 10cm

Fig.4.53 Artifacts from AKB-15(6) Tr.6 (15-18-043)



15-18-044

0 (1:4) 10cm

Fig.4.54 Artifacts from AKB-15(7) Tr.6 (15-18-044)

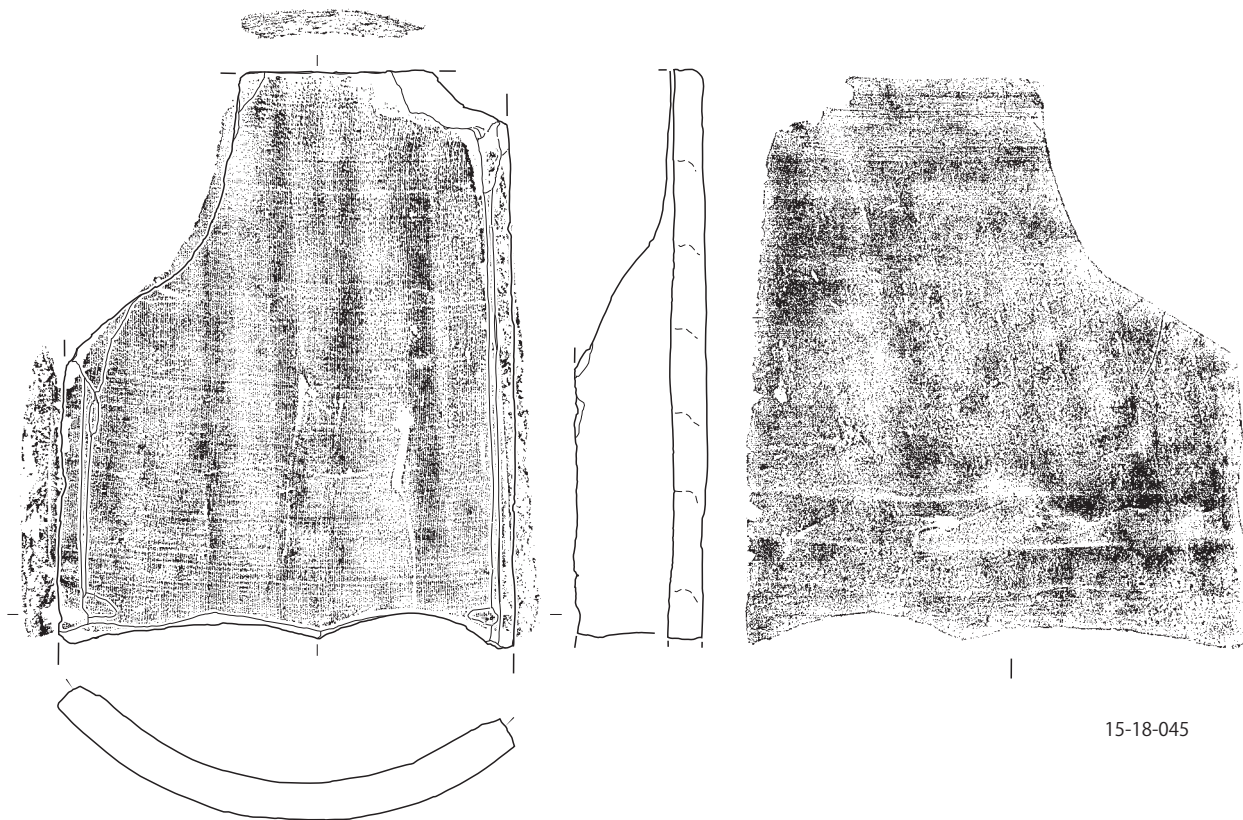


Fig.4.55 Artifacts from AKB-15(8) Tr.6 (15-18-045, 046)

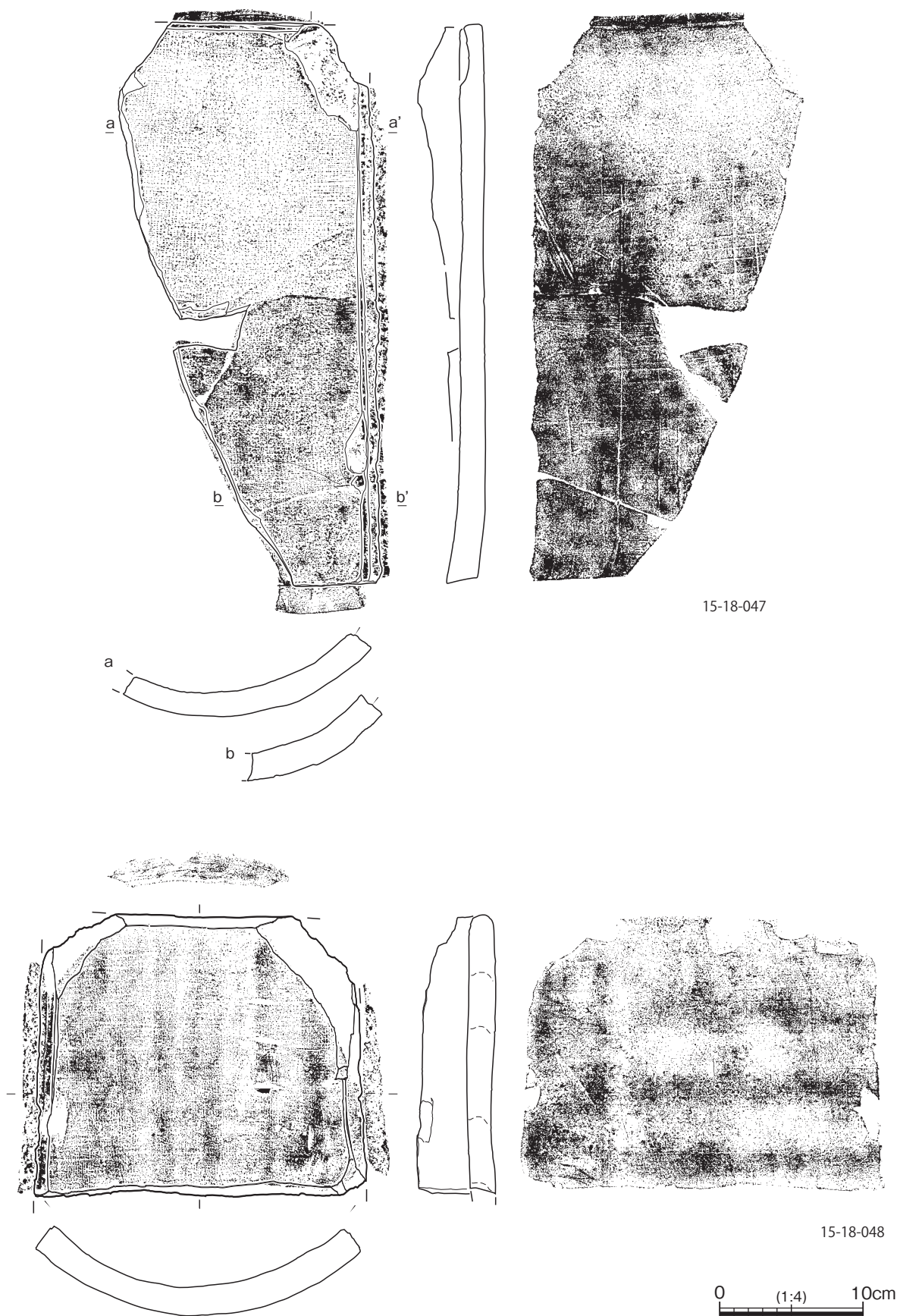


Fig.4.56 Artifacts from AKB-15(9) Tr.6 (15-18-047, 048)

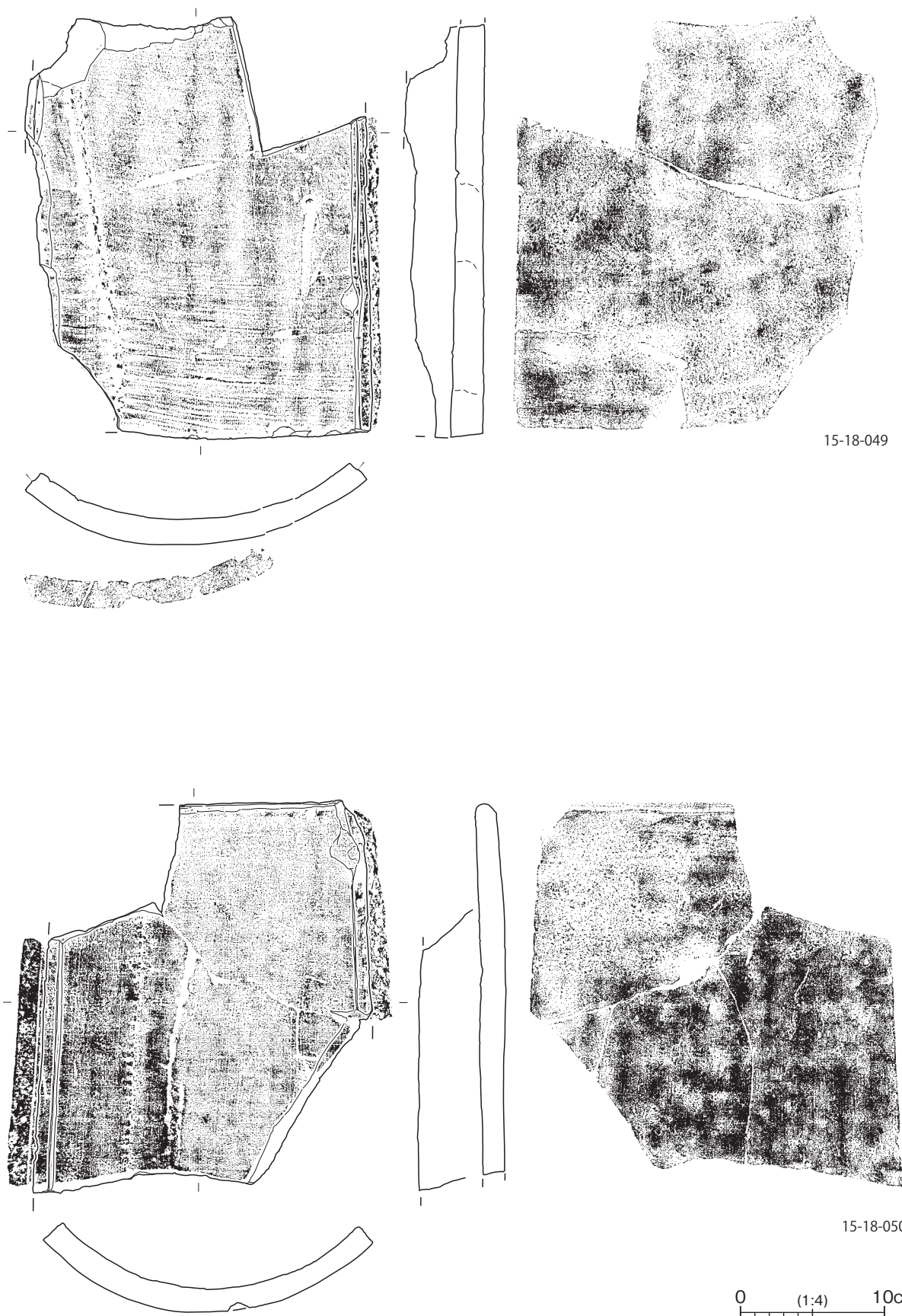
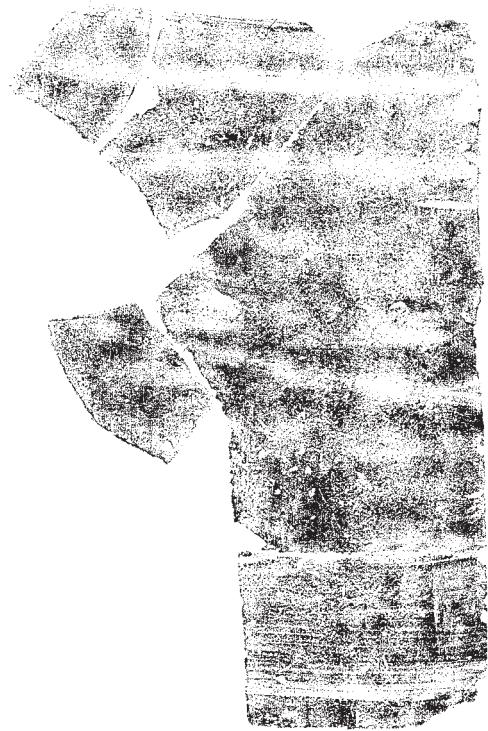
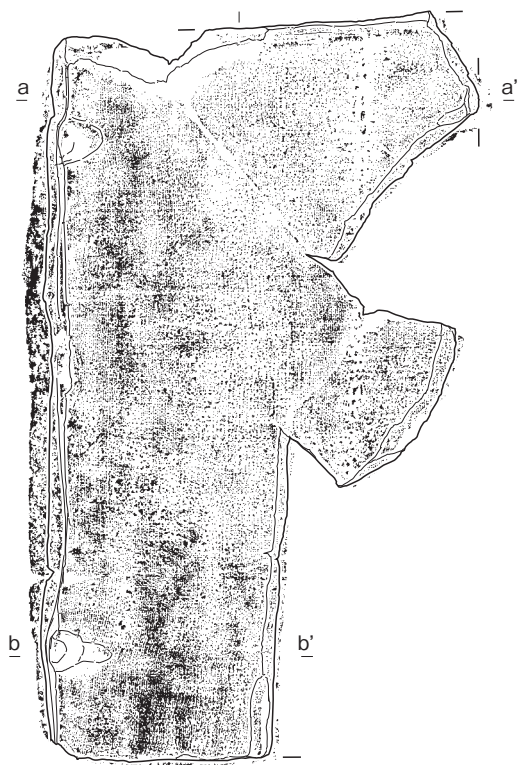
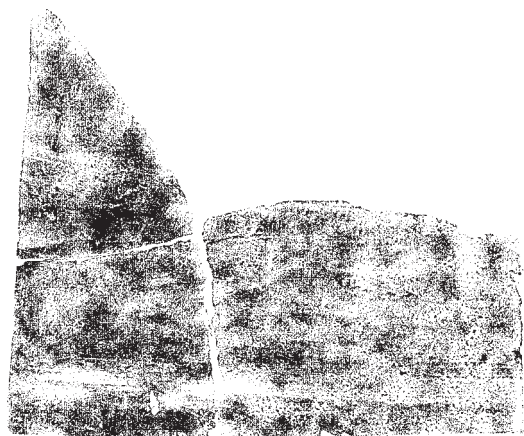
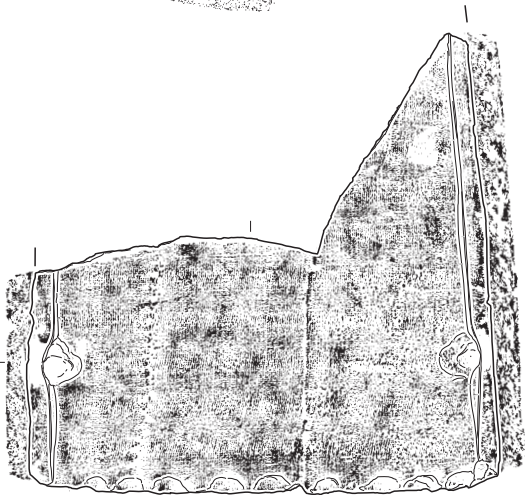
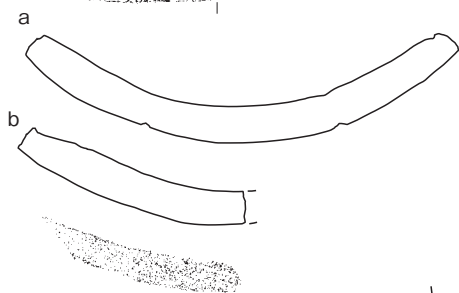


Fig.4.57 Artifacts from AKB-15(10) Tr.6 (15-18-049), top surface of stone mosaic in Tr.5 (15-18-050)



15-18-051



15-18-052

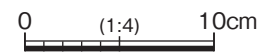
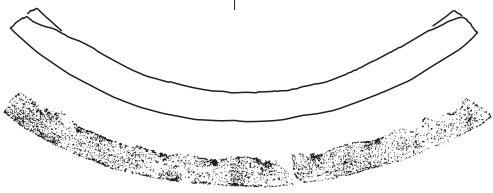


Fig.4.58 Artifacts from AKB-15(11) Top surface of stone mosaic in Tr.5 (15-18-051, 052)

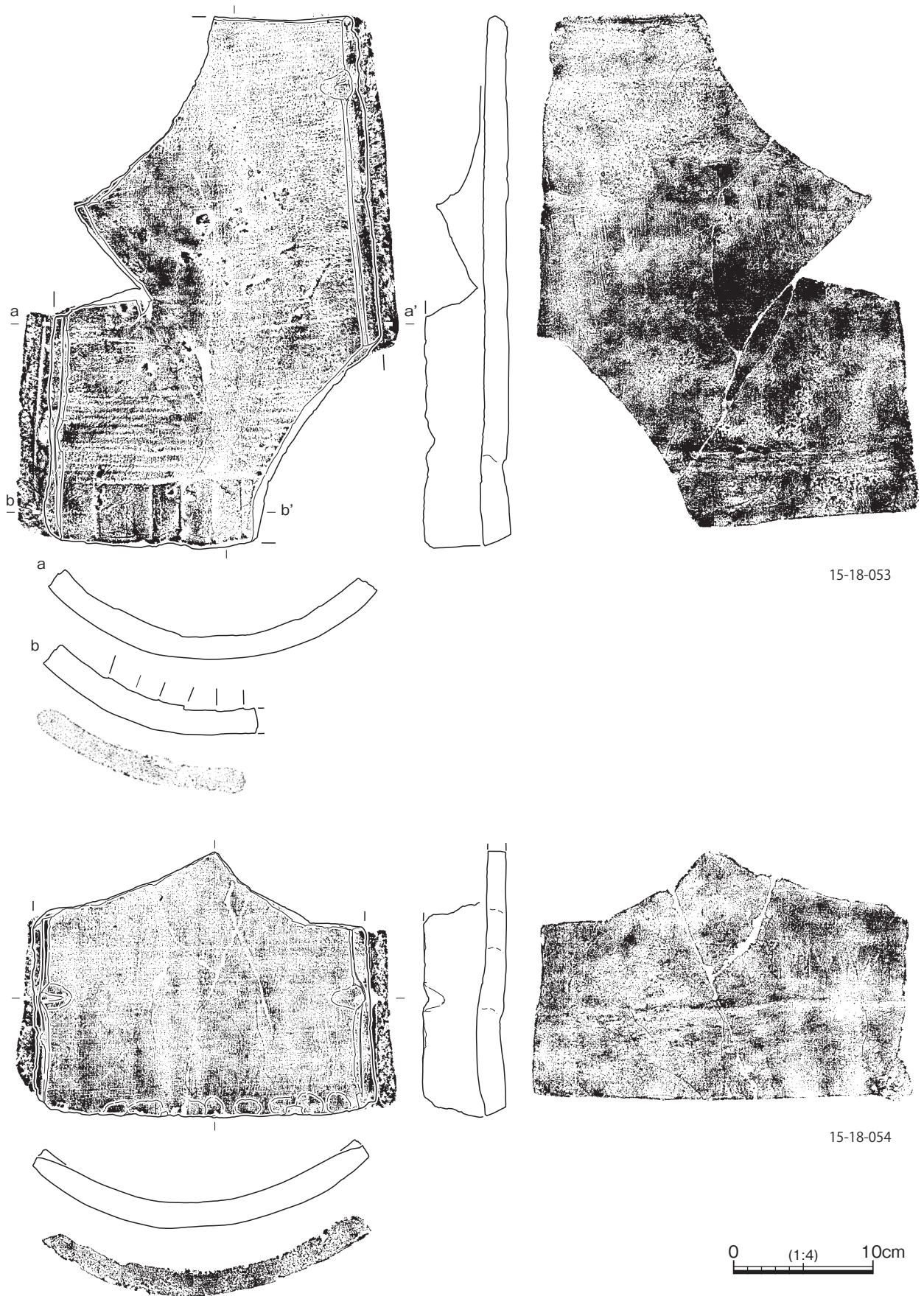
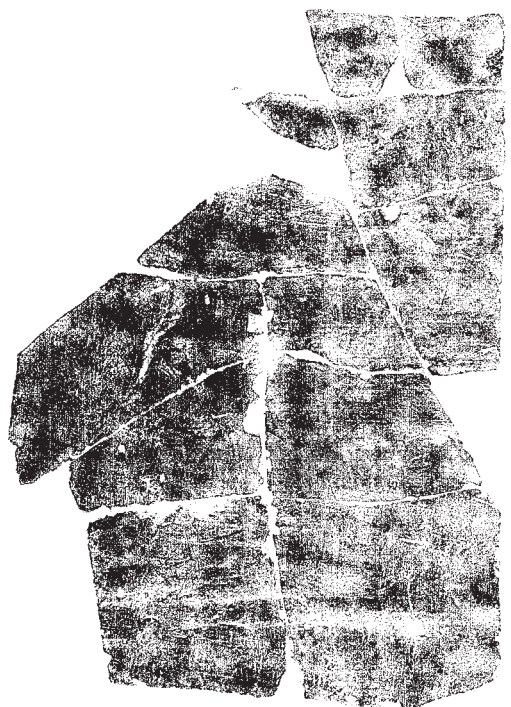


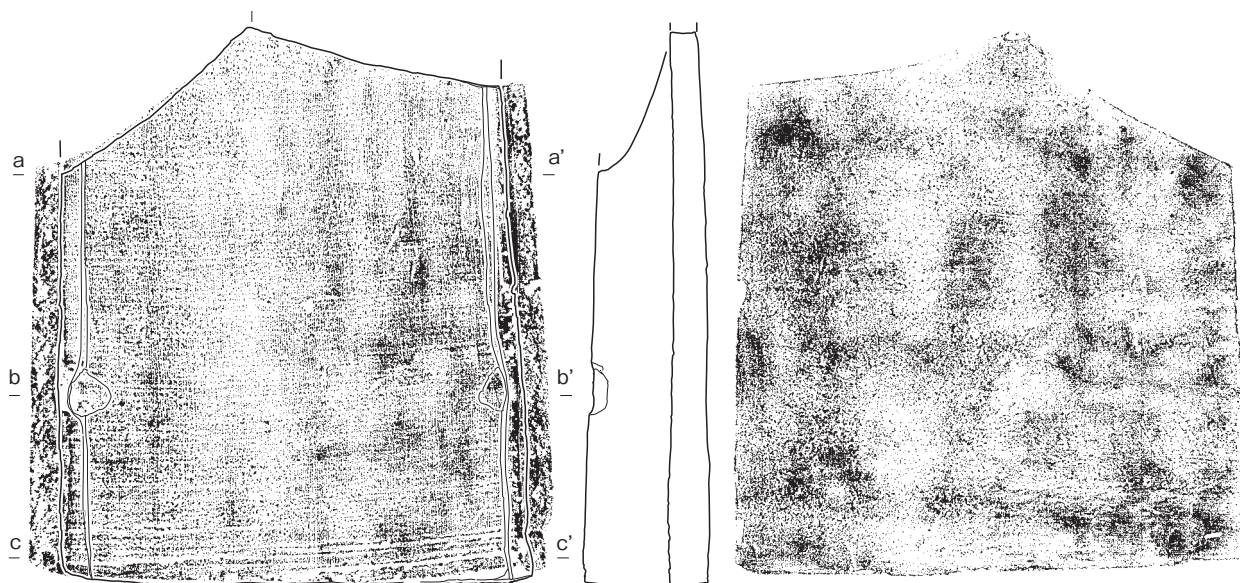
Fig.4.59 Artifacts from AKB-15(12) Top surface of stone mosaic in Tr.5 (15-18-053, 054)



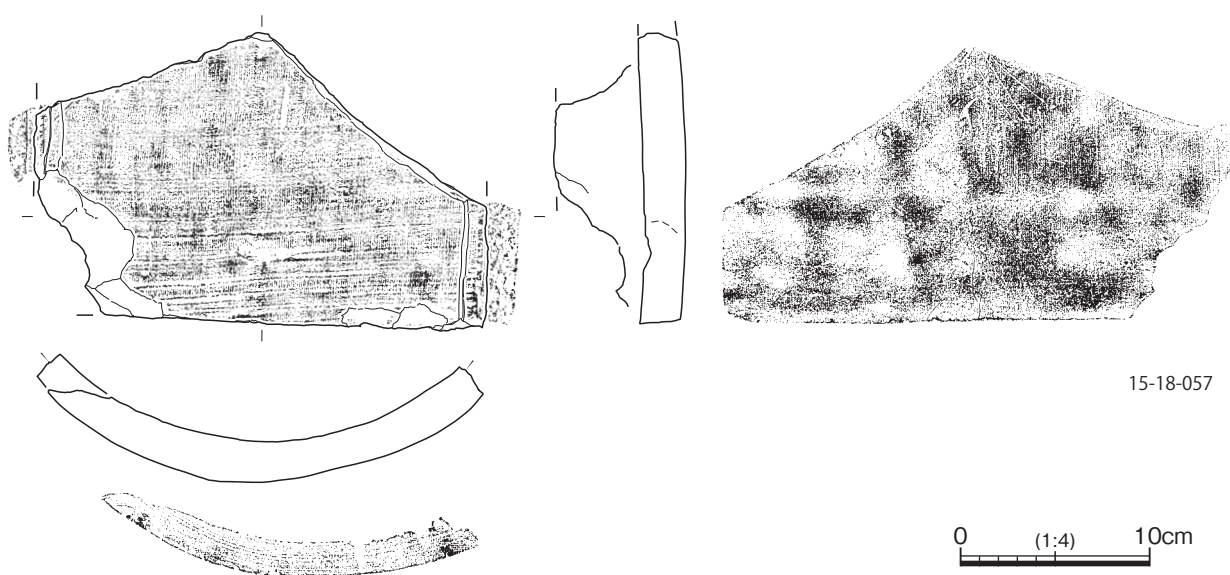
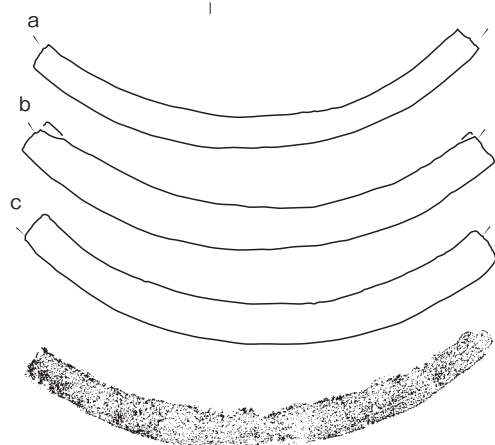
15-18-055

0 (1:4) 10cm

Fig.4.60 Artifacts from AKB-15(13) Top surface of stone mosaic in Tr.5 (15-18-055)



15-18-056



15-18-057

0 (1:4) 10cm

Fig.4.61 Artifacts from AKB-15(14) Tr.6 (15-18-056, 057)

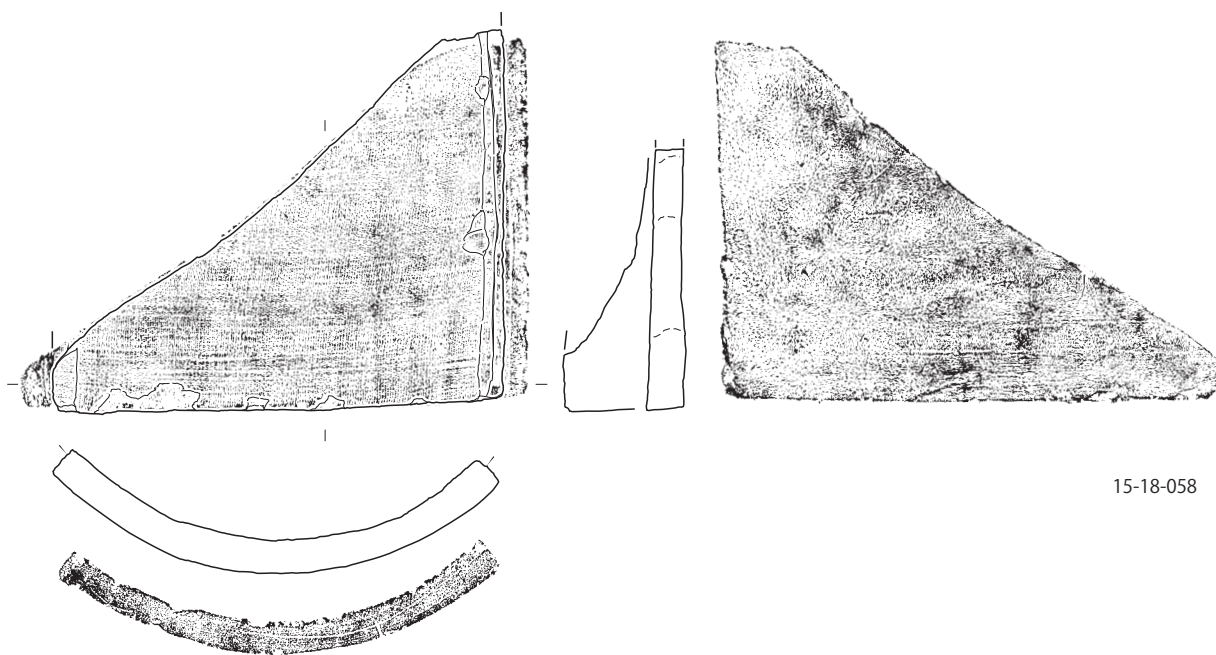
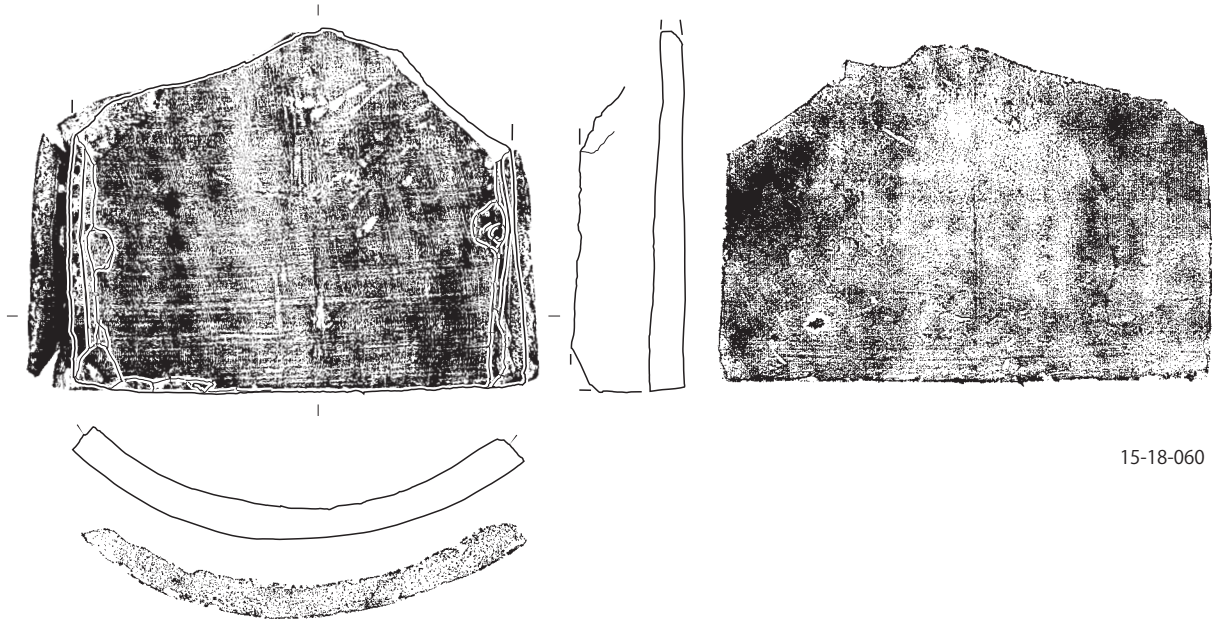
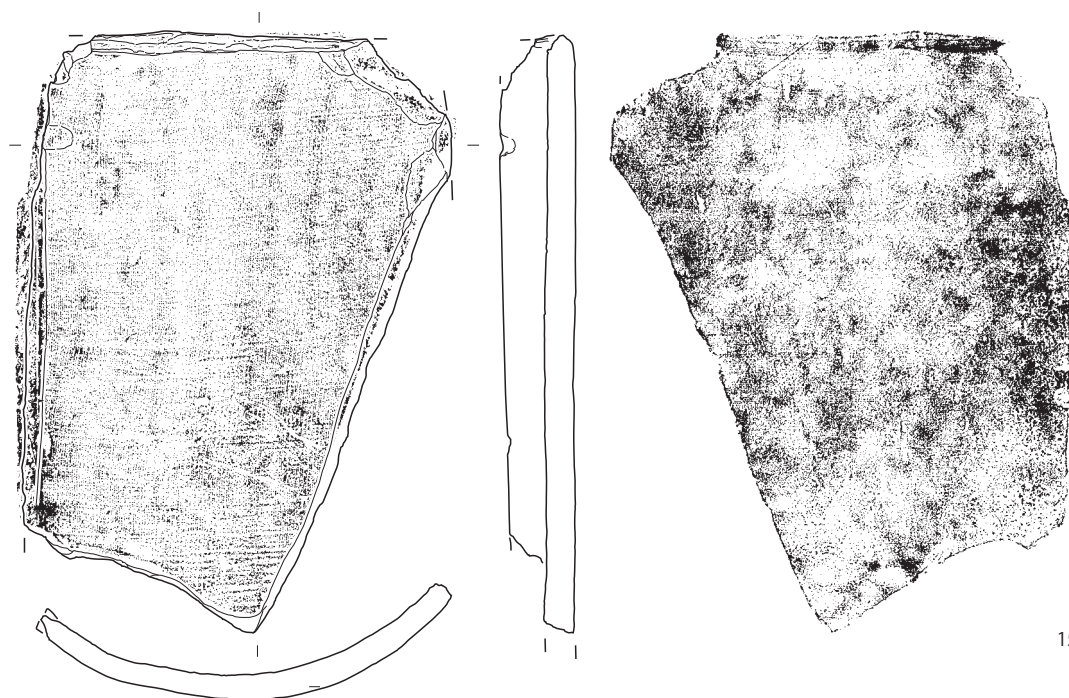


Fig.4.62 Artifacts from AKB-15(15) Tr.6 (15-18-058, 059)



15-18-060



15-18-061

0 (1:4) 10cm

Fig.4.63 Artifacts from AKB-15(16) Well-like pit in Tr.5 (15-18-060), top surface of stone mosaic in Tr.5 (15-18-061)

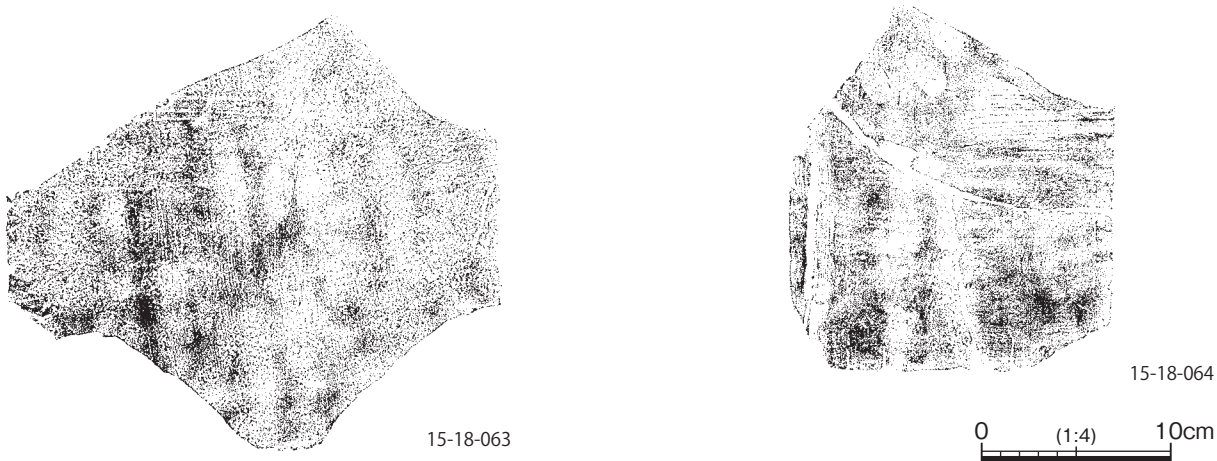
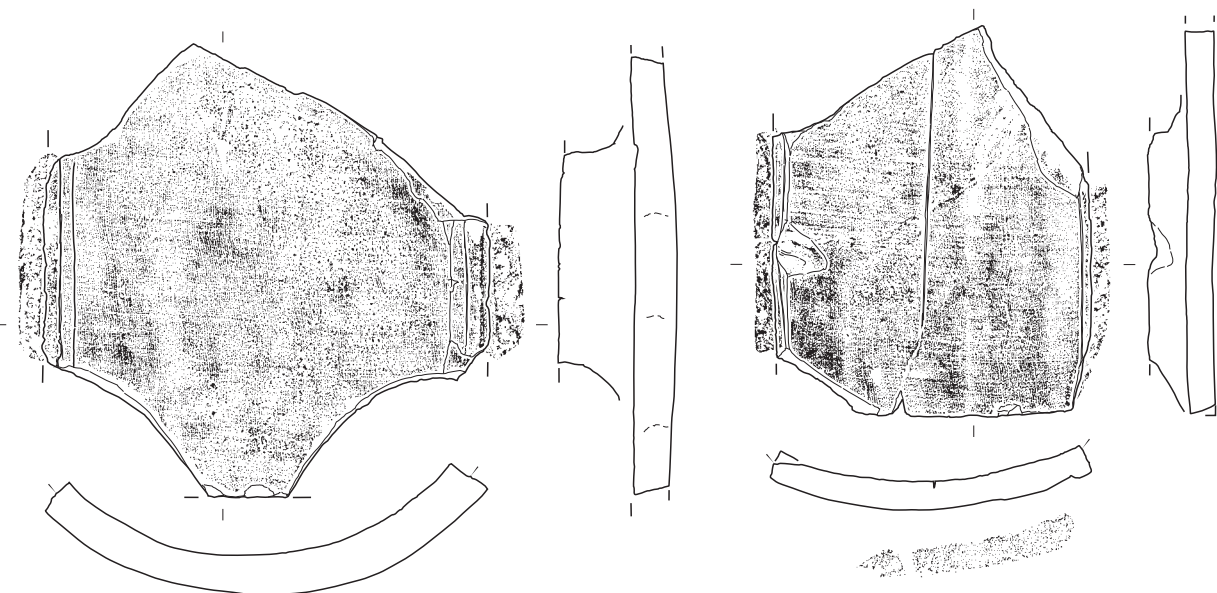
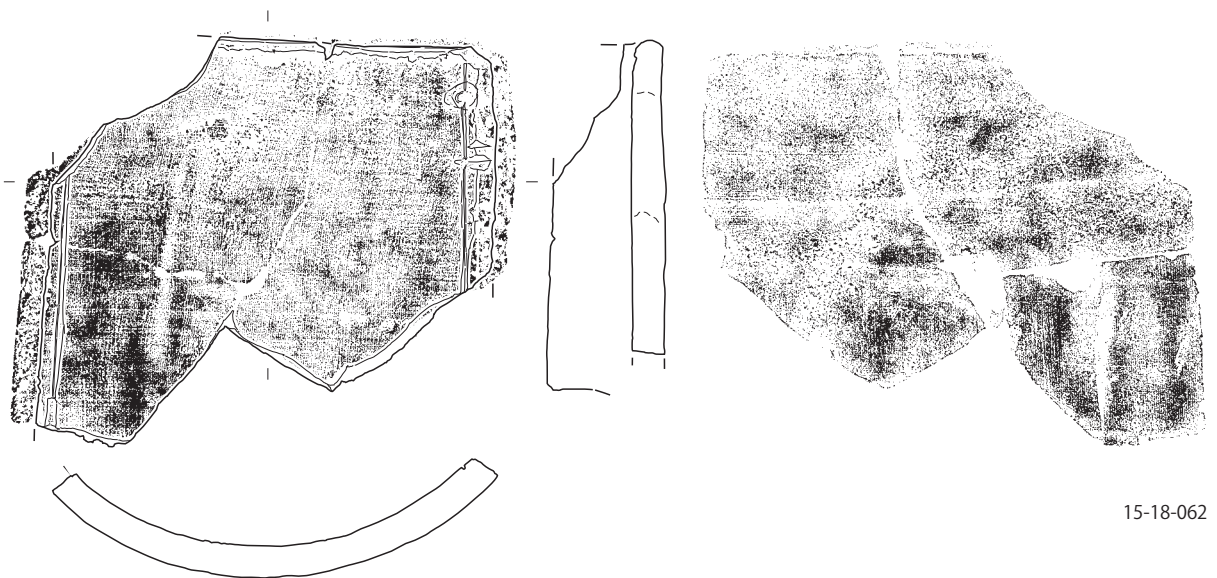


Fig.4.64 Artifacts from AKB-15(17) Top surface of stone mosaic in Tr.5 (15-18-062 – 064)

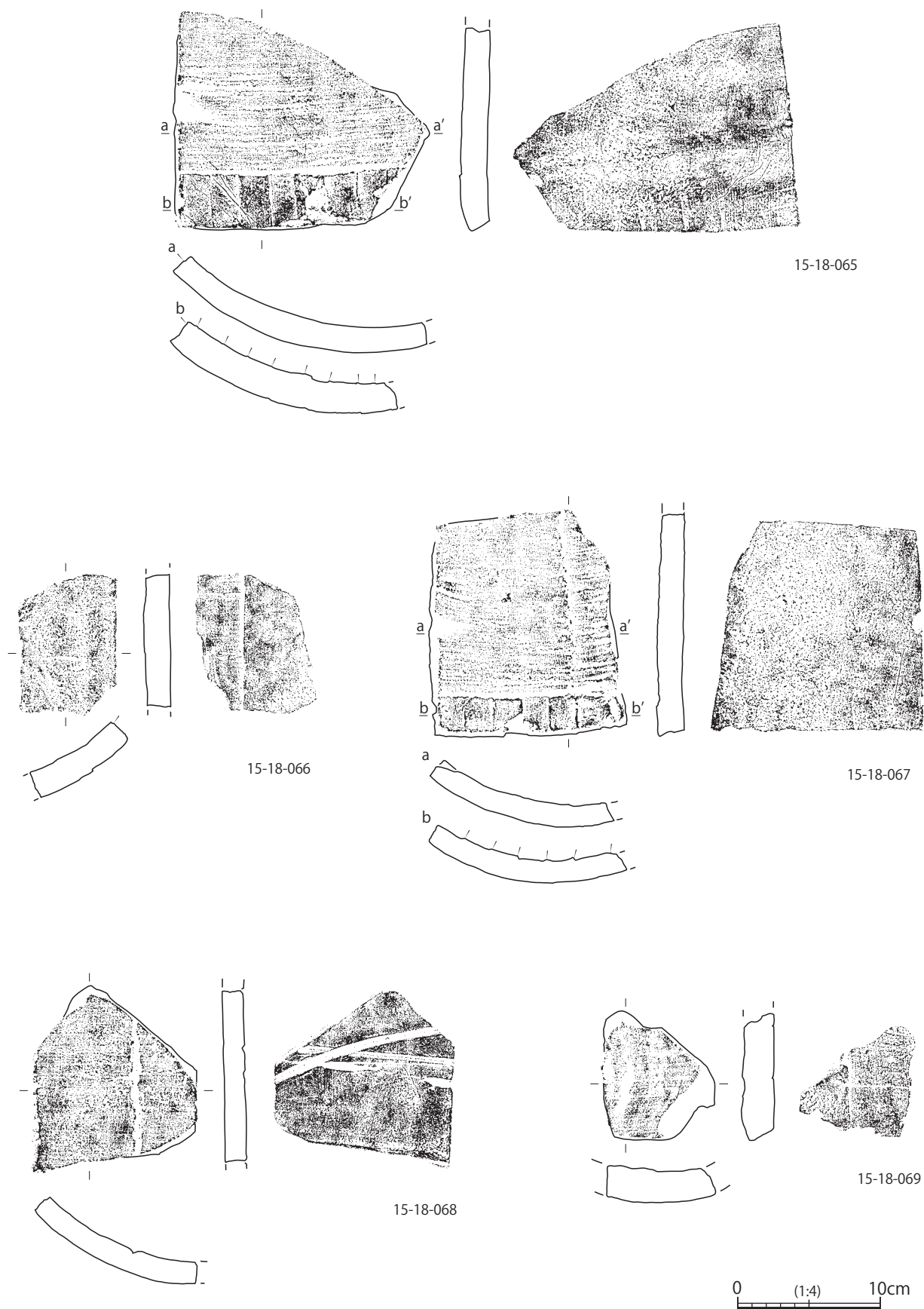


Fig.4.65 Artifacts from AKB-15(18) Top surface of stone mosaic in Tr.5 (15-18-065 – 069)

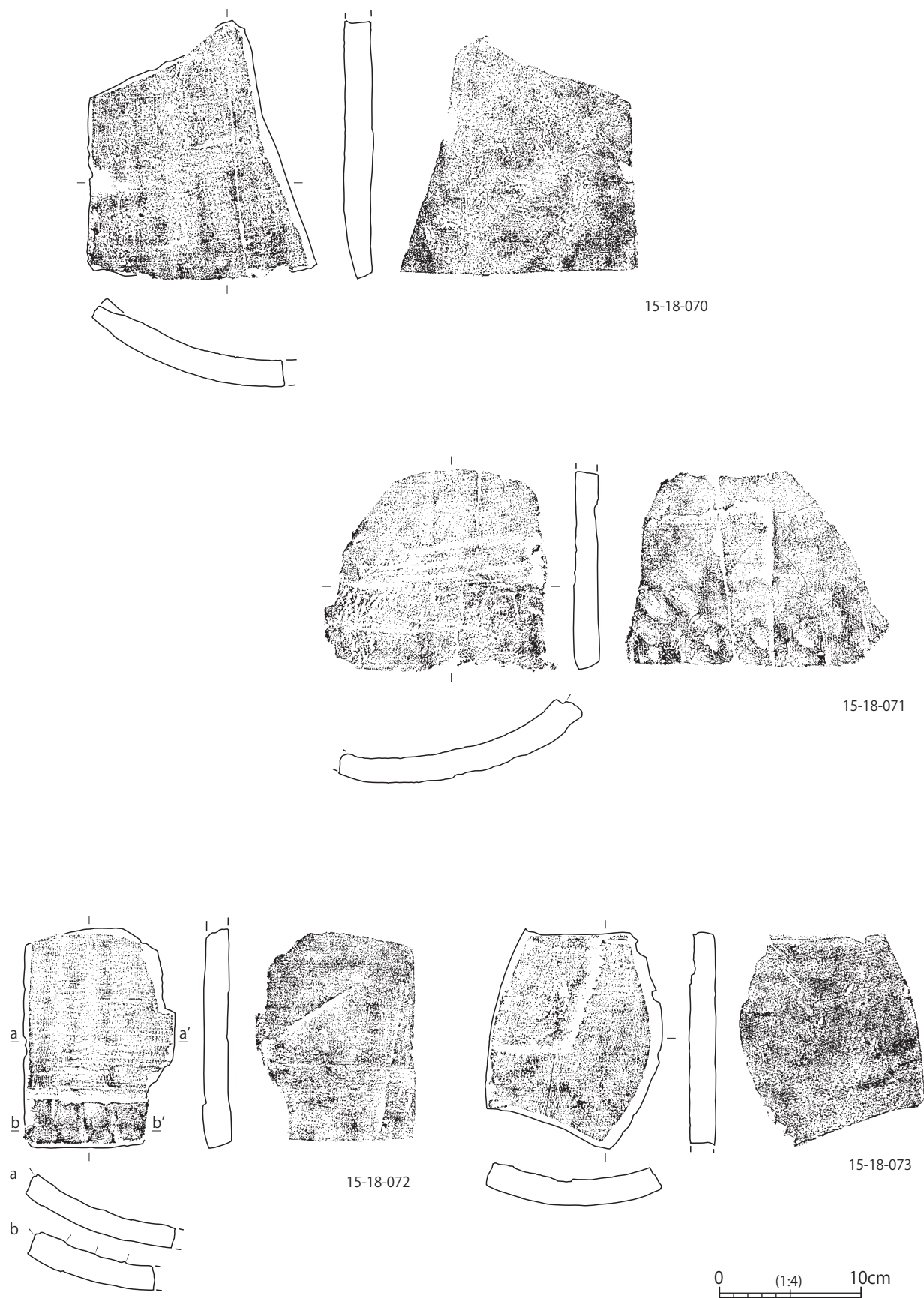
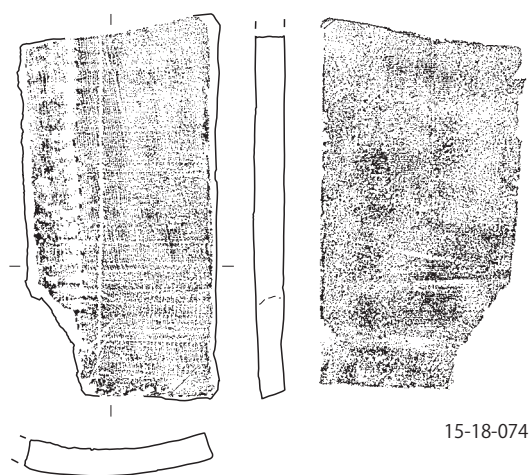
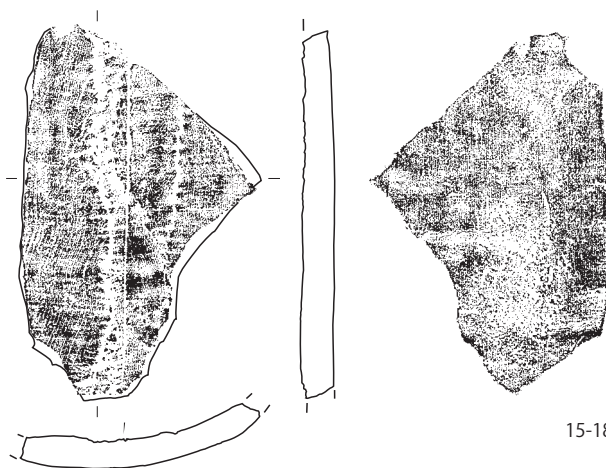


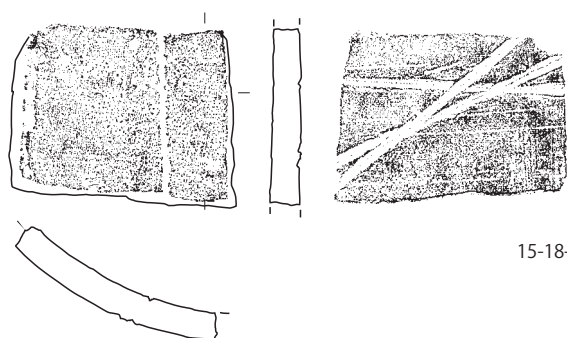
Fig.4.66 Artifacts from AKB-15(19) Top surface of stone mosaic in Tr.5 (15-18-070 – 073)



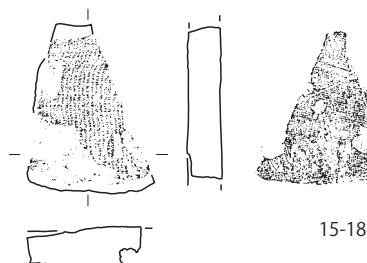
15-18-074



15-18-075



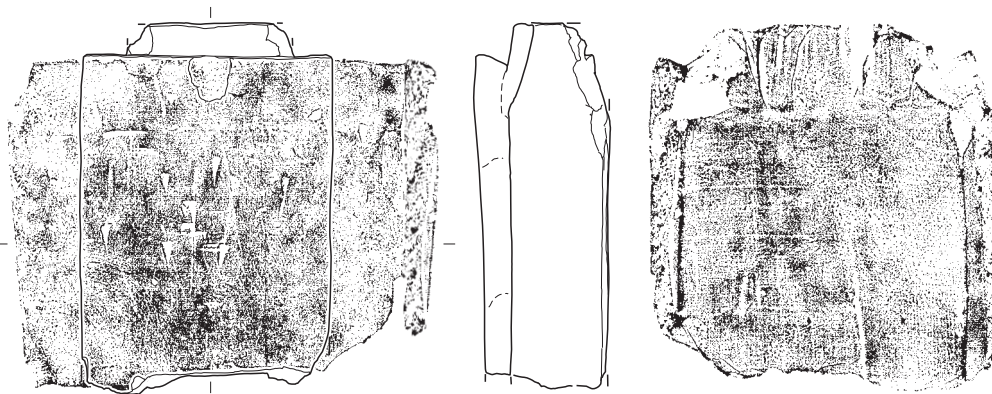
15-18-076



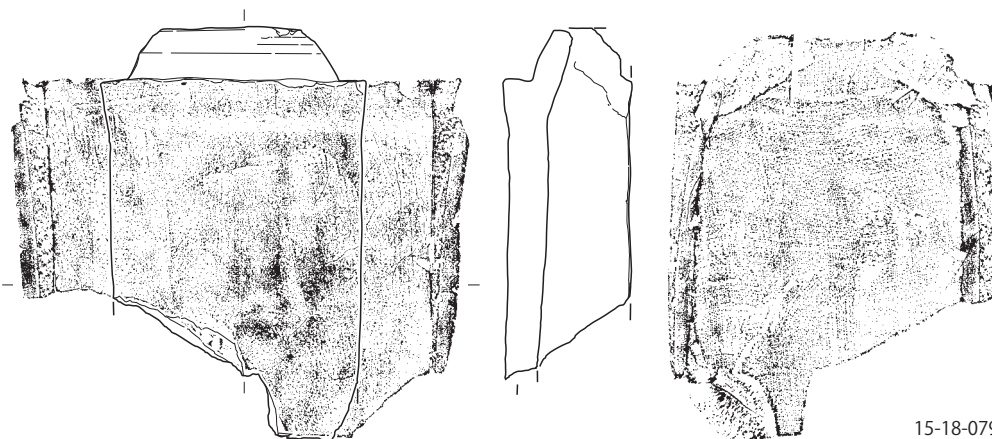
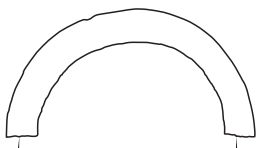
15-18-077

0 (1:4) 10cm

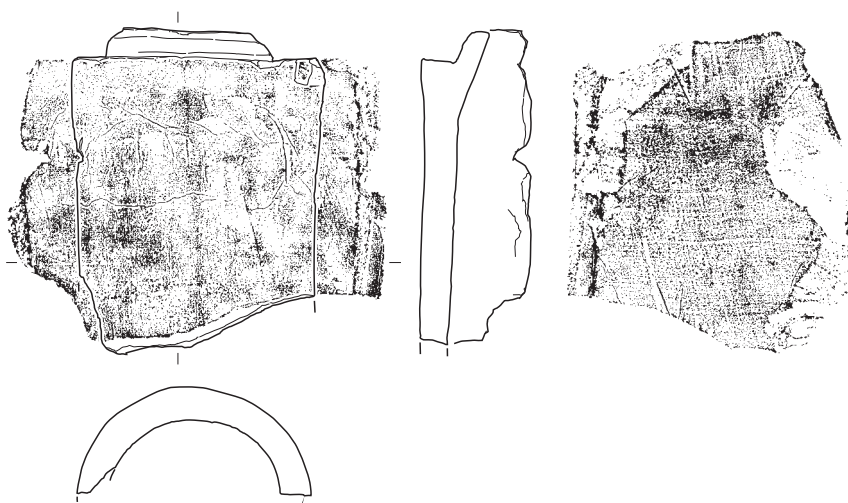
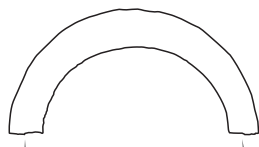
Fig.4.67 Artifacts from AKB-15(20) Top surface of stone mosaic in Tr.5 (15-18-074 – 076), trash pit in Tr.7 (15-18-077)



15-18-078



15-18-079



15-18-080

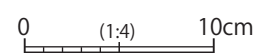
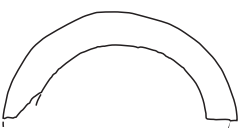


Fig.4.68 Artifacts from AKB-15(21) Tr.6 (15-18-078 – 080)

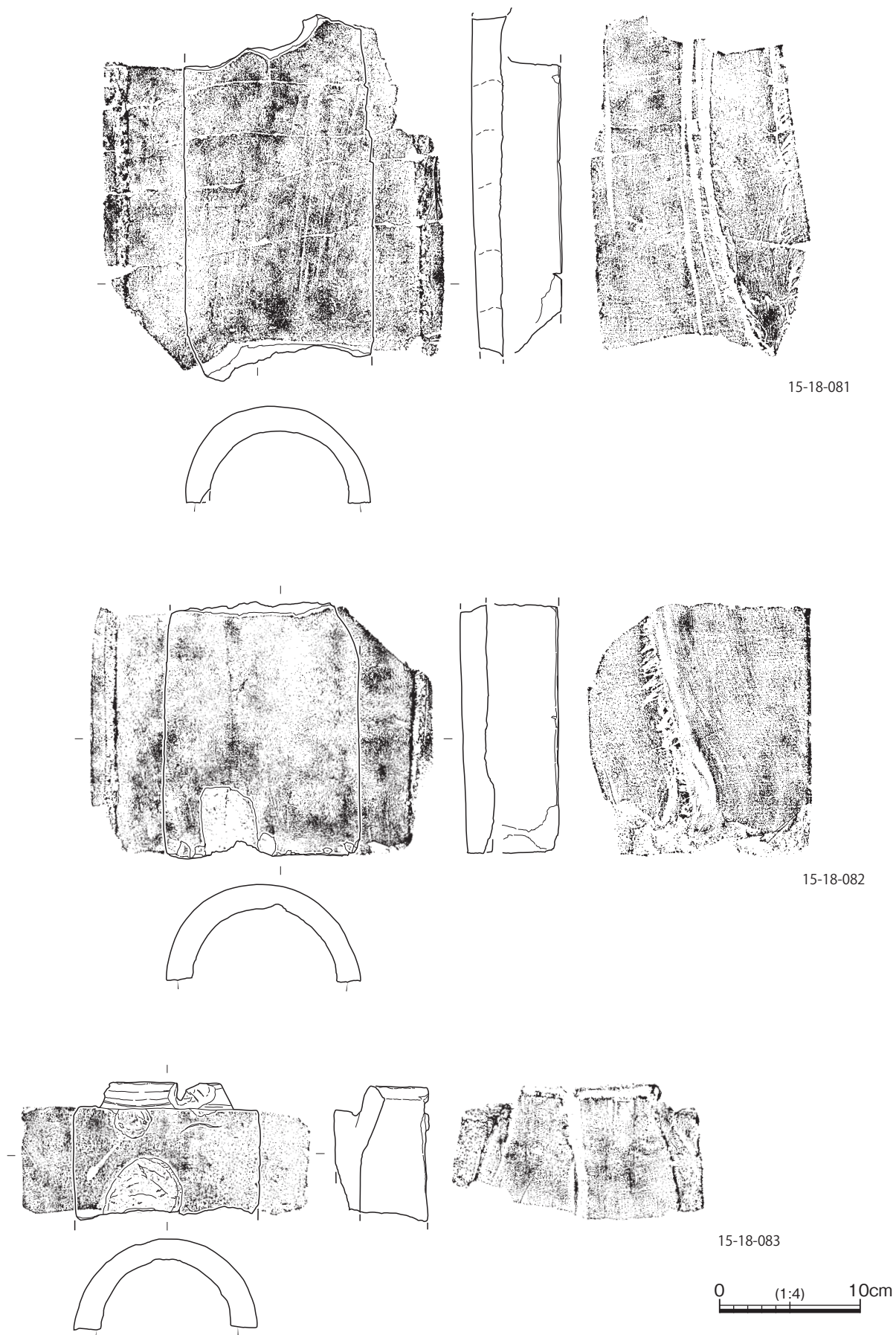
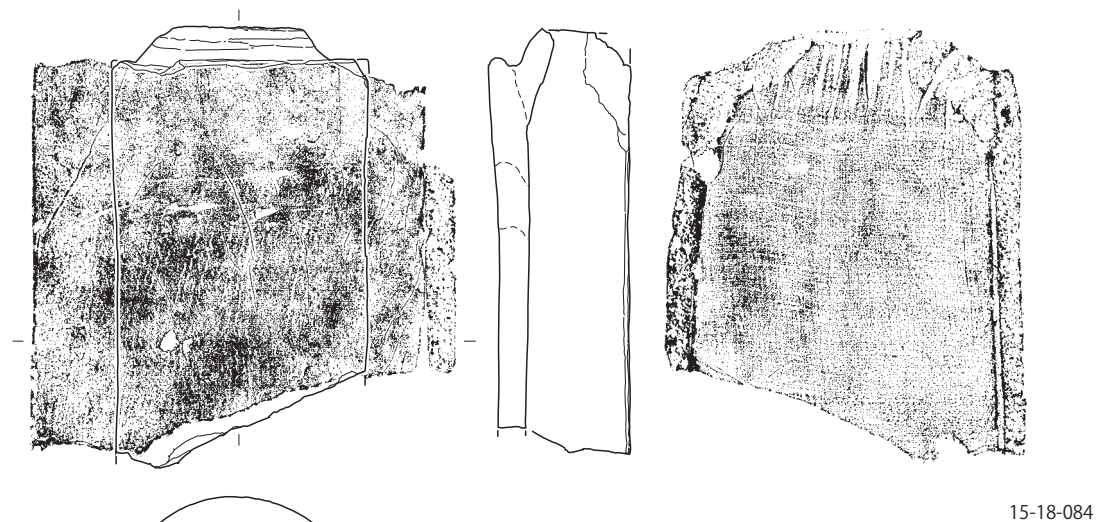
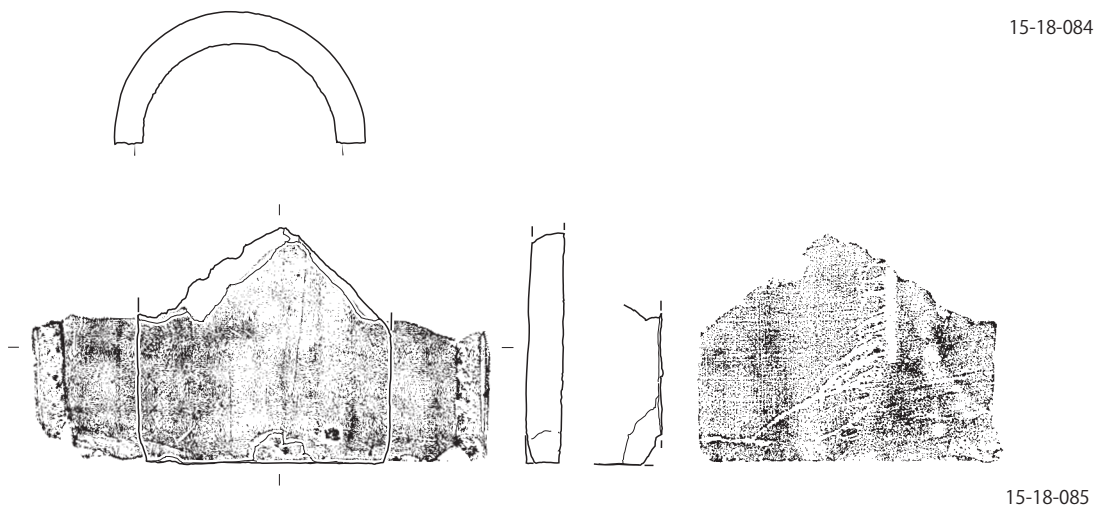


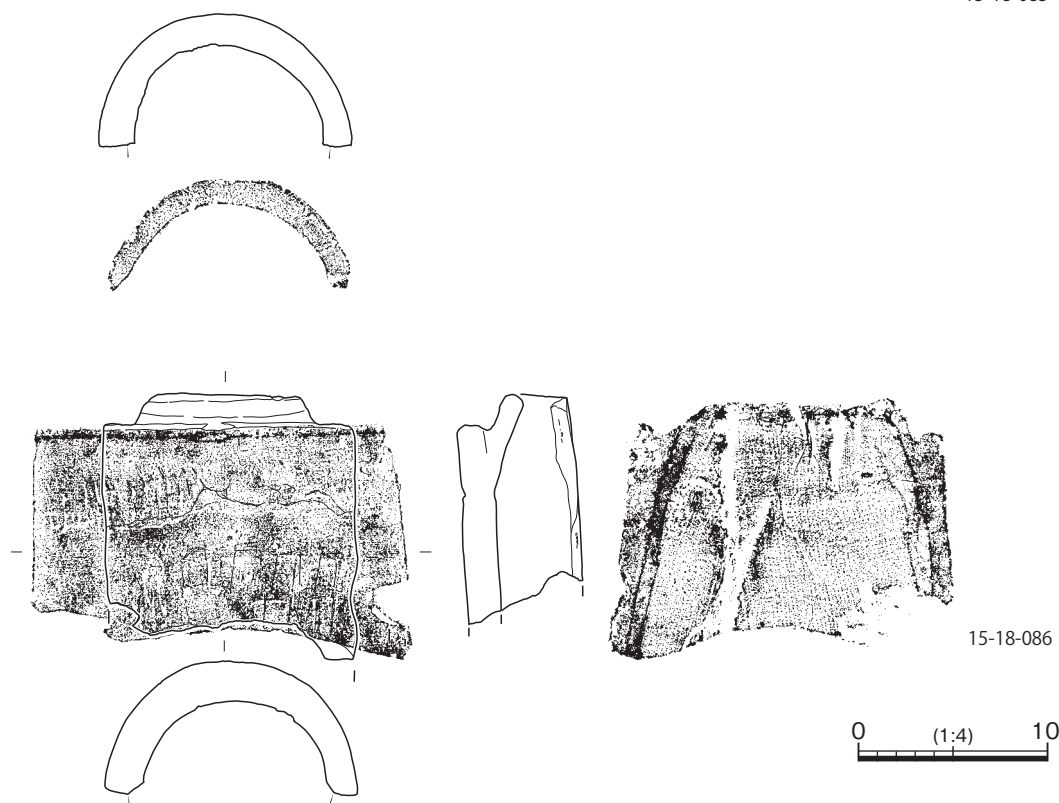
Fig.4.69 Artifacts from AKB-15(22) Tr.6 (15-18-081 – 082), trash pit in Tr.7 (15-18-083)



15-18-084



15-18-085



15-18-086

0 (1:4) 10cm

Fig.4.70 Artifacts from AKB-15(23) Tr.6 (15-18-084 – 086)

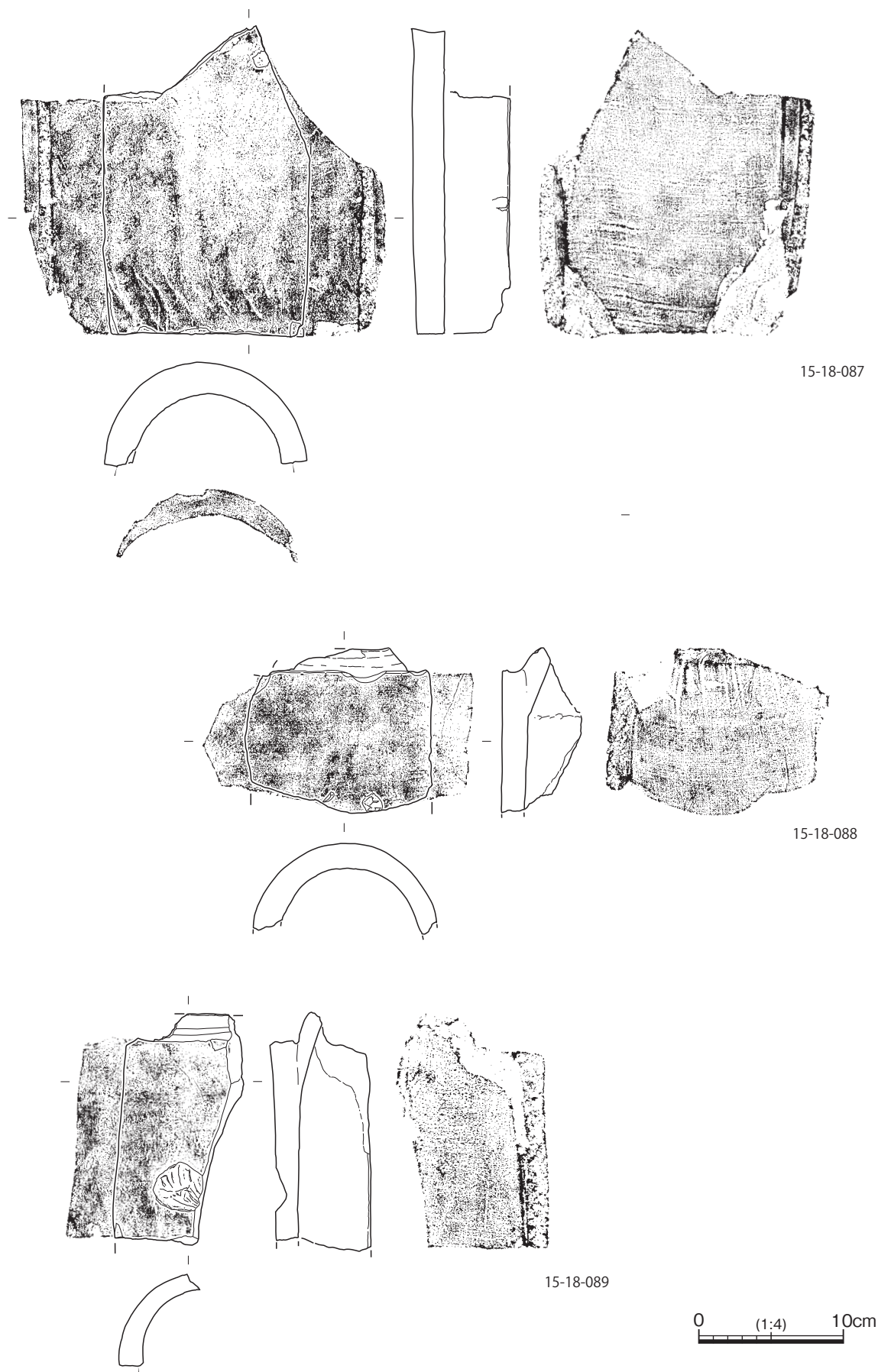
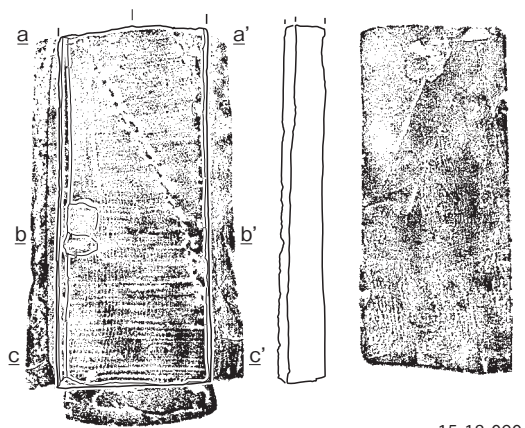
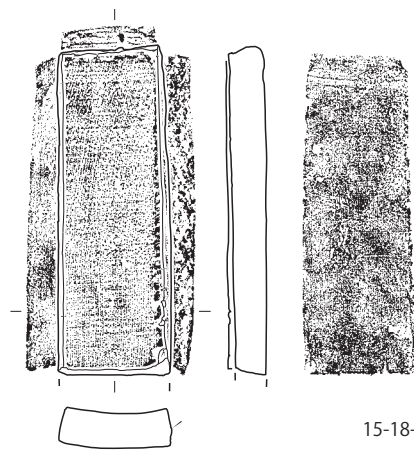
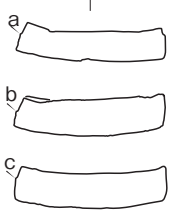


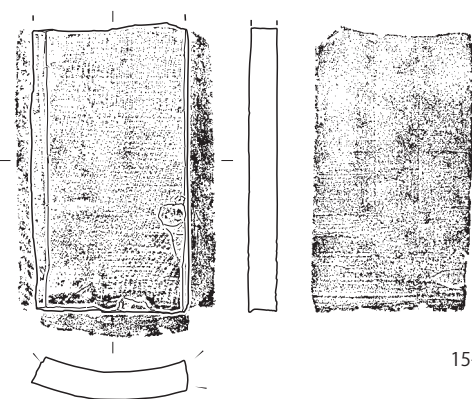
Fig.4.71 Artifacts from AKB-15(24) Tr.6 (15-18-087) , trash pit in Tr.7 (15-18-088 – 089)



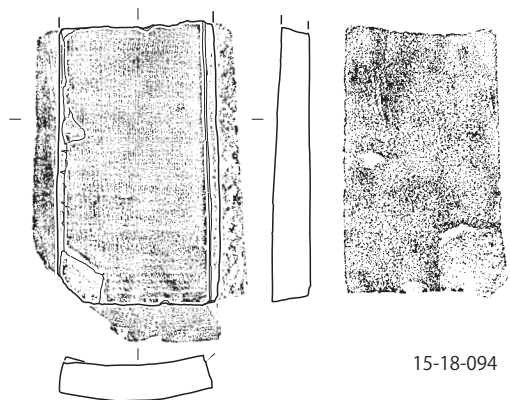
15-18-090



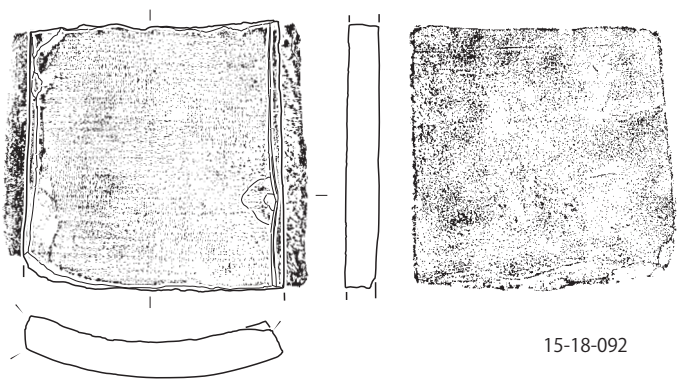
15-18-093



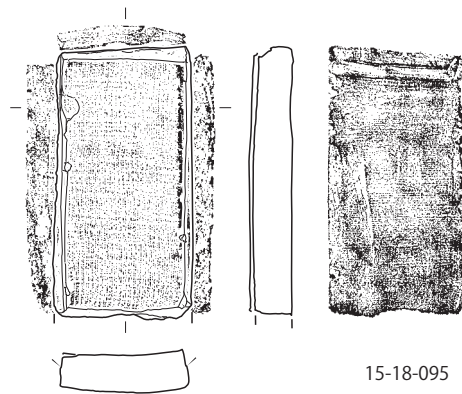
15-18-091



15-18-094



15-18-092



15-18-095

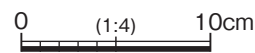
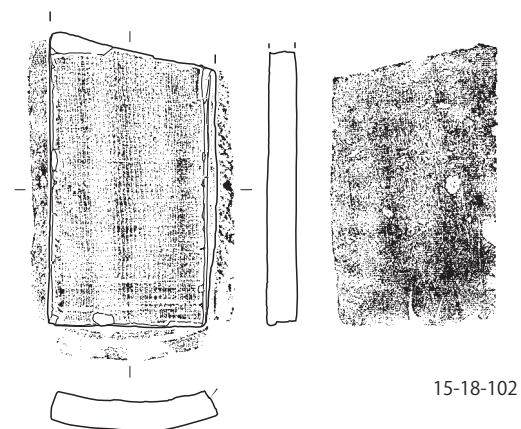
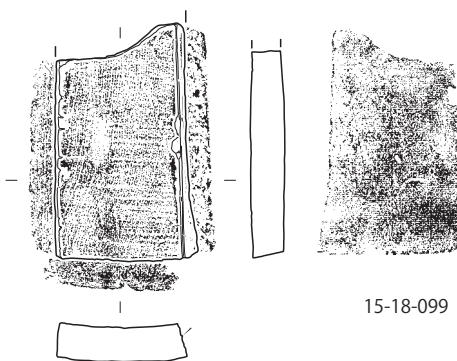
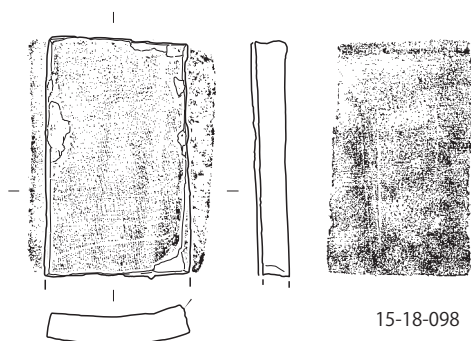
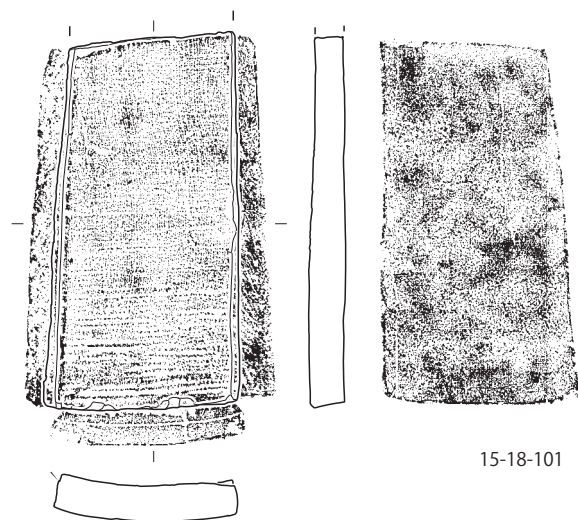
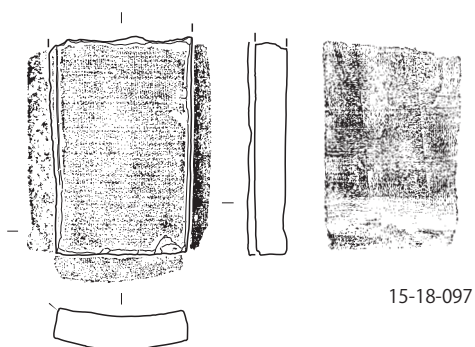
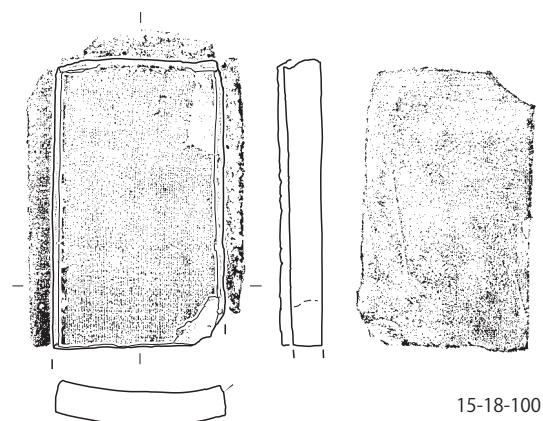
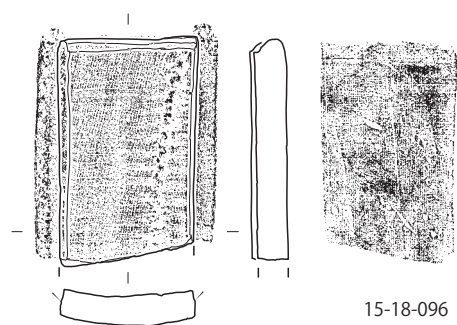
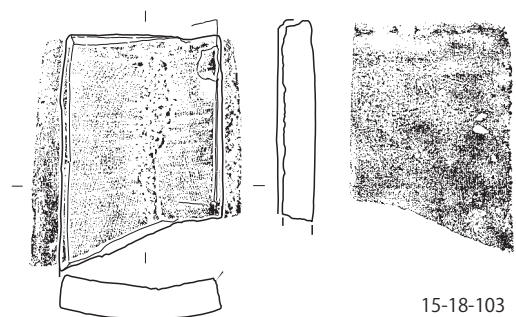


Fig.4.72 Artifacts from AKB-15(25) Tr.6 (15-18-090 – 095)

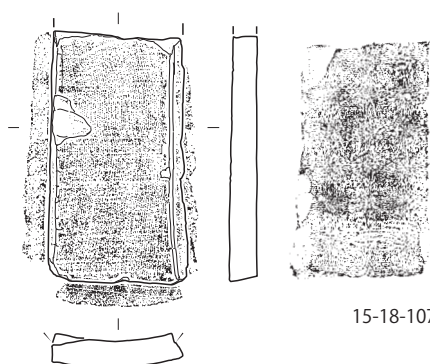


0 (1:4) 10cm

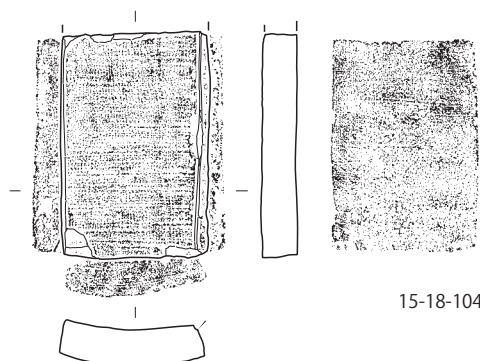
Fig.4.73 Artifacts from AKB-15(26) Tr.6 (15-18-096 – 102)



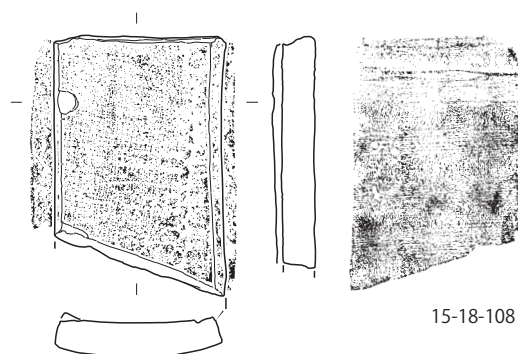
15-18-103



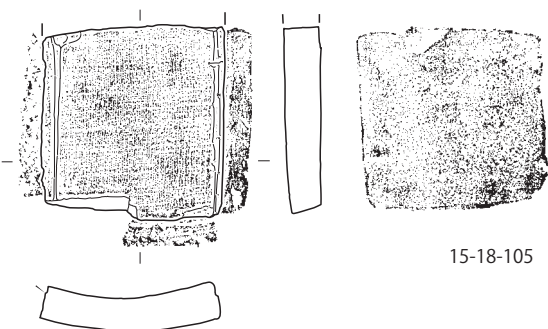
15-18-107



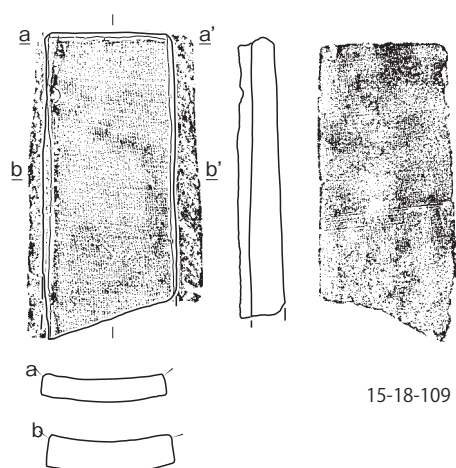
15-18-104



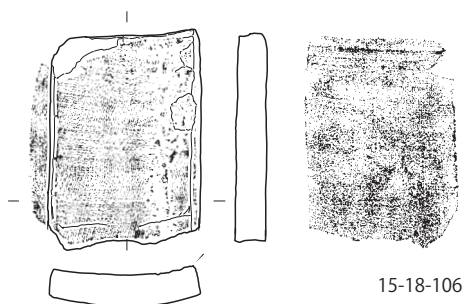
15-18-108



15-18-105



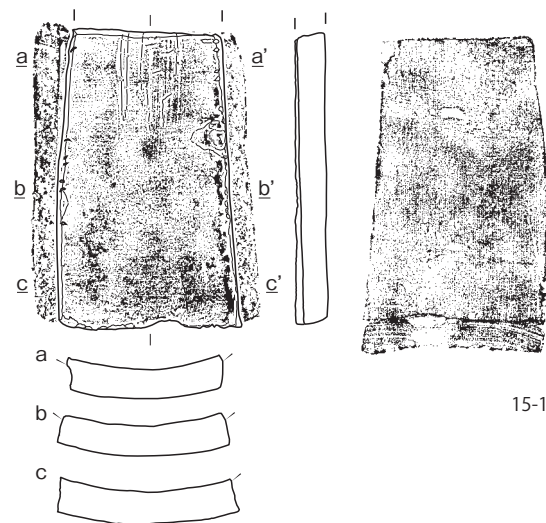
15-18-109



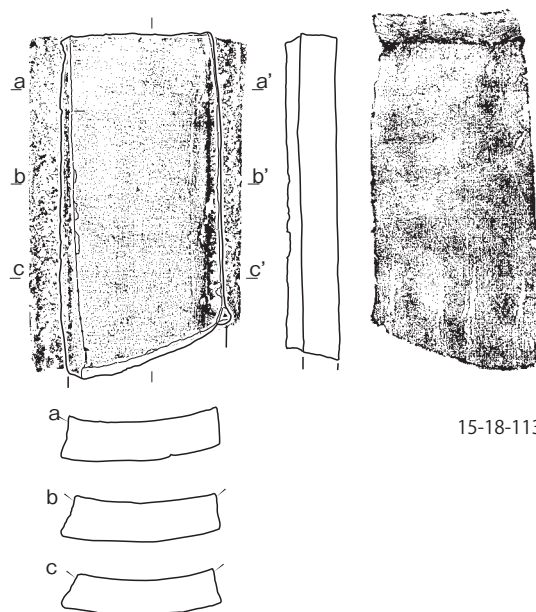
15-18-106

0 (1:4) 10cm

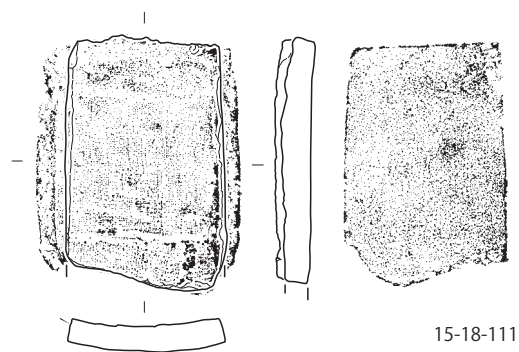
Fig.4.74 Artifacts from AKB-15(27) Tr.6 (15-18-103 – 108), trash pit in Tr.7 (15-18-109)



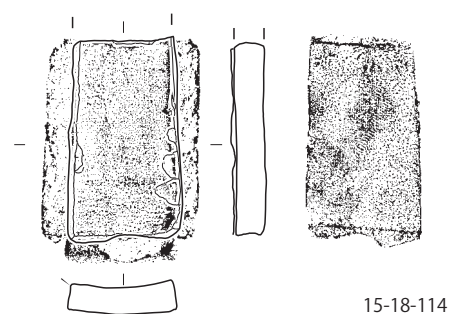
15-18-110



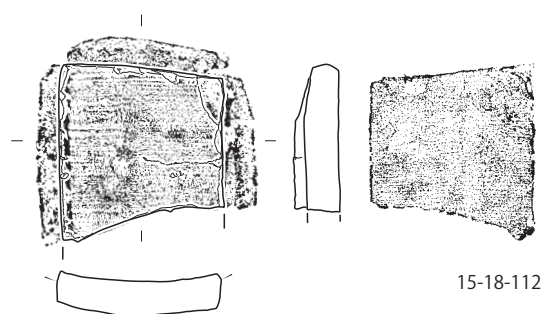
15-18-113



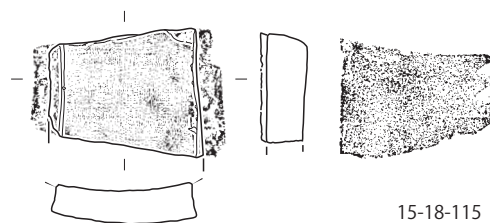
15-18-111



15-18-114



15-18-112



15-18-115

0 (1:4) 10cm

Fig.4.75 Artifacts from AKB-15(28) Trash pit in Tr.7 (15-18-110 – 115)

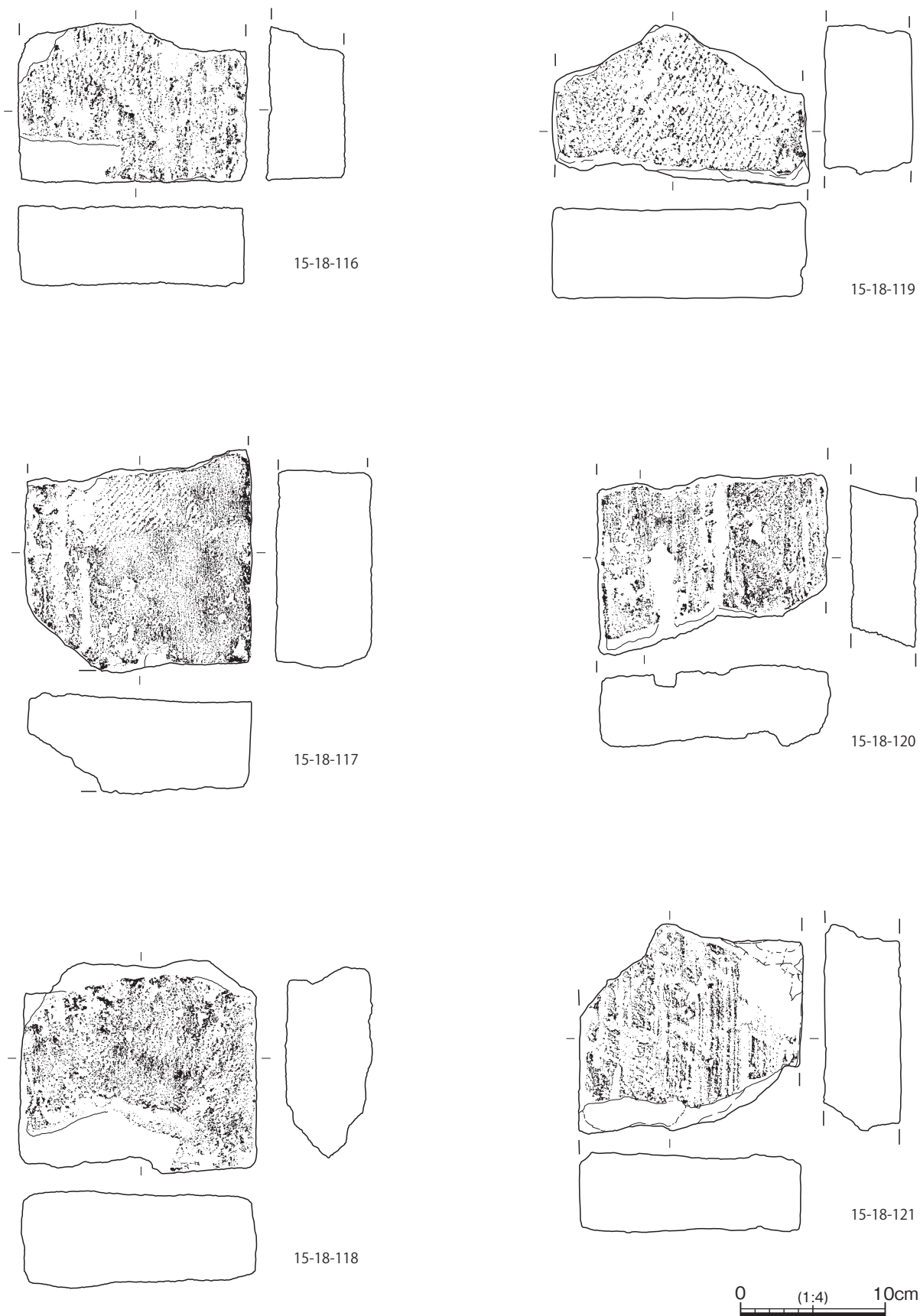
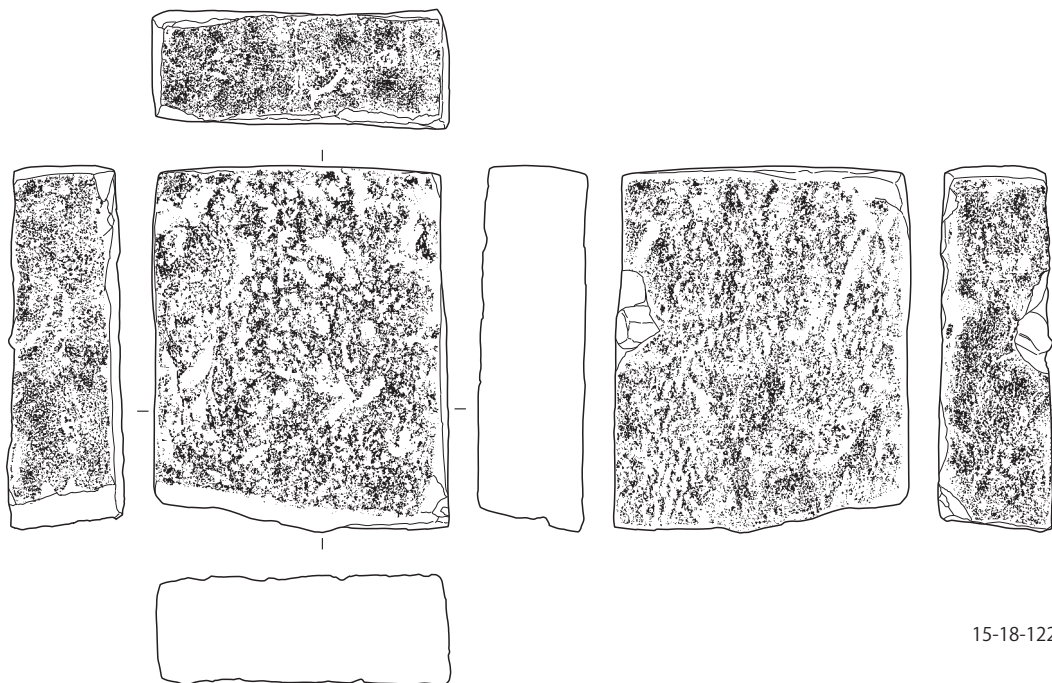
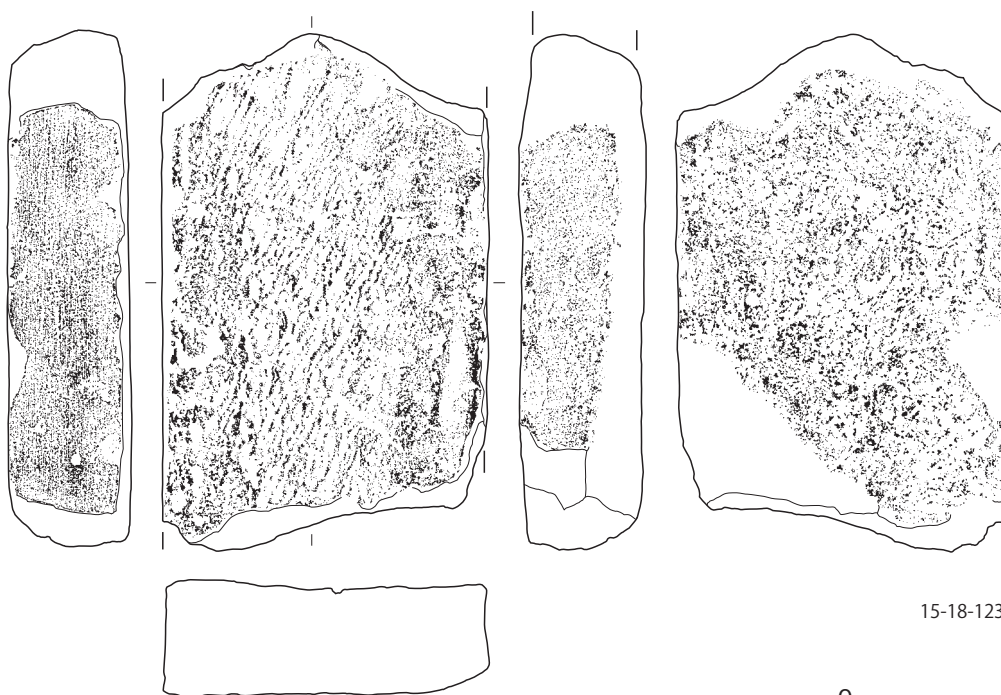


Fig.4.76 Artifacts from AKB-15(29) Top surface of stone mosaic in Tr.5 (15-18-116, 117), trash pit in Tr.7 (15-18-118, 121), Tr.5 (15-18-119), Tr.7 (15-18-120)



15-18-122



15-18-123

0 (1:4) 10cm

Fig.4.77 Artifacts from AKB-15(30) Tr.5 (15-18-123)

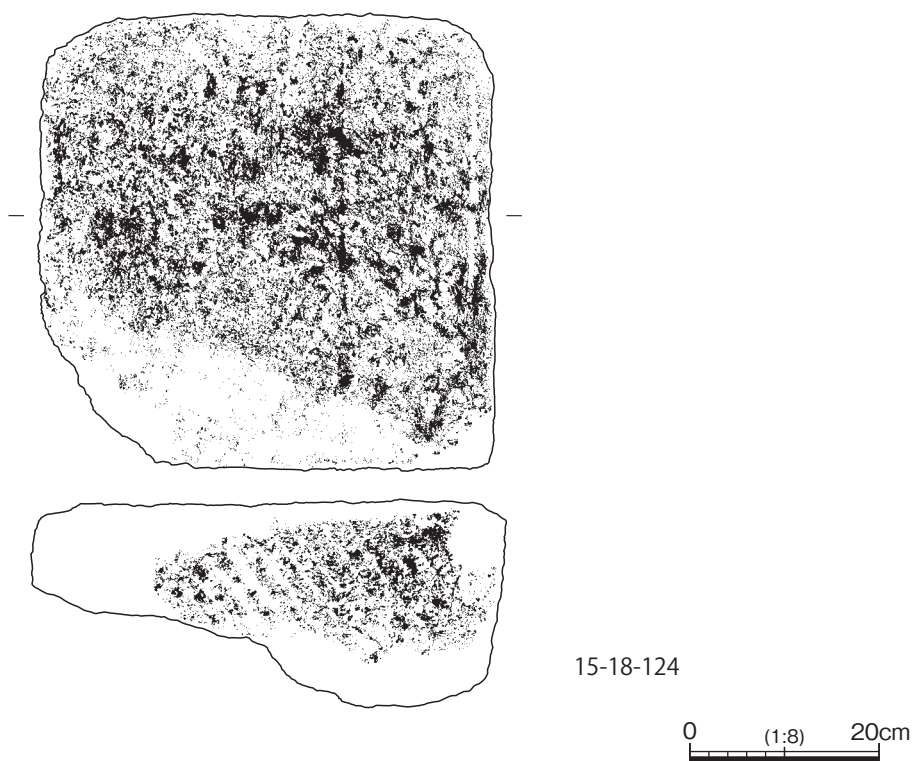


Fig.4.78 Artifacts from AKB-15(31) Surface collected material (15-18-124)



Fig.4.79 Artifacts from AKB-15(1) Trash Pit in Tr.7 (15-18-001) , well-like pit in Tr.5 (15-18-002), Tr.10a (15-18-003), top surface of stone mosaic in Tr.5 (15-18-004), Tr.8 (15-18-005), Tr.6.7 (15-18-006), Tr.5 (15-18-007), Tr.7 (15-18-008)



Fig.4.80 Artifacts from AKB-15(2) Tr.6 (15-18-009, 011), Tr.5 (15-18-010), Tr.10a (15-18-012), Tr.9 (15-18-013), Tr.5 (15-18-015, 016, 019), well-like pit in Tr.5 (15-18-017), east side of the top surface of Tr.5 stone mosaic (15-18-018, 020)



Fig.4.81 Artifacts from AKB-15(3) Top surface of stone mosaic in Tr.5 (15-18-021, 023, 027), Tr.5 (15-18-022, 024, 028), Tr.6 (15-18-025, 029), Tr.8 (15-18-026)



Fig.4.82 Artifacts from AKB-15(4) Tr.6 (15-18-030), Tr.5 (15-18-031, 033), top surface of stone mosaic in Tr.5 (15-18-032, 034 – 037)

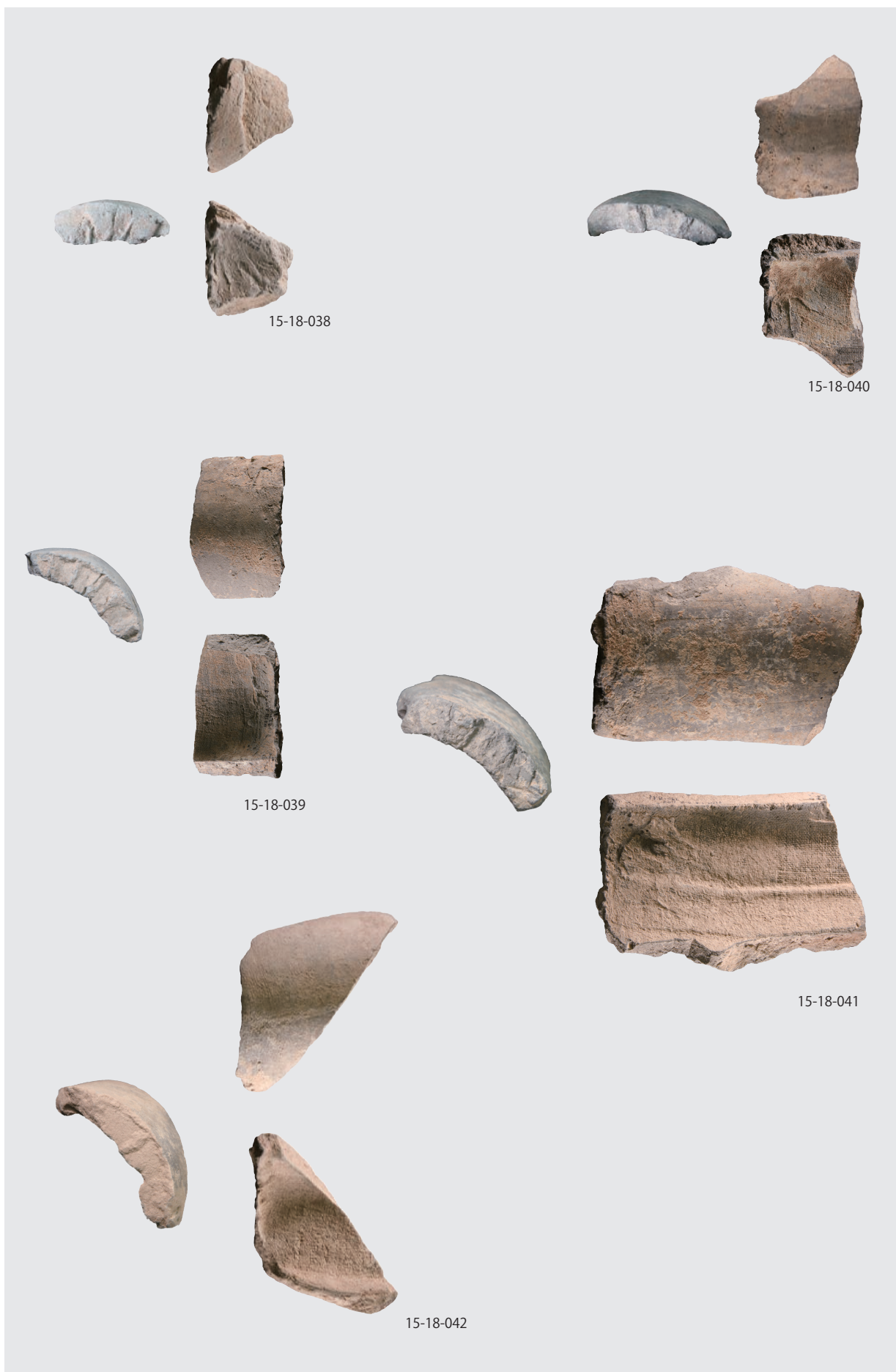


Fig.4.83 Artifacts from AKB-15(5) Tr.6 (15-18-038), top surface of stone mosaic in Tr.5 (15-18-039 – 042)



15-18-043



15-18-044

Fig.4.84 Artifacts from AKB-15(6) Tr.6 (15-18-043, 044)



Fig.4.85 Artifacts from AKB-15(7) Tr.6 (15-18-045, 046)



15-18-047



15-18-048

Fig.4.86 Artifacts from AKB-15(8) Tr.6 (15-18-047, 048)



Fig.4.87 Artifacts from AKB-15(9) Tr.6 (15-18-049), top surface of stone mosaic in Tr.5 (15-18-050)



Fig.4.88 Artifacts from AKB-15(10) Top surface of stone mosaic in Tr.5 (15-18-051, 052)



Fig.4.89 Artifacts from AKB-15(11) Top surface of stone mosaic in Tr.5 (15-18-053, 054)



15-18-055



15-18-056

Fig.4.90 Artifacts from AKB-15(12) Top surface of stone mosaic in Tr.5 (15-18-055), Tr.6 (15-18-056)



Fig.4.91 Artifacts from AKB-15(13) Tr.6 (15-18-057 – 059)



15-18-060



15-18-061

Fig.4.92 Artifacts from AKB-15(14) Well-like pit in Tr.5 (15-18-060), top surface of stone mosaic in Tr.5 (15-18-061)



15-18-062



15-18-063



15-18-064

Fig.4.93 Artifacts from AKB-15(15) Top surface of stone mosaic in Tr.5 (15-18-062 – 064)



Fig.4.94 Artifacts from AKB-15(16) Top surface of stone mosaic in Tr.5 (15-18-065 – 070)



Fig.4.95 Artifacts from AKB-15(17) Top surface of stone mosaic in Tr.5 (15-18-071 – 076), trash pit in Tr.7 (15-18-077)



15-18-078



15-18-079



15-18-080

Fig.4.96 Artifacts from AKB-15(18) Tr.6 (15-18-078 – 080)



Fig.4.97 Artifacts from AKB-15(19) Tr.6 (15-18-081 – 082), trash pit in Tr.7 (15-18-083)



15-18-084



15-18-085



15-18-086

Fig.4.98 Artifacts from AKB-15(20) Tr.6 (15-18-084 – 086)



15-18-087



15-18-088



15-18-089

Fig.4.99 Artifacts from AKB-15(21) Tr.6 (15-18-087) , trash pit in Tr.7 (15-18-088 – 089)



15-18-090



15-18-091



15-18-092



15-18-093



15-18-094



15-18-095



Fig.4.100 Artifacts from AKB-15(22) Tr.6 (15-18-090 – 095)



Fig.4.101 Artifacts from AKB-15(23) Tr.6 (15-18-096 – 102)



15-18-103



15-18-104



15-18-105



15-18-106



15-18-107



15-18-108



15-18-109



15-18-110



Fig.4.102 Artifacts from AKB-15(24) Tr.6 (15-18-103 – 108), trash pit in Tr.7 (15-18-109, 110)



Fig.4.103 Artifacts from AKB-15(25) trash pit in Tr.7 (15-18-111– 115)



Fig.4.104 Artifacts from AKB-15(26) Top surface of stone mosaic in Tr.5 (15-18-116, 117), trash pit in Tr.7 (15-18-118, 121), Tr.5 (15-18-119), Tr.7 (15-18-120)



Fig.4.105 Artifacts from AKB-15(27) Tr.5 (15-18-123) Surface collected material (15-18-124, 125)

Tab.4.3 Observation sheet of earthenware from AKB-15

Fig.	No.	Context	Feature	Classification	Vessel type	Rim ϕ /Bottom ϕ /Height	Fabric	Color (Exterior)	Color (Interior)	Notes
4.48	15-18-001	49	Trash pit of Tr.7	Earthenware			Small amount of sand such as white particles, etc., good firing	Light gray		
4.48	002	65	Well-like pit in Tr.5	Earthenware		(39.2)/-/-	White and black particles, good firing	Orange	Orange	
4.48	003		Tr.10a	Earthenware		(30.2)/-/-	Black particles, good firing	Dull orange	Dull orange	
4.48	004	52	Top surface of Tr.5 stone mosaic	Glazed ware		(29.8)/-9.0	White particles, good firing	Orange	Orange	Interior and exterior : white. Interior : characters
4.48	005		Tr.8	Earthenware		(11.7)/-/-	Large amount of small particles, slightly bad firing	Orange	Orange	Exterior : sooted
4.48	006		Tr.6.7	Earthenware		(30.6)/-/-	Small amount of black particles, small gravel, good firing	Orange	Orange	White coating?
4.48	007		Tr.5	Earthenware		(20.0)/-/-	Contains white particles, good firing	Orange	Orange	White coating?
4.49	008		Tr.7	Earthenware			Small amount of white and black particles, small gravel, good firing	Orange	Orange	
4.49	009	51	Tr.6	Earthenware		(10.6)/-/-	White and black particles, good firing	Orange	Orange	
4.49	010		Tr.5	Earthenware		-/-3.3	Small amount of white and black particles, small gravel, good firing	Dull orange	Dull orange	White coating?
4.49	011	51	Tr.6	Earthenware			Contains black particles	Grayish yellow brown		Reuse of inside of the bottom of earthenware

Tab.4.4 Observation sheet of eave-end tiles from AKB-15

Fig.	No.	Context	Feature	Classification	Type	Fabric	Firing	Color (Exterior)	Color (Interior)	Notes
4.50	15-18-021	52	Top surface of Tr.5 stone mosaic	Roof tile	Eave-end tile	Contains white particles (no sand)	Good	Yellowish gray	Yellowish gray	
4.50	022	-	Tr.5	Roof tile	Eave-end tile	Contains small gravel (round gravel)	Good	Gray	Gray	
4.50	023	52	Top surface of Tr.5 stone mosaic	Roof tile	Eave-end tile	Contains white particles (no sand)	Good	Gray	Gray	
4.50	024	-	Tr.5	Roof tile	Eave-end tile	White particles	Good	Light gray	Light gray	
4.50	025	51	Tr.6	Roof tile	Eave-end tile	Contains small amount of white particles	Slightly bad	Light gray	Light gray	
4.50	026	-	Tr.8	Roof tile	Eave-end tile	Almost no sand	Good	Light gray	Light gray	
4.50	027	52	Top surface of Tr.5 stone mosaic	Roof tile	Eave-end tile	No sand	Good	Light gray	Light gray	
4.50	028	62	Tr.5	Roof tile	Eave-end tile	Contains white particles (no sand)	Good	Grayish white	Grayish white	
4.50	029	51	Tr.6	Roof tile	Eave-end tile	Almost no sand	Slightly bad	Light gray	Light gray	
4.51	030	51	Tr.6	Roof tile	Eave-end tile	Almost no sand	Good	Light gray	Light gray	
4.51	031	-	Tr.5	Roof tile	Eave-end tile	No sand	Good	Light brownish gray	Light brownish gray	
4.51	032	67	Top surface of Tr.5 stone mosaic	Roof tile	Eave-end tile	No sand	Good	Light gray	Light gray	
4.51	033	-	Tr.5	Roof tile	Eave-end tile	Sand (small amount)	Good	Gray	Gray	
4.51	034	52	Top surface of Tr.5 stone mosaic	Roof tile	Eave-end tile	White particles	Good	Gray	Gray	Eave-end tile missing decorative cap
4.51	035	52	Top surface of Tr.5 stone mosaic	Roof tile	Eave-end tile	Small amount of sand (almost none)	Good	Gray	Gray	Eave-end tile missing decorative cap
4.51	036	52	Top surface of Tr.5 stone mosaic	Roof tile	Eave-end tile	Almost no sand	Good	Light gray	Light gray	Eave-end tile missing decorative cap
4.52	037	67	Top surface of Tr.5 stone mosaic	Roof tile	Eave-end tile	Small amount of white particles	Good	Light gray	Light gray	Eave-end tile missing decorative cap
4.52	038	51	Tr.6	Roof tile	Eave-end tile	Almost no sand	Slightly bad	Light gray	Light gray	
4.52	039	52	Top surface of Tr.5 stone mosaic	Roof tile	Eave-end tile	Small amount of sand	Good	Gray	Gray	Eave-end tile missing decorative cap
4.52	040	52	Top surface of Tr.5 stone mosaic	Roof tile	Eave-end tile	Almost no sand	Good	Gray	Gray	Eave-end tile missing decorative cap
4.52	041	52	Top surface of Tr.5 stone mosaic	Roof tile	Eave-end tile		Good	Gray	Gray	Eave-end tile missing decorative cap
4.52	042	52	Top surface of Tr.5 stone mosaic	Roof tile	Eave-end tile	Small amount of sand	Good	Gray	Gray	Eave-end tile missing decorative cap

Tab.4.5 Observation sheet of concave tiles from AKB-15

Fig.	No.	Context	Feature	Classification	Type	Fabric	Firing	Color (Exterior)	Color (Interior)	Notes
4.53	15-18-043	51	Tr.6	Roof tile	Concave tile	Contains white particles, no sand	Good	Light gray		Horizontally smoothed after vertically smoothed
4.54	044	51	Tr.6	Roof tile	Concave tile	Contains white particles, no sand	Good	Light gray		Clay belt accumulation, horizontally smoothed after vertically scraped with spatula
4.55	045	51	Tr.6	Roof tile	Concave tile	Contains white particles, small amount of sand	Good	Light gray		Coiled, horizontally smoothed after vertically tapped
4.55	046	51	Tr.6	Roof tile	Concave tile	Contains particles	Good	Light gray		Vertically tapped, horizontally smoothed
4.56	047	51	Tr.6	Roof tile	Concave tile	Contains particles	Good	Grayish yellow brown		Vertically tapped with board trace after horizontally smoothed
4.56	048	51	Tr.6	Roof tile	Concave tile	Small amount of sand	Good	Light gray		Coiled, horizontally smoothed after vertically tapped
4.57	049	51	Tr.6	Roof tile	Concave tile	Contains particles	Good	Light gray		Coiled, vertically tapped (smoothed?)
4.57	050	52	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile	Contains particles	Good	Dull yellow orange		Vertically tapped, horizontally smoothed
4.58	051	52	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile	Contains particles	Good	Light gray		Horizontally smoothed, vertically tapped
4.58	052	52	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile	Contains particles	Good	Brownish gray		Horizontally smoothed → vertically tapped
4.59	053	52	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile	Contains particles	Good	Light gray		Horizontally smoothed, vertically tapped. Bottom edge of inside : tub-shaped trace
4.59	054	52	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile	Contains particles	Good	Grayish yellow brown		Horizontally smoothed, vertically tapped, coiled? (no wrinkles visible on the exterior)
4.60	055	52	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile	Contains particles	Good	Grayish yellow brown		Horizontally smoothed, vertically tapped
4.61	056	51	Tr.6	Roof tile	Concave tile	Contains white particles, etc.	Good	Grayish yellow		Horizontally smoothed (obscurely coiled)
4.61	057	51	Tr.6	Roof tile	Concave tile	Contains particles, very small amount of sand	Good	Light gray		Coiled
4.62	058	51	Tr.6	Roof tile	Concave tile	Contains small particles	Good	Light gray		Coiled, vertically tapped, horizontally smoothed
4.62	059	51	Tr.6	Roof tile	Concave tile	Contains particles	Good	Brownish gray		Horizontally smoothed
4.63	060	65	Well-like pit in Tr.5	Roof tile	Concave tile	Contains particles	Good	Dull yellowish brown		Horizontally smoothed, tapped
4.63	061	51	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile	Small amount of particles (almost no sand)	Good	Light gray		Vertically tapped, horizontally smoothed, obscurely coiled
4.64	062	52	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile	Particles	Good	Grayish brown		Clay accumulation, vertically tapped after horizontally smoothed
4.64	063	52	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile	Particles	Good	Brownish gray		Coiled, horizontally smoothed, vertically tapped
4.64	064	52	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile	Particles	Good	Grayish brown		Horizontally smoothed → vertically tapped, traces of fingertips, obscure coiled trace, slit on the interior
4.65	065	67	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile	Contains white and black particles	Good	Light gray		Tub-shaped trace
4.65	066	67	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile	Contains sand, gravel 2cm	Good	Light gray		
4.65	067	67	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile	Contains particles	Good	Light gray		
4.65	068	67	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile	Contains small gravel, feldspar etc.	Good	Yellowish gray		
4.65	069	67	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile	Contains sand, feldspar	Good	Light gray	Light gray	Interior : textile impression
4.66	070	52	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile	Particles	Good	Brownish gray		
4.66	071	52	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile	Contains feldspar	Good	Brownish gray		
4.66	072	52	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile	Contains white particles, gravel 2mm	Good	Light gray		Tub-shaped trace
4.66	073	52	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile	Contains particles	Good	Brownish gray		
4.67	074	52	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile	Particles	Good	Gray		
4.67	075	52	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile	Particles	Good	Brownish gray		
4.67	076	52	Top surface of Tr.5 stone mosaic	Roof tile	Concave tile	Contains small round gravel	Good	Gray		
4.67	077	49	Trash pit in Tr.7	Roof tile	Concave tile	Feldspar, impression of snail	Good	Light gray		

Tab.4.6 Observation sheet of convex tiles from AKB-15

Fig.	No.	Context	Feature	Classification	Type	Fabric	Firing	Color (Exterior)	Color (Interior)	Notes
4.68	15-18-078	51	Tr.6	Roof tile	Convex tile	Contains feldspar (almost no sand)	Good	Light brownish gray		Smoothed with spatula
4.68	079	51	Tr.6	Roof tile	Convex tile	Contains white particles	Good	Grayish yellow		Vertically tapped → horizontally smoothed
4.68	080	51	Tr.6	Roof tile	Convex tile	Contains small gravel (no sand)	Good	Grayish yellow		Vertically tapped
4.69	081	51	Tr.6	Roof tile	Convex tile	Almost no sand	Good	Grayish yellow		Coiled, vertically tapped, horizontally smoothed, reddish in the whole surface (heating?)
4.69	082	51	Tr.6	Roof tile	Convex tile	White particles (almost no sand)	Good	Grayish yellow		Coiled, vertically smoothed?, horizontally smoothed
4.69	083	51	Trash pit in Tr.7	Roof tile	Convex tile	Contains feldspar	Good	Brownish gray		Smoothed with spatula (convex)
4.70	084	51	Tr.6	Roof tile	Convex tile	Contains white particles, small round gravel	Good	Light gray		Textile impression (convex)
4.70	085	51	Tr.6	Roof tile	Convex tile	Contains small gravel	Good	Light gray		Coiled, rope-tapping trace, horizontally smoothed
4.70	086	51	Tr.6	Roof tile	Convex tile	Contains feldspar	Good	Light brownish gray		Coiled, vertically smoothed (or tapping)
4.71	087	51	Tr.6	Roof tile	Convex tile	Contains particles	Good	Light gray		Scraped with spatula and smoothed after rope-tapping trace (convex), textile impression (convex), smoothed with spatula
4.71	088	49	Trash pit in Tr.7	Roof tile	Convex tile	Contains feldspar	Good	Brownish gray		Smoothed with spatula (convex), textile impression (concave)
4.71	089	49	Tr.7	Roof tile	Convex tile	Contains feldspar	Good	Brownish gray		Smoothed with spatula (convex), textile impression (convex)

Tab.4.7 Observation sheet of ridge tiles from AKB-15

Fig.	No.	Context	Feature	Classification	Type	Fabric	Firing	Color (Exterior)	Color (Interior)	Notes
4.72	15-18-090	51	Tr.6	Roof tile	Ridge tile	Contains particles	Good	Light gray		Coiled trace unknown, vertically tapped, left : smoothed on side, right : cut+crack
4.72	091	51	Tr.6	Roof tile	Ridge tile	Contains particles	Good	Light gray		Vertically tapped, horizontally smoothed
4.72	092	51	Tr.6	Roof tile	Ridge tile	Contains particles such as white particles, etc.	Good	Light gray		Horizontally smoothed, (coiled trace unknown, tapping also unknown)
4.72	093	51	Tr.6	Roof tile	Ridge tile	Contains particles	Good	Light gray		
4.72	094	51	Tr.6	Roof tile	Ridge tile	Contains particles	Good	Light gray		Exterior : vertically tapped, right : crack+cut, left : smoothed, fingertip impression
4.72	095	51	Tr.6	Roof tile	Ridge tile	Contains particles	Good	Light gray		Coiled trace unknown, horizontally smoothed → vertically tapped, right : smoothed (cut face remaining), left : cut+crack
4.73	096	51	Tr.6	Roof tile	Ridge tile	Contains particles	Good	Light gray		Horizontally smoothed, vertically tapped
4.73	097	51	Tr.6	Roof tile	Ridge tile	Contains white particles, etc.	Good	Light gray		Coiled?, horizontally smoothed → vertically tapped
4.73	098	51	Tr.6	Roof tile	Ridge tile	Contains particles	Good	Light gray		Coiled, horizontally smoothed → vertically tapped
4.73	099	51	Tr.6	Roof tile	Ridge tile	Contains particles	Good	Light gray		Contains particles
4.73	100	51	Tr.6	Roof tile	Ridge tile	Contains particles	Good	Light gray		Coiled, horizontally smoothed → vertically tapped
4.73	101	51	Tr.6	Roof tile	Ridge tile	Contains particles	Good	Light gray		Horizontally smoothed, (coiled trace unknown)
4.73	102	51	Tr.6	Roof tile	Ridge tile	Contains particles	Good	Light gray		Vertically tapped
4.74	103	51	Tr.6	Roof tile	Ridge tile	Contains particles	Good	Light gray		Horizontally smoothed
4.74	104	51	Tr.6	Roof tile	Ridge tile	Contains particles	Good	Light gray		Vertically tapped after horizontally smoothed
4.74	105	51	Tr.6	Roof tile	Ridge tile	Contains particles	Good	Light gray		Horizontally smoothed
4.74	106	51	Tr.6	Roof tile	Ridge tile	Contains particles	Good	Light gray		Horizontally smoothed
4.74	107	51	Tr.6	Roof tile	Ridge tile	Contains small gravel	Good	Light gray		
4.74	108	51	Tr.6	Roof tile	Ridge tile	Contains particles	Good	Light gray		Horizontally smoothed, vertically tapped
4.74	109	49	Tr.7	Roof tile	Ridge tile	Contains feldspar	Good	Light brownish gray		Left and right : crack+cut (concave), smoothed with spatula (convex)
4.75	110	49	Tr.7	Roof tile	Ridge tile	Contains feldspar	Good	Light brownish gray		Textile impression (concave)(fine), smoothed with spatula (convex)(horizontally)
4.75	111	49	Tr.7	Roof tile	Ridge tile	Contains feldspar, small gravel	Good	Brownish gray		Textile impression (concave)(coarse), trace of binding, impression, smoothed with spatula (convex)
4.75	112	49	Tr.7	Roof tile	Ridge tile	Contains feldspar, small gravel	Good	Light brownish gray		Textile impression (concave)(fine), smoothed with spatula (convex)(horizontally)

Fig.	No.	Context	Feature	Classification	Type	Fabric	Firing	Color (Exterior)	Color (Interior)	Notes
4.75	113	49	Tr.7	Roof tile	Ridge tile	Contains feldspar, small gravel	Good	Brownish gray		Textile impression (concave)(fine), smoothed with spatula
4.75	114	49	Tr.7	Roof tile	Ridge tile	Contains feldspar	Good	Light brown		Textile impression (concave)(fine), impression, vertically tapped (convex), smoothed with spatula
4.75	115	49	Tr.7	Roof tile	Ridge tile	Contains feldspar	Good	Brownish gray		Impression (concave), smoothed with spatula (convex)

Tab.4.8 Observation sheet of greyish burnt bricks from AKB-15

Fig.	No.	Context	Feature	Classification	Type	Fabric	Firing	Color (Front)	Color (Back)	Notes
4.76	15-18-116	67	Top surface of Tr.5 stone mosaic	Clay object	Greyish burnt brick	-	Good	Light gray		
4.76	117	52	Top surface of Tr.5 stone mosaic	Clay object	Greyish burnt brick	-	Good	Gray		Cord impression
4.76	118	49	Trash pit in Tr.7	Clay object	Greyish burnt brick	-	Good	Olive gray		
4.76	119	62	Tr.5	Clay object	Greyish burnt brick	-	Good	Grayish brown		Cord impression?
4.76	120		Tr.7	Clay object	Greyish burnt brick	-	Good	Reddish gray		
4.76	121	49	Trash pit in Tr.7	Clay object	Greyish burnt brick	-	Good	Reddish gray		Impression
4.77	122			Clay object	Greyish burnt brick	-	Good	Gray		
4.77	123		Tr.5	Clay object	Greyish burnt brick	-	Good	Light brownish gray		Cord impression (vertically nail-shaped)

Tab.4.9 Observation sheet of metal objects from AKB-15

Fig.	No.	Context	Feature	Classification	Type	L/W/D	Wt.(g)	Notes
4.49	15-18-016	53	Tr.5	Copper				
4.49	017	65	Well-like pit in Tr.5	Copper	Stud			
4.49	019	52	Tr.5	Copper	Dish-shaped?			
4.49	020	57	East side of the top surface of Tr.5 stone mosaic	Copper				

Tab.4.10 Observation sheet of clay objects from AKB-15

Fig.	No.	Context	Feature	Classification	Type	L/W/D	Wt.(g)	Fabric	Color (Exterior)	Color (Interior)	Notes
4.49	15-18-12		Tr.10a	Clay object	Clay disc			Small amount of feldspar, etc.	Pale orange	Orange	Reuse of earthenware fragment
4.49	13	46	Tr.9	Clay object	Clay disc			Small amount of sand	Grayish brown	Dull reddish brown	Reuse of earthenware fragment

Tab.4.11 Observation sheet of bone artifacts from AKB-15

Fig.	No.	Context	Feature	Classification	Type	L/W/D	Wt.(g)	Notes
4.49	15-18-018	57	East side of the top surface of Tr.5 stone mosaic	Animal bone				

Tab.4.12 Observation sheet of stone artifacts from AKB-15

Fig.	No.	Context	Feature	Classification	Type	Stone Material	Diameter/Thickness(cm)	Wt.(g)	Color (Exterior)	Notes
4.49	15-18-014			Stone artifact	Unknown stone artifact			0.6	Yellowish brown	
4.49	15		Tr.5	Stone artifact	Unknown stone artifact				Dark greenish gray	
4.78	124		Surface collection		Foundation stone			-		
-	125		Surface collection		Foundation stone			-		

Tab.4.13 Weight of unearthed materials from AKB-15 (g)

Area	Feature	Earthenware	Glazed ware	Convex tile	Concave tile	Eave-end tile	Ridge tile	Greyish burnt brick	Red brick	Bone	Stone artifact	Clay object	Metal	Slag	Wall clay	Charcoal
15	Tr.5	11189	15	16569	130394	17	953	11519	1844	387	9			21	64	
15	Tr.5 ext.	98		1132	13909			1033		6				46		
15	Tr.5 roof tile belt	784		21862	87251	31	76	2933	39	27	78					
15	Top surface of Tr.5 stone mosaic	10059	217	18527	1123442	899	2143	33086		1222				163	102	
15	Well-like pit in Tr.5				5344										86	
15	Well-like pit in Tr.5	4466	10	2390	101784		150	5406		717						
15	East side of the top surface of Tr.5 stone mosaic	3382		628	14379		108	2337		1393						
15	Around rain-permeable ditch of Tr.5	4535		3117	28552		280	6745	1699	123			87	184		
15	Kara-khanid period stove	87			2607					5						
15	Tr.6	1193		9032	53799		744	2065		33					159	
15	Tr.6 ext.	1557		5793	60804		80	2468		183				75		
15	Tr.6 roof tile belt	7464		89013	336509	1326	26728	5190	691	1008	422			378	2389	10
15	Tr.6.7	2541		3640	44695		347	2239	234	43						
15	Tr.7	860		505	6814		150	241		27						
15	Trash pit in Tr.7	5164		8547	112690		3184	15530		389	300					
15	Tr.8	5201		1334	50632			4504	27	245				200		
15	Tile accumulation in the south side of Tr.8	339		1564	60806			1021		43						
15	Tr.8 sub-trench	282		237	4559			275		10					31	
15	Tr.9	4179		1080	26608			4960	80	49				19	110	
15	Tr.10	8731		1492	30571		311	883	1289	263		45		410		
15	Tr.11	127						7790								
15	Surface collection										12625					
15	Unknown	1884		1740	47550			983	153	255	9					
Total		74122	242	188202	2343699	2273	35254	111208	6056	6428	13443	45	87	1496	2941	10

Tab.4.14 AKB-15 List of contexts

No.	Feature	Discription	Former No.	No.	Feature	Discription	Former No.
1	Tr.6	Roof tile belt	2017-R1	38	Tr.6	Layer 2 below topsoil layer	2017-R38
2	Tr.5	Coin	2017-R2	39	Tr.3	Earthenware (jug) in R20	2017-R39
3	Tr.4	Disc-shaped glazed ware	2017-R3	40	Tr.5	Glazed ware	2017-R40
4	Tr.4	Bottom of glazed ware	2017-R4	41	Surface collected	Eave-end tile	2017-R41
5	-	Glazed ware	2017-R5	42	Tr.5		2018-R001
6	Tr.3	Coin	2017-R6	43	Tr.5	Accumulation of tile on the north side of greyish burnt brick	2018-R002
7	Tr.3	Medal	2017-R7	44	Tr.7	Foundation stone board	2018-R003
8	Tr.4	Coin	2017-R8	45	Tr.9	Stone artifact	2018-R004
9	Tr.3	Glazed ware	2017-R9	46	Tr.9	Clay disc (talç?)	2018-R005
10	Tr.4	Eave-end tile	2017-R10	47	Tr.5	Stove (north side of the row of greyish burnt brick)	2018-R006
11	Tr.4	Bronze	2017-R11	48	Tr.11	Re-used greyish burnt brick, alter-shaped	2018-R007
12	Tr.5	Ring	2017-R12	49	Tr.7	Trash pit	2018-R008
13	Tr.3	Coin	2017-R13	50	Outside the excavation area	Foundation stone (AKB-18, 002)	2018-R009
14	Outside the excavation area	Foundation stone 124	2017-R14	51	Tr.6	Tiles from length of 2m, south of Tr.6 sub-trench (2017 – R15)	2018-R010
15	Tr.5	Surface of 2018 stone mosaic	2017-R15	52	Tr.5	Tile accumulated on stone mosaic. Taken from north in three lvels.	2018-R011
16	Tr.5	Near the west wall	2017-R16	53	Tr.5	Bronze (ornament on earrings?)	2018-R012
17	Tr.5	Northe side of R15 (surface of 2018 stone mosaic)	2017-R17	54	Tr.6 ext.	Bronze	2018-R013
18	Tr.4		2017-R18	55	Tr.6 ext.	Block of iron	2018-R014
19	Tr.4		2017-R19	56	Tr.6 ext.	Iron	2018-R015
20	Tr.3	Unit including furnace, kamado, etc.	2017-R20	57	Tr.5	Upper layer of stone mosaic	2018-R016
21	Tr.2	Cluster of earthenware, gravel	2017-R21	58	Tr.8	Tr.8 north sub-trench	2018-R017
22	Tr.6	Subtrench of roof tile belt (west side, topsoil layer)	2017-R22	59	Tr.6		2018-R018
23	Tr.6	Metal, above R1	2017-R23	60	Tr.8	Accumulation of tiles, east-west sub-trench on the south side	2018-R019
24	Tr.6	Convex tile; surface 1 of sub-trench of -roof tile belt (R1-2)	2017-R24	61	Tr.8	Accumulation of small gravel, east-west sub-trench on the south side	2018-R020
25	Tr.6	Roof tile; surface 2 of sub-trench of R1 roof tile belt (R1-2)	2017-R25	62	Tr.5	North end of roof tile belt, take up for 1m thick	2018-R021
26	Tr.6	Concave tile, convex tile; surface 3 of sub-trench of R1 roof tile belt (R1-3)	2017-R26	63	Tr.5	Decorative cap of an eave-end tile (above the west stone mosaic)	2018-R022
27	Tr.6	Charcoal sample; sub-trench of R1 roof tile belt	2017-R27	64		Dwellings of the Kara-khanid period	2018-R023
28	Tr.6	Surface 4 of sub-trench of R1 roof tile belt (R1-4)	2017-R28	65	Tr.5	Well-like pit (disruption of Kara-khanid period)	2018-R024
29	Tr.6	Charcoal sample; sub-trench of R1 roof tile belt	2017-R29	66	Tr.5	East side of belt, east	2018-R025
30	Tr.6	Sub-trench of R1 roof tile belt, on the platform side	2017-R30	67	Tr.5	Layer 2 of the section belt	2018-R026
31	Tr.6	Surface 5 of sub-trench of R1 roof tile belt (R1-5)	2017-R31	68	Tr.5	East side, cluster of roof tiles	2018-R027
32	Tr.6		2017-R32	69	Tr.6	Iron	2018-R028
33	Tr.6	Surface 6 of sub-trench of R1 roof tile belt (R1-6)	2017-R33	70	Tr.5	Southern half-sectioning of well-like pit	2018-R029
34	Tr.6	Surface 7 of sub-trench of R1 roof tile belt (R1-7)	2017-R34				
35	Tr.7	Charcoal sample; southwest corner	2017-R35				
36	Tr.6	East side of R1	2017-R36				
37	Tr.6	Layer 1 below topsoil layer (contains burnt soil, charcoal)	2017-R37				

5. Investigation of AKB-18

5.1. Location of Excavation Area (Fig.1.5)

It is located in the southeast of AKB-13, outside the south gate, to the east. The 1967 aerial photograph analysis shows two square sections aligned east-west at this point. The square section to the west is the site of the second Buddhist temple surveyed by Zyablin in 1955-1957. The walls were built with sun-dried bricks. There were entrances on all sides, and the wall paintings and fragments of clay Buddha statues were excavated, which clarified the structure and character of the site. The adjacent square section on the east side has not received much attention so far, but the photographs show that it is in the form of a square embankment, although it is unclear. Since the main axis of the two sections is the same, it is assumed to be the features of the Buddhist temple. We carried out an investigation in the vicinity of this eastern feature.

5.2. General Description of the Investigation (Fig.5.1~5.8)

In the current situation, the superstructure is completely missing due to land reclamation in the 1970s. However, the surrounding topography is remaining, so the approximate location can be estimated based on aerial photograph data of 1967. This time, based on the results of the ground-penetrating radar survey conducted in the first excavation in 2017, we set up a 10 × 10 m excavation area around the point where there were radar echoes of features. We dug down to the confirmation surface and confirmed the stratigraphy on the southern and eastern walls of the excavation area. Then, the area was further extended by 5 m square from the southwest corner to the west, and the feature was confirmed.

After digging down about 0.5 m below the surface and about 0.75 m inside the trench, a north-south ditch-like depression was detected in a straight line at the final stage. However, we were only able to confirm it this time. The recording was insufficient, so we did not carry out an excavation of the ditch-shaped features.

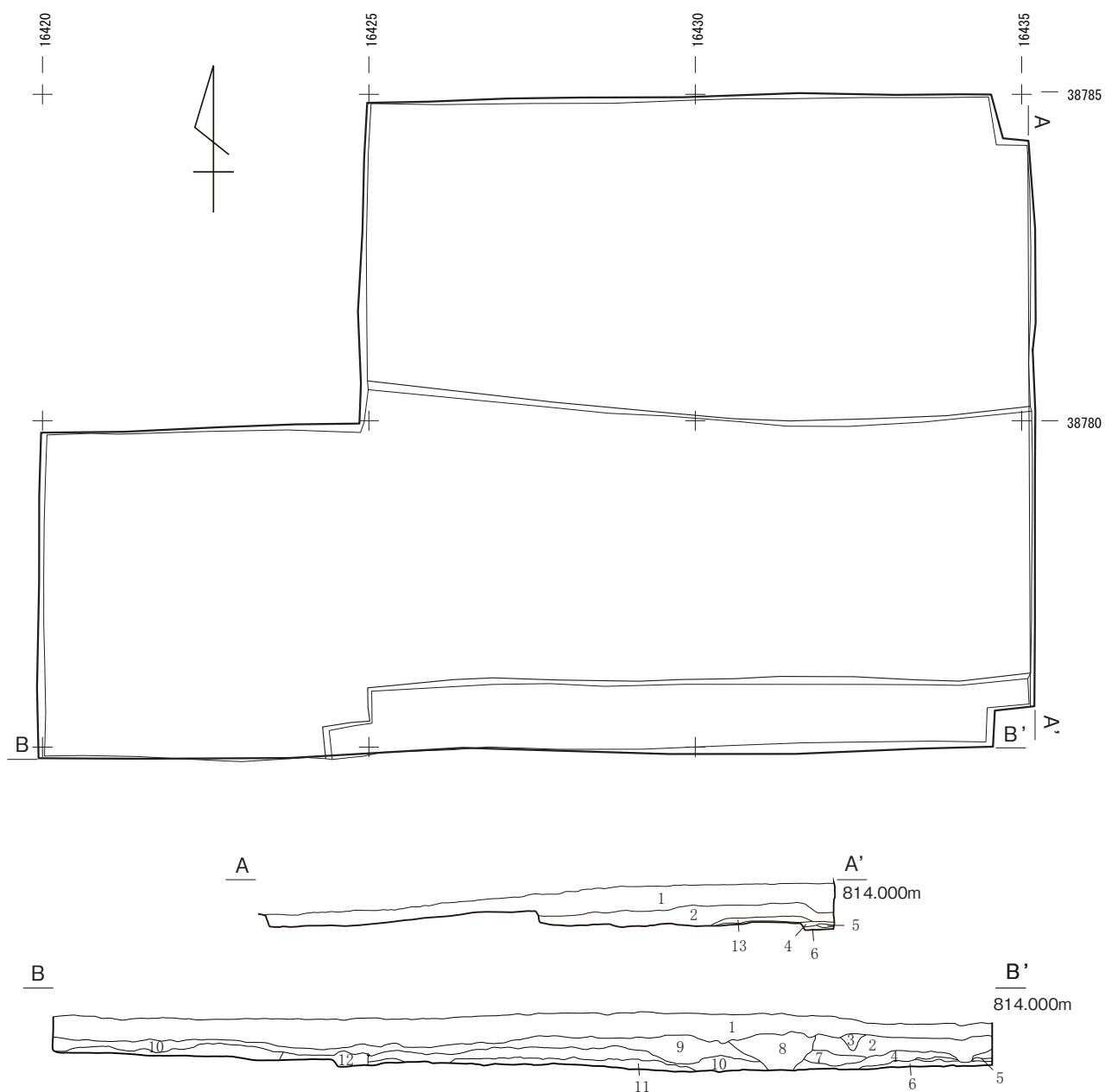
5.3. Artifacts Excavated from AKB-18 (BT2) (Fig.5.9, 5.10 : 18-18-001–002)

- Metal objects

There are only a few artifacts, including some earthenware and coins excavated from the cultural layer. 194 is a 1.6 cm-diameter square-holed bronze coin with letters.

- Foundation stone

002 is a foundation stone collected near the northwest pylon of the second Buddhist temple, between AKB-18 and SH1. It is a grayish-brown granite, about 50 cm square and 15 cm thick. The surface is flattened and shaped by chiseling. It is similar in size and quality to those of the foundation stone collected within SH2 (124). It is thought to have been moved during modern farmland reclamation, but there is a possibility that it was moved from SH2a or that a building with a foundation stone existed near the second Buddhist temple, but the latter is more likely based on the point of collection.



- 1 Dull brown soil: Soil after leveling by tractor. Very compact. Contains small amount of earthenware, tiles.
- 2 Dull yellow orange soil: Soil after leveling by tractor. Fine and very compact. Contains small amount of earthenware.
- 3 Dull brown soil: Disturbed.
- 4 Dull yellow orange soil: Silt-like soil containing knitted accumulation.
- 5 Dull brown soil: Coarse sand. Small gravel.
- 6 Dull orange soil: Silt-like soil containing knitted accumulation. More clay-like than layer 4.
- 7 Dull brown soil: Coarse sand. Small gravel. Almost the same as layer 5.
- 8 Dull yellow orange soil: Disturbed. Hard. Contains small amount of earthenware, burnt soil.
- 9 Dull yellow orange soil: Soil accumulation before leveling by tractor. Similar to layer 2 but less compact.
- 10 Dull yellow orange soil: Silt-like soil containing knitted accumulation. Similar to layer 4 but weak viscous.
- 11 Dull orange soil: Similar to layer 6 but weak viscous.
- 12 Dull yellowish brown soil: Very compact. Contains small amount of small lump of clay. Wall?
- 13 Dull brown soil: Coarse sand. Small gravel. Harder than layer 5.

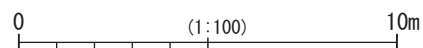


Fig.5.1 Full view of AKB-18



Fig.5.2 Distant view of the excavation area of AKB-18 (from west)



Fig.5.3 Distant view of the excavation area (from south)



Fig.5.4 Full view of the excavation area



Fig.5.5 Investigation scene



Fig.5.6 Investigation scene



Fig.5.7 Confirmation of ditch-like feature



Fig.5.8 Backfilling of excavation area

Tab.5.1 List of unearthed materials from AKB-18

No.	fig	Feature	Classification	Type
18-18-001	5.4		Copper	Coin
002	5.11	Surface collection		Foundation stone

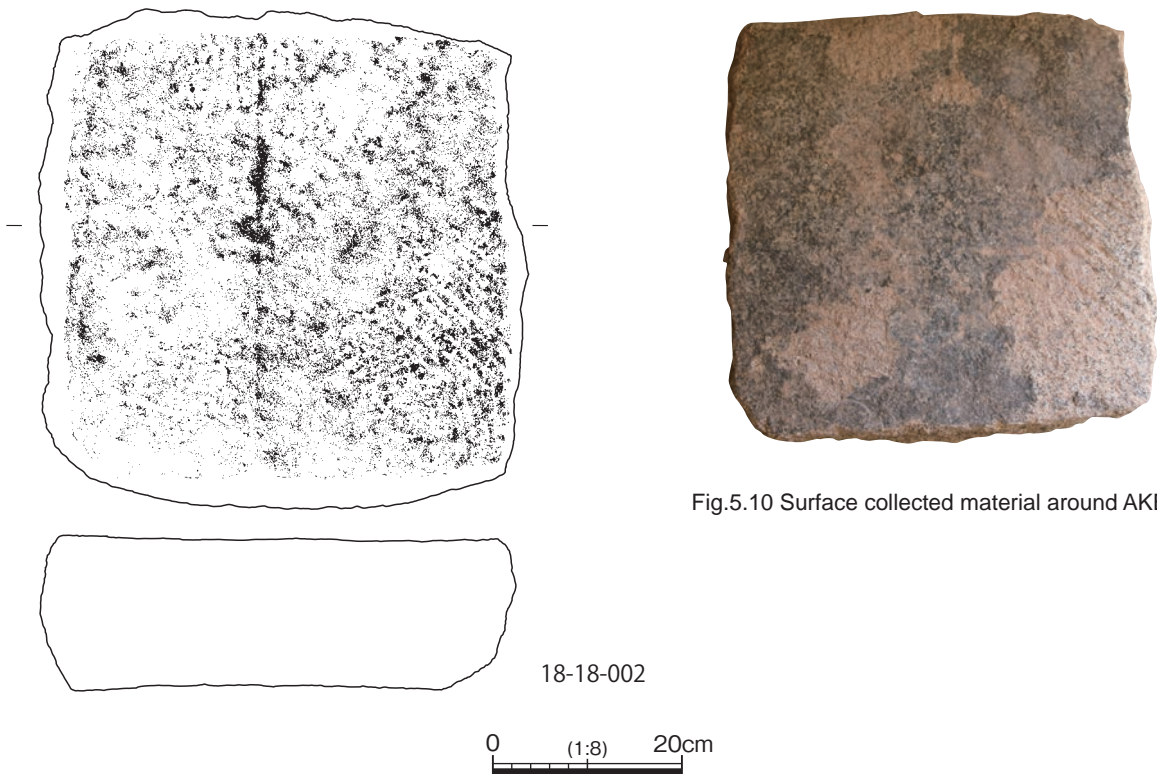


Fig.5.9 Artifacts from AKB-18

Fig.5.10 Surface collected material around AKB-18

Tab.5.2 Observation sheet of metal objects from AKB-18

Fig.	No.	Context	Feature	Classification	Type	L/W/D	Wt.(g)	Notes
5.9	18-18-001			Copper	Coin	1.5(square-hole 0.4cm)//	0.8	No.6 West ext. Interior : no character

Tab.5.3 Observation sheet of stone artifacts from AKB-18

Fig.	No.	Context	Feature	Classification	Type	Stone Material	Diameter/Thickness(cm)	Wt.(g)	Color (Exterior)	Notes
5.11	18-18-002		Surface collection		Foundation stone			-		

Tab.5.4 Weight of unearthed materials from AKB-18 (g)

Area	Feature	Earthenware	Glazed ware	Convex tile	Concave tile	Eave-end tile	Ridge tile	Greyish burnt brick	Red brick	Bone	Stone artifact	Clay object	Metal	Slag	Wall clay	Charcoal
18	West ext.	1468								297			17	919		
18	Cutting off on the south side	56														
18		4724			64				514	597			163	2324		
Total		6248	0	0	64	0	0	0	514	894	-	0	180	3243	0	0

6. Investigation of AKB-16

6.1. Introduction

The investigation of AKB-16 near the southern end of the east wall extending north-northeast to south-southwest of the First Shahrstan has been initiated since 2017 (Fig. 6.1). On the cross section of the trench set for this investigation, the structure of the wall built by rammed earth method was recognized, indicating that the wall was constructed during the Tang Dynasty (late 7th - 8th centuries) (Yamauchi and Bakit 2017). It is also known that the walls were deformed after construction for some reason. In the investigation in 2018, we attempted to reconstruct the deformation of this wall from geoarchaeological perspective and report our conclusion that the deformation was most likely induced by an earthquake.

6.2. Investigation Cross Section and Its Interpretation

6.2.1. Cross Section

The investigation trench was set in the direction perpendicular to the extension of the east wall, and the internal structures of the wall and its lower natural layers were observed. Fig.6.2 is the surface of the cross section facing north in the trench, which is classified into layer "a" to layer "p". Layer "b" to layer "k" consist of embankment constructed by slab construction. Layers "l" to layer "p" consist of natural accumulations of developed laminae. Layers "a" and "a'" consist of aeolian layers overlying these layers (part of layer "a'" may have been artificially accumulated). Of these, layer "a" has more developed plant roots than layer "a'", which inconsistently covers layer "b". Layer "b" to layer "k" consist mainly of a mixture of sand and clay, and the layer levels are divided by the different soil densities above and below each layer boundary. This is attributed to the fact that the boundary was rammed during construction of the slab. Layer "l" to layer "p" consist mainly of sand, with a thin layer of clay in between. Since laminae are also developed, these were determined to be hydrolytic accumulations (some may be air-laid). The deformation structure shows the presence of accumulations consisting of sand to clay which are vertically inter-bedded from layer "b" to layer "m". The thickness is several cm, and the lamina develops horizontally. From layer "n" to layer "o", a westward sloping shear plane is formed. The displacement observed in layer "n" is 11 cm in the vertical direction and 10.5 cm in the horizontal direction. This shear layer does not extend into layer "p", but layer "p" is sinking in the direction of shear layer extension. In addition, there was disorder such that the constituent materials of layer "o", which consisted of sand to clay, entered layer "n", which also consisted of sand and clay. The layer boundaries of natural accumulations are divided simply by color and particle size.

6.2.2. In-situ Test

In-situ tests using the Yamanaka soil hardness tester and soil layer strength test rods (Geology Team, Materials and Geotechnical Research Group, Independent Administrative Institution Public Works Research Institute, 2010) were conducted to confirm the mechanical properties of embankments constructed by slab construction and natural accumulations. The soil layer strength test rod can mount a vane cone on its tip, and the maximum shear stress (τ_f) can be calculated by measuring the pushing force of the rod and the number of rotations of the vane cone required to shear the soil layer under multiple loading conditions. In addition, from the results, the adhesive force (c) and internal friction angle (ϕ) can be estimated.

Measurements with soil hardness tester were carried out for layer "a" to layer "p". Measurements were taken five times for each layer, and the measurement results were based on the average values. From the measurement results (Table.6.1), the lowest strength of 10.9 was obtained in layer "p".

Layer "k" and layer "l", which are the boundary between the embankment and the natural accumulation, show a difference in strength of 24.0 and 15.4, respectively. Vane cone shear tests using soil layer strength test rod were conducted for layer "k" to layer "p". The results are shown in Fig. 6.3. c is 40.5kN/m² and Φ is 43.2° in layer "k". c is 14.0kN/m² and Φ is 32.0° in layer "l". c is 31.0kN/m² and Φ is 29.4° in layer "m". c is 12.5kN/m² and Φ is 39.1° in layer "n". c is 5.5kN/m² and Φ is 41.2° in layer "o". c is -1.0kN/m² and Φ is 29.4° in layer "p". These in-situ tests were conducted on April 29, 2018. The weather was clear, and the cross section was extremely dry.

6.2.3. Discussion

From the results of the observation of the cross section surface, it was found that layer "b" to layer "k" consisted of fill constructed by slab construction, and layer "l" to layer "p" consisted of natural accumulation with lamina development. Of these, accumulation consisting of sand to clay inter-bedded vertically from layer "b" to layer "m" was present. The origin of this is thought to be the accumulation which filled open cracks in the wall. Although the structure of open cracked fillings is not readable in the lower layer levels below layer "n", which consists of natural accumulations, a westward sloping shear layer was formed from layer "n" to layer "o". It is determined that the upper layer levels, except for layers "a" and "a'", were also lowered on the west side due to this shear displacement, bordering the open crack structure. The presence of subsidence in the extensional direction of the shear layer in layer "p" is considered to have caused this shear displacement. In other words, the series of deformation structures observed in layer "b" to layer "p" indicate that the wall was deformed by displacement of natural accumulation after the construction of the wall. Soil hardness was measured by soil hardness tester and vane cone shear test was conducted. Among them, soil hardness of layer "p" showed lower value than other layer levels, and adhesive force (c) was -1.0kN/m², which was almost zero (although negative value was not theoretically possible). Layer "p" is composed of sand with many space and is considered to have sunk due to the load of the embankment.

The authors believe that this subsidence is not due to a compaction of the loaded embankment, but an immediate subsidence caused by seismic motion. The reason for this is the structure of layer "o" constituent material, which is found in layer "n" and layer "o", rising to layer "n". This structure was considered to be formed by the discharge of pore water from layer "o" due to the seismic motion and the load of the embankment. The sandy layer "p" is also considered to have sunk immediately due to the discharge of pore water. The immediate subsidence of layer "o" triggered the shear displacement of layer "b" to layer "n". In addition, in the embankment parts where the lateral parts are not restrained (layers "b" to "m"), the seismic acceleration is amplified and toppling occurred which lead to open cracks bordering the shear surface.

Then, when did this earthquake occur? A large number of tiles associated with the collapse of structures have been found in the second Shahrستان (Fig. 6.1), located southwest of the first Shahrستان (Yamauchi and Bakit, 2017). Since these tiles are from the Tang Dynasty, it is possible that an earthquake occurred in the 8th century, and the seismic motion caused the collapse of the building and deformation of the west wall. As reported by Sato et al. (2018), a clear active fault cliff bordering the Chu River Basin and the Tianshan Mountains develops in an east-west direction 13 km south of the investigation site (Fig. 6.4 and Fig. 6.5). The earthquake that deformed the wall is highly related to this active fault. In the future, it is required to investigate whether there are any traces of earthquakes in the features other than the east wall of the AKB-13, and to conduct an active fault investigation as well.



Fig.6.1 Ak-Beshim (aerial photograph taken in 1967)

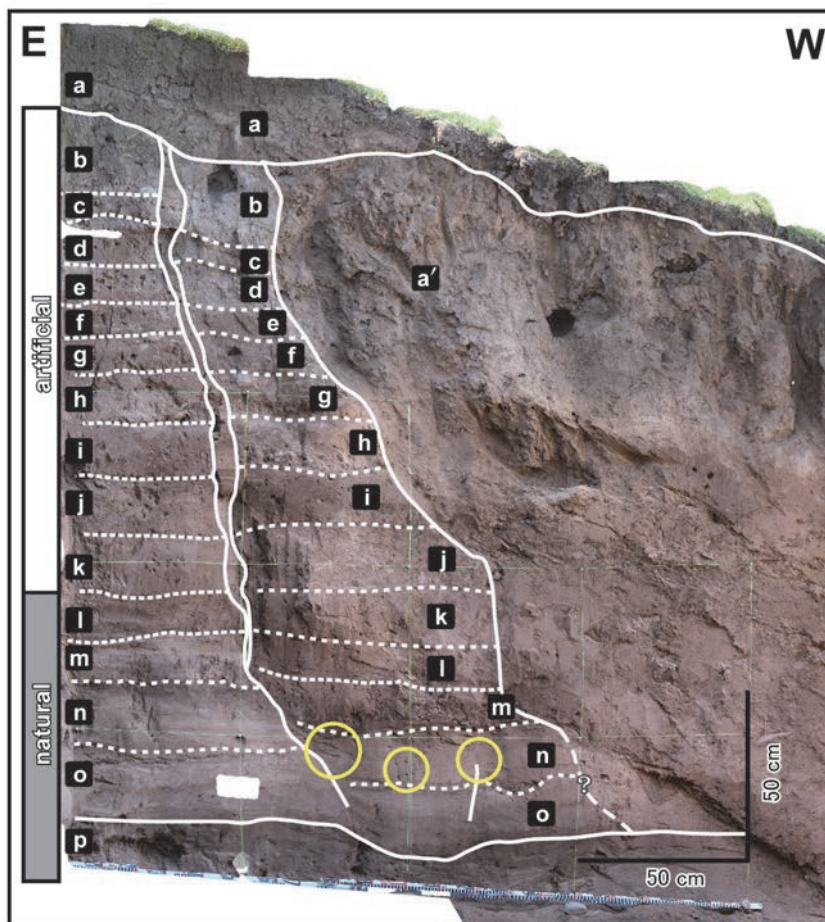


Fig.6.2 Cross-section of the investigation trench: circles indicate structural disorder

Tab.6.1 Soil hardness of layer "a" to layer "p"

Layer	artificial											natural				
	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
Hardness (mm)	16.8	19.4	17.4	13.0	21.6	23.4	22.8	24.8	22.6	23.2	24.0	15.4	22.0	23.4	21.4	10.9

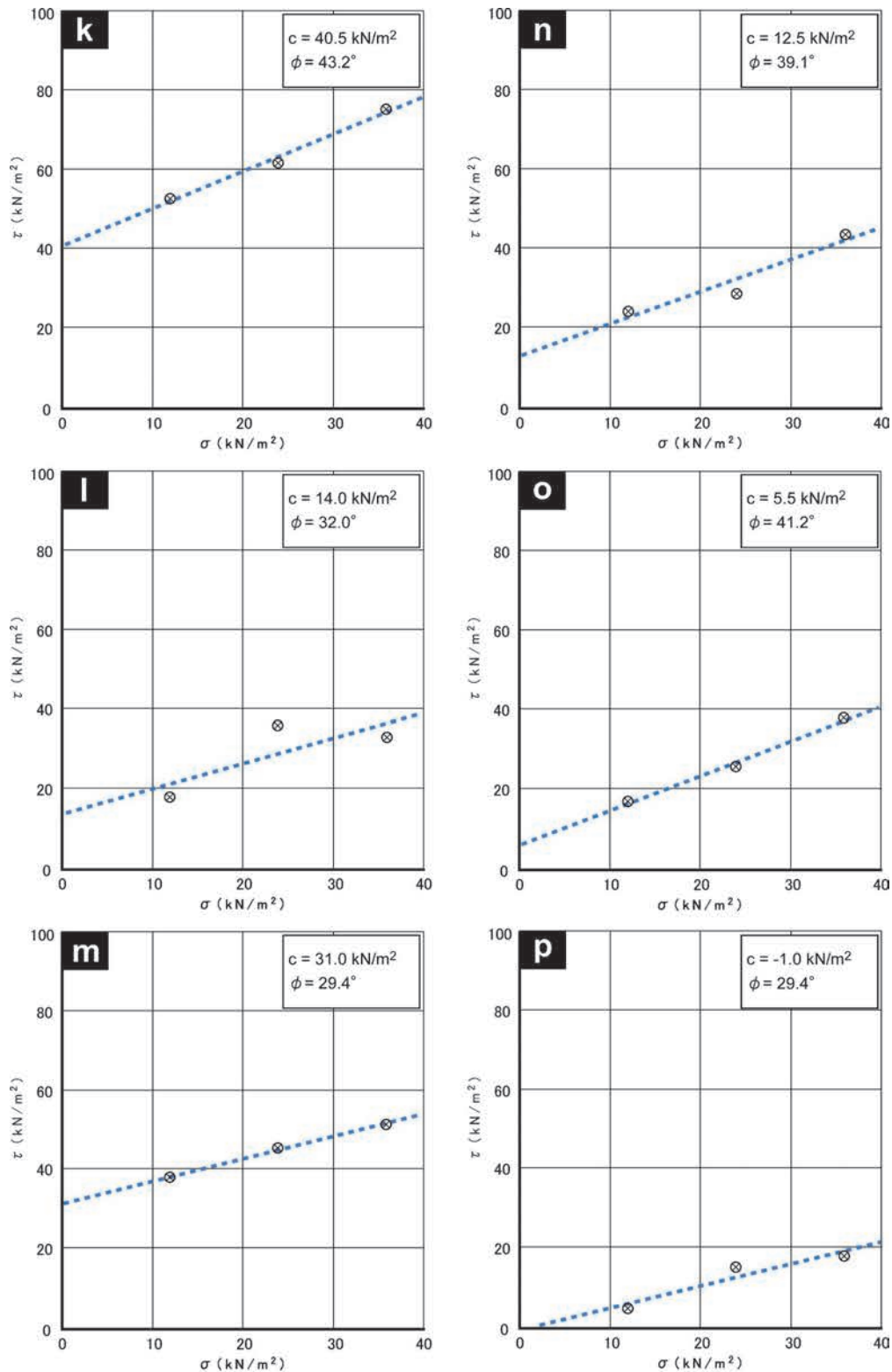


Fig.6.3 Adhesion force (c) and internal friction force (Φ) of layer "k" to layer "p"

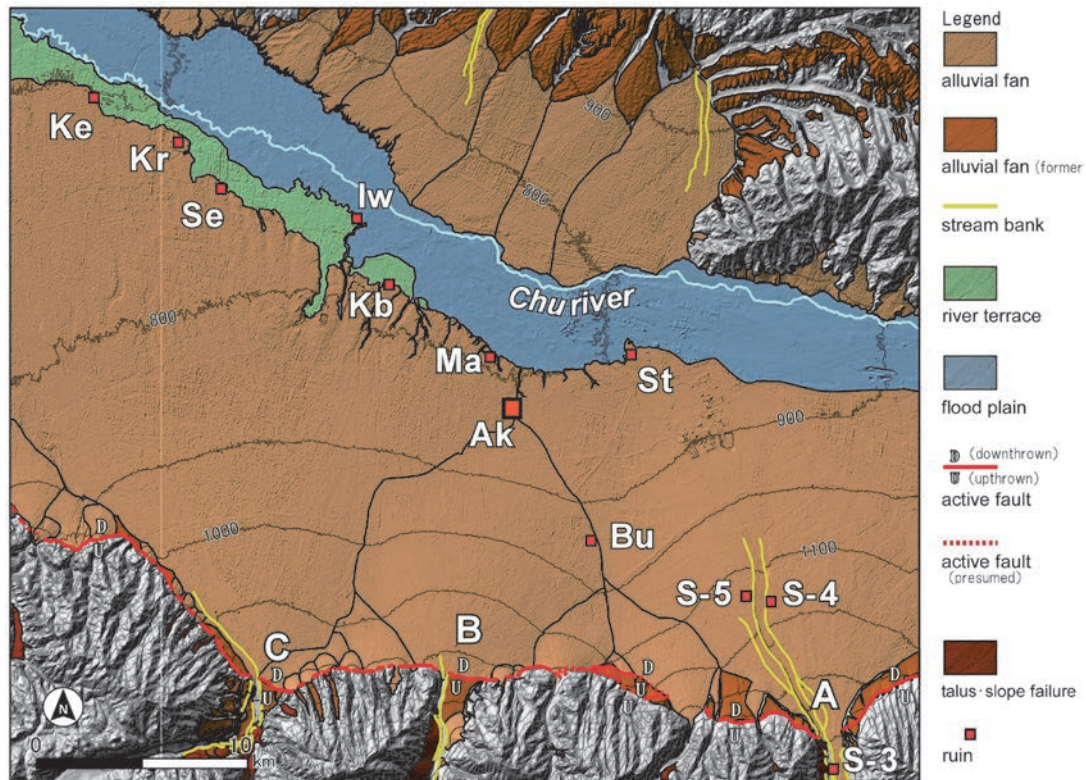


Fig.6.4 Topographical classification map around Ak-Beshim
 Ke: Kenesh, Kr: Krasnaya-Rechka, Se: Selekhozhimiya, Iw: Iwanovka, Kb: Ken-Bulun, Ma: Malie-Ak-Beshim, Ak: Ak-Beshim, St: Staraya-Pakrovka, Bu: Burana, S-3: Shamshi3, S-4: Shamshi4, S-5: Shamshi5.
 Created from Sato et al. (2018).

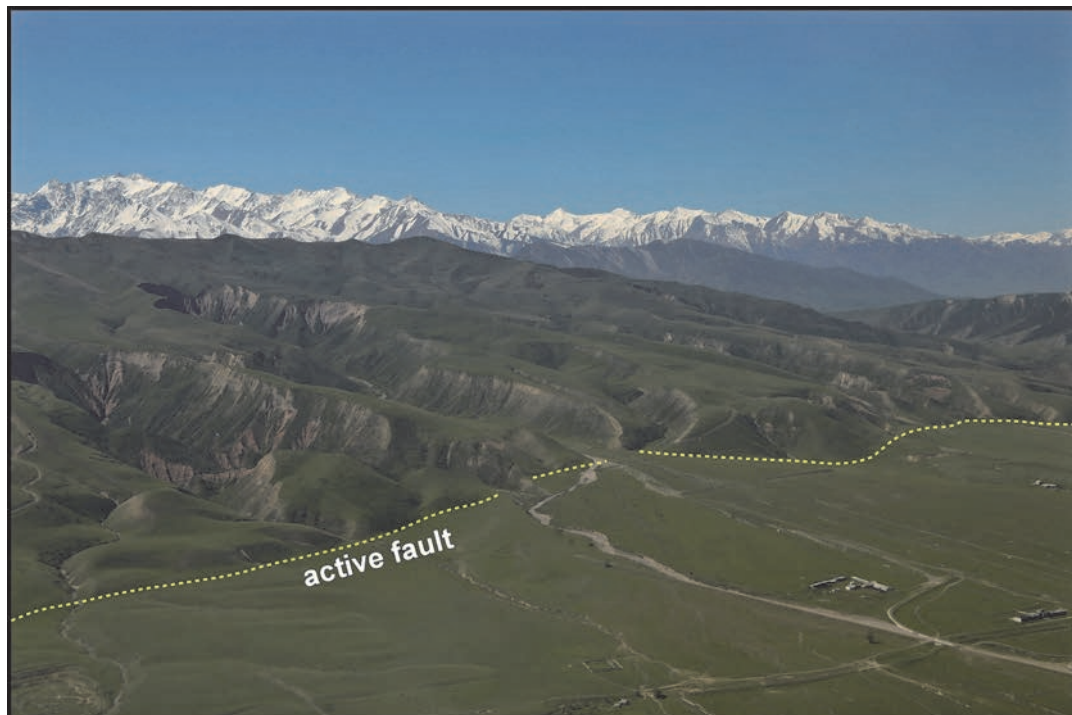


Fig.6.5 Active fault cliffs at the boundary of the Chu River Basin and the Tien Shan Mountains (photographed on May 7, 2018).



Fig.6.6 Cross-section of east wall



Fig.6.7 Investigation scene

References

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7. Survey of Sogdian and Other Written Materials in the Collection of the Kyrgyz National Museum

During my stay in Bishkek, I conducted surveys of the Sogdian epigraphic materials found among those excavations of spring, 2018 which were being investigated at the basement of the hotel. I also surveyed the Sogdian materials stored at the National Museum. Here I will give a brief report of these two groups of materials.

7.1. Sogdian Materials among the Excavations of Spring 2018

Two types Sogdian epigraphic materials were discovered in the course of the excavation at the site of Ak-Beshim in the spring of 2018: one ostrakon and the other coin legends.

7.1.1. Ostrakon: (Fig.3.68, 88 : 13-18-042)

Obviously, the word was inscribed before firing. On a small fragment one finds one word, of which the beginning is damaged and lost. It reads as follows:

1/](δ)c'rpt

The word could be a title of the head of some profession ending in -pt, like δpyrpt “chief clerk” or δrwtpt “chief carpenter,” but this form is not known. If the letter read as “r” is a misspelling and was intended to be ' (alif), then *(δ)c”pt would be complete and represent the same Sogdian personal name as δšcy”pt or δš”pt. As a matter of fact, this interpretation seems more likely. The dating of the inscription can only be inferred from the calligraphic style; since it is written in a neat cursive script, it is likely to date from the first half of the eighth century or a little earlier.

7.1.2. Coin Legends

7.1.2.1. Coins Bearing Recognizable Legends

Some bronze coins of a Chinese type with a square hole show legends. However, it is not easy to read them, because they were either severely damaged, or because the surface of the coins accumulates rust. One can recognize the legends of the following five coins.

(1) Coin excavated from AKB-13 (Fig.3.65, 85 : 13-18-022)

Diameter 2.5cm, weight 5.5-5.6g; the hole in the centre assumes a circular shape rather than square.

Side a: βγγ twrkyš x'γ'n pny (The part corresponding to x'γ'n pny is hardly legible.)

“The copper coin of the god-like Turgesh-qaghan.”

Side b: Bow-shaped tamgha

Dating: Considering its heavy weight, the coin is likely to have been produced during the golden age of the Turgesh qaghanate, in particular the reign of Qaghan Sulu 蘇祿 (716-738).

(2) Coin excavated from AKB-13 (Fig.3.65, 85 : 13-18-023)

Diameter 2.3cm, weight 2.7-2.8g

Side a: Sogdian letters seem to exist, but hardly legible. I presume to read βγγ x'γ'n, but the reading is far from certain.

Side b: There seems to be no legend

Dating: In view of the neat shape, the coin may go back to the mid-eighth century, though one can hardly verify the dating.

(3) Coin excavated from AKB-18 (Fig.5.3, 4 : 18-18-001)

Diameter 1.5cm, weight 0.8g

Side a: βγγ twrkyš x'γ'n pny (The part corresponding to x'γ'n pny is hardly legible)

Side b: It is completely flat and seems to have no letters.

Dating: This coin appears to be a poor imitation of a Turgesh coin and may perhaps have been casted during the second half of the eighth century.

(4) Coin excavated from AKB-13 (Fig.3.65, 85 : 13-18-021)

The label attached to the envelope holding the coins indicates eight items in it. Nevertheless, one actually finds two lumps of four and three apparently identical coins stucked together. Thus, there are actually seven rather than eight coins.

Diameter 1.5cm.

Weight of the lump consisting of four coins: 4.4g (average weight of one coin, 1.1g); the lump consisting of three coins: 3.7g (average weight of one coin, 1.2g)

All the four observable sides bear the same legend, and all the coins are assumed to represent the same type. Accordingly, the other sides of the coin are invisible.

Side a: βγγ twrkyš x'γ'n pny

In all instances, the surfaces are blurred, and the letters are hard to read.

Dating: They seem to be a poor imitation of a Turgesh coin and may perhaps have been casted during the second half of the eighth century.

(5) Coin excavated from AKB-13 (Fig.3.80, 98 : 13-18-153)

Diameter 1.8cm, weight 1.6-1.8g

Side a: The legend looks like βγγ twrkyš x'γ'n pny.

Side b: The surface accumulates rust and it is impossible to see if the letters were present or not.

Dating: The coin seems to be a poor imitation of a Turgesh coin and may have perhaps been casted during the second half of the eighth century.

7.1.2.2. Coins Bearing No Legend as well as Others Whose Legends are Totally Unrecognizable (Listed in a Random Order)

(1) AKB 2018 SH 1 R5 160 7/5/2018 (Fig.3.80, 98 : 13-18-159)

Diameter 1.3cm, square hole 5mm, weight 0.4g

A coin casted without legend.

Dating: The author of this section, having not yet encountered this type of coin among those excavated in this area, cannot make any suggestion. This coin is similar to the one listed under (2).

(2) AKB 2018 SH1 168 7/5/2018 (Fig.3.82, 100 : 13-18-181)

Its circular outer rim is deformed with protrusion: Diameter 1.6cm, square hole 6mm, weight 0.8g

A coin casted without legend.

Dating: The author of this section, having not yet encountered this type of coin among those excavated in this area, cannot make any suggestion.

(3) AKB 2018 SH1 191 11/5/2018 (Fig.3.82, 100 : 13-18-181)

Diameter 2.0cm, weight 1.6g

Inscription: Its rusty surface makes it impossible to recognize a legend, if any.

(4) AKB 2018 SH1 122 3/5/2018 (Fig.3.80, 98 : 13-18-154)

Diameter ca. 1.8 cm, weight 1.7g

Inscription: Its rusty surface makes it impossible to recognize a legend, if any.

(5) AKB 2018 SH1 148 5/5/2018 (Fig.3.80, 98 : 13-18-156)

Diameter 1.5cm, weight 0.9g

Inscription: Its rusty surface makes it impossible to recognize a legend, if any.

(6) AKB 2018 SH1 103 1/5/2018 (Fig.3.80, 98 : 13-18-155)

Diameter ca. 2.0cm, weight 1.6g

Inscription: Its rusty surface makes it impossible to recognize a legend, if any. The coin seems to have no hole, but it is also possible that the hole was filled with rust.

(7) AKB 2018 SH1 Room 4 No. 1777 10/5/2018 (Fig.3.80, 98 : 13-18-160)

A few coins stucked together.

Diameter 2cm, weight of the lump 4.0g

Apart from the lump, two fragments are collected under the same number, of which the description is abandoned in this report.

(8) AKB 2018 SH1 R2 22/4/2018 (Fig.3.66, 86 : 13-18-037)

A fragment: unmeasurable.

(9) AKB 2018 SH1 155 5/5/2018 (Fig.3.80, 98 : 13-18-157)

Diameter 1.6cm (slightly damaged), weight 0.4g

Letters are either unreadable or nonexistent.

(10) AKB 2018 SH1 152 5/5/2018 (Fig.3.80, 98 : 13-18-158)

Fragment of a coin with a square hole (cracked in half)

Radius 1.2cm, weight 1.8g

The surface is covered with rust and letters are hardly recognizable

Dating: Judging from the estimated size and weight (diameter, 2.4 cm and weight, 3.6 g), it is likely to be a fragment of either the Kaiyuan Tongbao or the Turgesh coin. If that is the case, the coin could date back to the second half of the seventh or the first half of the eighth century.

7.2. Sogdian Epigraphic Materials among the National Museum Exhibits

One afternoon was spent in surveying Sogdian texts among the excavated objects which were being prepared to be displayed in the renewed National Museum. As I just went around the floor and made only a quick and random search of those inscriptions which looked like Sogdian, the following list is inevitably far from exhaustive and accurate. All of them are found on fragments of pottery.

7.2.1. Rim of a Large Jar (Fig.7.1)

A complete rim of a large jar consisting of a few fragments. The inscription occupies the almost entire rim. In view of its cursive ductus, the inscription seems to be dated to the ninth or tenth century. The jar was employed for storing wine in a Christian church.

It was discovered in the site of Krasnaya Rechka in 1941. In 1981 V. A. Livšic published the inscription, in which one finds a Turkish name yrwxtkyn or Yaruq tegin. Later in 2009, when N. Sims-Williams referred to it, he only published its translation ("Christian Literature", in: R. E. Emmerick and m. Macuch (eds.), *The literature of Pre-Islamic Iran. Companion volume I to A history of Persian literature*, New York 2009, pp. 273-274). Livšic's reading is repeated in his work published in 2015 (V. A. Livshits, *Sogdian epigraphy of Central Asia and Semirech'e*, London 2015,

pp. 271-272). When compared with the original, Sims-Williams' reading appears to be superior, but it is not clear how he interpreted the word like pstwn (pštwn).

(a) Livshits's text and translation:

'yny xwyc'k yrwy tkyn mlp'ny pyδ'r xw xwšt'ry pštwn xcy βrywncey y't 'myn 'myn

"This vessel (was made) for Yaruq-tegin, the teacher. The master craftman (?) is Pashtwan. May he (the teacher?) be diligent. Amen, Amen."

(b) N. Sims-Williams's translation:

"This jar is a container of burnt ashes of the teacher (malpānā) Yaruq-tegin. May he be blessed, amen and amen!"

7.2.2. Ink Inscription around the Outer Rim of a Deep Plate Discovered in the Third Buddhist Temple, Ak-Beshim (Fig.7.2)

The diameter of the plate is 18.5 cm, and its height is ca. 3.5 cm. An ink inscription is found around the outer rim of the plate. Some parts of the inscription are no doubt written in Sogdian script, whereas the remaining traces are not readily recognized as done in Sogdian script. It is also hard to know where the inscription begins. For the sake of convenience, I assume that a short vertical line (|) in the inscription marks the start. Although I tentatively transcribe letters, I refrain from translating them, because I am not certain if the text is really Sogdian or not.

| rty ms wδ//// i //// s//// xwnt rty (nm)'cw ZY p'sk y'n & BLANK

What I transcribe as 'i' may perhaps represent a numeral 'one'. & in the text indicates the sign not looking like a Sogdian letter.

The remaining traces on the rim, which cannot be understood as written in Sogdian script, are ignored in the present report.

7.2.3. Remaining Two Items, Which are Not in Sogdian (Fig.7.3, 7.4)

(a) Two ink inscriptions on the body of a large, broken jar, comprising 14 and 9 short lines.

The two inscriptions are written in late cursive script but by two different hands, which are likely to go back to the tenth century. One cannot find any words which are demonstrably Sogdian, while a form like 'ltwn does look like an Old Turkish word *altun* 'gold' (possibly a name element?). At my request, Professor P. Zieme of Turfanforschung (Berlin), who is a specialist of Old Turkish, was kind enough to confirm that the both inscriptions are in Old Turkish.

(b) Five fragments from the rim of a large jar

Out of the five fragments three are joined to make a larger fragment (here referred to as (i)), while the remaining two can also be joined to make another larger fragment referred to as (ii). On both (i) and (ii), one finds scratches, which look like Sogdian letters but make no sense. I assume that they are a kind of design or pattern.

When transcribed as letters, it can be read as follows. Two short vertical lines (||) represent a crack in the fragment.

(i) [](.) ww'w' [||](.)xwy(.p[||]//n wp[

(ii) [](.)' wp ww' [||]// w δ &[

The sign '&' indicates a part which cannot be read as a Sogdian letter. It may have been intended as an ornament.



13-18-022



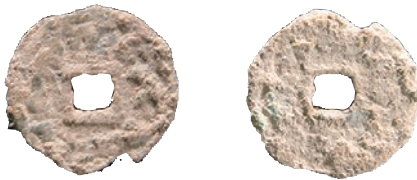
13-18-023



18-18-001



13-18-021



13-18-153



13-18-042



Fig.7.1 Photograph of 7.2.1



Fig.7.2 Photograph of 7.2.2

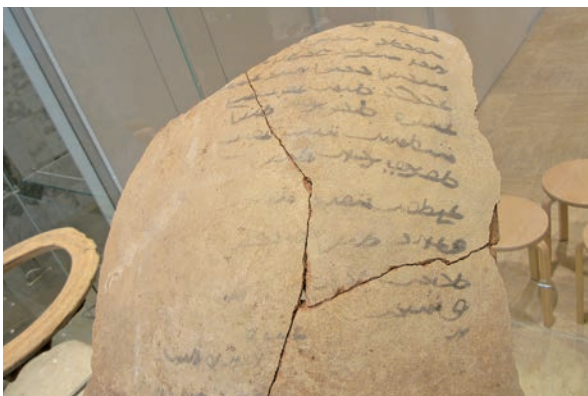


Fig.7.3 Photograph of 7.2.3 (a) in Turkish



Fig.7.4 Photograph of 7.2.3 (b)

8. Animal Remains

In the 2018 investigation, animal remains were unearthed from AKB-13 of the First Shahrستان and AKB-15 of the Second Shahrستان. However, since there was only a few specimens from AKB-15 and none associated with features, the analysis was focused on AKB-13. The numbers of specimens from AKB-13 was large, and only about 30% of the the entire specimens has been completed so far. The following is a summary of the analysis results. The detailed results of the analysis have already been reported together with the results of the FY2019 investigation of AKB-15 (Uetsuki and Arai 2020).

8.1. Materials and Methods

For the specimens excavated from AKB-13, bags were randomly selected and the analysis was conducted so that the analyzed portion of major features would be roughly the same (stratification and other factors were not considered). At this point, we have completed the analysis of an average of about 30% of the specimens from each feature. The total weight of the bones for which the analysis was completed was 48,251g. All specimens were hand-picked during the excavation and none are from water sieving.

8.2. Results

A total of 571 specimens were identified. The four features with relatively large numbers were tabulated separately and compared with the 2011-13 investigation data by Arai (2016). The assemblage of all the features and units mainly consists of 3 taxa, *Ovis/Capra*, *Equus* and *Bos taurus*. The first two are mostly sheep (*O. aries*) and horse (*E. caballus*) judging from specimens that can be identified to the species. In Fig. 8.1, older features are placed near the lower end. Although it is necessary to consider the inclusion of specimens from different periods because the time frame of the features cannot be limited as in the case with pits, it can be pointed out that in a broad perspective, horses tend to decrease while sheep tend to increase through time. This tendency continues to the 2019 investigation specimens from AKB-15, which follows the assemblage presented here. Another feature of this assemblage is the presence, although small, of pig/ wild boar (*Sus scrofa*) was in most features. This is a feature not recognized in AKB-15 assemblage from 2019.

In addition, the following are some of the characteristics of AKB-13 (FY2018 investigation) that have come to light, through the comparison with AKB-15 (FY2019 investigation).

- The percentage of specimens with butchering traces is higher than AKB-15.
- The proportion of specimens with carnivore gnaw marks (probably by dogs) is higher than AKB-15.
- There are two peaks in the estimated age at death of horses around 4 years and 10 years old (same as in AKB-15).
- Majority of sheep are slaughtered between the ages of 2.5 and 4 years (same as in AKB-15).
- The estimated withers height of horses ranges from 120 to 155 cm, with an average of about 135 cm (same as in AKB-15).
- Cattle had equal sex ratio judging from size (more female-dominated in AKB-15).

8.3. Conclusion

From the similarities between the two districts (AKB-13 & 15), we can see how animal resources were generally used at this site. At the same time, their differences also indicate temporal changes and spatial variation in animal resource exploitation. We presume that these changes are related to the transition in the character of the site from a city to a rural settlement (Uetsuki and Arai 2020). We hope to carry on the investigation as clearly more data is needed to verify this hypothesis.

References

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Tab.8.1 Taxonomic distribution of animal remains

	NISP (Number of Identified Specimen)						MNI (Minimum Number of Individuals)					Weight (g)						
Period	②/③	①/③	②	②		③	②/③	③	②	②		②/③	③	②	②		③	
Feature	M1	R1	R4	R5	計	Arai	M1	R1	R4	R5	計	M1	R1	R4	R5	計	Arai	
<i>Canis familiaris</i>	1			5	7	9	1			1	3	22	0	0	169	258	67	
<i>Equus</i> sp.	34	14	22	98	176	177	3	2	2	7	18	3,074	903	2,602	11,757	35,085	16,749	
<i>Bos taurus</i>	12	11	13	30	69	136	1	2	1	5	10	455	448	725	3,772	15,053	9,653	
<i>Ovis / Capra</i>	35	46	9	68	190	587	6	6	2	9	31	447	588	218	1,843	12,158	9,062	
<i>Ovis aries</i>	30	21.5	1	41	112	192	5	5	1	5	22	689	586	33	1,578	6,801	3,915	
<i>Sus scrofa</i>	1	4		10	16	3	1	1		1	4	4	58	0	264	804	478	
other mammal	0	1	0	1	2	36	0	0	0	0	0	0	63	0	63	1,089	963	
Cervidae						2						0	0	0	0	229	229	
<i>Capra hircus</i>		1		1	2	29		1		1	2	0	63	0	63	831	705	
Indet.						5						0	0	0	0	30	30	
Total	113	97.5	45	253	571	1,140	12	11	5	23	66	4,691	2,646	3,578	19,446	71,247	40,886	

Arai= Materials form 2011-13. By Arai. Total is the total for 2018 including non-major features (total for major features only for MNI).

Period classification : ①End of 7th - end of 8th century. ②Late 8th- end of 9th century. ③10th century. ④Late 10th - early 11th century.

⑤ Late 11th - mid 12th century

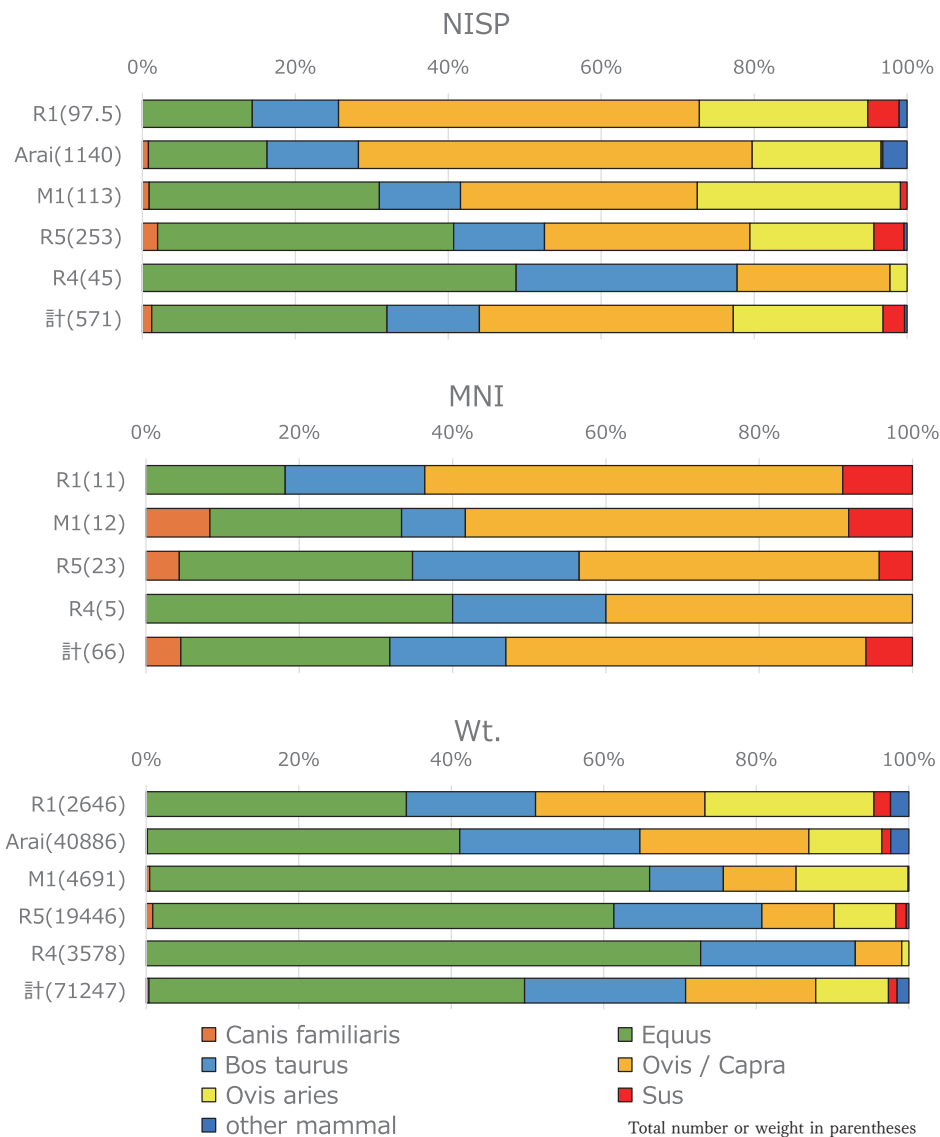


Fig.8.1 Mammal assemblage

9. Plant Remains

In the 2015 and 2018 excavations, we collected sediment samples from AKB-13 for a macro-botanical analysis to determine the food plants and plant utilization of Ak-Beshim. The results are summarized in this chapter. The appendix for this report includes further details.

9.1. Methods

We collected 16 sediment samples at the site during two seasons and processed them by water sieving using 0.5, 1, 2, and 4 mm mesh sieves to collect plant remains.

The collected plant remains were sorted using a microscope at a hotel in Tokmok and brought to Japan for identification at the Research Institute of Cultural Properties, Teikyo University.

Each plant remain was photographed from three directions (front, back, and lateral) using the Hi-Rox Digital Microscope RH-2000 to record the size, shape, and surface structure for identification purposes.

Nakayama conducted the initial identification. Nakayama and Akashi conducted the secondary (double-checking) identification.

9.2. Summary of the Results

Plants belonging to 11 families were identified in this study. The list of the remains found is as follows:

- | | |
|--------------------------------|----------------------------|
| (1) <i>Poaceae</i> | (4) <i>Vitaceae</i> |
| <i>Hordeum vulgare</i> | <i>Vitis</i> |
| <i>Triticum durum/aestivum</i> | (5) <i>Rubiaceae</i> |
| <i>Aegilops</i> | <i>Galium</i> |
| <i>Panicum miliaceum</i> | (6) <i>Boraginaceae</i> |
| <i>Setaria italica</i> | <i>Lithospermum</i> |
| <i>Setaria viridis</i> | (7) <i>Asteraceae</i> |
| <i>Cynodon</i> | <i>Xanthium strumarium</i> |
| (2) <i>Fabaceae</i> | (8) <i>Caryophyllaceae</i> |
| <i>Lens culinaris</i> | <i>Vaccaria</i> |
| <i>Pisum sativum</i> | (9) <i>Plantaginaceae</i> |
| <i>Vicia faba</i> | <i>Plantago</i> |
| <i>Trifolieae</i> | (10) <i>Brassicaceae</i> |
| (3) <i>Pedaliaceae</i> | (11) <i>Polygonaceae</i> |
| <i>Sesamum indicum</i> | |

10. Radiocarbon Dating and Wood Species Identification

10.1. Sample and Analysis Method

For a total of eight pieces (three pieces of charcoal, four pieces of carbonized seeds, and one piece of raw wood) excavated from AKB-13, dating and seed identification were carried out with the aim of estimating the age of the features and obtaining information on the former vegetation. The samples were collected from two charcoals in R1 (sample No. 37 and 38), one charcoal in Pit 29 (sample No. 39), one raw wood in Pit 27 (sample No. 40), and four carbonized seeds (*Triticum durum/aestivum*) detected in the section belt in R4 (layer 12, 16, 17, and 21) (sample No. 4, 9, 23, and 40). Radiocarbon dating by accelerator mass spectrometry (AMS) and charcoal identification were carried out by the Paleo-Labo AMS dating group.

10.2. Results

The details of the report can be found in the addendum. As a result of the analysis, two charcoals in R1 belonged to subfam. Maloideae and Salicaceae *Populus sp.* The date was from the end of the 9th century to the second half of the 10th century. The charcoal in P29 belonged to Pyroideae and dates were from the end of the 7th century to the second half of the 8th century. The raw wood in P27 belonged to Picea and dates was from the end of the 7th century to the second half of the 8th century. The four carbonized seeds in R5 all dated to the second half of the 8th century to the second half of the 9th century and no age differences within R5 was detected. Based on these dates, we can estimate the time of formation of each features and the process of accumulation of the fill, and assume that the road surface (A1) of R1 was formed from the end of the 7th century until the second half of the 8th century, and the burial period of R5 from the second half of the 8th century to the second half of the 9th century.

11. Afterword

The joint research by Teikyo University Silk Road Scientific Investigation Team and the Institute of History and Cultural Heritage, National Academy of Sciences of the Kyrgyz Republic, which started in 2016, has made significant achievements in the last three years in excavations of AKB-13 and AKB-15.

In AKB-13, the structure of the city is gradually unraveled, including the streets running north-south through the city, the buildings on both sides of the streets, the corner where the trash pits are gathered, the intersection connecting the north-south and east-west sides of the city, and the square located there. In addition, the key to clarifying the mechanism of waste disposal in the city, and how the city gradually became higher due to the waste discarded on a daily basis, resulting in the hill-like site we see today, has also been revealed. Furthermore, the study of excavated plant seeds and animal bones has made it possible to solve the question of the kinds of food available. With the various excavated materials, including buildings and earthenware, we are gradually approaching our goal of documenting and reconstructing the lives of the people who lived in the trading cities along the Silk Road.

In AKB15, the appearance of the Suyab Garrison, which was one of the four garrisons of Anxi built in the Tang Dynasty, is gradually being revealed, albeit dimly. In addition to the accumulation of tile fragments found in 2017, several features of buildings were excavated in Shahrstan 2a in 2018, which is considered to be the central area. These included stone mosaic and well-like pits with floral patterns, rain-permeable ditches constructed with greyish burnt bricks, and building foundations lined with tile fragments. With these discoveries, we can assume that various buildings existed inside Shahrstan 2a, and that Suyab Garrison had been reconstructed two or three times. It is expected that future investigations will reveal the structure of the Suyab Garrison and the lives of the Tang troops and people stationed there.

In addition to these archaeological investigations, multifaceted and interdisciplinary investigations are being conducted, such as investigations of Sogdian script materials and Chinese-style Buddhist statues excavated from Ak-Beshim site and Krasnaya Rechka site, investigations from the perspective of geomorphology, and historical research on Ak-Beshim site based on Chinese historic documents.

The joint research team of Teikyo University Silk Road Scientific Investigation Team and the Institute of History and Cultural Heritage, National Academy of Sciences of the Kyrgyz Republic will continue to conduct investigations with the goal of comprehensively clarifying the Ak-Beshim site through such wide range of interdisciplinary approaches.

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1. Investigation Journal

1.1. The First Investigation in 2018

- 17 April (Tue): Departure of an investigator from Japan (Mochizuki), and entry to Kyrgyz as an advance investigator for preparation.
- 18 April (Wed): Preparation, including confirmation of accommodation and equipments.
- 19 April (Thu): Preparation for the investigation.
- 20 April (Fri): Departure of investigators from Japan (Yamauchi, Kushiara, Chie Nakayama, Takagi, Mihashi, Kato, Tomoko Araki, Akira Araki). Departure from Narita, transfer at Incheon (South Korea), arrival and stay in Almaty (Kazakhstan).
- 21 April (Sat): Departure after visit to Central Museum. Arrival in Bishkek and transfer to Tokmok by car. Arrival at the hotel.
- 22 April (Sun): Clear weather. The first day of the investigation. There has been no rain for a while now and the site is dry. Weeding in AKB-13 after greeting and explaining to the workers. Takagi and Mihashi visited the site guided by Bakit. Close investigation in R2 of AKB-13, the investigation of pits starts. Reconfirmation of the cross-section of MS1. Close investigation of R3. Confirmation and installation of stakes for re-measuring of SH2. There are about 20 visitors, including families and Chinese tourists.
- 23 April (Mon): Fair weather. The work is divided into two areas: AKB-13 and AKB-15. In the AKB-13, the R1 sheet is stripped and closely investigated, and the belt is set and dug down to the lower surface. In R2, digging into the pit. Dice excavated in R3.
- 24 April (Tue): Cloudy weather. Close investigation in R1 of AKB-13, a large amount of small gravel is excavated. After removing the belt in R2 and checking the pit, half-sectioning. Close investigation of R3, half-sectioning and drawing of pit. There were 5 Japanese visitors, including JICA staff. At night, a strong wind blows and the yurt collapses.
- 25 April (Wed): Light rain. Arrival of investigators from Japan (Seiji Nakayama, Fukuda) in Tokmok. Installation of stakes in AKB-15, setting up excavation area and digging down. About 50 Japanese tourists (Hankyu Kotsu) visited the site in two buses. Continuation of AKB-13 investigation
- 26 April (Thu): Light rain. Suspension of site work due to rain. Water sieving of excavated artifacts in the hotel courtyard. In the afternoon, Bakit and Yamauchi gave a lecture at the International University of Central Asia (Tokmok). Others visited Burana.
- 27 April (Fri): Clear weather. Seiji Nakayama, Kushiara, Takagi, Mihashi, Askat Jumabaev, Mayumi Kato, Akira Araki, Tomoko Araki and Kato in charge of AKB-13, Yamauchi, Mochizuki, Chie Nakayama and Otani in charge of AKB-15. In R1 of AKB-13, close investigation of the small gravel surface and removal of the belt. In R2, close investigation of the wall, Drawing of the pit. In R3, drawing. In MS1, close investigation of the surface paved with gravel. In AKB-15, setting up an extended area beside the roof tile belt and digging down.
- 28 April (Sat): Clear weather. Arrival of investigators from Japan (Sato, Takagi). Close investigation of the surface paved with gravel in R1 of AKB-13. After drawing of pit, completion of digging and removal of X1 and furnace. In MS1, extension of the trench by the south wall, confirmation of sidewalk-like sun-dried bricks and confirmation of future investigation policy. Digging into R2-2, confirmation of two pits. In AKB-15, digging into the extended are and excavation in the trench. Close investigation of rain-permeable ditch. In the afternoon, volunteers conduct water sieving of artifacts. Collect a foundation stone in SH2. At night, arrival of an investigator from Japan (Tsutsui).
- 29 April (Sun): Clear weather. Turns out that the gravel pavement in R1 of AKB-13 is a road sur-

- face. In R2, half-sectioning, drawing and completion of digging of pit. In MS1, the first layer is partially removed to expose the gravel pavement surface of the second layer, which is then dug down. Collection of a 1 m square piece of slag for analysis. In AKB-15, setting up an excavation area on the east side of the rain-permeable ditch and digging down. Detection of the frame-shaped features using greyish burnt bricks. Investigation in the trench of the east extended area. In AKB-13 (the east wall of SH1), reexcavation and measurement for analysis of landslide in cross-section by Sato, Yagi and Mochizuki. Interview survey by Tsutsui. The visitors are a group of about 20 people from Singapore, Austria, and Canada, as well as one Japanese person.
- 30 April (Mon): Fair weather. In R1 of AKB-13, Pole shooting after close investigation of the surfaces of gravel and sun-dried brick. Setting up some belts and digging down. Completion of digging of the pits in R2. General photography and pole photography after completion of digging of the pits in R3. In MS1, close investigation of the second layer and confirmation the pit line on the east side. In AKB-15, the extension of trench leads to confirming what appears to be a corner of the roof tile belt. Three Chinese visitors.
- 1 May (Tue): In R1 of AKB-13, close investigation of the gravel pavement surface. In R4, setting up belts and trenches and digging down. Continuation of the investigation in AKB-15. Visitors included about 20 Taiwanese and one Japanese.
- 2 May (Wed): Clear weather. Close investigation of the second layer of MS1 in AKB-13. Detecting the central ditch. Drawing and completion of digging of side road pit line. Close investigation of the gravel pavement surface of R1 and removal of the belt. Digging into the trench along the east wall of R4. Close investigation of the wall surface. Preparation for the investigation of the second Buddhist Temple. Investigation in the trench of AKB-15. In the afternoon, water sieving and weighing of artifacts.
- 3 May (Thu): Fair weather. Continuation of digging into the trench along the east walls of R4 and R5 in AKB-13. Close investigation of the gravel pavement surface in R1. Visit to Lake Issyk Kul area (Seiji Nakayama, Takagi, Mihashi, Kato, Otani). Water sieving, selection and weighing of artifacts.
- 4 May (Fri): Cloudy weather. Participation of Iwai. Iwai and Takagi in charge of AKB-18. Setting up and digging in grids. Digging down with the belts of R4 and R5 in AKB-13 left. Digging into the central ditch of MS1. Photography drawing and removal of R1 belt. Continuation of the investigation of AKB-15. Filming for TBS TV “Discovery of the World’s Mysteries”. In the afternoon, artifacts water sieving.
- 5 May (Sat): Cloudy weather. End of the close investigation of gravel pavement surface in R1 of AKB-13. Continuation of digging down with the belts of R4 and R5 left. Confirmation of the soil layers of the belt cross-section. Confirmation of the rain-permeable ditch with greyish burnt bricks and the surface of floral stone mosaic with round gravel from the lower layers of the roof tile belt in AKB-15. Continuation of digging down in AKB-18. Visitors included two Italians, about 10 Japanese embassy staff and their families, and three Japanese. In the afternoon, conducting water sieving of artifacts and extracting of charcoal.
- 6 May (Sun): Sunny then rainy. No work done. Only in the morning, water sieving, sorting and weighing of artifacts, and extracting of charcoal. Yamauchi moves to Lake Issyk Kul for the interview. Volunteer participants (Tomoko Araki, Akira Araki, Takahashi) returns to Japan.
- 7 May (Mon): Fair weather. Sato and Yagi take aerial photos of the site with a Cessna. Continuation of work in both AKB-13 and AKB-15. In the afternoon, water sieving, sorting weighing, etc. of artifacts. Yamauchi moves to Bedel Pass with photo/filming staff. One visitor.
- 8 May (Tue): Fair weather. Sato, Yagi and Takagi return to Japan. Close investigation and aerial photography of the stone mosaic surface of R1 in AKB-13. Close investigation of the third layer

- of MS1. Explanation of belt soil layer of R4 and R5. Digging down following the stone mosaic surface of AKB-15, and confirmation of the L-shaped arrangement. Establishing and digging into the extended area in the west in AKB-18.
- 9 May (Wed): Fair weather. No work due to holiday. Conducting water sieving, sorting and weighing of artifacts. Close investigation of the stone mosaic surface in AKB-15. Japanese tourists, about 20 people, visit. Visit to Kegeti Valley.
- 10 May (Thu): Fair weather. Digging into R4 and R5 of AKB13, removal of the belt and collecting soil. Removal of the belt of R3. Water sieving and photographing of the stone mosaic surface and half-sectioning of the pit in AKB-15. Close investigation of the confirmation surface in AKB-18. In the afternoon, water sieving, sorting and weighing of artifacts. Visitors included two Japanese, about 20 Koreans, and about 20 Chinese from Shanghai. Visitors included the director of the Brana Museum and three others.
- 11 May (Fri): Fair weather. Iwai returns to Japan. Removal of the belts of R4 and R5 in AKB-13. Weeding. Half-sectioning of the pit and examination of the soil layer of AKB-15. Examination of the soil layer of the wall surface in AKB-18. Water sieving, sorting and weighing of artifacts. Extraction of charcoal.
- 12 May (Sat): Fair weather. Visitors included the Deputy Minister of Education of Kyrgyzstan and about 10 others. Visitors included about 20 Chinese tourists. General photography and aerial photography of AKB-13, and completion of digging pit lines in M1. Half-sectioning and pole shooting of the AKB-15 pit. Aerial photography of AKB-18 and photography of the wall. Start of backfilling by tractor. In the afternoon, water sieving, sorting and weighing of artifacts.
- 13 May (Sun): Cloudy weather. General photography by drone. Installation of standard stakes. In the afternoon, water sieving, sorting and weighing of artifacts and extraction of charcoal.
- 14 May (Mon): Heavy rain until morning. Water sieving, selecting and weighing of artifacts.
- 15 May (Tue): Cloudy weather. Pole shooting of part of AKB-13. Close investigation and aerial photography of AKB-18. Confirmation of ditches mixed with burnt soil but could not be drawn. Backfilling. Backfilling with wire mesh and sand paved on the stone mosaic surface of the AKB-15. Investigators from Japan (Mochizuki, Seiji Nakayama, Fukuda) return to Japan after visit to Site of Krasnaya Rechka. JICA staff visit.
- 16 May (Wed): After cleaning the artifacts, rinsing tools, cleaning up, and dismantling the yurt. Transporting equipment and artifacts by 4-ton dump truck to the Academy of Sciences and storing them in the warehouse. Organize artifacts and equipment.
- 17 May (Thu): Fair weather. Cleaning up the warehouse at the Academy of Sciences. Visit to Manas University Museum.
- 18 May (Fri): Fair weather. Preparation for return to Japan, departure, transfer at Almaty.
- 19 May (Sat): Arrival at Narita via Incheon and dismissal.

1.2. The Second Investigation in 2018

- 7 Aug (Tue): Departure of investigators from Japan (Kushihara, Nakayama, Mihashi), transfer at Incheon (South Korea) and arrival in Almaty (Kazakhstan). Move to the hotel in Bishkek by car.
- 8 Aug (Wed): Fair weather. After the meeting, transport the equipment and artifacts from the Academy of Sciences warehouse to the hotel basement. After preparing for the work, starting to join the earthenware. Three archaeology students from Kyrgyz National University joining the organization work today.
- 9 Aug (Thu): Fair weather. Sorting and weighing at the warehouse. Jointing of artifacts in the basement of the hotel.
- 10 Aug (Fri): Fair weather. Sorting at the warehouse. Two Japanese visit. Extraction of artifacts and

transfer them to the hotel. Jointing of them in the basement.

11 Aug (Sat): Fair weather. Sorting and weighing at the warehouse. Meeting. Starting to join the tiles. Extraction of the earthenware.

12 Aug (Sun): Thunderstorm. Jointing, etc. of artifacts in the basement.

13 Aug (Mon): Fair weather. Sorting and weighing at the warehouse.

14 Aug (Tue): Fair weather. Sorting and weighing at the warehouse. Transporting artifacts to the hotel basement. Arrival of Uetsuki.

15 Aug (Wed): Fair weather. Photographing and measuring the foundation stone. Classification of bones. Arrival of late investigators from Japan (Yamauchi, Hirano, Iwasaki, Tanaka).

16 Aug (Thu): Classification and jointing of artifacts. Meeting at Ak-Beshim. Analysis of bones. Starting to actual measuring of artifacts.

17 Aug (Fri): Actual measuring of tiles. Students are trained in plaster reconstructions and bones.

18 Aug (Sat): Cloudy weather. Organization and drawing of tiles. Plaster reconstruction.

19 Aug (Sun): Fair weather. Drawing and visit to Ak-Beshim, Burana site and Krasnaya Rechka site.

20 Aug (Mon): Fair weather. Jointing, making rubbed copy and drawing of tiles. Transporting undrawn artifacts to the warehouse.

21 Aug (Tue): Fair weather. Drawing.

22 Aug (Wed): Fair weather. Drawing.

23 Aug (Thu): Fair weather. Continuation of drawing.

24 Aug (Fri): Fair weather. Drawing and starting to make rubbed copy of tiles. Drawing of other artifacts.

25 Aug (Sat): Fair weather. Yamauchi, Hirano, Tanaka and Iwasaki to Ak-Beshim. Drawing of greyish burnt bricks and making rubbed copy and drawing of tiles. Yoshida arrives at the hotel.

26 Aug (Sun): Jointing, drawing and making rubbed copy of tiles. Drawing of other artifacts. Classification of bones. Uetsuki returns to Japan. Mori arrives at the hotel.

27 Aug (Mon): Jointing, drawing and making rubbed copy of tiles. Drawing of other artifacts. Yamauchi, Kushihara and Mori investigate materials at the National Museum. Yoshida attends the Altai conference.

28 Aug (Tue): Fair weather. Making rubbed copy and drawing of tiles and drawing of other artifacts. Yamauchi and Mori investigated materials at Kyrgyz Russian Slavic University. Yoshida attends the conference.

29 Aug (Wed): Fair weather. Drawing of earthenware, making rubbed copy of tiles and annotation and drawing of greyish burnt bricks. Yamauchi, Yoshida and Mori to Ak-Beshim and Burana site.

30 Aug (Thu): Diagramming and making rubbed copy. Research on written materials at the National Museum of History. Transport the package to the Academy of Sciences. Local students' participation in the work end today.

31 Aug (Fri): Clearing out the luggage. Setting up shelves in the warehouse and organizing equipment and materials. Japanese investigators return to Japan.

1 Sep (Sat): Fair weather. Photographing of artifacts and creation of observation table. Mori returns to Japan.

2 Sep (Sun): Cloudy weather. Photographing of artifacts and creation of observation table.

3 Sep (Mon): Storing artifacts in plastic bags. Meeting about the future.

4 Sep (Tue): Departure to return to Japan. To Incheon via Almaty.

5 Sep (Wed): Arrival at Narita via Incheon.

2. Plant Remains Excavated from Ak-Beshim

2.1. Introduction

The Sogdians, who were active in Central Asia during the Tang Dynasty in China, served as a bridge between East and West Asia by trading on the Silk Road. However, the Sogdians who appear in Chinese literature were a strong trading and nomadic people, and it is difficult to reconstruct the reality of their daily lives.

Therefore, the authors decided to study the plant remains excavated from the Ak-Beshim site in Kyrgyzstan, where the National Academy of Sciences of the Republic of Kyrgyzstan and the Research Institute of Cultural Properties, Teikyo University, have been conducting ongoing excavations. This report presents the results of samples collected from AKB-13 of Shakhristan-1 during the 2015 and 2018 seasons.

The Sogdians occupied AKB-13 during the Tang and Kara-Khanid dynasties, and the plant assemblage excavated from the features of each period will be useful materials to highlight the plant foods and resources used by the “nomadic” people.

2.2. Methods

The processing and analysis of the macro-botanical remains were carried out in the following steps:

- (1) Sediment samples were collected from layers containing large amounts of charred residue. The same volume of 4 L was targeted for a subsequent quantitative analysis.
- (2) The sediment was placed in water, and the charred remains contained in the sample were collected using four sieves with different mesh sizes (4 mm, 2 mm, 1 mm, and 0.5 mm). The collected remains were stored in water-filled vials to minimize damage.
- (3) The vials containing the remains were brought to Japan and the water inside was drained. The charred remains dried naturally.
- (4) In the laboratory of the Research Institute of Cultural Properties, Teikyo University, we used Hi-Rox's Digital Microscope RH-2000 to capture photographs of the front, back, and lateral views of the charred remains so that we could record their size, shape, and surface structure for identification purposes.
- (5) After Nakayama conducted the initial identification, they were rechecked by both Nakayama and Akashi for final identification.

2.3. Sampling Contexts

Samples were collected from 16 loci on AKB-13 (Fig. App.2.1, Tab. App.2.1). Two samples were collected in the 2015 season, and 14 were collected during the 2018 season, mainly from the room fill.

The dates of the samples were estimated to be from the 8th to 10th centuries—roughly, from the Tang dynasty to the early Kara-Khanid dynasty—based on the accompanying artifacts and C14 dating of charcoal.

2.4. Results

A total of 501 plant and fruit seeds or remains belonging to 11 families were recovered (Tab. App.2.2). The following are descriptions of the recovered plant remains.

2.4.1. Poaceae

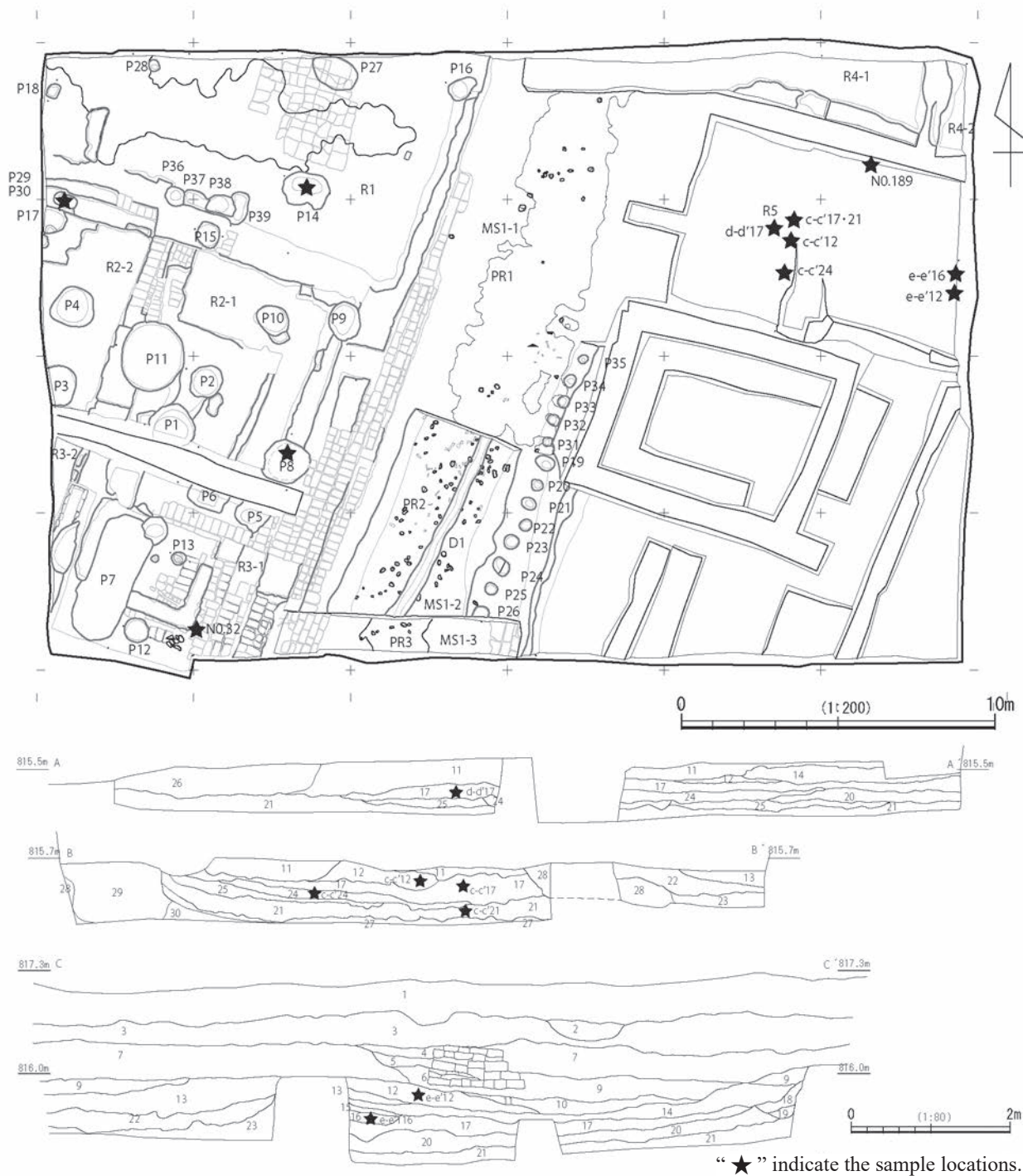


Fig.App.2.1 Contexts of the samples

(1) *Hordeum vulgare*

Two types of barley grains were excavated in Ak-Beshim.

The excavated naked barley grains varied in size from 3.1 to 6.5 mm in length, 1.8 to 3.6 mm in width, and 1.2 to 2.8 mm in thickness. Hulled barley varied more in outline and included large, spindle-shaped types and elongated types measuring 3.9 to 7.6 mm in length, 2.3 to 4.1 mm in width, and 1.8 to 3.2 mm in thickness.

(2) *Triticum durum/aestivum*

Wheat grains were obovate or oblong with a deep longitudinal groove on the ventral side and max-

Tab.App.2.1 List of the sediment samples for the macro-botanical analysis

Division	Feature	Sampling context	Soil Amount	Number of samples analyzed
AKB-13	2015	No.121 pottery subtrench	2.5L	16
AKB-13	2015	A1 No.202 mat impression	3.6L	16
AKB-13	Room1	Pit14. layer1.61	1.0L	2
AKB-13	Room2	Pit8. layer5. No.176-2	4.0L	1
AKB-13	Room2	Pit.8. layer6. No.193-3	4.0L	10
AKB-13	Room2	Pit.29. No.194	4.0L	41
AKB-13	Room2	Pit.29. No.192	2.0L	17
AKB-13	Room3	No.32	4.0L	4
AKB-13	Room5	Sec.c-c'.layer12	4.0L	40
AKB-13	Room5	Sec.c-c'.layer17	4.0L	132
AKB-13	Room5	Sec.c-c'.layer21	4.0L	35
AKB-13	Room5	Sec.c-c'.layer24	4.0L	51
AKB-13	Room5	Sec.d-d'.layer17	4.0L	33
AKB-13	Room5	Sec.e-e'.layer12	4.0L	16
AKB-13	Room5	Sec.e-e'.layer16	4.0L	79
AKB-13	Room5	No.189	2.0L	8
				Total 501

imum thickness at the bottom of the embryo (rather than at the middle). All excavated caryopses were the naked type and varied in size from 2.2 to 5.5 mm in length, 1.9 to 3.7 mm in width, and 1.7 to 3.1 mm in thickness.

(3) *Panicum miliaceum*

Broomcorn millet grains had a broad scutellum with a slightly pointed apex. Some were covered by paleae and lemma. The dehusked seeds were generally spherical or broadly ovoid, with the embryo reaching approximately half the length of the grain. A spatula-like hollow was observed at the base of the other side.

The remains of broomcorn millet were 2.8–3.0 mm long, 1.5–1.8 mm wide, and 1.1–1.4 mm thick in the grains covered with husks and 1.3–2.9 mm long, 1.3–2.0 mm wide, and 1.0–1.8 mm thick in the dehusked ones.

(4) *Setaria italica*

Foxtail millet seeds found were dehusked, except for one specimen, in which the papillate surface of the paleae/lemma was preserved. The size was 1.3–2.2 mm long, 1.2–1.9 mm wide, and 0.9–2.0 mm thick. Deformation from firing and carbonization was noted. The caryopses were generally elliptical or spherical, and the A-shaped embryo reached two-thirds of the grain length. The opposite surface had a small spatula-shaped hollow

(5) *Setaria viridis*

This species is considered an ancestor of the domesticated foxtail millet. It is distributed in Eurasia.

Seeds found were spindle-shaped with a pointed tip, 2.3 mm long, 1.5 mm wide, and 1.5 mm thick. The surface of a crescent-shaped smooth area was left at the boundary between the paleae and lemma, and the rest of the surface was covered with papillae.

(6) *Aegilops* sp.

The caryopses were 2.8–4.6 mm long, 1.7–2.1 mm wide, and 1.2–2.0 mm thick.

Tab.App.2.2 List of the plant remains from Ak-Beshim

Sample spot Plant name	2015.No121	A1.No202	R1.Pt14	R2.Pt8L5	R2.Pt8L6	R2.Pt29.192	R2.Pt29.194	R32	R5.c-1.L12	R5.c-1.L17	R5.c-1.L21	R5.c-1.L24	R5.d-1.L17	R5.e-1.L12	R5.e-1.L16	R5.No189	Total
<i>Triticum durum/aestivum</i> (naked)	6	1				2	3	1	10	11	11	25	13	2	15		100
<i>Hordeum vulgare</i> (naked)		1	1		1		1	1	4	18	6	5	3	1	7		49
<i>Hordeum vulgare</i> (hulled)				1		2			2	51	8	8	9	2	11		94
<i>Hordeum vulgare</i> (indet.)						1			3	16	1	1	1	1	8	1	33
<i>Aegilops</i>		1							3		1	1			1		7
<i>Setaria italica</i>	2	5			1	2			2		1	2			4		19
<i>Setaria italica</i> ?												1	1				2
<i>Setaria viridis</i>						1											1
<i>Panicum miliaceum</i>		3			2	10	20		1			1		1	11		49
<i>Panicum miliaceum</i> ?															1		1
<i>Cynodon</i>										1							1
<i>Lens culinaris</i>	2	1					5			3				1			12
<i>Lens culinaris</i> ?	1				1												2
<i>Vicia faba</i>														1			1
<i>Pisum sativum</i>															2		2
<i>Sesamum indicum</i>		1															1
<i>Vitis</i> sp.	1				1						3						5
<i>Galium</i> sp.								1	5	4	1	2		4	6		23
<i>Lithospermum</i>	1								2								3
<i>Plantago</i> sp.								1									1
<i>Xanthium strumarium</i>							2										2
<i>Vaccaria</i>									1	1					1		3
<i>Trifolieae</i>										1							1
Brassicaceae									1								1
Rubiaceae										5							5
Polygonaceae										1					1		2
Poaceae						1				2			1	1			5
Cereal							1		2	3	1	1	2				10
<i>Triticum</i> sp.									1	1			1				3
<i>Panicoidae</i>							2			2					5		9
<i>Setaria</i>							1										1
Fabaceae									1					1		1	3
Unknown	3	3	1		4	1	3		2	12	2	4	2	1	6	6	50
Total	16	16	2	1	10	17	41	4	40	132	35	51	33	16	79	8	501

(7) cf. *Cynodon* sp.

A single seed similar to *Cynodon* sp. was recovered; it was 2.7 mm long, 1.6 mm wide, and 1.6 mm thick. It was tentatively identified as a *Cynodon* sp. based on its size and outline.

2.4.2. Fabaceae

(1) *Lens culinaris*

Lentil, the most common legume at the site: the size was 2.4–4.1 mm long, 2.3–3.9 mm wide, and 1.6–2.4 mm thick. A notable feature was the elongated hilum on the side.

(2) *Pisum sativum*

Pea: the excavated seeds were 4.0–5.4 mm long, 3.9–4.7 mm wide, and 3.7 mm thick, with a slightly flattened spherical shape. The characteristic hilum was well-preserved.

(3) *Vicia faba*

Broad bean: the detected seeds were 10.0 mm long, 6.0 mm wide, and 5.5 mm thick, slightly flattened, and oval in shape. The oval hilum at the end was not covered. The thick outer skin was cracked, indicating a fully ripe state.

(4) Trifolieae

Astragalus, *Trigonella*, *Trifolium*, and *Melilotus* are lumped together as Trifolieae because of the similar morphology of their seeds. The excavated seed was ellipsoid, 2.4 mm long, 1.3 mm wide,



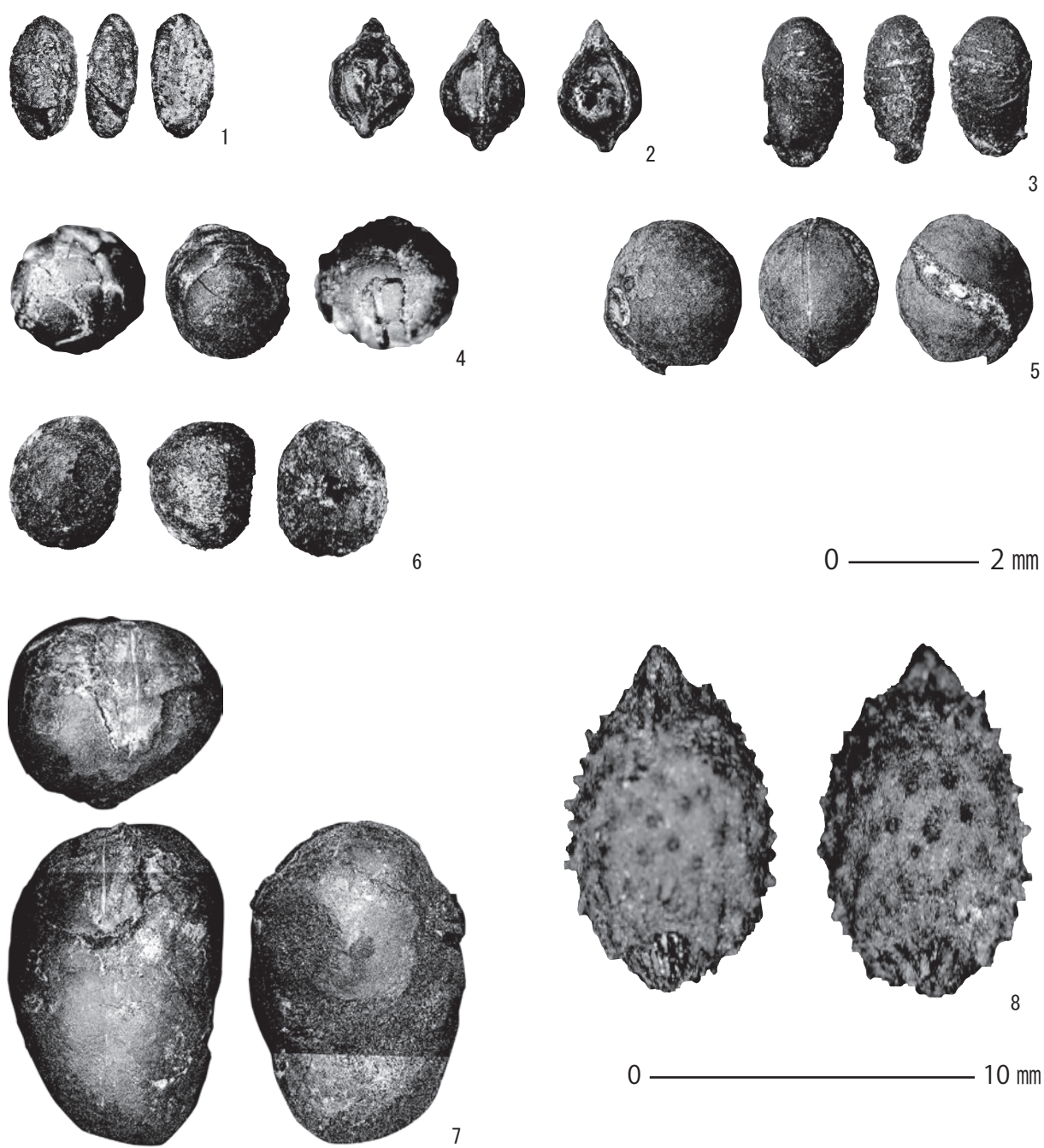
1. *Aegilops* sp. 2 • 3. *Triticum durum/aestivum* 4. *Hordeum vulgare* (naked) 5 • 6. *Hordeum vulgare* (hulled)

Fig.App.2.2 Plant remains from Ak-Beshim (1)



1. *Setaria viridis* 2. *Setaria italica* 3-5 *Panicum mileaceum* 6. cf. *Cynodon* sp. 7. *Sesamum indicum* 8. Rubiaceae
9 • 11. *Galium* sp. 10. *Lens culinaris* 12. *Pisum sativum* 13. *Vitis* sp. 14. *Lithospermum* sp.

Fig.App.2.3 Plant remains from Ak-Beshim (2)



1. *Plantago* sp. 2. Polygonaceae 3. Trifolia 4. *Vaccaria* sp. 5. Brassicaeae 6. Rubiaceae 7. *Vicia fab*
8. *Xanthium strumarium*

Fig.App.2.4 Plant remains from Ak-Beshim (3)

and 1.1 mm thick, with a smooth surface structure.

2.4.3. Pedaliaceae

Sesamum indicum

Sesame: the single seed was obovate in outline and 2.4 mm long, 1.4 mm wide, and 1.0 mm thick.

2.4.4. Vitaceae

Vitis sp.

Grape: the detected seeds were obovate or thin obovate, 4.7 mm long, 2.6–3.5 mm wide, and 1.8–2.7 mm thick, and slightly flattened.

2.4.5. Rubiaceae

Galium sp.

The recovered seeds were classified into two types: large and small. The smaller ones were oval, 1.4–1.8 mm long, 1.2–1.4 mm wide, and 1.0–1.3 mm thick. The larger ones were round with semi-circle cross-sections and measured 2.0–3.0 mm long, 1.5–2.7 mm wide, and 1.4–2.2 mm thick. An uneven surface and circular hole were the common characteristics..

2.4.6. Boraginaceae

Lithospermum sp.

The excavated seeds were 2.9–3.2 mm long, 2.0 mm wide, and 1.7–1.8 mm thick, with a conical body on top of a hemispherical base. The surface was covered with small protuberances, except for the base. This species can be preserved and mineralized without charring. The seeds from Ak-Beshim were found in a mineralized state.

2.4.7. Asteraceae

Xanthium strumarium

The two involucre were spindle-shaped with both apexes pointed and surfaces covered with spines. Length was 11.0 mm, width was 7.0 mm, and thickness was 6.0 mm.

2.4.8. Caryophyllaceae

Vaccaria sp.

The detected seeds were globular, 1.5–2.2 mm long, 1.8–2.2 mm wide, and 1.6–2.0 mm thick. They split into halves due to charring..

2.4.9. Plantaginaceae

Plantago sp.

The seed was elliptical in outline, 1.9 mm long, 1.1 mm wide, and 0.9 mm thick, and furrowed on the ventral side.

2.4.10. Brassicaceae

The seed was spherical, 2.3 mm long, 2.1 mm wide, and 1.9 mm thick, with a slightly pointed base.

2.4.11. Polygonaceae

The excavated seeds were 2.1 mm long, 1.4 mm wide, and 1.1–1.3 mm thick, with a pointed apex and keeled ridges. The surface was smooth.

2.5. Discussion

The archaeobotanical study of the plant remains at AKB-13 of Ak-Beshim showed the utilization of various cultivated plants (Tab. App. 2.2, Fig. App. 2.5).

The composition of the 501 plant species identified, excluding the 50 unknown species, was dominated by barley (39.0% of the total), followed by wheat (22.2%), broomcorn millet (11.1%), bed-straw (5.1%), foxtail millet (4.7%), and lentil (3.1%) (Tab. App. 2.3). The predominant food plants were barley and wheat, cereals that originated in West Asia, and small millets that originated from East Asia, such as foxtail millet and broomcorn millet. Legumes—such as lentils, peas, and broad beans—, and fruits, such as grapes, were present in small amounts. However, the fact that rice, the most important grain in China and East Asia during the same period, was not found is interesting when considering the dietary habits of the people of Central Asia at that time.

Looking at the products and plants of Central Asia as described in the “Great Tang Records on the Western Regions” written by the monk Xuanzang, 麩黍 (millets), 麦 (barley/wheat) and grapes are known in the area around 素葉水城 (Suyab) where the Ak-Beshim is located (Tab. App. 2.4, written by Xuanzang, translated by Mizutani. 1971). The composition of the plant remains showed that barley, wheat, and broomcorn millet were the major grains. This finding corresponds to the descriptions of Xuanzang. In addition, 大唐大慈恩寺三藏法師傳 (Xuanzang A biography of the Tripitaka master of the great Ci'en monastery of the great Tang Dynasty, written by Śramaṇa Huili / Shi Yancong), mentions 蒲桃漿 (grape juice) being served, which indicates that grapes were also consumed as some kind of beverage (Nagasawa 1985). Shiji (“Historical Records”) written during the Han Dynasty, contains remarks on fruit wine.

The wheat was probably processed into bread. The 餅 mentioned in the 大唐大慈恩寺三藏法師傳 may represent bread or noodles. The original meaning is wheat processed for food in China (Ishige 1991).

Barley is the most predominant cereal in Ak-Beshim. About 50% of the barley detected at the site was the hulled type, and 30% was the naked type. A variety of traditional methods for cooking barley to make bread, porridge, and roasted barley flour appear in written records (Ozaki 2015). How these two types of barley were eaten in Central Asia around the 8th century A.D. should be investigated further.

2.6. Conclusions

The macro-botanical analysis of Ak-Beshim revealed the consumption of various cereal, leguminous, and tree-fruit plants from the 8th to 10th centuries, although the analysis was based on a limited number of samples. Further sampling and research will allow us not only to understand the plant utilization of the residents of Ak-Beshim but also the differences and similarities between the various excavated areas and the changes over time. Thus, we can reconstruct the history of foodways for different cultural groups.

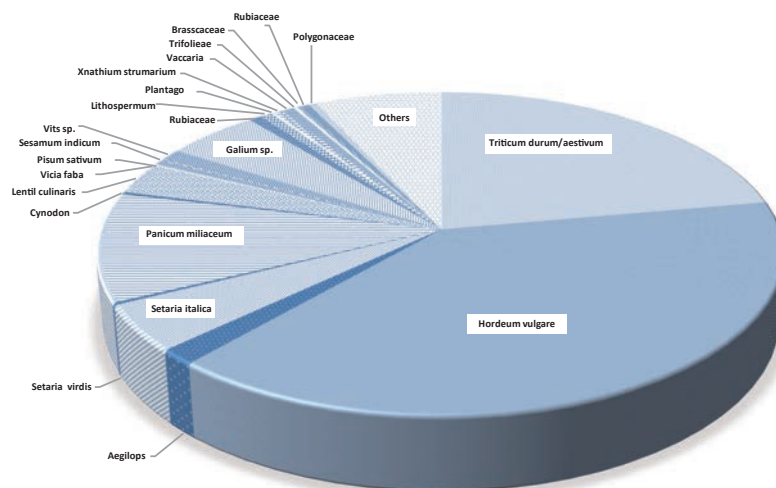


Fig.App.2.5 Overall plant assemblage of Ak-Beshim

Tab.App.2.3 Plants in *Great Tang Records on the Western Regions*

Country / Place	Products	Other references
阿耆尼国 (Agni)	糜黍, 宿麦, 香棗, 葡萄, 梨, 柰, 木綿	
屈支国 (Kucha)	糜黍, 麦, 粳稻, 葡萄, 石榴, 梨, 柰, 桃, 杏	蒲桃漿 (<i>A biography of the Tripitaka master of the great C'en monastery of the great Tang Dynasty</i>)
跋禄国 (Bālūkā)	Similar to Kucha.	
素葉水城 (Suyab)	糜黍, 麦, 葡萄	餅飯酥乳石蜜刺蜜, 蒲桃漿 (<i>A biography of the Tripitaka master of the great C'en monastery of the great Tang Dynasty</i>)
斂赤建国 (Nūjkand)	華, 果, 葡萄	
赭時国 (Tashkent)	Similar to Nūjkand.	粟・麦 (<i>Suishu</i>)
怖捍国 (Ferghana)	華, 果	稻麦, 葡萄酒, 葡萄 (<i>Shiji</i>) 飴羅果, 香棗, 桃, 李 (<i>Jingxingji</i>)
宰堵利瑟那国 (Ustrushana)	Similar to Tashkent.	
颯秣建国 (Samarkand)	花, 果	
弭秣賀国 (Māymurgh)	Similar to Samarkand.	
劫布咥那国 (Kabūdhan)	Similar to Samarkand.	
屈霜你迦国 (Kushānīya)	Similar to Samarkand.	
喝捍国 (Kharghan)	Similar to Samarkand.	
捕喝国 (Bukhara)	Similar to Samarkand.	
伐地国 (Fadi)	Similar to Samarkand.	
貨利習弥伽国 (Khwārazm)	Similar to Samarkand.	
羯霜那国 (Kish)	Similar to Samarkand.	

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3. Wood Species Identification and Radiocarbon Dating

3.1. Introduction

Radiocarbon dating and wood species identification of the charcoal excavated from the Ak-Beshim were carried out by accelerator mass spectrometry (AMS). This analysis is a compilation of two rounds of data analyzed by the Paleo-Lab AMS dating group (Shigeru Ito, Masanori Sato, Masashi Hirota, Hideki Yamagata, Zaur Lomtadze, and Yasuko Kuronuma), with some additions and corrections.

3.2. Sample and Analysis Method

The information and adjustment data of the measurement samples are shown in Fig. 33. The samples consisted of three pieces of charcoal excavated from excavation area R1 (Sample Nos. 37, 38, 40: PLD-36818, 36819, 36821), one piece of charcoal excavated from excavation area R2 (Sample No. 39: PLD-36820), and four pieces of carbonized seed excavated from excavation area R5. Of the four charcoals, sample No. 40 of R1 was collected from P27, sample No. 39 of excavation area R2 was collected from P29, and the four carbonized seeds are sample No. 4 (PLD-37462) excavated from layer 12 of sec. c-c', sample No. 9 (PLD-37463) excavated from layer 17, sample No. 23 (PLD-37464) excavated from layer 21, and sample No. 40 (PLD-37465) excavated from layer 16 of sec. e-e'. In addition, sample No. 37 of excavation area R1 and sample No. 39 of excavation area R2 retained the terminal ring. On the other hand, sample No. 38 of excavation area R1 and sample No. 40 of excavation area R2 did not retain the terminal ring and the parts were unknown.

After preparation, samples were measured using an accelerator mass spectrometer (Paleo Lab, Compact AMS: NEC 1.5SDH). The obtained ^{14}C concentrations were corrected for isotope fractionation effects, and then the ^{14}C ages and calendar years were calculated.

For wood species identification, three cross sections (transverse, tangential, and radial) were determined from the samples using a razor or by hand, and the samples were fixed to a 1 cm diameter brass sample stand with double-sided tape. Next, a gold coating was applied by ion sputtering, and the wood species were identified and photographed using a scanning electron microscope (KEYENCE VE-9800).

3.3. Results of Dating

Tab. App. 3.2 shows the carbon isotope ratios ($\delta^{13}\text{C}$) used to correct for the isotope fractionation effect, the age values used for the calendar year calibration with the correction for the isotope fractionation effect and the age range obtained by the calibration, the ^{14}C ages with the customary rounding of the age values and errors, and Fig. App. 3.2 shows the results of the calendar year calibration. The age values used for the calendar year calibration are unrounded values with the last digit and are listed so that the calendar year calibration can be performed using these age values when the calendar year calibration curve is updated in the future.

The ^{14}C age is an age that shows how many years ago, starting from AD 1950. To calculate the ^{14}C age (yrBP), we used the Libby half-life of 5568 years as the ^{14}C half-life. In addition, the ^{14}C age error ($\pm 1\sigma$) appended is calculated based on the statistical error of the measurement, standard deviation, etc., and indicates that there is a 68.2% probability that the ^{14}C age of the sample falls within that ^{14}C age error.

The details of the calendar year calibration are as follows.

Calendar year calibration is to calculate an age that is closer to the actual age value by calibrating fluctuations of ^{14}C concentration in the atmosphere due to past changes in cosmic ray intensity and the Earth's magnetic field, as well as differences in half-life (half-life of ^{14}C is 5730 ± 40 years), in

Tab.App.3.1 Measured sample data

Measurement No	Remains data	Sample data	Pretreatment
PLD-36818	Division : R1 Artifact No.45 Sample No.37	Type : Charcoal (Pear subfamily) Shape : log ? (1.5 cm in diameter, Remaining 4-year rings ?) Property : Terminal ring Collected part : The outer 1-year ring Condition : dry	Ultrasonic cleansing Organic solvent treatment: acetone Acid-alkali- acid washing (hydrochloric acid, sodium hydroxide)
PLD-36819	Division : R1 Artifact No.46 Sample No.38	Type : Charcoal (<i>Populus</i>) Shape : splinter (remaining diameter 0.7×2.5cm, Remaining 3-year rings) Property : Region unknown except for the finally formed annual ring Collected part : The outer 1-year ring Condition : dry	Ultrasonic cleansing Organic solvent treatment: acetone Acid-alkali- acid washing (hydrochloric acid, sodium hydroxide)
PLD-36820	Division : R2 Feature : pit29 Artifact No.192 Sample No.39	Type : Charcoal Wood (Maloideae) Shape : log ? (2 cm in diameter, Remaining 25-year rings) Property : Terminal ring Collected part : The outer 2-year ring Condition : dry	Ultrasonic cleansing Organic solvent treatment: acetone Acid-alkali- acid washing (hydrochloric acid, sodium hydroxide)
PLD-36821	Division : R1 Feature : pit27 Artifact No.119 Sample No.40	Type : Wood (<i>Picea</i>) Shape : log ? (4 cm in diameter, Remaining 10-year rings) Property : region unknown except for the finally formed annual ring Collected part : The outer 1-year ring Condition : dry	Ultrasonic cleansing Organic solvent treatment: acetone Acid-alkali- acid washing (hydrochloric acid, sodium hydroxide) Treatment notes : Bad condition
PLD-37462	Feature : R5 Location : sec.c-c' Stratum : 12 Sample No.4	Type : Carbonized seed Condition : dry	Ultrasonic cleansing Organic solvent treatment: acetone Acid-alkali- acid washing (hydrochloric acid, sodium hydroxide)
PLD-37463	Feature : R5 Location : sec.c-c' Stratum : 17 Sample No.9	Type : Carbonized seed Condition : dry	Ultrasonic cleansing Organic solvent treatment: acetone Acid-alkali- acid washing (hydrochloric acid, sodium hydroxide)
PLD-37464	Feature : R5 Location : sec.c-c' Stratum : 21 Sample No.23	Type : Carbonized seed Condition : dry	Ultrasonic cleansing Organic solvent treatment: acetone Acid-alkali- acid washing (hydrochloric acid, sodium hydroxide)
PLD-37465	Feature : R5 Location : sec.e-e' Stratum : 16 Sample No.40	Type : Carbonized seed Condition : dry	Ultrasonic cleansing Organic solvent treatment: acetone Acid-alkali- acid washing (hydrochloric acid, sodium hydroxide)

contrast with the 14C ages calculated assuming constant 14C concentration in the atmosphere and a half-life of 5568 years.

For calendar year calibration of 14C ages, OxCal4.3 (calibration curve data: IntCal13) was used. In addition, the 1 σ calendar year range is the calendar year range with a 68.2% confidence limit, which corresponds to the 14C age error calculated using the OxCal probability method, and similarly, the 2 σ calendar year range is the calendar year range with a 95.4% confidence limit. The percentage value in parentheses means the probability of a calendar year's age falling within that range. The curve on the vertical axis in the graph shows the probability distribution of 14C ages, and the double curve shows the calendar year calibration curve.

3.4. Wood Species Identification

As a result of wood species identification, the conifer *Picea* sp. and the broad-leaved tree subfam. Maloideae and *Populus* sp. were identified. In the following, the characteristics of the wood structure on which the identification was based are described and scanning electron micrographs are shown (Fig. App. 3.2).

Tab.App.3.2 Results of dating

Measurement No.	$\delta^{13}\text{C}$ (‰)	Age for dating calibration (yrBP $\pm 1\sigma$)	Age range of ^{14}C (yrBP $\pm 1\sigma$)	Age range of ^{14}C age calibrated into calendar year	
				1 σ calendar year range	2 σ calendar year range
PLD-36818 Sample No.37	-25.52 ± 0.12	1112 ± 17	1110 ± 15	898-925 cal AD (34.1%) 945-970 cal AD (34.1%)	892-981 cal AD (95.4%)
PLD-36819 Sample No.38	-25.19 ± 0.16	1131 ± 16	1130 ± 15	891-902 cal AD (14.0%) 920-962 cal AD (54.2%)	884-973 cal AD (95.4%)
PLD-36820 Sample No.39	-24.69 ± 0.11	1244 ± 16	1245 ± 15	695-700 cal AD (3.5%) 710-745 cal AD (51.8%) 764-774 cal AD (12.9%)	685-779 cal AD (87.4%) 791-805 cal AD (2.6%) 812-826 cal AD (1.8%) 839-862 cal AD (3.6%)
PLD-36821 Sample No.40	-24.20 ± 0.13	1263 ± 17	1265 ± 15	690-730 cal AD (44.5%) 736-750 cal AD (15.4%) 761-769 cal AD (8.3%)	685-772 cal AD (95.4%)
PLD-37462 Sample No.4	-21.92 ± 0.22	1223 ± 19	1225 ± 20	725-739 cal AD (11.4%) 768-778 cal AD (10.6%) 791-828 cal AD (27.4%) 839-864 cal AD (18.9%)	711-745 cal AD (18.3%) 765-883 cal AD (77.1%)
PLD-37463 Sample No.9	-19.81 ± 0.29	1228 ± 19	1230 ± 20	719-742 cal AD (21.7%) 766-778 cal AD (12.4%) 791-806 cal AD (11.0%) 812-826 cal AD (8.3%) 840-863 cal AD (14.8%)	694-746 cal AD (29.2%) 764-879 cal AD (66.2%)
PLD-37464 Sample No.23	-25.68 ± 0.42	1224 ± 22	1225 ± 20	723-740 cal AD (12.8%) 767-779 cal AD (10.0%) 790-829 cal AD (26.3%) 838-866 cal AD (19.0%)	695-700 cal AD (1.0%) 710-745 cal AD (20.0%) 764-883 cal AD (74.4%)
PLD-37465 Sample No.40	-25.33 ± 0.25	1219 ± 19	1220 ± 20	730-736 cal AD (4.7%) 769-778 cal AD (9.3%) 790-829 cal AD (31.6%) 838-865 cal AD (22.5%)	718-743 cal AD (12.1%) 766-883 cal AD (83.3%)

3.4.1. *Picea* sp., Pinaceae (Fig. App.3.2) 1a-1c (Sample No.40)

It is a conifer composed of tracheids, vertical and horizontal resin canals, radiating tissues, and radiating tracheids. The transition from earlywood to latewood is relatively gradual and the latewood area is narrow. The large resin canal is surrounded by thin-walled epithelial cells. Cross-field pitting is *Picea*-type, with radiating tracheids above and below the radiating tissue. Evergreen trees distributed in the temperate zone, including *Picea jezoensis*, *Picea polita*, and *Picea* sp.

3.4.2. Subfam. Maloideae, Rosaceae (Fig. App.3.2) 2a-2c (Sample No.37), 3a-3c (Sample No.39)

It is diffuse-porous wood in which small conduits are distributed evenly, almost singly. The axial parenchyma becomes a short line. Perforation of the conduit is single. There is a series of large crystals in the axial parenchyma and radial tissues. The radiating tissue is isomeric and one to three rows wide. There are 12 genera in the subfam. Maloideae, including *Crataegus* sp., *Eriobotrya* sp., *Photinia* sp., *Sorbus* sp., and *Malus* sp..

3.4.3. *Populus* sp., Salicaceae (Fig. App.3.2) 4a-4c (Sample No.38)

It is a diffuse-porous wood with a rather dense distribution of small conduits, either singly or in combination with several others. The perforation of the conduit is single. The radiating tissue is single-row and isomorphic. It is a deciduous tall tree distributed in the temperate zone, and there are two species: *Populus suaveolens* and *Populus nigra*.

3.5. Discussion

In the following, we organize the results by focusing on the 2 σ calendar year range (95.4% proba-

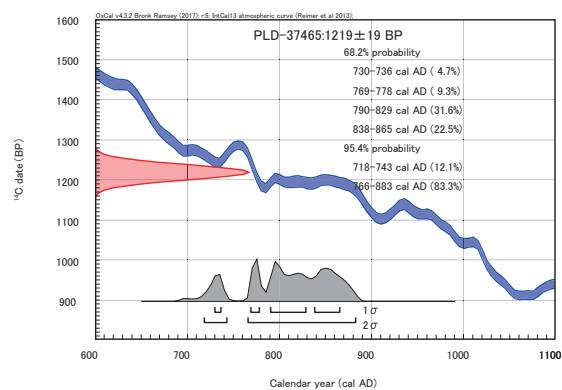
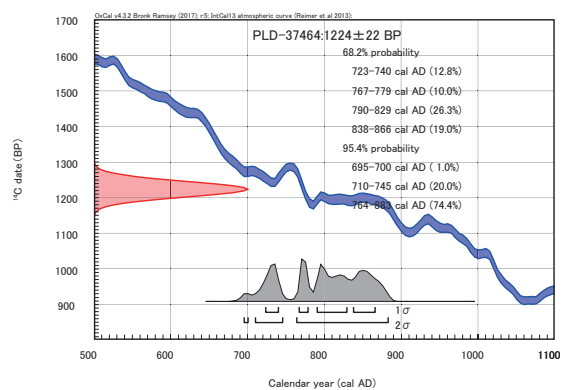
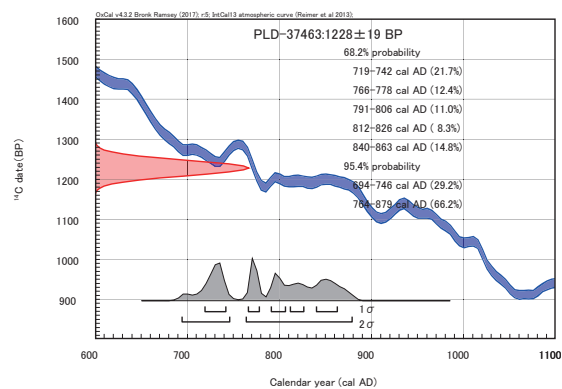
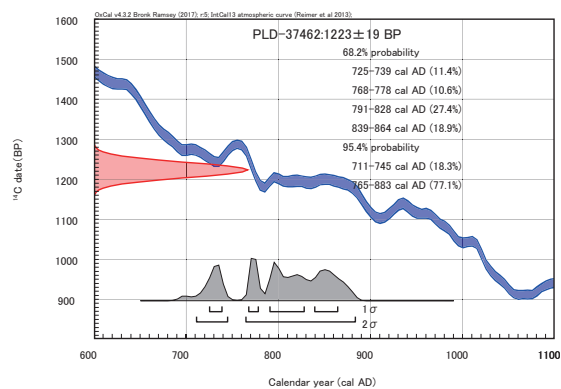
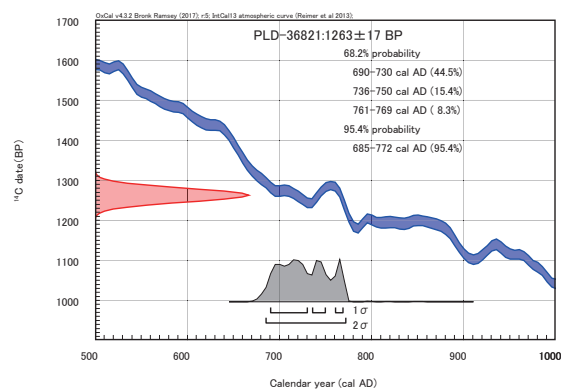
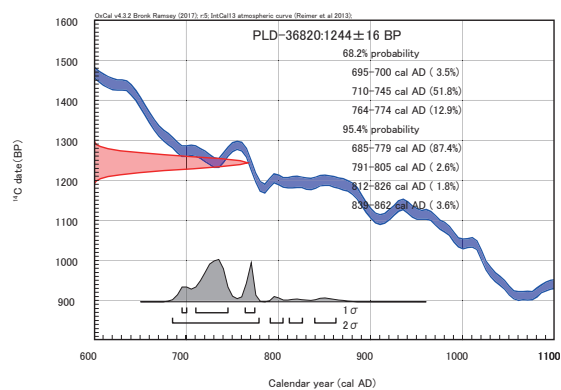
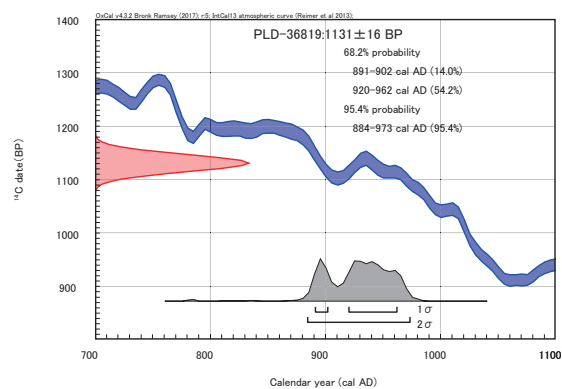
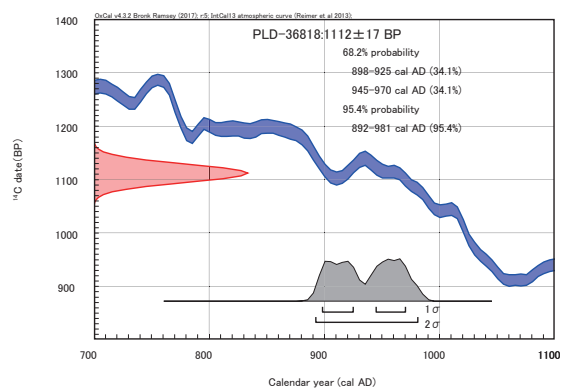
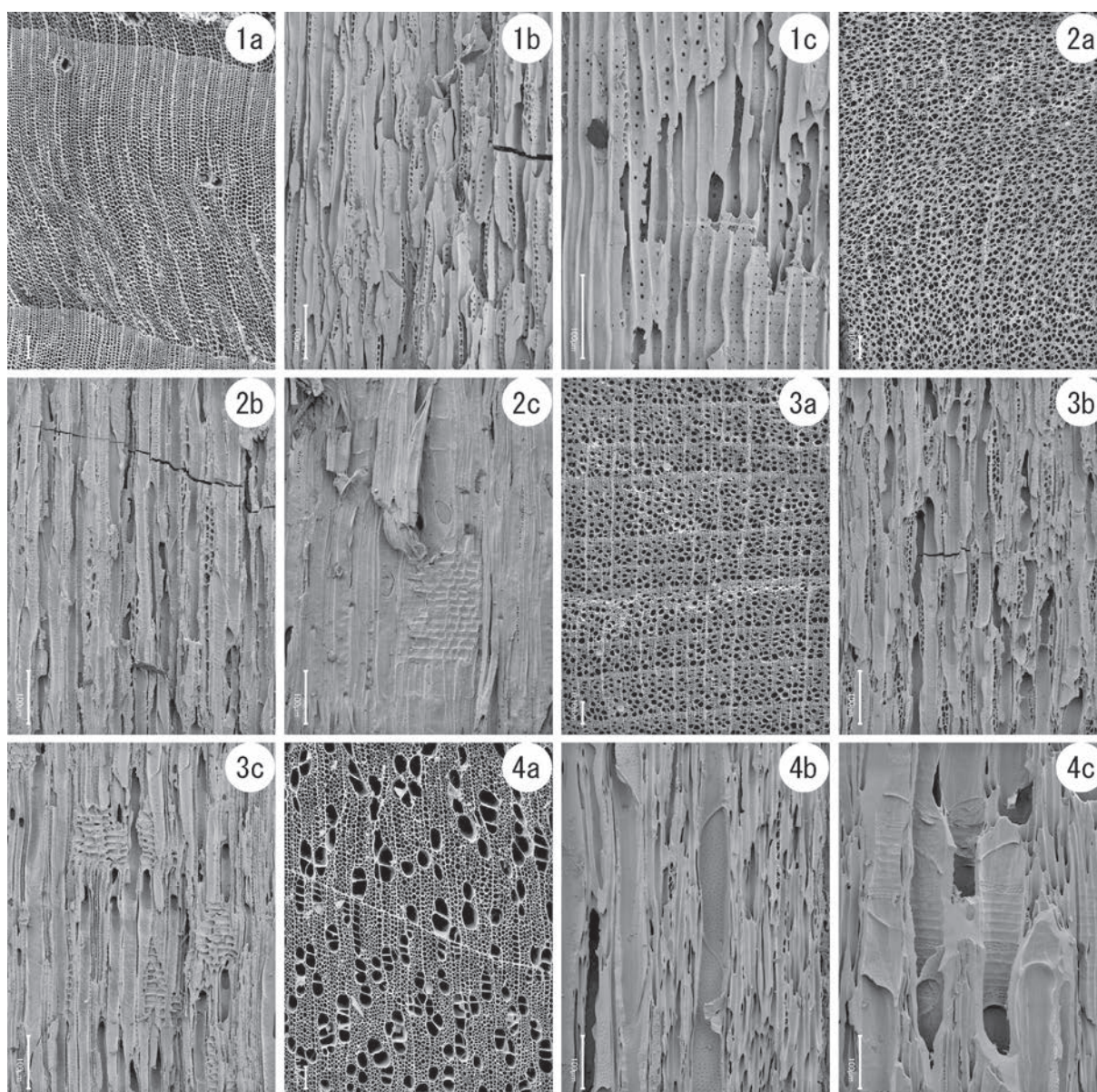


Fig.App.3.1 Result of the calendar year calibration



1a-1c. *Picea* sp. (Sample No.40), 2a-2c. Maloideae (Sample No.37), 3a-3c. Maloideae (Sample No.39),
4a-4c. *Populus* sp. (Sample No.38)
a : Cross-section, b : Tangent section, c : Radial section

Fig.App.3.2 Scanning electron microscope photographs of charcoal

bility) of the calendar year calibration results for each sample.

The charcoal of subfam. Maloideae (Sample No. 37: PLD-36818) excavated from the excavation area R1 was 892-981 cal AD (95.4%), and the charcoal of *Populus* sp. (Sample No. 38: PLD-36819) was 884-973 cal AD (95.4%).

The charcoal of *Picea* sp. (Sample No. 40: PLD-36821) excavated from P27 of excavation area R1 was 685-772 cal AD (95.4%).

The charcoal of subfam. Maloideae (Sample No. 39: PLD-36820) excavated from P29 of excavation area R2 was 685-779 cal AD (87.4%), 791-805 cal AD (2.6%), 812-826 cal AD (1.8%) and 839-862 cal AD (3.6%).

In the case of wood, measuring the final-formed annual growth rings gives the age of death or logging, but measuring the inner rings gives the older age of the inner rings (old wood effect). Sample o.37 (PLD-36818) from excavation area R1 and sample No. 39 (PLD-36820) from P29 in R2 still have the final formed annual growth rings, and the obtained age of the final formed annual growth rings may indicate the age when the wood was cut down or died. On the other hand, sample No. 38 (PLD-36819) from excavation area R1 and sample No. 40 (PLD-36821) from P27 are charcoal of unknown parts lacking final formed annual growth rings, and the dating results may be affected by the old wood effect, which may indicate an age slightly older than the age when the trees died or were cut down.

Among the carbonized seeds excavated from R5, sample No. 4 (PLD-37462) from sec. c-c 12 layer shows a calendar age of the first half of the 8th century to the second half of the 9th century with 711-745 cal AD (18.3%) and 765-883 cal AD (77.1%). Sample No. 9 (PLD-37463), excavated from layer 17, the lower layer of sec. c-c', showed 694-746 cal AD (29.2%) and 764-879 cal AD (66.2%), and sample No. 23 (PLD-37464), excavated from layer 21, the even lower layer, showed 695-700 cal AD (1.0%), 710-745 cal AD (20.0%), and 764-883 cal AD (74.4%), both of which indicate a calendar age of the end of the 7th century to the latter half of the 9th century. On the other hand, sample No. 40 (PLD-37465) from layer 16 of sec. e-e' showed a calendar age of the first half of the 8th century to the second half of the 9th century with 718-743 cal AD (12.1%) and 766-883 cal AD (83.3%). All the samples in this survey were seeds, and the measurement results indicate the fruiting age of the seeds.

(AMS Dating Group, Paleo Lab)

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