



Society for the Exploration of Eurasia, Switzerland

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UCL - Central Asian Archaeological Landscape

**FIELD REPORT
ON THE
ARCHAEOLOGICAL EXCAVATIONS
AT KESKEN KUYUK KALA,
KAZAKHSTAN IN 2025**



stratigraphy of the Kesken-Kuyuk Kala site

Almaty 2025

LIST OF EXECUTORS

Head of expedition	Dmitriy Voyakin
Director	Denis Sorokin
Field Archaeologist	Alexandr Dolgushev
Field Archaeologist	Nargiz Aituganova
Environmental Archaeologist	Alexandra Slucky
Field Archaeologist	Katherine Turchin
Osteologist	Mambet Shegerbayev
Ceramist	Anna Kuzminova

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Introduction

Under the overall supervision of Dr Christoph Baumer, President of the Society for the Exploration of EurAsia (Bern, Switzerland), the project at the medieval site of Kesken-Kuyuk Kala in the Eastern Aral Sea region, Kazakhstan, continues to expand international cooperation in the field of Central Asian archaeology.

The project is implemented by RUTRUM LLC (Almaty, Kazakhstan) with financial support from the Society for the Exploration of EurAsia, in collaboration with University College London (UCL, United Kingdom) within the framework of the international initiative Central Asian Archaeological Landscapes (CAAL Project – team lead is Prof. Tim Williams), and with the University of York (United Kingdom).

Fieldwork is carried out with the support of the Akimat of Kyzylorda Region, which provides the necessary organizational base for the conduct of fieldwork and subsequent research.

The Kazakhstani side of the project is led by Dr Dmitriy Voyakin. The core scientific team includes Mr Denis Sorokin (Kazakhstan), Mr Alexander Dolgushev (archaeologist, Kazakhstan), Ms Nargiz Aituganova (archaeologist, Kazakhstan), Ms Katherine Turchin (UCL, United Kingdom), and Ms Alexandra Slucky (University of York, United Kingdom), who are responsible respectively for field coordination, excavation and recording, site archaeology, digital documentation, and environmental–archaeobotanical studies.

The archaeobotanical section of this report has been prepared by Alexandra Slucky, PhD Candidate in the Department of Archaeology with BioArCH at the University of York (United Kingdom), serving as the environmental archaeologist for the 2025 field season. This work is conducted in collaboration with the Central Asian Archaeological Landscapes (CAAL) Project and is based on the archaeobotanical materials collected during the 2025 excavations, as well as comparative samples obtained in previous years. All samples are currently undergoing laboratory processing and analysis at the BioArCH facilities, University of York, in coordination with the CAAL Project, integrating archaeobotanical, isotopic, and environmental datasets for a comprehensive understanding of the ancient agricultural systems and local ecology of Kesken-Kuyuk Kala.

In addition to the archaeobotanical program, the 2025 season produced a substantial assemblage of faunal, ceramic, and small artefact material, significantly expanding the analytical base for reconstructing subsistence practices, craft production, and everyday life within the site.

The archaeozoological assemblage, studied within the framework of a specialized laboratory program, comprises over one thousand identified faunal remains from the 2015 and 2025 excavations. The material is strongly dominated by domestic mammals, accounting for more than ninety-five percent of the identified specimens. Small ruminants (sheep/goat) form the principal component of the assemblage, representing roughly three quarters of the identified bones, with clear predominance of sheep. Cattle constitute the second most significant group, followed by horse, camel, and donkey in much smaller proportions. The faunal spectrum indicates a mixed but strongly meat-oriented herding economy, with a stable role of cattle supported by floodplain pastures and a specialized emphasis on sheep husbandry adapted to arid and semi-arid environments.

Age-profile analysis demonstrates intensive slaughter of young and sub-adult small ruminants and cattle, consistent with meat-production strategies, while horses are represented almost exclusively by mature and old individuals, indicating their primary use as transport and working animals, with secondary consumption. Taphonomic study shows extensive traces of chopping and butchering, reflecting standardized carcass processing using heavy metal tools. Spatial differences between excavation areas suggest the presence of both primary butchering zones and consumption refuse areas within different sectors of the site.

The ceramic assemblage from the 2025 excavation season is diverse and technologically informative, consisting of both handmade and wheel-thrown vessels. The dominant categories include pots, jars, bowls, cups, lids, and large storage or cooking containers. Fabrics range from well-levigated dense red and grey pastes to more porous fabrics with visible sand, mica, chamotte, and mineral inclusions. Many vessels are coated with red, brown, or dark slip (engobe), frequently combined with burnishing, sometimes producing a glossy surface. Evidence of uneven firing, soot, and secondary burning is common, indicating intensive domestic use.

Morphological elements include thickened and everted rims, rolled and flattened rim edges, loop handles of oval, triangular, and sub-rectangular section, and applied lugs and knobs. Decorative techniques include incised and combed ornament, finger-impressed bands, applied ridges, herringbone and zigzag motifs, concentric lines, and nail impressions. Several nearly complete handmade vessels and cups were recovered in situ, including slipped and burnished examples with loop handles and flat bases. Ceramic lids with modeled knobs and incised decoration are also present, as well as specialized ceramic forms interpreted as portable stands for cooking vessels.

The small finds assemblage includes worked bone objects, such as shaped tubular bone tools and modified astragali, stone artefacts including fragments of quernstones and grinding equipment, and metal objects such as bronze belt plaques, small fittings, and copper alloy ornaments. Glass-paste beads and other personal items were also recorded. Together, these materials reflect household production activities, food processing, and elements of personal adornment.

Taken together, the integrated archaeobotanical, archaeozoological, ceramic, and artefactual datasets from the 2025 season substantially refine the reconstruction of the economic and cultural practices at Kesken-Kuyuk Kala. They confirm the presence of a stable urban community supported by diversified agriculture, irrigated field systems, specialized herding strategies, and developed household craft traditions within the Lower Syr Darya cultural zone.

More detailed methodological descriptions and analytical status of these research components are provided in the following section on the 2025 Field Season scope of work.

2025 Field Season: Scope of Work and Results

While the Introduction summarizes the project framework and principal material categories recovered, the present section focuses specifically on the operational work carried out during the 2025 season and the implementation status of each research component.

The 2025 field season at Kesken-Kuyuk Kala in the Eastern Aral Sea region of Kazakhstan marked a major new phase in the long-term investigation of this early medieval urban centre. During this season, for the first time in the history of the project, archaeological excavations were conducted within the citadel — the central elevated core of the site — following eighteen consecutive years of research focused on the shahristan and rabad sectors. The planned objectives of the season were successfully implemented, and the principal analytical components of the work have been completed or are currently in the final stages of specialist processing and report preparation.

The principal goals of the 2025 campaign and their implementation results are summarized below:

1. Investigation of the presumed citadel zone — completed.

A new 10 × 10 m excavation area was opened in the south-western part of the shahristan within the elevated sector interpreted as the citadel. Excavation and full stratigraphic documentation were carried out. Architectural remains, construction techniques, internal layout elements, and functional installations were recorded. Multiple construction horizons were identified and documented, including walls, platforms, floors, and ritual features. These data form a dedicated architectural and stratigraphic section of the season report.

2. Geophysical and remote-sensing survey - completed and under analytical processing.

Geophysical prospection using magnetometry and ground-penetrating radar (GPR) was conducted over an area of approximately 2,700 m² in and around the citadel sector. The results have been recorded and are currently being integrated into the GIS project database together with LiDAR-derived terrain models, UAV photogrammetry, and high-resolution aerial imagery. Interpretation maps and analytical layers are being prepared for inclusion in the final report.

A large-scale UAV aerial documentation campaign using the DJI Matrice 4 was completed. Several thousand high-resolution images covering the site and its surrounding irrigation and agricultural landscape were produced. Processing into orthophotos, DEMs, and topographic and analytical GIS layers is ongoing and will be fully reflected in the post-season documentation package.

3. Architectural and functional analysis of the citadel complex — completed at field level, under report preparation.

Architectural remains exposed during excavation — including well-preserved mud-brick walls, plastered surfaces, platforms, and a monumental floor altar with associated hearth installation — were fully recorded through plans, sections, photographs, and 3D documentation. Construction phases and repair episodes were identified. Conservation-stabilisation measures were undertaken where required. The architectural analysis section is currently being finalized for the technical report.

4. Stratigraphic and contextual analysis - completed.

Layer-by-layer excavation and stratigraphic recording were carried out across the excavation area. Construction horizons, activity layers, ash deposits, refuse contexts, and later burial intrusions were documented. Stratigraphic matrices and context descriptions have been compiled and are incorporated into the excavation record and report chapters.

5. Environmental and archaeobotanical sampling - completed; laboratory analysis in progress.

A total of 31 environmental samples were collected from stratified contexts, including soil, ash, charcoal, plant impressions in mudbrick, and related materials, taken from the citadel trench, stratigraphic test trench, and agricultural test pits. Field sampling and primary processing (including flotation of most samples) have been completed. Laboratory sorting and identification are currently underway at the University of York and within the CAAL partner framework. The archaeobotanical report section is in preparation based on these materials.

6. Archaeozoological, ceramic, and artefact studies - completed at primary analysis level; specialist reports prepared or in preparation.

Faunal remains, ceramic assemblages, and small finds recovered during excavation have undergone primary classification, cataloguing, and specialist study. The archaeozoological analysis has established taxonomic composition, herd structure, and butchering patterns. The ceramic assemblage has been typologically and technologically described, including fabrics, forms, surface treatments, and ornamentation. Specialist descriptions of ceramic and faunal materials have been prepared and are incorporated or being incorporated as separate report sections and annexes.

7. Geoarchaeological and landscape analysis - field component completed; analytical synthesis in preparation.

Field observations and sampling relating to geomorphology, sediments, and landscape structure were conducted in conjunction with excavation and remote sensing. These data are being synthesized with geospatial datasets to support landscape and irrigation system interpretation in the final analytical chapters.

8. Regional and chronological synthesis - in preparation.

Integration of the 2025 season results into the broader regional and chronological framework of early medieval site and landscape development in the Lower Syr Darya region is currently underway and will be presented in the concluding interpretative section of the report.

Key Results of the 2025 Season

The following section highlights the key scientific findings of the season and their interpretative significance, without repeating the operational details described above.

This section summarizes the principal scientific findings of the 2025 season and their interpretative significance, without repeating the operational and methodological details presented in the scope-of-work section above.

The 2025 excavation season at Kesken-Kuyuk Kala marked a significant step forward in the multidisciplinary study of this early medieval urban centre. For the first time, archaeological investigations reached the citadel — the central elevated core of the site — revealing a remarkably well-preserved third construction horizon distinguished by thick and intact plaster coatings on the interior walls. This state of preservation is exceptional for the Eastern Aral Sea region and creates strong potential for the future identification of mural decoration in adjacent rooms. In earlier excavations within the shahristan, only fragmentary traces of wall painting had been documented, and these were poorly preserved due to plaster deterioration. The conservation level observed in the 2025 season therefore substantially expands research possibilities related to interior decorative traditions of Oghuz-period architecture.

The application of integrated interdisciplinary methods — including geophysical prospection, aerial photogrammetry, and environmental sampling — significantly increased the analytical resolution of the excavation results. Geophysical datasets refined the interpretation of subsurface architectural patterns within the citadel sector, while UAV documentation using the DJI Matrice 4 platform produced high-resolution spatial coverage of both the site and its surrounding irrigation and agricultural landscape. These datasets are currently being processed into Digital Elevation Models (DEMs), orthophotos, topographic plans, and GIS analytical layers for inclusion in the comprehensive report.

One of the most important outcomes of the season derives from the archaeobotanical investigation conducted by Alexandra Slucky (University of York, BioArCH), based on 31 environmental samples collected from multiple stratigraphic contexts across the site. Preliminary laboratory identification has already produced significant results, including the confirmed presence of *Lagenaria siceraria* (bottle gourd, also known as Indian cucumber). This represents the first such identification in the archaeological record of the Aral region and suggests the cultivation and practical use of this plant. The identification is based on preliminary laboratory analysis and will be further refined through ongoing specialist study. The find provides direct evidence for crop diversity and long-distance agricultural exchange during the Oghuz period and strengthens the interpretation of Kesken-Kuyuk Kala as a centre of agricultural and environmental adaptation in a semi-arid zone.

Taken together, the 2025 season confirms the effectiveness of a multi-scalar and interdisciplinary research strategy combining excavation, geophysical mapping, aerial documentation, and bioarchaeological analysis. The integrated datasets obtained during the season establish a strong analytical foundation for the planned expansion of excavation in the citadel area in subsequent field campaigns, where additional architectural complexes and stratified contexts are expected to be investigated.

Following completion of fieldwork, the preliminary results of the 2025 season were presented at a press briefing in Kyzylorda led by Dr Dmitriy Voyakin. The findings — including the exceptional preservation of architectural structures and the recovery of significant environmental evidence — received broad regional and national media coverage and positive professional attention, reflecting the growing recognition of Kesken-Kuyuk Kala in the archaeological landscape of Central Asia (for example: 24.kz cultural news report, 2025).

Technical Details

In 2025, archaeological investigations were continued in the south-western part of the shahristan of Kesken-Kuyuk Kala, within the elevated sector interpreted as the citadel. A 10 × 10 m excavation area was laid out according to the cardinal directions on a terrace visually dominating the shahristan.

Objective of the excavations:

To identify and study architectural remains, domestic structures, construction layers, and occupation horizons within the presumed citadel sector of the site.

Stratigraphic analysis demonstrated a clearly multi-phase occupation sequence. Three principal construction horizons were identified.

First (Latest) Construction Horizon

The first and most recent construction horizon corresponds to a late historical phase and is represented by an aeolian-disturbed surface layer. It consists of a grey weathered crust with visible traces of modern disturbance, including vehicle tracks.

Surface material included small ceramic fragments of both handmade and wheel-thrown vessels, including burnished and slipped tableware forms, as well as small animal bone fragments and pieces of red- and yellow-fired brick. The layer also contained domestic refuse such as broken glass, gravel, wooden fragments, and structural debris.

Surface collection produced several metal artefacts:

- heart-shaped bronze belt plaque (0.9 × 0.9 cm; thickness 0.2–0.3 cm)
- fragment of a copper pin or needle (possibly a hairpin), 1.3 cm long
- fragment of a bronze belt plaque (1.3 × 0.7 cm) with partial ornament preserved
- spherical green glass-paste bead (diameter 0.5 cm)

During excavation, five child burials and two adult graves were identified across different parts of the trench. The burials were placed in soil pits oriented northwest–southeast, consistent with Muslim funerary practice. These interments are provisionally attributed to a post-medieval (ethnographic) phase.

Second Construction Horizon

The second construction horizon is represented by a loose loamy layer containing adobe brick fragments, ash, charcoal, and decayed bulrush and reed remains.

Adobe walls built of blocks measuring 35 × 30 × 10 cm were identified along several sides of the trench, defining a room used during the second and third construction phases. Ash and charcoal lenses were documented, including a distinct concentration recorded as Feature 3. A sufa (bench/platform) of pakhsa (rammed earth) construction was exposed along the eastern wall.

A floor altar belonging to the upper phase of this horizon was uncovered in the central-southern area of the room. It was constructed on a dense adobe floor and built of compact grey loam with shaped adobe borders (approx. 2.10 × 1.20 m; height 10–12 cm). Evidence of repair and rebuilding indicates sustained use.

Osteological remains consist mainly of small ruminant bones (sheep/goat) and fish remains. These are consistent with the broader faunal pattern documented at the site.

Ceramic finds include handmade and wheel-thrown vessels, including a burnished mug fragment with a loop handle and incised triangular sign. Two complete vessels — a loop-handled jug and a red-slipped cup — were found in the altar area. Additional finds include a stone quern fragment, a worked drilled tubular bone object, and a gaming astragalus (asik), indicating domestic and household activity.

Third Construction Horizon

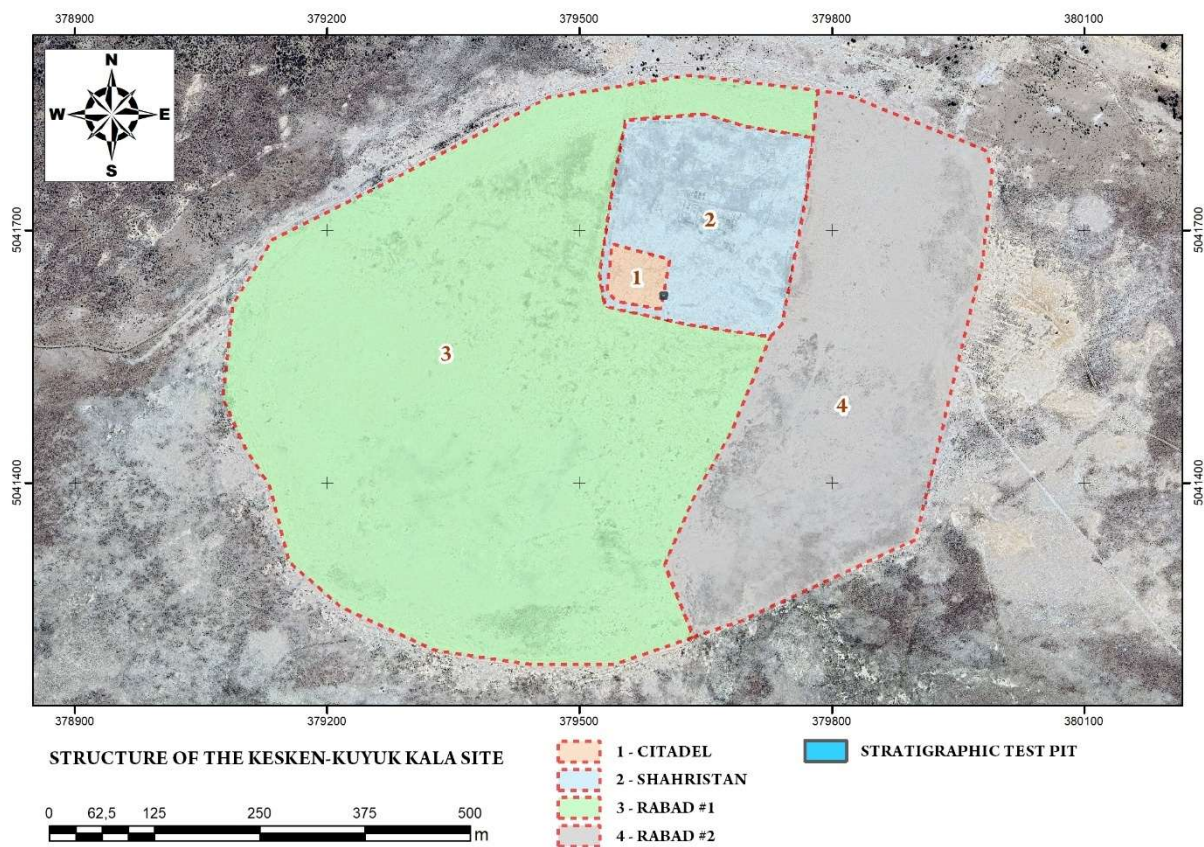
The third construction horizon includes loamy deposits with adobe collapse, ash, and reed remains. Adobe wall masonry of standard block size was exposed, with interior wall surfaces preserving mud plaster covered by multiple layers of white lime plaster and whitewash.

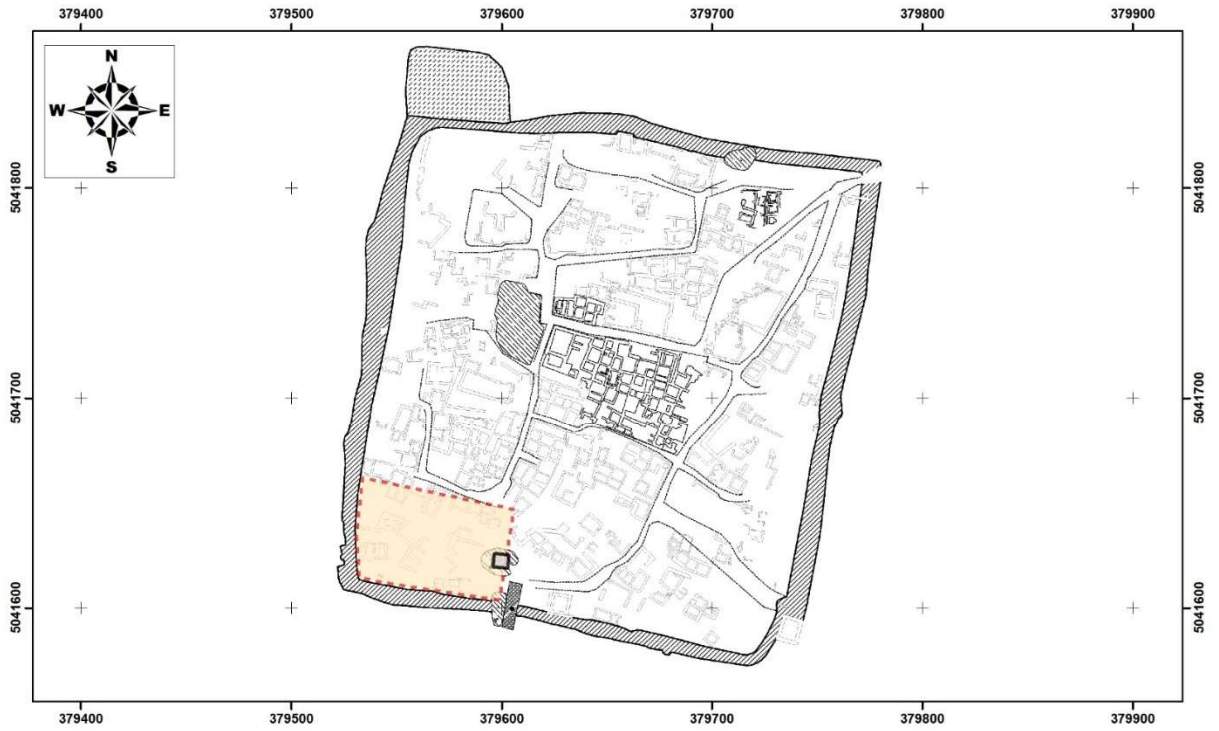
At approximately 1.60 m depth, a compact adobe floor and room boundaries were clearly defined. A wall-adjacent tandyr oven with a stoking channel and wall niche was excavated along the western wall and is well preserved, providing important evidence of in situ domestic heating and cooking installations.

In the central and southern part of the room, the largest floor altar documented in eighteen seasons at the site was uncovered (approx. 2.20×1.40 m; height 10–12 cm). Its scale, construction quality, and rebuilding traces indicate sustained functional and possibly symbolic importance within the room complex.

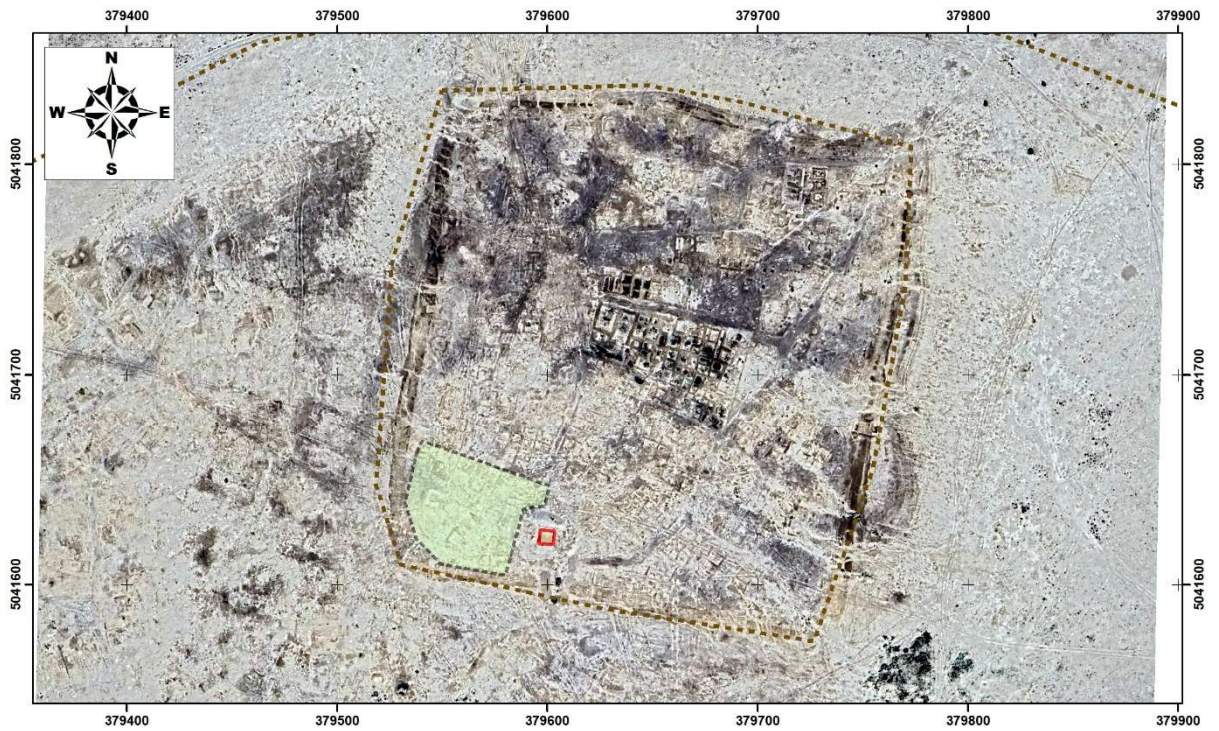
Ceramic material again includes handmade and wheel-thrown vessels, including two complete forms recovered from altar contexts. A copper bracelet with green oxidation was also found within this layer.

Pictures to the Introduction

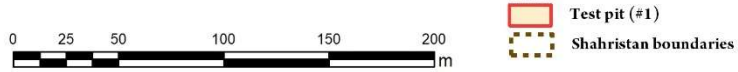




STRUCTURE OF THE KESKEN-KUYUK KALA SITE





DIG PLAN FOR 2025 (KESKEN-KUYUK KALA)





DIG PLAN FOR 2025 (KESKEN-KUYUK KALA)



-  GPR area (2700 sq.m)
-  Test pit (#1)



Excavation, 2025



Excavation, 2025



Alexandra with the vessel



Sampling from the trench



Documentation process



Geophysics



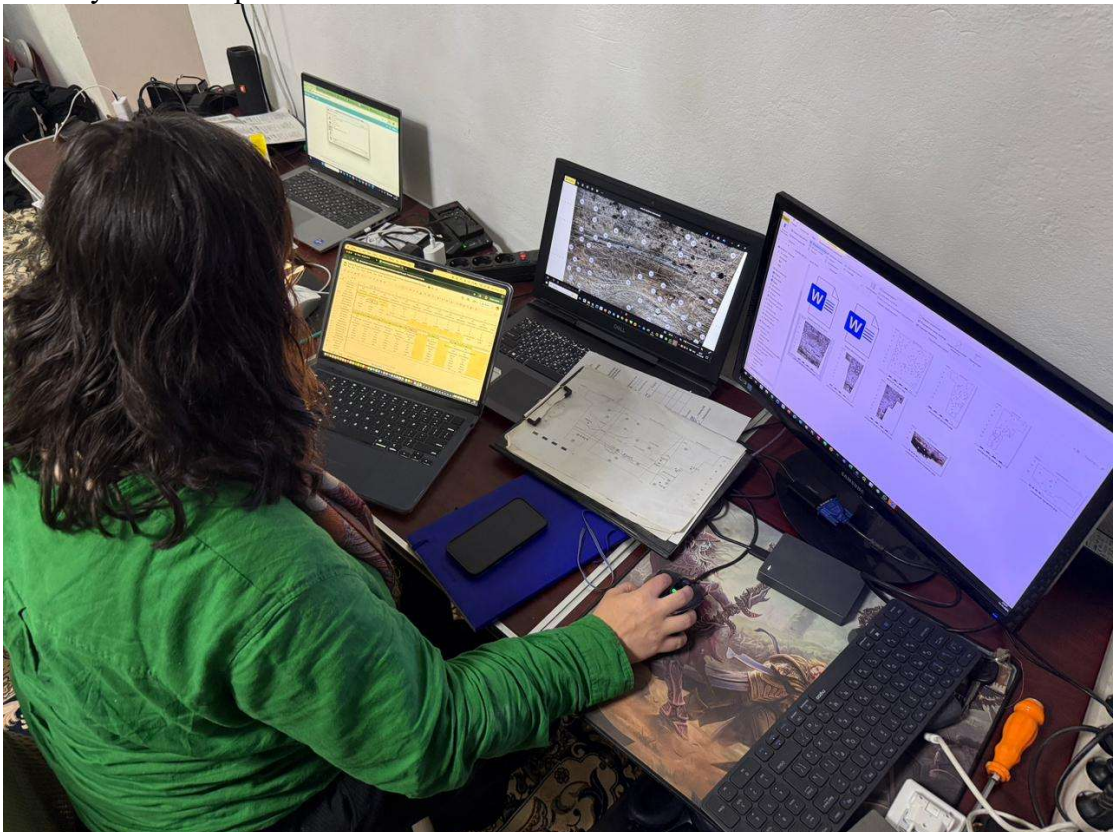
Dust blowing process



Documentation



Analysis of samples



Analysis of samples



Dinner time



Part of the team

Main Section

Excavations at the Kesken-Kuyuk Kala site in 2025.

In 2025, investigations were continued in the southwestern part of the shahristan of the Kesken-Kuyuk Kala site at the presumed citadel site. An Excavation was established in this area aligned with the cardinal directions. The Excavation is square in plan, measuring 10 x 10 m.

The objective of the Excavation: to identify, within the presumed citadel in the southwestern part of the shahristan at the Kesken-Kuyuk Kala site, and to study architectural constructions, residential complexes, construction layers, and occupational horizons.

Excavation documentation was carried out according to a unified field recording system: planigraphic plans and sections were prepared, staged photographic documentation was conducted, stratigraphy and context descriptions were compiled, and identified objects and finds were referenced within the coordinate system of the Excavation. All elements (objects) and individual finds were assigned field numbers (series Ks-25-Excavation number-element number-field find number), ensuring the comparability of the Excavation materials with the report sections and field records.

Prior to the initiation of the excavation, a geophysical survey of the area (GPR) was carried out using GSSI-2000 equipment over an area of 50 × 50 m. The data obtained were used to refine planimetric anomalies.

Ceramic material was selected by element, labeled, initially sorted by technological groups (handmade/wheel-thrown, surface/firing/engobe/burnishing, etc.), and submitted for detailed typological analysis—see the separate appendix to the report. Osteological materials were collected separately by element. Traces of chopping and cutting, as well as the degree of preservation, were documented; subsequently, the bones were submitted for taxonomic identification, assessment of the herd's age structure, and reconstruction of the population's subsistence and economic practices.

The selected area exhibits evidence of pronounced late and modern disturbances, including the removal of a geodetic marker and regular mechanical surface disruption, which must be considered when interpreting materials from the upper stratum.

The burials identified in the upper layers are regarded as late (ethnographic period) secondary intrusions into the ruined structures. These were documented separately from the early medieval contexts and are not included in the reconstruction of the layout and functions of the earlier horizons.

Description of research activities

Prior to the commencement of research activities aimed at studying the construction horizons and the structures comprising the cultural layer, preparatory measures were carried out to document the area, including a description of its appearance and the photographic documentation of the territory designated for the upcoming investigations.

Scientific research on the investigation of earlier layers and construction elements commenced with the geomagnetic survey at the site of the proposed excavation grid. The geomagnetic survey was conducted using a GSSI-2000 geoscanner over an area of 50×50 m. (Appendix, Figure 1–6).

Excavation work was conducted simultaneously across the entire excavation area, utilizing the method of stratigraphic cleaning of each identified stratum, with the phased removal of soil infill.

Photographic documentation and recording of the identified elements—including the refuse pit, brick walls, and floor altars belonging to different construction horizons—were conducted across the entire area of the designated Excavation.

During the excavation work within the Excavation area, two construction horizons were identified, containing building elements consisting of rectangular raw brick arrangements (suf 41, 42) and a lens of loose loam in the northwestern part of the Excavation.

In addition to the identified elements, ceramic and osteological materials were revealed during the cleaning of the soil infill.

The ceramic assemblage is represented by fragments of handmade and wheel-thrown vessels: vessel rims, handles, ornamented and unornamented walls of ceramic vessels made of red and grey clay.

The osteological assemblage is represented by fragments of cattle and small ruminant bones, as well as fish bones. All materials were recovered from layers of different construction horizons: in soil fillings and in refuse pits of various periods.

The osseous materials are represented by an antler point and a bone preform. The lithic artefact is represented by fragments of stone querns.

The metal artefact is represented by a copper bracelet.

Element 0. Aeolian layer.

In the southwestern part of the shahristan of the Kesken-Kuyuk Kala site, at the location of the presumed citadel, a square-shaped Excavation aligned with the cardinal directions, measuring 10×10 m, was established.

The presumed excavation site is situated on an elevation that is visually distinguishable above the shahristan.

The Excavation is characterized by an uneven surface bearing traces of motorcycle and passenger car wheels (Appendix. Figure 7-13).

A geodetic triangulation marker in the form of a metal tripod was located at the center until 2011. After 2011, this marker was illegally dismantled by unidentified individuals.

The surface of the marked Excavation consists of a gray crust of weathered aeolian deposit. Within the surface layer, small fragments of ceramics are observed during surface collection (Appendix. Figure 14-16). These ceramics pertain to both handmade and wheel-thrown vessels. Burnished, engobed, and wheel-thrown fragments, belonging to different types of vessels, are observed here. Small fragments of animal bones are also present on the surface. Fragments of fired red clay and yellow clay bricks are visible in various locations.

In addition to the aforementioned finds, domestic refuse is encountered within the layer, including broken glass, gravel, wooden fragments, and constructions.

Metal artifacts were discovered during the surface collection.

A heart-shaped bronze belt plaque, measuring 0.9 × 0.9 cm and 0.2–0.3 cm thick. A fastening rod, 0.3 cm in length and 0.3 cm in thickness, is soldered to the center of the interior side. A rim is visible on the exterior, dividing the plaque into two halves. The find was assigned the individual number: Ks-25-01-0-1.

A fragment of a rod from a copper needle (possibly a pin) was found during stratigraphic inspection. Length 1.3 cm, thickness 0.2 cm. The rod is covered with green oxidation. The find was assigned an individual number: Ks-25-01-0-2.

Fragment of a bronze belt plaque, measuring 1.3 × 0.7 cm, with a thickness of 0.2–0.3 cm. Part of the plaque, as well as the rod, are missing. The external surface of the plaque partially preserves ornamentation. The find was assigned an individual number: Ks-25-01-0-3.

A fragment of a green spherical glass bead was discovered, with a diameter of 0.5 cm, a height of 0.3 cm, and a perforation diameter of 0.2 cm. The find was assigned an individual number: Ks-25-01-0-4.

Element 1. Loose loamy layer.

After examination of Layer 0, it was decided to deepen by a shovel blade (30 cm).

During the clearing and deepening of the layer along the southern and eastern walls of the excavation (Appendix, Figure 17–20), a partially damaged human skull (2) was discovered in the

southeastern corner of the excavation. The skull was located on the surface of a presumed brick wall, which had not yet been fully excavated. The skull was oriented eastward. The other parts of the skeleton had not been discovered at the time of documentation.

A layer of ash and cinder was identified along the eastern section of the excavation. Subsequently, an ash-ash spot was detected. This spot was assigned sequential number (3).

During removal of the mudbrick collapse in the southern part of the room, a floor altar was uncovered in the central and southern sections. The altar was situated on a compact mudbrick floor of the room, between the western (20) and northern (12) walls, with its southern side adjoining the masonry of the southern wall of construction horizon 2. The altar is oriented north-south. It is noteworthy that the Altar underwent later repair and reconstruction (Appendix, Figure 23–31).

During the clearing of the layer in the northeastern part of the excavation, fish bones were identified—scales, gill cover, and ribs.

The osteological material present in the layer is represented by fragments of small ruminant bones.

Ceramics are represented by fragments of coil-built and wheel-thrown water vessels. Noteworthy is a fragment of a burnished handmade cup—the base, the side, and part of a loop-shaped handle. An incised mark in the form of a triangle is observable on the side.

During the removal of the loose loamy layer (1), an accumulation of handmade vessels was discovered in the central part of the excavation, arranged adjacent to each other.

During the removal of the fill layer of the premises of the upper construction horizon, a fragment of a stone millstone—deirmen—was discovered (Appendix, Figure 21, 22). The fragment is suboval in shape, measuring $9.8-7.5 \times 8-9.5 \times 3.5$ cm. On the side, there is a drilled handle socket with a diameter of 1.5 cm and a depth of 2 cm. The working surface is smooth. The upper surface bears traces of chipping. Near the edge, the quern displays a chipped, beveled surface.

The find has been assigned the individual number: Ks-25-01-1-1.

Alongside ceramics and animal bones. Among the bones of small ruminants, a bone artifact made from a tubular bone was discovered.

A chip is present on one side. Internally, the tubular bone was cleaned of the medullary septum, then polished. At one edge, two drilled holes are observable, with diameters of 0.7 and 0.5 cm. The length of the bone is 11.2 cm; the width is 1.3–1.5 cm. The functional purpose of the object remains unknown.

The find has been assigned an individual number: Ks-25-01-1-2.

Another bone object was discovered during clearing near the northern wall (23).

A gaming asyk (astragalus) was found in the layer near the northern wall of the room. A hole with a diameter of 0.3 cm was drilled in the center of the asyk. The asyk measures 3.3 cm in length, 1.8 cm in width, and 1.7 cm in height.

The find was assigned an individual number: Ks-25-01-1-3.

Element 2. A human skull in the southeastern corner of the excavation (Late construction phase).

The human skull in the southeastern corner of the excavation was discovered during the removal of the loose loamy layer (1).

Subsequently, the fill soil surrounding the skull was removed, which revealed an oval spot measuring 140×70 cm. A portion of the grave extends beyond the limits of the excavation.

The bones of the skeleton were partially disturbed, apparently by animals, as they were found at varying levels in disarray.

Element 3. Ash-ash spot in the eastern part of the excavation (Late construction phase).

During the excavation of the loose loamy layer along the eastern section of the excavation, a layer of ash and cinder was identified. Subsequently, an ash-ash spot measuring 17×47 cm and 10 cm deep was discovered (Appendix, Figure 32–37).

Element 4. Concentration of vessels.

Upon removal of the loose clay loam layer (1), a concentration of molded vessels arranged adjacent to each other was discovered in the central part of the excavation. Three vessels were exposed: one is a ceramic pot with a loop-shaped handle, and the other two are classified as molded ceramic cups. A single ceramic mug was recovered as a scatter of several fragments. All vessels were found inverted, with their bases facing upwards, during excavation.

Vessel 1. A handmade, pot-shaped vessel with a loop handle, 11.4 cm in height, featuring a wide mouth with a diameter of 8.5 cm and an out-turned vessel rim, with a loop handle. The loop handle, 4.8 cm in height and 1.8–2 cm thick, with an aperture diameter of 1.8–2 cm, is attached on one side to the out-turned vessel rim and on the other to the swollen vessel wall. The vessel rim is bent outward, forming an inclined flat surface. The thickness of the vessel rim is 1 cm, and the width of the surface is 0.7 cm. The internal depth of the vessel is 10 cm, with a wall thickness of 1 cm. The vessel is smoke-blackened, covered with a layer of soot. The walls are cracked due to exposure to fire (Appendix. Figure 38, 39).

A vessel neck is visible between the rim and the body, transitioning into a swollen body. The lower part of the side wall smoothly transitions into the flat base of the vessel. The base of the vessel is flat, with a diameter of 6.3–6.5 cm. The vessel was assigned the individual number: Ks-25-01-04-1.

During removal of the loose clay loam layer in the central part of the Excavation, at a distance of 30 cm from the handmade ceramic pot, a ceramic mug with a looped handle was uncovered. It was found upside down and covered with red engobe. The ceramic mug with a vertically oriented looped handle was produced using the hand-building technique. The handle is positioned and affixed to the side of the vessel. The rim of the mug is slightly turned outward. The wall of the mug is straight, at the top forming a slight curve that transitions into the curved vessel rim. The base is flat. On the base surface, marks in the form of four dots forming a distinctive square configuration can be observed. The height of the vessel is 9.3 cm; the width of the vessel rim is 6.2 cm. The width of the side wall is 4–4.7 cm. The diameter of the base is 4.9 cm. The handle is flattened in cross-section. Height of the handle – 3.8 cm, thickness – 0.8 cm, width – 1.6 cm, internal diameter – 1.2 cm. The walls are burnished and coated with a red engobe. At a later stage, the vessel's walls were blackened and fired as a result of exposure to fire (Appendix. Figure 40, 41).

The vessel was assigned an individual number: Ks-25-01-04-2.

An archaeologically complete ceramic mug was found in a fragmentary state. The mug is coated with a brown-red engobe, the surface is burnished, and the loop-shaped handle is absent. The attachment point of the loop-shaped handle is preserved. The base is thickened and partially missing. The vessel rim of the mug is partially preserved and exhibits a slightly convex form at the edges. The walls are thin. The sides are straight. The Vessel fabric is poorly levigated, with the addition of chamotte. The true dimensions could not yet be determined prior to reconstruction. The vessel was assigned an individual number: Ks-25-01-04-3.

Element 5. Altar of the room.

During the removal of mudbrick debris from the room, a floor altar was uncovered in the center of the room (Appendix. Figure 42–50). The altar was situated on a compact mudbrick floor of the room, between the western (20) and northern (12) walls, with its southern side adjoining the masonry of the southern wall of construction horizon 2. The altar is oriented north-south. It is noteworthy that the altar underwent later repair and reconstruction.

The altar of the second upper construction phase is a rectangular platform constructed from grey loam, measuring 2.10 × 1.20 m, with a height of 10–12 cm.

The rims of the altar are constructed along the sides using mudbrick masonry with well-mixed clay. The edges of the rims are beveled. The upper part of the rim is narrow and oval at the top, gradually widening toward the base, and is separated from the lower section by a protruding rim, evidently formed as a result of altar repairs.

The dimensions of the eastern rim are 155 cm in length, 20 cm wide at the base, and 15 cm wide at the top. The height of the rim is 12 cm. The dimensions of the western rim are 155 cm in length, 25 cm in width at the base, and 12.5 cm in width at the upper part. The height of the rim is 12 cm. Including the height of the earlier rim, the total height is 28 cm from the level of the excavated floor. The length of the southern rim is 120 cm, with a width of 10 cm.

In the northern part of the altar, no vertically positioned ornamented posts—protomes—were identified during the clearing.

On the northern side of the altar, there is a decoration in the form of sub-triangular horns carved from mudbrick. On the southern side, where an altar protome that has not been preserved was presumably located, a ceramic vessel with a loop-shaped handle was discovered on the fired surface during clearing. It was placed in a rounded pit, previously excavated into the inner surface of the altar (Appendix, Figure 51). The ceramic vessel with a vertically oriented loop-shaped handle was manufactured using hand-building techniques. The handle is positioned and attached at the junction of the vessel rim and the neck. The vessel rim is slightly flared outward. The wall of the pot is convex. The walls were burnished. Subsequently, the vessel walls became blackened and fired due to exposure to fire, resulting in cracking. The vessel was assigned the individual number: Ks-25-01-05-1.

Thirty centimeters south of the hand-made pot, a ceramic mug was placed in a rounded pit, previously excavated into the inner surface of the altar (Appendix, Figure 52). Ceramic mug with a loop-shaped handle, covered with red engobe. The ceramic mug with a vertically oriented loop-shaped handle was produced using the hand-building technique. The handle is positioned and affixed to the side of the vessel. The rim of the mug is slightly turned outward. The wall of the mug is straight, with a slight curvature at the top, transitioning into a curved vessel rim. The height of the vessel is 10 cm; the width of the vessel rim is 6 cm. The width of the side wall is 12 cm. The diameter of the base is 5.3 cm. The handle is subtriangular in cross-section, with a height of 5.5 cm, a width of 2.8–3 cm, and an internal diameter of 1.8–2 cm. The walls are burnished and coated with a red engobe. Subsequently, the walls of the vessel became blackened and underwent firing due to exposure to fire. The vessel was assigned an individual number: Ks-25-01-05-2.

The inner part of the altar consisted of a leveled surface, coated with a layer of clay plaster over the older altar. The thickness of the plaster was irregular and measured 3–4 cm. During cleaning, an ash layer and a reddish-brown fire mark were identified at the center of the altar's surface.

Clay plaster was applied as a result of repair works to which the pagan altar was subjected. The later plaster covered a layer of burning, ash, and small charcoal fragments. During the removal of the burning and ash layer, a more internal surface of the altar was revealed (Appendix, Figure 53, 57).

Beneath the cleared upper altar, an altar from an earlier period was discovered during excavation, in which vessels were found.

On the northern side of the altar, there is a decorative element consisting of four subtriangular modeled horns. The horns measure 24 × 20 × 10 cm.

The interior of the altar comprises a flat surface, 155 cm in length and 95 cm in width, coated with a clay plaster layer 3–7 mm thick. An ash layer was observed on the surface during the cleaning process. At the eastern, western, and southern rim, a black ash layer of subrectangular shape, measuring 64 × 74 cm, was uncovered. During the removal of the surface plaster layer, a scorched area was identified.

Clay plaster was applied as part of repair activities undertaken on the altar. A later plaster layer was deposited atop an ash layer, small charcoal fragments, and traces of burnt residue. When clearing the burnt and ash layers, an earlier altar plaster up to 7 mm thick was identified.

During the dismantling of the layer amid the collapse of mudbrick covering the ash layer, charcoal, animal bones, and vessel fragments, an altar protome preserved in a fragmentary state

was uncovered. The upper part of the altar protome with a stylized representation of a ram's head in the form of horns, decorated with carved ornamentation.

Element 6. Ash layer, ash, and fired loam in the central part of the Excavation (second construction period).

During the excavation of the loose, cloddy loam layer in the southwestern and western sections of the room from the second construction period, between the floor altar (5) and the partially excavated upper masonry of the western wall (20), in the central part of the Excavation at elevation 35.708, a layer of ash, ash, and fired loam was revealed. Subsequently, an ash-ash spot and a heat-affected loam of amorphous form measuring 68×85 cm were identified. This layer was traced to a depth of 30 cm (Appendix. Figure 58, 71).

Element 7. A square heat-affected spot adjacent to the ash layer, ash, and heat-affected loam in the central part of the excavation.

During the excavation of the loose, cloddy loam layer in the southwestern and western parts of the room of the second construction period, between the floor altar (5) and the partially excavated upper masonry of the western wall (20), a layer of ash, ash, and heat-affected loam was exposed. Adjacent to the calcined layer at level 35.708, a calcined red-brown loam measuring 35 x 30 cm was revealed. A similar calcined area is observed nearby, 40 cm to the south (Appendix, Figure 71, 72).

Element 8. Child Grave by the northern wall of the Excavation.

During cleaning of the layer in the northern part at the specified level, reed decomposition from a square-shaped mat became visible. The mat, measuring 75 x 60 cm, was situated near masonry composed of collapsed bricks. The mat was overlain by both arranged and fallen bricks. Beneath the mat, alternating shrub branches with a diameter of 3 cm and a length of up to 60 cm were laid consecutively (Appendix, Figure 73–75).

After clearing the mat and tree branches, a teardrop-shaped grave stain became visible at a depth of 10 cm.

The teardrop-shaped grave stain was excavated in a northwest–southeast orientation. The grave, which is narrow at the head, widens in the area of the feet. The width of the grave at the head was 22 cm, at the middle part 42 cm, and at the feet 48 cm. The length of the grave was 70 cm and the depth was 40 cm.

The skeleton of a child under one year of age was arranged anatomically in an extended position along the Northwest–southeast axis. The child's head was positioned on the northwest side, the arms were placed in the pelvic area, and the legs were directed towards the southeast. The child's height was 65 cm. No associated material was found during the cleaning of the skeleton (Appendix. Figure 76–80).

It was not possible to determine the timing of the burial.

Element 9. Badrab.

The badrab, measuring 67 × 82 cm, is located in the northeastern part of the Excavation. The pit, gray in color, has an irregular, elongated shape (Appendix. Figure 81–88).

During the cleaning of the internal fill, two fragments of mudbrick were discovered, which overlap the pit from above. During the cleaning of the pit's internal fill, small charcoal particles, two ceramic fragments, and fragments of SRM bones were discovered.

Element 10. Grave of an adult individual in the center of the excavation.

The grave, in the form of an elongated, suboval grey stain, was located by the northern brick wall (23) within a compacted dark grey clay loam surface, oriented northwest–southeast (Appendix, Figure 89–94). On the southeastern side of the burial area, masonry of mudbrick from the northern wall (23) is evident. The bricks measure 35 × 30 × 10 cm.

The area is filled with loose, lumpy loam containing fragments of mudbrick. During cleaning of the upper part of the grave, remnants of a decayed reed mat were revealed, which covered the upper part of the grave (Appendix, Figure 95, 96). While cleaning the side walls, wooden pegs up to 2 cm thick and up to 40 cm high were found along the walls; the mat was

attached to these, forming a kind of canopy that covered the body after it was placed in the burial pit. After clearing, the grave measures 2 m. The width of the grave is 70 cm at the head, 68 cm at the center, and at the feet.

During clearing, a human skull was encountered at this level. With further deepening at this level, the pelvis and rib cage of a human were revealed; in the southeastern part of the grave, the legs were uncovered.

The Skeleton in the grave belonged to a woman under 40 years of age. The woman was buried according to the inhumation rite. The body was extended from northwest to southeast. The head was positioned on a slight elevation in the northwestern part of the grave, with the face oriented toward the southeast. The hands were placed in the pelvic region. The legs were extended, and the feet were joined together. The length of the woman's body from the skull to the calcaneus is 150 cm (Appendix. Figure 97–99).

Element 11. South wall.

The wall of the structure is situated in the southern part of the excavation and is constructed along the west–east axis from clayey bricks. To the east, the wall adjoins at its end the excavated eastern wall (12) of the second construction horizon of the altar chamber. To the west, the wall connects at its end with the upper masonry of the excavated wall (20) of the second construction horizon, which was laid perpendicular to the excavated wall and is located on the western side (Appendix, Figure 100–105).

The preserved wall masonry consists of square mud bricks made from well-levigated and mixed loam. The Wall, lacking a foundation, was constructed upon an earlier occupation horizon composed of softer and looser soil (1), which includes loam, fragments of unfired brick, charcoal, ash, and domestic refuse, collectively forming a distinctive cushion and substrate (Fig.).

The total length of the Wall is 5.50 m, and the Wall's width is 50 cm. The Wall height is 10 cm.

During the cleaning of the Wall in the southeastern section of its masonry, a pit from a Post (16) was documented, which apparently functioned as a support or column during a later period.

At the time of the excavation, a single course of brickwork was preserved.

Element 12. Eastern wall.

The described wall is located on the eastern side of the room and is constructed along a southeast-northwest axis from square mudbrick blocks measuring 35×30×10 cm (Appendix. Figure 106-109).

During the deepening of the excavation, the preserved masonry of the wall was revealed, consisting of eight courses of bricks in height and two courses in width, laid from mudbrick blocks molded from well-levigated and thoroughly mixed clay. The block masonry of the wall is bonded with a clay mortar and internally coated, followed by the application of six layers of multilayer plaster (Appendix. Figure 106–109, 110–113, 114–118, 244–246).

On the northern side, between the end face of the eastern wall and wall (24), there is an entrance opening (14). On the western side of the masonry, at different levels, two sufas (13, 41) were arranged, constructed in a south–north orientation from bricks and covered with a layer of coating. On the eastern side, the Wall is oriented with its façade facing toward the altar rooms of the first and second construction periods.

On the southern side, at a later stage, Wall (11) was adjoined perpendicularly to it at the upper part.

During the cleaning of the Wall in the southern part, a burial of an infant (38), dating to a later period, was excavated. The grave is of small size and partially damaged the edge of the Wall masonry (38).

Wall parameters: length 4.70 m, width 60 cm, height 1.40 m.

Element 13. Sufa at the eastern wall (second construction horizon).

The sufa is rectangular in shape, with rims constructed from mudbrick, oriented south–north, made of light gray loam, and positioned along wall (12). The bedding is lined along the edge

on the western side with a single row of mudbrick, each brick measuring $32 \times 16 \times 8$ cm. The surface of the sufa was coated and plastered with a thin layer. The length of the sufa is 4.70 cm. The width of the sufa is 95 cm. The height from the floor to the rim is 15 cm (Appendix, Figure 119-122).

Element 14. Entrance opening between the eastern (12) and northern (23) walls.

While clearing layer 1 at a depth of 50 cm beneath the layer of collapsed mudbrick blocks from the eastern wall (12), an entrance opening filled with soil and broken fragments of mudbrick blocks was identified. During the excavation, a section of the entrance opening was revealed; the remaining part lay beyond the limits of the partially excavated walls. The width of the partially cleared entrance opening is 1.40 m, and the length is 1 m.

The entrance opening was in use during the third construction horizon and continued to exist into the second horizon.

Element 15. Pit from a post in the southeastern part of the masonry of wall (11) from the late construction period.

During the clearing of the wall in the southeastern part of the Excavation, a pit from a post was recorded, apparently serving in the late period as a support or column with a diameter of 16 cm. The pit was excavated along the same axis as pit (16), identified on the masonry of wall (11) from the late construction period.

Element 16. Pit from a post in the southern part on the masonry of wall (11) of the late construction period.

During the cleaning of wall (11) in the southeastern part of the excavation, a post pit was documented. The pit was dug in the masonry of the wall, apparently serving as a support or column during the late period. The diameter of the pit is 16 cm (Appendix. Figure 124–125).

Element 17. Collapse of mudbrick blocks from the masonry of wall (12) in the northeastern and eastern parts of the room. Second construction horizon.

The collapse of mudbrick blocks from the masonry of wall (12) was identified during the clearing of the loose loam layer in the northeastern and eastern parts of the room.

The collapse of mudbrick blocks is situated on both sides of the masonry of the eastern wall (12), covering an area of 1.80×2.60 m. The dimensions of the mudbrick blocks are $36 \times 30 \times 10$ cm. Based on the compact arrangement of the blocks, it can be assumed that part of the wall masonry slid into the interior of the room, while the remainder collapsed. During the collapse, some of the mudbrick blocks broke into two or three fragments. Over time, most of the mudbrick blocks were destroyed by atmospheric precipitation, transforming into a loose loamy layer (Appendix. Figure 126–128).

Element 18. Loamy fill in the northeastern part of the room. Second construction horizon.

During the clearance of the fill between the northern (23) and eastern (20) walls, along the northern wall (23) and the eastern wall, a loose, lumpy loam with inclusions of small carbonates was observed. Reed and bulrush detritus are present in the layer. In the described layer, fragments of mudbrick blocks and bricks from the room walls, as well as small pieces of charcoal and ash, are also observed.

The ceramics found in the layer are represented by handmade Khum-type Vessels, decorated along the rim of the wide mouth with encircling rims bearing oblique alternating impressions in a herringbone pattern. Thin-walled water-bearing vessels decorated on the exterior with red engobe should be noted.

The osteological material encountered within the layer is represented by fragments of small ruminant bones (Appendix. Figure 127–133).

Element 19. Loamy fill of the premises in the southwestern and western parts of the room. Second construction horizon.

During the removal of the fill between the floor altar (5) and the western wall (20), a loose, lumpy loam with inclusions of small carbonates was observed. Reed and bulrush detritus are

present in the layer. In the western part, burnt and decomposed animal manure is observed, as well as small charcoal fragments and ash.

A similar fill is observed in the northeastern and eastern sections of the deposit.

The ceramics found in the layer are represented by handmade Khum-type Vessels, decorated along the rim of the wide mouth with encircling rims bearing oblique alternating impressions in a herringbone pattern. Thin-walled water-bearing vessels decorated on the exterior with red engobe should be noted.

The osteological material encountered in the layer is represented by fragments of bones of small and large cattle, birds, as well as fish bones.

Element 20. Western Wall.

The described Wall is situated on the western side of the room. The Wall is constructed along a south–north axis from raw, square blocks measuring 35×30×10 cm (Fig.). The preserved wall masonry consists of eight courses of bricks in height and two courses in width, constructed from mudbrick blocks produced by molding well-levigated and kneaded clay. The masonry of the wall blocks is bonded with a clay mortar and, on the interior side, coated with plaster, subsequently covered with six layers of multilayer rendering (Appendix. Figure 136–143). During the cleaning of the wall surface, traces of lime whitewashing were identified on the plaster, which had been subjected to fire and was covered with soot (Appendix. Figure 134, 135).

On the northern side, the described wall abuts with its end face against the northern wall (24). On the eastern side of the wall masonry was a Sufa (41), constructed in a south–north orientation from bricks and finished with plaster. In the central part of the wall masonry is an attached wall furnace with an arched niche and a Flue. The furnace adjoins the end face of the Sufa with its body.

To the east, the wall faces toward the altars of the second and third construction periods.

During the cleaning of the wall in the western part, a burial of an infant (26) from a later period was excavated.

Wall parameters: length 6.20 m, width 60 cm. Wall height: 1.40 m.

Element 23. Northern wall of the room (second and third construction horizons).

The wall of the room is situated in the northern part of the Excavation and constructed along the west–east axis from mudbrick blocks measuring 35 × 30 × 10 cm, bonded with liquid clay as binding mortar. The element abuts with its end part against the excavated western wall (20) of the second construction horizon, laid perpendicular to the excavated wall and situated on the western side (Appendix. Figure 144, 145).

The masonry of the wall is constructed in bond with raw square bricks made from well-levigated and kneaded loam (Appendix. Figure). The wall measures 6.80 m in length, with a masonry width of 60 cm, and the preserved masonry height from the excavated base is 1.40 m (Appendix. Figure 150).

The interior surface of the wall is covered with clay plaster and multilayered stucco, which is partially preserved on the wall masonry (Appendix. Figure 146–149). The thickness of the plaster and stucco is up to 2.5 cm.

Between the northern and eastern walls (12), in the northeastern part of the room, there is a passage (14), which was filled during the excavation with broken and whole loess blocks.

During the cleaning of the wall in the southeastern part of its masonry, a pit from a post was documented, which apparently served in the later period as a support or column.

On the northwestern side, adjacent to wall (23), a niche (44) is present in the mudbrick floor between bricks, located between two projecting mudbrick masonry structures. The dimensions of the masonry are 76 x 32 cm, with a height of 30 cm from the floor; the dimensions of the brick masonry are as indicated. During the cleaning of the loose loam (36) within the niche, a bull's horn wrapped in felt (koshma) was discovered.

While clearing the upper masonry of the wall from the aeolian layer, a grave (10) from the late construction phase was uncovered, in which an adult individual was interred. The Grave damaged seven courses of masonry in its central part on the exterior side.

Element 24. Arrangement of bricks along mudbrick wall 23 (late construction phase).

A platform measuring 150×78 cm was constructed of mudbrick in a single course, 6 cm high, to the south of mudbrick wall 23 (Appendix, Figure 152, 153). The arrangement consists of mudbrick measuring $25 \times 25 \times 6$ cm. The bricks were laid on loamy fill from an earlier period. The functional designation of the masonry is unknown.

Element 25. Child burial on the surface of the western wall (20) (Late construction phase).

The child burial was identified during removal of the loose loamy layer (1) in the area of the northern wall (24).

The remains belonged to a child under one year old. Subsequently, the fill soil around the skull was cleaned, resulting in the identification of an oval spot measuring 85×50 cm. While excavating the fill soil within the spot, the child skeleton was cleared (Appendix, Figure 154–157).

The child's skeleton was found in anatomical order, extended along the northwest–southeast axis. The child's head was positioned on the northwest side, with the feet directed toward the southeast. The child's height measures 70 cm. No associated materials were recorded during the cleaning of the skeleton.

It was not possible to determine the timing of the burial.

Element 26. Child burial near the western wall of the excavation (Late construction phase).

The child burial was identified during the removal of the loose loamy layer (1) and the cleaning of the masonry surface adjacent to the western wall of the excavation.

Initially, during the removal of the clay layer, a child's skull was identified. Subsequently, the fill soil around the skull was carefully cleaned, revealing a pear-shaped stain measuring 60×37 cm. The burial depth was 30 cm. During the excavation of the fill soil surrounding the skull, a disarticulated child's skeleton, disturbed by rodents, was exposed (Appendix, Figure 158–160).

The bones of the child's skeleton were found in an extended position oriented northwest–southeast. The head was located in the northwestern part, with the feet oriented to the southeast. The length of the buried child is 50 cm. Based on the skeleton, the child died at an age of up to 3 months.

No artifacts were found during cleaning.

Element 27. Child burial at the northern wall (23) (Late construction phase).

The child burial was identified during the removal of the loose loamy layer (1) and the cleaning of the surface masonry of wall (23) in the northern part of the excavated room.

A child's skull was initially discovered. Subsequently, the fill soil surrounding the skull was removed, which revealed an oval stain measuring 65×37 cm. The burial depth was 30 cm. The grave was excavated on the surface of the wall masonry and was situated 90 cm west of grave (10) (Appendix, Figure 161–164).

The bones of the child's skeleton were found in an extended position oriented northwest–southeast. The head was located in the northwestern part, with the feet oriented to the southeast. The length of the buried child is 57 cm. Based on the skeleton, the child died at an age of up to 6 months.

No artifacts were found during cleaning.

Element 28. Child burial (Late construction phase).

During the dismantling of the collapse of mudbrick blocks near the eastern wall, within the layers of the second construction horizon, a child's skull was discovered beneath the collapse of mudbrick blocks. Upon further dismantling of the mudbrick blocks, the skeletal remains of an adolescent were uncovered.

The remains belonged to an adolescent, a child under the age of 10, who had been interred in a pit of sub-oval shape measuring 1.40×0.60 m. Evidently, following the burial, the grave pit was overlain with mudbrick blocks.

The skeleton of an adolescent was found in anatomical order, in an extended position oriented northwest–southeast. The child's head was positioned on the northwest side, with the feet directed toward the southeast. The child's height is 1.30 m. No associated materials were identified during the cleaning of the skeleton (Appendix, Figure 165–166).

It was not possible to determine the timing of the burial.

Element 29. Collapse of mudbrick blocks near the eastern wall (12).

During the cleaning of soil (1) at elevation 35.361, a collapse of mudbrick blocks lying flat and alternating in sequence was revealed near the eastern wall (12) within the room, over an area of 1.45 × 1.25 m. The dimensions of the mudbrick blocks are 30x35x10 cm. Most of the blocks were destroyed when the masonry of the wall collapsed into two parts (Appendix, Figure 167–170).

At a later time, a child burial (28) was carried out above the brick collapse.

Element 30. Child burial (Late construction phase).

The child burial was revealed during the removal of the loose loamy layer (1) at a distance of 20 cm from the previously excavated altar (5) in the center of the excavation.

A child's skull was initially discovered. Subsequently, the fill soil around the skull was cleaned, resulting in the identification of an oval spot measuring 115x50 cm. During excavation of the fill within the feature, a disarticulated child's skeleton was uncovered (Appendix, Figure 171–181).

The bones of the skeleton had evidently been disturbed by animals, as they were found at various levels and in disarray. Based on the orientation of the foot and skull fragments, which lay northwest–southeast, it can be inferred that the child, whose height was 90 cm, was interred in an extended position. In the jaw area, during cleaning of the skeleton, a spherical blue glass paste bead was discovered, measuring 1 cm in diameter, 0.7 cm in height, with a perforation diameter of 0.4 cm. The find has been assigned the individual number: Ks-25-01-30-1.

Element 31. Layer of clay loam fill and small brick fragments. Intermediate layer between the second and third construction horizons.

The excavated layer consists of loose, cloddy, light brown clay loam, present across nearly the entire area of the room (Appendix, Figure 182–189). Osteological material is present in the layer—sheep bones, camel bones, bones and a skull belonging to a rodent (marmot?), as well as fish scales, bones, and an operculum.

The ceramics are represented by fragments of khum-shaped and water-bearing vessels.

Near the northern wall (23) and in the center, within an area measuring 1.50 × 1.20 m, an accumulation of ash, cinder, and fired loam (34) was recorded.

During the clearing of the layer along the western wall (20), an opening was partially excavated, which was interpreted as a wall-adjacent furnace. Traces of ash, soot, and fired raw brick blocks from the wall masonry were identified here, as well as the upper part of the pakhsa structure of the furnace.

Upon deepening to a second shovel blade at the northern wall (23), a complete copper bracelet covered with green oxide was discovered.

The copper bracelet consists of a flattened arc with rounded edges. In cross-section, the bracelet is of a flattened form. The outer surface of the bracelet is decorated with a separating rib. The diameter of the arc of the bracelet is 10 cm, the width is 1.2 cm, and the thickness is 0.2 cm. The find was assigned an individual number: Ks-25-01-35-1.

Element 32. Pit from a post near the northern wall masonry (23). Third construction period.

During cleaning of the floor near the northern wall masonry, a pit from a post was exposed, apparently serving as a support or column. The diameter of the pit is 16 cm, depth 12 cm (Appendix, Figure 190–192).

Element 33. Wall-adjacent hearth near the western wall masonry (23). Third construction period.

As layers (1) and (31) were being cleaned on the western side of the room near the western wall (20), the silhouettes of a square pedestal were revealed. An ash layer and traces of burning were identified on the surface of the platform in its central section. The edges of the platform are lined with fragments of the walls of a hum-shaped vessel, with an average size of 28×20×1 cm (Appendix, Figure 193–200).

During the removal of the ash layer, soot, and small charcoal fragments along the boundaries of the burnt area, the vessel rim and neck of a hum-shaped vessel placed inside the pakhsa platform were found (Appendix, Figure 201).

The plinth is square in plan, with slightly inclined and tapering edges from bottom to top, constructed using the pakhsa masonry technique. It has a height of 75 cm, and the width of the excavated exterior section of the plinth measures 76–80 cm. It appears that the remaining sides, concealed by the masonry wall on the west and north and adjoining to the south the stove platform (42), had similar parameters.

In the center of the plinth, during its construction from pakhsa, a hummock-shaped vessel without a base was placed. The edges of the vessel were tightly coated with clay. Hum-shaped vessel, 57 cm in height, with a neck diameter of 37 cm and a thickness of 1 cm, produced by hand-molding and subsequently fired (Appendix. Figure 204, 205).

Thereafter, the tump was given a truncated form. Subsequently, the sides of the oven were smoothed. At the edges, the neck of the oven is lined with fragments of the aforementioned hum-shaped vessel.

During excavation inside the oven, a layer of loam, small fragments of plaster from the domed vault, ash, and small charcoal pieces was observed. Owing to the effects of fire, the walls of the buried vessel were fired and developed cracks. In addition, a fragment of a black engobed water-carrying vessel was found inside the oven.

Furthermore, during the clearing inside the oven, a cattle rib with traces of chipping was discovered. Apparently, the rib served as a tool for the internal cleaning of the oven from ash and soot.

While cleaning the floor near the oven, a curved flue was exposed below, measuring 14 × 12 cm. The flue is located 47 cm below the oven mouth and 30 cm above the excavated clay floor (Appendix, Figure 202–203).

Subsequently, during the excavation of the body of the western wall above the wall-adjacent stove, a curved domed vault—a niche—was identified.

The niche is 45 cm high, with an upper width of 28 cm, a lower width of 52 cm, and a depth of 22 cm within the stove space.

The interior of the vault and the sides of the niche are ornamented with arched fluting, serving as a facing. The width of the fluting varies between 3 and 3.3 cm. The walls of the niche are coated with five layers of fine plaster, blackened by exposure to fire and smoke.

Element 34. Accumulation of ash, soot, and calcined loam adjacent to the northern wall (23) and in the central area of the room. Second construction horizon.

During removal and cleaning of the second layer of loose, lumpy loam adjacent to the northern wall (23) and in the center over an area of 1.50 x 1.20 m, an amorphous accumulation of ash, soot, and calcined loam was recorded. Within the accumulation, small fragments of charred wood and reed were encountered (Appendix. Figure 206-212).

Element 35. A layer of loose loamy fill, as well as broken fragments of mudbrick blocks and bricks.

The excavated layer constitutes a loose, lumpy, loamy mass, which occurs across nearly the entire area of the room. Osteological material is present in the layer—sheep bones, camel bones, bones and a skull belonging to a rodent (marmot?), as well as fish scales, bones, and an operculum.

Ceramics are represented by fragments of khum-shaped and water-bearing vessels, as well as fragments of a ceramic mug (Appendix. Figure 213).

Near the northern wall (23) and in the center, within an area measuring 1.50×1.20 m, an accumulation of ash, cinder, and fired loam (34) was recorded.

During the clearing of the layer along the western wall (20), an opening was partially excavated, which was interpreted as a wall-adjacent furnace. Here, traces of ash, soot, and firing of the mudbrick blocks in the wall masonry, as well as of the upper part of the pakhsa body of the stove, were identified.

Upon deepening to a second shovel blade at the northern wall (23), a complete copper bracelet covered with green oxide was discovered.

The copper bracelet consists of a flattened arc with rounded edges. In cross-section, the bracelet is of a flattened form. The outer surface of the bracelet is decorated with a separating rib. The diameter of the arc of the bracelet is 10 cm, the width is 1.2 cm, and the thickness is 0.2 cm. The find was assigned an individual number: Ks-25-01-35-1.

With the exception of the southern section of the room, the remaining area revealed, alongside loose loam, fragments of mudbrick blocks and bricks.

In the vicinity of the northern wall (23), during cleaning, a patch of loose loam (36) was identified, within which a bull's horn wrapped in felt (koshma) was found.

The ceramics are represented by fragments of handmade pottery pertaining to water-carrying vessels and braziers.

A fragment of a ceramic engobed mug was uncovered during the clearing of the described layer.

The osteological material is represented by the bones of small and large bovids.

The discovery of bottle gourd seeds in the area of the excavated wall-adjacent oven (33) should be noted. These seeds were selected for paleobotanical analysis.

Element 36. A patch of loose loam in the layer of loamy infill and fragments of broken mudbrick blocks near the northern wall (23).

After cleaning layer (31) in the area of the northern wall, a square patch of loose grey loam measuring 65×45 cm was revealed. During the excavation of the loose stratum, fragments of a bull's horn were discovered, along with fragments of decayed felt (koshma), located in a distinctive niche between the bricks.

Upon removal of the loose loam, a niche (44) was identified adjacent to the northern wall of the room (Appendix. Figure 214–216).

During the removal of the layer, a collapse consisting of whole and broken fragments of mudbrick blocks was recorded in the central and western parts of room (37), as well as a cleared collapse of whole and broken fragments of mudbrick blocks in the northern and eastern sections of room (39), positioned parallel to the collapse in (37).

Element 37. Accumulation of whole and broken fragments of mudbrick blocks in the center and west of the room.

Following the cleaning of layer (35) in the center and west of the room, in the area of the western wall (20), an accumulation of broken mudbrick block fragments was documented over an area of 5.10×3.40 m (Appendix. Figure 217–221).

The accumulation consists of fallen or subsided fragments of wall masonry, as well as individual blocks lying in disarray.

In the southwestern part of the excavation, the described accumulation partially covered the floor altar (43) of the third construction horizon, as well as the sufa (42) near the western wall, and partially covered the base of the attached stove pedestal and the floor in the western, northwestern, and central parts of the room. During the clearing of the altar, fragments and complete mud bricks were discovered, as well as mud blocks that covered part of the altar in the northern and partially in the central area.

While clearing the collapse layer, fragments of a cauldron lid decorated with stamped geometric ornamentation were found, as well as fragments of a thin-walled engobed vessel bearing traces of soot and fire exposure. (Appendix. Figure 222-224).

During the excavation of collapsed whole and fragmented mudbrick blocks, a layer of cattail and reed up to 4 cm thick was identified in the course of disassembly and cleaning. This layer apparently served as the upper covering of the room—the roof (Appendix. Figure 225–227).

Element 38. Child burial at the eastern wall (Late construction phase).

The child burial was identified during the removal of the loose loamy layer (1) and the cleaning of the masonry of the wall surface (12).

A child's skull was initially discovered. Subsequently, the fill soil surrounding the skull was cleaned, revealing a pear-shaped feature measuring 68 × 35–27 cm. The burial depth was 40 cm. During the excavation of the fill within the feature, the disarticulated skeleton of a child, disturbed by rodents, was uncovered.

The bones of the skeleton had evidently been disturbed by animals, as they were found at various levels and in disarray. Based on the orientation of the foot and skull fragments, which lay northwest–southeast, it can be inferred that the child, whose height was 90 cm, was interred in an extended position. The bones of the left leg and the vertebrae were in anatomical position. The bones of the skeleton on the right side were disturbed by rodents (Appendix. Figure 228–231).

No artifacts were found during cleaning.

Element 39. An accumulation of intact and fragmented mudbrick blocks was observed adjacent to the northern (23) and eastern (12) walls.

During the removal of the loose loamy fill layer (35) in the northern and northeastern sector near the northern wall (23), in the area of the eastern wall (12), an accumulation of fragmented mudbrick blocks was documented over an area measuring 2.70 × 3.90 m. The described accumulation represents fallen or collapsed fragments of wall masonry, as well as isolated blocks and bricks lying in disorder.

The described collapse partially obstructed the sufa (41) of the third construction horizon, which was situated along the eastern Wall, overlaid the floor in the eastern and northeastern parts of the room, and also blocked the entrance opening between the eastern (12) and northern (23) Walls. During the clearing of the altar, fragments and complete mud bricks were discovered, as well as mud blocks that covered part of the altar in the northern and partially in the central area.

During the removal of the collapsed bricks among the mudbrick blocks and bricks between the eastern (12) and northern (23) Walls, which blocked the entrance opening (14) at the edge of the sufa (41), a fragment of a reed mat was discovered. Apparently, the mat lay on the floor of the room, which, like the mat, was buried by fallen blocks and bricks (Appendix, Figures 232–236).

Element 40. A spot of fired loam of amorphous shape with a layer of ash and cinder in the central part of the excavation. Third construction period.

During the excavation of the loose, cloddy loam layer with inclusions of fragments of broken and whole bricks and blocks from the walls (35) in the northwestern and central parts of the room, near the floor altar (5) of the western wall (20) with the annexed stove and the northern wall, a spot of fired soil was revealed. An amorphous-shaped spot of light red-brown color with a layer of ash and soot. Adjacent to the firing layer at the same level, a patch of fired red-brown loam measuring 1.80 x 80 cm was identified. A similar instance of firing is observed one level higher, near the altar (5) of the second construction horizon (Appendix, Figure 237–241).

Element 41. Sufa at the eastern wall (third construction horizon).

Rectangular sufa with rims made of mudbrick, laid out south–north along wall (12). Uncovered during the clearance of mudbrick block debris from the collapse of wall (12). The sleeping platform is constructed from mudbrick, each measuring 32x16x8 cm, set on edge tightly together. The space between the mudbrick masonry is filled with liquid clay. The edge of the sufa is faced along the western side with a single row of mudbrick, measuring 32x16x8 cm with the flat surface outward. The surface of the sufa was coated and plastered with a thin layer. The edge of the sufa, as well as the surface of the sleeping platform, is coated with a plaster layer up to 4 cm thick. Subsequently, the surface of the sufa was covered with a thin layer of plaster. The sufa

measures 6.10 m in length. The width of the sufa is 1 m. The height from the floor to the rim is 15 cm (Appendix, Figure 242–250).

Element 42. Sufa adjacent to the western wall (third construction horizon).

Rectangular sufa with a rim constructed of mudbrick, aligned south–north from light grey loam along the wall (20). The uncovered bench revealed during the clearing of debris consisting of mudbrick blocks and bricks (37) from the collapsed masonry of wall (20). The bench was constructed using the pakhsa masonry technique. The edge of the sufa is faced along the western side with a single row of mudbrick, measuring 32x16x8 cm with the flat surface outward. The surface of the sufa was coated and plastered with a thin layer. The edge of the sufa, as well as the surface of the sleeping platform, is coated with a plaster layer up to 4 cm thick. Subsequently, the surface of the sufa was covered with a thin layer of plaster.

The northern corner of the sufa is rounded and is nearly adjoining the wall stove (33), which was situated within wall (20).

The sufa is 2.60 m in length. The width of the sufa is 95 cm. The height from the floor to the rim is 50 cm (Appendix, Figure 251-255).

Element 43. Floor altar of the third construction horizon.

During the removal of the mudbrick collapse from the room, a floor altar was uncovered in the central and southern sections, partially overlain by mudbrick blocks and bricks from a fallen wall (20). The collapse partially covered the floor altar in the northern and partly in the central section (Appendix, Figure 256-259).

While cleaning the surface of the altar in its southern section, a cauldron-shaped ceramic stand with a looped vertical handle was found. The stand was decorated with an ornament consisting of horizontally alternating depressions, forming a distinct 'herringbone' pattern (Appendix, Figure 260–262).

The Altar was situated on a dense mudbrick floor (45) of the room, between the western (20) and northern (12) walls. The altar is oriented north-south. It is noteworthy that the altar from the early period underwent reconstruction at a later time. It should be noted that above it was a similarly excavated altar (5) of the second construction horizon, positioned 1.20 meters above the altar of the third construction horizon.

The Altar of the third lower construction period is a rectangular platform, 2.30 m in length, constructed of grey loam.

The rims of the altar are constructed along the sides using mudbrick masonry with well-mixed clay. The rims are straight, built using the pakhsa masonry method as a monolith, with subsequent finishing to achieve the final form (Appendix, Figure 260–262).

The dimensions of the eastern rim are 155 cm in length and 15 cm in width. The height of the rim is 8–10 cm above the level of the excavated floor. The dimensions of the western rim are 155 cm in length and 15 cm in width. The height of the rim is 13 cm above the level of the excavated floor. The southern rim is 1.40 m long and 10 cm wide.

In the northern part of the altar, traces of two now-lost Posts—protomes measuring 24 × 13 cm, made of clay by hand-molding with the addition of chamotte—were discovered. The protomes were heavily fired and damaged.

On the northern side of the altar, there is a decoration in the form of a sub-triangular horn, carved from adobe brick, measuring 20 × 25 × 10 cm. Where the altar protomes were not preserved, a rounded pit was discovered on the fired surface during cleaning. Within the pit, with an external diameter of 32 cm and an internal diameter of 23 cm, a ceramic vessel was placed in a previously excavated recess in the inner surface of the altar (Appendix, Figure 263-265).

Beneath the protomes on the inner platform, a fired vessel fragment was positioned, serving for the collection of ash. The base and part of the wall of the vessel have been preserved. During clearing, the vessel fragments disintegrated into small pieces, making it impossible to determine the vessel type.

The inner part of the altar consisted of a leveled surface, coated with a layer of clay plaster over the older altar. The thickness of the coating was 2.7 cm. On the surface, during clearing, an ash layer and a light brown firing stain were observed.

Clay plaster was applied as a result of repair works to which the pagan altar was subjected. A later plaster layer was deposited atop an ash layer, small charcoal fragments, and traces of burnt residue. During the clearing of the firing and ash layer, an earlier internal surface of the altar was identified.

Beneath the cleared upper altar, an altar from an earlier period was discovered during clearing.

The rims and the platform of the altar were formed by molding well-kneaded clay (Appendix. Figure 266–278).

The eastern and western rims measure 1.55 m in length and 15 cm in width. The height of the rims is 8–10 cm.

The southern rim is 1.40 m in length and 10 cm in width.

Element 44. Niche by the northern wall (23).

During the clearing of a patch of loose loam (36) in the area of the northern wall, a niche was identified.

The niche is situated on the northwest side adjacent to the body of wall (23) within the mudbrick floor, between two projecting structures constructed of mudbrick. The structures measure 76 x 32 cm, with a height of 30 cm above the floor; the brickwork measures 32 x 16 x 8 cm. The space between the bricks measures 72 x 40 cm. Within the niche space, during the clearing of loose loam (36), a bull's horn wrapped in felt (koshma) was discovered (Appendix. Figure 279–281).

Element 45. Mudbrick floor of the room. Third construction horizon.

After the removal of brick collapse layers in the area of rooms (37, 39) at a depth of ? Along the eastern and western sufa benches (41, 42), the wall-adjacent oven (33), and along the western and northern walls (20, 23), a dense mudbrick floor belonging to the third construction horizon was exposed.

The floor consists of a flat, compacted, and smoothed clay surface, on which, on the southern side, a floor altar made of clay was constructed from north to south. On the western and eastern sides, from south to north along the walls (12, 20), two sufa-benches (41, 42) were constructed. On the floor near the western wall (20), the base of an attached stove (33) was constructed using pakhsa masonry. To the north, by wall (23), a niche (44) is located in the mudbrick floor between the bricks. Near the northern wall (23), a pit was excavated in the floor, presumably for a post supporting the roof. (Appendix. Figure 282–285).

Conclusion

In 2025, investigations were continued in the southwestern part of the shahristan of the Kesken-Kuyuk Kala site at the presumed citadel site. An Excavation was established in this area aligned with the cardinal directions. Excavation of a square configuration, measuring 10 x 10 m. The presumed excavation site is situated on an elevation that is visually distinguishable above the shahristan.

During the excavation of the presumed citadel, three construction horizons were identified.

The first construction—the latest historical horizon—is represented by eolian destruction.

It constitutes an uneven surface with traces of motorcycle and automobile wheels.

The surface of the marked Excavation consists of a gray crust of weathered aeolian deposit. Small ceramic fragments are observed in the surface layer. These ceramics pertain to handmade and wheel-thrown vessels. Burnished, engobed, and wheel-thrown fragments, belonging to different types of vessels, are observed here. Small fragments of animal bones are also present on the surface. Fragments of red-clay and yellow-clay fired bricks are visible in various locations.

In addition to the previously mentioned and described finds, domestic refuse was encountered within the layer, including broken glass, gravel, wooden fragments, and structural elements.

Metal artifacts were discovered during the surface collection.

A heart-shaped bronze belt plaque, measuring 0.9×0.9 cm and 0.2–0.3 cm thick. A fragment of a rod from a copper needle (possibly a pin) was found during stratigraphic inspection. Length 1.3 cm, thickness 0.2 cm. Fragment of a bronze belt plaque, measuring 1.3×0.7 cm, with a thickness of 0.2–0.3 cm. Part of the plaque, as well as the rod, are missing. The external surface of the plaque partially preserves ornamentation. A fragment of a green spherical glass bead was discovered, with a diameter of 0.5 cm, a height of 0.3 cm, and a perforation diameter of 0.2 cm.

The second construction horizon is characterized by a loose loamy layer containing fragments of broken mudbrick, ash, cinder, and decomposed cattail and reed.

During the clearing and deepening throughout the entire Excavation area—in the central, western, northern, and southeastern sections—burials of infants and children up to 9 years of age were discovered, as well as two graves belonging to adult individuals. All children and the adult individual interred in the graves were buried according to the inhumation rite in an extended position. All graves are oriented northwest–southeast. All of the deceased were laid with their heads to the northwest and their feet in the southeastern part of the grave pit. The arms of the infants were extended along the body. The arms of the adult individual were positioned in the pelvic region.

Excavation of the described layer from the west, east, and north sides revealed the upper course of walls constructed of mudbrick blocks measuring $35 \times 30 \times 10$ cm. Within the boundaries of the walls, the outline of a room that was in use during the second and third construction horizons was identified.

Along the eastern part of the Excavation, as well as in the center and west, a Layer of ash and cinder was observed. Subsequently, an ash-ash spot (3) was detected.

Additionally, along the eastern wall, a Sufa made of paksha masonry was revealed.

While clearing the area of the room from the south, adjacent to the collapse of mudbrick, a floor altar from the second upper construction period was exposed in the central and southern part of the room. The Altar was situated on the compacted earthen floor of the room, between the western (20) and northern (12) walls, with its southern rim abutting the masonry of the southern wall (11) of the second construction horizon. The altar was oriented along the north–south axis and constitutes a rectangular platform constructed of grey loam, measuring 2.10×1.20 m, with a height of 10–12 cm.

The rims of the altar are constructed along the sides using mudbrick masonry with well-mixed clay. The dimensions of the western and eastern rims are 155 cm in length, 20–25 cm wide at the base, and 12.5–15 cm wide at the upper part. The rim height is 12 cm. The length of the southern rim is 120 cm, with a width of 10 cm.

It should be noted that the altar underwent repairs and reconstruction at a later period. The edges of the rims are beveled. The upper part of the rim is narrow and oval at the top, gradually widening toward the base, and is separated from the lower section by a protruding rim, evidently formed as a result of altar repairs.

Osteological material encountered in the layer is represented by fragments of small ruminant bones, and fish bones—including scales, a gill cover, and ribs.

Ceramics are represented by fragments of coil-built and wheel-thrown water vessels. Noteworthy is a fragment of a burnished handmade cup—the base, the side, and part of a loop-shaped handle. A clearly incised mark in the form of a triangle is visible on the side. Also found at the site of the floor altar being excavated were archaeologically intact ceramic vessels: a pot with a loop handle and a mug with a loop handle, the latter covered with a red engobe.

During the removal of the loose loamy layer (1), an accumulation of handmade vessels was discovered in the central part of the excavation, arranged adjacent to each other.

In the process of removing the fill layer from the premises of the upper Construction horizon, a fragment of a stone millstone (deirmen) was discovered. Alongside ceramics and animal bones. Among the bones of small ruminants, a bone artifact manufactured from a tubular bone with evidence of drilling was identified. Additionally, during cleaning near the northern wall (23), a gaming asyk—an astragalus—was recovered from the layer adjacent to the northern wall of the premises.

The third Construction horizon is represented by a loose loamy layer containing fragments of mudbrick, ash, cinders, and decayed bulrush and reed. Within the layer, a collapse of loamy blocks from the fallen masonry of the eastern and northern Wall of the room was cleared.

During the excavation of the described layer from the western, eastern, and northern sides, masonry of Walls constructed from Mudbrick blocks measuring 35×30×10 cm was revealed. When cleaning the internal surface of the Walls, a clay plaster coating was discovered on the Walls, overlaid with several layers of plaster. Traces of limewash are visible on some of them. Within the boundaries of the Walls, at a depth of 1.60 m, the limit of a room that functioned during the second and third construction horizons, as well as a compacted Mudbrick floor, was identified.

Attention should be drawn to the excavated wall-adjacent tandoor oven with a Flue and niche, built into the mass of the western wall. The oven has survived to the present day in good condition.

In the central and southern sections of the room, the largest floor Altar—excavated over 18 field seasons and attributed to the third construction period—was exposed. The Altar was situated on the compacted earthen floor of the room, between the western (20) and northern (12) walls, with its southern rim abutting the masonry of the southern wall (11) of the second construction horizon. The Altar is oriented north-south and consists of a rectangular platform constructed from gray loam, measuring 2.20 × 1.40 m and 10–12 cm in height.

The rims of the altar are constructed along the sides using mudbrick masonry with well-mixed clay. The dimensions of the western and eastern rims are 155 cm in length, 25 cm in width at the base, and 15 cm in width at the top. The height of the rim is 13 cm. The length of the southern rim is 120 cm, with a width of 10 cm.

Ceramics are represented by fragments of coil-built and wheel-thrown water vessels. Archaeologically intact ceramic vessels recovered from the site of the excavated floor altar include a pot and a mug, both with loop-shaped handles and covered with red engobe.

Of note is a copper bracelet of female attribution, covered with a green patina, found within the layer.

List of elements

Element 0. Aeolian layer.

Element 1. Loose loamy layer.

Element 2. A human skull in the southeastern corner of the excavation (Late construction phase).

Element 3. Ash-ash spot in the eastern part of the excavation (Late construction phase).

Element 4. Concentration of vessels.

Element 5. Altar of the room.

Element 6. Ash layer, ash, and fired loam in the central part of the Excavation (second construction period).

Element 7. A square-shaped patch of burning near the layer of ash, soot, and burnt loam in the central part of the Excavation.

Element 8. Child Grave by the northern wall of the Excavation.

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Element 10. Grave of an adult individual in the center of the excavation.

- Element 11.** Southern wall.
- Element 12.** Eastern wall.
- Element 13.** Sufa at the eastern wall (second construction horizon).
- Element 14.** Entrance opening between the eastern (12) and northern (23) walls.
- Element 15.** Pit from a post in the southeastern part of the masonry of wall (11) from the late construction period.
- Element 16.** Pit from a post in the southern part on the masonry of wall (11) of the late construction period.
- Element 17.** Collapse of mudbrick blocks from the masonry of wall (12) in the northeastern and eastern parts of the room. Second construction horizon.
- Element 18.** Loamy fill in the northeastern part of the room. Second construction horizon.
- Element 19.** Loamy fill of the premises in the southwestern and western parts of the room. Second construction horizon.
- Element 20.** Western Wall.
- Element 23.** Northern wall of the room (second and third construction horizons).
- Element 24.** Arrangement of bricks along mudbrick wall 23 (late construction phase).
- Element 25.** Child burial on the surface of the western wall (20) (Late construction phase).
- Element 26.** Child burial near the western wall of the excavation (Late construction phase).
- Element 27.** Child burial at the northern wall (23) (Late construction phase).
- Element 28.** Child burial (Late construction phase).
- Element 29.** Collapse of mudbrick blocks near the eastern wall (12).
- Element 30.** Child burial (Late construction phase).
- Element 31.** Layer of clay loam fill and small brick fragments. Intermediate layer between the second and third construction horizons.
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- Element 36.** A patch of loose loam in the layer of loamy infill and fragments of broken mudbrick blocks near the northern wall (23).
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- Element 42.** Sufa adjacent to the western wall (third construction horizon).
- Element 43.** Floor altar of the third construction horizon.
- Element 44.** Niche by the northern wall (23).
- Element 45.** Mudbrick floor of the room. Third construction horizon.

Stratigraphy of the southern part of the Excavation

The planigraphic Excavation at the presumed citadel of the site exhibits an uneven surface. The soil is loose, gray-brown in color, and covered at the top by a dense saline crust. On the western and northern sides, the surface of the Excavation partially slopes

downward toward the east and south, where the fortress Wall was located. Beyond the remains of the fortress Wall lies the territory of the rabat. A noticeable downward slope extends toward the east. On the surface of the Excavation, the contours of the fortress Wall and the adjacent walls of rooms are discernible, appearing as dark bands against the gray soil background. Fragments of hand-molded and wheel-thrown ceramics, fragments of domestic animal bones, and broken fired bricks of green and red hues are also present here.

The stratigraphy of the southern section of the Excavation is represented by three layers (Appendix – Drawing Documentation, Figure 24).

The first layer (aeolian) is composed of loose loamy soil, grey and brown in color, interspersed with fragments of broken mudbrick and blocks. The thickness of the aeolian layer is irregular, varying from 2 to 5 cm. Within the aeolian layer, fragments of small ruminant bones—jaws, ribs, and astragali—are found throughout, as well as small tubular bones, jaws, and ribs, apparently belonging to large cattle. Alongside the osteological material, the layer reveals fragments of handmade and wheel-thrown ceramics, small fragments of glass including both ancient and modern glass, concrete, and domestic refuse. Additionally, quartzite-sandstone chips are unevenly distributed throughout the layer. The aeolian layer is continually degraded due to the effects of atmospheric precipitation and wind. During strong winds, the layer is subject to constant wind erosion. The presence of salt can be observed in the soil, which leads to the formation of a thin brownish-gray salt crust on the surface after rain and the melting of snow in the spring during hot weather.

During the cleaning of the southern side of the aeolian layer, the Wall from the first, late construction horizon was uncovered.

The Wall of the room belonging to the late construction horizon is situated in the southern part of the Excavation and is built along a west-east axis from loamy bricks. To the east, the Wall abutted, with its terminal section, the excavated eastern Wall (12) of the altar room from the second and third construction horizons. To the west, the Wall is joined at its end to the upper masonry of the excavated Wall (20) from the second and third construction horizons, which is laid perpendicular to the excavated Wall located on the western side. The total length of the Wall is 5.50 m, and the Wall's width is 50 cm. The Wall height is 10 cm.

During the clearing of the wall in the southeastern section of its masonry, a pit from a Post (16) was documented, apparently serving as a support or column.

Second construction horizon.

The described stratigraphic layer formed during the period of abandonment of the studied structure, when the majority of inhabitants had left the city and the deserted houses and buildings became distinctive spaces bearing traces of interior remodeling. Many abandoned houses or rooms were used for the accumulation of domestic and construction refuse by the remaining residents or by individuals who returned for temporary habitation after a certain period.

The layer constitutes infill consisting of broken clay mudbrick, loose loam derived from the collapse of architectural structures, decomposed and burnt manure, charcoal, ash, and soot. Numerous bones of camel, cattle, horse, as well as sheep and goat, are present within the layer. The layer being excavated is loose, containing carbonate inclusions, wood ash, and soot of black and gray coloration. Throughout the layer under excavation, fragments of hand-made and wheel-thrown ornamented and unornamented ceramics are prevalent, including fragments of braziers and hand-made mugs decorated with black and reddish engobe and incised ornamentation. Fragments of fired hum-shaped vessels, including wall sections, vessel rims, and lower body parts, are encountered ubiquitously. All handmade vessels are subject to deterioration. A fragment of a ceramic mug with a swollen body and a straight vessel rim is noteworthy.

This represents an infill, overlain by the area of the room associated with the second construction horizon. The southern stratigraphic wall of the Excavation, in the east, corresponds to the eastern wall (12), beneath which is located ,

Third layer.

The stratigraphic layer represents an infill consisting of loose loam derived from the collapse of architectural structures, decomposed and charred reed and bulrush, fragments of charcoal, ash and cinder, and fired mudbrick. The layer contains bones of small ruminants—sheep and goat—as well as cattle and camel. In the excavated loose, cloddy layer, carbonate inclusions, wood ash, and black and grey cinder are observed. The layer contains fragments of hand-made and wheel-thrown, ornamented and unornamented ceramics: fragments of hand-made and wheel-thrown vessels. Vessels are represented by fragments of braziers, as well as fragments of hand-made mugs decorated with a reddish engobe and incised ornaments. Fragments of fired khum-shaped vessels are also present, including wall fragments, vessel rims, and lower parts.

This described layer was formed during the period of habitation within the excavated quarter and corresponds to the second construction horizon.

The eastern Wall (12), with a length of 4.70 m and a width of 60 cm, belongs to the third construction horizon. The Wall's height is 1.40 m. Adjacent to the Wall is a Sufa-bench (41), 6.10 m long and 1 m wide, constructed from mudbrick measuring 32 x 16 x 8 cm.

On the western side of the Wall and the Sufa, a floor Altar (43) is located on the floor of the room, with its southern rim abutting the stratigraphic section. The rim measures 1.40 m in length and 10 cm in width. The Altar is a rectangular platform, 2.30 m long, constructed of grey loam, decorated at the northern edge with an arrangement in the form of a horn.

Appendix – Results of Archaeozoological Analysis of Animal Bone Remains

Introduction

The study of osteological materials from the excavations of the Kessken Kuyuk-kala site (Excavations of 2015 and 2025) is aimed at reconstructing the economic and household organization of the population inhabiting the lower Syrdarya region in the medieval period. The relevance of this research is due to the necessity for a detailed investigation of the structure of animal husbandry: species composition, age characteristics of the herd, and technologies of carcass processing. The site, classified among the group of 'marsh sites,' constitutes an important subject for the analysis of the adaptation of Oghuz pastoral traditions to the conditions of the arid zone and floodplain landscapes.

Materials and Methods

The study was based on a collection of animal bone remains amounting to 1,159 specimens (of which 1,107 are identifiable as domestic animal remains to the species level). The osteological material is predominantly composed of domestic mammals (95.5% NISP), which is characteristic of sedentary and semi-sedentary sites in the Syrdarya region (Dzhetyasar and Oghuz cultures). A comprehensive suite of standard archaeozoological methods was employed in the processing of the osteological material. The species affiliation of the bones was established through taxonomic analysis by comparing the finds with reference collections. Quantitative analysis of the material was conducted using the widely accepted indicators NISP, for evaluating the total number of bones, and MNI, for calculating the minimum number of individuals. A detailed anatomical analysis was conducted to identify the functional zones of the site and to reconstruct traditions of carcass utilization. This method enabled the allocation of bone remains by skeletal regions and the differentiation of locations associated with primary butchering from those linked to direct meat consumption. During the description of the animal bone remains, the manual by A.I. Akaevsky [Akaevsky et al., 2005: 65–120] was utilized. For the assessment of bone preservation, the methodology of N.G. Erokhin and O.P. Bachura [Erokhin, Bachura, 2011: 62–69] was employed. The age composition of the herd was determined on the basis of an analysis of the dental system of the lower jaws. This study is based on the methodologies of Payne and Silver [Payne, 1973: 281–303; Silver, 1970: 286–295], which consider the sequence of eruption and the degree of wear of the molar occlusal surfaces. To differentiate the skeletal elements of goat and sheep (hereinafter: small ruminants), specialized methodological works were employed [Gromova, 1953; Zeder, Pilaar, 2010; Zeder, Lapham, 2010]. The nature of anthropogenic impact on the bones was examined within the framework of taphonomic analysis. This method included the documentation and classification of various butchery marks, such as chopping and cutting, as well as the identification of antemortem pathological alterations in bone tissue. Morphological characteristics and exterior parameters of the animals were determined through osteometric analysis. All biometric measurements of sheep bones were conducted in accordance with the international standards established by von den Driesch [Driesch, 1976].

The present study was based on a specialized archaeozoological database compiled from the processing of osteological material from the Kessken Kuyuk-kala site. The database structure includes primary information regarding taxonomic affiliation, anatomical composition, preservation state of skeletal elements, and metric parameters of each bone unit (Table 17).

During the study, photodocumentation was conducted for the most representative skeletal elements of domestic ungulates. Particular attention during imaging was paid to recording individual animal elements, characteristic modification traces resulting from anthropogenic activity, as well as various pathological changes in bone tissue (Figures 7–25).

Analysis of taxonomic composition and herd structure

According to the consolidated data (Table 1), the structure of animal husbandry demonstrates a pronounced meat and dairy orientation, with a predominance of small ruminants.

Small ruminants. This is the dominant group (73.4% NISP, 60 individuals by MNI). Analysis of Table 3 (2025) shows that within this group, sheep predominate overwhelmingly (432 specimens compared to 2 specimens of goat), which indicates an economic specialization in sheep husbandry, presumably of fat-tailed breeds.

Cattle (Cattle). Cattle occupy the second position (19.6% NISP). The stable proportion of cattle (approximately 20% in both Excavations) indicates the presence of an adequate forage base in the Syrdarya floodplain meadows and relative sedentarism of the population, as cattle are less mobile than sheep.

Horse and camel. Together, they constitute approximately 4.2% NISP. The low percentages of camel (0.8%) and donkey (0.2%) are characteristic of their use for domestic purposes (transport) rather than for meat production.

Domestic carnivores. Noteworthy is the high concentration of cat remains in the 2015 Excavation. (5.6% NISP, 25 bones), which serves as an indicator of a developed urban environment and the necessity of protecting grain reserves from rodents.

Comparison of Tables 2 and 3 reveals the dynamics or spatial specialization of areas within the Site.

2015 Excavation. It is characterized by a higher proportion of cattle (20.1%) and a significant presence of cats. This may indicate a residential or economic sector characterized by a high intensity of life activities.

Excavation of 2025. Demonstrates the absolute predominance of sheep (66.3% NISP). The occurrence of wild animal remains (hare, ground squirrel) and birds is noteworthy, as it may suggest a more diverse diet or indicate the seasonal character of bone accumulation in this area.

Wild species and indeterminate remains

The proportion of wild animals is negligible (less than 0.3%), which underscores the productive nature of the economy. Hunting was of a sporadic or auxiliary nature. The presence of fish remains (14 specimens) confirms the exploitation of Syrdarya resources; however, the small sample size may be due to poor preservation of small bones.

Anatomical composition of skeletal elements

(Tables 4, 5, 6)

Analysis of the distribution of skeletal elements by region (head, axial skeleton, limbs) revealed specific patterns for each animal species. For small ruminants, there is a predominance of elements with a high meat index and bones remaining after primary butchering. Ribs (up to 28%) and vertebrae (8.7%) constitute a substantial proportion of the assemblage. The high proportion of mandibles (up to 10.5% in 2025) and cranial fragments attests to the on-site processing of animal heads. The consistent presence of both proximal (humerus, radius, femur) and distal (metacarpal, metatarsal) skeletal elements indicates that animals were slaughtered and butchered within the Site, rather than being brought in as disarticulated parts. In cattle, a different pattern is observed, indicating selectivity in consumption. An abnormally high percentage (up to 20.5% in the 2025 excavation) accompanies a low proportion of cranial elements (1.1% in 2015). The femur is the most massive and meat-rich part of the carcass. Such concentrations may indicate specialized consumption or butchery zones. In the 2015 excavation, a spike in vertebral finds was recorded (28.9%). An extremely low percentage of phalanges suggests that hooves (secondary butchery products) were discarded outside the areas uncovered by the excavations. The osteological spectrum of Horses differs significantly from that of productive livestock. Teeth constitute up to 41.7% (Excavation 2015) and 31.6% (aggregate data). A high proportion of teeth with an almost complete absence of cranial vaults is a classical indicator of poor preservation of

bone tissue or of pronounced fragmentation of the jaws. In the 2025 Excavation, ribs constitute 57.1% of the remains of Horses. This is a clear marker of kitchen refuse (the consumption of horse meat as food).

Distribution of skeletal regions

The data in Tables 7, 8, and 9 demonstrate three distinct models of bone accumulation, which are dependent on the species of animal and the localization of the excavation. The distribution of skeletal regions for small ruminants (sheep and goats) is the most balanced. The head and trunk together constitute approximately 52–57% (Excavation 2025 – 56.8%). Such a high proportion of the axial skeleton and cranial bones is characteristic of areas associated with direct food consumption and primary butchery. A proportion of distal elements ranging from 5.7 to 13.8% suggests that skins were removed on site, or that animals were brought to the area as whole carcasses. Small ruminants constituted the principal source of the daily meat diet, and were fully processed without the export of large fragments beyond the residential area.

For cattle, there is a marked disproportion in favor of the most fleshy parts. The proximal segments of the limbs (shoulder, thigh) are predominant across all assemblages, reaching 55.1% in the 2025 Excavation. This is 1.7 times higher than that for small ruminants. Excavation 2015. The proportion of cattle heads is minimal—only 3.3%. Cattle were processed at specialized areas (possibly outside residential buildings), after which the most nutritionally valuable limb portions were brought into the residential zone. Excavation 2015. This area represents a zone of exclusive consumption of 'premium' cattle parts.

Horse remains demonstrate an unstable structure, which is attributed to the small sample size and the specific nature of their utilization. An abnormally high proportion of isolated teeth (31.6% in the summary table) indicates substantial destruction of cranial vaults. Horse bones may have been utilized as raw material for bone carving or subjected to more intensive fragmentation. In the 2025 Excavation. The torso predominates (57.1%—primarily ribs), which distinctly signifies kitchen refuse. In this context, the horse serves not only as a transport animal, but also as a regular food source.

Excavation 2015. It is characterized by the maximal proportion of limb sections (up to 58% combined for cattle and horses). This indicates the accumulation of waste from already processed and prepared meat portions.

Excavation 2025. Here, the proportion of head sections is significantly higher (up to 20.1% for small ruminants and 18.1% for cattle). This brings this area closer to a location of primary slaughter or initial carcass butchery.

Age composition of domestic ungulates

Data regarding the state of the dental system (eruption of molars) allow for conclusions to be drawn about the purposes of animal husbandry—whether for meat, milk, or as draught animals.

1. Small ruminants. The age structure of small ruminants (Tables 10, 11, and 12) indicates intensive exploitation of animals for meat production. Juvenile individuals (up to 12 months) comprise more than half of the assemblage (53.3%). The high proportion of slaughter at 3–12 months (38.3%) and up to 3 months (15%) indicates the consumption of tender meat (lamb) and possibly herd size regulation to conserve milk yield. The proportion of adult individuals at 33.3% represents the 'reproductive core' of the herd (ewes and breeding males), which were slaughtered after the end of their reproductive period or upon fulfillment of their economic functions.

In the 2025 excavation. A very high proportion of lambs up to 3 months of age was recorded (22.2%). This may indicate the proximity of the slaughter site to enclosures used for spring lambing, or the occurrence of an epizootic (mortality among juvenile individuals).

2. Cattle (Cattle). The age profile of cattle demonstrates the absence of old animals, which is atypical for draught oxen. 57.1% of individuals were slaughtered at the age of 6–18 months.

This is the 'optimal slaughter age for meat', when the animal has reached sufficient mass, but the meat still retains high organoleptic qualities. Relatively mature individuals (18–28 months) account for 35.7%. The near-complete absence of individuals older than 2.5 years indicates that cattle in these areas were primarily utilized as a meat resource, rather than for ploughing or prolonged milk production.

3. Horses. The age composition of horses differs markedly from that of cattle and small ruminants. There is a complete absence of juvenile individuals. The sample contains no individuals younger than 5 years; 60% are adult horses (5–10 years) and 40% are old (over 10 years). Horses were used exclusively as a labor, transport, or military resource. They were only consumed as food at a mature or advanced age, which confirms the secondary role of horse meat in the diet in comparison to mutton.

Analysis of modification and pathological changes

The data in Table 13 enable reconstruction of the final stage in the osteological material's history—from the animals' in vivo pathologies to the specifics of culinary carcass processing.

Modification changes

The overwhelming majority of recorded modifications are of anthropogenic origin, which confirms the status of the assemblage as 'kitchen refuse.' The absolute predominance of chopped bones (826 specimens) indicates the use of heavy metal implements. This evidence attests to the standardization of carcass butchery practices characteristic of medieval urban sites: bones were split into compact, portion-sized pieces for thermal processing in cauldrons. The small number of fine cut marks suggests that primary butchering (separation of soft tissues from bone with a knife) was rarely practiced. The majority of meat was consumed together with the bone. The presence of traces of dog gnawing confirms the existence of domestic carnivores within the Site and indicates that bone remains were accessible to scavenging animals following the completion of meals. Isolated finds of artifacts and the polishing of fractures indicate the episodic use of bone as raw material for the production of household items.

Pathological alterations

The sample of pathological alterations (12 cases) permits an assessment of the physical loads and maintenance conditions of the livestock population. Deformation and enlargement of the articular surfaces are associated with age-related changes or chronic functional overloads. In cattle, this constitutes an indirect marker of the exploitation of animals as draught power. A specific lesion of the talus, frequently observed in small ruminants and cattle. This pathology is etiologically linked to the keeping of livestock on hard substrates in damp enclosures. The presence of signs of purulent inflammation indicates previous infectious diseases or complications following mechanical injuries, which provides evidence regarding the conditions of animal husbandry. Mechanical damage could have occurred both during grazing on uneven terrain and as a result of anthropogenic influences associated with the management of livestock.

Biometric analysis

The analysis conducted allows the following conclusions: the osteometric parameters of sheep (Tables 14, 15, and 16; Figures 1–6) from the Excavations of 2015 and 2025 demonstrate a high degree of homogeneity. The animals are characterized by medium stature, adapted to the conditions of the arid pastures of the Aral Sea region. The absence of pronounced anomalies in size indicates a stable selection base and continuity of animal husbandry traditions at this site.

Conclusion

Based on the archaeozoological analysis of materials from the Kessken Kuyuk-kala site, it is possible to formulate final conclusions concerning the subsistence practices of the site. The

primary component of the herd was small ruminants, represented predominantly by sheep, whose share accounts for more than 73% of the bone assemblage. Cattle and horses played a supplementary yet stable role in supplying the population with meat, dairy products, and draft power.

The age profile of the herd indicates a pronounced meat-oriented specialization of animal husbandry, as evidenced by the intensive slaughter of juvenile individuals of small ruminants and cattle at the optimal age. Such a structure reflects a prosperous economic condition that enabled the population to consume high-quality meat from young animals. Meanwhile, the status of the Horse at the site was fundamentally different: the complete absence of juvenile individuals and the predominance of adults or older specimens demonstrates that horses were used exclusively as labor and transport resources.

The carcass processing techniques correspond to an urban type of economic activity, as the overwhelming prevalence of cut marks indicates the use of heavy tools for the partitioning of meat. Spatial analysis revealed local differences between the areas: the 2015 Excavation exhibits a consumer profile, characterized by a high proportion of meat-bearing parts of cattle, whereas the 2025 Excavation displays a production-oriented character, with an abundance of skull bones and remains of juvenile individuals from the first months of life.

The final biometric data of the sheep confirm the morphological stability of the flock and the existence of a consolidated group of medium-sized animals with a robust constitution, which were well adapted to the local environmental conditions.

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Tables and diagrams

Species	*NISP	%NISP	**MNI
Domestic animals			
Small ruminants	812	73,4	60
Cattle	217	19,6%	14
Horse	38	3,4%	5
Camel	9	0,8%	3
Donkey	2	0,2%	1
Dog	4	0,4%	1
Cat	25	2,3%	1
Total domestic animals	1107	100,0%	85
Wild animals			
Hare	2	66,7%	1
Ground squirrel	1	33,3%	1
Total wild animals	3	100,0%	1
Bones indeterminable to species			
Mammals	28	Large	18 / 64,3
		Small	10 / 35,7
Bird	6		
Fish	14		
Human	1		
Total bones	1159		
<i>*NISP – Number of Identified Specimens; **MNI – Minimum Number of Individuals</i>			

Table 1. Kessken Kuyuk-kala site. Excavations of 2015 and 2025. Taxonomic composition of animal bone remains

Species	NISP	%NISP	MNI
Domestic animals			
Sheep	298	66,5%	24
Cattle	90	20,1%	10
Horse	24	5,4%	3
Camel	7	1,6%	2
Dog	4	0,9%	1
Cat	25	5,6%	1
Total domestic animals	448	100,0%	41
Bones indeterminable to species			
Mammals	10	Large	1 / 9,1
		Small	10 / 90,9
Fish	8		
Total bones	466		

Table 2. Kessken Kuyuk-kala site. Excavation of 2015. Taxonomic composition of animal bone remains

Species	NISP	%NISP	MNI
Domestic animals			
Small ruminants	73	11,2%	
Sheep	432	66,3%	
Goat	2	0,3%	

Cattle	127	19,5%	
Horse	14	2,1%	
Camel	2	0,3%	
Donkey	2	0,3%	
Total domestic animals	652	100,0%	
Wild animals			
Hare	2	66,7%	1
Ground squirrel	1	33,3%	1
Total wild animals	3	100,0%	1
Bones indeterminable to species			
Mammals	18	Large	9 / 100
		Small	9 / 100
Bird		6	
Fish		6	
Human		1	
Overall total		686	

Table 3. Kessken Kuyuk-kala site. Excavation of 2025. Taxonomic composition of animal bone remains

Skeletal element	Small ruminants		Cattle		Horse	
	abs.	%	abs.	%	abs.	%
Horn	1	0,1%	5	2,3%	0	0,0%
Skull	50	6,2%	10	4,6%	0	0,0%
Hyoid bone	1	0,1%	0	0,0%	0	0,0%
Upper jaw	12	1,5%	4	1,8%	0	0,0%
Lower jaw	75	9,3%	7	3,2%	0	0,0%
Tooth	38	4,7%	2	0,9%	12	31,6%
Atlas	2	0,2%	0	0,0%	1	2,6%
Vertebra	65	8,1%	33	15,2%	0	0,0%
Rib	212	26,3%	26	12,0%	11	28,9%
Scapula	45	5,6%	9	4,1%	1	2,6%
Humerus	48	6,0%	16	7,4%	0	0,0%
Ulna	2	0,2%	4	1,8%	0	0,0%
Radius	52	6,5%	16	7,4%	4	10,5%
Pelvis	34	4,2%	8	3,7%	1	2,6%
Femur	23	2,9%	43	19,8%	3	7,9%
Tibia	52	6,5%	4	1,8%	1	2,6%
Calcaneus	6	0,7%	6	2,8%	0	0,0%
Talus	15	1,9%	4	1,8%	0	0,0%
Carpal	0	0,0%	2	0,9%	0	0,0%
Tarsal	2	0,2%	0	0,0%	0	0,0%
Metacarpal	28	3,5%	5	2,3%	1	2,6%
Metatarsal	38	4,7%	3	1,4%	0	0,0%
Phalanx I	4	0,5%	3	1,4%	1	2,6%
Phalanx II	0	0,0%	4	1,8%	1	2,6%
Phalanx III	0	0,0%	3	1,4%	1	2,6%

Total	805	100,0%	217	100,0%	38	100,0%
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Table 4. Kessken Kuyuk-kala site. Excavations of 2015 and 2025. Quantity and composition of skeletal elements of domestic ungulates

Skeletal element	Cattle		Horse		Sheep	
	abs.	%	abs.	%	abs.	%
Skull	1	1,1%	0	0,0%	10	3,4%
Upper jaw	1	1,1%	0	0,0%	5	1,7%
Lower jaw	1	1,1%	0	0,0%	22	7,4%
Tooth	0	0,0%	10	41,7%	12	4,0%
Atlas	0	0,0%	1	4,2%	2	0,7%
Vertebra	26	28,9%	0	0,0%	21	7,0%
Rib	9	10,0%	3	12,5%	70	23,5%
Scapula	5	5,6%	1	4,2%	19	6,4%
Humerus	6	6,7%	0	0,0%	23	7,7%
Ulna	0	0,0%	0	0,0%	1	0,3%
Radius	3	3,3%	2	8,3%	21	7,0%
Pelvis	0	0,0%	1	4,2%	15	5,0%
Femur	17	18,9%	3	12,5%	9	3,0%
Tibia	2	2,2%	0	0,0%	21	7,0%
Calcaneus	5	5,6%	0	0,0%	3	1,0%
Talus	2	2,2%	0	0,0%	3	1,0%
Carpal	2	2,2%	0	0,0%	0	0,0%
Metacarpal	1	1,1%	0	0,0%	18	6,0%
Metatarsal	3	3,3%	0	0,0%	22	7,4%
Phalanx I	2	2,2%	1	4,2%	1	0,3%
Phalanx II	4	4,4%	1	4,2%	0	0,0%
Phalanx III	0	0,0%	1	4,2%	0	0,0%
Total	90	100,0%	24	100,0%	298	100,0%

Table 5. Kessken Kuyuk-kala site. Excavation of 2015. Quantity and composition of skeletal elements of domestic ungulates

Skeletal elements	Small ruminants		Cattle		Horse	
	abs.	%	abs.	%	abs.	%
Horn	1	0,2%	5	3,9%	0	0,0%
Skull	40	7,9%	9	7,1%	0	0,0%
Hyoid bone	1	0,2%	0	0,0%	0	0,0%
Upper jaw	7	1,4%	3	2,4%	0	0,0%
Lower jaw	53	10,5%	6	4,7%	0	0,0%
Tooth	26	5,1%	2	1,6%	2	14,3%
Vertebra	44	8,7%	7	5,5%	0	0,0%
Rib	142	28,0%	17	13,4%	8	57,1%
Scapula	26	5,1%	4	3,1%	0	0,0%
Humerus	25	4,9%	10	7,9%	0	0,0%
Ulna	1	0,2%	4	3,1%	0	0,0%
Radius	31	6,1%	13	10,2%	2	14,3%

Pelvis	19	3,7%	8	6,3%	0	0,0%
Femur	14	2,8%	26	20,5%	0	0,0%
Tibia	31	6,1%	2	1,6%	1	7,1%
Calcaneus	3	0,6%	1	0,8%	0	0,0%
Talus	12	2,4%	2	1,6%	0	0,0%
Tarsal	2	0,4%	0	0,0%	0	0,0%
Metacarpal	10	2,0%	4	3,1%	1	7,1%
Metatarsal	16	3,2%	0	0,0%	0	0,0%
Phalanx I	3	0,6%	1	0,8%	0	0,0%
Phalanx III	0	0,0%	3	2,4%	0	0,0%
Total	507	100,0%	127	100,0%	14	100,0%

Table 6. Kessken Kuyuk-kala site. Excavation of 2025. Quantity and composition of skeletal elements of domestic ungulates

Skeletal regions	Small ruminants		Cattle		Horse	
	Abdome n	%	Abdome n	%	Abdome n	%
Head	139	17,3%	26	12,0%	0	0,0%
Isolated teeth	38	4,7%	2	0,9%	12	31,6%
Trunk	279	34,7%	59	27,2%	12	31,6%
Proximal section of the limbs	277	34,4%	110	50,7%	10	26,3%
Distal section of the limbs	72	8,9%	20	9,2%	4	10,5%
Total bones (specimens / %)	805	100,0%	217	100,0%	38	100,0%

Table 7. Kessken Kuyuk-kala site. Excavations of 2015 and 2025. Proportions of skeletal sections of domestic ungulates

Skeletal regions	Small ruminants		Cattle		Horse	
	Abdome n	%	Abdome n	%	Abdome n	%
Head	37	12,4%	3	3,3%	0	0,0%
Isolated teeth	12	4,0%	0	0,0%	0	0,0%
Trunk	93	31,2%	35	38,9%	4	28,6%
Proximal section of the limbs	115	38,6%	40	44,4%	7	50,0%
Distal section of the limbs	41	13,8%	12	13,3%	3	21,4%
Total bones (specimens / %)	298	100,0%	90	100,0%	14	100,0%

Table 8. Kessken Kuyuk-kala site. Excavation of 2015. Proportions of skeletal sections of domestic ungulates

Skeletal regions	Small ruminants		Cattle		Horse	
	Abdome n	%	Abdome n	%	Abdome n	%
Head	102	20,1%	23	18,1%	0	0,0%

Isolated teeth	26	5,1%	2	1,6%	2	14,3%
Trunk	186	36,7%	24	18,9%	8	57,1%
Proximal section of the limbs	164	32,3%	70	55,1%	3	21,4%
Distal section of the limbs	29	5,7%	8	6,3%	1	7,1%
Total bones (specimens / %)	507	100,0%	127	100,0%	14	100,0%

Table 9. Kessken Kuyuk-kala site. Excavation of 2025. Proportions of skeletal sections of domestic ungulates

Condition of the dental system of the mandible	Age	Abs.	%
	<i>Small ruminants</i>		
m3 present	Older than 24 months	10	41,7%
m2 present, m3 absent	12–24 months	3	12,5%
m1 present, m2 absent	3–12 months	10	41,7%
m1 absent	Up to 3 months	1	4,2%
Total individuals		24	100%
<i>Cattle</i>			
m2 present, m3 absent	18–28 months	3	30,0%
m1 present, m2 absent	6–18 months	7	70,0%
Total individuals		10	100%
<i>Horse</i>			
Aged individuals	Over 10 years	1	33,3%
Adult individuals	5–10 years	2	66,7%
Total individuals		3	100%

Table 10. Kessken Kuyuk-kala site. Excavation of 2015. Age composition of domestic ungulates.

Condition of the dental system of the mandible	Age	Abs.	%
	<i>Small ruminants</i>		
m3 present	Older than 24 months	10	27,8%
m2 present, m3 absent	12–24 months	5	13,9%
m1 present, m2 absent	3–12 months	13	36,1%
m1 absent	Up to 3 months	8	22,2%
Total individuals		36	100%
<i>Cattle</i>			
m2 present, m3 absent	18–28 months	2	50,0%
m1 present, m2 absent	6–18 months	1	25,0%
m1 absent	Up to 6 months	1	25,0%
Total individuals		4	100%
<i>Horse</i>			
Aged individuals	Over 10 years	1	50,0%
Adult individuals	5–10 years	1	50,0%
Total individuals		2	100%

Table 11. Kessken Kuyuk-kala site. Excavation of 2025. Age composition of domestic ungulates.

	Age	Abs.	%
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Condition of the dental system of the mandible	Small ruminants		
m3 present	Older than 24 months	20	33,3%
m2 present, m3 absent	12–24 months	8	13,3%
m1 present, m2 absent	3–12 months	23	38,3%
m1 absent	Up to 3 months	9	15,0%
Total individuals		60	100%
<i>Cattle</i>			
m2 present, m3 absent	18–28 months	5	35,71%
m1 present, m2 absent	6–18 months	8	57,14%
m1 absent	Up to 6 months	1	7,14%
Total individuals		14	100%
<i>Horse</i>			
Aged individuals	Over 10 years	2	40,0%
Adult individuals	5–10 years	3	60,0%
Total individuals		5	100%

Table 12. Kessken Kuyuk-kala site. Excavations of 2015 and 2025. Age composition of domestic ungulates.

Modification changes	Abs.	%
Burned	2	0,2%
Cut mark	19	2,1%
Chop mark	826	93,4%
Manufactured object	3	0,3%
Polishing of fracture surfaces	5	0,6%
Canine gnawing	27	3,1%
Effects of soil acids	2	0,2%
Total	884	100,0%
Pathological changes	Abs.	%
Joint expansion (lipping)	3	25,0%
<i>Laesio circumscripta tali</i>	4	33,3%
Indicators of purulent inflammation	1	8,3%
Bone tissue damage	4	33,3%
Total	12	100,0%

Table 13. Kessken Kuyuk-kala site. Excavations of 2015 and 2025. Correlation of modification and pathological changes

Taxon	№	Bones	BG	LG	Glp
Oves aries	133/64	scapula	24,6	30,8	39,7
Oves aries	133/52	scapula	23,2	29,2	36,4
Oves aries	133/65	scapula	24,6	32,4	40,2
Oves aries	133/101	scapula	21,4	29,4	36,8
Oves aries	133/85	scapula	24,7	28,6	34,3
Oves aries	133/34	scapula	25,9	33,2	40,7
Oves aries	133/33	scapula	22,4	29,2	37,6

Table 14. Kessken Kuyuk-kala site. Excavations of 2015 and 2025. Biometric data of sheep scapulae

Taxon	№	Bones	Bp	SD	Bd	GL
Oves aries	133/44	metatarsus	20,8	12,6	26,1	134,6
Oves aries	133/8	metatarsus	23,1	13,2	26,9	140,2
Oves aries	133/120	metatarsus	23,2	13,6	-	-
Oves aries	133/61	metatarsus	20,4	11,9	-	-
Oves aries	133/60	metatarsus	21,4	13,4	-	-
Oves aries	133/88	metatarsus	23,2	-	-	-
Oves aries	133/89	metacarpus	25,6	15,2	-	-

Table 15. Kessken Kuyuk-kala site. Excavations of 2015 and 2025. Biometric data of sheep metatarsal bones

Taxon	№	Bones	Dm	Di	GLm	Gli	Bd	Sag
Oves aries	133/73	Talus	17,8	17,4	30,4	31,2	18,6	25,2
Oves aries	133/14	Talus	19,7	18,1	32,4	33,2	21,2	27,8
Oves aries	133/74	Talus	16,5	17,9	29,2	30,8	20,8	24,7
Oves aries	133/7	Talus	19,2	18,7	31,1	32,4	21,2	26,2
Oves aries	133/62	Talus	18,6	17,2	30,2	31,4	20,2	25,2
Oves aries	133/114	Talus	19,3	18,2	30,1	30,5	21,2	25,4
Oves aries	133/75	Talus	18,2	17,1	29,2	29,8	20,1	24,1
Oves aries	133/49	Talus	17,4	17,9	30,1	31,2	20,1	24,8
Oves aries	133/48	Talus	17,6	16,2	27,8	28,1	19,2	23,1
Oves aries	133/115	Talus	19,4	17,5	29,6	31,7	22,3	24,2

Table 16. Kessken Kuyuk-kala site. Excavations of 2015 and 2025. Biometric data of sheep astragali

Site	Year	Species	Bone	Pres.	Spec.
Kessken Kuyuk-kala	2015	Sheep	Upper jaw	3	1
Kessken Kuyuk-kala	2015	Sheep	Upper jaw	3	1
Kessken Kuyuk-kala	2015	Sheep	Lower jaw	12304	1
Kessken Kuyuk-kala	2015	Sheep	Skull	034	4
Kessken Kuyuk-kala	2015	Sheep	Tooth	05	1
Kessken Kuyuk-kala	2015	Sheep	Tooth	05	2
Kessken Kuyuk-kala	2015	Sheep	Tooth	05	3
Kessken Kuyuk-kala	2015	Sheep	Tooth	05	1
Kessken Kuyuk-kala	2015	Sheep	Skull	05	5
Kessken Kuyuk-kala	2015	Sheep	Rib	123	2
Kessken Kuyuk-kala	2015	Sheep	Rib	1234	9
Kessken Kuyuk-kala	2015	Sheep	Rib	23	11
Kessken Kuyuk-kala	2015	Sheep	Rib	102	2
Kessken Kuyuk-kala	2015	Sheep	Rib	023	2
Kessken Kuyuk-kala	2015	Sheep	Rib	034	2
Kessken Kuyuk-kala	2015	Sheep	Vertebra	3024	3
Kessken Kuyuk-kala	2015	Sheep	Scapula	023	2

Kessken Kuyuk-kala	2015	Sheep	Vertebra	04	3
Kessken Kuyuk-kala	2015	Sheep	Humerus	02	1
Kessken Kuyuk-kala	2015	Sheep	Humerus	2345	1
Kessken Kuyuk-kala	2015	Sheep	Radius	0234	4
Kessken Kuyuk-kala	2015	Sheep	Radius	345	1
Kessken Kuyuk-kala	2015	Sheep	Radius	234501	2
Kessken Kuyuk-kala	2015	Sheep	Femur	2301	1
Kessken Kuyuk-kala	2015	Sheep	Pelvis	03	1
Kessken Kuyuk-kala	2015	Sheep	Femur	2301	1
Kessken Kuyuk-kala	2015	Sheep	Tibia	2034	1
Kessken Kuyuk-kala	2015	Sheep	Tibia	23405	1
Kessken Kuyuk-kala	2015	Sheep	Tibia	345	3
Kessken Kuyuk-kala	2015	Sheep	Tibia	45	1
Kessken Kuyuk-kala	2015	Sheep	Metatarsal	12304	2
Kessken Kuyuk-kala	2015	Sheep	Metatarsal	01234	2
Kessken Kuyuk-kala	2015	Sheep	Metacarpal	12304	2
Kessken Kuyuk-kala	2015	Sheep	Metatarsal	03	11
Kessken Kuyuk-kala	2015	Sheep	Calcaneus	12345	1
Kessken Kuyuk-kala	2015	Sheep	Phalanx I	12345	1
Kessken Kuyuk-kala	2015	Sheep	Humerus	23405	1
Kessken Kuyuk-kala	2015	Cattle	Scapula	0234	1
Kessken Kuyuk-kala	2015	Cattle	Vertebra	034	6
Kessken Kuyuk-kala	2015	Cattle	Rib	02	1
Kessken Kuyuk-kala	2015	Cattle	Femur	02	3
Kessken Kuyuk-kala	2015	Cattle	Humerus	23045	1
Kessken Kuyuk-kala	2015	Cattle	Radius	05	1
Kessken Kuyuk-kala	2015	Cattle	Radius	23405	1
Kessken Kuyuk-kala	2015	Cattle	Carpal	12345	1
Kessken Kuyuk-kala	2015	Cattle	Talus	012345	1
Kessken Kuyuk-kala	2015	Cattle	Metacarpal	02345	1
Kessken Kuyuk-kala	2015	Cattle	Phalanx II	12345	1
Kessken Kuyuk-kala	2015	Horse	Tooth	05	7
Kessken Kuyuk-kala	2015	Horse	Tooth	05	1
Kessken Kuyuk-kala	2015	Fish	Operculum	05	1
Kessken Kuyuk-kala	2015	Fish	Vertebra	05	1
Kessken Kuyuk-kala	2015	Fish	Operculum	1245	1
Kessken Kuyuk-kala	2015	Fish	Vertebra	234	1
Kessken Kuyuk-kala	2015	Sheep	Upper jaw	03	1
Kessken Kuyuk-kala	2015	Sheep	Upper jaw	3	1
Kessken Kuyuk-kala	2015	Sheep	Upper jaw	3	1
Kessken Kuyuk-kala	2015	Sheep	Lower jaw	12304	1
Kessken Kuyuk-kala	2015	Sheep	Lower jaw	1203	1
Kessken Kuyuk-kala	2015	Sheep	Lower jaw	012	2

Kessken Kuyuk-kala	2015	Sheep	Tooth	05	1
Kessken Kuyuk-kala	2015	Sheep	Scapula	12034	3
Kessken Kuyuk-kala	2015	Sheep	Rib	123	5
Kessken Kuyuk-kala	2015	Sheep	Rib	234	10
Kessken Kuyuk-kala	2015	Sheep	Vertebra	23	6
Kessken Kuyuk-kala	2015	Sheep	Vertebra	1234	2
Kessken Kuyuk-kala	2015	Sheep	Vertebra	023	1
Kessken Kuyuk-kala	2015	Sheep	Rib	02	2
Kessken Kuyuk-kala	2015	Sheep	Pelvis	023	2
Kessken Kuyuk-kala	2015	Sheep	Humerus	45	2
Kessken Kuyuk-kala	2015	Sheep	Humerus	2345	1
Kessken Kuyuk-kala	2015	Sheep	Humerus	3405	1
Kessken Kuyuk-kala	2015	Sheep	Humerus	34021	1
Kessken Kuyuk-kala	2015	Sheep	Humerus	405	1
Kessken Kuyuk-kala	2015	Sheep	Humerus	3	1
Kessken Kuyuk-kala	2015	Sheep	Radius	23401	2
Kessken Kuyuk-kala	2015	Sheep	Radius	234	1
Kessken Kuyuk-kala	2015	Sheep	Radius	12	2
Kessken Kuyuk-kala	2015	Sheep	Femur	0234	4
Kessken Kuyuk-kala	2015	Sheep	Pelvis	023	3
Kessken Kuyuk-kala	2015	Sheep	Tibia	234	3
Kessken Kuyuk-kala	2015	Sheep	Metacarpal	12304	2
Kessken Kuyuk-kala	2015	Sheep	Calcaneus	12345	1
Kessken Kuyuk-kala	2015	Cattle	Rib	234	5
Kessken Kuyuk-kala	2015	Cattle	Tibia	01	1
Kessken Kuyuk-kala	2015	Cattle	Phalanx II	12345	1
Kessken Kuyuk-kala	2015	Horse	Phalanx II	12345	1
Kessken Kuyuk-kala	2015	Dog	Lower jaw	45	1
Kessken Kuyuk-kala	2015	Mammals	Indeterminate	05	10
Kessken Kuyuk-kala	2015	Sheep	Skull	03	2
Kessken Kuyuk-kala	2015	Sheep	Atlas	12345	1
Kessken Kuyuk-kala	2015	Sheep	Lower jaw	03	1
Kessken Kuyuk-kala	2015	Sheep	Lower jaw	12304	1
Kessken Kuyuk-kala	2015	Sheep	Lower jaw	12304	1
Kessken Kuyuk-kala	2015	Sheep	Lower jaw	12304	1
Kessken Kuyuk-kala	2015	Sheep	Scapula	123	3
Kessken Kuyuk-kala	2015	Sheep	Scapula	1023	2
Kessken Kuyuk-kala	2015	Sheep	Humerus	2013	1
Kessken Kuyuk-kala	2015	Sheep	Humerus	345	3
Kessken Kuyuk-kala	2015	Sheep	Humerus	03	1
Kessken Kuyuk-kala	2015	Sheep	Radius	4035	2
Kessken Kuyuk-kala	2015	Sheep	Vertebra	03	1
Kessken Kuyuk-kala	2015	Sheep	Rib	123	6

Kessken Kuyuk-kala	2015	Sheep	Pelvis	123	1
Kessken Kuyuk-kala	2015	Sheep	Tibia	2301	1
Kessken Kuyuk-kala	2015	Sheep	Metacarpal	2345	2
Kessken Kuyuk-kala	2015	Sheep	Metacarpal	234501	1
Kessken Kuyuk-kala	2015	Sheep	Metatarsal	2345	1
Kessken Kuyuk-kala	2015	Sheep	Tibia	2345	1
Kessken Kuyuk-kala	2015	Cattle	Rib	02	1
Kessken Kuyuk-kala	2015	Cattle	Vertebra	1203	1
Kessken Kuyuk-kala	2015	Cattle	Vertebra	1203	2
Kessken Kuyuk-kala	2015	Cattle	Vertebra	023	2
Kessken Kuyuk-kala	2015	Cattle	Femur	01	1
Kessken Kuyuk-kala	2015	Cattle	Femur	013	2
Kessken Kuyuk-kala	2015	Cattle	Tibia	504	1
Kessken Kuyuk-kala	2015	Cattle	Calcaneus	12345	1
Kessken Kuyuk-kala	2015	Cattle	Calcaneus	234501	1
Kessken Kuyuk-kala	2015	Cattle	Metatarsal	1023	1
Kessken Kuyuk-kala	2015	Horse	Tooth	5	2
Kessken Kuyuk-kala	2015	Horse	Rib	1203	2
Kessken Kuyuk-kala	2015	Horse	Scapula	03	1
Kessken Kuyuk-kala	2015	Horse	Femur	05	3
Kessken Kuyuk-kala	2015	Dog	Vertebra	12345	1
Kessken Kuyuk-kala	2015	Dog	Radius	12345	1
Kessken Kuyuk-kala	2015	Dog	Metapodium	12345	1
Kessken Kuyuk-kala	2015	Sheep	Skull	05	2
Kessken Kuyuk-kala	2015	Sheep	Upper jaw	23	2
Kessken Kuyuk-kala	2015	Sheep	Lower jaw	12345	1
Kessken Kuyuk-kala	2015	Sheep	Lower jaw	12345	1
Kessken Kuyuk-kala	2015	Sheep	Lower jaw	12345	1
Kessken Kuyuk-kala	2015	Sheep	Tooth	05	1
Kessken Kuyuk-kala	2015	Sheep	Tooth	05	1
Kessken Kuyuk-kala	2015	Sheep	Rib	1234	5
Kessken Kuyuk-kala	2015	Sheep	Vertebra	03	1
Kessken Kuyuk-kala	2015	Sheep	Vertebra	3012	1
Kessken Kuyuk-kala	2015	Sheep	Humerus	2345	1
Kessken Kuyuk-kala	2015	Sheep	Metatarsal	2304	1
Kessken Kuyuk-kala	2015	Sheep	Metacarpal	1234	1
Kessken Kuyuk-kala	2015	Sheep	Calcaneus	4503	1
Kessken Kuyuk-kala	2015	Cattle	Phalanx II	12345	1
Kessken Kuyuk-kala	2015	Fish	Lower jaw	05	1
Kessken Kuyuk-kala	2015	Fish	Vertebra	05	1
Kessken Kuyuk-kala	2015	Sheep	Tooth	05	1
Kessken Kuyuk-kala	2015	Sheep	Rib	1203	2
Kessken Kuyuk-kala	2015	Sheep	Radius	023	1

Kessken Kuyuk-kala	2015	Sheep	Atlas	03	1
Kessken Kuyuk-kala	2015	Sheep	Humerus	02	1
Kessken Kuyuk-kala	2015	Cattle	Femur	05	1
Kessken Kuyuk-kala	2015	Fish	Operculum	05	2
Kessken Kuyuk-kala	2015	Sheep	Scapula	045	1
Kessken Kuyuk-kala	2015	Sheep	Rib	1234	1
Kessken Kuyuk-kala	2015	Sheep	Humerus	234	1
Kessken Kuyuk-kala	2015	Sheep	Tibia	2345	1
Kessken Kuyuk-kala	2015	Sheep	Radius	023	1
Kessken Kuyuk-kala	2015	Sheep	Lower jaw	102	1
Kessken Kuyuk-kala	2015	Sheep	Vertebra	03	1
Kessken Kuyuk-kala	2015	Sheep	Vertebra	123	1
Kessken Kuyuk-kala	2015	Sheep	Pelvis	203	2
Kessken Kuyuk-kala	2015	Sheep	Humerus	2301	1
Kessken Kuyuk-kala	2015	Sheep	Radius	23	1
Kessken Kuyuk-kala	2015	Sheep	Tibia	45	1
Kessken Kuyuk-kala	2015	Sheep	Tibia	345	1
Kessken Kuyuk-kala	2015	Sheep	Talus	12345	1
Kessken Kuyuk-kala	2015	Sheep	Talus	12345	1
Kessken Kuyuk-kala	2015	Sheep	Metacarpal	05	4
Kessken Kuyuk-kala	2015	Cattle	Carpal	12345	1
Kessken Kuyuk-kala	2015	Cattle	Femur	02	1
Kessken Kuyuk-kala	2015	Cattle	Femur	023	1
Kessken Kuyuk-kala	2015	Sheep	Rib	123	4
Kessken Kuyuk-kala	2015	Sheep	Vertebra	03	1
Kessken Kuyuk-kala	2015	Sheep	Femur	01	2
Kessken Kuyuk-kala	2015	Sheep	Humerus	201	1
Kessken Kuyuk-kala	2015	Sheep	Tibia	01	1
Kessken Kuyuk-kala	2015	Sheep	Radius	234	1
Kessken Kuyuk-kala	2015	Sheep	Talus	12345	1
Kessken Kuyuk-kala	2015	Sheep	Lower jaw	1203	1
Kessken Kuyuk-kala	2015	Sheep	Lower jaw	1203	1
Kessken Kuyuk-kala	2015	Sheep	Scapula	023	3
Kessken Kuyuk-kala	2015	Sheep	Rib	1234	2
Kessken Kuyuk-kala	2015	Sheep	Rib	234	1
Kessken Kuyuk-kala	2015	Sheep	Humerus	23	2
Kessken Kuyuk-kala	2015	Sheep	Radius	123405	1
Kessken Kuyuk-kala	2015	Sheep	Pelvis	123	1
Kessken Kuyuk-kala	2015	Sheep	Tibia	3405	1
Kessken Kuyuk-kala	2015	Sheep	Tibia	2345	1
Kessken Kuyuk-kala	2015	Sheep	Metacarpal	12345	1
Kessken Kuyuk-kala	2015	Cattle	Vertebra	05	5
Kessken Kuyuk-kala	2015	Cattle	Vertebra	04	1

Kessken Kuyuk-kala	2015	Cattle	Rib	2304	1
Kessken Kuyuk-kala	2015	Cattle	Humerus	01	1
Kessken Kuyuk-kala	2015	Cattle	Femur	102	1
Kessken Kuyuk-kala	2015	Cattle	Phalanx I	12345	1
Kessken Kuyuk-kala	2015	Horse	Atlas	034	1
Kessken Kuyuk-kala	2015	Horse	Rib	1234	1
Kessken Kuyuk-kala	2015	Horse	Radius	023	1
Kessken Kuyuk-kala	2015	Horse	Phalanx I	12345	1
Kessken Kuyuk-kala	2015	Sheep	Lower jaw	403	1
Kessken Kuyuk-kala	2015	Sheep	Scapula	203	1
Kessken Kuyuk-kala	2015	Sheep	Scapula	1203	1
Kessken Kuyuk-kala	2015	Sheep	Rib	203	3
Kessken Kuyuk-kala	2015	Sheep	Radius	234	1
Kessken Kuyuk-kala	2015	Sheep	Radius	102	1
Kessken Kuyuk-kala	2015	Sheep	Ulna	201	1
Kessken Kuyuk-kala	2015	Sheep	Pelvis	1023	2
Kessken Kuyuk-kala	2015	Sheep	Pelvis	123	1
Kessken Kuyuk-kala	2015	Sheep	Femur	201	1
Kessken Kuyuk-kala	2015	Sheep	Tibia	23405	1
Kessken Kuyuk-kala	2015	Sheep	Tibia	23405	1
Kessken Kuyuk-kala	2015	Sheep	Tibia	345	1
Kessken Kuyuk-kala	2015	Sheep	Metatarsal	10234	2
Kessken Kuyuk-kala	2015	Sheep	Metatarsal	01	1
Kessken Kuyuk-kala	2015	Sheep	Metatarsal	12345	1
Kessken Kuyuk-kala	2015	Cattle	Lower jaw	023	1
Kessken Kuyuk-kala	2015	Cattle	Skull	02	1
Kessken Kuyuk-kala	2015	Cattle	Vertebra	01223	1
Kessken Kuyuk-kala	2015	Cattle	Vertebra	023	4
Kessken Kuyuk-kala	2015	Cattle	Scapula	023	1
Kessken Kuyuk-kala	2015	Cattle	Rib	0234	1
Kessken Kuyuk-kala	2015	Cattle	Radius	012	1
Kessken Kuyuk-kala	2015	Cattle	Femur	023	4
Kessken Kuyuk-kala	2015	Cattle	Humerus	504	2
Kessken Kuyuk-kala	2015	Cattle	Talus	12345	1
Kessken Kuyuk-kala	2015	Cattle	Phalanx II	12345	1
Kessken Kuyuk-kala	2015	Horse	Radius	023	1
Kessken Kuyuk-kala	2015	Horse	Phalanx III	12345	1
Kessken Kuyuk-kala	2015	Camel	Humerus	102	1
Kessken Kuyuk-kala	2015	Camel	Radius	12	1
Kessken Kuyuk-kala	2015	Camel	Rib	234	2
Kessken Kuyuk-kala	2015	Camel	Humerus	45	1
Kessken Kuyuk-kala	2015	Sheep	Skull	04	1
Kessken Kuyuk-kala	2015	Sheep	Lower jaw	12034	1

Kessken Kuyuk-kala	2015	Sheep	Lower jaw	1203	1
Kessken Kuyuk-kala	2015	Sheep	Lower jaw	123	1
Kessken Kuyuk-kala	2015	Sheep	Lower jaw	45023	1
Kessken Kuyuk-kala	2015	Sheep	Lower jaw	23	1
Kessken Kuyuk-kala	2015	Sheep	Lower jaw	302	1
Kessken Kuyuk-kala	2015	Sheep	Lower jaw	045	1
Kessken Kuyuk-kala	2015	Sheep	Tooth	05	1
Kessken Kuyuk-kala	2015	Sheep	Scapula	2301	3
Kessken Kuyuk-kala	2015	Sheep	Rib	123	1
Kessken Kuyuk-kala	2015	Sheep	Pelvis	03	1
Kessken Kuyuk-kala	2015	Sheep	Pelvis	12345	1
Kessken Kuyuk-kala	2015	Sheep	Humerus	012	1
Kessken Kuyuk-kala	2015	Sheep	Tibia	23405	1
Kessken Kuyuk-kala	2015	Sheep	Metacarpal	023	2
Kessken Kuyuk-kala	2015	Sheep	Metacarpal	1234	1
Kessken Kuyuk-kala	2015	Sheep	Metacarpal	504	1
Kessken Kuyuk-kala	2015	Sheep	Metacarpal	2345	1
Kessken Kuyuk-kala	2015	Sheep	Metatarsal	2345	1
Kessken Kuyuk-kala	2015	Cattle	Upper jaw	03	1
Kessken Kuyuk-kala	2015	Cattle	Vertebra	023	4
Kessken Kuyuk-kala	2015	Cattle	Scapula	023	3
Kessken Kuyuk-kala	2015	Cattle	Humerus	021	1
Kessken Kuyuk-kala	2015	Cattle	Humerus	01	1
Kessken Kuyuk-kala	2015	Cattle	Femur	01	3
Kessken Kuyuk-kala	2015	Cattle	Metatarsal	0123	1
Kessken Kuyuk-kala	2015	Cattle	Metatarsal	1203	1
Kessken Kuyuk-kala	2015	Cattle	Calcaneus	12345	1
Kessken Kuyuk-kala	2015	Cattle	Calcaneus	12345	1
Kessken Kuyuk-kala	2015	Cattle	Calcaneus	2345	1
Kessken Kuyuk-kala	2015	Cattle	Phalanx I	12345	1
Kessken Kuyuk-kala	2015	Horse	Pelvis	03	1
Kessken Kuyuk-kala	2015	Camel	Radius	12	1
Kessken Kuyuk-kala	2015	Camel	Rib	012	1
Kessken Kuyuk-kala	2015	Cat	Scapula	12345	2
Kessken Kuyuk-kala	2015	Cat	Vertebra	12345	4
Kessken Kuyuk-kala	2015	Cat	Rib	12345	5
Kessken Kuyuk-kala	2015	Cat	Humerus	12345	2
Kessken Kuyuk-kala	2015	Cat	Radius	12345	2
Kessken Kuyuk-kala	2015	Cat	Ulna	12345	2
Kessken Kuyuk-kala	2015	Cat	Pelvis	12345	2
Kessken Kuyuk-kala	2015	Cat	Femur	12345	2
Kessken Kuyuk-kala	2015	Cat	Tibia	12345	2
Kessken Kuyuk-kala	2015	Cat	Metacarpal	12345	2

Kessken Kuyuk-kala	2025	Small ruminants	Upper jaw	023	1
Kessken Kuyuk-kala	2025	Small ruminants	Lower jaw	123	1
Kessken Kuyuk-kala	2025	Small ruminants	Lower jaw	012	1
Kessken Kuyuk-kala	2025	Small ruminants	Tooth	05	1
Kessken Kuyuk-kala	2025	Small ruminants	Tooth	05	1
Kessken Kuyuk-kala	2025	Small ruminants	Scapula	23	1
Kessken Kuyuk-kala	2025	Small ruminants	Vertebra	023	3
Kessken Kuyuk-kala	2025	Small ruminants	Rib	1234	4
Kessken Kuyuk-kala	2025	Small ruminants	Rib	0234	12
Kessken Kuyuk-kala	2025	Small ruminants	Humerus	0234	4
Kessken Kuyuk-kala	2025	Small ruminants	Radius	023	6
Kessken Kuyuk-kala	2025	Small ruminants	Hyoid bone	123	1
Kessken Kuyuk-kala	2025	Small ruminants	Radius	023	2
Kessken Kuyuk-kala	2025	Small ruminants	Radius	234	1
Kessken Kuyuk-kala	2025	Small ruminants	Radius	1234	1
Kessken Kuyuk-kala	2025	Small ruminants	Radius	12304	1
Kessken Kuyuk-kala	2025	Small ruminants	Pelvis	023	2
Kessken Kuyuk-kala	2025	Small ruminants	Tibia	45	1
Kessken Kuyuk-kala	2025	Small ruminants	Tibia	345	1
Kessken Kuyuk-kala	2025	Small ruminants	Tibia	02	1
Kessken Kuyuk-kala	2025	Small ruminants	Talus	12345	1
Kessken Kuyuk-kala	2025	Small ruminants	Metatarsal	12345	1
Kessken Kuyuk-kala	2025	Small ruminants	Pelvis	12345	1
Kessken Kuyuk-kala	2025	Cattle	Femur	02	2
Kessken Kuyuk-kala	2025	Cattle	Tibia	45	1
Kessken Kuyuk-kala	2025	Cattle	Phalanx III	12345	1
Kessken Kuyuk-kala	2025	Small ruminants	Lower jaw	123	1
Kessken Kuyuk-kala	2025	Small ruminants	Lower jaw	45	1
Kessken Kuyuk-kala	2025	Small ruminants	Vertebra	234	5
Kessken Kuyuk-kala	2025	Small ruminants	Rib	0234	14
Kessken Kuyuk-kala	2025	Small ruminants	Humerus	234501	1
Kessken Kuyuk-kala	2025	Small ruminants	Talus	12345	1
Kessken Kuyuk-kala	2025	Small ruminants	Phalanx I	12345	1
Kessken Kuyuk-kala	2025	Cattle	Humerus	45	1
Kessken Kuyuk-kala	2025	Cattle	Rib	023	3
Kessken Kuyuk-kala	2025	Cattle	Radius	023	1
Kessken Kuyuk-kala	2025	Cattle	Rib	3	1
Kessken Kuyuk-kala	2025	Horse	Rib	123	1
Kessken Kuyuk-kala	2025	Bird	Humerus	2345	1
Kessken Kuyuk-kala	2025	Bird	Cannon bone	234	2
Kessken Kuyuk-kala	2025	Ground squirrel	Lower jaw	1234	1
Kessken Kuyuk-kala	2025	Hare	Pelvis	12345	1
Kessken Kuyuk-kala	2025	Fish	Lower jaw	05	1

Kessken Kuyuk-kala	2025	Fish	Operculum	05	2
Kessken Kuyuk-kala	2025	Sheep	Upper jaw	023	2
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	023	1
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	23	1
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	23	1
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	01	3
Kessken Kuyuk-kala	2025	Sheep	Tooth	05	3
Kessken Kuyuk-kala	2025	Sheep	Tooth	05	1
Kessken Kuyuk-kala	2025	Sheep	Skull	05	1
Kessken Kuyuk-kala	2025	Sheep	Rib	23	4
Kessken Kuyuk-kala	2025	Sheep	Radius	023	2
Kessken Kuyuk-kala	2025	Sheep	Femur	023	1
Kessken Kuyuk-kala	2025	Sheep	Tibia	045	1
Kessken Kuyuk-kala	2025	Sheep	Radius	12	1
Kessken Kuyuk-kala	2025	Sheep	Pelvis	045	1
Kessken Kuyuk-kala	2025	Sheep	Tarsal	12345	1
Kessken Kuyuk-kala	2025	Sheep	Calcaneus	12345	1
Kessken Kuyuk-kala	2025	Cattle	Horn	2345	1
Kessken Kuyuk-kala	2025	Cattle	Skull	05	1
Kessken Kuyuk-kala	2025	Cattle	Rib	234	1
Kessken Kuyuk-kala	2025	Cattle	Rib	2	1
Kessken Kuyuk-kala	2025	Cattle	Femur	02	1
Kessken Kuyuk-kala	2025	Cattle	Femur	01	1
Kessken Kuyuk-kala	2025	Horse	Radius	1203	1
Kessken Kuyuk-kala	2025	Donkey	Phalanx II	12345	1
Kessken Kuyuk-kala	2025	Donkey	Phalanx III	12345	1
Kessken Kuyuk-kala	2025	Cattle	Femur	02	3
Kessken Kuyuk-kala	2025	Cattle	Humerus	023	3
Kessken Kuyuk-kala	2025	Cattle	Femur	012	4
Kessken Kuyuk-kala	2025	Sheep	Scapula	123	1
Kessken Kuyuk-kala	2025	Sheep	Rib	05	6
Kessken Kuyuk-kala	2025	Sheep	Radius	02	1
Kessken Kuyuk-kala	2025	Sheep	Humerus	04	1
Kessken Kuyuk-kala	2025	Sheep	Pelvis	123	1
Kessken Kuyuk-kala	2025	Sheep	Tibia	2345	1
Kessken Kuyuk-kala	2025	Sheep	Upper jaw	02	1
Kessken Kuyuk-kala	2025	Sheep	Scapula	234	1
Kessken Kuyuk-kala	2025	Sheep	Scapula	123	1
Kessken Kuyuk-kala	2025	Sheep	Scapula	1234	1
Kessken Kuyuk-kala	2025	Sheep	Rib	234	3
Kessken Kuyuk-kala	2025	Sheep	Vertebra	23	5
Kessken Kuyuk-kala	2025	Sheep	Femur	02	3
Kessken Kuyuk-kala	2025	Sheep	Humerus	23405	2

Kessken Kuyuk-kala	2025	Sheep	Tibia	234	3
Kessken Kuyuk-kala	2025	Sheep	Pelvis	123	1
Kessken Kuyuk-kala	2025	Cattle	Lower jaw	23	1
Kessken Kuyuk-kala	2025	Cattle	Rib	234	2
Kessken Kuyuk-kala	2025	Cattle	Pelvis	03	1
Kessken Kuyuk-kala	2025	Cattle	Radius	01	1
Kessken Kuyuk-kala	2025	Cattle	Ulna	201	1
Kessken Kuyuk-kala	2025	Cattle	Radius	4503	1
Kessken Kuyuk-kala	2025	Horse	Tooth	5	1
Kessken Kuyuk-kala	2025	Horse	Radius	45	1
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	123	1
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	123	1
Kessken Kuyuk-kala	2025	Sheep	Rib	234	8
Kessken Kuyuk-kala	2025	Sheep	Skull	05	1
Kessken Kuyuk-kala	2025	Sheep	Humerus	023	3
Kessken Kuyuk-kala	2025	Sheep	Radius	23	1
Kessken Kuyuk-kala	2025	Sheep	Radius	123	1
Kessken Kuyuk-kala	2025	Sheep	Tibia	2345	1
Kessken Kuyuk-kala	2025	Sheep	Metatarsal	12345	1
Kessken Kuyuk-kala	2025	Cattle	Lower jaw	045	1
Kessken Kuyuk-kala	2025	Cattle	Skull	05	1
Kessken Kuyuk-kala	2025	Cattle	Vertebra	123	1
Kessken Kuyuk-kala	2025	Cattle	Scapula	012	1
Kessken Kuyuk-kala	2025	Cattle	Pelvis	023	1
Kessken Kuyuk-kala	2025	Cattle	Metacarpal	12345	1
Kessken Kuyuk-kala	2025	Cattle	Horn	023	3
Kessken Kuyuk-kala	2025	Horse	Rib	23	1
Kessken Kuyuk-kala	2025	Sheep	Vertebra	1234	1
Kessken Kuyuk-kala	2025	Sheep	Vertebra	0123	1
Kessken Kuyuk-kala	2025	Sheep	Rib	23	1
Kessken Kuyuk-kala	2025	Sheep	Tibia	023	3
Kessken Kuyuk-kala	2025	Sheep	Metacarpal	234	1
Kessken Kuyuk-kala	2025	Sheep	Pelvis	023	1
Kessken Kuyuk-kala	2025	Cattle	Rib	023	1
Kessken Kuyuk-kala	2025	Sheep	Skull	023	1
Kessken Kuyuk-kala	2025	Sheep	Tooth	5	1
Kessken Kuyuk-kala	2025	Sheep	Tooth	05	1
Kessken Kuyuk-kala	2025	Sheep	Tooth	05	1
Kessken Kuyuk-kala	2025	Sheep	Rib	23	6
Kessken Kuyuk-kala	2025	Sheep	Vertebra	023	1
Kessken Kuyuk-kala	2025	Fish	Operculum	05	1
Kessken Kuyuk-kala	2025	Horse	Tooth	05	1
Kessken Kuyuk-kala	2025	Cattle	Humerus	045	1

Kessken Kuyuk-kala	2025	Cattle	Radius	023	1
Kessken Kuyuk-kala	2025	Horse	Rib	123	2
Kessken Kuyuk-kala	2025	Horse	Rib	023	2
Kessken Kuyuk-kala	2025	Sheep	Rib	23	7
Kessken Kuyuk-kala	2025	Sheep	Vertebra	023	4
Kessken Kuyuk-kala	2025	Sheep	Humerus	034	2
Kessken Kuyuk-kala	2025	Sheep	Radius	23	2
Kessken Kuyuk-kala	2025	Sheep	Radius	12	1
Kessken Kuyuk-kala	2025	Sheep	Tibia	234	1
Kessken Kuyuk-kala	2025	Sheep	Tibia	23	1
Kessken Kuyuk-kala	2025	Sheep	Metacarpal	023	2
Kessken Kuyuk-kala	2025	Sheep	Metacarpal	123405	1
Kessken Kuyuk-kala	2025	Sheep	Talus	12345	1
Kessken Kuyuk-kala	2025	Sheep	Talus	12345	1
Kessken Kuyuk-kala	2025	Fish	Operculum	1234	1
Kessken Kuyuk-kala	2025	Hare	Femur	2345	1
Kessken Kuyuk-kala	2025	Cattle	Lower jaw	23	1
Kessken Kuyuk-kala	2025	Cattle	Femur	01	2
Kessken Kuyuk-kala	2025	Cattle	Skull	05	2
Kessken Kuyuk-kala	2025	Cattle	Horn	05	1
Kessken Kuyuk-kala	2025	Cattle	Rib	23	1
Kessken Kuyuk-kala	2025	Cattle	Pelvis	023	1
Kessken Kuyuk-kala	2025	Cattle	Radius	02	1
Kessken Kuyuk-kala	2025	Cattle	Femur	02	3
Kessken Kuyuk-kala	2025	Cattle	Metacarpal	45	1
Kessken Kuyuk-kala	2025	Cattle	Talus	12345	1
Kessken Kuyuk-kala	2025	Goat	Horn	12345	1
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	123	1
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	23	1
Kessken Kuyuk-kala	2025	Sheep	Scapula	1203	1
Kessken Kuyuk-kala	2025	Sheep	Rib	123	10
Kessken Kuyuk-kala	2025	Sheep	Vertebra	023	3
Kessken Kuyuk-kala	2025	Sheep	Vertebra	1234	1
Kessken Kuyuk-kala	2025	Sheep	Vertebra	0123	1
Kessken Kuyuk-kala	2025	Sheep	Pelvis	1234	1
Kessken Kuyuk-kala	2025	Sheep	Metatarsal	23	3
Kessken Kuyuk-kala	2025	Sheep	Metacarpal	23	1
Kessken Kuyuk-kala	2025	Sheep	Radius	012	1
Kessken Kuyuk-kala	2025	Sheep	Metatarsal	123	1
Kessken Kuyuk-kala	2025	Sheep	Metatarsal	1234	1
Kessken Kuyuk-kala	2025	Sheep	Tarsal	123	1
Kessken Kuyuk-kala	2025	Sheep	Talus	12345	1
Kessken Kuyuk-kala	2025	Sheep	Phalanx I	1234	1

Kessken Kuyuk-kala	2025	Fish	Operculum	1234	1
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	023	1
Kessken Kuyuk-kala	2025	Sheep	Skull	05	8
Kessken Kuyuk-kala	2025	Sheep	Upper jaw	23	1
Kessken Kuyuk-kala	2025	Sheep	Tooth	05	2
Kessken Kuyuk-kala	2025	Sheep	Tooth	05	1
Kessken Kuyuk-kala	2025	Sheep	Rib	1234	19
Kessken Kuyuk-kala	2025	Sheep	Vertebra	23	6
Kessken Kuyuk-kala	2025	Sheep	Scapula	123	1
Kessken Kuyuk-kala	2025	Sheep	Scapula	12	1
Kessken Kuyuk-kala	2025	Sheep	Scapula	023	3
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	023	7
Kessken Kuyuk-kala	2025	Sheep	Humerus	234	5
Kessken Kuyuk-kala	2025	Sheep	Radius	1234	1
Kessken Kuyuk-kala	2025	Sheep	Radius	12	1
Kessken Kuyuk-kala	2025	Sheep	Radius	12	1
Kessken Kuyuk-kala	2025	Sheep	Ulna	12	1
Kessken Kuyuk-kala	2025	Sheep	Pelvis	123	1
Kessken Kuyuk-kala	2025	Sheep	Pelvis	1234	1
Kessken Kuyuk-kala	2025	Sheep	Pelvis	023	2
Kessken Kuyuk-kala	2025	Sheep	Femur	045	1
Kessken Kuyuk-kala	2025	Sheep	Tibia	0234	5
Kessken Kuyuk-kala	2025	Sheep	Tibia	045	2
Kessken Kuyuk-kala	2025	Sheep	Tibia	2345	1
Kessken Kuyuk-kala	2025	Sheep	Tibia	2345	1
Kessken Kuyuk-kala	2025	Sheep	Metacarpal	12	1
Kessken Kuyuk-kala	2025	Sheep	Talus	12345	1
Kessken Kuyuk-kala	2025	Sheep	Talus	12345	1
Kessken Kuyuk-kala	2025	Sheep	Talus	12345	1
Kessken Kuyuk-kala	2025	Sheep	Talus	02345	2
Kessken Kuyuk-kala	2025	Bird	Cannon bone	12345	1
Kessken Kuyuk-kala	2025	Cattle	Lower jaw	023	1
Kessken Kuyuk-kala	2025	Cattle	Scapula	23	1
Kessken Kuyuk-kala	2025	Cattle	Ulna	023	2
Kessken Kuyuk-kala	2025	Horse	Tibia	012	1
Kessken Kuyuk-kala	2025	Cattle	Phalanx III	12345	1
Kessken Kuyuk-kala	2025	Camel	Ulna	12	1
Kessken Kuyuk-kala	2025	Sheep	Metacarpal	0123	2
Kessken Kuyuk-kala	2025	Human	Clavicle	12345	1
Kessken Kuyuk-kala	2025	Sheep	Skull	05	4
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	023	1
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	12345	1
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	123	1

Kessken Kuyuk-kala	2025	Sheep	Lower jaw	23	1
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	123	1
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	23	1
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	23	1
Kessken Kuyuk-kala	2025	Sheep	Tooth	05	1
Kessken Kuyuk-kala	2025	Sheep	Skull	05	10
Kessken Kuyuk-kala	2025	Sheep	Tooth	05	6
Kessken Kuyuk-kala	2025	Sheep	Tooth	05	1
Kessken Kuyuk-kala	2025	Sheep	Tooth	05	5
Kessken Kuyuk-kala	2025	Sheep	Rib	23	15
Kessken Kuyuk-kala	2025	Sheep	Skull	05	4
Kessken Kuyuk-kala	2025	Sheep	Vertebra	0234	6
Kessken Kuyuk-kala	2025	Sheep	Scapula	0123	3
Kessken Kuyuk-kala	2025	Sheep	Scapula	1203	1
Kessken Kuyuk-kala	2025	Sheep	Radius	023	2
Kessken Kuyuk-kala	2025	Sheep	Pelvis	023	1
Kessken Kuyuk-kala	2025	Sheep	Pelvis	234	1
Kessken Kuyuk-kala	2025	Sheep	Femur	023	5
Kessken Kuyuk-kala	2025	Sheep	Tibia	01234	2
Kessken Kuyuk-kala	2025	Sheep	Tibia	45	1
Kessken Kuyuk-kala	2025	Sheep	Metatarsal	0123	1
Kessken Kuyuk-kala	2025	Sheep	Metatarsal	1203	1
Kessken Kuyuk-kala	2025	Sheep	Metacarpal	1234	1
Kessken Kuyuk-kala	2025	Sheep	Rib	05	5
Kessken Kuyuk-kala	2025	Sheep	Calcaneus	2345	1
Kessken Kuyuk-kala	2025	Sheep	Phalanx I	1234	1
Kessken Kuyuk-kala	2025	Sheep	Femur	234	1
Kessken Kuyuk-kala	2025	Sheep	Femur	234	1
Kessken Kuyuk-kala	2025	Sheep	Femur	234	1
Kessken Kuyuk-kala	2025	Sheep	Femur	234	1
Kessken Kuyuk-kala	2025	Sheep	Tibia	234	1
Kessken Kuyuk-kala	2025	Sheep	Tibia	234	1
Kessken Kuyuk-kala	2025	Cattle	Rib	234	3
Kessken Kuyuk-kala	2025	Cattle	Vertebra	0234	1
Kessken Kuyuk-kala	2025	Cattle	Humerus	0234	5
Kessken Kuyuk-kala	2025	Cattle	Radius	023	4
Kessken Kuyuk-kala	2025	Cattle	Radius	0123	1
Kessken Kuyuk-kala	2025	Cattle	Radius	45	1
Kessken Kuyuk-kala	2025	Cattle	Skull	05	5
Kessken Kuyuk-kala	2025	Cattle	Femur	023	3
Kessken Kuyuk-kala	2025	Cattle	Tibia	012	1
Kessken Kuyuk-kala	2025	Cattle	Metacarpal	012	2
Kessken Kuyuk-kala	2025	Cattle	Tooth	05	1

Kessken Kuyuk-kala	2025	Cattle	Talus	12345	1
Kessken Kuyuk-kala	2025	Cattle	Phalanx I	12345	1
Kessken Kuyuk-kala	2025	Cattle	Radius	12	1
Kessken Kuyuk-kala	2025	Horse	Rib	123	2
Kessken Kuyuk-kala	2025	Horse	Metacarpal	045	1
Kessken Kuyuk-kala	2025	Bird	Radius	1234	1
Kessken Kuyuk-kala	2025	Bird	Cannon bone	123	1
Kessken Kuyuk-kala	2025	Goat	Skull	123	1
Kessken Kuyuk-kala	2025	Sheep	Skull	023	9
Kessken Kuyuk-kala	2025	Sheep	Upper jaw	234	1
Kessken Kuyuk-kala	2025	Sheep	Upper jaw	234	1
Kessken Kuyuk-kala	2025	Sheep	Scapula	023	7
Kessken Kuyuk-kala	2025	Sheep	Scapula	123	3
Kessken Kuyuk-kala	2025	Sheep	Scapula	1203	1
Kessken Kuyuk-kala	2025	Sheep	Skull	04	1
Kessken Kuyuk-kala	2025	Sheep	Vertebra	0234	7
Kessken Kuyuk-kala	2025	Sheep	Rib	1234	21
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	45	1
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	45	1
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	23	1
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	23	1
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	012	5
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	123	1
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	123	1
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	123	1
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	12	1
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	123	1
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	12	1
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	23	1
Kessken Kuyuk-kala	2025	Sheep	Humerus	234	6
Kessken Kuyuk-kala	2025	Sheep	Humerus	23245	1
Kessken Kuyuk-kala	2025	Sheep	Radius	23	3
Kessken Kuyuk-kala	2025	Sheep	Radius	2345	1
Kessken Kuyuk-kala	2025	Sheep	Tibia	23	2
Kessken Kuyuk-kala	2025	Sheep	Tibia	45	1
Kessken Kuyuk-kala	2025	Sheep	Pelvis	234	3
Kessken Kuyuk-kala	2025	Sheep	Pelvis	1234	1
Kessken Kuyuk-kala	2025	Sheep	Pelvis	1234	1
Kessken Kuyuk-kala	2025	Sheep	Calcaneus	12345	1
Kessken Kuyuk-kala	2025	Sheep	Talus	12345	1
Kessken Kuyuk-kala	2025	Sheep	Talus	12345	1
Kessken Kuyuk-kala	2025	Cattle	Upper jaw	23	1
Kessken Kuyuk-kala	2025	Cattle	Upper jaw	23	1

Kessken Kuyuk-kala	2025	Cattle	Tooth	05	1
Kessken Kuyuk-kala	2025	Cattle	Upper jaw	23	1
Kessken Kuyuk-kala	2025	Cattle	Rib	123	4
Kessken Kuyuk-kala	2025	Cattle	Vertebra	023	5
Kessken Kuyuk-kala	2025	Cattle	Lower jaw	02	1
Kessken Kuyuk-kala	2025	Cattle	Lower jaw	045	1
Kessken Kuyuk-kala	2025	Cattle	Scapula	023	2
Kessken Kuyuk-kala	2025	Cattle	Femur	01	1
Kessken Kuyuk-kala	2025	Cattle	Pelvis	023	5
Kessken Kuyuk-kala	2025	Cattle	Radius	201	1
Kessken Kuyuk-kala	2025	Cattle	Ulna	02	1
Kessken Kuyuk-kala	2025	Cattle	Femur	021	6
Kessken Kuyuk-kala	2025	Cattle	Calcaneus	2345	1
Kessken Kuyuk-kala	2025	Cattle	Phalanx III	12345	1
Kessken Kuyuk-kala	2025	Camel	Radius	12	1
Kessken Kuyuk-kala	2025	Sheep	Lower jaw	023	8
Kessken Kuyuk-kala	2025	Sheep	Tooth	05	1
Kessken Kuyuk-kala	2025	Sheep	Rib	0234	7
Kessken Kuyuk-kala	2025	Sheep	Radius	23	1
Kessken Kuyuk-kala	2025	Sheep	Metatarsal	01234	6
Kessken Kuyuk-kala	2025	Sheep	Metacarpal	023	1
Kessken Kuyuk-kala	2025	Sheep	Metatarsal	1234	1
Kessken Kuyuk-kala	2025	Mammals	Indeterminate	05	18

Table 17. Kessken Kuyuk-kala site. Excavations of 2015 and 2025. Archaeozoological database (analyses conducted in the zooarchaeology laboratory)

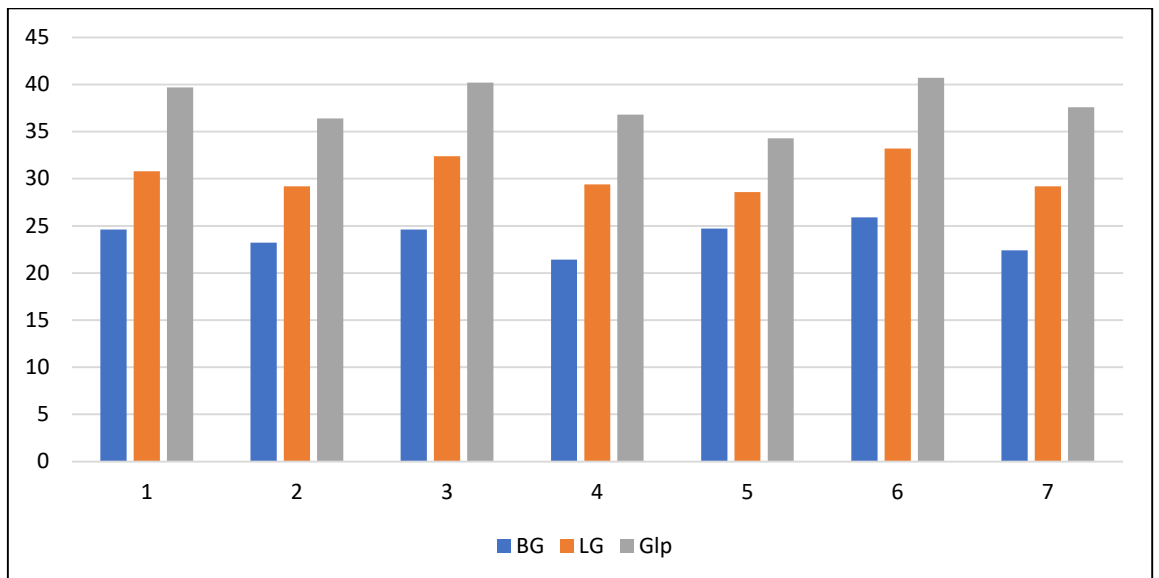


Figure 1. Kessken Kuyuk-kala site. Excavation 2025. Size proportions of sheep scapulae (*Ovis aries*) according to the method of A. von den Driesch (1976)

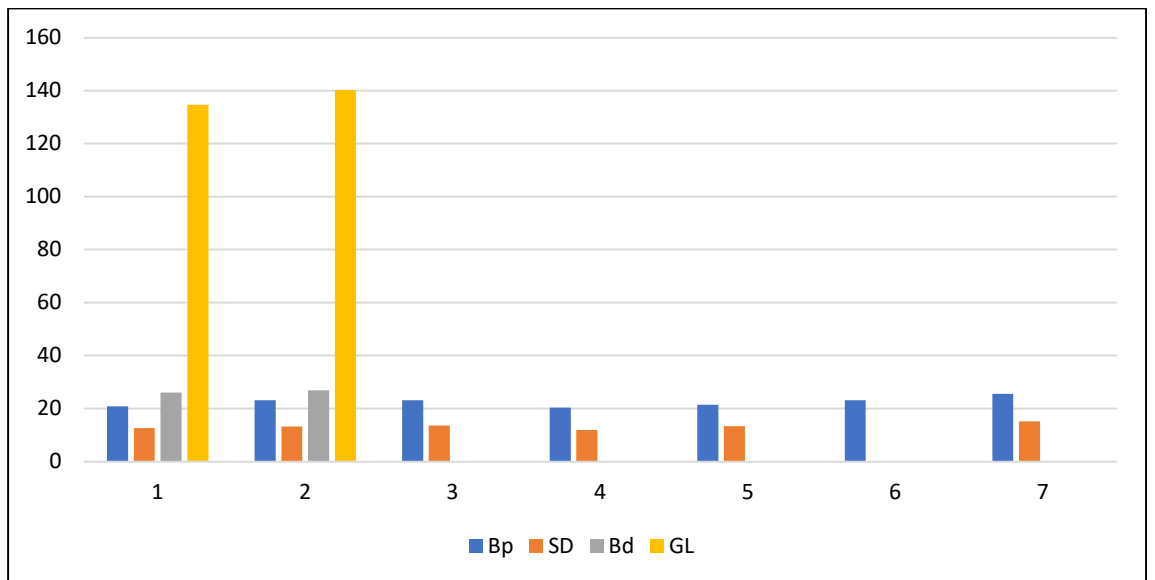


Figure 2. Kessken Kuyuk-kala site. Excavation 2025. Size proportions of sheep metatarsal bones (*Ovis aries*)

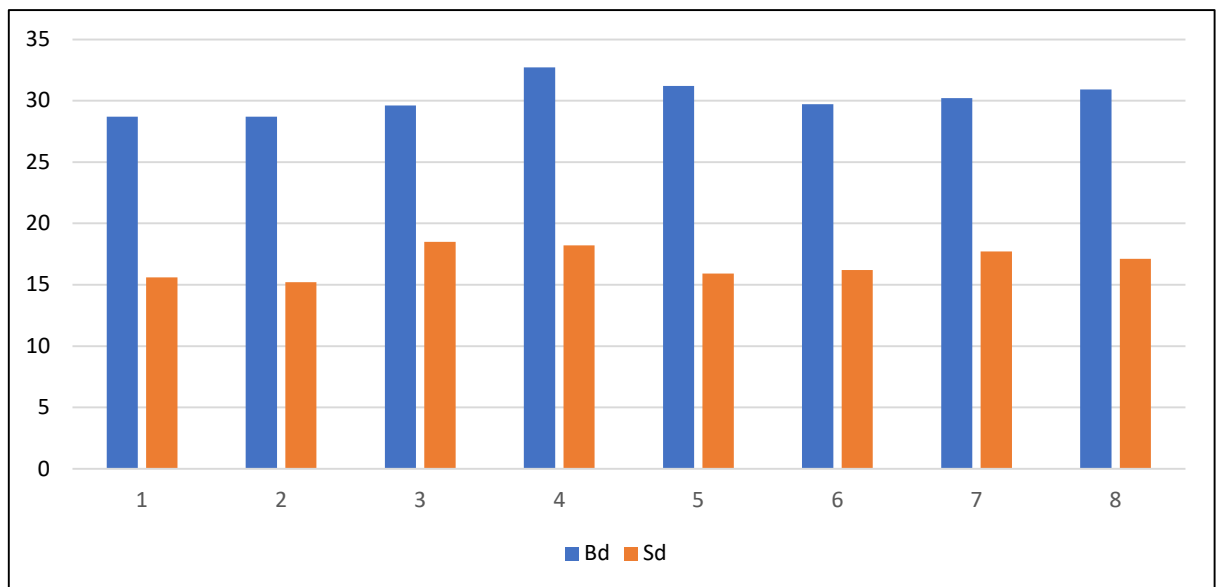


Figure 3. Kessken Kuyuk-kala site. Excavation 2025. Dimensional ratios of sheep tibiae (*Ovis aries*).

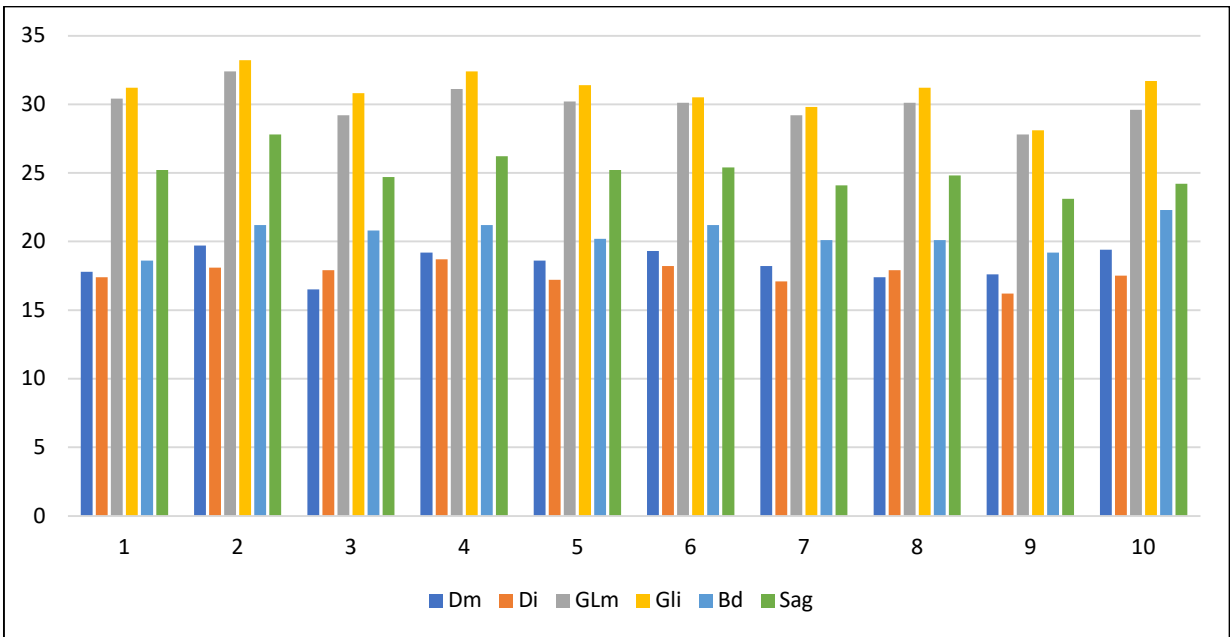


Figure 4. Kessken Kuyuk-kala site. Excavation 2025. Dimensional ratios of sheep tali (*Ovis aries*).

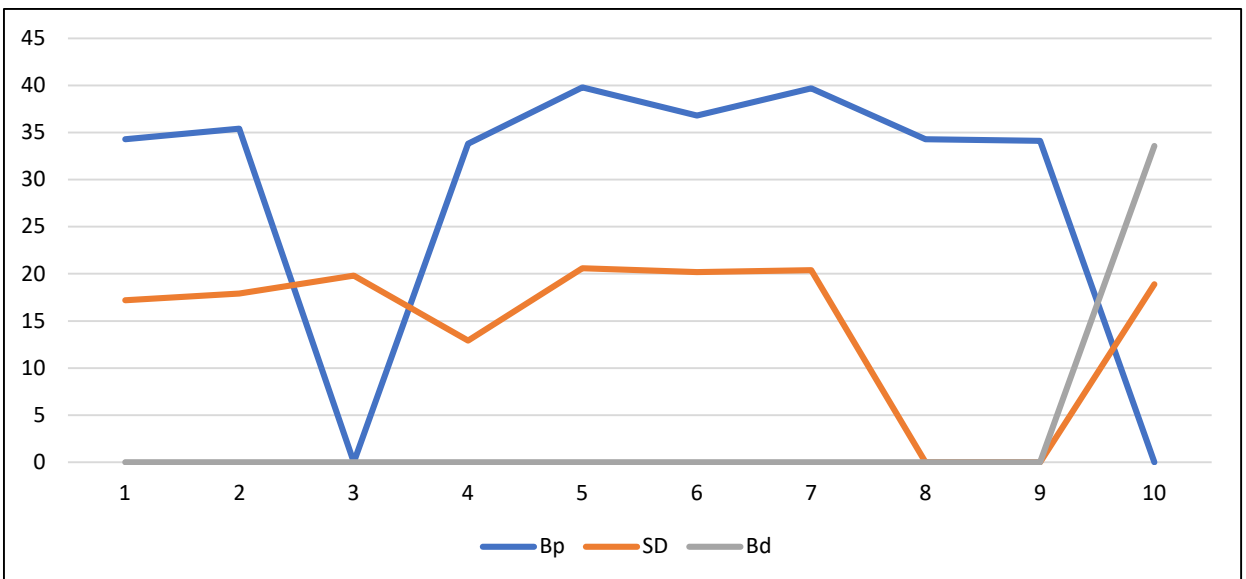


Figure 5. Kessken Kuyuk-kala site. Excavation 2025. Dimensional ratios of sheep radii (*Ovis aries*).

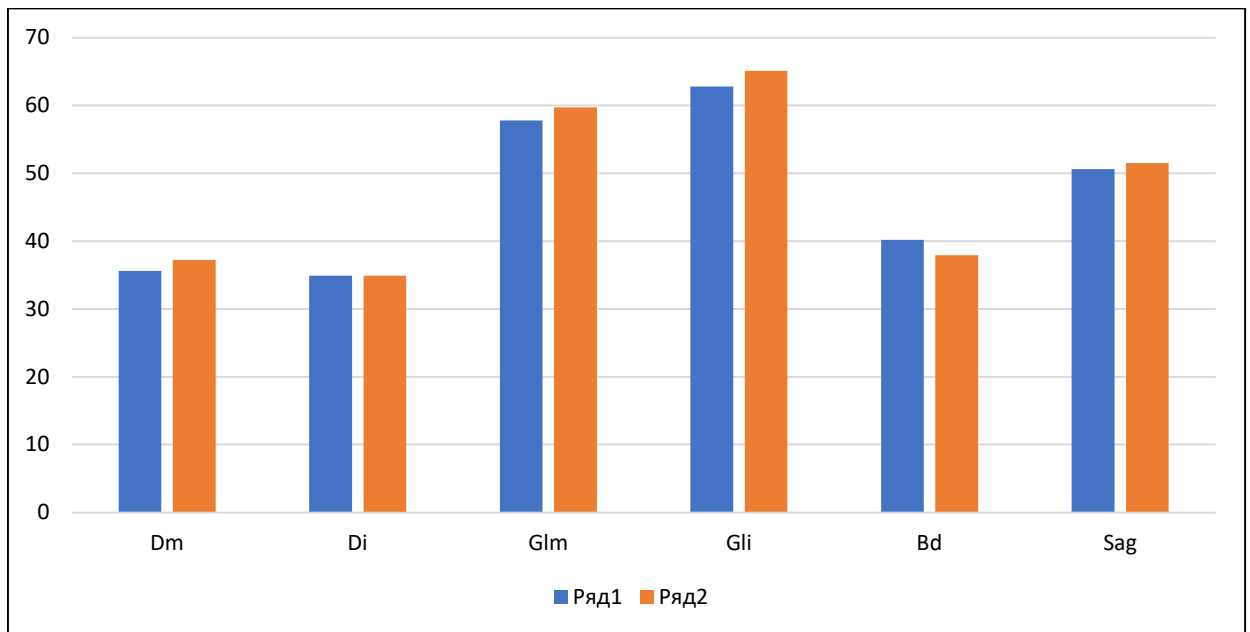


Figure 6. Kessken Kuyuk-kala site. Excavation 2025. Dimensional ratios of cattle tali (*Bos taurus*).

Figures



Figure 7. Kessken Kuyuk-kala site. Excavation 2025. Tali of small ruminants.



Figure 8. Kessken Kuyuk-kala site. Excavation 2025. Calcanei, first phalanges, and central tarsal bones of small ruminants.



Figure 9. Kessken Kuyuk-kala site. Excavation 2025. Incisor (left) and molar (right) of the upper jaw of Horses.



Figure 10. Kessken Kuyuk-kala site. Excavation 2025. Pelvic bones of small ruminants.



Figure 11. Kessken Kuyuk-kala site. Excavation 2025. Horn process of the frontal bone of the goat (*Capra hircus*).



Figure 12. Kessken Kuyuk-kala site. Excavation 2025. Sheep skull and thoracic vertebra of large cattle.



Figure 13. Kessken Kuyuk-kala site. Excavation 2025. Horn core of large cattle.



Figure 14. Kessken Kuyuk-kala site. Excavation 2025. Distal ends of the radius bones of Horses.



Figure 15. Kessken Kuyuk-kala site. Excavation 2025. Skeletal elements of large cattle: distal ends of the tibia, humerus, and metatarsal bone, and a complete metacarpal bone from the left leg.



Figure 16. Kessken Kuyuk-kala site. Excavation 2025. Upper and lower jaws of cattle.



Figure 17. Kessken Kuyuk-kala site. Excavation 2025. Fragment of an upper jaw of cattle (*Bos taurus*) with upper molars (PM³-M²); The tooth roots have undergone age-related resorption.



Figure 18. Kessken Kuyuk-kala site. Excavation 2025. Distal ends of radial bones of cattle and Horses, metapodium, and proximal end of the radial bone of the Horse.



Figure 19. Kessken Kuyuk-kala site. Excavation 2025. Phalanges of the Horse and cattle, as well as talus bones of cattle. Traces of ornamented incisions are observed on the plantar surface of the talus.



Figure 20. Kessken Kuyuk-kala site. Excavation 2025. Left talus of large cattle. Geometric ornamental incisions are recorded on the plantar surface.



Figure 21. Kessken Kuyuk-kala site. Excavation 2025. The same talus (see Fig. 20) of large cattle with ornamental incisions on the palmar surface.



Figure 22. Kessken Kuyuk-kala site. Excavation 2025. Metatarsal and metacarpal bones, as well as the diaphysis of the tibia, of small cattle.



Figure 23. Kessken Kuyuk-kala site. Excavation 2025. Fragments of skeletal remains of fish, birds, and small mammals.



Figure 24. Kessken Kuyuk-kala site. Excavation 2025. Mandibles of small ruminants of various ages.



Figure 25. Kessken Kuyuk-kala site. Excavation 2025. Left ramus of the mandible of a small ruminant (small ruminants). Pathological wear of the occlusal surface of the first molar (m1).

Description and drawings of the artifacts discovered at the Kesken-Kuyuk Kala site in 2025

Ks_25_R1_0 (R here and below refers to Excavation)

Rims

A fragment of the rim from a small vessel, presumably a bowl, was recovered. It is manufactured from well-mixed, dense red paste with an orange-beige shade, containing minor inclusions of fine sand particles visible at the fractures. The surface of the rim, on both the exterior and interior, is partially covered with a light slip of beige color, which is only partly preserved. The rim is slightly constricted inward, oval in cross-section, with a diameter of 13 cm and a wall thickness of 0.5–0.6 cm. On the exterior along the rim margin, slightly pronounced concentric lines are visible, arranged horizontally along the entire diameter (Figure 1).

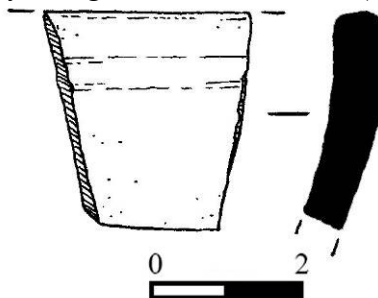


Figure 1. Ks_25_R1_0_1

A fragment of the rim from a handmade vessel of the jar type was discovered. It is made of a moderately mixed, loose grey paste, containing numerous visible inclusions of fine sand particles, mica, and chamotte within the fracture surfaces. The surface of the fragment is covered on the interior and exterior with a dense, thick layer of red slip of a yellow-beige shade. In certain areas, there are light patches caused by uneven firing, as well as soot stains. Partial banded burnishing without gloss is observable. The rim possesses a thickened, roller-shaped edge, everted outward. Ornamentation is present along the rim in the form of a horizontal band composed of alternating, left-leaning incised dashes. The rim diameter is approximately 25 cm along the external side, with a wall thickness of 1 cm (Figure 2).

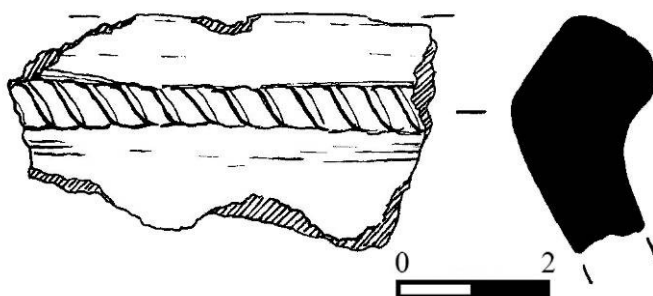


Figure 2. Ks_25_R1_0_2

A fragment of the rim from a large pot-shaped vessel was identified; it is made from well-mixed, dense red paste with a grey-beige hue and contains minor visible inclusions of fine sand particles and mica in the fracture. The surface of the fragment is covered on both the exterior and interior with a layer of light slip; in certain areas, reddish spots are observed, presumably resulting from uneven firing. Rim with an outwardly turned edge, forming a straight platform 2.6 cm wide; the rim edges are oval in cross-section, diameter is 22 cm, wall thickness is 0.8–0.9 cm (Figure 3).

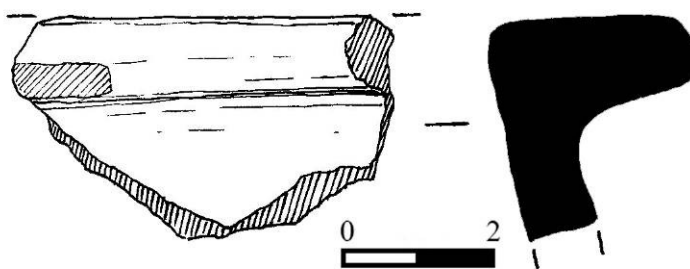


Figure 3. Ks_25_R1_0_3

A fragment of a rim from a hand-built vessel was also found, presumably from a wide-mouthed jug. It is made of a moderately mixed, dense, grey paste, with minor visible inclusions of fine sand particles noted in the fracture. The interior surface of the vessel is covered with a layer of red slip, while the exterior surface is coated with a dark, almost black slip. Burnishing with a sheen is visible on the interior. The rim of the vessel is everted, forming a funnel-shaped neck with an oval cross-section and a diameter of 14 cm. On the exterior, below the rim, there is a partially preserved handle of subrectangular form in cross-section, measuring 2.4 cm in width and 1.6 cm in thickness. The vessel wall thickness is 0.9–1 cm (Figure 4).

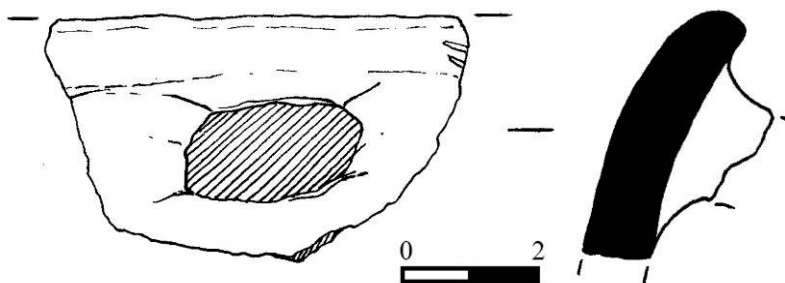


Figure 4. Ks_25_R1_0_4

Ornamented vessel side walls

A fragment of the side wall from a large vessel, presumably a pot, was found. It is made from well-kneaded, dense red paste with a yellow-beige hue, containing minor visible inclusions of fine sand particles and mica in the fracture surfaces. The external surface of the fragment is coated with a layer of light slip; in addition, the vessel wall displays incised ornamentation in the form of concentric straight and wavy lines, applied using a combed tool. The vessel wall thickness is 0.7–0.8 cm. On the interior surface of the walls, alternating horizontal depressed lines produced by the maker's hands are evident, indicating that the vessel was manufactured on a potter's wheel (Figure 5).

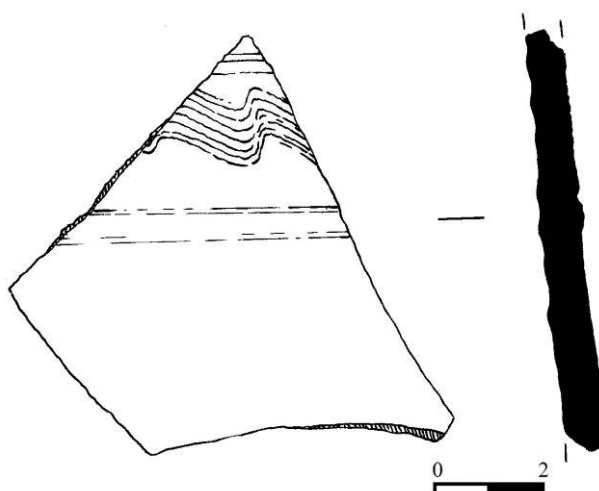


Figure 5. Ks_25_R1_0_5

During the excavation, a small fragment of the vessel wall was discovered, with an applique of truncated-conical form attached, made from well-kneaded, dense red paste with a yellow-beige hue, containing minor inclusions of fine sand particles and mica visible in the fracture. The exterior surface of the fragment is covered with a partially preserved layer of light slip; the applique measures 1.2 cm in height, with a base diameter of approximately 2.3 cm, and a vessel wall thickness of 0.6 cm (Figure 6).

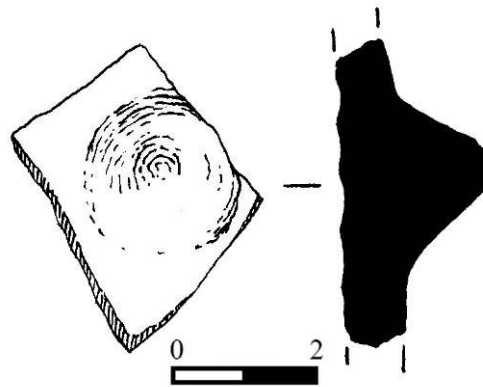


Figure 6. Ks_25_R1_0_6

Lids

A small fragment of a hand-made, slightly convex lid was found, produced from moderately mixed, dense, grey paste, with numerous inclusions of fine sand particles and mica visible in the fracture. The inner surface of the lid is covered with a layer of red slip, whereas the outer surface features a black engobe and traces of striped burnishing; ornamentation in the form of oval lines is also present on the exterior. The edges of the lid are oval in cross-section; the diameter of the lid is approximately 15 cm, and the wall thickness is 0.9 cm (Figure 7).

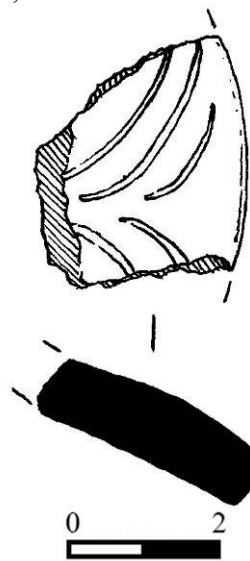


Figure 7. Ks_25_R1_0_7

Metal objects



Figure 8. Ks_25_R1_0_8

Ks_25_R1_1

Rims

A rim fragment of a small handmade pot was identified, produced from moderately mixed, loosely compacted red fabric with numerous visible inclusions of fine and coarse sand particles, mica, and minerals observable in the fracture. Due to uneven firing, the fabric color varies to gray and dark shades. The surface of the vessel is covered on both the exterior and interior with a layer of brown slip; banded burnishing with a sheen is also present on the exterior and partially on the interior. Rim with a straight, low neck, 2.2 cm in height; the edge in section is subrectangular-oval in shape, diameter 12 cm. The body of the vessel expands almost immediately, exhibiting a spherical form. Vessel wall thickness is 0.7–0.8 cm (Figure 9).

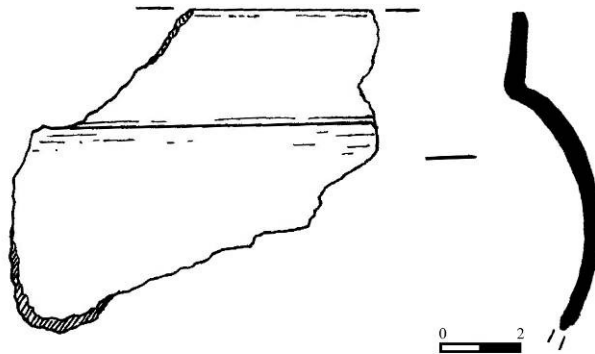


Figure 9. Ks_25_R1_1_1

A rim fragment of a hand-built cauldron-shaped vessel was encountered, produced from moderately mixed, loose red fabric with a yellow-beige tint. Numerous inclusions—fine and coarse particles of sand, mica, and minerals—are visible in the fractures. Due to uneven firing, the fabric color inside the vessel walls exhibits a grayish tint. The surface of the fragment, both externally and internally, is covered with a light engobe. Soot stains are observable, and traces of burnishing are present on the interior. Rim of the vessel with a thickened edge; on the exterior along the rim, small alternating strokes were applied, forming a pattern of lines inclined in various directions. The rim diameter is 16 cm, with a wall thickness of 0.6–0.8 cm (Figure 10).

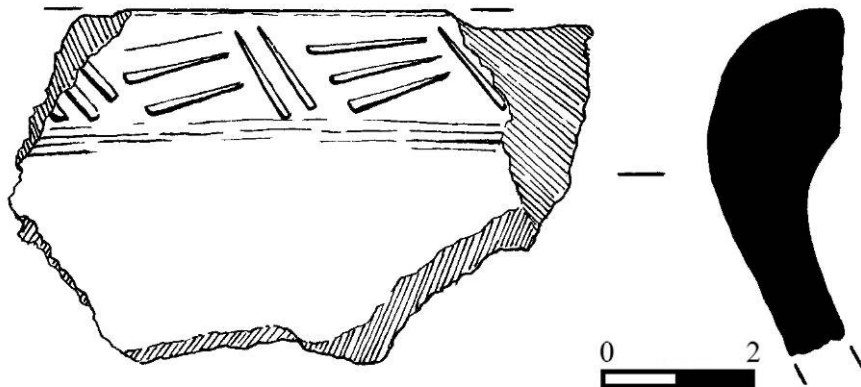


Figure 10. Ks_25_R1_1_10

A fragment of a rim from a small handmade vessel, presumably a pot, was also discovered. It is made from moderately mixed loose-textured brown fabric, with numerous visible inclusions of fine sand particles present in the fracture. The exterior surface of the vessel is covered with a layer of red slip, and traces of dull burnishing are also observable. The rim of the vessel is thickened, with a subrectangular cross-section. On the exterior edge, ornamentation is present in the form of small alternating left-leaning lines forming a horizontal band, and slightly above, additional alternating slanted lines forming zigzags. Rim with a diameter of 17 cm, wall thickness approximately 0.6–0.8 cm (Figure 11).

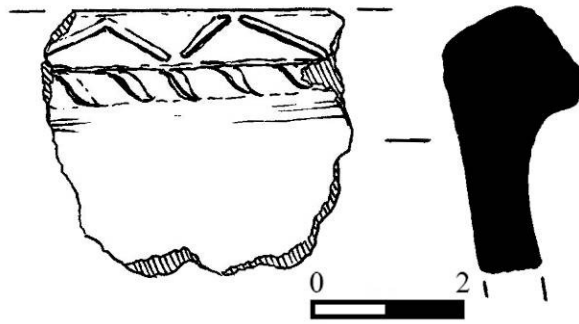


Figure 11. Ks_25_R1_1_3

A fragment of the rim from a handmade vessel of the vase type with a funnel-shaped rim flared outward was recorded. The rim was produced from well-kneaded, dense clay of a reddish, yellow-beige hue, with minor visible admixtures of fine sand particles and mica inclusions observable at the fracture. The surface of the fragment is covered on both the inner and outer sides with a layer of dense red slip; traces of soot are visible on the interior. Rim with a straight, outwardly bent edge, subrectangular in cross-section, diameter 17 cm, wall thickness 0.7–0.8 cm (Figure 12).

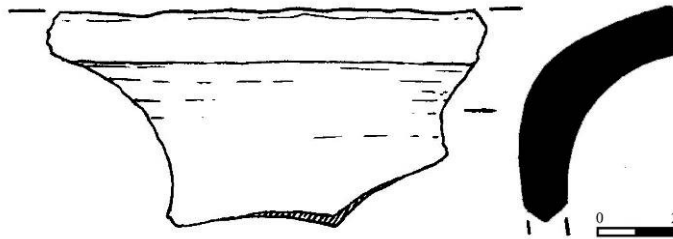


Figure 12. Ks_25_R1_1_4

During the excavations, a fragment of the rim from a large handmade vessel of the pot type was found. It is made from moderately mixed, loosely compacted red body clay with an orange-beige tint, containing numerous visible inclusions of small and large grains of sand, mica, and chamotte in the fracture. Due to uneven firing, the color of the body clay varies from yellow to gray in certain areas. The external surface of the fragment is covered with a layer of light slip; spots of soot are also visible. The rim features a thickened edge of subrectangular cross-section, with an external height of 2.5 cm, a diameter of 31 cm, and a vessel wall thickness of 1.2–1.3 cm. Ornamentation is present on the outer part of the rim, consisting of an incised concentric band formed by small, alternating, left-leaning dashes (Figure 13).

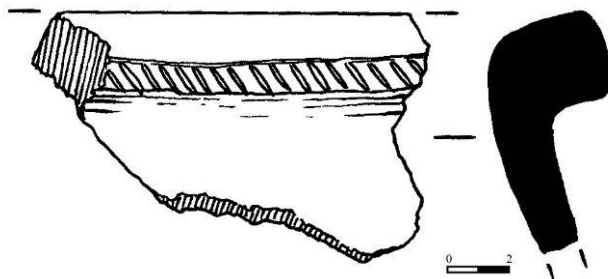


Figure 13. Ks_25_R1_1_5

A fragment of the rim from a hand-built small vessel of the pot type was found, made of moderately mixed, porous, red-colored fabric, containing numerous visible inclusions of fine sand grains and white particles in the fracture. Due to uneven firing, the color of the fabric inside the sherd wall varies from gray to dark, almost black. The inner surface of the vessel is coated with a layer of light slip; black spots of soot and smoke are also visible across the entire surface. The rim of the vessel is thickened and subrectangular in section. Ornamentation is present on the outer side of the rim as a wide band extending along the entire diameter, composed of small alternating lines

forming a 'fir-tree' motif. A small projection, presumably a pseudo-handle, is present on the exterior of the rim. The rim diameter is 17 cm, and the wall thickness is 0.6–0.7 cm (Figure 14).

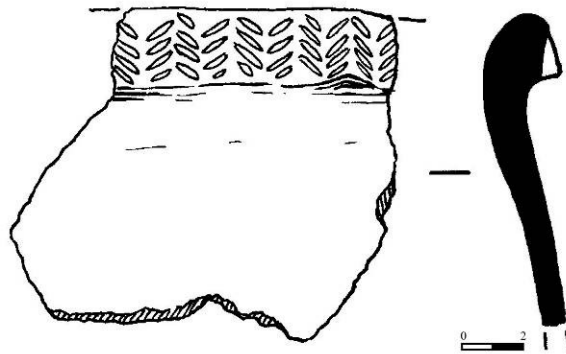


Figure 14. Ks_25_R1_1_6

Ornamented vessel side walls

A wall fragment from a large handmade vessel was discovered, produced from moderately mixed, loose red clay with numerous visible inclusions of both small and large sand particles, as well as white inclusions in the fracture. Due to uneven firing, the colour of the clay body inside the sherd exhibits a greyish tint. The interior surface of the vessel is coated with a light brownish layer, while the exterior surface is covered with a thick layer of light slip. Traces of well-fired areas and soot stains are observed. On the exterior, there is an applique roller-shaped, protruding band, on the surface of which alternating finger pinches are present; vessel wall thickness is 1.1–1.2 cm (Figure 15).

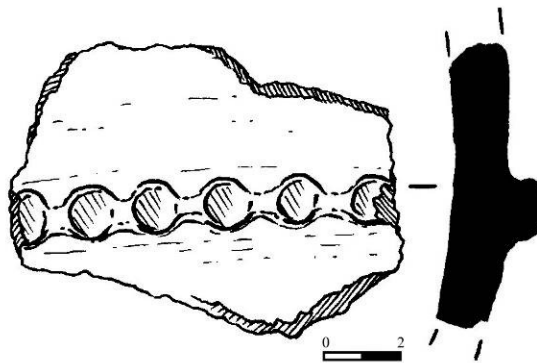


Figure 15. Ks_25_R1_1_7

Bone artifacts

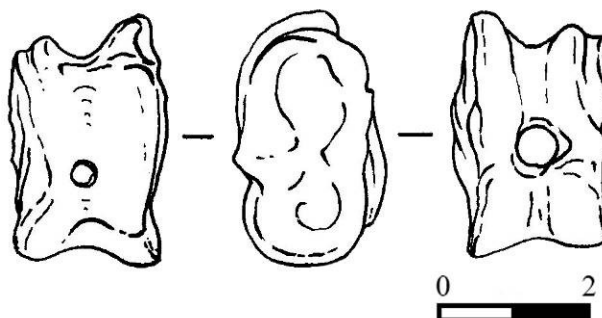


Figure 16. Ks_25_R1_1_8

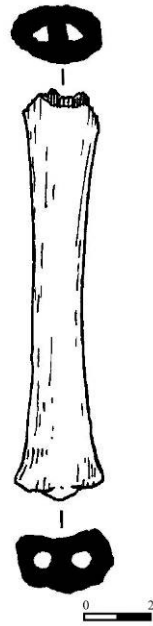


Figure 17. Ks_25_R1_1_9

Stone artifacts

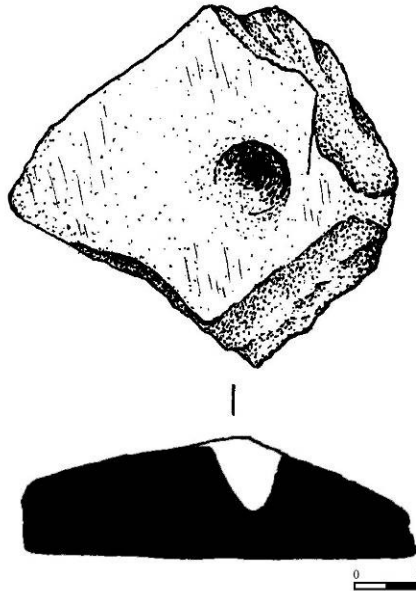


Figure 18. Ks_25_R1_1_10

Ks_25_R1_4

Whole or half-complete vessels

An archaeologically intact handmade cup was identified, produced from well-kneaded, dense red clay with a yellow-beige hue, and minor visible inclusions of fine sand particles observable in the fracture. Both the exterior and interior surfaces of the cup are covered with a partially preserved layer of red slip, and traces of burnishing with a sheen are evident. The cup features an elongated cylindrical form with a flared rim; in cross-section, the rim exhibits a flattened-oval shape. The rim diameter is 6.2 cm, and the body diameter is approximately 4.3 cm. The walls of the vessel transition into a flat bottom with a diameter of 4.3 cm; a loop-shaped vertical handle, flattened-oval in cross-section, 1.9 cm wide and 0.6 cm thick, is attached laterally. The height of the mug is 9.8 cm (Figure 19).

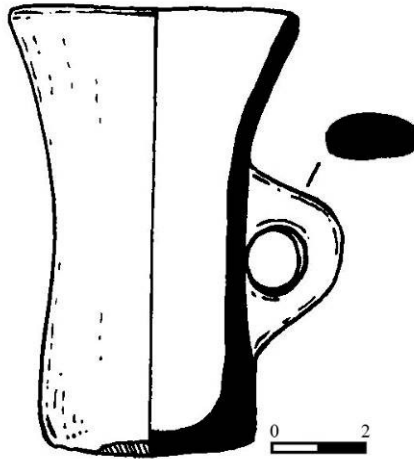


Figure 19. Ks_25_R1_4_1

An archaeologically complete handmade mug was discovered, manufactured from a moderately mixed dense red paste with an orange-beige hue, containing minor inclusions of fine sand particles and mica visible in the fracture. The surface of the vessel is coated, both externally and internally, with a dense layer of red slip; burnishing without gloss is also visible on the exterior. The rim is turned outward with slightly flared edges, sub-rectangular-oval in section, with a rim diameter of 8 cm. The walls of the vessel are slightly constricted in the central part, and a small loop-shaped handle of flattened-oval cross-section, 1.9 cm wide and 0.8 cm thick, is attached to the exterior of the lower body. Towards the base, the walls of the mug slightly taper and transition into a flattened bottom with a diameter of 4.8 cm; the height of the vessel is 10.2 cm (Figure 20).

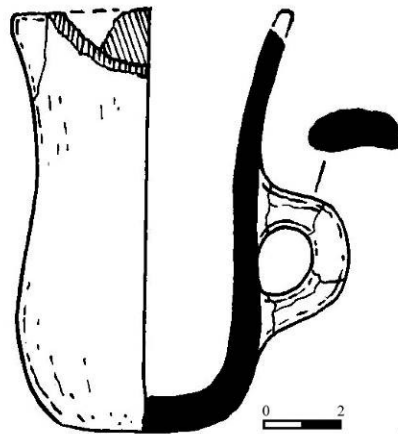


Figure 20. Ks_25_R1_4_2

An archaeologically complete handmade vessel, typologically resembling a small pot, was also discovered. It is made from moderately mixed, loosely compacted red paste with a pink-beige tint, containing numerous visible inclusions of both fine and coarse sand particles, as well as white-colored inclusions. Owing to uneven firing, the paste exhibits a color transition from yellow to grey shades. The surface of the vessel, both on the exterior and interior, is covered with spots of soot and smoke. In some areas, a light beige engobe is visible, preserved only partially. The rim of the vessel is thickened, with an outwardly turned bead-shaped edge. In cross-section, it is sub-rectangular to oval in shape. A small loop-shaped vertical handle, 1.7 cm wide and 1 cm thick, is attached laterally near the rim and the shoulder of the vessel; the handle is only partially preserved. The body of the vessel is slightly swollen in the central part; the walls taper towards a flat bottom with a diameter of 6.2 cm. The edges of the bottom are smoothed on the exterior. The height of the vessel is 10.7 cm (Figure 21).

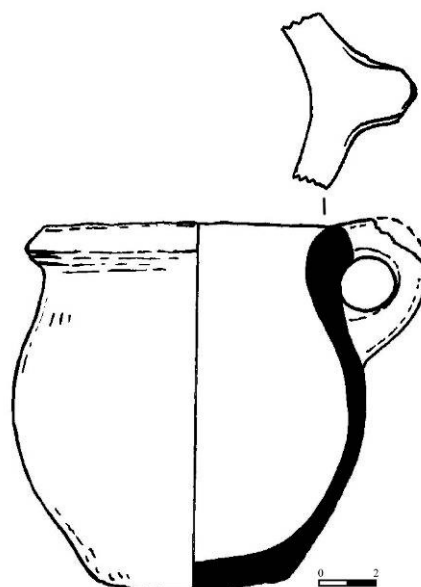


Figure 21. Ks_25_R1_4_3

Ks_25_R1_5

Whole or half-complete vessels

A half-complete handmade mug was encountered, manufactured from moderately mixed dense red paste, with minor inclusions of small sand particles visible on the fracture. Due to uneven firing, the color of the paste in the interior exhibits a dark gray hue. The surface of the mug, both interior and exterior, is covered with a partially preserved layer of red slip; burnishing with a sheen is also evident. The rim is bent outward, with a flattened-oval cross-section; the diameter is 8 cm. The walls of the body widen slightly towards the base, which is not preserved; wall thickness is 0.5–0.9 cm. On the lower part of the body, there are traces of attachment of a loop-shaped handle. The preserved height of the mug is 10.7 cm (Figure 22).

Figure 22. Ks_25_R1_5_1

Ks_25_R1_10

Handles

A fragment of a loop-shaped handle from a vessel, presumably a mug, was found. It is made from well-kneaded, dense red paste with a pinkish-beige hue and minor inclusions of fine sand particles. The surface of the handle is coated with a partially preserved layer of red slip, and burnishing with a sheen is also evident. The handle has a subtriangular cross-section, with a width of 1 cm and a thickness of 1.1 cm (Figure 23).

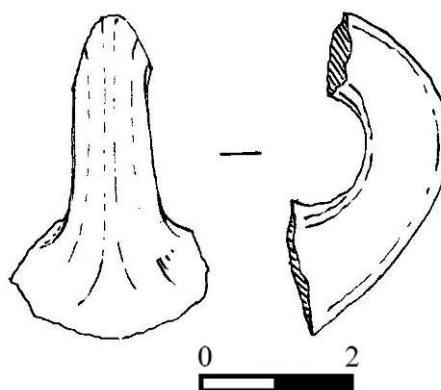


Figure 23. Ks_25_R1_10_1

Metal objects

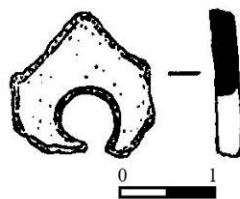


Figure 24. Ks_25_R1_10_2

Ks_25_R1_30

Beads

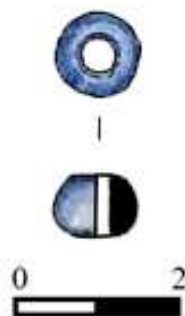


Figure 25. Ks_25_R1_30_1

Ks_25_R1_35

Rims

During the excavation, a fragment of the rim from a small bowl-type vessel was found, manufactured from dense, well-mixed grey clay body, with minor visible inclusions of fine sand particles and white inclusions observable in the break. The surface of the vessel, both on the exterior and interior, is coated with a layer of light grey slip; soot traces and evidence of strong firing are also observed on the surface. A bowl with slightly outward-flaring straight walls; the rim edges are straight and exhibit a flattened-oval cross-sectional profile. An outward-bent pouring spout is present laterally. Rim diameter is approximately 14 cm, wall thickness measures 0.7–0.9 cm, and the estimated vessel height is 5.1 cm (Figure 26).

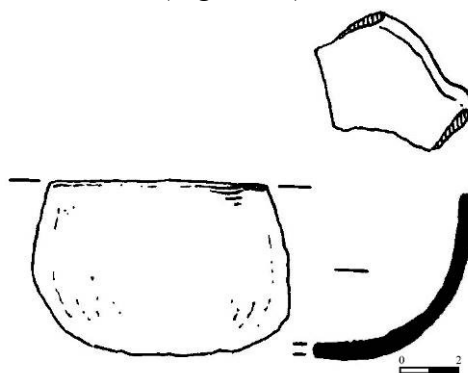


Figure 26. Ks_25_R1_35_1

A rim fragment, presumably from a large jar (khumcha?), was also found. It is produced from a moderately mixed, loose red fabric with a yellow-beige hue and contains numerous visible inclusions of both fine and coarse sand particles, as well as white inclusions observable in fracture. Due to uneven firing, the fabric color within the sherd transitions to grey. The surface of the vessel is coated with a layer of light slip on the exterior and partially on the interior. The rim of the vessel is straight, with thickened edges, and is decorated externally with wide horizontal bands composed of inclined short lines forming vertical and horizontal 'fir tree' ornaments. The width of the upper

band is 2.8 cm, and the width of the lower band is 2.5 cm. The diameter of the rim is 34 cm, and the vessel wall thickness is 1.1 cm (Figure 27).

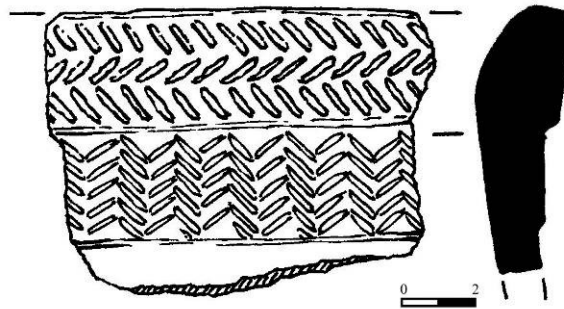


Figure 27. Ks_25_R1_35_2

Lids

A fragment of a lid for vessels was found, specifically the upper part with a partially preserved loop-shaped handle. The fragment is composed of moderately mixed, dense grey paste with minor inclusions of small sand particles. The inner surface of the lid is coated with a layer of brown slip, with traces of burnishing and a visible sheen. The outer surface is partially preserved with a layer of red slip, as well as a layer of soot; in some areas, burnishing with a sheen is also observed. The handle is preserved at the base, with its upper parts missing. The surface of the lid is decorated with incised oval lines. The thickness of the lid is 1.2 cm, and the preserved height of the handle is 2.8 cm (Figure 28).

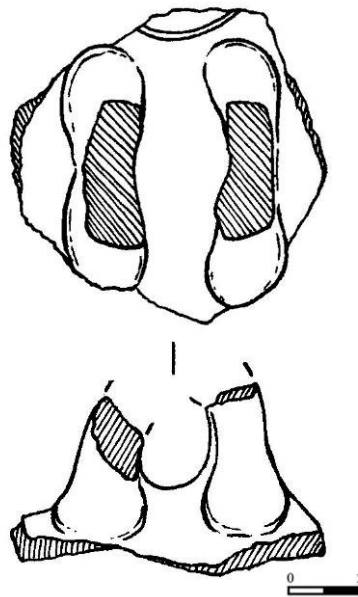
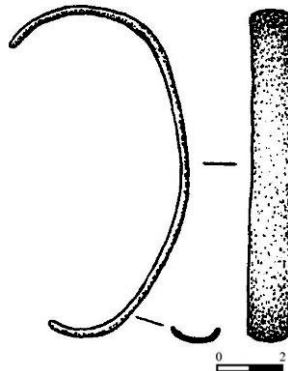


Figure 28. Ks_25_R1_35_3

Metal objects



Ks_25_R1_43***Whole or half-complete vessels***

An archaeologically complete handmade vessel of the pot type was discovered, manufactured from moderately mixed, loose, red paste containing numerous inclusions of small and large sand particles, as well as mineral inclusions visible in the fracture. Due to uneven firing, the color of the paste inside changes to gray. The surface of the vessel is covered on both the interior and exterior with a layer of light slip, and is further marked by patches of soot; partial banded burnishing with a sheen is evident. The rim possesses a thickened, slightly outward-bent edge, with a flattened-oval cross-section; externally, the lip is adorned with horizontal bands composed of incised short lines, forming a ‘fir tree’ pattern in both vertical and horizontal arrangements. The rim diameter is 16.5 cm; a vertical loop-shaped handle is attached laterally to the rim and the shoulder, with a subtriangular-oval cross-section measuring 2.1 cm in width and 1.6 cm in thickness. The body of the vessel is slightly swollen in the central part, with external ornamentation in the form of alternating nail impressions arranged in a line; the vessel walls taper towards a flat bottom with a diameter of 10.6 cm, wall thickness of 0.6–0.9 cm, and vessel height of 22.5 cm (Figure 30).

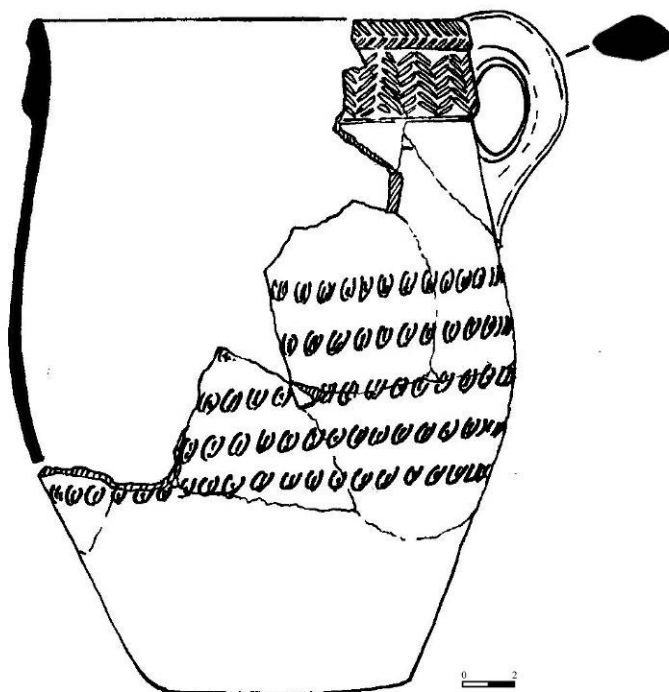


Figure 30. Ks_25_R1_43_1

Lids

A large, handmade lid for a vessel, approximately half preserved, was encountered. It was manufactured from moderately mixed dense grey paste with numerous inclusions of small and large sand particles, as well as white inclusions. The surface of the lid is covered with a layer of light slip; traces of uneven firing are visible as dark spots. Both the exterior and interior of the lid are burnished to a shine. In the central part of the lid, there is a protruding truncated-conical finial, the edge of which is missing. A vertical loop-shaped handle, oval in cross-section, measuring 1.5 cm in width and 1.1 cm in thickness, is attached laterally to the finial. The entire exterior surface of the lid is decorated with incised ornamentation consisting of oval and straight lines, as well as small carved triangles. The edges of the lid are oval in cross-section, with a diameter of 21 cm, a wall thickness of 0.7–1 cm, and a preserved lid height of 11.2 cm (Figure 31).

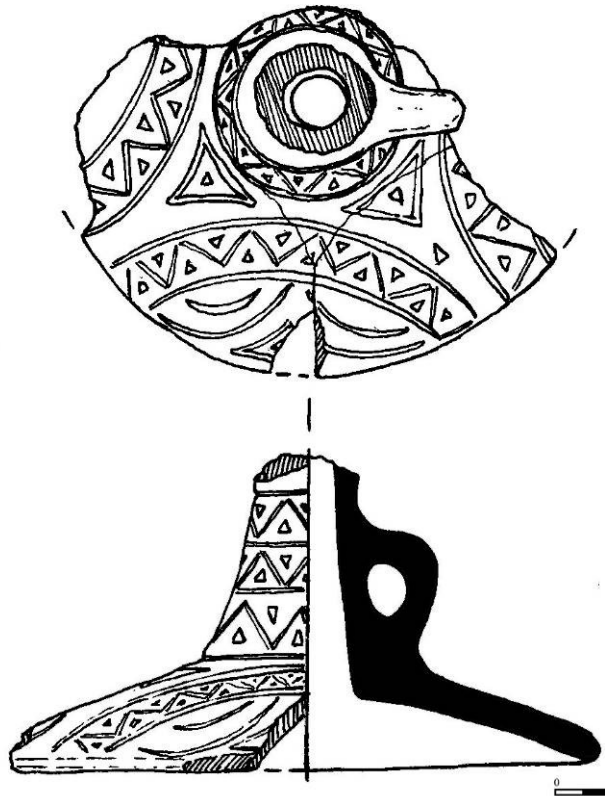


Figure 31. Ks_25_R1_43_2

Other

A fragment of a ceramic vessel was found, presumably a portable stand for cauldrons, made from moderately mixed porous red clay with a yellow-beige shade, containing numerous fine and coarse sand inclusions visible in the fracture; due to uneven firing, the color of the clay inside varies from gray to black. The surface of the vessel is uniformly covered with a layer of lighter-colored clay slip of more liquid consistency; a loop-shaped handle, oval in cross-section, is attached to the side, measuring 1.4 cm in width and 1.6 cm in thickness. Ornamentation is present on the exterior surface of the vessel in the form of alternating impressed small lines, applied across the entire surface. The edges of the vessel are subrectangular in cross-section, with the walls expanding toward the base. The height of the stand is 6.5 cm, with a thickness of 1.3 cm at the upper part and 3 cm at the lower part (Figure 32).

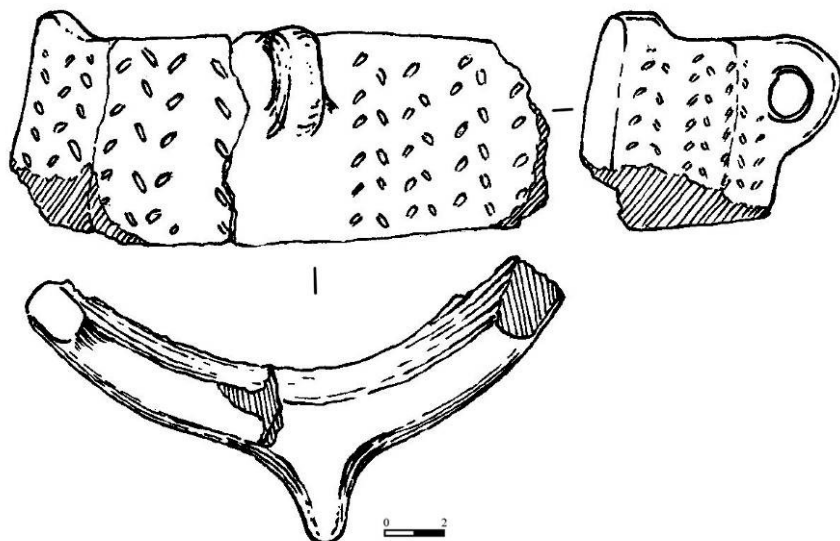


Figure 32. Ks_25_R1_43_3

Ks_25_Sh_0

Rims

During the excavation, a rim fragment from a vessel of the pot type was discovered, manufactured from moderately mixed, loose gray fabric with numerous inclusions of fine sand particles, mica, and chamotte visible on the fracture. The surface of the fragment is coated on both the interior and exterior with a dense, thick layer of red slip of an orange-beige hue. In some areas, there are light patches resulting from uneven firing, as well as spots of soot. Partial banded burnishing is evident, lacking luster. Rim with a thickened, roller-shaped edge, slightly turned outward; along the edge of the rim there is a prominent roller-shaped band on which alternating left-inclined impressed strokes are applied. The rim diameter is approximately 16 cm on the exterior; wall thickness is 0.5–0.6 cm (Figure 33).

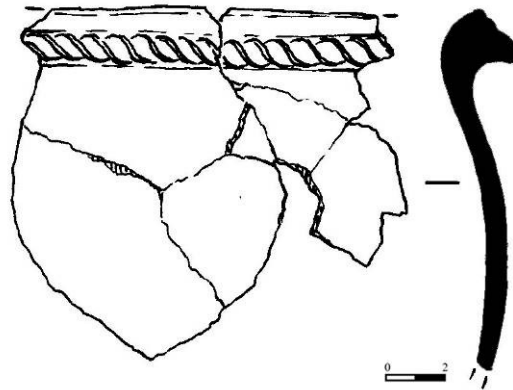


Figure 33. *Ks_25_Sh_0_1*

A rim fragment from a large trapezoidal bowl was also discovered, manufactured from moderately mixed, dense grey clay, with numerous inclusions of both small and large particles of sand, mica, and minerals; due to uneven firing, traces of strong well-fired spots appear on the surface as grey and light patches. The surface of the bowl is covered on both the interior and exterior with a thick layer of red slip, and traces of banded burnishing with a sheen are also visible. The rim is slightly thickened and turned inward at the edges, with an oval cross-section; the diameter is 34 cm, and the wall thickness is 0.6–0.7 cm (Figure 34).

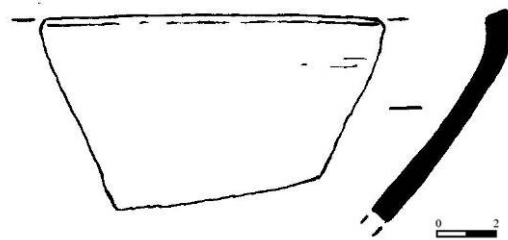


Figure 34. *Ks_25_Sh_0_2*

A fragment of the rim from a large bowl was found, made of well-mixed, dense red-bodied clay with a yellowish-beige tint, containing minor visible inclusions of fine sand particles in the break. The surface of the vessel is partially covered, both internally and externally, with a layer of red slip, which is partially preserved; traces of striped burnishing with a sheen are also visible. On the interior wall of the vessel, a subtriangular applique, presumably intended for a lid, is attached, measuring 2 cm in length and 5.5 cm in width at the base. The rim is straight, with edges of subrectangular cross-section; the diameter is approximately 32 cm, and the wall thickness is 1–1.1 cm (Figure 35).

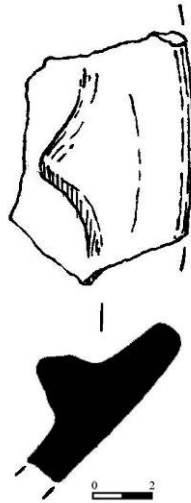


Figure 35. Ks_25_Sh_0_3

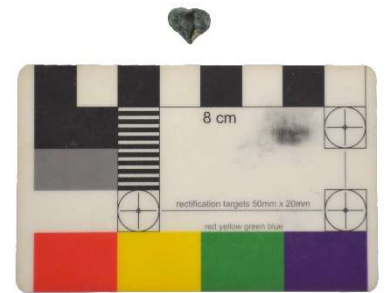
Collection Inventory

No	Artifact Codes	Title and Description of Object	Photograph
Test Pit (Excavation 1)			
1	<p>Rim fragment from a vessel of the jar type (KS_25_Sh_0_1)</p> <p>Rim fragment from a large trapezoidal bowl (KS_25_Sh_0_2)</p> <p>Rim fragment from a large bowl (KS_25_Sh_0_3)</p>	<p>Rim fragment from a vessel of the jar type, manufactured from moderately mixed, loosely compacted grey fabric, with numerous visible inclusions of fine sand particles, mica, and grog apparent in section. The surface of the fragment is covered internally and externally with a dense, thick layer of red engobe of an orange-beige hue; in certain areas, light spots are present due to uneven firing, as well as soot stains. Partial banded burnishing without luster is discernible. Rim with a thickened, roller-shaped edge, slightly everted; a prominent roller-shaped band is applied along the rim edge, on the surface of which alternately impressed, left-leaning lines are incised. Rim diameter is approximately 16 cm along the exterior; wall thickness measures 0.5–0.6 cm. (KS_25_Sh_0_1)</p> <p>Rim fragment from a large, trapezoidal bowl, produced from a densely tempered, medium-mixed grey clay body containing numerous inclusions of fine and coarse sand particles, mica, and minerals. Due to uneven firing, the surface displays traces of intense firing as grey and light spots. The surface of the bowl, both interior and exterior, is covered with a thick layer of red engobe; traces of striped, lustrous burnishing are also visible. Rim with slightly thickened and inward-curved edges, oval-shaped in section; diameter 34 cm, wall thickness 0.6–0.7 cm. (KS_25_Sh_0_2)</p> <p>Rim fragment from a large bowl, produced from well-mixed, dense, red clay with a yellow-beige tint and minor inclusions of fine sand particles visible in the fracture. The surface of the vessel, both on the interior and exterior, is</p>	 <p>The photograph shows three distinct pottery rim fragments. The fragment on the left is dark brown and heavily charred. The fragment on the top right is a reddish-brown color. The fragment on the bottom right is a lighter, yellowish-brown color. A color calibration chart with various colored squares and a ruler is placed below the fragments for scale and color reference.</p>

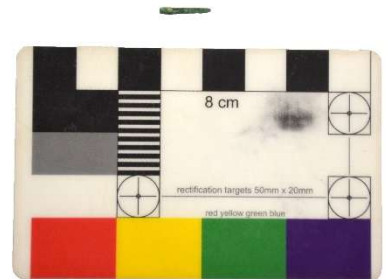
covered with a partially preserved layer of red engobe; traces of banded burnishing with a sheen are also present. On the interior surface of the vessel wall, a subtriangular applique, presumably intended for a lid, is attached; it has a length of 2 cm and a width at the base of 5.5 cm. Rim is straight, with the edges in section exhibiting a subrectangular form; diameter is approximately 32 cm, wall thickness 1–1.1 cm. (KS_25_Sh_0_3)

Recovered material (layer 0)

2 Heart-shaped bronze belt plate
KS_25_0_8
Heart-shaped bronze belt plate, measuring 0.9×0.9 cm, with a thickness of 0.2–0.3 cm. On the inner side at the center, a rod for attachment is soldered, measuring 0.3 cm in length and 0.3 cm in thickness. A rim is visible on the exterior, dividing the plaque into two sections.



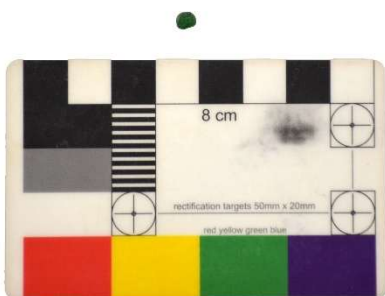
3 Fragment of a rod from a copper needle
KS_25_0_2
Fragment of a rod from a copper needle (possibly a pin) found during stratigraphic survey. Length: 1.3 cm; thickness: 0.2 cm. The rod is coated with green oxide.



4 Fragment of a bronze belt plaque
KS_25_0_3
Fragment of a bronze belt plaque, measuring 1.3×0.7 cm, with a thickness of 0.2–0.3 cm. Portions of the plaque and the rod are missing. Remnants of ornamentation are partially preserved on the exterior of the plaque.



5 Fragment of a green glass bead
KS_25_0_4
Fragment of a spherical green glass bead; diameter 0.5 cm, height 0.3 cm, perforation diameter 0.2 cm.



- 6 Rim fragment from a small vessel, presumably a bowl.
KS_25_1_0_1
Rim fragment from a handmade vessel, of the jar type.
KS_25_1_0_2
Rim fragment from a large jar-shaped vessel.
(KS_25_1_0_3)
Rim fragment from a handmade vessel.
KS_25_1_0_4
Fragment of the body of a large vessel.
KS_25_1_0_5
Fragment of a vessel wall with an attached applique of truncated conical form.
KS_25_1_0_6
Fragment of a handmade, slightly convex lid.
KS_25_1_0_7

Rim fragment from a small vessel, presumably a bowl, manufactured from a well-mixed, dense clay body of red coloration with an orange-beige hue, containing minor inclusions of fine sand particles visible in the breaks. The surface of the rim on both the exterior and interior is partially covered with a layer of light engobe, beige in color. The rim possesses slightly inward-constricted edges and is oval-shaped in section, with a diameter of 13 cm and a wall thickness of 0.5–0.6 cm. On the exterior, along the rim’s edge, slightly pronounced concentric lines are visible, arranged horizontally across the entire diameter. (KS_25_1_0_1)
Rim fragment of a handmade vessel of the pot type, produced from moderately mixed, loosely compacted gray paste, with numerous visible inclusions of fine sand particles, mica, and grog in the fracture surfaces. The surface of the fragment is coated both internally and externally with a dense, thick layer of red engobe exhibiting a yellow-beige tint; localized light patches are present as a result of uneven firing, along with soot stains. Partial banded burnishing without gloss is evident. Rim with a thickened, roll-shaped edge bent outward; ornamentation was applied along the rim in the form of a horizontal band consisting of alternating, left-leaning strokes. The rim diameter is approximately 25 cm along the exterior; wall thickness is 1 cm. (KS_25_1_0_2)
Rim fragment from a large, pot-shaped vessel, made of well-mixed, dense, reddish clay with a gray-beige tint, showing minor visible inclusions of fine sand particles and mica in the fracture. The surface of the fragment is covered on both the exterior and interior sides with a layer of light-colored engobe; in certain areas, reddish stains are visible, presumably resulting from uneven firing. Rim with an outwardly turned edge forming a flat surface 2.6 cm wide. Rim edges are oval in cross-section,



diameter 22 cm, wall thickness 0.8–0.9 cm. (KS_25_1_0_3)

Rim fragment from a hand-built vessel, presumably a wide-mouthed jug, manufactured from a moderately mixed, dense grey fabric with minor inclusions of fine sand particles visible in the fractures. The vessel's interior surface is coated with a layer of red engobe; the exterior surface is covered with a dark, almost black engobe. Burnishing with a sheen is visible on the interior. The rim of the vessel is turned outward, forming a funnel-shaped neck with an oval-shaped cross-section. The diameter is 14 cm. On the exterior, beneath the rim, there is a partially preserved handle of subrectangular cross-section, 2.4 cm in width and 1.6 cm in thickness. The vessel wall thickness is 0.9–1 cm. (KS_25_1_0_4)

Body fragment from a large vessel, presumably from a pot, manufactured from well-kneaded, dense red fabric with a yellow-beige hue; minor visible inclusions of fine sand particles and mica are present in the breaks. The surface of the fragment on the exterior is coated with a layer of light engobe; additionally, incised ornamentation in the form of concentric straight and wavy lines, applied using a comb-like tool, is present on the exterior wall of the vessel. The vessel wall thickness is 0.7–0.8 cm. The interior surface of the walls bears impressed, horizontally alternating lines from the maker's hands, indicating that the vessel was produced on a potter's wheel. (KS_25_1_0_5)

Small wall fragment of a vessel, bearing an attached truncated-conical applique, manufactured from well-levigated, dense, red fabric with a yellow-beige tint, with minor visible admixtures of fine sand particles and mica inclusions visible in the breaks. The surface of the fragment on the exterior side is partially covered with a surviving layer of light engobe; the applique has a height of 1.2 cm, a diameter at the base of approximately 2.3 cm, and the vessel

wall thickness measures 0.6 cm (KS_25_1_0_6).

Small fragment of a hand-built, slightly convex lid, manufactured from a medium-mixed, dense grey fabric, exhibiting numerous visible inclusions of fine sand particles and mica in the fracture. The interior surface of the lid is covered with a layer of red engobe; the exterior surface exhibits black engobe and traces of banded burnishing. Ornamentation in the form of oval lines is also present on the exterior. The edges of the lid are oval-shaped in cross-section; the diameter of the lid is approximately 15 cm, with a wall thickness of 0.9 cm. (KS 25 1 0 7)

7 Beads
KS_25_1_0_8

The beads were collected from the surface. A set comprising 10 beads, varying in material, manufacturing technique, and morphology.

Materials: The assemblage is predominantly composed of objects fashioned from semi-precious stones (presumably carnelian, quartz varieties), opaque colored and translucent glass, as well as ceramics and organic materials (shell/stone).

The assemblage includes a broad typological spectrum of forms: from classical spheroidal and annular types to complex geometric configurations, including biconical faceted and cylindrical shapes. The dimensions of the objects range from small beads (diameter approximately 5–7 mm) to large pendant beads (diameter approximately 30 mm).



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Excavation 1, element 1

8 Rim fragment from a hand-made small pot.
KS_25_1_1_1
Rim fragment from a hand-made cauldron-shaped vessel.

Rim fragment from a hand-made small pot, produced from a moderately mixed, loose, red fabric with numerous visible inclusions of fine and coarse sand, mica, and minerals in the break; due to uneven firing, the fabric color varies to gray and dark tones. The surface of the vessel is covered on both the exterior and interior with a layer of brown engobe; banded burnishing with a sheen is also present



KS_25_1_1_1
0

Rim fragment
from a small
hand-made
vessel.

KS_25_1_1_3

on the exterior and partially on the interior. Rim with a straight, low neck, 2.2 cm in height; rim edge in cross-section is subrectangular to oval-shaped; diameter 12 cm. The vessel body expands almost immediately, exhibiting a spherical form; wall thickness 0.7–0.8 cm. (KS_25_1_1_1)

Rim fragment of a handmade cauldron-shaped vessel, produced from moderately mixed, loose, red clay with a yellow-beige tint, containing numerous visibly discernible inclusions of fine and coarse sand particles, mica, and minerals in the fracture surfaces. Due to uneven firing, the color of the clay body within the vessel walls displays a grayish hue. The surface of the fragment on both the exterior and interior is coated with a pale engobe. Soot stains are present, and traces of burnishing are visible on the interior. Rim of a vessel with a thickened edge; on the exterior of the rim, small alternating incisions were applied, forming a pattern of lines inclined in various directions. The rim diameter is 16 cm; wall thickness is 0.6–0.8 cm. (KS_25_1_1_10)

Rim fragment from a small handmade vessel, presumably a pot, manufactured from a moderately mixed, loosely compacted brown paste containing numerous visible inclusions of fine sand particles in the fracture surfaces. The exterior surface of the vessel is coated with a layer of red engobe; traces of burnishing without gloss are also visible. Rim of the vessel with a thickened edge, of subrectangular form in cross-section; ornamentation is applied to the exterior of the lip in the form of small, alternating left-leaning lines forming a horizontal band, with additional alternating left-leaning lines above, forming a zigzag pattern. Rim diameter: 17 cm; wall thickness: approximately 0.6–0.8 cm. (KS 25 1 1 3)



- 9 Rim fragment from a hand-built vessel of the vase type. KS_25_1_1_4
 Rim fragment from a large hand-built vessel of the jar type. KS_25_1_1_5
 Rim fragment from a small hand-built vessel of the jar type. KS_25_1_1_6
 Wall fragment from a large hand-built vessel. KS_25_1_1_7

Rim fragment from a hand-built vessel of the vase type, with a funnel-shaped rim flared outward; made of well-mixed, dense red fabric, exhibiting a yellow-beige hue, with minor visible admixtures of fine sand particles and mica inclusions in the breaks. The surface of the fragment is coated on both the interior and exterior with a dense layer of red engobe; traces of soot are visible on the interior. Rim with a straight, externally everted edge, subrectangular in cross-section, diameter 17 cm, wall thickness 0.7–0.8 cm. (KS_25_1_1_4)

Rim fragment from a large, hand-built vessel of the pot type, manufactured from a moderately mixed, loose red fabric with an orange-beige hue. Numerous inclusions of both fine and coarse particles of sand, mica, and grog are visible in the break. Owing to uneven firing, the fabric color varies from yellow to gray in certain areas. The exterior surface of the fragment is coated with a layer of light engobe; soot stains and traces are also present. Rim with a thickened edge, subrectangular in cross-section; external rim height is 2.5 cm, diameter 31 cm, vessel wall thickness 1.2–1.3 cm. Ornamentation on the exterior of the rim is represented by an incised concentric band composed of small, alternating left-leaning strokes. (KS_25_1_1_5)

Rim fragment of a hand-formed small vessel of the pot type, produced from moderately mixed, loose red fabric, with numerous visible inclusions of fine sand particles and white fragments apparent in breakage. Owing to uneven firing, the color of the fabric within the vessel wall ranges from grey to dark, nearly black. The interior surface of the vessel is coated with a layer of light engobe; additionally, black soot stains are present across the entire surface. The rim of the vessel is thickened, with a subrectangular cross-section; the exterior edge bears ornamentation in the form of a broad band encircling the entire diameter, consisting of small

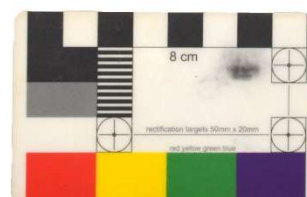


alternating lines forming a 'fir-tree' motif. A small projection is present on the exterior of the rim, presumably a pseudo-handle. Rim diameter is 17 cm; wall thickness is 0.6–0.7 cm. (KS_25_1_1_6)

Wall fragment from a large hand-built vessel, composed of a medium-mixed, loosely compacted red fabric with numerous inclusions of small and large sand particles, as well as white inclusions visible in the breaks. Due to uneven firing, the fabric within the sherd exhibits a greyish hue. The interior surface of the vessel is covered with a layer of light brown hue, while the exterior surface is coated with a thick, light engobe. Firing traces and soot stains are observable. The exterior side bears an appliqued, roller-shaped protruding band, the surface of which displays alternating finger pinches; the wall thickness of the vessel is 1.1–1.2 cm. (KS_25_R1_1_7)

10 Fragment of a stone quern.
KS_25_1_1_1_0

During the removal of the fill layer from the upper construction horizon of the room, a fragment of a stone hand-mill (dirmen) was discovered. The fragment exhibits a suboval shape, measuring 9.8–7.5 × 8–9.5 × 3.5 cm. A drilled handle socket is present on the side, with a diameter of 1.5 cm and a depth of 2 cm. The working surface is smooth. The upper surface bears traces of chipping. Near the edge, the millstone displays a chipped, beveled surface.



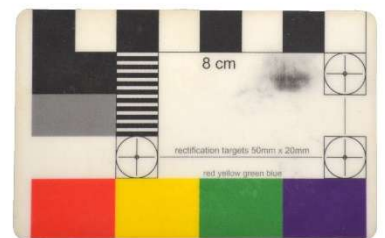
11 Bone artifact
made from
tubular bone.
KS_25_1_1_9

Bone object manufactured from a tubular bone. A fracture is present on one side. The interior of the tubular bone has been cleaned of the medullary septum and subsequently polished. At one edge, two drilled perforations are present, with diameters of 0.7 cm and 0.5 cm. Length of the bone: 11.2 cm; width: 1.3–1.5 cm. The functional designation of the object is unknown.



12 Gaming
asyk—
astragalus.
KS_25_1_1_8

The gaming asyk—astragalus was discovered within the layer adjacent to the northern wall of the room. A drilled hole with a diameter of 0.3 cm is present at the center of the asyk. The asyk measures 3.3 cm in length, 1.8 cm in width, and 1.7 cm in height.



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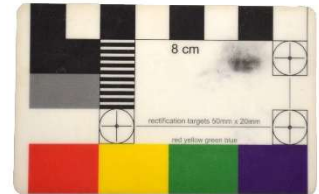
Excavation 1, element 2.

13 Archaeological
ly complete
hand-built cup.
KS_25_1_4_1

Archaeologically complete hand-built cup, manufactured from well-mixed, dense red clay exhibiting a yellow-beige tint, with minor visible inclusions of fine sand particles in the fracture surfaces. The surface of the mug is partially covered, both externally and internally, with a layer of red engobe that is partially preserved, with visible traces of glossy burnishing. The mug exhibits an elongated cylindrical form with an



everted rim; the rim cross-section is flattened and oval-shaped. The rim diameter measures 6.2 cm, and the body diameter is approximately 4.3 cm. The vessel walls transition into a flat base with a diameter of 4.3 cm. Attached laterally is a loop-shaped vertical handle of flattened oval cross-section, measuring 1.9 cm in width and 0.6 cm in thickness. The height of the mug is 9.8 cm.



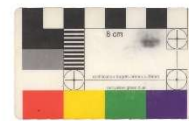
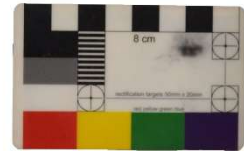
14 Archaeological ly complete hand-built cup KS_25_1_4_2.

Archaeologically complete hand-built vessel, of the small pot type, produced from moderately mixed, porous red fabric with a pink-beige tint, containing numerous visible inclusions of both fine and coarse sand particles, as well as white inclusions. Due to uneven firing, the color of the fabric ranges from yellow to grey. The surface of the vessel, both exterior and interior, is covered with soot and smoke stains; in some areas, a light beige engobe coating is partially preserved. The vessel rim is thickened, with an outwardly turned, ridge-shaped edge; in cross-section, it is sub-rectangular to oval-shaped. A small loop-shaped vertical handle, 1.7 cm in width and 1 cm in thickness, is laterally attached to the rim and the vessel shoulder. The handle is partially preserved. The vessel body is slightly expanded in the central part; the walls taper towards a flat base with a diameter of 6.2 cm. The external edges of the base are smoothed. The height of the vessel is 10.7 cm.



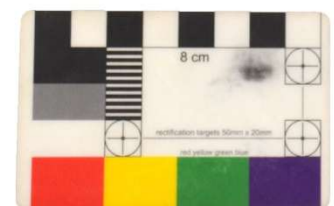
15 Archaeological
ly complete
hand-built
vessel
KS_25_1_4_3.

Archaeologically complete hand-built vessel, of the small pot type, produced from moderately mixed, porous red fabric with a pink-beige tint, containing numerous visible inclusions of both fine and coarse sand particles, as well as white inclusions. Due to uneven firing, the color of the fabric ranges from yellow to grey. The surface of the vessel, both exterior and interior, is covered with soot and smoke stains; in some areas, a light beige engobe coating is partially preserved. The vessel rim is thickened, with an outwardly turned, ridge-shaped edge; in cross-section, it is sub-rectangular to oval-shaped. A small loop-shaped vertical handle, 1.7 cm in width and 1 cm in thickness, is laterally attached to the rim and the vessel shoulder. The handle is partially preserved. The vessel body is slightly expanded in the central part; the walls taper towards a flat base with a diameter of 6.2 cm. The external edges of the base are smoothed. The height of the vessel is 10.7 cm.



16 Half-complete
hand-built cup.
KS_25_1_5_1

Half-complete hand-built cup, produced from a moderately mixed, dense red paste with minor visible inclusions of fine sand particles in the fracture; due to uneven firing, the interior paste exhibits a dark grey hue. The surface of the cup, both interior and exterior, is covered with a partially preserved layer of red engobe; areas of burnishing with a distinct sheen are also evident. Rim with outwardly flared edge, in cross-section flattened oval-shaped; diameter 8 cm. The walls of the body expand slightly toward the base; the base is not preserved. Wall thickness 0.5–0.9 cm. On the lateral side of the lower body, traces of attachment for a loop-shaped handle are present. The height of the preserved portion of the mug is 10.7 cm.



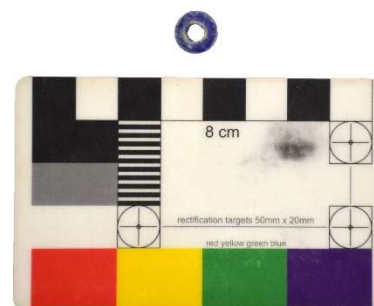
- 17 Fragment of a loop-shaped handle from a vessel, presumably from a mug, manufactured from well-kneaded, dense red clay of pinkish-beige hue with minor inclusions of fine sand particles. The surface of the handle is partially covered with a layer of red engobe, and areas of glossy burnishing are also evident. The handle exhibits a sub-triangular cross-section, with a width of 1 cm and a thickness of 1.1 cm.



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Excavation 1, element 30.

- 18 Spherical glass paste bead. Within the child's burial (late construction period), a spherical blue glass paste bead was found in the mandibular region during the cleaning of the child's skeleton; it measures 1 cm in diameter, 0.7 cm in height, and possesses a perforation diameter of 0.4 cm.



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Excavation 1, element 35.

- 19 Rim fragment from a small bowl-type vessel. Rim fragment from a vessel, presumably from a large jar. Portion of a vessel lid.
- Rim fragment from a small bowl-type vessel, manufactured from dense, well-mixed grey fabric with minor visible inclusions of fine sand particles and white components in the fracture. The surface of the vessel, both externally and internally, is covered with a layer of light grey engobe; traces of soot and evidence of intense firing are also present on the surface. Bowl with slightly outward-flaring straight walls; rim edges are straight and, in cross-section, flattened oval-shaped. A laterally attached pouring spout extends outward. Rim diameter approximately 14 cm; wall thickness 0.7–0.9 cm; estimated vessel height 5.1 cm. (KS_25_1_35_1)
- Rim fragment from a vessel, presumably from a large jar (khumcha?), manufactured from moderately tempered, porous red fabric with a yellow-beige hue. Numerous visible admixtures of both fine and coarse sand particles, as well as white inclusions, are present in fracture. Due to uneven firing,



the color of the paste within the sherd varies to gray. The surface of the vessel is coated with a layer of light engobe on the exterior and partially on the interior. The rim of the vessel is straight, with thickened edges. The exterior is adorned with wide horizontal bands composed of small, inclined lines, forming vertical and horizontal 'fir-tree' ornaments. The width of the upper band is 2.8 cm; the width of the lower band is 2.5 cm. The rim diameter measures 34 cm, and the wall thickness of the vessel is 1.1 cm. (KS_25_1_35_2)

Upper part of a vessel lid, featuring a partially preserved loop-shaped handle. Fragment manufactured from a medium-mixed, dense, grey fabric with minor inclusions of fine sand particles. The interior surface of the lid is coated with a layer of brown engobe and exhibits traces of burnishing with a sheen; the exterior surface retains a partially preserved layer of red engobe, as well as soot and smoke deposits, with areas showing evidence of burnishing with a sheen. The handle is preserved at the base; its upper portion is missing. The surface of the lid is adorned with incised oval lines. The lid's thickness measures 1.2 cm, and the preserved height of the handle is 2.8 cm. (KS 25 1 35 3)

20 Copper bracelet.
KS_25_1_35_4

The copper bracelet is formed as a flattened arc with rounded edges. The bracelet has a flattened cross-section. The exterior of the bracelet is decorated with a separating ridge. Diameter of the bracelet arc: 10 cm; bracelet width: 1.2 cm; thickness: 0.2 cm.



CITADEL
Excavation 1, element 43.

21 Archaeological ly complete hand-built vessel of the pot type.
KS_25_1_43_1

Archaeologically complete hand-built vessel of the pot type, manufactured from moderately mixed, loosely compacted red fabric with multiple visible inclusions of fine and coarse sand particles, as well as mineral inclusions apparent in the fracture; due to uneven firing, the interior fabric color changes to grey. The surface of the vessel on both the interior and exterior is covered with a layer of light engobe, as well as patches of soot. Partial banded burnishing with sheen is observable. Rim with a thickened, slightly outwardly turned edge; in section, flattened oval-shaped. The exterior of the rim is decorated with horizontal bands composed of incised short lines, forming a 'fir tree' pattern with vertical and horizontal motifs. Rim diameter: 16.5 cm. A vertical loop-shaped handle of subtriangular-oval cross-section is attached laterally to the rim and shoulder, with a width of 2.1 cm



and a thickness of 1.6 cm. The vessel body is slightly swollen at the central section; on the exterior, there is ornamentation consisting of alternating, linearly arranged nail impressions. The vessel walls taper to a flat base with a diameter of 10.6 cm, wall thickness of 0.6–0.9 cm, and vessel height of 22.5 cm.

22 Half-complete, large, hand-modeled lid for a vessel. KS_25_1_43_2

Half-complete, large, hand-modeled lid for a vessel, manufactured from moderately mixed, dense grey paste, containing numerous inclusions of fine and coarse sand particles, as well as white inclusions. The surface of the lid is covered with a layer of light engobe; uneven firing marks in the form of dark spots are also visible. Both the exterior and interior surfaces of the lid are burnished to a sheen. In the central part of the lid, there is a projecting, truncated conical knob, with its edge lost. Affixed to the side of the knob is a vertical loop-shaped handle, oval-shaped in cross-section, 1.5 cm in width and 1.1 cm in thickness. The entire external surface of the lid is adorned with incised ornamentation, consisting of oval and straight lines, as well as small, cut-out triangles. The edges of the lid are oval-shaped in cross-section; the diameter is 21 cm, the wall thickness is 0.7–1 cm, and the preserved height of the lid is 11.2 cm.



23 Fragment of a ceramic object, presumably a portable stand for cauldrons. KS_25_1_43_3

Fragment of a ceramic object, presumably a portable stand for cauldrons, manufactured from moderately mixed, loosely compacted red fabric with a yellow-beige tint; numerous visible inclusions of both fine and coarse sand grains are present in the break, and due to uneven firing, the color of the fabric inside varies to grey or black. The surface of the object is uniformly covered on all sides with a layer of lighter-colored, more fluid clay slip; a loop-shaped handle, oval-shaped in cross-section, with a width of 1.4 cm and a thickness of 1.6 cm, is affixed laterally. The exterior surface of the



object exhibits ornamentation consisting of alternating impressed small notches distributed across the entire surface. The edges of the object are subrectangular in cross-section, with the walls expanding towards the base. The height of the stand is 6.5 cm; the thickness at the upper section is 1.3 cm, and at the lower section is 3 cm.



Photographic Appendix to the Catalogue Inventory



Figure 1 - Fragments of rimsKS_25_SH_0_1-3



Figure 2 - Heart-shaped bronze belt plaque KS_25_0_8

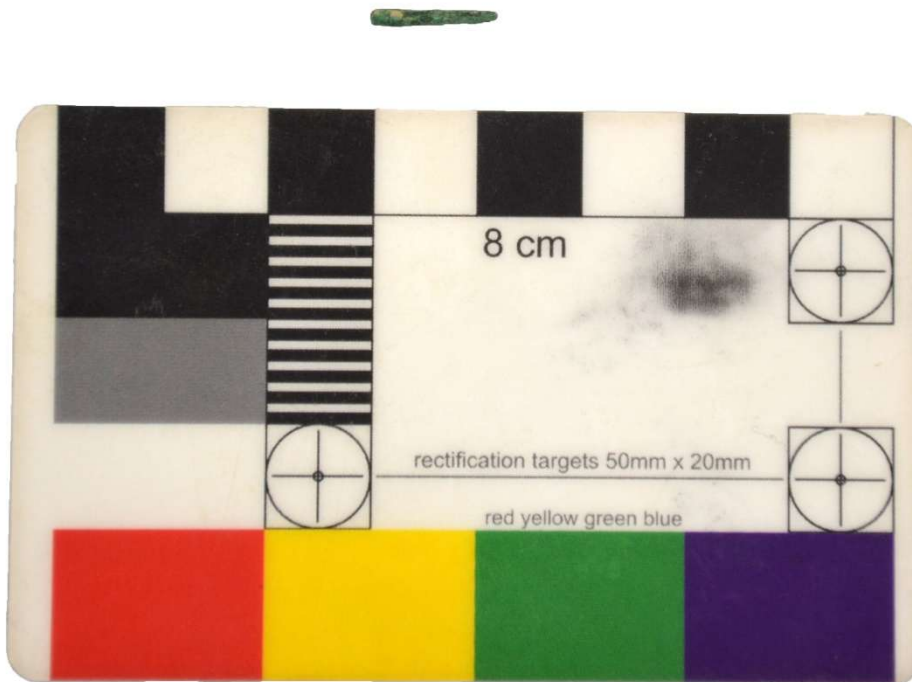


Figure 3 - Fragment of shaft from copper needle KS_25_0_2

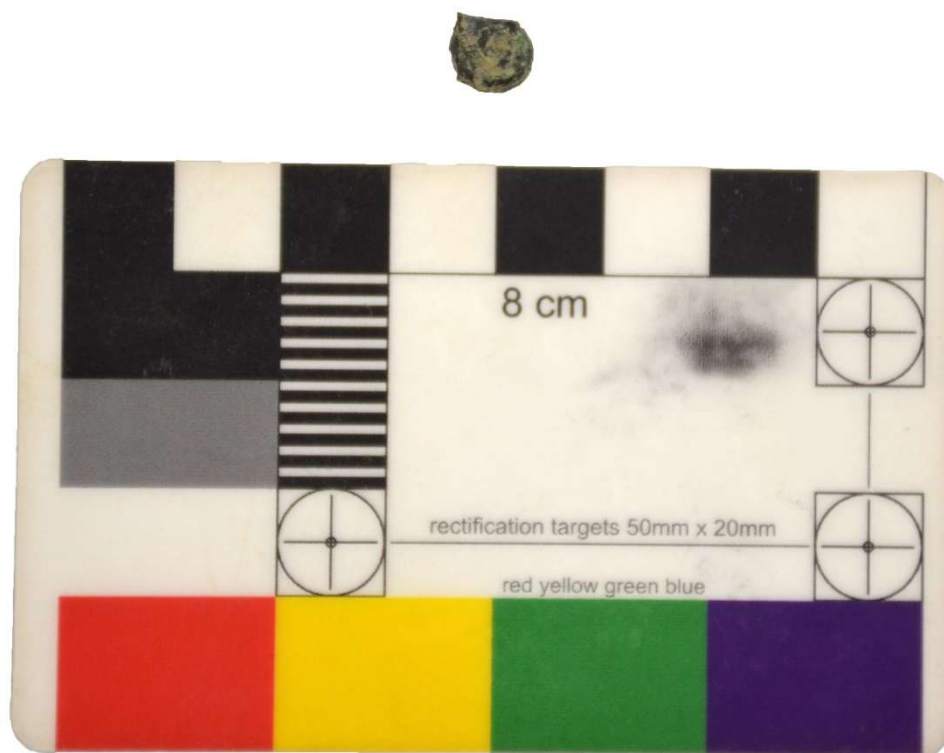


Figure 4 - Fragment of bronze belt plaque KS_25_0_3

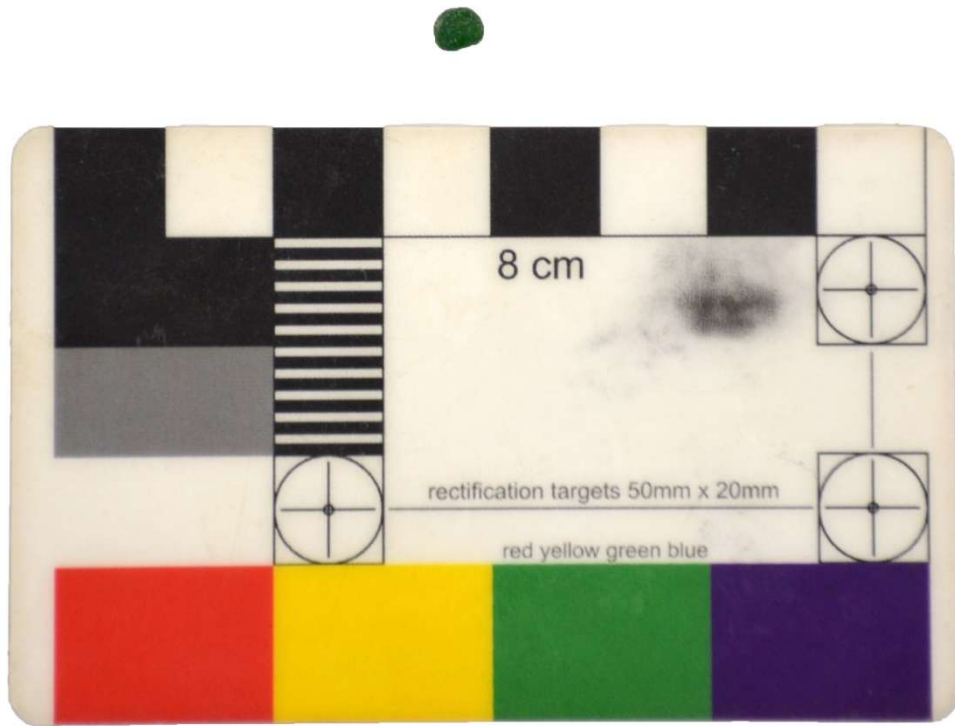


Figure 5 - Fragment of green paste bead KS_25_0_4

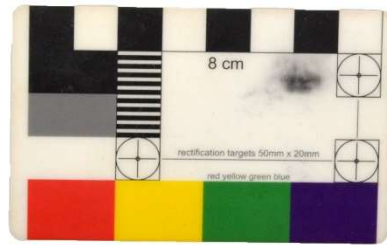




Figure 6 - Rim fragments KS_25_0_1-7



Figure 7 - Beads KS_25_0_8



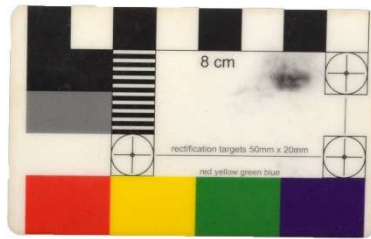


Figure 8 - Rim fragments KS_25_1_1_1, 3, 10

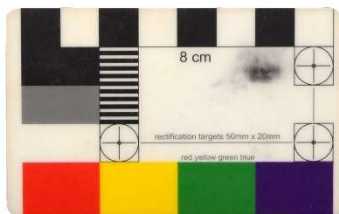




Figure 9 - Rim fragments KS_25_1_1_4-7



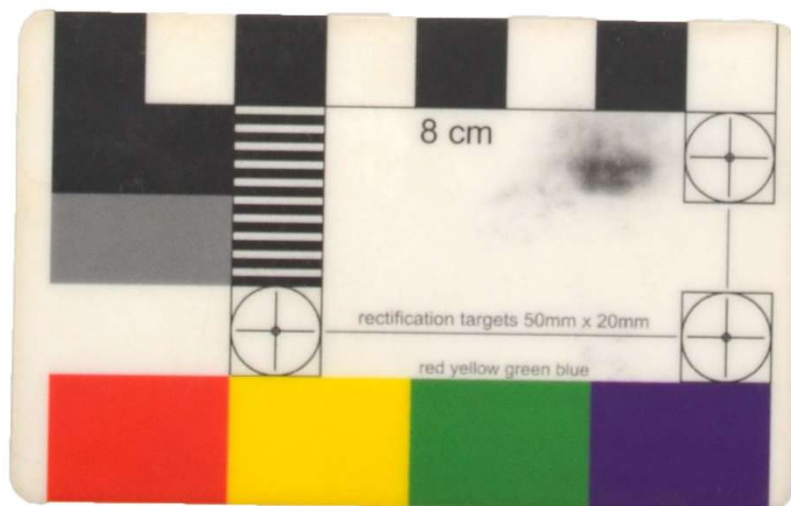


Figure 10 - Fragment of a stone quern KS_25_1_1_10

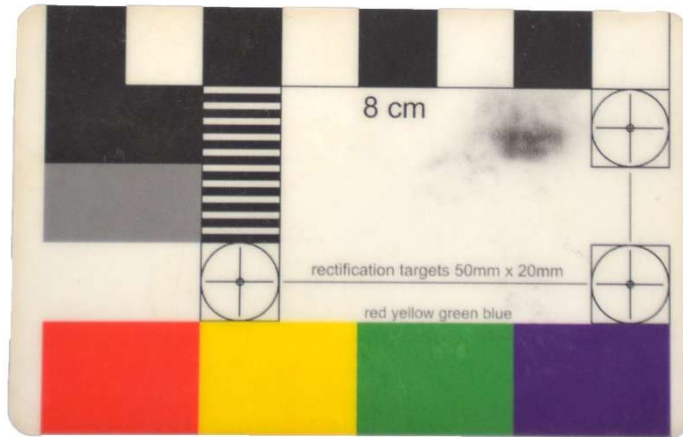
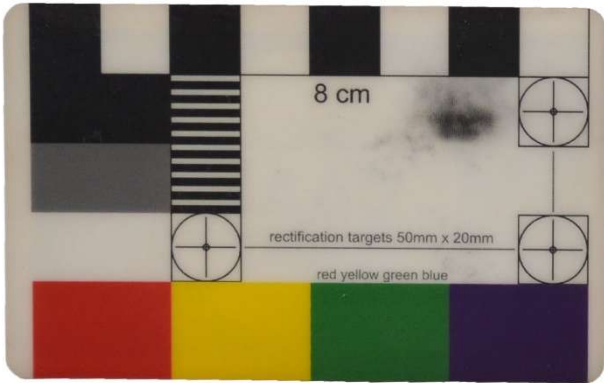


Figure 11 - Bone artefact made from tubular bone KS_25_1_1_9



Figure 12 - Game asyk – astragalus KS_25_1_1_8



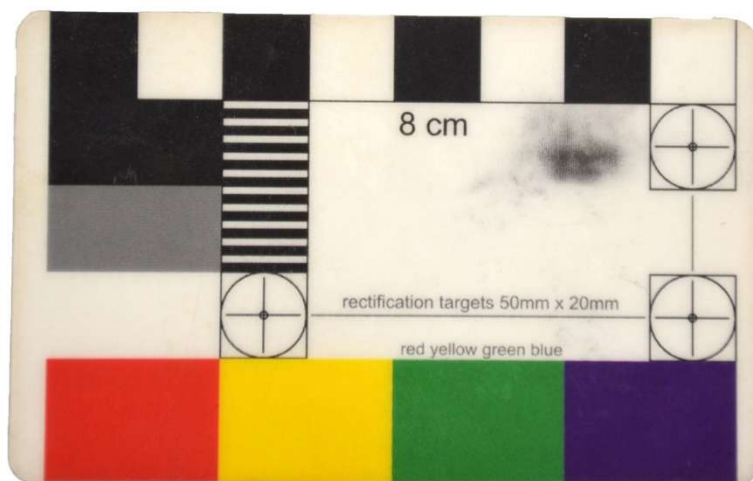


Figure 13 – Archaeologically intact hand-built cup KS_25_1_4_1

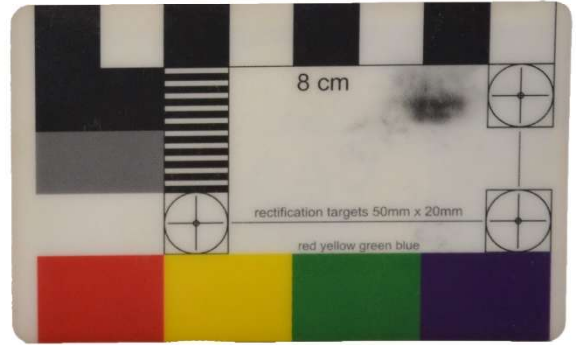
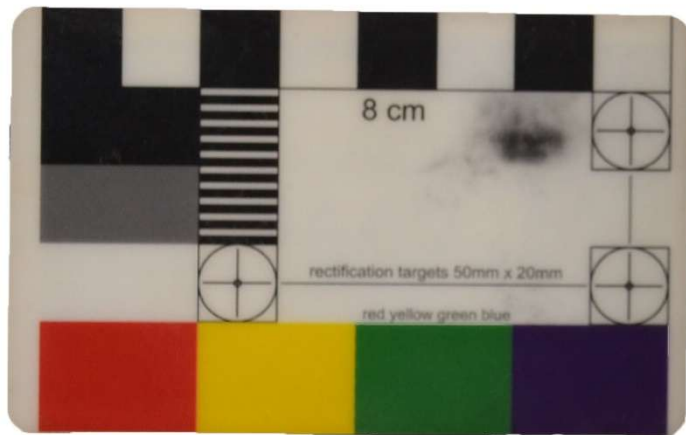




Figure 14 – Archaeologically intact hand-built cup KS_25_1_4_2



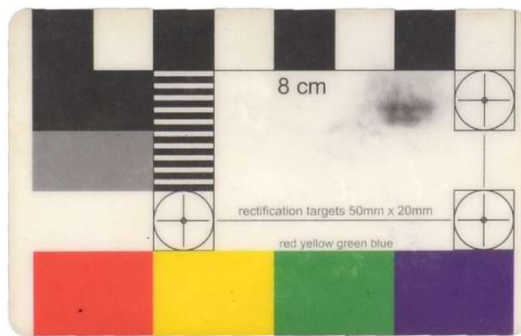


Figure 15 – Archaeologically intact hand-built vessel KS_25_1_4_3

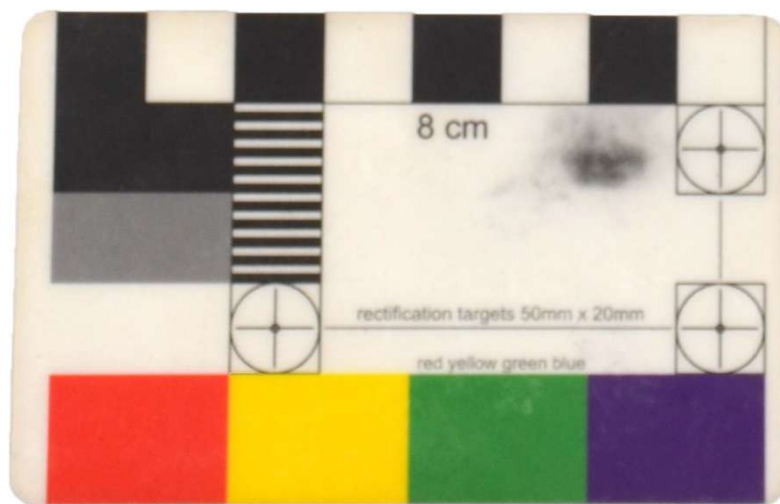


Figure 16 – Partially complete hand-built cup KS_25_1_5_1

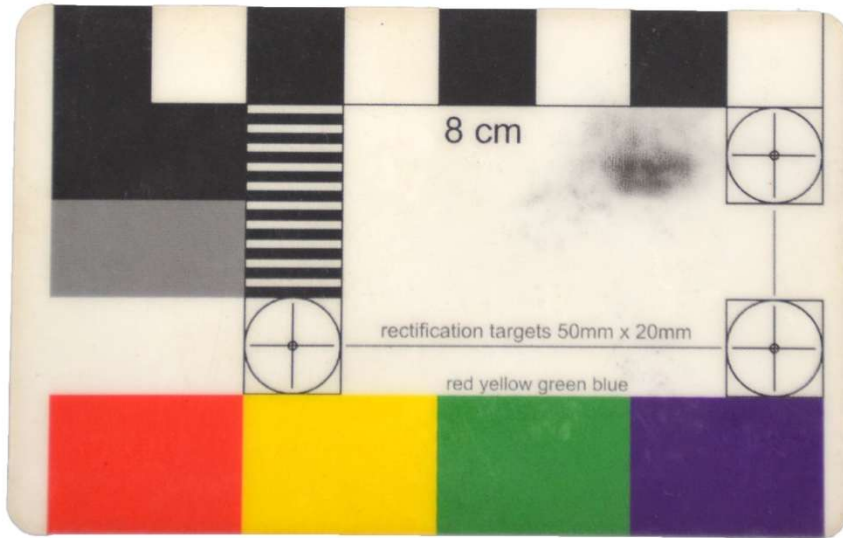


Figure 17 – Fragment of a looped handle from a vessel KS_25_1_10_1

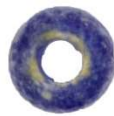


Figure 18 – Spherical glass paste bead KS_25_1_30_1



Figure 19 - Fragments of rims and handle KS_25_1_35_1-3

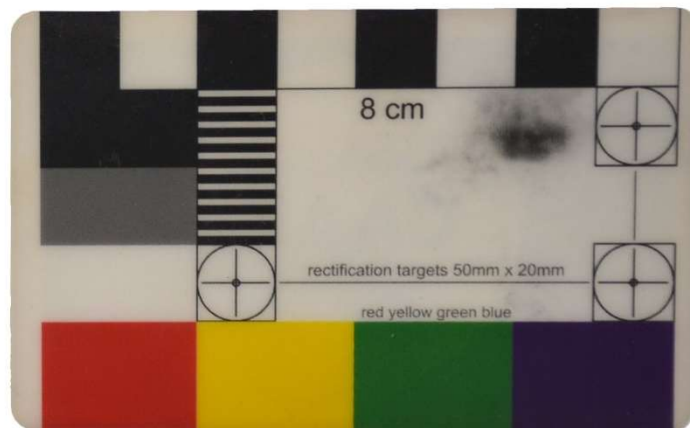
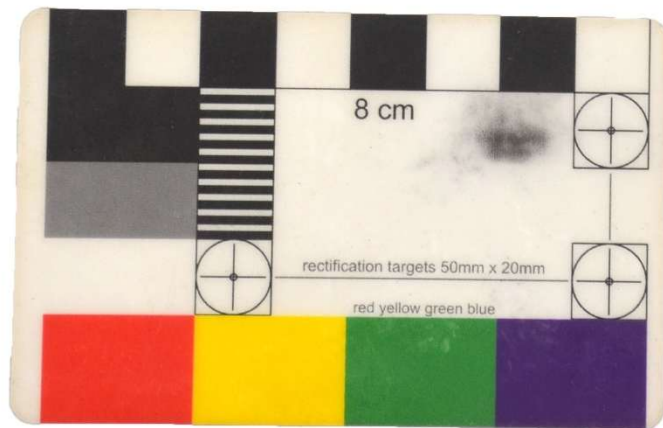


Figure 20 - Copper bracelet KS_25_1_35_4



Figure 21 - Archaeologically intact hand-built vessel, pot type KS_25_1_43_1

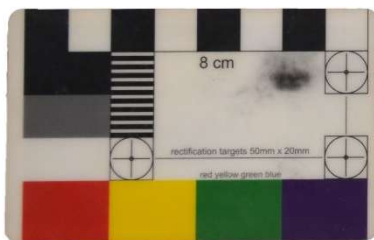
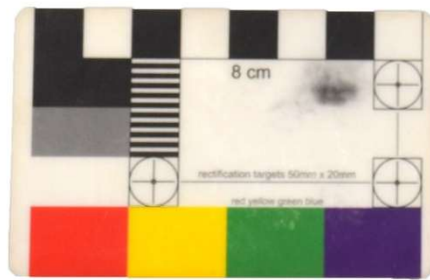


Figure 22 - Partially intact large hand-built lid for vessel KS_25_1_43_2

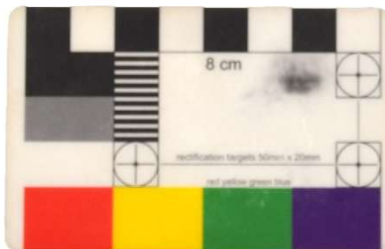
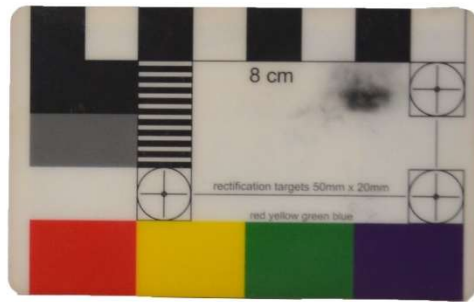


Figure 23 - Fragment of ceramic object, presumably a portable stand for cauldrons
KS_25_1_43_3

Statistical analysis of unglazed pottery

Ks_2025
Excavation 1 (R-1)
Element 0

Ceramics Kuyuk kala		Keskken-	Ks_2025					R_1	
Type	Technology	Rim	Base	Body, unornam ented.	Body, ornamente d.	Handl es	Lids	Other	Total
1) Very well-levigated red fabric without inclusions, unslipped.	Dense fabric, very even on the fracture. Very few micropores, isolated mica.								
1a) Well-levigated red fabric with inclusions, unslipped.	The dense fabric is uniform on the fracture. Not many. Pores, microcracks, micas, minerals.	2	1	8	4			1	16
1b) Well-levigated red fabric with a dark (black) slip.	Dense fabric, fairly uniform on the fracture. Not many pores, microcracks, micas, or minerals.			2					2
1c) Same as 1b, plus burnishing.	Same as 1b, plus burnishing.								
1d) Well-levigated red fabric with a light (white or beige) slip.	Dense fabric, relatively uniform on the fracture. Few pores and microcracks; large quantity of micas and white inclusions.	1	1	38				3	43
1e) The same as 1d, plus slip streaks of dark or red color.	The same as 1d, plus streaks over a light slip background.			3					3
1f) The same as 1d, plus burnishing.	The same as 1d, plus burnishing.			5					5
1g) Well-levigated red fabric with a red (red-brown) slip.	Dense fabric, relatively uniform on the fracture. Few pores and microcracks; mica.			22	2				24

	Large quantity of small and medium white inclusions.								
1h) Same as 1f, plus burnishing.	Same as 1f, plus burnishing.			13	1				14
2) Moderately levigated red fabric, not slipped.	Not a dense fabric, uneven on the fracture. Large number of rather large cracks and pores.		1	56					57
2a) Moderately levigated red fabric with a light (white) slip.	Same as 2, plus light slip.	2		123	3		4	2	134
2b) The same as 2a, with slip streaks of dark or red color.	The same as 2a, with streaks over a light slip background.			10					10
2b) The same as 2a, with burnishing.	The same as 2a, with burnishing.								
2c) Medium-levigated red fabric with a reddish slip.	The same as 2, with red slip.	2		61					63
2d) The same as 2c, with burnishing.	The same as 2c, with burnishing.	1		11			3		15
2e) Medium-levigated red fabric with a brown slip.	The same as 2, plus brown slip.								
2f) The same as 2e, plus burnishing.	The same as 2e, plus burnishing.								
2g) Moderately processed red body/fabric with dark (black) slip.	The same as 2, plus dark (black) slip.			5					5
2h) The same as 2g, plus burnishing.	The same as 2g, plus burnishing.	1							1
Type	Technology	Rim	Base	Body, unornamented.	Body, ornamented.	Handles	Lids	Other	Total
3) Very well levigated grey body/fabric,	Dense fabric, very even on the fracture. Very little. White								

without inclusions, unslipped.	inclusions, micropores.								
3a) Well-levigated grey body/fabric, with inclusions, unslipped.	Dense fabric, relatively even on the fracture. Small and medium white inclusions, small stones observed.								
3b) Well-levigated grey body/fabric with (dark) black slip.	Dense fabric, fairly uniform on the fracture. Not many pores, microcracks, micas, or minerals.			2					2
3c) Same as 3b, with burnishing.	Same as 3b, with burnishing.								
3d) Well-levigated grey body/fabric with light slip.	Dense fabric, fairly uniform on the fracture. Few pores and microcracks. Abundant micas, white inclusions.			6					6
3e) Same as 3d, with slip streaks of dark or red color.	Same as 3d, with streaks of dark or red color on a red slip background.								
3f) Same as 3d, with burnishing.	Same as 3d, with burnishing.								
3g) Well-levigated grey body with red (red-brown) slip.	Dense fabric, fairly uniform on the fracture. Few pores and microcracks; mica. A large number of small and medium white inclusions.								
3h) Same as 3f, with burnishing.	Same as 3f plus burnishing.								
4) Moderately levigated grey body/fabric, unslipped.	Not a dense fabric, uneven on the fracture. A large number of rather sizable cracks and pores. Numerous minerals: white, black, and brown inclusions of			11	1		3	2	17

	varying sizes, stones, mica.								
4a) Moderately levigated grey body/fabric with a light slip.	Same as 4 plus light slip.			14	2		1	1	18
4b)	Same as 4a plus burnishing.			2			2		4
4c) Moderately levigated grey body/fabric with a brown or red slip.	Same as 4 + brown slip.			9	3	1	1	1	15
4d) Same as 4c plus burnishing.	Same as 4c plus burnishing.			2		1	1		4
4e) Moderately levigated grey body with a dark (black) slip.	Same as 4 plus dark (black) slip.	2			1				3
4g) Same as 4e plus burnishing.	Same as 4e plus burnishing.	1							1
5) Very well levigated brown body, without inclusions, unslipped.	Dense fabric, very even on the fracture. Occurs individually. Very rare. White inclusions, micropores.								
5a) Well-levigated brown body/fabric with inclusions, not slipped.	Dense fabric, fairly uniform on the fracture. Small and medium white inclusions, as well as small stones, are present.								
Type	Technology	Rim	Base	Body, unornamented.	Body, ornamented.	Handles	Lids	Other	Total
5b) Well-levigated brown body/fabric with a (dark) black slip.	Dense fabric, fairly uniform on the fracture. Not many pores, microcracks, micas, or minerals.								
5c) Same as 5b, plus burnishing.	Same as 5b, plus burnishing.								
5d) Well-kneaded brown	Dense fabric, fairly uniform on the fracture. Few pores								

body/fabric with a light slip.	and microcracks. Abundant micas, white inclusions.								
5e)	Same as 5d, plus burnishing.								
5f) Well-levigated brown body with a red (red-brown) slip.	Dense fabric, fairly uniform on the fracture. Few pores and microcracks; mica. A large number of small and medium-sized white inclusions.								
5g) Same as 5f, plus burnishing.	Same as 5f, plus burnishing.								
6) Moderately levigated brown body, unslipped.	Not a dense fabric, uneven on the fracture. Large number of rather large cracks and pores. Numerous minerals: white, black, and brown inclusions of varying sizes, stones, mica.								
6a) Moderately levigated brown body with a light slip.	Same as 6, plus a light slip.			12					12
6b) Same as 6a, plus burnishing.	Same as 6a + burnishing.			2					2
4c) Moderately levigated grey fabric with brown slip.	Same as 6 + brown slip.			9					9
4d) Same as 4c + burnishing.	Same as 4c + burnishing.								
6e) Moderately processed brown fabric with a dark (black) slip.	Same as 6 + dark (black) slip.			4					4
6f) Same as 6e + burnishing.	Same as 6e + burnishing.								

7) Poorly levigated red fabric.	Coarse, porous, brittle body/fabric; numerous large cracks; many preserved vegetal inclusions. Large black and white inclusions, chamotte.								
Total:		12	3	430	17	2	15	10	489

Ks_2025
Excavation 1 (R_1)
Element 1

Ceramics Kala	Kesken-Kuyuk Technology	Ks_2025							R_1	
		Rim	Base	Body, unornam ented.	Body, ornamente d.	Handl es	Lids	Other	Total	
1) Very well levigated red paste without inclusions, unslipped.	Dense paste, very even in fracture. Very few micropores, occasional mica.									
1a) Well levigated red paste with inclusions, unslipped.	Dense paste, even in fracture. Not many. Pores, microcracks, mica, minerals.		1	1		1			3	
1b) Well-levigated red paste with a (dark) black slip.	Dense paste, fairly even in fracture. Not many. Pores, microcracks, mica, and minerals.									
1c) Same as 1b, plus burnishing.	Same as 1b, plus burnishing.									

1d) Well-levigated red paste with a light (white or beige) slip.	Dense paste, fairly even in fracture. Not soft. Pores and microcracks. Large quantity of mica; white inclusions.			2		1			3
1e) Same as 1d, with slip drips of dark or red color.	Same as 1d, with drips over a light slip background.								
1f) Same as 1d, with burnishing.	Same as 1d, with burnishing.								
1g) Well-levigated red paste with a red (red-brown) slip.	Dense paste, rather even in fracture. Few pores and microcracks; mica. Large quantity of small to medium white inclusions.			3					3
1h) Same as 1f, plus burnishing.	Same as 1f, plus burnishing.								
2) Moderately levigated red paste, unslipped.	Paste not dense, uneven in fracture. Numerous rather large cracks and pores.			16					16
2a) Moderately levigated red paste with light (white) slip.	Same as 2 + light slip.	12	7	31	1		1	1	53
2b) Same as 2a + slip drips of dark or red color.	Same as 2a + drips over a light slip background.			2					2
2b) Same as 2a + burnishing.	Same as 2a + burnishing.	2	1	4			1		8
2c) Medium-fine red paste with reddish slip.	Same as 2 + red slip.	9		9				1	19
2d) Same as 2c + burnishing.	Same as 2c + burnishing.	4	1	7					12
2e) Moderately levigated red paste with brown slip.	Same as 2+ brown slip.		2						2
Same as 2e + burnishing.	Same as 2e + burnishing.								
2g) Moderately levigated red paste with dark (black) slip.	Same as 2+ dark (black) slip.								

Type	Technology	Rim	Base	Body, unornamented.	Body, ornamented.	Handles	Lids	Other	Total
3) Very well levigated grey paste, without inclusions, unslipped.	Dense paste, very even in fracture. Very small white inclusions, micropores.								
3a) Well-levigated grey paste with inclusions, unslipped.	Dense paste, fairly even in fracture. Small and medium white inclusions, small stones present.								
3b) Well-levigated grey paste with (dark) black slip.	Dense paste, fairly even in fracture. Not many. Pores, microcracks, mica, and minerals.								
3c) Same as 3b, plus burnishing.	Same as 3b, plus burnishing.								
3d) Well-levigated grey paste with light slip.	Dense paste, fairly even in fracture. Not many. Pores and microcracks. Abundant mica and white inclusions.			1					1
3e) Same as 3d, with additional drips of dark or red color.	Same as 3d, with additional drips of dark or red color on a red slip background.								
3f) Same as 3d, with additional burnishing.	Same as 3d, with additional burnishing.								
3g) Well-levigated grey paste with a red (red-brown) slip.	Dense paste, relatively even in fracture. Few pores and mica. Numerous small and medium white inclusions.								
3h) Same as 3f, with burnishing.	Same as 3f, with burnishing.								

4) Moderately levigated grey paste, unslipped.	Paste not dense, uneven in fracture. Numerous rather large cracks and pores. Pl. Minerals: white, black, and brown inclusions of various sizes; stones; mica.			2					2
4a) Moderately levigated grey paste with light slip.	Same as 4, with light slip.			3					3
4b) Same as 4a, with burnishing.	The same as 4a + burnishing.	1		1					2
4c) Moderately levigated grey paste with brown or red slip.	The same as 4 + brown slip.		1						1
4d) The same as 4c + burnishing.	The same as 4c + burnishing.	2							2
4e) Moderately levigated grey paste with dark (black) slip.	The same as 4 + dark (black) slip.								
4g) The same as 4e + burnishing.	The same as 4e + burnishing.								
5) Very well-levigated brown paste, without inclusions, unslipped.	Dense paste, very even in fracture. Very small white inclusions and micropores occur singly.								
5a) Well-levigated brown paste, with inclusions, unslipped.	Dense paste, fairly even in fracture. Small and medium white inclusions, small stones present.								
Type	Technology	Rim	Base	Body, unornamented.	Body, ornamented.	Handles	Lids	Other	Total
5b) Well-levigated brown paste with (dark) black slip.	Dense paste, fairly even in fracture. Not many. Pores, microcracks, mica, and minerals.								
5c) Same as 5b, with burnishing.	Same as 5b, with burnishing.								

5d) Well-levigated brown paste with a light slip.	Dense paste, fairly even in fracture. Not many. Pores and microcracks. A substantial amount of mica; white inclusions.								
5e) Same as 5d, with the addition of burnishing.	Same as 5d, with burnishing.								
5f) Well-levigated brown paste with a red (red-brown) slip.	Dense paste, fairly even in fracture. Few pores and microcracks. Presence of mica. Numerous small and medium white inclusions.								
5g) Same as 5f, with the addition of burnishing.	Same as 5f, with burnishing.								
6) Moderately levigated brown paste, unslipped.	Paste not dense, uneven in fracture. Numerous rather large cracks and pores. Pl. Minerals: white, black, and brown inclusions of various sizes; stones; mica.			1					1
6a) Moderately levigated brown paste with a light slip.	The same as 6 plus light slip.		1		1				2
6b)	The same as 6a plus burnishing.								
4c) Moderately levigated grey paste with brown slip.	The same as 6 plus brown slip.				1				1
4d) The same as 4c plus burnishing.	The same as 4c plus burnishing.								
6e) Moderately processed brown paste with dark (black) slip.	The same as 6 plus dark (black) slip.			1					1
6f) Same as 6e, plus burnishing.	Same as 6e, plus burnishing.			1					1

7) Poorly levigated red paste.	Coarse, friable, brittle paste with numerous large cracks. Many preserved vegetal inclusions. Large black and white inclusions, as well as chamotte, are present.			17	5				22
Total:		30	14	102	8	2	2	2	160

Ks_2025
Excavation 1 (R_1)
Element 9

Ceramics kala	Kesken-Kuyuk	Ks_2025					R_1			Total
		Rim	Base	Body. Unornam ented.	Body. Ornament ed.	Handl es	Lids	Other		
1) Very well levigated red paste without inclusions; unslipped.	Dense fabric, very even on the fracture. Very few micropores; isolated mica.									
1a) Well levigated red paste with inclusions; unslipped.	Dense fabric, even on the fracture. Not much. Pores, microcracks, mica, minerals.									
1b) Well-levigated red paste with a (dark) black slip.	Dense fabric, rather even on the fracture. Not much. Pores, microcracks, mica, and minerals.									
1c) Same as 1b, plus burnishing.	Same as 1b, plus burnishing.									

1d) Well-levigated red paste with a light (white or beige) slip.	Dense fabric, relatively even on the fracture. Not soft. Pores and microcracks; abundant mica and white inclusions.								
1e) Same as 1d, plus slip trails of dark or red color.	Same as 1d, plus trails over a light slip background.								
1f) Same as 1d, plus burnishing.	Same as 1d, plus burnishing.								
1g) Well-levigated red fabric with a red (red-brown) slip.	Dense fabric, fairly even on the fracture. A few pores and microcracks. Mica. A large number of small and medium-sized white inclusions.								
1h) Same as 1f, plus burnishing.	Same as 1f, plus burnishing.								
2) Moderately levigated red fabric, unslipped.	Not a dense fabric, uneven on the fracture. A large number of rather large cracks and pores.								
2a) Moderately levigated red fabric with a light (white) slip.	The same as 2 + light slip.			1					1
2b) The same as 2a, plus slip trails of dark or red color.	The same as 2a, plus trails over a light slip background.								
2b) The same as 2a, plus burnishing.	The same as 2a, plus burnishing.								
2c) Medium-fired red paste with a reddish slip.	The same as 2 + red slip.								
2d) The same as 2c, plus burnishing.	The same as 2c, plus burnishing.								
2e) Moderately levigated red fabric with brown slip.	Same as 2 , but with brown slip.								

2f) Same as 2e, but with burnishing.	Same as 2e, but with burnishing.								
2g) Moderately levigated red fabric with dark (black) slip.	Same as 2, but with dark (black) slip.								
2h) Same as 2g, but with burnishing.	Same as 2g, but with burnishing.								
Type	Technology	Rim	Base	Body. Unornamented.	Body. Ornamented.	Handles	Lids	Other	Total
3) Very well levigated grey fabric, without inclusions, unslipped.	Dense fabric, very even on the fracture. Very small white inclusions and micropores.								
3a) Well-levigated grey paste with inclusions, unslipped.	Dense fabric, fairly even on the fracture. Small and medium white inclusions, small stones occur.								
3b) Well-levigated grey paste with a (dark) black slip.	Dense fabric, rather even on the fracture. Not much. Pores, microcracks, mica, and minerals.								
3c) Same as 3b, with burnishing.	Same as 3b, with burnishing.								
3d) Well-levigated grey paste with a light slip.	Dense fabric, rather even on the fracture. Not much. Pores and microcracks. Abundant mica and white inclusions.								
3e) Same as 3d, plus slip trails of dark or red color.	Same as 3d, plus trails of dark or red color on a red slip background.								
3f) Same as 3d, plus burnishing.	Same as 3d, plus burnishing.								
3g) Well-levigated grey paste with a red (red-brown) slip.	Dense fabric, rather even on the fracture. Few pores and mica. A large number of small and medium-sized white inclusions.								

3h) Same as 3f, plus burnishing.	Same as 3f, plus burnishing.								
4) Moderately levigated grey paste, unslipped.	Not a dense fabric, uneven on the fracture. A large number of rather large cracks and pores. Pl. Minerals: white, black, and brown inclusions of various sizes, stones, mica.								
4a) Moderately levigated grey paste with light slip.	Same as 4, plus light slip.								
4b) Same as 4a, plus burnishing.	Same as 4a plus burnishing.								
4c) Moderately levigated grey paste with brown or red slip.	Same as 4 plus brown slip.								
4d) Same as 4c plus burnishing.	Same as 4c plus burnishing.								
4e) Moderately processed grey paste with dark (black) slip.	Same as 4 plus dark (black) slip.								
4g) Same as 4e plus burnishing.	Same as 4e plus burnishing.								
5) Very well-levigated brown paste, without inclusions, unslipped.	Dense fabric, very even on the fracture. Occasionally, very small white inclusions and micropores occur.								
5a) Well-levigated brown paste, with inclusions, unslipped.	Dense fabric, fairly even on the fracture. Small and medium white inclusions, small stones occur.								
Type	Technology	Rim	Base	Body. Unornamented.	Body. Ornamented.	Handles	Lids	Other	Total

5b) Well-levigated brown paste with a (dark) black slip.	Dense fabric, rather even on the fracture. Not much. Pores, microcracks, mica, and minerals.								
5c) As in 5b, with additional burnishing.	As in 5b, with additional burnishing.								
5d) Well-levigated brown paste with a light slip.	Dense fabric, rather even on the fracture. Not much. Pores and microcracks. A large amount of mica, with white inclusions.								
5e)	Same as 5d, plus burnishing.								
5f) Well-levigated brown fabric with a red (red-brown) slip.	Dense fabric, fairly even on the fracture. Some pores and microcracks. Mica. A large number of small and medium-sized white inclusions.								
5g) Same as 5f, plus burnishing.	Same as 5f, plus burnishing.								
6) Moderately levigated brown fabric, unslipped.	Not a dense fabric, uneven on the fracture. A large number of rather large cracks and pores. Pl. Minerals: white, black, and brown inclusions of various sizes, stones, mica.								
6a) Moderately levigated brown fabric with a light slip.	Same as 6 + light slip.								
6b)	Same as 6a + burnishing.								
4c) Moderately levigated grey paste with brown slip.	Same as 6 + brown slip.								

4d) Same as 4c + burnishing.	Same as 4c + burnishing.								
6e) Moderately processed brown paste with dark (black) slip.	Same as 6 + dark (black) slip.								
6f) Same as 6e, plus burnishing.	Same as 6e, plus burnishing.								
7) Poorly levigated red fabric.	Coarse, loose, brittle paste. Numerous large cracks. Many preserved vegetal inclusions. Large black and white inclusions are present, as well as chamotte.								
Total:				1					1

Ks_2025
Excavation 1 (R_1)
Element 10

Ceramics Kala		Kesken-Kuyuk		Ks_2025			R_1		
Type	Technology	Rim	Base	Body, unornam ented	Body, ornamente d	Handl es	Lids	Other	Total
1) Very well levigated red fabric without inclusions, unslipped.	Dense fabric, very even fracture surface. Very few micropores, occasional mica.								
1a) Well levigated red fabric with inclusions, unslipped.	Dense fabric, with an even fracture surface. Not many pores, microcracks, mica, minerals								

1b) Well-levigated red fabric with a (dark) black slip.	Dense fabric, with a fairly even fracture surface. Not many pores, microcracks, mica, and minerals								
1c) Same as 1b, with additional burnishing.	Same as 1b, with additional burnishing.								
1d) Well-levigated red fabric with a light (white, beige) slip.	Dense fabric, relatively even on the break. Not soft. Pores and microcracks. Abundant mica and white inclusions.			1					1
1e) As 1d, with slip runs of dark or red color.	As 1d, with slip runs over a light slip background.								
1f) As 1d, with burnishing.	As 1d, with burnishing.								
1g) Well-levigated red fabric with a red (red-brown) slip.	Dense fabric, relatively even fracture surface. Few pores and microcracks; mica present. Numerous small and medium white inclusions.								
1h) As 1f, with the addition of burnishing.	As 1f, with the addition of burnishing.					1		1	2
2) Moderately levigated red fabric, unslipped.	Low-density fabric, uneven fracture surface. Numerous rather large cracks and pores.			1					1
2a) Moderately levigated red fabric with a light (white) slip.	Same as 2 + light slip.	1	1	2					4
2b) Same as 2a, with slip runs of dark or red color.	Same as 2a, with runs over a light slip background.								
2b) Same as 2a, with burnishing.	Same as 2a, with burnishing.								
2c) Medium-fired red fabric with a reddish slip.	Same as 2 + red slip.			1					1
2d) Same as 2c, with burnishing.	Same as 2c, with burnishing.								

2e) Medium levigated red fabric with brown slip.	Same as 2 with brown slip.								
2f) Same as 2e with burnishing.	Same as 2e with burnishing.								
2g) Medium levigated red fabric with dark (black) slip.	Same as 2 with dark (black) slip.								
2h) Same as 2g with burnishing.	Same as 2g with burnishing.								
Type	Technology	Rim	Base	Body, unornamented	Body, ornamented	Handles	Lids	Other	Total
3) Very well levigated grey fabric, without inclusions, unslipped.	Dense fabric, very even fracture surface. Very small white inclusions, micropores.								
3a) Well-levigated grey fabric with inclusions, unslipped.	Dense fabric, fairly even fracture surface. Small and medium white inclusions, small stones present.								
3b) Well-levigated grey fabric with (dark) black slip.	Dense fabric, with a fairly even fracture surface. Not many pores, microcracks, mica, and minerals								
3c) Same as 3b, with burnishing.	Same as 3b, with burnishing.								
3d) Well-levigated grey fabric with light slip.	Dense fabric, with a fairly even fracture surface. Not many. Large number of pores and microcracks, abundant mica, white inclusions.								
3e) Same as 3d, plus slip runs of dark or red color.	Same as 3d, plus runs of dark or red color on a red slip background.								
3f) Same as 3d, plus burnishing.	Same as 3d, plus burnishing.								

3g) Well-levigated grey fabric with a red (red-brown) slip.	Dense fabric, fairly even on the break. Few pores and mica. Large quantity of small and medium white inclusions.								
3h) Same as 3f, plus burnishing.	Same as 3f, plus burnishing.								
4) Moderately levigated grey fabric, unslipped.	Low-density fabric, uneven fracture surface. Large number of relatively large cracks and pores. Minerals: white, black, and brown inclusions of various sizes; stones; mica.								
4a) Moderately levigated grey fabric with a light slip.	Same as 4, plus light slip.								
4b) Same as 4a, plus burnishing.	Same as 4a + burnishing.								
4c) Moderately levigated grey fabric with brown or red slip.	Same as 4 + brown slip.								
4d) Same as 4c + burnishing.	Same as 4c + burnishing.								
4e) Moderately processed grey fabric with dark (black) slip.	Same as 4 + dark (black) slip.								
4g) Same as 4e + burnishing.	Same as 4e + burnishing.								
5) Very well-levigated brown fabric, without inclusions, unslipped.	Dense fabric, very even fracture surface. Rare, very small white inclusions and micropores are present.								
5a) Well-levigated brown fabric with	Dense fabric, fairly even fracture surface. Small and								

inclusions, unslipped.	medium white inclusions, small stones present.								
Type	Technology	Rim	Base	Body, unornamented	Body, ornamented	Handles	Lids	Other	Total
5b) Well-levigated brown fabric with a (dark) black slip.	Dense fabric, with a fairly even fracture surface. Not many pores, microcracks, mica, and minerals								
5c) As 5b, with additional burnishing.	As 5b, with additional burnishing.								
5d) Well-levigated brown fabric with a light slip.	Dense fabric, with a fairly even fracture surface. Not many pores and microcracks. Abundant mica, white inclusions.								
5e)	As in 5d, with the addition of burnishing.								
5f) Well-levigated brown fabric with a red (or red-brown) slip.	Dense fabric, fairly even fracture surface. Few pores and microcracks; mica present. Large quantity of small and medium white inclusions.								
5g) As in 5f, with the addition of burnishing.	As in 5f, with the addition of burnishing.								
6) Moderately levigated brown fabric, unslipped.	Low-density fabric, uneven fracture surface. Large number of relatively large cracks and pores. Minerals: white, black, and brown inclusions of various sizes; stones; mica.								
6a) Moderately levigated brown	Same as 6 + light slip.								

fabric with a light slip.									
6b)	Same as 6a + burnishing.								
4c) Moderately levigated grey fabric with brown slip.	Same as 6 + brown slip.								
4d) Same as 4c + burnishing.	Same as 4c + burnishing.								
6e) Moderately processed brown fabric with dark (black) slip.	Same as 6 + dark (black) slip.								
6f) Same as 6e, with burnishing.	Same as 6e, with burnishing.								
7) Poorly levigated red fabric.	Coarse, loose, brittle fabric; numerous large cracks; abundant preserved vegetal inclusions. Large black and white inclusions, as well as chamotte, are present.								
Total:		1	1	5		1		1	9

Ks_2025
Excavation 1 (R_1)
Element 31

Ceramics kala		Kesken-Kuyuk		Ks_2025					R_1	
Type	Technology	Rim	Base	Body. Unornam ented	Body. Ornament ed	Handl es	Lids	Other	Total	

1) Very well levigated red ceramic paste without inclusions, unslipped.	Dense fabric, very even on the fracture. Very few micropores, occasional mica.								
1a) Well levigated red ceramic paste with inclusions, unslipped.	Dense fabric, even on the fracture. Few. Pores, microcracks, micas, minerals.								
1b) Well-levigated red ceramic paste with a (dark) black slip.	Dense fabric, fairly even on the fracture. Few. Pores, microcracks, micas, and minerals.								
1c) Same as 1b, plus burnishing.	Same as 1b, plus burnishing.								
1d) Well-levigated red ceramic paste with a light (white or beige) slip.	Dense fabric, fairly even on the fracture. Not soft. Pores and microcracks; abundant micas; white inclusions.								
1e) Same as 1d, with slip drips of dark or red color.	Same as 1d, with drips over a light slip background.								
1f) Same as 1d, with burnishing.	Same as 1d, with burnishing.								
1g) Well-levigated red ceramic paste with red (red-brown) slip.	Dense fabric, rather even on the fracture. Few pores and microcracks; mica present. A large quantity of small and medium-sized white inclusions.								
1h) Same as 1f, plus burnishing.	Same as 1f, plus burnishing.								
2) Moderately levigated red ceramic paste, unslipped.	Not a dense fabric, uneven on the fracture. A large number of fairly large cracks and pores.								
2a) Moderately levigated red ceramic paste with a light (white) slip.	Same as 2 plus light slip.			1					1

2b) Same as 2a plus slip drips of dark or red color.	Same as 2a plus drips on a light slip background.								
2b) Same as 2a plus burnishing.	Same as 2a plus burnishing.								
2c) Medium-fired red ceramic paste with a reddish slip.	Same as 2 plus red slip.				1				1
2d) Same as 2c plus burnishing.	Same as 2c plus burnishing.								
2e) Moderately levigated red ceramic paste with brown slip.	Same as 2, with brown slip.								
2f) Same as 2e, with burnishing.	Same as 2e, with burnishing.								
2g) Moderately levigated red ceramic paste with dark (black) slip.	Same as 2, with dark (black) slip.								
2h) Same as 2g, with burnishing.	Same as 2g, with burnishing.								
Type	Technology	Rim	Base	Body. Unornamented	Body. Ornamented	Handles	Lids	Other	Total
3) Very well levigated grey fabric, without inclusions, unslipped.	Dense fabric, very uniform on the fracture. Very small white inclusions and micropores.								
3a) Well-levigated grey ceramic paste with impurities, unslipped.	Dense fabric, fairly uniform on the fracture. Small and medium white inclusions; small stones are present.								
3b) Well-levigated grey ceramic paste with a (dark) black slip.	Dense fabric, fairly even on the fracture. Few. Pores, microcracks, micas, and minerals.								
3c) As in 3b, with additional burnishing.	As in 3b, with additional burnishing.								
3d) Well-levigated grey	Dense fabric, fairly even on the fracture. Few. Pores and								

ceramic paste with a light slip.	microcracks. Large amounts of mica, with white inclusions.								
3e) Same as 3d, plus slip drips of dark or red color.	Same as 3d, plus drips of dark or red color on a red slip background.								
3f) Same as 3d, plus burnishing.	Same as 3d, plus burnishing.								
3g) Well-levigated grey fabric with a red (or red-brown) slip.	Dense fabric, fairly even on the fracture. Few pores and mica. A large quantity of small and medium white inclusions.								
3h) The same as 3f, plus burnishing.	The same as 3f, plus burnishing.								
4) Moderately levigated grey ceramic paste, unslipped.	Not a dense fabric, uneven on the fracture. A large quantity of rather large cracks and pores. Minerals: white, black, and brown inclusions of various sizes, stones, mica.								
4a) Moderately levigated grey ceramic paste with light slip.	The same as 4, plus light slip.								
4b) The same as 4a, plus burnishing.	Same as 4a + burnishing.								
4c) Moderately levigated grey ceramic paste with brown or red slip.	Same as 4 + brown slip.								
4d) Same as 4c + burnishing.	Same as 4c + burnishing.								
4e) Moderately levigated grey ceramic paste	Same as 4 + dark (black) slip.								

with dark (black) slip.									
4g) Same as 4e + burnishing.	Same as 4e + burnishing.								
5) Very well-levigated brown ceramic paste, without inclusions, unslipped.	Dense fabric, very uniform on the fracture. Isolated occurrences of very small white inclusions and micropores.								
5a) Well-levigated brown ceramic paste, with inclusions, unslipped.	Dense fabric, fairly uniform on the fracture. Small and medium white inclusions; small stones are present.								
Type	Technology	Rim	Base	Body. Unornamented	Body. Ornamented	Handles	Lids	Other	Total
5b) Well-levigated brown ceramic paste with (dark) black slip.	Dense fabric, fairly even on the fracture. Few. Pores, microcracks, micas, and minerals.								
5c) Same as 5b, with additional burnishing.	Same as 5b, with additional burnishing.								
5d) Well-prepared brown ceramic paste with light slip.	Dense fabric, fairly even on the fracture. Few. Pores and microcracks. Large amounts of mica, with white inclusions.								
5e)	Same as 5d, plus burnishing.								
5f) Well-levigated brown ceramic paste with a red (red-brown) slip.	Dense fabric, fairly uniform on the fracture. Few pores and microcracks. Mica. A large quantity of small and medium white inclusions.								
5g) Same as 5f, plus burnishing.	Same as 5f, plus burnishing.								

6) Moderately levigated brown ceramic paste, unslipped.	Not a dense fabric, uneven on the fracture. A large quantity of rather large cracks and pores. Minerals: white, black, and brown inclusions of various sizes, stones, mica.								
6a) Moderately levigated brown ceramic paste with a light slip.	The same as 6 + light slip.								
6b)	The same as 6a + burnishing.								
4c) Moderately levigated grey fabric with brown slip.	The same as 6 + brown slip.								
4d) The same as 4c + burnishing.	The same as 4c + burnishing.								
6e) Moderately processed brown fabric with dark (black) slip.	The same as 6 + dark (black) slip.								
6f) Same as 6e, plus burnishing.	Same as 6e, plus burnishing.								
7) Poorly levigated red ceramic paste.	Coarse, porous, brittle ceramic paste. Numerous large cracks. Abundant preserved vegetal inclusions. Large black and white inclusions are present, as well as grog.			3					
Total:				4	1				5

Excavation 1 (R_1)
Element 35

Ceramic materials Kuyuk kala		Kesken-	Ks_2025							R_1
Type	Technology	Rim	Base	Body. Unornam ented.	Body. Ornament ed.	Handl es	Lids	Other	Total	
1) Very well levigated red paste without inclusions, unengobed.	Dense paste, very smooth on the fracture. Very few micropores, occasional mica.									
1a) Well levigated red paste with inclusions, unengobed.	Dense paste, smooth on the fracture. Not much. Pore, microcracks, mica, minerals.									
1b) Well-levigated red paste with (dark) black engobe.	Dense paste, fairly smooth on the fracture. Not much. Pore, microcracks, mica, and minerals.									
1c) Same as 1b, plus burnishing.	Same as 1b, plus burnishing.									
1d) Well-levigated red paste with light (white, beige) engobe.	Dense paste, relatively smooth on the fracture. Not soft. Pores and microcracks; large quantity of mica and white inclusions.			2					2	
1e) Same as 1d, with engobe runs of dark or red color.	Same as 1d, with runs over a light engobe background.									
1f) Same as 1d, with burnishing.	Same as 1d, with burnishing.									
1g) Well-levigated red paste with a red (red-brown) engobe.	Dense paste, relatively smooth on the fracture. Few pores and microcracks; mica. Numerous small and medium white inclusions.		1			1		1	3	
1h) Identical to 1f, with the	Identical to 1f, with the addition of burnishing.			7					7	

addition of burnishing.									
2) Moderately levigated red paste, unengobed.	Loose paste, uneven on the fracture. Numerous rather large cracks and pores.								
2a) Moderately levigated red paste with a light (white) engobe.	The same as 2 plus light engobe.	4	3	6					13
2b) The same as 2a plus engobe runs of a dark or red color.	The same as 2a plus runs over a light engobe background.			2					2
2b) The same as 2a plus burnishing.	The same as 2a plus burnishing.	3		2					5
2c) Medium-fine red paste with a reddish engobe.	The same as 2 plus red engobe.	1		7					8
2d) The same as 2c plus burnishing.	The same as 2c plus burnishing.	7	1	10			1		19
2e) Moderately levigated red paste with brown engobe.	Same as 2 + brown engobe.								
Same as 2e + burnishing.	Same as 2e + burnishing.								
2g) Moderately levigated red paste with dark (black) engobe.	Same as 2 + dark (black) engobe.								
Same as 2g + burnishing.	Same as 2g + burnishing.								
Type	Technology	Rim	Base	Body. Unornamented.	Body. Ornamented.	Handles	Lids	Other	Total
3) Very well levigated grey paste, without inclusions, unengobed.	Dense paste, very smooth on the fracture. Very small white inclusions and micropores.								
3a) Well-levigated grey paste with admixtures, unengobed.	Dense paste, fairly smooth on the fracture. Small and medium white inclusions, as well								

	as small stones, are present.								
3b) Well-levigated grey paste with (dark) black engobe.	Dense paste, fairly smooth on the fracture. Not much. Pore, microcracks, mica, and minerals.								
3c) As in 3b, with the addition of burnishing.	As in 3b, with the addition of burnishing.								
3d) Well-levigated grey paste with light engobe.	Dense paste, fairly smooth on the fracture. Not much. Pores and microcracks; abundant mica and white inclusions.								
3e) As 3d, with the addition of engobe runs of dark or red colour.	As 3d, with runs of dark or red colour on a red engobe background.			2					2
3f) As 3d, with the addition of burnishing.	As 3d, with the addition of burnishing.								
3g) Well-levigated grey paste with a red (or red-brown) engobe.	Dense paste, rather smooth in the fracture; few pores and mica. A large quantity of small and medium white inclusions.								
3h) The same as 3f, plus burnishing.	The same as 3f, plus burnishing.								
4) Moderately levigated grey paste, not engobed.	Loose paste, uneven on the fracture. A large number of rather large cracks and pores. Multiple. Minerals: white, black, and brown inclusions of various sizes, stones, mica.			2					2
4a) Moderately levigated grey	The same as 4, plus a light engobe.								

paste with a light engobe.									
4b) The same as 4a, plus burnishing.	Same as 4a, plus burnishing.	1							1
4c) Moderately levigated grey paste with a brown or red engobe.	Same as 4, plus brown engobe.								
4d) Same as 4c, plus burnishing.	Same as 4c, plus burnishing.								
4e) Moderately levigated grey paste with a dark (black) engobe.	Same as 4, plus dark (black) engobe.								
4g) Same as 4e, plus burnishing.	Same as 4e, plus burnishing.								
5) Very well levigated brown paste, without inclusions, unengobed.	Dense paste, very smooth on the fracture. Isolated occurrences of very small white inclusions and micropores.								
5a) Well levigated brown paste, with inclusions, unengobed.	Dense paste, fairly smooth on the fracture. Small and medium white inclusions, as well as small stones, are present.								
Type	Technology	Rim	Base	Body. Unornamented.	Body. Ornamented.	Handles	Lids	Other	Total
5b) Well levigated brown paste with (dark) black engobe.	Dense paste, fairly smooth on the fracture. Not much. Pore, microcracks, mica, and minerals.								
5c) Same as 5b, with additional burnishing.	Same as 5b, with additional burnishing.								
5d) Well levigated brown paste with light engobe.	Dense paste, fairly smooth on the fracture. Not much. Pores and microcracks;								

	abundant mica, white inclusions.								
5e)	Same as 5d, plus burnishing.								
5f) Well-levigated brown paste with a red (red-brown) engobe.	Dense paste, fairly smooth on the fracture. Few pores and microcracks; mica. A large quantity of small and medium white inclusions.								
5g) Same as 5f, plus burnishing.	Same as 5f, plus burnishing.								
6) Moderately levigated brown paste, unengobed.	Loose paste, uneven on the fracture. A large number of rather large cracks and pores. Multiple. Minerals: white, black, and brown inclusions of various sizes, stones, mica.								
6a) Moderately levigated brown paste with a light engobe.	The same as 6 + light engobe.								
6b)	The same as 6a + burnishing.								
4c) Moderately levigated grey paste with brown engobe.	The same as 6 + brown engobe.								
4d) The same as 4c + burnishing.	The same as 4c + burnishing.								
6e) Moderately processed brown paste with dark (black) engobe.	The same as 6 + dark (black) engobe.								
6f) Same as 6e, plus burnishing.	Same as 6e, plus burnishing.								
7) Poorly levigated red paste.	Coarse, porous, brittle paste; numerous large cracks; abundant preserved plant			4				1	5

	inclusions; occurrence of large black and white inclusions; chamotte present.								
Total:		16	5	44		1	1	2	69

Ks_2025
Excavation 1 (R_1)
Element 43

Ceramics kala		Kesken-Kuyuk	Ks_2025				R_1		
Type	Technology	Rim	Base	Body, unornam ented	Body, ornam ented	Handl es	Lids	Other	Total
1) Very well levigated red fabric without inclusions, unslipped.	Dense fabric, very smooth at the fracture surface. Very few micropores, occasional mica.								
1a) Well levigated red fabric with inclusions, unslipped.	Dense fabric, smooth at the fracture surface. Not much. pore, microcracks, micas, minerals								
1b) Well- levigated red fabric with (dark) black slip.	Dense fabric, fairly smooth at the fracture surface. Not much. pore, microcracks, micas, and minerals								
1c) Same as 1b, with burnishing.	Same as 1b, with burnishing.								
1d) Well- levigated red fabric with light (white, beige) slip.	Dense fabric, fairly smooth at the fracture surface. Not soft. Pores and microcracks;								

	abundant micas and white inclusions.								
1e) Same as 1d, with slip streaks of dark or red color.	Same as 1d, with streaks over a light slip background.								
1f) Same as 1d, with burnishing.	Same as 1d, with burnishing.								
1g) Well-levigated red fabric with a red (red-brown) slip.	Dense fabric, fairly smooth at the fracture surface. Some pores and microcracks; mica. Large quantity of small and medium-sized white inclusions.								
1h) Same as 1f, plus burnishing.	Same as 1f, plus burnishing.								
2) Moderately levigated red fabric, unslipped.	Non-dense fabric, not smooth at the fracture surface. Large quantity of relatively large cracks and pores.								
2a) Moderately levigated red fabric with a light (white) slip.	Same as 2 + light slip.								
2b) Same as 2a + slip streaks of dark or red color.	Same as 2a + streaks over a light slip background.								
2b) Same as 2a + burnishing.	Same as 2a + burnishing.								
2c) Medium fired red fabric with a reddish slip.	Same as 2 + red slip.								
2d) Same as 2c + burnishing.	Same as 2c + burnishing.								
2e) Moderately levigated red fabric with brown slip.	Same as 2 plus brown slip.								
2f) Same as 2e plus burnishing.	Same as 2e plus burnishing.								
2g) Moderately fired red fabric	Same as 2 plus dark (black) slip.								

with dark (black) slip.									
2h) Same as 2g plus burnishing.	Same as 2g plus burnishing.								
Type	Technology	Rim	Base	Body, unornamented	Body, ornamented	Handles	Lids	Other	Total
3) Very well levigated grey fabric, without inclusions, unslipped.	Dense fabric, very smooth at the fracture surface. Very small white inclusions, micropores.								
3a) Well-levigated grey fabric with inclusions, unslipped.	Dense fabric, fairly smooth at the fracture surface. Small and medium white inclusions observed, small stones.								
3b) Well-levigated grey fabric with (dark) black slip.	Dense fabric, fairly smooth at the fracture surface. Not much pore, microcracks, micas, and minerals								
3c) Same as 3b, with burnishing.	Same as 3b, with burnishing.								
3d) Well-levigated grey fabric with light slip.	Dense fabric, fairly smooth at the fracture surface. Not much. Pores and microcracks. Abundant mica, white inclusions.								
3e) Same as 3d, plus slip streaks of dark or red color.	Same as 3d, plus streaks of dark or red color on a red slip background.								
3f) Same as 3d, plus burnishing.	Same as 3d, plus burnishing.								
3g) Well-levigated grey fabric with a red (red-brown) slip.	Dense fabric, rather smooth at the fracture surface. Few pores and mica. A large number of small and								

	medium-sized white inclusions.								
3h) Same as 3f + burnishing.	Same as 3f + burnishing.								
4) Moderately levigated grey fabric, unslipped.	Non-dense fabric, not smooth at the fracture surface. A large number of relatively large cracks and pores. Pl. minerals: white, black, and brown inclusions of various sizes, stones, mica.								
4a) Moderately levigated grey fabric with a light slip.	Same as 4 + light slip.						3	3	6
4b) Same as 4a + burnishing.	Same as 4a + burnishing.								
4c) Moderately levigated grey fabric with brown or red slip.	Same as 4 + brown slip.								
4d) Same as 4c + burnishing.	Same as 4c + burnishing.								
4e) Moderately processed grey fabric with dark (black) slip.	Same as 4 + dark (black) slip.								
4g) Same as 4e + burnishing.	Same as 4e + burnishing.								
5) Very well levigated brown fabric, without inclusions, unslipped.	Dense fabric, very smooth at the fracture surface. Single occurrences of very small white inclusions and micropores.								
5a) Well-levigated brown fabric, with inclusions, unslipped.	Dense fabric, fairly smooth at the fracture surface. Small and medium white inclusions observed, small stones.								

Type	Technology	Rim	Base	Body, unornamented	Body, ornamented	Handles	Lids	Other	Total
5b) Well-levigated brown fabric with (dark) black slip.	Dense fabric, fairly smooth at the fracture surface. Not much pore, microcracks, micas, and minerals								
5c) Same as 5b, with burnishing.	Same as 5b, with burnishing.								
5d) Well-levigated brown fabric with light slip.	Dense fabric, fairly smooth at the fracture surface. Not much. Pores and microcracks. Large quantity of mica, white inclusions.								
5e)	Same as 5d, plus burnishing.								
5f) Well-levigated brown fabric with a red (red-brown) slip.	Dense fabric, fairly smooth at the fracture surface. Few pores and microcracks. Mica. A large number of small and medium-sized white inclusions.								
5g) Same as 5f, plus burnishing.	Same as 5f, plus burnishing.								
6) Moderately levigated brown fabric, unslipped.	Non-dense fabric, not smooth at the fracture surface. A large number of relatively large cracks and pores. Pl. minerals: white, black, and brown inclusions of various sizes, stones, mica.								
6a) Moderately levigated brown fabric with a light slip.	Same as 6 + light slip.								

6b)	Same as 6a + burnishing.								
4c) Moderately levigated grey fabric with brown slip.	Same as 6 + brown slip.								
4d) Same as 4c + burnishing.	Same as 4c + burnishing.								
6e) Moderately levigated brown fabric with dark (black) slip.	Same as 6 + dark (black) slip.								
6f) Same as 6e, plus burnishing.	Same as 6e, plus burnishing.								
7) Poorly levigated red fabric.	Coarse, porous, brittle fabric. Numerous large cracks. Abundant preserved vegetal inclusions. Large black and white inclusions, as well as chamotte, are present.								
Total:							3	3	6

Ks_2025
Trail trench 1 (Sh 1)
Element 0 (surface)

Pottery kala	Kesken-Kuyuk	Ks_2025							Total
		Rim	Base	Body, unornam ented.	Body, ornamente d.	Handl es	Lids	Other	
1) Very well levigated red paste without inclusions, unslipped.	Dense paste, very even in fracture. Very few micropores; occasional mica flakes.								

1a) Well levigated red paste with inclusions, unslipped.	Dense paste, even in fracture. Not many. Pores, microcracks, mica, minerals.								
1b) Well-levigated red paste with (dark) black slip.	Dense paste, rather even in fracture. Not many. Pores, microcracks, mica, and minerals.								
1c) Same as 1b, with burnishing.	Same as 1b, with burnishing.								
1d) Well-levigated red paste with a light (white, beige) slip.	Dense paste, fairly even in fracture. Not laminated. Pores and microcracks. Large quantity of mica and white inclusions.			2					2
1e) Same as 1d, plus slip drippings of dark or red color.	Same as 1d, plus drippings over a light slip background.								
1f) Same as 1d, plus burnishing.	Same as 1d, plus burnishing.								
1g) Well-levigated red paste with red (or red-brown) slip.	Dense paste, relatively even in fracture. Few pores and microcracks; mica present. Numerous small and medium white inclusions.			2					2
1h) As in 1f, with the addition of burnishing.	As in 1f, with the addition of burnishing.								
2) Moderately levigated red paste, unslipped.	Paste is not dense, uneven in fracture. Numerous rather large cracks and pores.							2	2
2a) Moderately levigated red paste with a light (white) slip.	The same as 2 + light slip.	1		4					5
2b) The same as 2a, with slip drippings of dark or red color.	The same as 2a, with drippings over a light slip background.								

2b) The same as 2a, with burnishing.	The same as 2a, with burnishing.	1		1					2
2c) Medium levigated red paste with a reddish slip.	The same as 2 + red slip.	2		1					3
2d) The same as 2c, with burnishing.	The same as 2c, with burnishing.	1		7					8
2e) Moderately levigated red paste with brown slip.	Same as 2 + brown slip.								
2f) Same as 2e + burnishing.	Same as 2e + burnishing.								
2g) Moderately levigated red paste with dark (black) slip.	Same as 2 + dark (black) slip.								
2h) Same as 2g + burnishing.	Same as 2g + burnishing.								
Type	Technology	Rim	Base	Body, unornamented.	Body, ornamented.	Handles	Lids	Other	Total
3) Very well levigated grey paste, without inclusions, unslipped.	Dense paste, very even in fracture. Very small white inclusions, micropores.								
3a) Well-levigated grey paste, with admixture, unslipped.	Dense paste, fairly even in fracture. Small and medium white inclusions, small stones present.								
3b) Well-levigated grey paste with (dark) black slip.	Dense paste, rather even in fracture. Not many. Pores, microcracks, mica, and minerals.								
3c) Same as 3b, plus burnishing.	Same as 3b, plus burnishing.								
3d) Well-levigated grey paste with light slip.	Dense paste, rather even in fracture. Not many. Pores and microcracks. Abundant mica, white inclusions.								

3e) Same as 3d, with the addition of slip drippings of dark or red coloration.	Same as 3d, with the addition of drippings of dark or red coloration on a red slip background.								
3f) Same as 3d, with the addition of burnishing.	Same as 3d, with the addition of burnishing.								
3g) Well-levigated grey paste with a red (red-brown) slip.	Dense paste, relatively even in fracture. Few pores and mica. A large number of small and medium white inclusions.								
3h) The same as 3f, plus burnishing.	The same as 3f, plus burnishing.								
4) Medium-levigated grey paste, unslipped.	Paste is not dense, uneven in fracture. A large number of rather large cracks and pores. Minerals: white, black, and brown inclusions of various sizes, stones, and mica.			1	1				2
4a) Medium-levigated grey paste with a light slip.	The same as 4, with a light slip.								
4b) The same as 4a, plus burnishing.	Same as 4a + burnishing.								
4c) Moderately levigated grey paste with brown or red slip.	Same as 4 + brown slip.								
4d) Same as 4c + burnishing.	Same as 4c + burnishing.								
4e) Moderately levigated grey paste with dark (black) slip.	Same as 4 + dark (black) slip.								
4g) Same as 4e + burnishing.	Same as 4e + burnishing.	1							1

5) Very well levigated brown paste, without inclusions, unslipped.	Dense paste, very even in fracture. Very small white inclusions and micropores occur singly.								
5a) Well levigated brown paste, with inclusions, unslipped.	Dense paste, fairly even in fracture. Small and medium white inclusions, small stones present.								
Type	Technology	Rim	Base	Body, unornamented.	Body, ornamented.	Handles	Lids	Other	Total
5b) Well levigated brown paste with a (dark) black slip.	Dense paste, rather even in fracture. Not many. Pores, microcracks, mica, and minerals.								
5c) Same as 5b, with the addition of burnishing.	Same as 5b, with the addition of burnishing.								
5d) Well levigated brown paste with a light slip.	Dense paste, rather even in fracture. Not many. Pores and microcracks. A large amount of mica and white inclusions.								
5e)	Same as 5d, plus burnishing.								
5f) Well-levigated brown paste with a red (red-brown) slip.	Dense paste, fairly even in fracture. Few pores and microcracks. Mica. A large number of small and medium white inclusions.								
5g) Same as 5f, plus burnishing.	Same as 5f, plus burnishing.								
6) Medium-levigated brown paste, unslipped.	Paste is not dense, uneven in fracture. A large number of rather large cracks and pores. Minerals: white, black, and brown inclusions of								

	various sizes, stones, and mica.								
6a) Medium-levigated brown paste with a light slip.	Same as 6 + light slip.								
6b)	Same as 6a + burnishing.								
4c) Moderately levigated grey paste with brown slip.	Same as 6 + brown slip.								
4d) Same as 4c + burnishing.	Same as 4c + burnishing.								
6e) Moderately levigated brown paste with dark (black) slip.	Same as 6 + dark (black) slip.								
6f) Same as 6e, plus burnishing.	Same as 6e, plus burnishing.								
7) Poorly levigated red paste.	Coarse, friable, brittle paste; numerous large cracks; abundant preserved plant inclusions; large black and white inclusions are present; grog.								
Total:		6		18	1			2	27

Appendix – Photographic Appendix



Figure 1. Geomagnetic survey in the area of the planned excavations prior to marking the research site at the location of the presumed citadel. Work in progress.



Figure 1. Geomagnetic survey in the area of the planned excavations prior to marking the research site at the location of the presumed citadel. Work in progress.



Figure 3. Process of marking the excavation at the location of the presumed citadel. Work in progress.



Figure 4. Process of marking the excavation at the location of the presumed citadel. Work in progress.



Figure 5. Process of marking the excavation at the location of the presumed citadel. Work in progress.



Figure 6. Process of marking the excavation at the location of the presumed citadel. Work in progress.



Figure 7. Excavation surface at the location of the presumed citadel after marking. View to the north.



Figure 8. Excavation surface at the location of the presumed citadel after marking. View to the west.



Figure 9. Excavation surface at the location of the presumed citadel after marking. View to the south.



Figure 10. Excavation surface at the location of the presumed citadel after marking. View to the east.

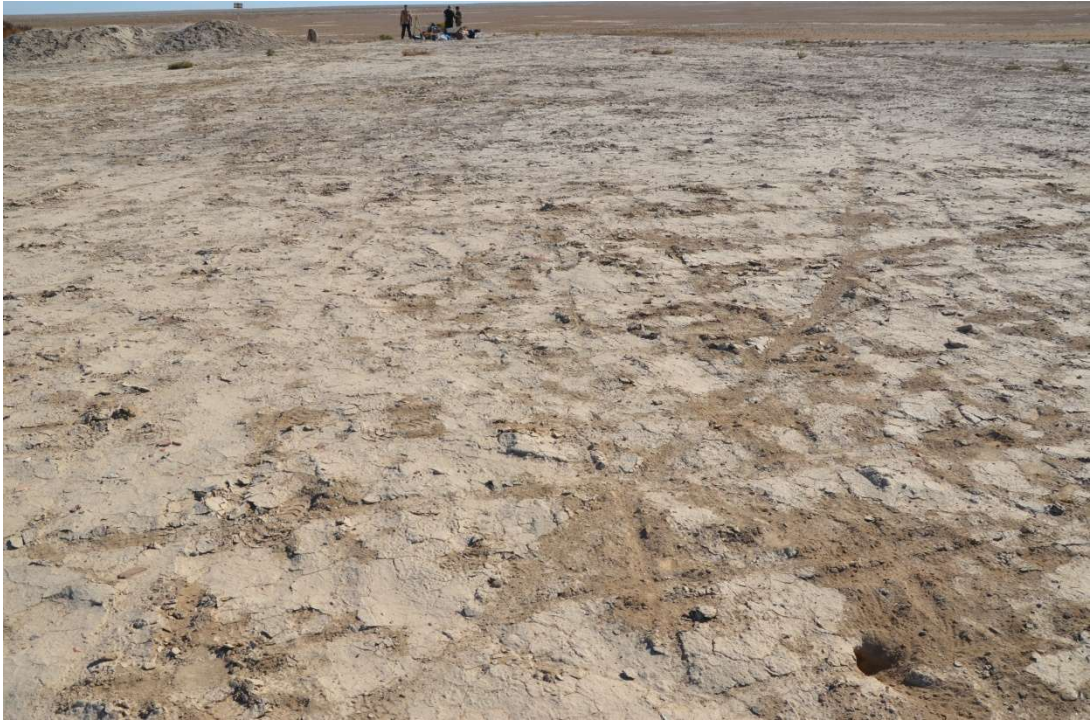


Figure 11. Element 0. Aeolian, upper layer. Excavation surface prior to the commencement of excavations. View to the east.



Figure 12. Element 0. Aeolian, upper layer. Excavation surface prior to the commencement of work. Overhead view.



Figure 13. Element 0. Aeolian, upper layer. Excavation surface prior to the commencement of work. Overhead view.



Figure 14. Element 0. Aeolian, upper layer. Collection of artifacts from the surface of the layer. Southwest view.



Figure 15. Element 0. Aeolian, upper layer. Collection of artifacts from the surface of the layer. Southwest view.



Figure 16. Element 0. Aeolian, upper layer. Collection of artifacts from the surface of the layer. Southwest view.



Figure 17. Element 1. Removal of the upper layer in the southern part of the excavation. Southwest view.



Figure 18. Element 1. Removal of the upper layer in the southern part of the excavation. Southwest view.



Figure 19. Element 1. Process of removing the upper layer in the northern part of the Excavation. View to the southwest.



Figure 20. Element 1. Process of removing the upper layer in the northern part of the Excavation. View to the southwest.



Figure 21. Element 1. Stone millstone in a loose, cloddy layer in the central part of the Excavation. Top view.



Figure 22. Element 1. Stone millstone in a loose, cloddy layer in the central part of the Excavation. Top view.



Figure 23. Element 1. Process of cleaning a loose, cloddy layer in the western part of the Excavation. View to the west.



Figure 24. Element 1. Process of cleaning a loose, cloddy layer in the western part of the Excavation. View to the west.



Figure 25. Element 1. Excavation surface following the removal and cleaning of the loose, lumpy layer in the western part of the excavation. View to the northwest.



Figure 26. Element 1. Excavation surface following the removal and cleaning of the loose, lumpy layer in the western part of the excavation. View to the north.



Figure 27. Element 1. Excavation surface following the removal and cleaning of the loose, lumpy layer in the western part of the excavation. View to the northeast.



Figure 28. Element 1. Excavation surface following the removal and cleaning of the loose, lumpy layer in the western part of the excavation. View to the east.



Figure 29. Element 1. Excavation surface after removal and cleaning of the loose, cloddy layer in the western part of the excavation. View to the southeast.



Figure 30. Element 1. Excavation surface after removal and cleaning of the loose, cloddy layer in the western part of the excavation. View to the south.

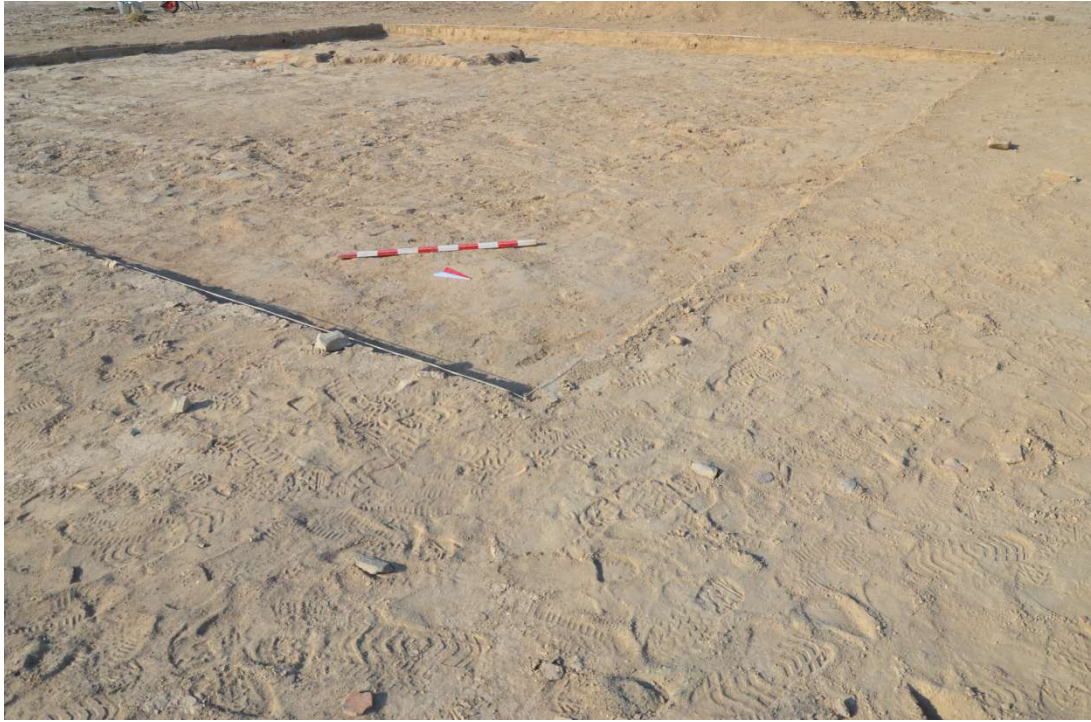


Figure 31. Element 1. Excavation surface after removal and cleaning of the loose, cloddy layer in the western part of the excavation. View to the southwest.



Figure 32. Element 3. Ash and charcoal stain in the eastern part of the excavation (late construction period). View to the north.



Figure 33. Element 3. Ash and charcoal stain in the eastern part of the excavation (late construction period). View to the east.



Figure 34. Element 3. Ash and charcoal stain in the eastern part of the excavation (late construction period). View to the south.



Figure 35. Element 3. Ash and charcoal stain in the eastern part of the excavation (late construction period). View to the west.



Figure 36. Element 3. Cleaning of the ash-cinder stain in the eastern part of the excavation (Late construction period). View to the west.



Figure 37. Element 3. Cleaning of the ash-cinder stain in the eastern part of the excavation (Late construction period). View to the west.



Figure 38. Element 4. Ceramic pot with handle in excavated layer (1) at the center of the excavation. Top view.



Figure 39. Element 4. Ceramic pot with handle in excavated layer (1) at the center of the excavation. Top view.



Figure 40. Element 4. Ceramic mug with handle in excavated layer (1) at the center of the excavation. Top view.



Figure 41. Element 4. Ceramic mug with handle in excavated layer (1) at the center of the excavation. Top view.



Figure 42. Element 5. Process of cleaning the floor altar in the excavated layer (1) in the southern and central parts of the excavation. View to the west.



Figure 43. Element 5. Process of cleaning the floor altar in the excavated layer (1) in the southern and central parts of the excavation. View to the east.



Figure 44. Element 5. Floor altar after initial cleaning in the excavated layer (1) in the southern and central parts of the excavation. View to the north.



Figure 45. Element 5. Floor altar after initial cleaning in the excavated layer (1) in the southern and central parts of the excavation. View to the north.

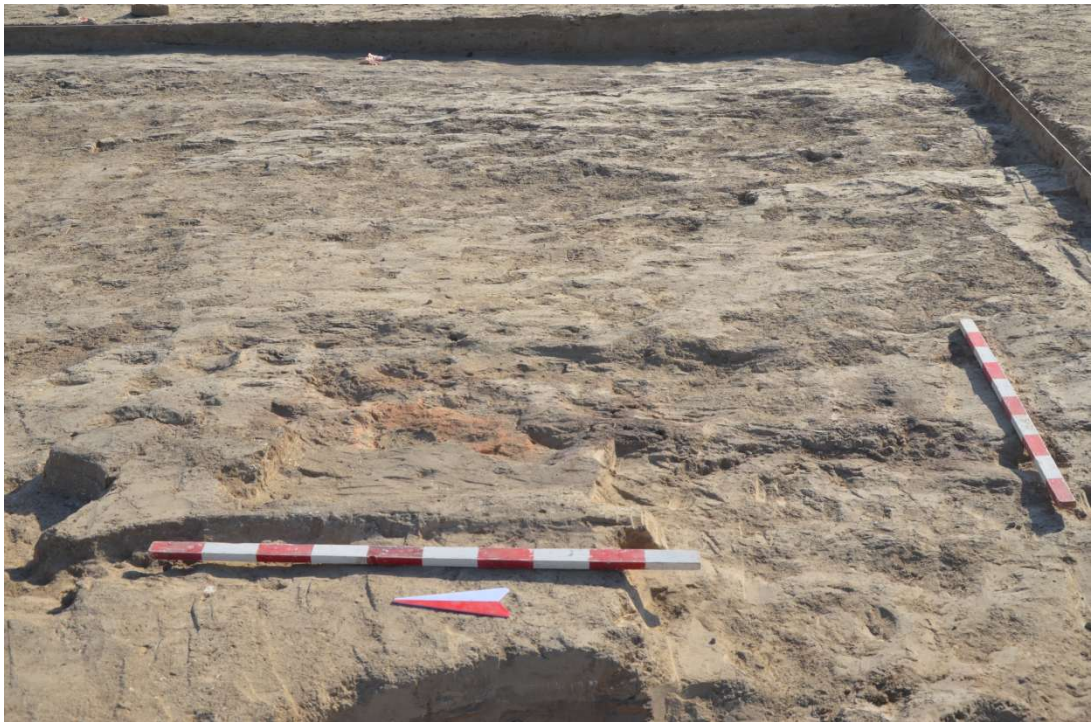


Figure 46. Element 5. Floor altar following initial cleaning in the excavated layer (1) in the southern and central part of the excavation. View to the east.



Figure 47. Element 5. Floor altar following initial cleaning in the excavated layer (1) in the southern and central part of the excavation. View to the south.



Figure 48. Element 5. Floor altar following initial cleaning in the excavated layer (1) in the southern and central part of the excavation. View to the west.



Figure 49. Element 5. Decorative arrangement of the floor altar at the northern side from the exterior. View to the south.

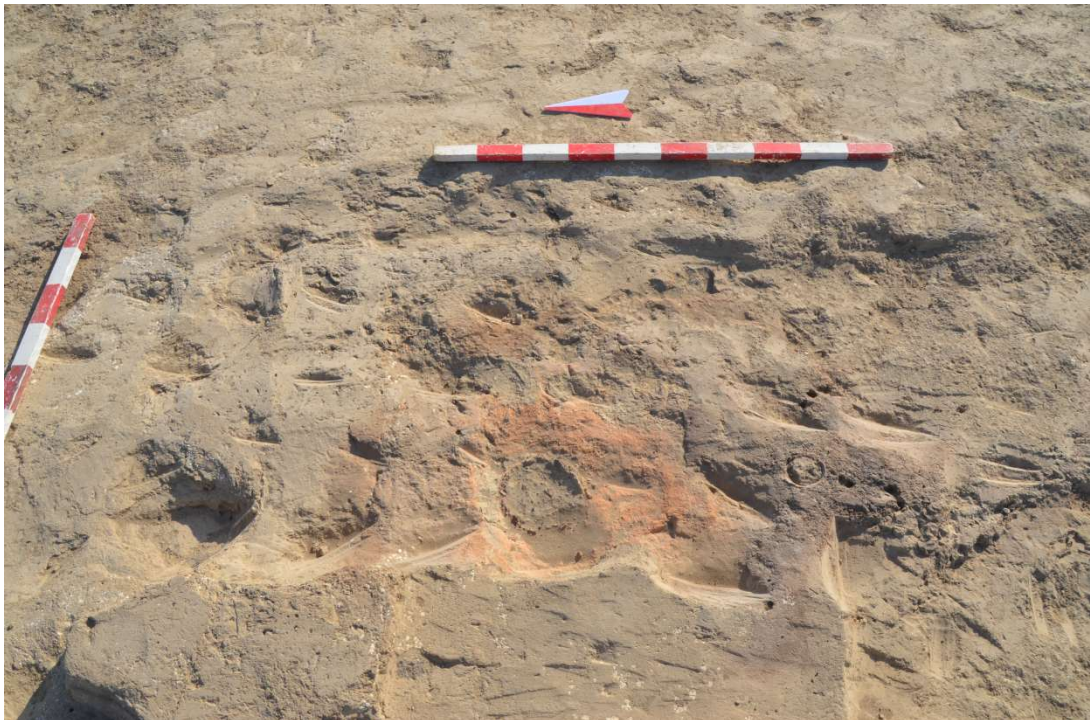


Figure 50. Element 5. Decorative arrangement of the floor altar, layer of firing and ash, ceramic vessels inside the altar. Top view to the east.



Figure 51. Element 5. Ceramic vessel with handle inside the altar. Top view to the north.



Figure 52. Element 5. Ceramic cup with handle inside the altar. Top view to the north.



Figure 53. Element 5. Work in progress: cleaning inside the floor altar (5). View to the north.



Figure 54. Element 5. Work in progress: cleaning inside the floor altar (5). View to the east.



Figure 55. Element 5. Process of cleaning a vessel inside the floor altar (5). View to the east.



Figure 56. Element 5. Process of cleaning a vessel inside the floor altar (5). View to the east.



Figure 57. Element 5. Process of cleaning a vessel inside the floor altar (5). View to the east.



Figure 58. Process of cleaning the soil in the area of the floor altar (5). View to the northwest.



Figure 59. Element 6. Layer of ash, cinder, and fired loam above the hearth in the central part of the Excavation (second construction period). View to the north.



Figure 60. Element 6. Layer of ash, soot, and baked loam above the hearth in the central part of the Excavation (second construction period). View to the east.



Figure 61. Element 6. Cleaning process of the layer of ash, soot, and baked loam above the hearth in the central part of the Excavation. Sampling of ash and soot for analysis. View to the west.



Figure 62. Element 6. Cleaning process of the layer of ash, soot, and baked loam in the central part of the Excavation. Sampling of ash and soot for analysis. View to the west.

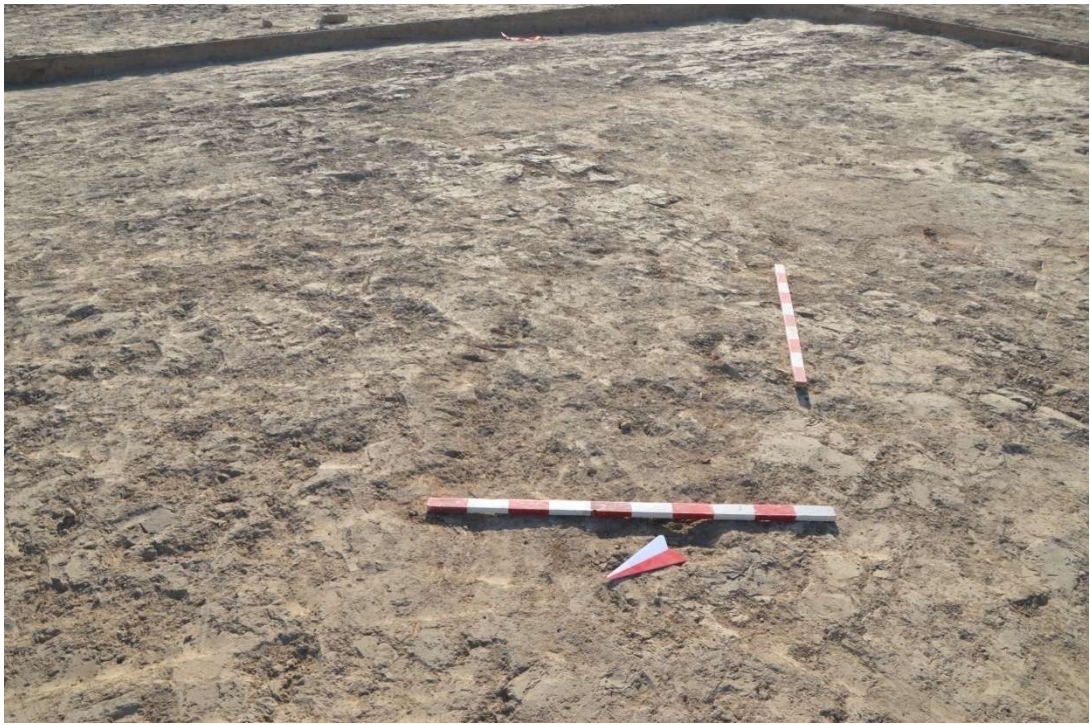


Figure 63. Element 6. A layer of ash, soot, and baked loam on the surface of the hearth in the central part of the Excavation after the surface was cleaned. View to the southeast.



Figure 64. Element 6. A layer of ash, soot, and baked loam on the surface of the hearth in the central part of the Excavation after the surface was cleaned. View to the southeast.

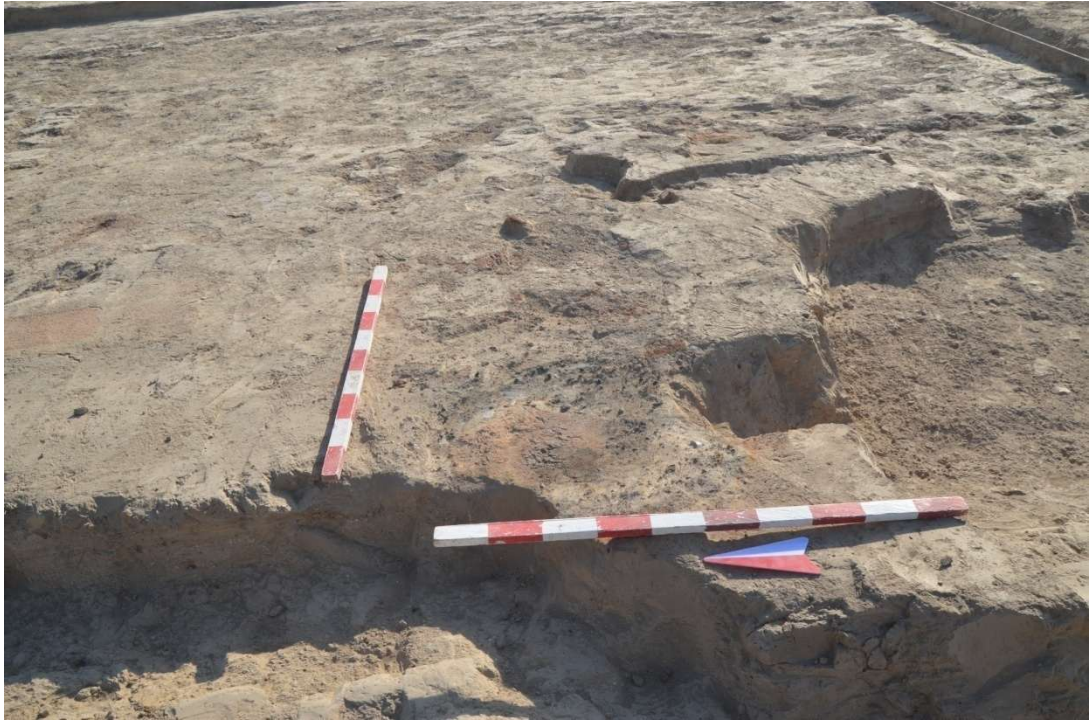


Figure 65. Element 6. A layer of ash, soot, and baked loam on the surface of the hearth in the central part of the Excavation after the surface was cleaned. View to the east.



Figure 66. Element 6. A layer of ash, soot, and baked loam on the surface of the hearth in the central part of the Excavation after the surface was cleaned. View to the east.



Figure 67. Element 6. Layer of ash, soot, and baked loam on the surface of the stove in the central part of the Excavation following cleaning of the surface. View to the north.



Figure 68. Element 6. Layer of ash, soot, and baked loam on the surface of the stove in the central part of the Excavation following cleaning of the surface. View to the north.



Figure 69. Element 6. Cleaning of the layer of ash, soot, and baked loam on the surface of the stove in the central part of the Excavation following cleaning of the surface. View to the north.



Figure 70. Element 6. Cleaning of the layer of ash, soot, and baked loam on the surface of the stove in the central part of the Excavation following cleaning of the surface. View to the north.



Figure 71. Element7. Square-shaped spot of burnt soil near the layer of ash, soot, and baked loam in the central part of the Excavation.



Figure 72. Element7. Square-shaped spot of burnt soil near the layer of ash, soot, and baked loam in the central part of the Excavation.



Figure 73. Element 8. Child burial. Rush mat above the child burial at the northern edge of the excavation. View to the north.



Figure 74. Element 8. Child burial. Rush mat above the child burial at the northern edge of the excavation. View to the east.



Figure 75. Element 8. Child burial. Rush mat above the child burial at the northern edge of the excavation. View to the south.



Figure 76. Element 8. Stage of cleaning the burial at the northern wall of the excavation. View to the northwest.



Figure 77. Element 8. Stage of cleaning the burial at the northern wall of the excavation. View to the northeast.



Figure 78. Element 8. The child's skull in the northwestern part of the burial during systematic cleaning. View to the northeast.



Figure 79. Element 8. The child's burial during systematic cleaning. View to the southeast.



Figure 80. Element 8. The child's skull in the northwestern part of the grave during progressive clearing. View towards the southeast.



Figure 81. Element 9. Badarab spot in the corner of the northeastern part of the Excavation. View to the north.



Figure 82. Element 9. Badarab spot in the corner of the northeastern part of the Excavation. View to the east.



Figure 83. Element 9. Badrah spot in the corner of the northeastern part of the Excavation. View to the south.



Figure 84. Element 9. Badrah stain in the corner of the northeastern part of the Excavation. View to the west.



Figure 85. Element 9. Badrah in the corner of the northeastern part of the Excavation after clearing. View to the north.



Figure 86. Element 9. Badrah in the corner of the northeastern part of the Excavation after clearing. View to the northwest.



Figure 87. Badrah in the corner of the northeastern part of the Excavation after clearing. View to the east.



Figure 88. Element 9. Badrah in the corner of the northeastern part of the excavation after cleaning. View to the south.



Figure 89. Element 10. Burial by the wall (23). View to the southwest.



Figure 90. Element 10. Burial by the wall (23). View to the southwest.

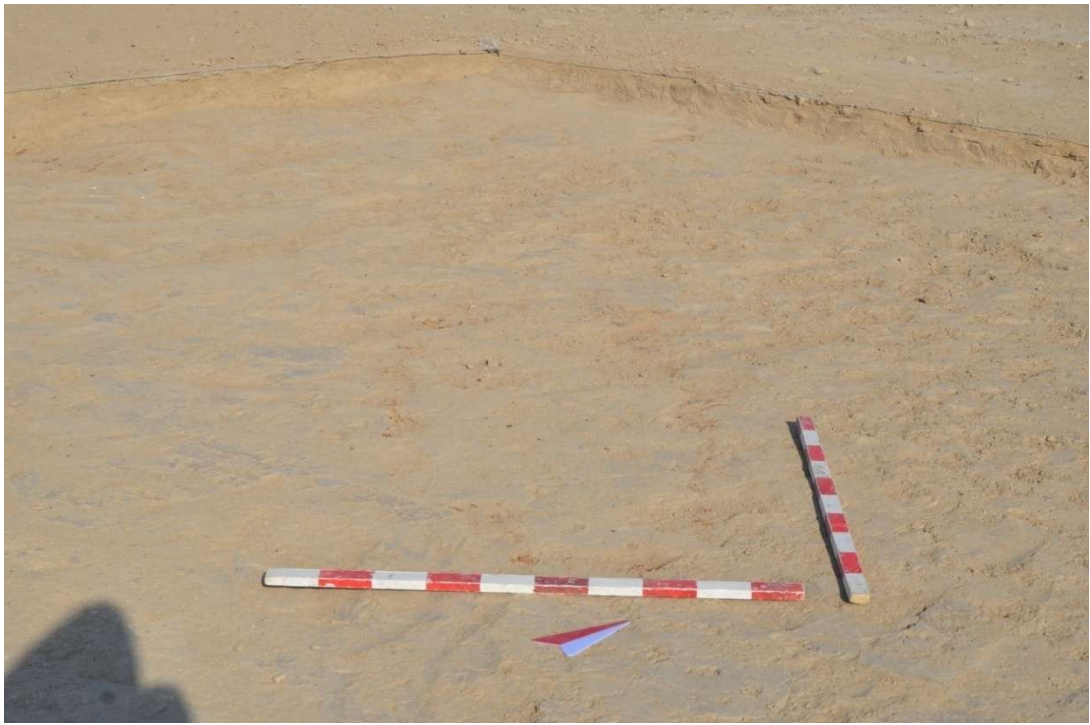


Figure 91. Element 10. Burial by the northern wall of the excavation. View to the northwest.



Figure 92. Element 10. Burial by the northern wall of the excavation. View to the northwest.



Figure 93. Element 10. Burial by the northern wall of the excavation. View to the northeast.



Figure 94. Element 10. Burial by the northern wall of the excavation. View to the northeast.



Figure 95. Element 10. Beginning of the burial clearing at the northern wall of the excavation. View to the southwest.



Figure 96. Element 10. Beginning of the burial clearing at the northern wall of the excavation. View to the southeast.



Figure 97. Element 10. Cleared burial of an adult individual of the late period at the northern wall of the excavation of the room of the second construction level during the clearing of the fill (14). View to the southwest.



Figure 98. Element 10. Excavated burial of an adult individual from the late period at the northern wall of the excavation area of the room of the second construction level, during the cleaning of infill (14). View to the southeast.



Figure 99. Element 10. Excavated burial of an adult individual from the late period at the northern wall of the excavation area of the room of the second construction level, during the cleaning of infill (14). View to the northeast.



Figure 100. Element 11. Southern wall of the late construction period. View to the west.



Figure 101. Element 11. South wall of the late construction period. View to the west.



Figure 102. Element 11. South wall of the late construction period. View to the south.



Figure 103. Element 11. South wall of the late construction period. View to the south.



Figure 104. Element 11. South wall of the late construction period. View to the east.

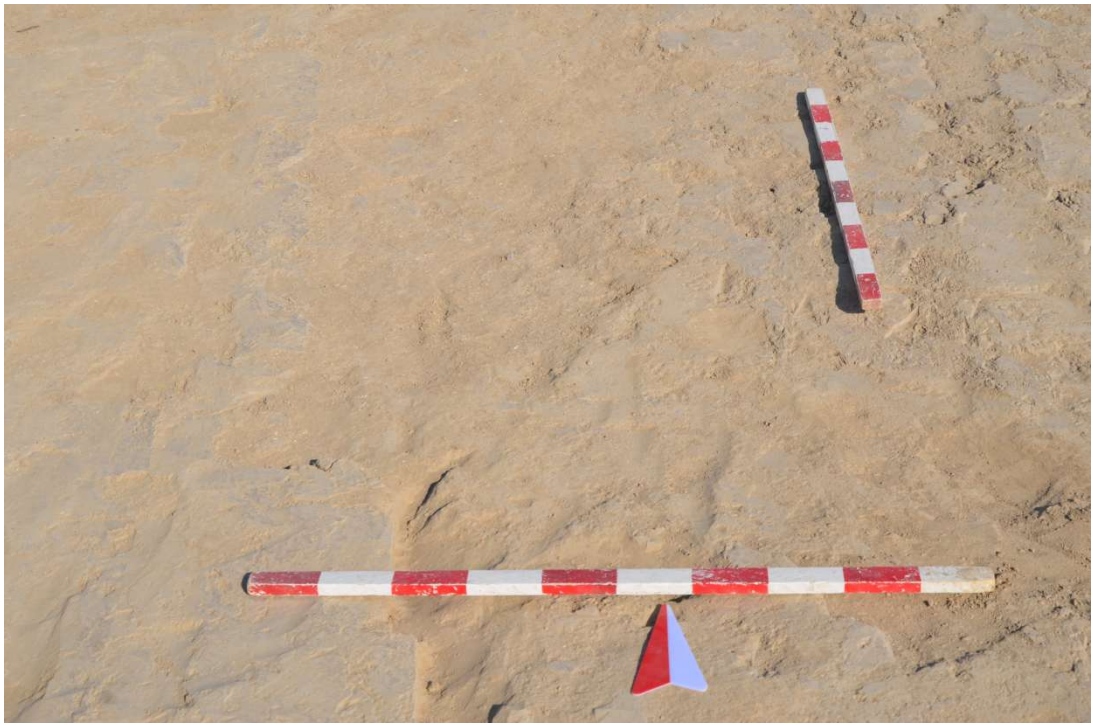


Figure 105. Element 11. South wall of the late construction period. View to the west.



Figure 106. Element 12. Surface of the eastern wall of the second and third construction periods. View to the east.



Figure 107. Element 12. Surface of the eastern wall of the second and third construction periods. View to the east.



Figure 108. Element 12. Surface of the eastern wall from the second and third construction periods. View to the west.

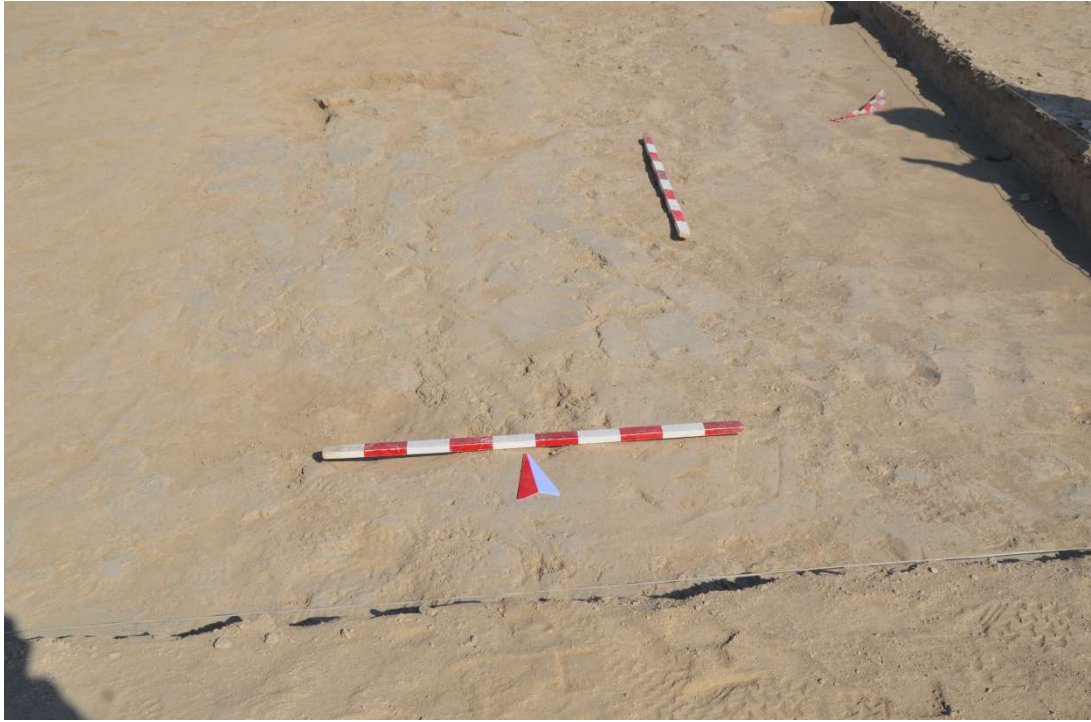


Figure 109. Element 12. Surface of the eastern wall from the second and third construction periods. View to the west.



Figure 110. Element 12. Cleaning process of the internal surface and plaster of the eastern wall from the second and third construction periods. View to the southwest.



Figure 111. Element 12. Cleaning process of the internal surface and plaster of the eastern wall from the second and third construction periods. View to the east.



Figure 112. Element 12. Cleaning process of the internal surface and plaster of the eastern wall from the second and third construction periods. View to the east.



Figure 113. Element 12. Cleaning process of the internal surface and plaster of the eastern wall from the second and third construction periods. View to the southeast.



Figure 114. Element 12. Fragment of the internal surface of the eastern wall from the second and third construction periods, with preserved plaster and traces of whitewash. View to the east.



Figure 115. Element 12. Fragment of the internal surface of the eastern wall from the second and third construction periods, with preserved plaster and traces of whitewash. View to the east.



Figure 116. Element 12. Fragment of the internal surface of the eastern wall from the second and third construction periods, with preserved plaster and traces of whitewash. View to the east.



Figure 117. Element 12. Fragment of the internal surface of the eastern wall from the second and third construction periods, with preserved plaster and traces of whitewash. View to the east.



Figure 118. Element 12. Fragment of the internal surface of the eastern wall from the second and third construction periods, with preserved plaster and traces of whitewash. Top view, facing south.

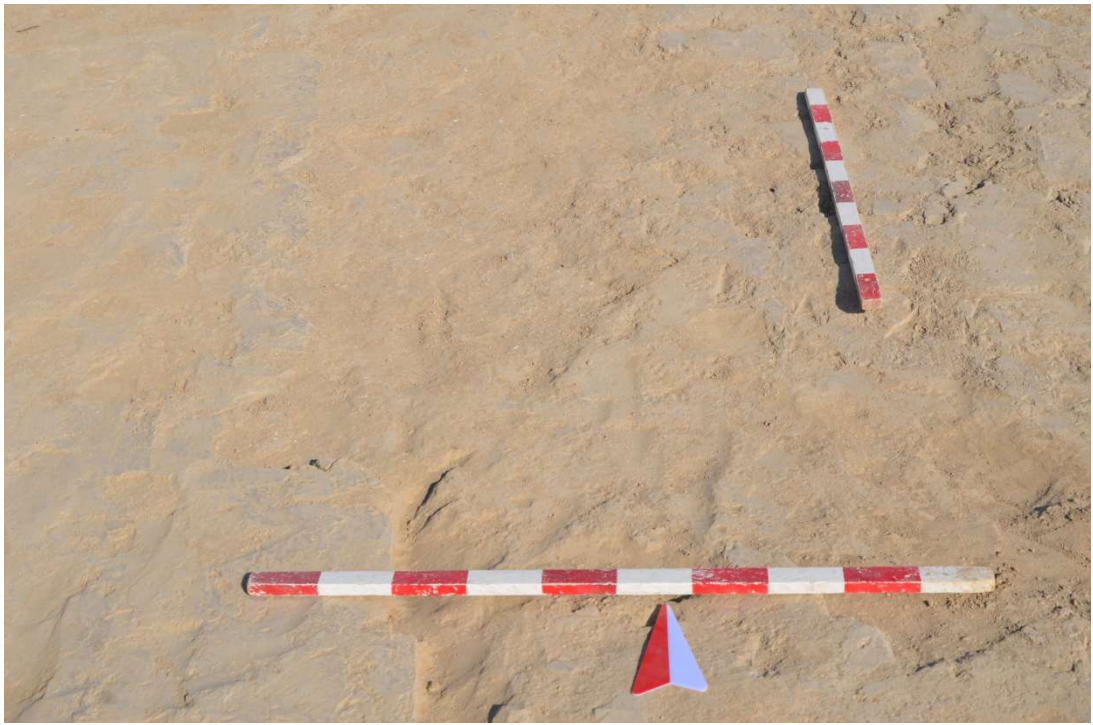


Figure 119. Element 13. Surface of the sufa of the second horizon at the eastern wall (12). View to the north.



Figure 120. Element 13. Surface of the sufa of the second horizon at the eastern wall (12). View to the west.



Figure 121. Element 13. Surface of the sufa of the second horizon at the eastern wall (12). View to the east.



Figure 122. Element 13. Surface of the sufa of the second horizon by the eastern wall (12). View to the south.



Figure 123. Element 14. Excavation of the loamy layer along the walls from the second and third construction periods. View to the northwest.



Figure 124. Element 16. Post hole in the masonry of the southern wall from the late construction period. View to the west.



Figure 125. Element 16. Post hole in the masonry of the southern wall from the late construction period. View to the south.



Figure 126. Element 17. Collapse of mudbrick blocks on the northern side of the eastern wall (12). View to the south.



Figure 127. Element 17. Collapse of mudbrick blocks on the northern side of the eastern wall (12). View to the west.

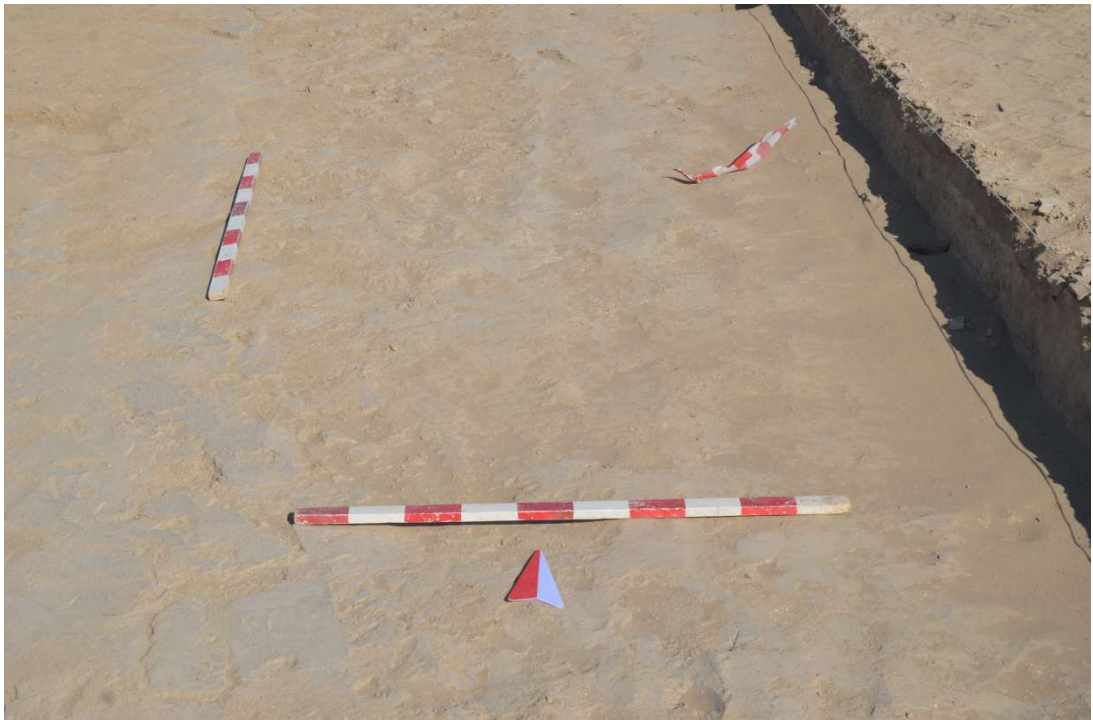


Figure 128. Element 17. Collapse of mudbrick blocks on the northern side of the eastern wall (12). View to the north.



Figure 129. Element 17. Collapse of mudbrick blocks on the northern side of the eastern wall (12). View to the east.



Figure 130. Element 18. Filling of the second construction level composed of mudbrick blocks, clay loam, and domestic refuse between the northern and eastern walls (12) of the room. View to the north.



Figure 131. element 18. Filling of the second construction level composed of mudbrick blocks, clay loam, and domestic refuse between the northern and eastern walls (12) of the room. View to the east.



Figure 132. element 18. Filling of the second construction level composed of mudbrick blocks, clay loam, and domestic refuse between the northern and eastern walls (12) of the room. View to the south.



Figure 133. Element 18. Fill of the second construction horizon consisting of mudbrick blocks, loam, and domestic debris between the northern and eastern walls (12) of the room. View to the west.



Figure 134. Element 20. Fragment of plaster with traces of whitewash from the western wall (20) of the room.

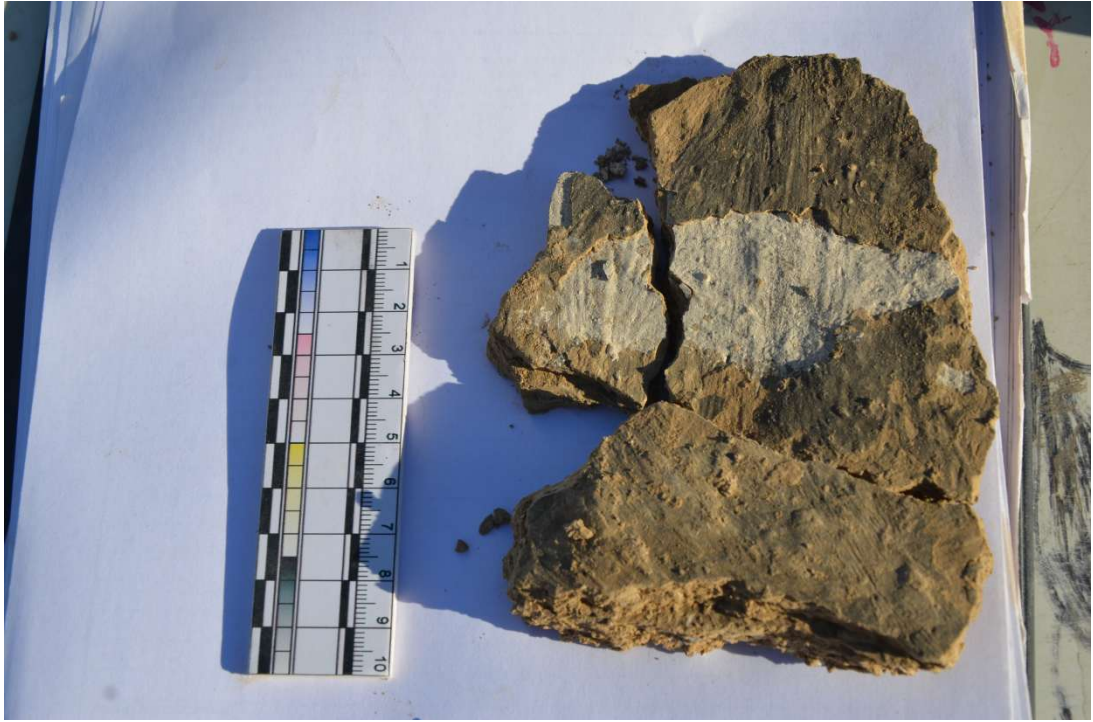


Figure 135. Element 20. Fragment of plaster with traces of whitewash from the western wall (20) of the room.



Figure 136. Element 20. Western wall (20) of the room and the adjacent sufa (43). View to the west.



Figure 137. Element 20. The western wall (20) of the room, situated adjacent to the sufa (43), as well as a wall-adjacent stove with an arched niche. View to the northwest.



Figure 138. Element 20. The western wall (20) of the room, situated adjacent to the sufa (43), as well as a wall-adjacent stove with an arched niche. View to the southwest.



Figure 139. Element 20. The western wall (20) of the room with partially preserved plaster, situated adjacent to the sufa (43), as well as a wall-adjacent stove with an arched niche. View to the northwest.

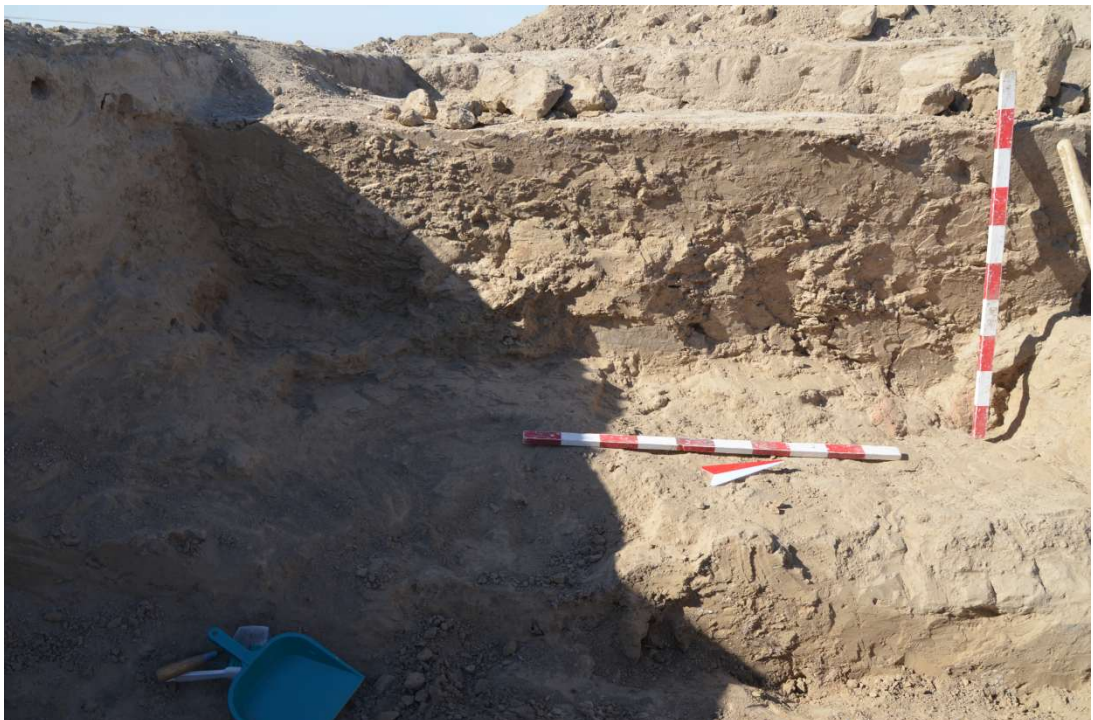


Figure 140. Element 20. The western wall (20) of the room, with partially preserved plaster, located adjacent to the sufa (43). View to the west.

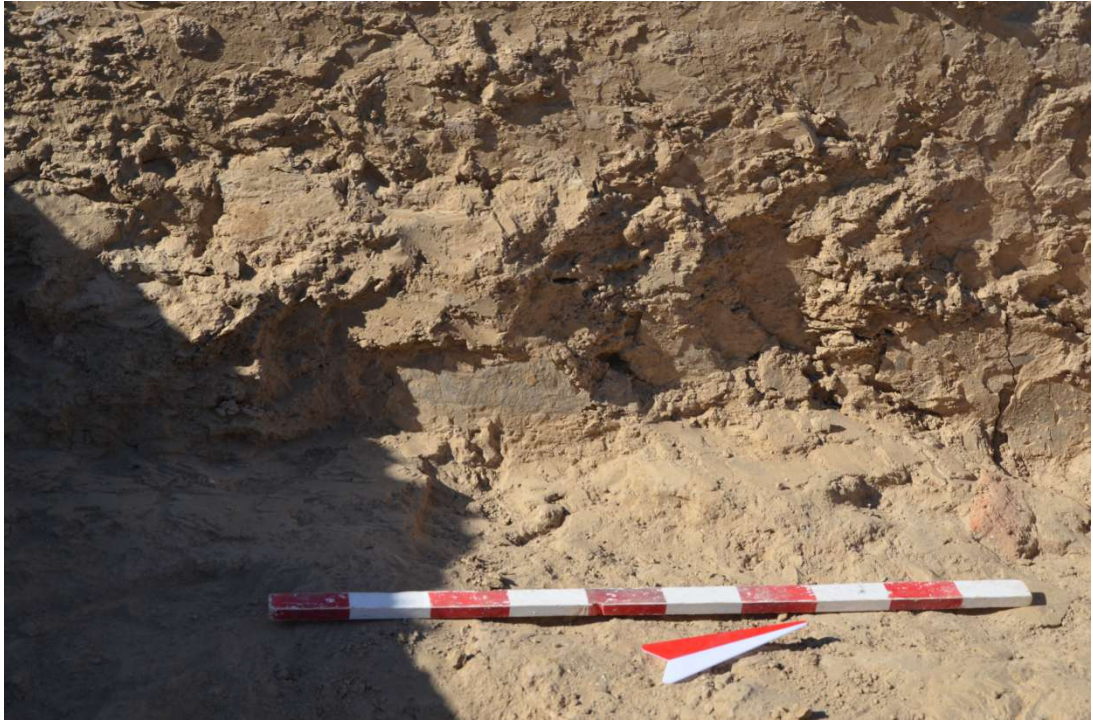


Figure 141. Element 20. The western wall (20) of the room, with partially preserved plaster, located adjacent to the sufa (43). View to the west.



Figure 142. Element 20. Thickness with partially preserved plaster on the western wall (20) of the room. View to the east.

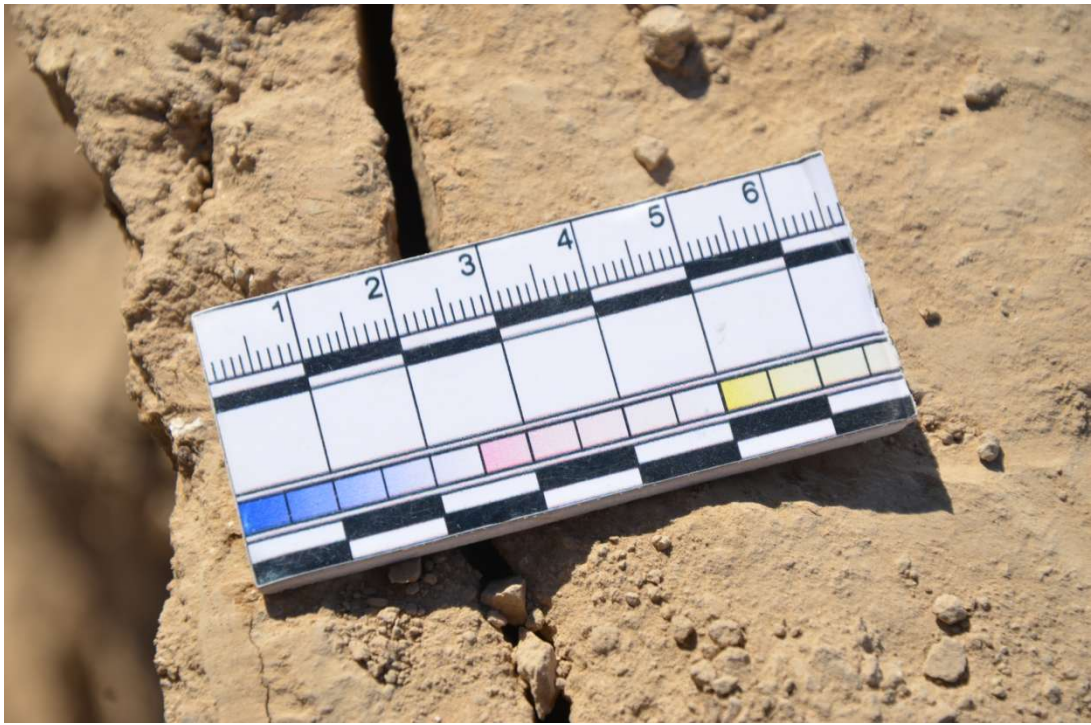


Figure 143. Element 20. Thickness with partially preserved plaster on the western wall (20) of the room. View to the south.



Figure 144. Elements 23, 24. Section of the masonry of the northern wall (23) and a platform of mud-brick blocks adjacent to the wall. View to the east.



Figure 145. Elements 23, 24. Section of the masonry of the northern wall (23) and a platform of mud-brick blocks adjacent to the wall. View to the north.



Figure 146. Element 23. Fragment of the inner surface of the northern wall from the second and third construction periods, with preserved plaster and traces of sealing. Top view to the north.

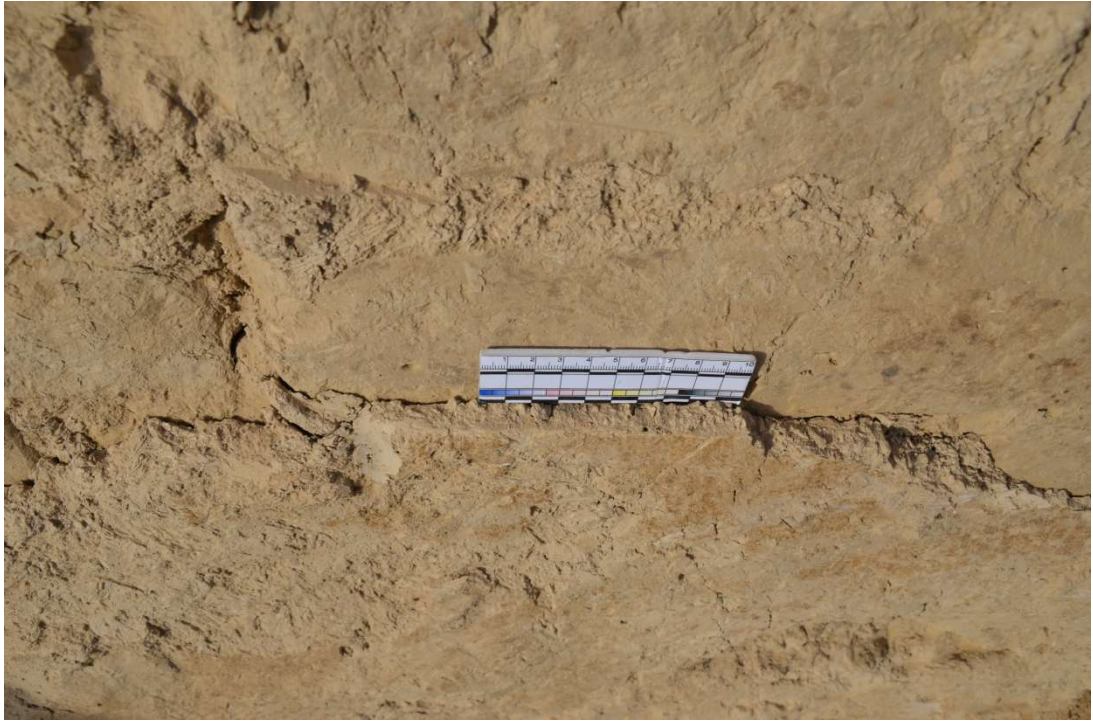


Figure 147. Element 23. Fragment of the inner surface of the northern wall from the second and third construction periods, with preserved plaster and traces of sealing. Top view to the north.



Figure 148. Element 23. Fragment of the inner surface of the northern wall from the second and third construction periods, with preserved plaster and traces of sealing. Top view to the north.



Figure 149. Element 23. Fragment of the inner surface of the northern wall from the second and third construction periods, with preserved plaster and traces of sealing. Top view to the north.



Figure 150. Element 23. Fragment of masonry of the northern wall from the second and third construction periods, composed of mudbrick blocks. North view.



Figure 151. Element 24. Platform composed of mudbrick blocks near the northern wall (23). View to the north.

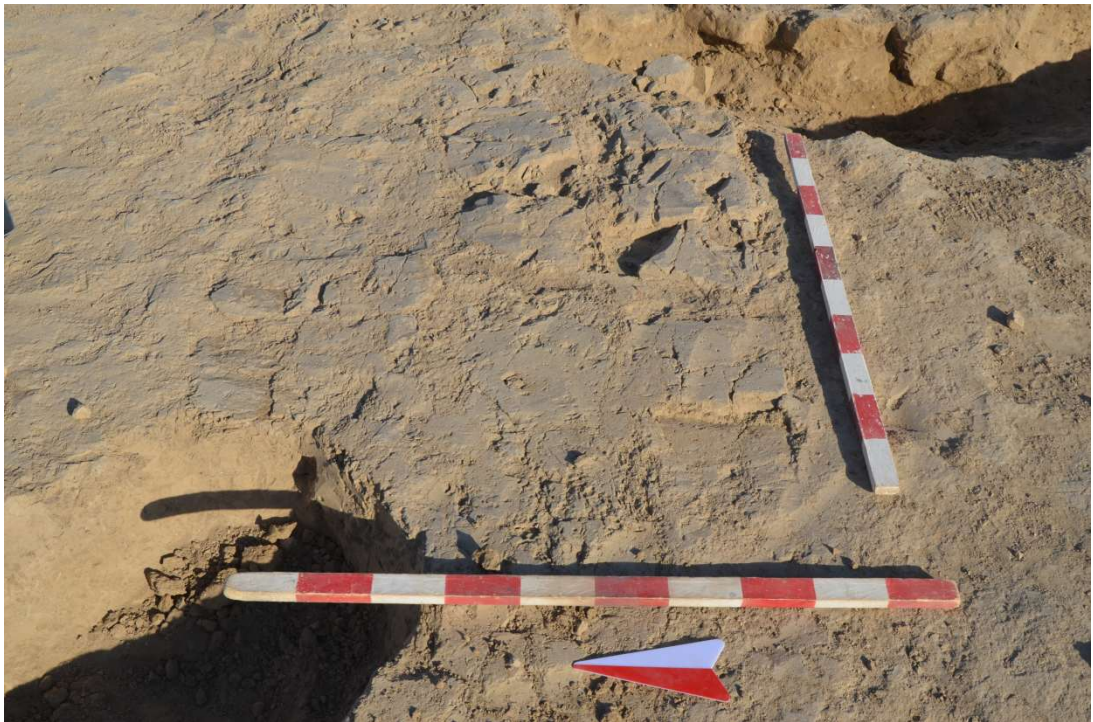


Figure 152. Element 24. Platform constructed of mudbrick blocks adjacent to the northern wall (23). View to the east.



Figure 153. Element 24. Platform constructed of mudbrick blocks adjacent to the northern wall (23). View to the south.



Figure 154. Element 25. Child burial on the surface of the western wall (20) following cleaning. View to the north.



Figure 155. Element 25. Child burial on the surface of the western wall (20) following cleaning. View to the east.



Figure 156. Element 25. Child burial on the surface of the western wall (20) following cleaning. View to the south.



Figure 157. Element 25. Child burial on the surface of the western wall (20) following cleaning. View to the west.



Figure 158. Element 26. Child burial at the western edge of the excavation following cleaning. View to the north.



Figure 159. Element 26. Child burial at the western edge of the excavation following cleaning. View to the east.



Figure 160. Element 26. Child burial at the western edge of the excavation following cleaning. View to the south.



Figure 161. Element 27. Child burial along the northern wall of the excavation after cleaning. View to the west.



Figure 162. Element 27. Child burial at the western edge of the excavation following cleaning. View to the south.



Figure 163. Element 27. Child burial at the western edge of the excavation following cleaning. View to the east.



Figure 164. Element 27. Child burial at the western edge of the excavation following cleaning. View to the north.



Figure 165. Element 28. Child burial adjacent to the western wall of the excavation after cleaning. View to the west.



Figure 166. Element 28. Child burial adjacent to the western wall of the excavation after cleaning. View to the west.

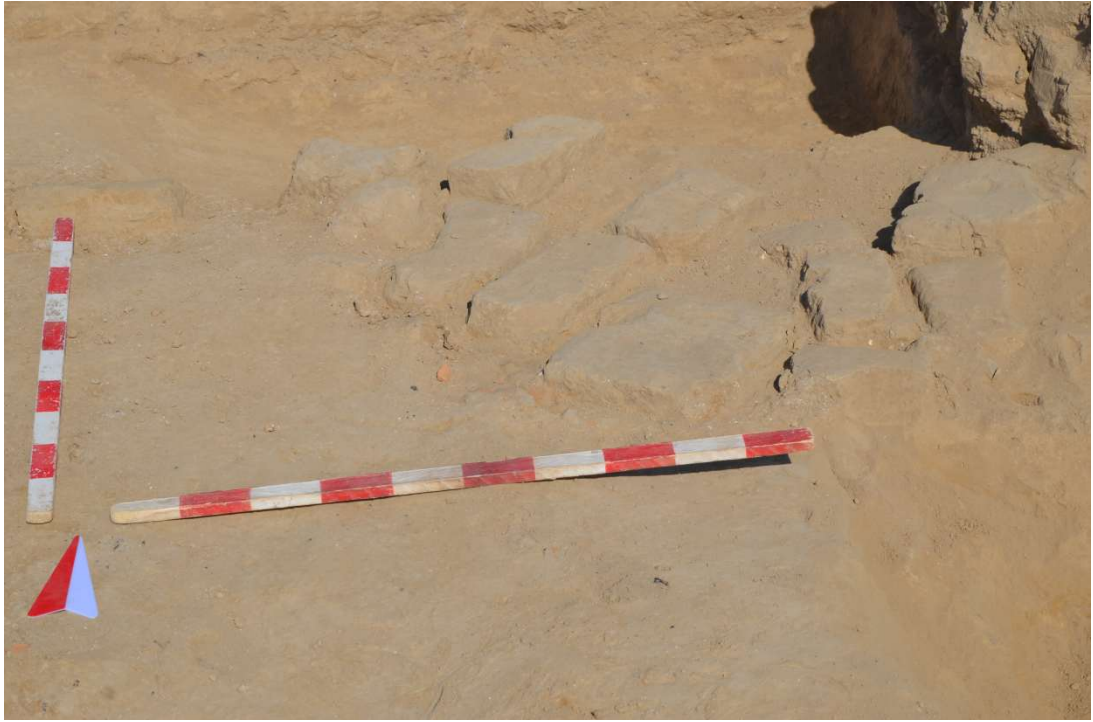


Figure 167. Element 29. Collapse of mudbrick blocks near the eastern wall (12), Second construction phase. View to the north.

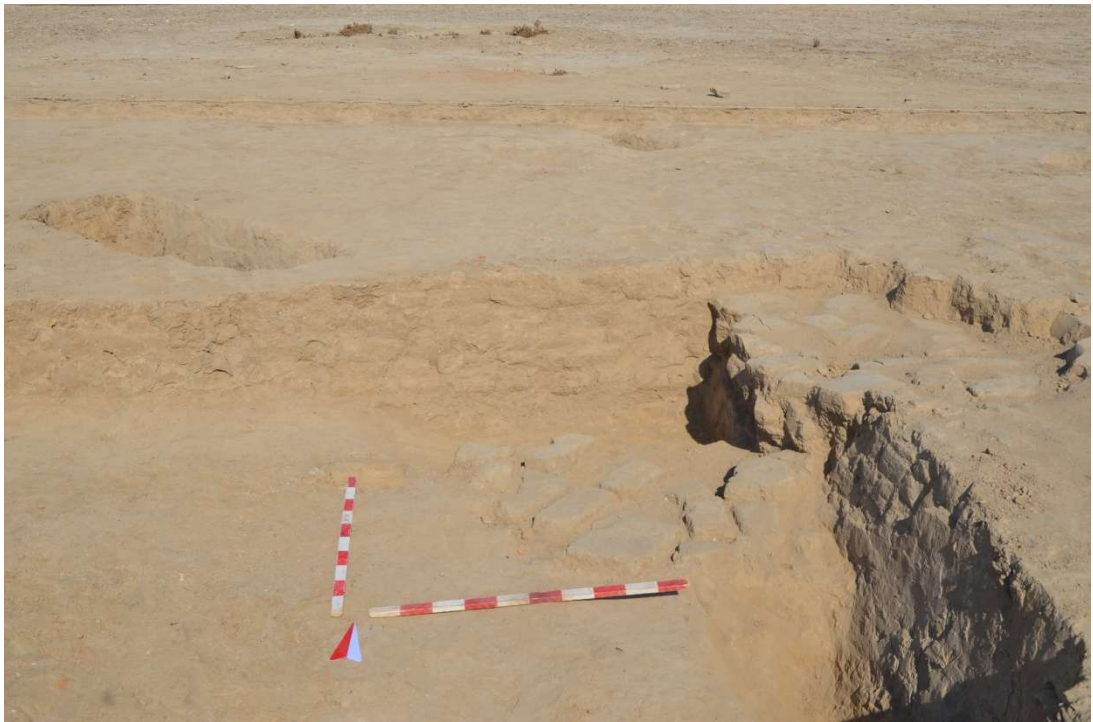


Figure 168. Element 29. Collapse of mudbrick blocks near the eastern wall (12), Second construction phase. View to the north.



Figure 169. Element 29. Collapse of mudbrick blocks against the eastern wall (12), second construction phase. View to the east.



Figure 170. Element 29. Collapse of mudbrick blocks near the eastern wall (12), Second construction phase. View to the north.



Figure 171. Element 30. Clearing of a late-period adolescent burial in the eastern part of the room of the second construction level during removal of fill (14). View to the east.



Figure 172. Element 30. Clearing of a late-period adolescent burial in the eastern part of the room of the second construction level during removal of fill (14). View to the east.



Figure 173. Element 30. Late-period adolescent burial in the eastern part of the room of the second construction level during removal of fill (14). View to the southwest.



Figure 174. Element 30. Disarticulated remains of an adolescent in a late-period grave in the eastern part of the room of the second construction level during cleaning of fill (14). View to the southwest.



Figure 175. Element 30. Burial of an adolescent from the late period in the eastern part of the room of the second construction level during cleaning of fill (14). View to the northeast.



Figure 176. Element 30. Burial of an adolescent from the late period in the eastern part of the room of the second construction level during cleaning of fill (14). View to the south.



Figure 177. Element 30. Paste bead at the hip of an adolescent in a grave of the late period in the eastern part of the room of the second construction level during the clearance of fill (14). View to the southwest.



Figure 178. Element 30. Paste bead at the hip of an adolescent in a grave of the late period in the eastern part of the room of the second construction level during the clearance of fill (14). View to the southwest.



Figure 179. Element 30. Grave of an adolescent from the late period in the eastern part of the room of the second construction level during the clearance of fill (14). View to the northeast.



Figure 180. Element 30. Grave of an adolescent from the late period in the eastern part of the room of the second construction level during the clearance of fill (14). View to the north.



Figure 181. Element 30. Grave of an adolescent from the late period in the eastern part of the room of the second construction phase during cleaning of fill (14). View to the south.

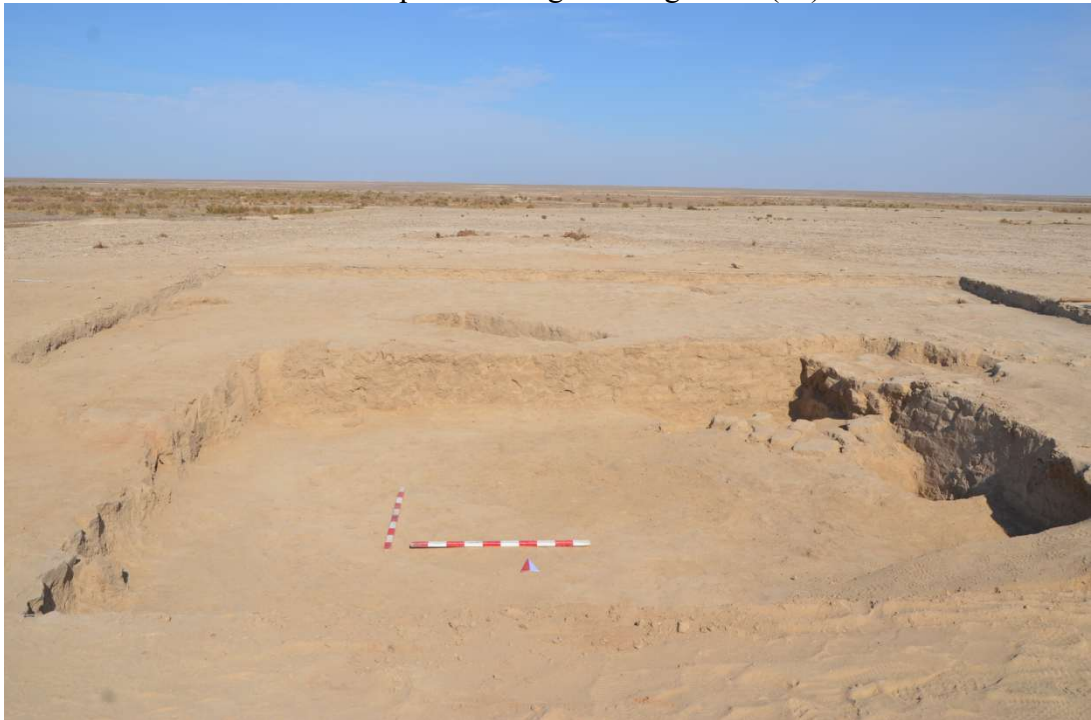


Figure 182. Element 31. General view of the excavation after removal of clayey fill and broken fragments of unfired mudbrick wall blocks of the room. Second construction phase. View to the north.



Figure 183. Element 31. General view of the excavation after removal of clayey fill and broken fragments of unfired mudbrick wall blocks of the room. Second construction phase. View to the north.



Figure 184. Element 31. General view of the excavation after removal of clayey fill and broken fragments of unfired mudbrick wall blocks of the room. Second construction phase. View to the east.



Figure 185. Element 31. General view of the excavation after removal of clayey fill and broken fragments of unfired mudbrick wall blocks of the room. Second construction phase. View to the east.

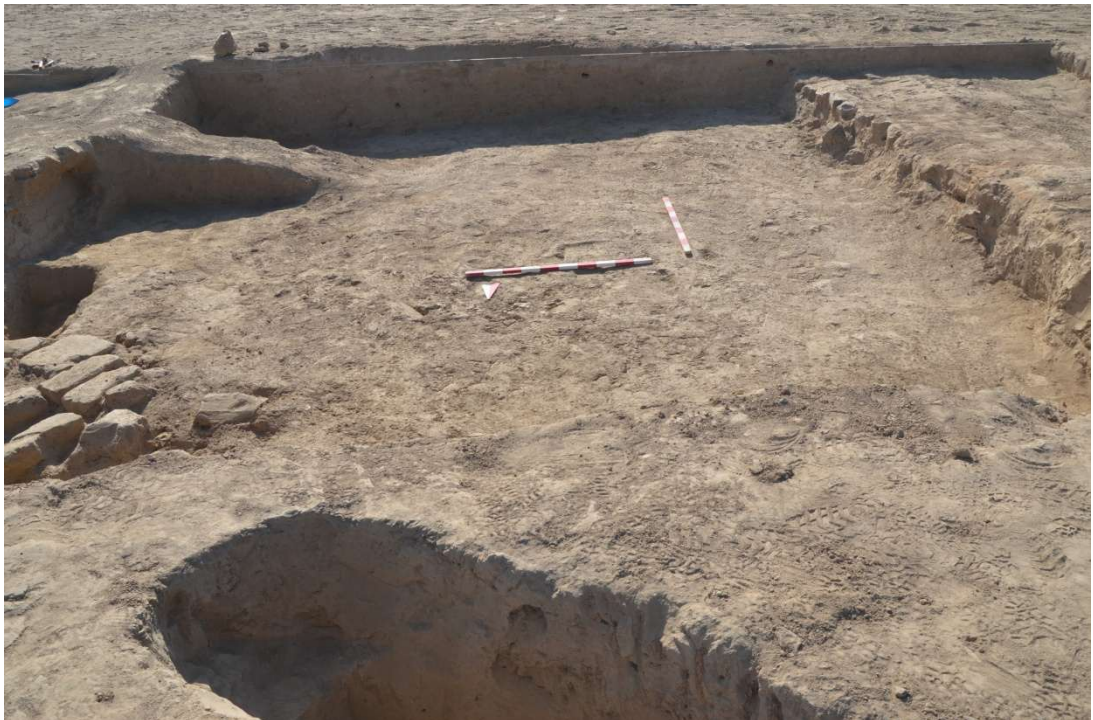


Figure 186. Element 31. General view of the excavation after removal of clayey fill and broken fragments of unfired mudbrick wall blocks of the room. Second construction phase. View to the south.



Figure 187. Element 31. General view of the excavation after removal of clayey fill and broken fragments of unfired mudbrick wall blocks of the room. Second construction phase. View to the south.

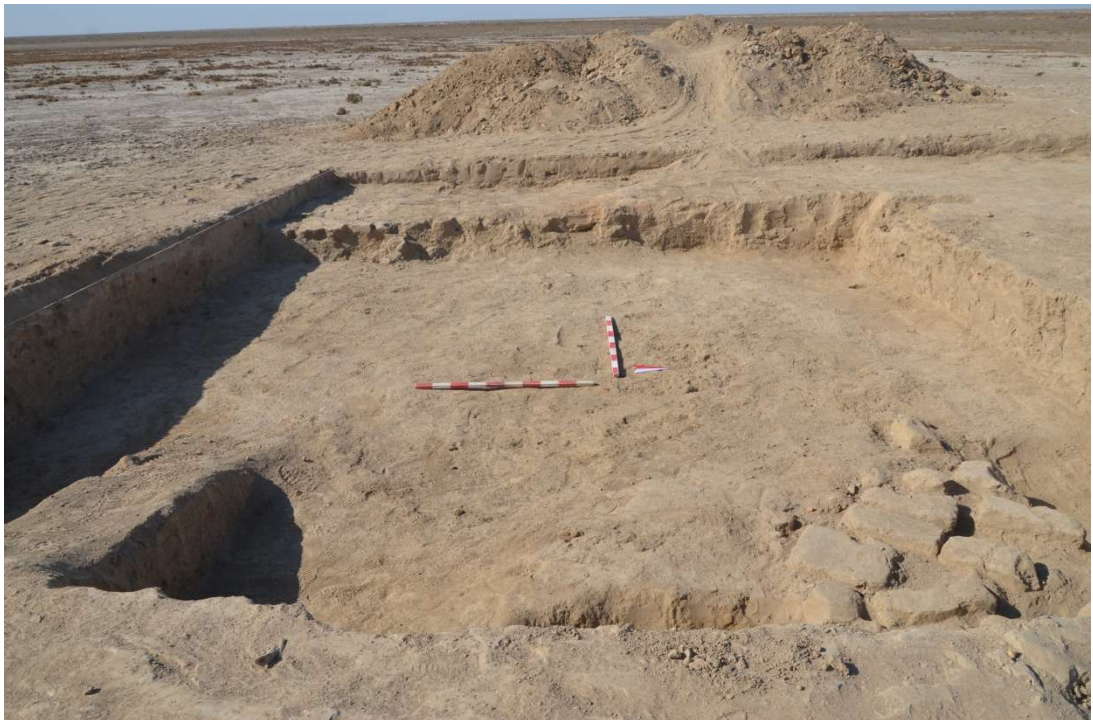


Figure 188. Element 31. General view of the excavation after removal of clayey fill and broken fragments of unfired mudbrick wall blocks of the room. Second construction phase. View to the west.



Figure 189. Element 31. General view of the excavation after removal of clayey fill and broken fragments of unfired mudbrick wall blocks of the room. Second construction phase. View to the west.



Figure 190. Element 32. Posthole adjacent to the northern wall, second construction phase. View to the north.



Figure 191. Element 32. Posthole adjacent to the northern wall, second construction phase. View to the east.



Figure 192. Element 32. Posthole adjacent to the northern wall, second construction phase. View to the south.



Figure 193. Element 33. Wall-adjacent hearth by the western wall (20) of the second and third construction periods. View to the west.



Figure 194. Element 33. Wall-adjacent hearth by the western wall (20) of the second and third construction periods. View to the west.



Figure 195. Element 33. Wall-adjacent hearth by the western wall (20) of the second and third construction periods. View to the west.



Figure 196. Element 33. Process of cleaning the interior of the wall-adjacent hearth by the western wall (20) of the second and third construction periods. View to the west.



Figure 197. Element 33. Process of cleaning the interior of the wall-adjacent hearth by the western wall (20) of the second and third construction periods. View to the west.



Figure 198. Element 33. Fill of loose and cloddy loam within the wall-adjacent hearth by the western wall (20) of the second and third construction periods. View to the west.



Figure 199. Element 33. Fill within the wall-adjacent stove and the masonry composed of fragments of ceramic vessels on the exterior side near the western wall (20) of the second and third construction phases. View to the west.



Figure 200. Element 33. Fill within the wall-adjacent stove and the masonry composed of fragments of ceramic vessels on the exterior side near the western wall (20) of the second and third construction phases. View to the west.



Figure 201. Element 33. Wall furnace, featuring construction from fragments of ceramic vessels on the external surface and a stokehole adjacent to the western wall (20) of the second and third building phases. View to the west.



Figure 202. Element 33. Stokehole of the wall furnace, adjacent to the western wall (20) of the second and third building phases. View to the west.



Figure 203. Element 33. Stokehole of the wall furnace, adjacent to the western wall (20) of the second and third building phases. View to the west.



Figure 204. Element 33. Interior of the wall furnace, after cleaning, adjacent to the western wall (20) of the second and third building phases. View to the west.



Figure 205. Element 33. Interior of the wall furnace after cleaning, adjacent to the western wall (20) of the second and third construction periods. Top view to the west.



Figure 206. Element 34. Ash layer and fired loam near the northern wall (23) of the second and third construction periods. View to the north.



Figure 207. Element 34. Ash layer and fired loam near the northern wall (23) of the second and third construction periods. View to the east.



Figure 208. Element 34. Ash layer and fired loam near the northern wall (23) of the second and third construction periods. View to the east.



Figure 209. Element 34. Ash layer and fired loam near the northern wall (23) from the second and third building periods. View to the south.



Figure 210. Element 34. Ash layer and fired loam near the northern wall (23) from the second and third building periods. View to the west.



Figure 211. Element 34. Ash layer and fired loam near the northern wall (23) of the second and third construction periods. View to the north.



Figure 212. Element 34. Ash layer and fired loam near the northern wall (23) from the second and third building periods. View to the west.



Figure 213. Element 35. Fragment of a ceramic slipware mug in a layer of loamy fill and broken fragments of sun-dried wall blocks from the room. Third construction phase. View to the south.



Figure 214. Element 36. Patch of loose loam within a layer of loamy fill and broken fragments of unfired brick blocks near the northern wall (23) of the room. Third construction phase. View to the north.



Figure 215. Element 36. Patch of loose loam within a layer of loamy fill and broken fragments of unfired brick blocks near the northern wall (23) of the room. Third construction phase. View to the east.



Figure 216. Element 36. Patch of loose loam within a layer of loamy fill and broken fragments of unfired brick blocks near the northern wall (23) of the room. Third construction phase. View to the west.



Figure 217. Element 37. Collapse layer consisting of whole and fragmentary unfired brick blocks and loose loam bricks in the center of the room. Third construction phase. View to the west.



Figure 218. Element 37. Collapse layer consisting of whole and fragmentary unfired brick blocks and loose loam bricks in the center of the room. Third construction phase. View to the west.



Figure 219. Element 37. Collapse layer consisting of whole and fragmentary unfired brick blocks and loose loam bricks in the center of the room. Third construction phase. View to the south.



Figure 220. Element 37. Collapse layer consisting of whole and fragmentary unfired brick blocks and loose loam bricks in the center of the room. Third construction phase. View to the east.



Figure 221. Element 37. Collapse layer consisting of whole and fragmentary unfired brick blocks and loose loam bricks in the center of the room. Third construction phase. Plan view.



Figure 222. Element 37. Fragments of ceramic vessels recovered during the clearance of collapsed intact and fragmented unfired clay blocks and bricks, as well as loose loam, in the center of the room. Third construction phase. Plan view.



Figure 223. Element 37. Fragments of ceramic vessels recovered during the clearance of collapsed intact and fragmented unfired clay blocks and bricks, as well as loose loam, in the center of the room. View to the west.



Figure 224. Element 37. Fragments of ceramic vessels recovered during the clearance of collapsed intact and fragmented unfired clay blocks and bricks, as well as loose loam, in the center of the room. Third construction phase. View to the west.



Figure 225. Element 37. Fragments of unfired clay blocks and bricks of loose loam, as well as decomposed reed and bulrush, in the center of the room. Third construction phase. View to the west.



Figure 226. Element 37. Fragments of unfired clay blocks and bricks, loose loam, and decomposed bulrush in the room. Third construction phase. View to the south.



Figure 227. Element 37. Fragments of un-fired clay blocks and bricks, and loose loam in the room. Third construction phase. View to the west.

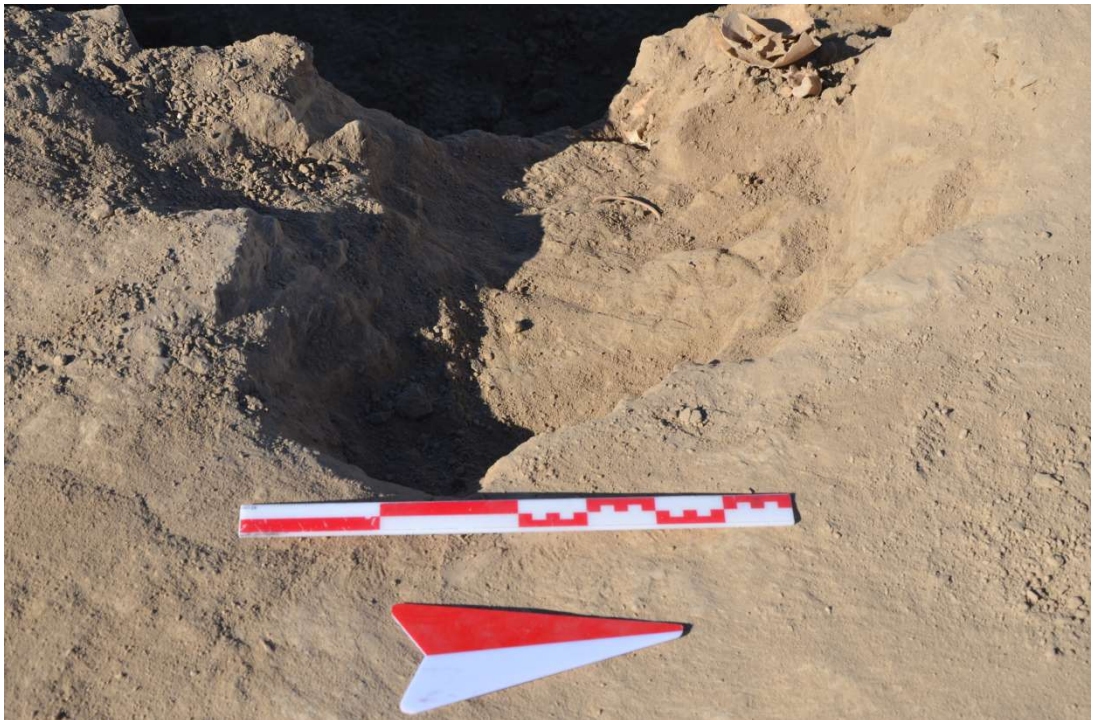


Figure 228. Element 38. Late-period child burial on the surface of the eastern wall (12). First construction phase. View to the east.



Figure 229. Element 38. Late-period child burial on the surface of the eastern wall (12). First construction phase. View to the southwest.



Figure 230. Element 38. Late-period child burial on the surface of the eastern wall (12). First construction phase. View to the north.



Figure 231. Element 38. Child burial—skull and bones on the surface of the eastern wall (12). Late period, first construction phase. View to the south.



Figure 232. Element 39. Collapse of adobe blocks on the surface between the eastern (12) and northern (23) walls, blocking the entrance opening (14). First construction phase. View to the west.



Figure 233. Element 39. Collapse of adobe blocks on the surface between the eastern (12) and northern (23) walls, blocking the entrance opening (14). First construction phase. View to the south.



Figure 234. Element 39. Fragment of a reed mat among mudbrick blocks and bricks between the eastern (12) and northern (23) walls, which covered the entrance opening (14). Third construction phase. Plan view.



Figure 235. Element 39. Fragment of a reed mat among mudbrick blocks and bricks between the eastern (12) and northern (23) walls, which covered the entrance opening (14). Third construction phase. Plan view.



Figure 236. Element 39. Collapse of adobe blocks on the surface between the eastern (12) and northern (23) walls, blocking the entrance opening (14). First construction phase. View to the southeast.



Figure 237. Element 40. Layer of fired loam, ash, and soot in the center of the room. Third construction phase. View to the north.



Figure 238. Element 40. Layer of fired loam, ash, and soot in the center of the room. Third construction phase. View to the east.



Figure 239. Element 40. Layer of fired loam, ash, and soot in the center of the room. Third construction phase. View to the south.



Figure 240. Element 40. Layer of fired loam, ash, and soot in the center of the room. Third construction phase. View to the west.

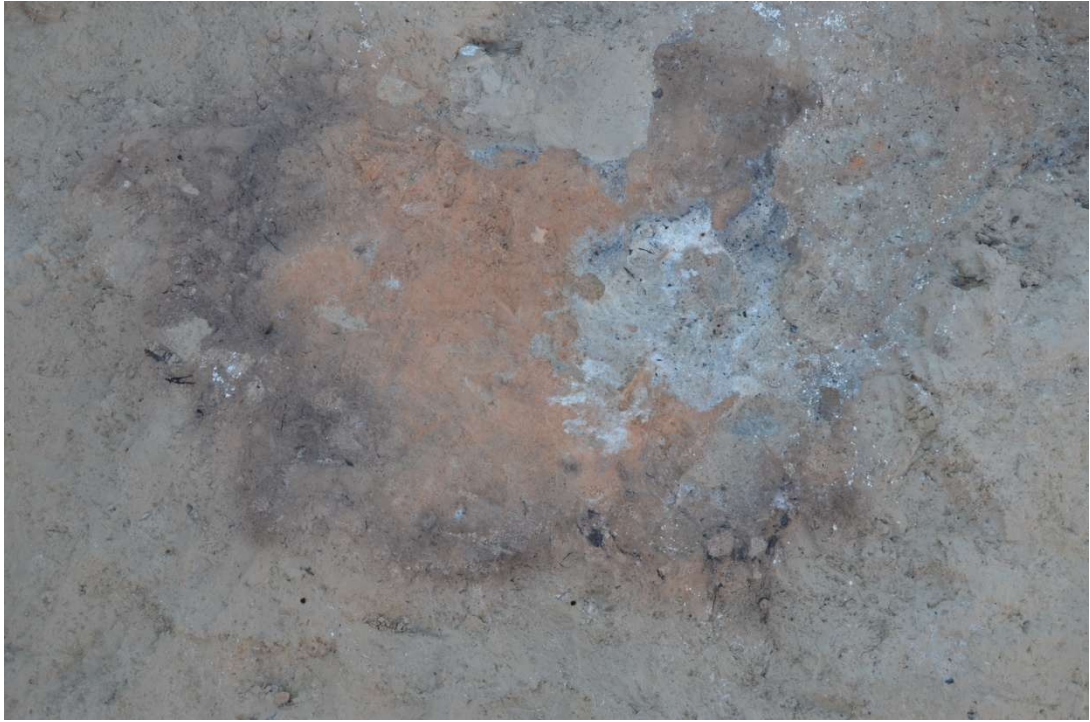


Figure 241. Element 40. Layer of fired loam, ash, and soot in the center of the room. Third construction phase. Plan view.



Figure 242. Element 41. Sufa adjacent to the eastern wall (12) of the room. Third construction phase. View to the south.



Figure 243. Element 41. Sufa adjacent to the eastern wall (12) of the room. Third construction phase. View to the south.



Figure 244. Element 41. Sufa adjacent to the eastern wall (12) of the room. Third construction phase. View to the east.



Figure 245. Element 41. Sufa adjacent to the eastern wall (12) of the room. Third construction phase. View to the east.



Figure 246. Element 41. Sufa adjacent to the eastern wall (12) of the room. Third construction phase. View to the north.



Figure 251. Element 42. Bench border along the western wall (20) of the room. Third construction period. View to the south.



Figure 252. Element 42. Bench border along the western wall (20) of the room. Third construction period. View to the south.

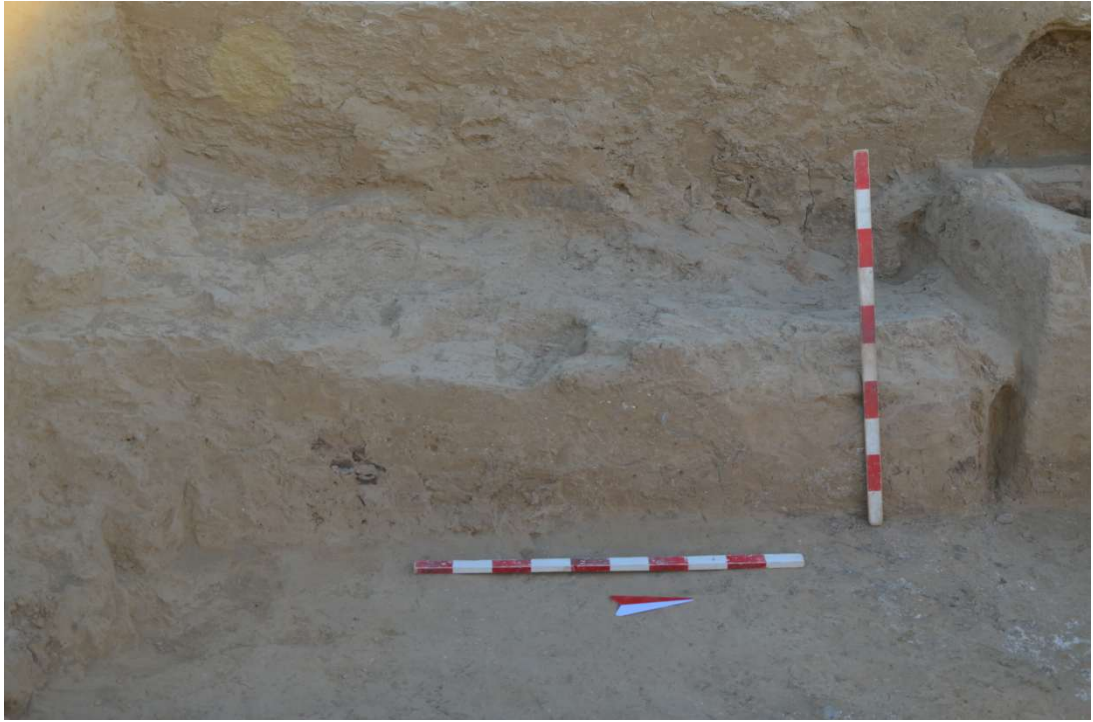


Figure 253. Element 42. Bench along the western wall (20) of the room. Third construction period. View to the west.

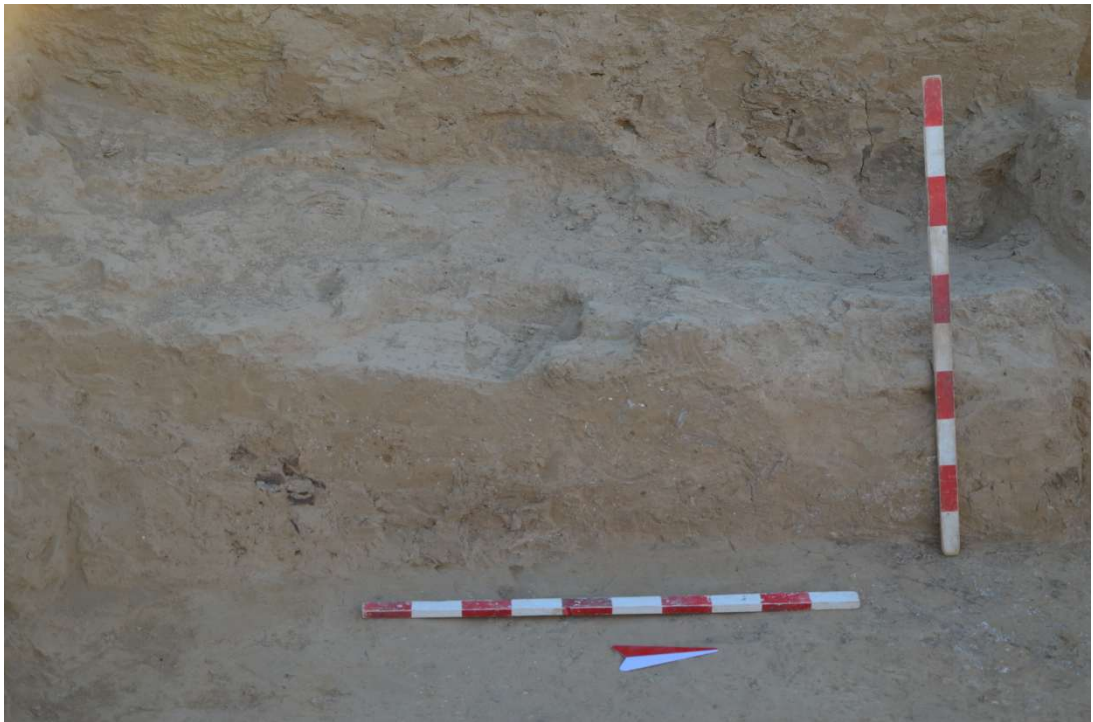


Figure 254. Element 42. Bench along the western wall (20) of the room. Third construction period. View to the west.



Figure 255. Element 42. Bench and wall hearth (33) along the western wall (20) of the room. Third construction period. View to the north.



Figure 256. Element 43. Process of clearing the floor altar in excavation layer (35) in the southern and central parts of the trench. Third construction horizon. View to the northwest.



Figure 257. Element 43. Process of clearing the floor altar in excavation layer (35) in the southern and central parts of the trench. Third construction horizon. View to the north.



Figure 258. Element 43. Process of clearing the floor altar in excavation layer (35) in the southern and central parts of the trench. Third construction horizon. View to the west.



Figure 259. Element 43. Process of clearing the floor altar in excavation layer (35) in the southern and central parts of the trench. Third construction horizon. View to the west.



Figure 260. Element 43. Pit from a vessel within the floor altar during excavation in the southern and central areas of the trench. Third construction horizon. View to the west.



Figure 261. Element 43. Ceramic cauldron stand with handle for a vessel within the floor altar during excavation in the southern and central areas of the trench. Third construction horizon. View to the west.



Figure 262. Element 43. Excavation of a ceramic stand with handle for a vessel within the floor altar during work in the southern and central areas of the trench. Third construction horizon. View to the west.



Figure 263. Element 43. Floor altar with a vessel depression and remains of protomes after cleaning of the interior portion. Third construction horizon. View to the east.



Figure 264. Element 43. Floor altar with a vessel depression and remains of protomes after cleaning of the interior portion. Third construction horizon. View to the south.

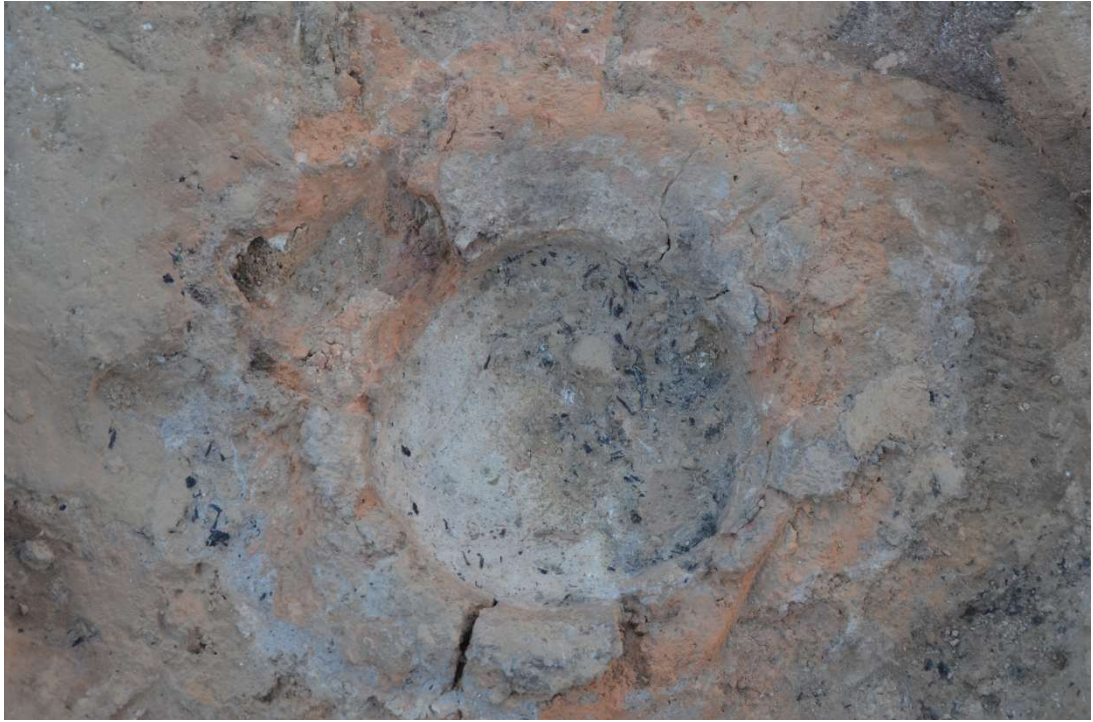


Figure 265. Element 43. Vessel depression inside the floor altar after cleaning. Third construction horizon. Top view.



Figure 266. Element 43. Floor altar with side walls, vessel depression, and remains of protomes after cleaning of the interior portion. Third construction horizon. View to the north.



Figure 267. Element 43. Process of clearing the floor altar in excavation layer (35) in the southern and central parts of the trench. Third construction horizon. View to the northwest.



Figure 268. Element 43. Process of clearing the floor altar in excavation layer (35) in the southern and central parts of the trench. Third construction horizon. View to the north.



Figure 269. Element 43. Process of clearing the floor altar in excavation layer (35) in the southern and central parts of the trench. Third construction horizon. View to the west.



Figure 270. Element 43. Pit from a vessel within the floor altar during excavation in the southern and central areas of the trench. Third construction horizon. View to the west.



Figure 271. Element 43. Floor altar with a vessel depression and remains of protomes after cleaning of the interior portion. Third construction horizon. View to the east.



Figure 272. Element 43. Floor altar with a vessel depression and remains of protomes after cleaning of the interior portion. Third construction horizon. View to the south.



Figure 273. Element 43. Floor altar with side walls, vessel depression, and remains of protomes after cleaning of the interior portion. Third construction horizon. View to the north.



Figure 274. Element 43. Floor altar with borders, a vessel depression, and remnants of protomes after final cleaning. Third construction horizon. View to the south.



Figure 275. Element 43. Floor altar with borders, a vessel depression, and remnants of protomes, adorned near the northern platform with a horn-shaped arrangement, after final cleaning. Third construction horizon. View to the south.



Figure 276. Element 43. Floor altar with borders, a vessel depression, and remnants of protomes, adorned near the northern platform with a horn-shaped arrangement, after final cleaning. Third construction horizon. View to the east.



Figure 277. Element 43. Floor altar with borders, a vessel depression, and remnants of protomes, adorned near the northern platform with a horn-shaped arrangement, after final cleaning. Third construction horizon. View to the west.



Figure 278. Element 43. Floor altar with borders, a vessel depression, and remnants of protomes, adorned near the northern platform with a horn-shaped arrangement, after final cleaning. Third construction horizon. View to the north.



Figure 279. Element 44. Brick niche at the northern wall following clearance of the internal fill. Third construction horizon. View to the north.



Figure 280. Element 44. Brick niche at the northern wall following clearance of the internal fill. Third construction horizon. View to the north.



Figure 281. Element 44. Brick niche at the northern wall following clearance of the internal fill. Third construction horizon. View to the north.



Figure 282. Element 45. Dense loamy floor along the sufa at the eastern wall (12) of the room. Third construction period. View to the north.



Figure 283. Element 45. Dense loamy floor along the sufa at the western wall (20) of the room. Third construction period. View to the south.



Figure 284. Element 45. Dense loamy floor along the sufa at the western wall (20) of the room. Third construction period. View to the west.



Figure 285. Element 45. Dense loamy floor along the sufa at the eastern wall (12) of the room. Third construction period. View to the south.



Figure 286. Commencement of the excavation reclamation process.



Figure 247. Element 41. Sufa adjacent to the eastern wall (12) of the room. Third construction phase. View to the north.



Figure 248. Element 41. Edge of the sufa by the eastern wall (12) of the room. Third construction phase. View to the east.



Figure 249. Element 41. Edge of the sufa by the eastern wall (12) of the room. Third construction phase. View to the south.



Figure 250. Element 41. Edge of the sufa by the eastern wall (12) of the room. Third construction phase. View to the north.

Appendix – Drawings Documentation

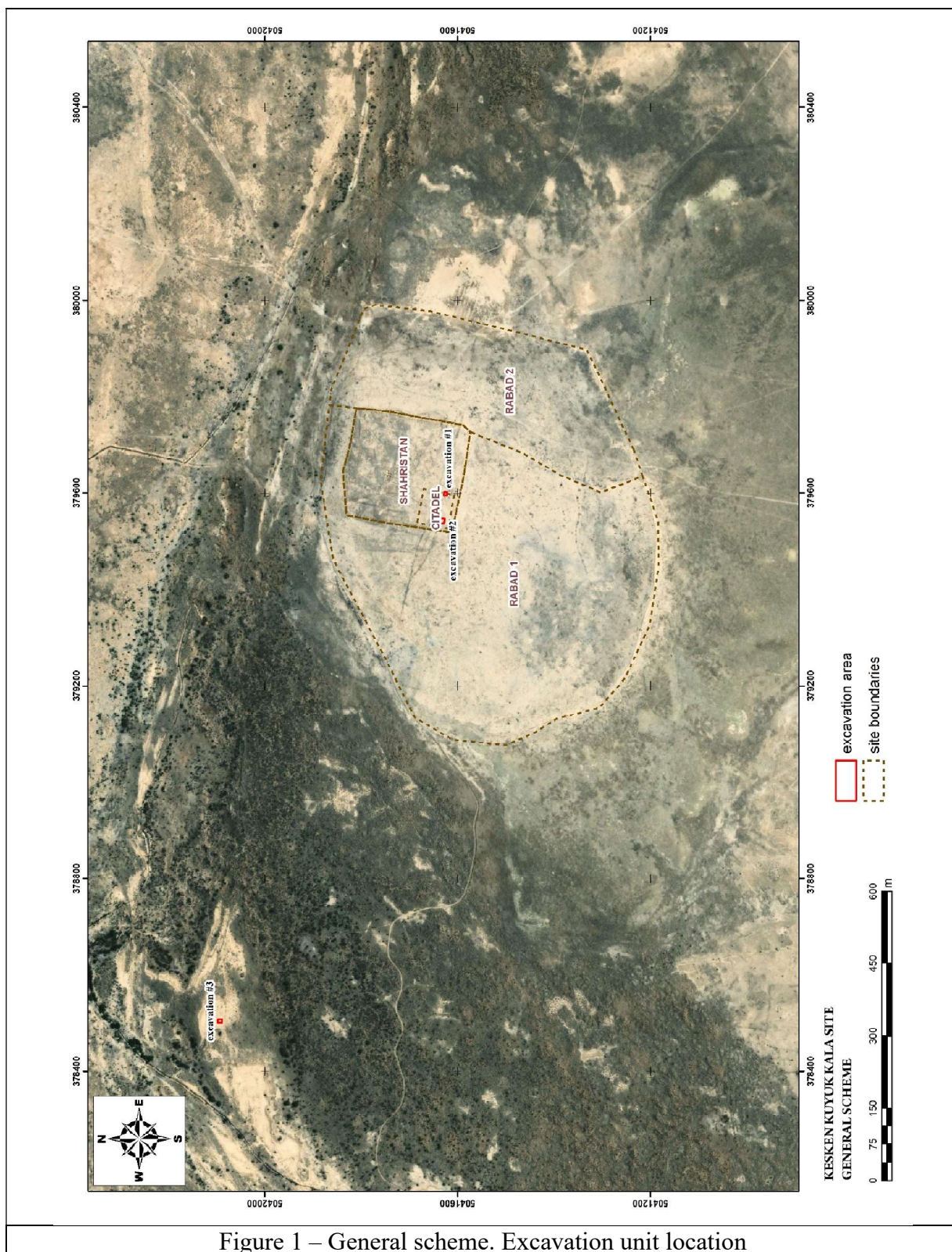


Figure 1 – General scheme. Excavation unit location

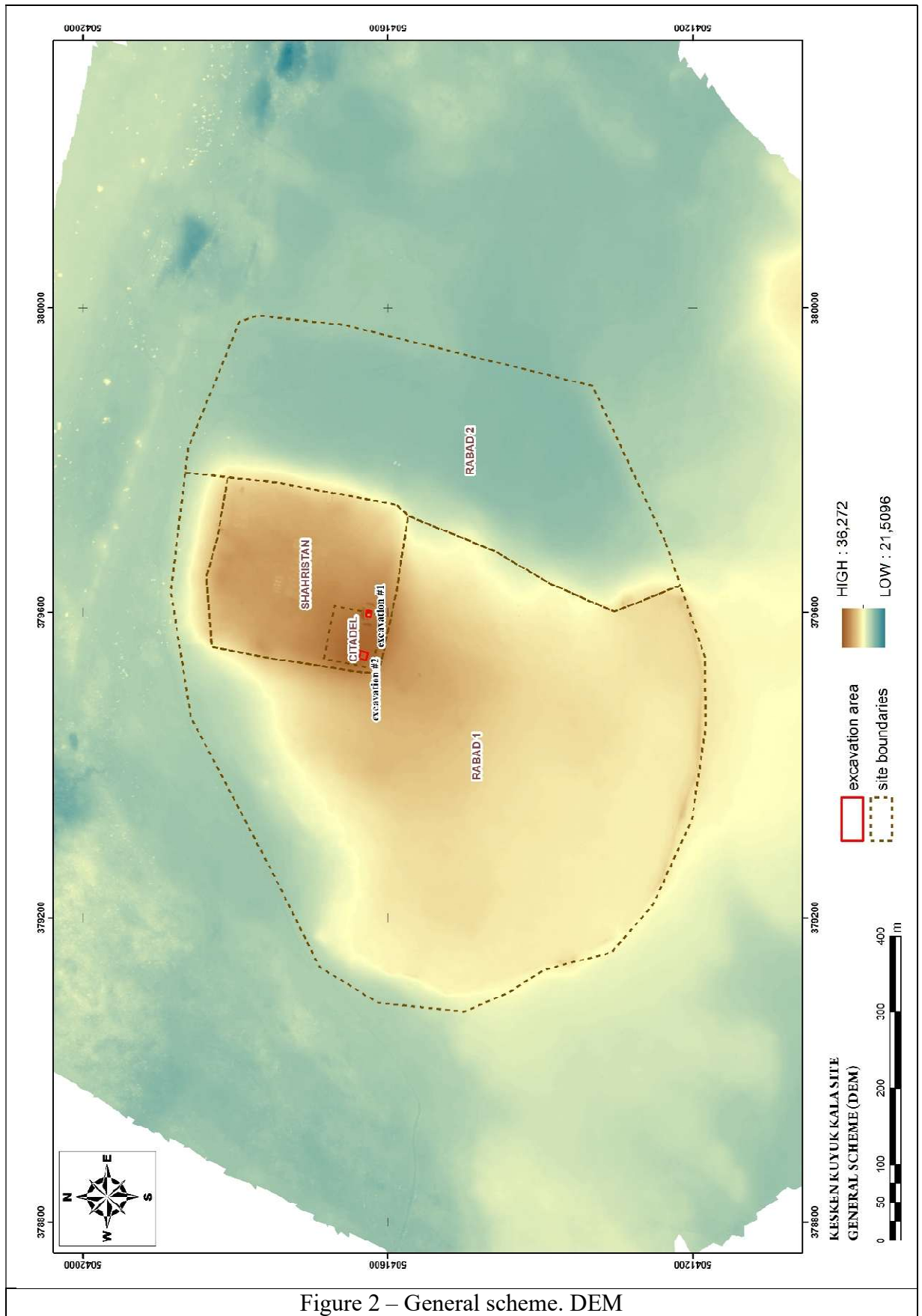


Figure 2 – General scheme. DEM

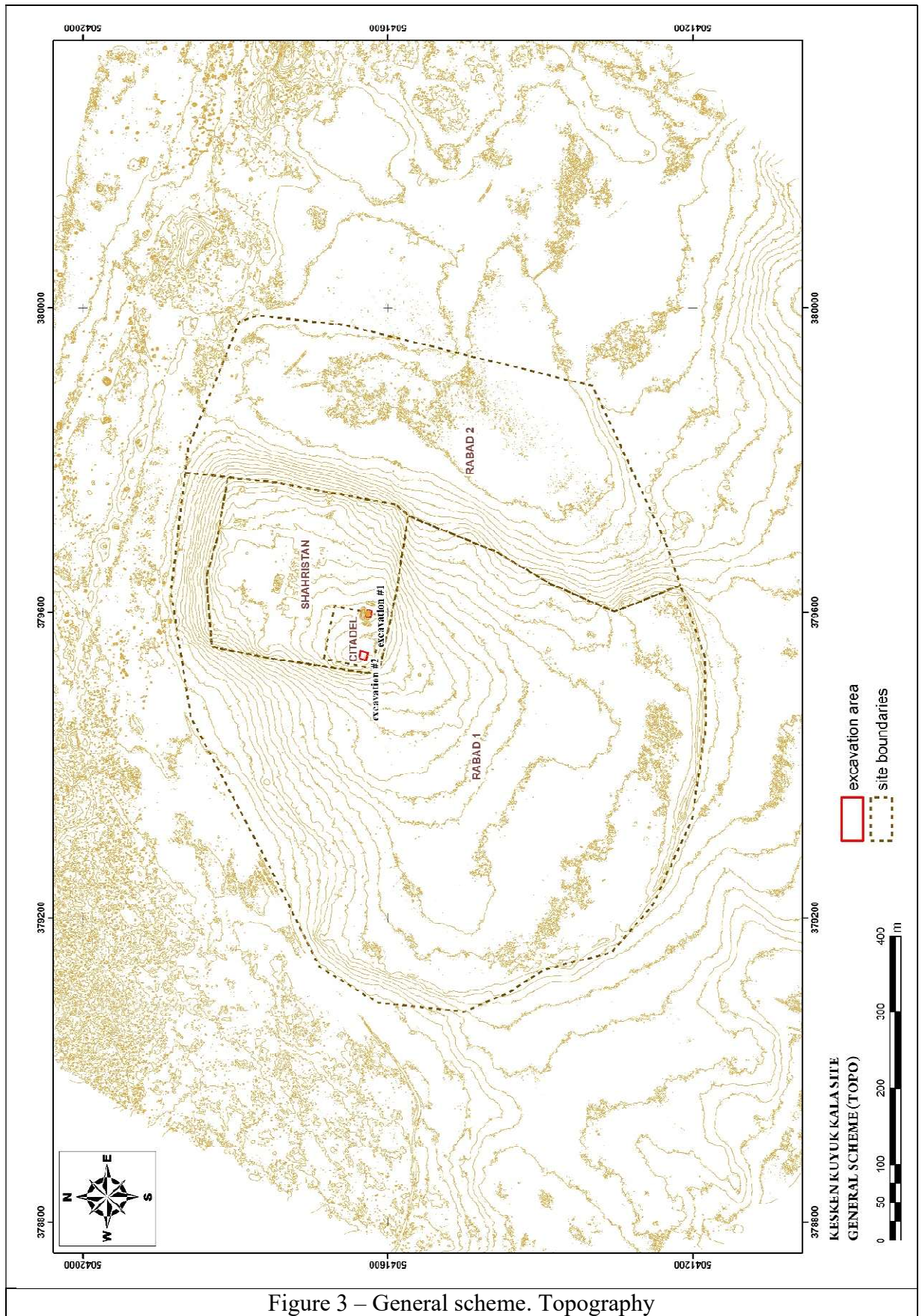


Figure 3 – General scheme. Topography

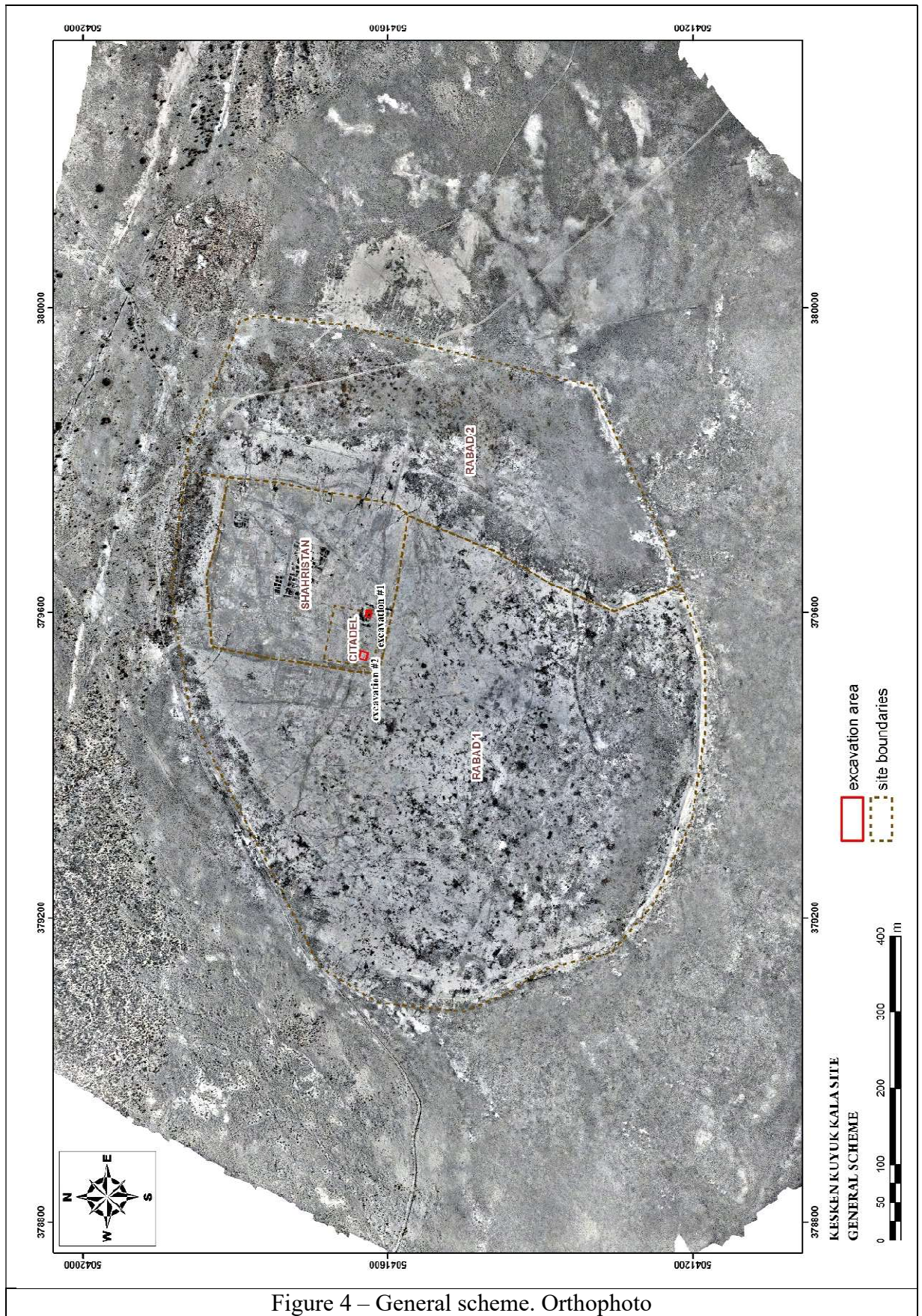


Figure 4 – General scheme. Orthophoto

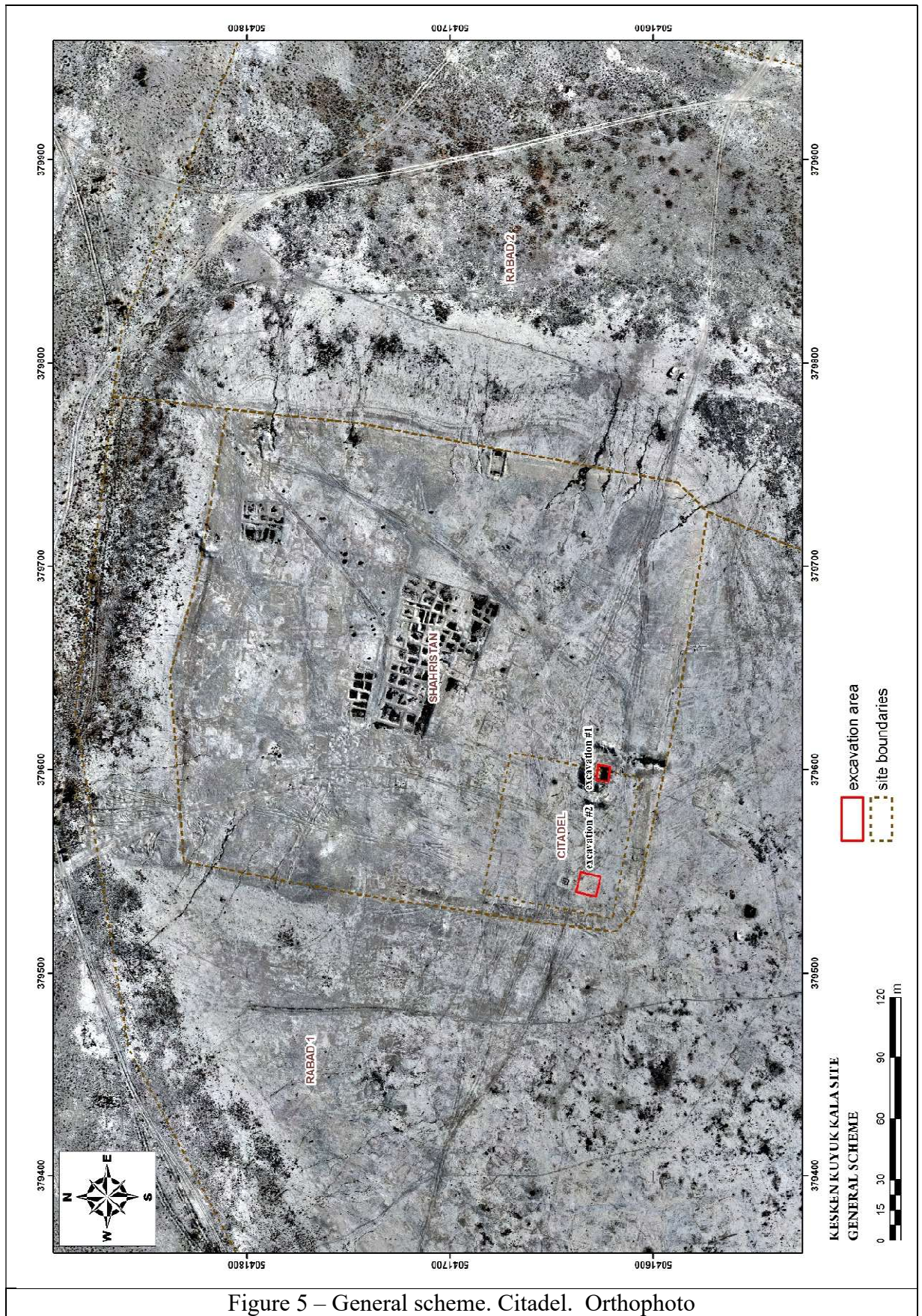


Figure 5 – General scheme. Citadel. Orthophoto

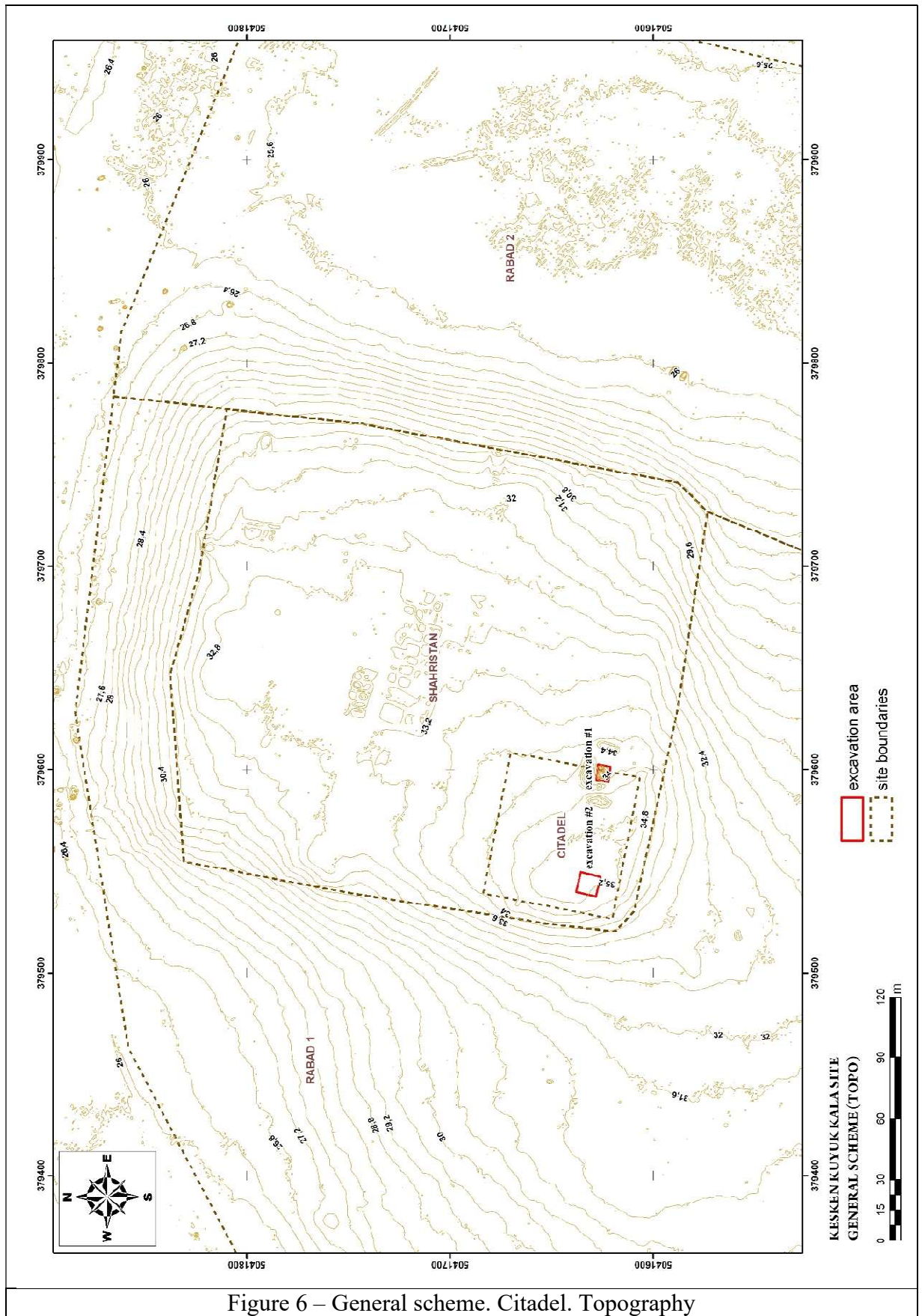


Figure 6 – General scheme. Citadel. Topography

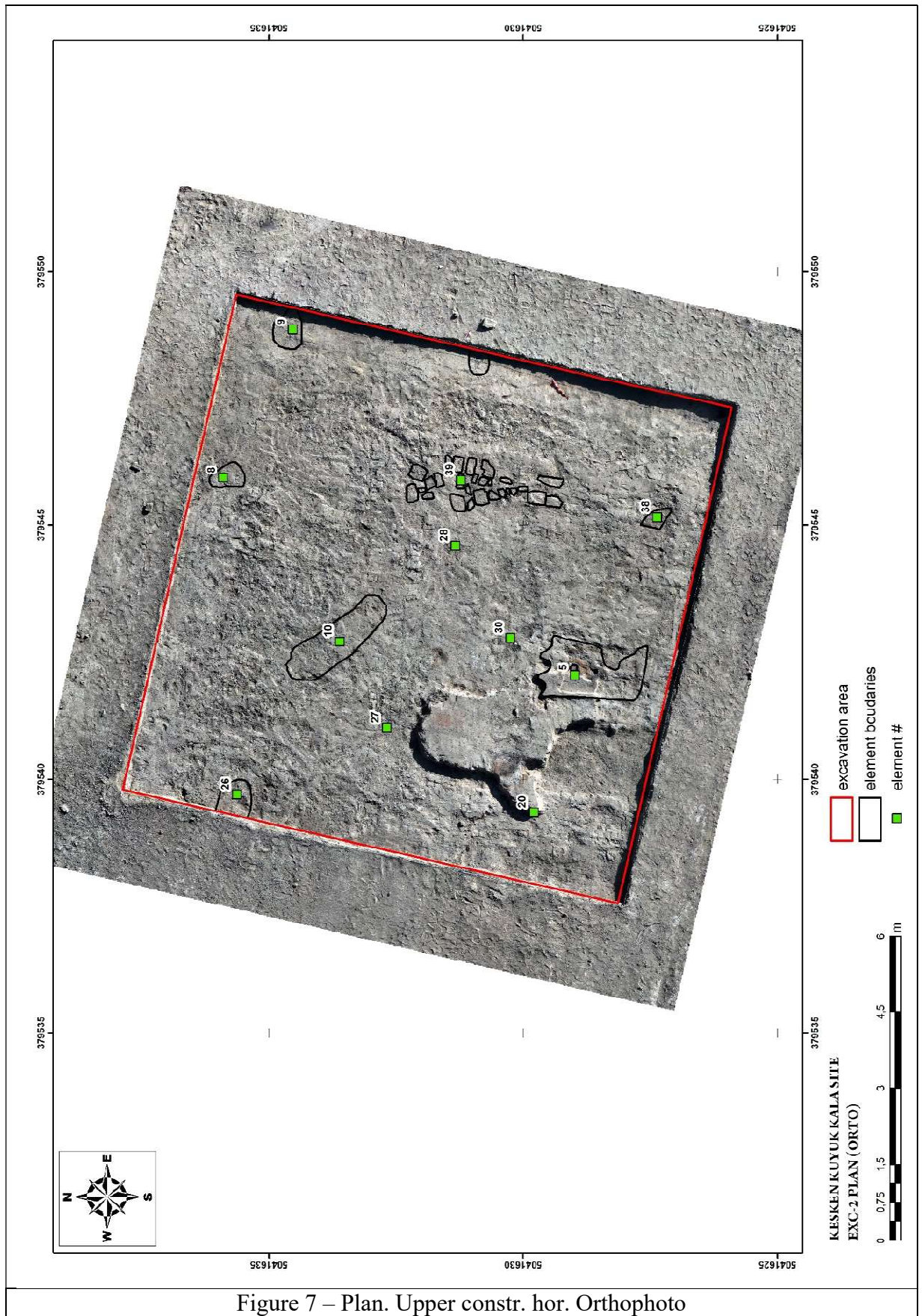


Figure 7 – Plan. Upper constr. hor. Orthophoto

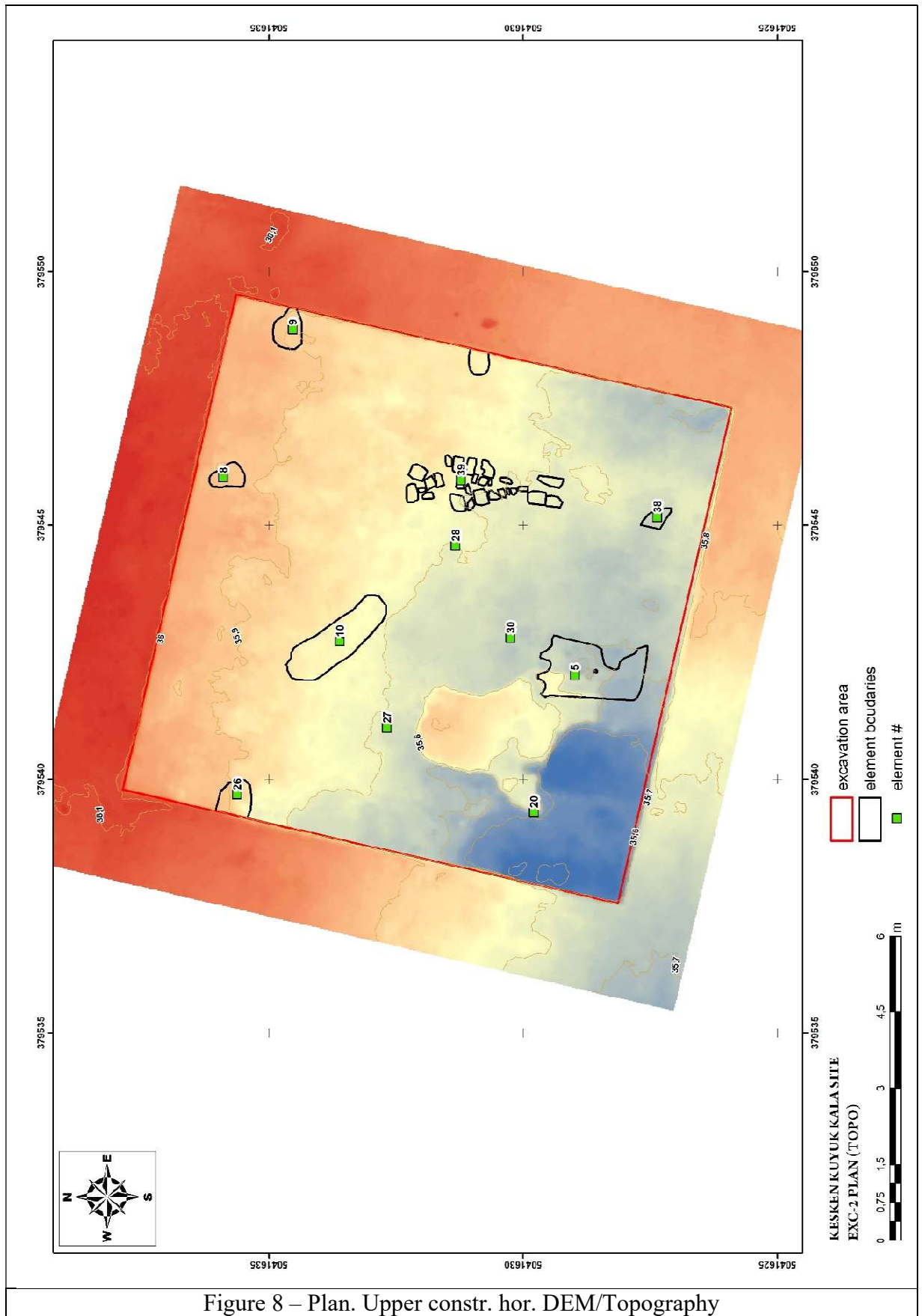


Figure 8 – Plan. Upper constr. hor. DEM/Topography

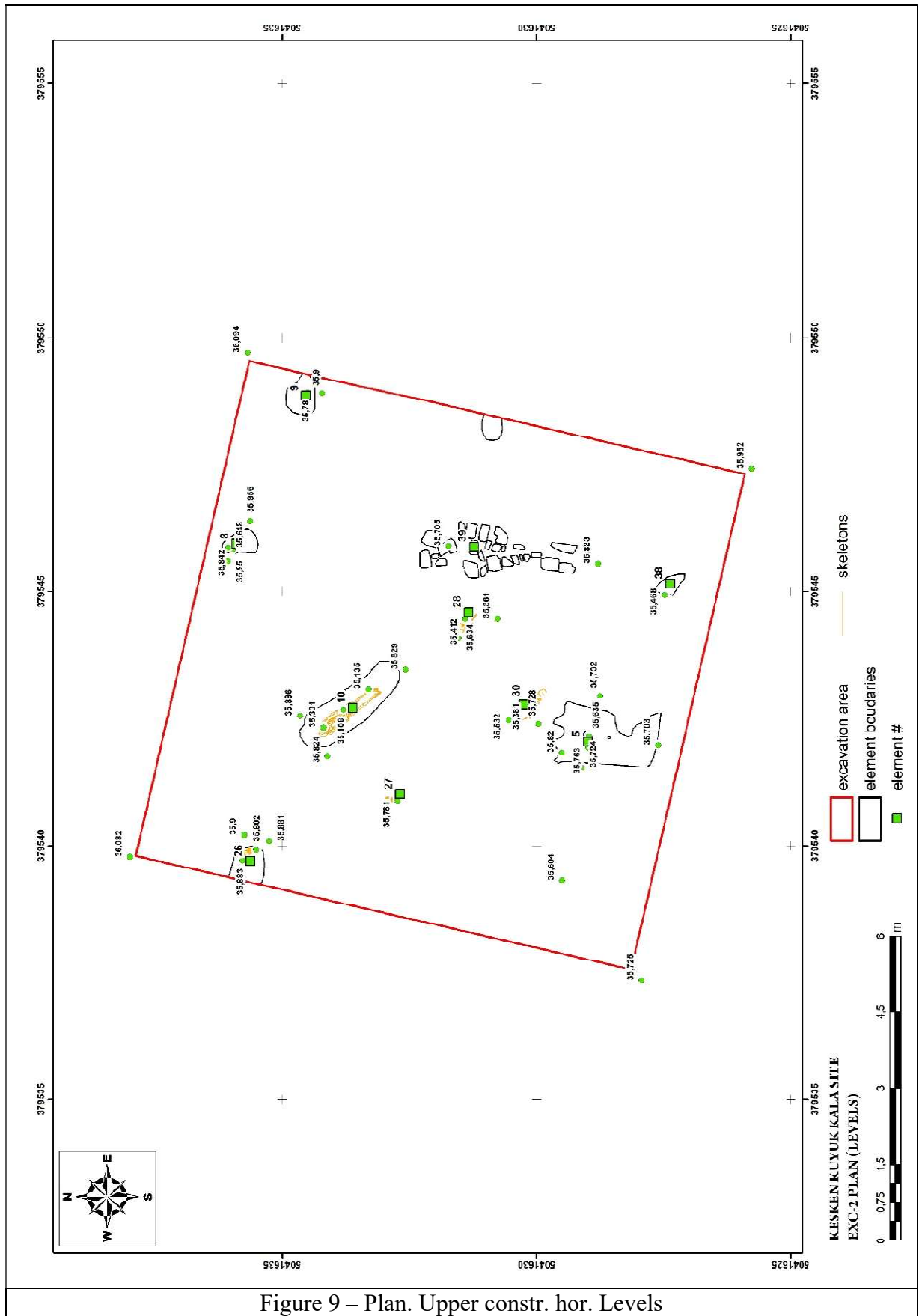


Figure 9 – Plan. Upper constr. hor. Levels

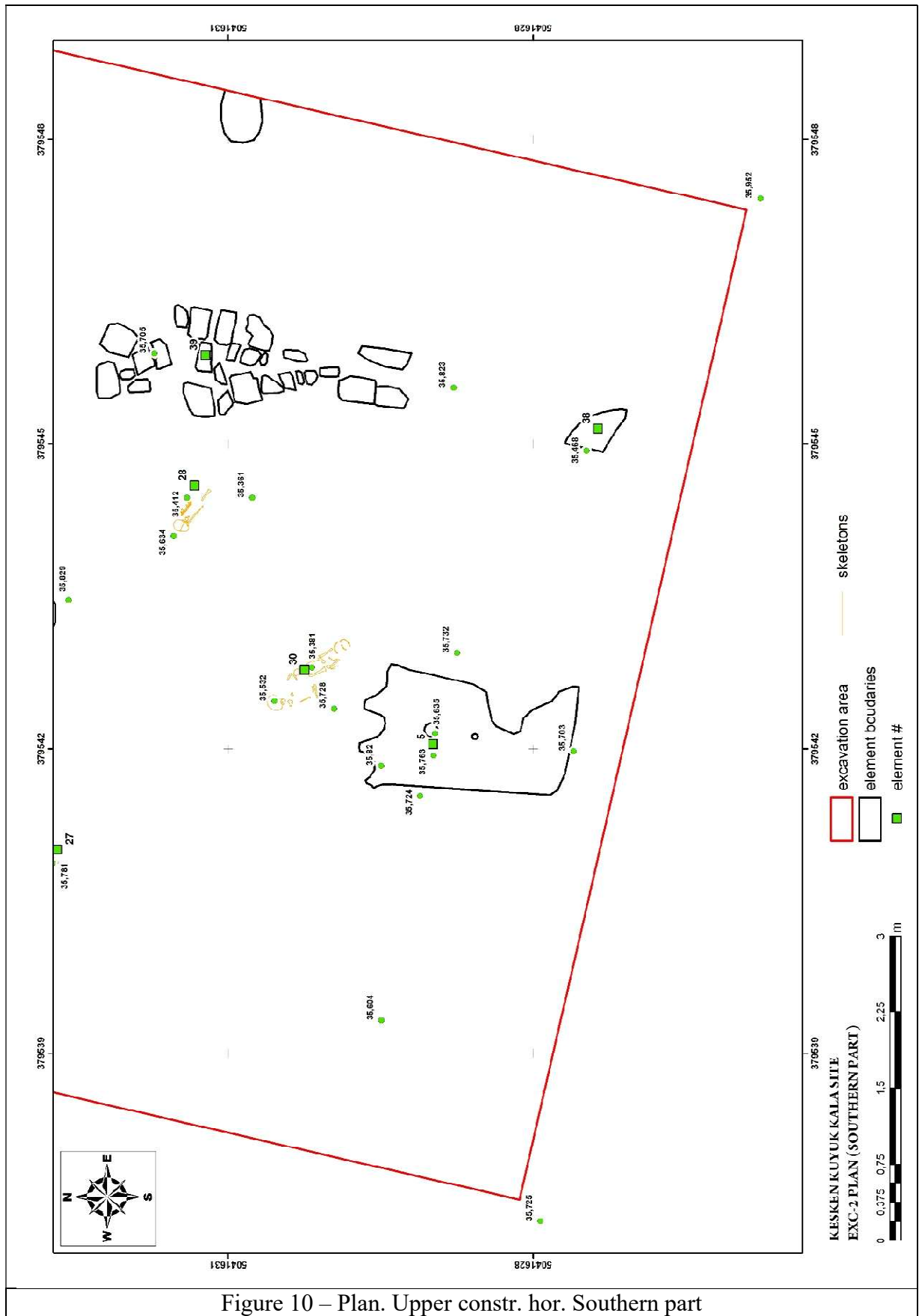


Figure 10 – Plan. Upper constr. hor. Southern part

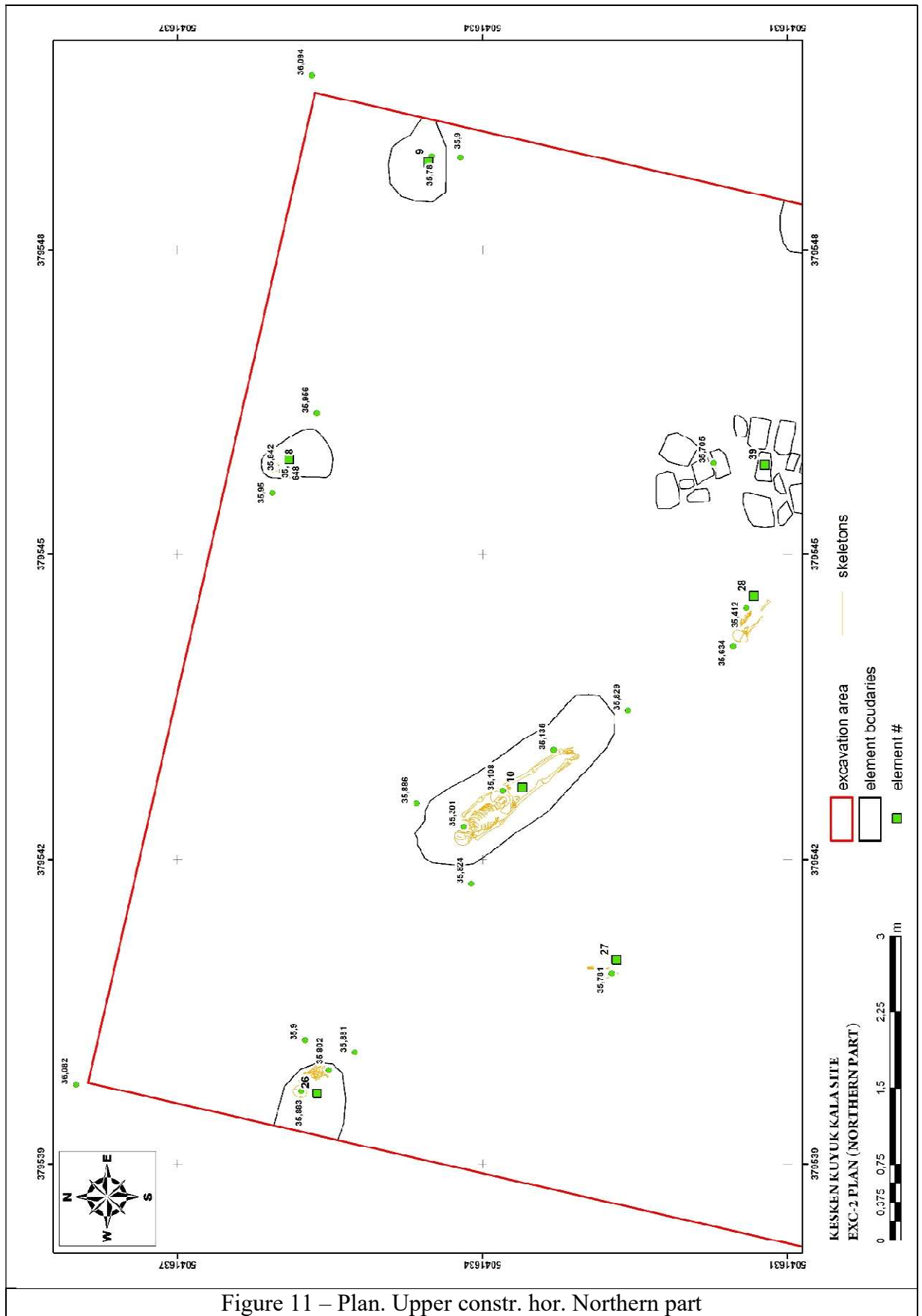
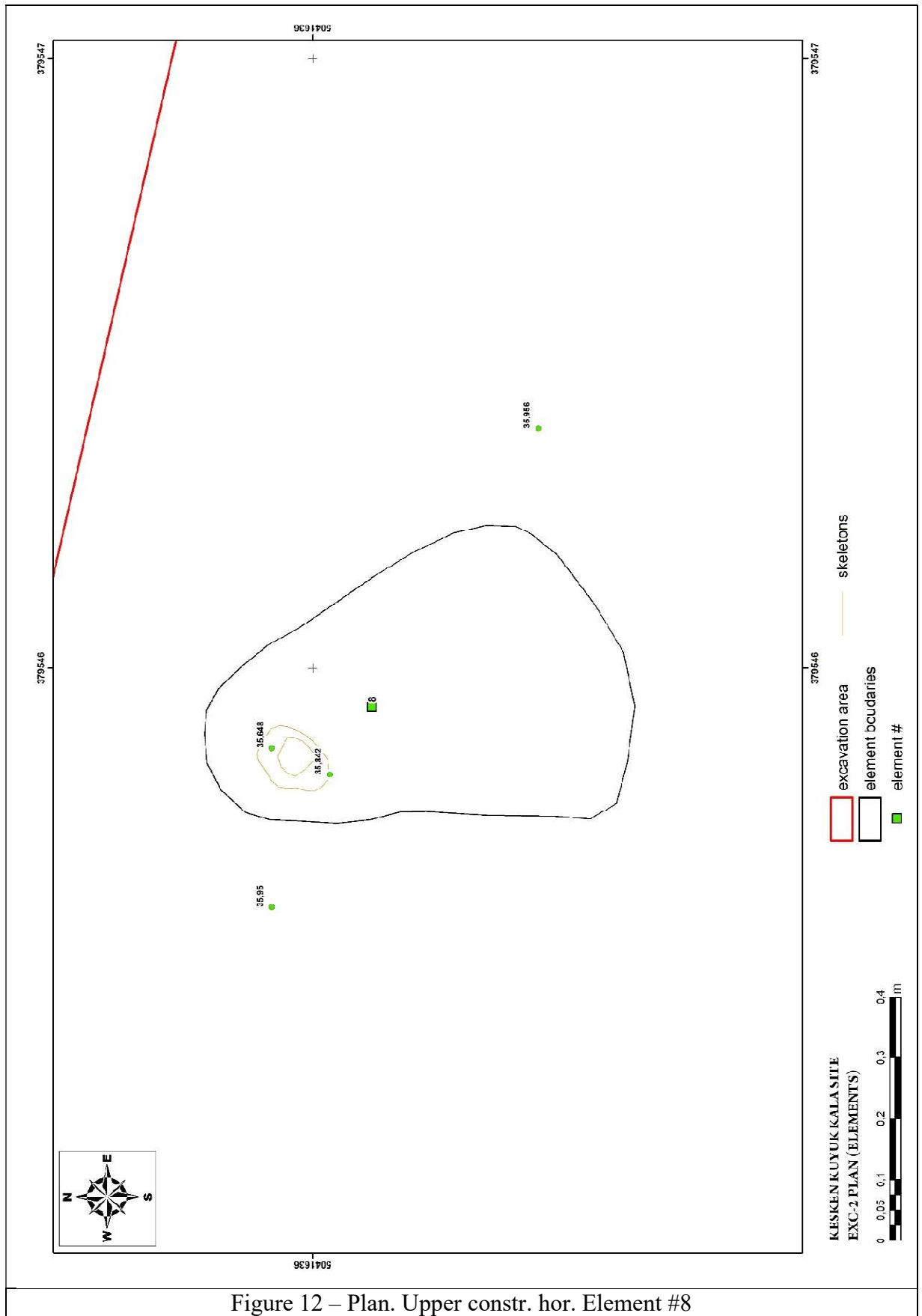


Figure 11 – Plan. Upper constr. hor. Northern part



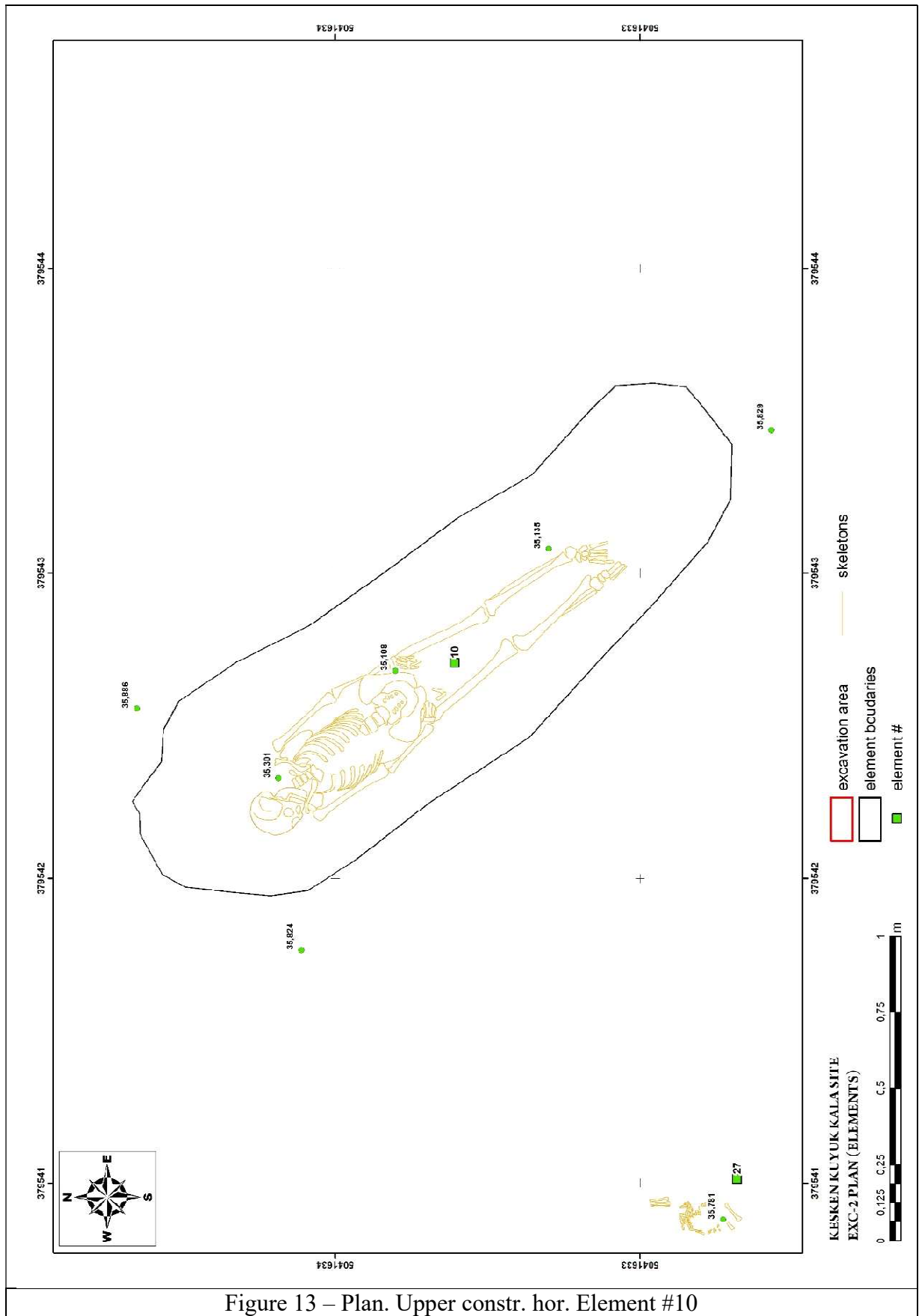
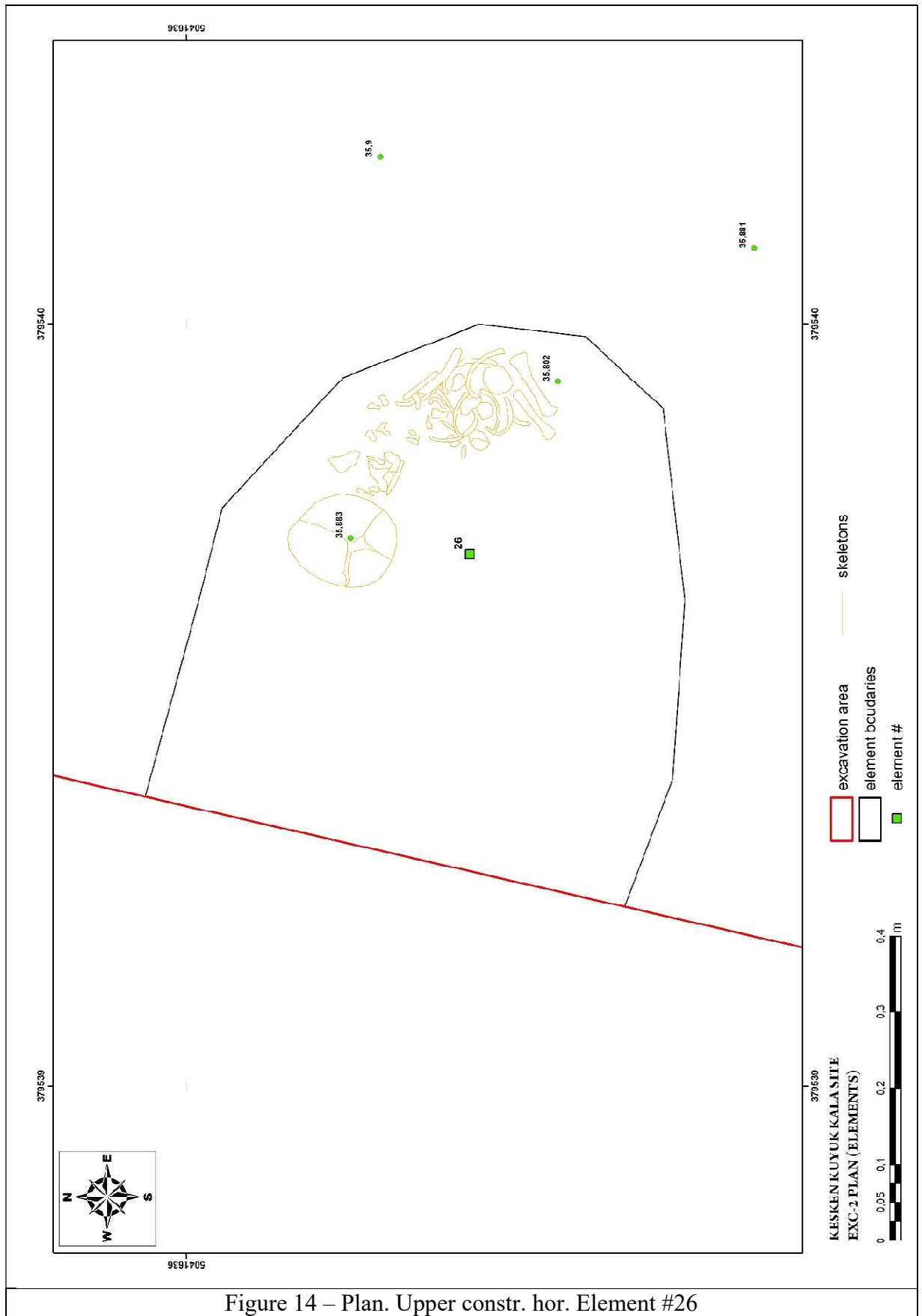


Figure 13 – Plan. Upper constr. hor. Element #10



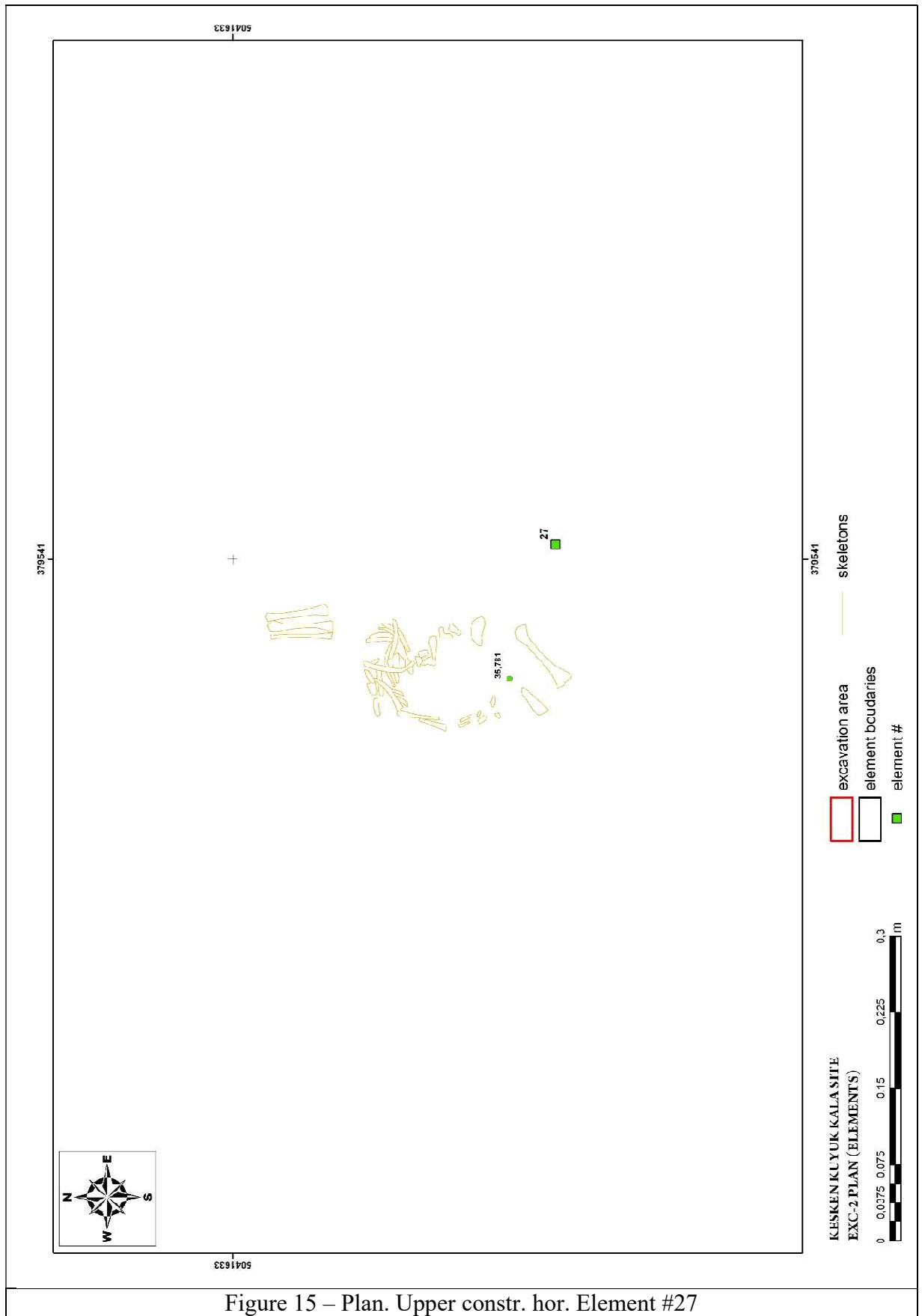


Figure 15 – Plan. Upper constr. hor. Element #27

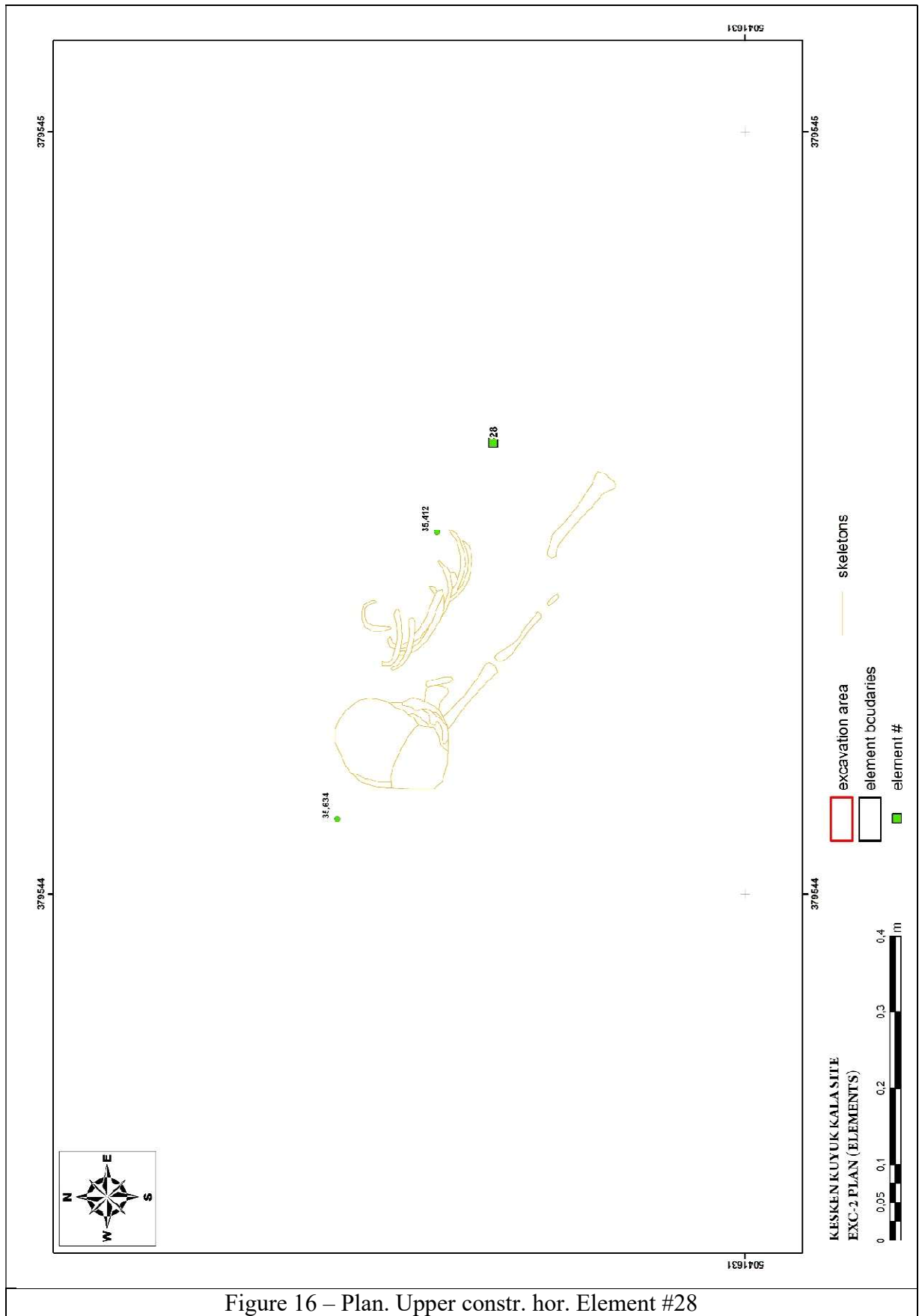


Figure 16 – Plan. Upper constr. hor. Element #28

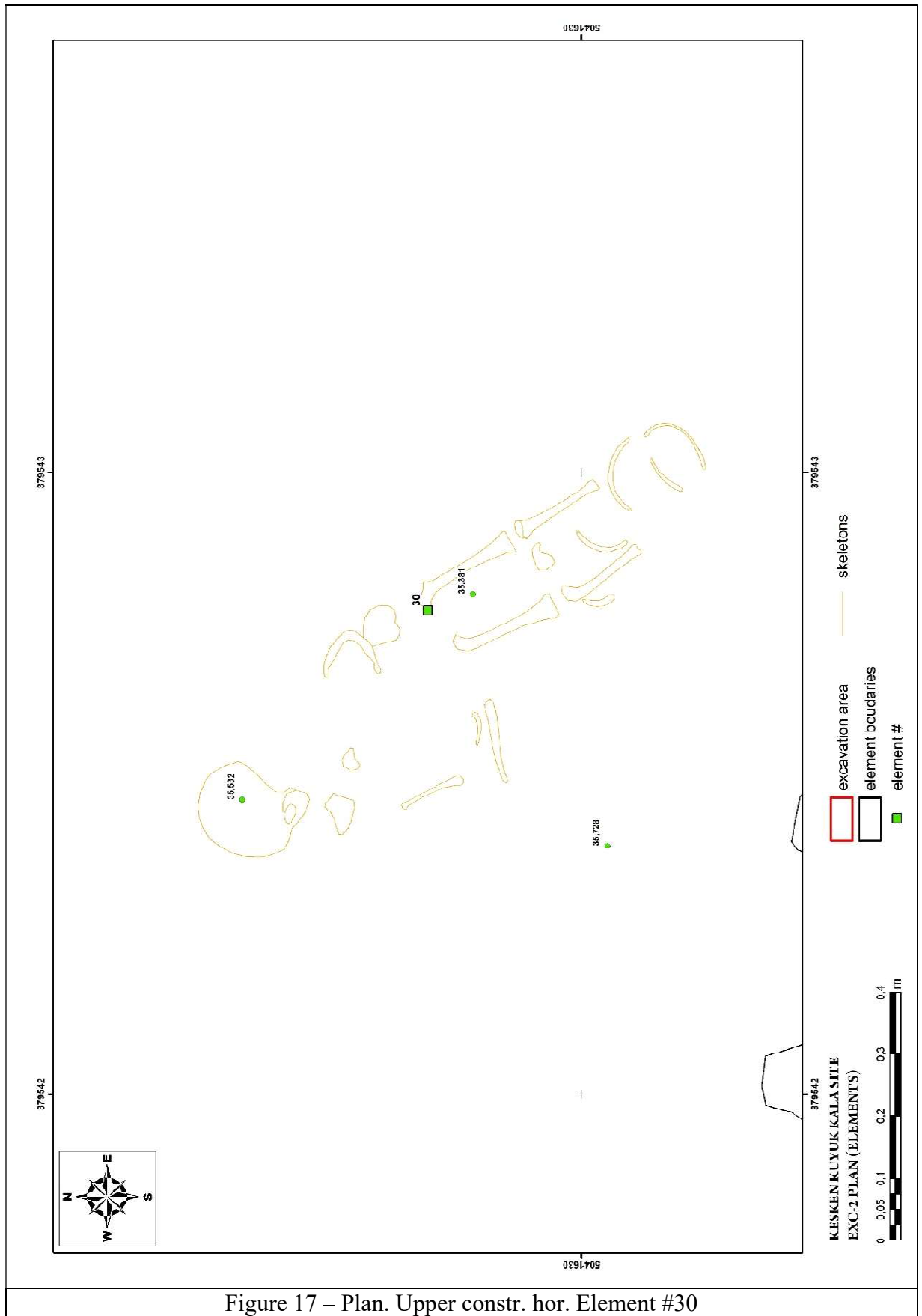


Figure 17 – Plan. Upper constr. hor. Element #30

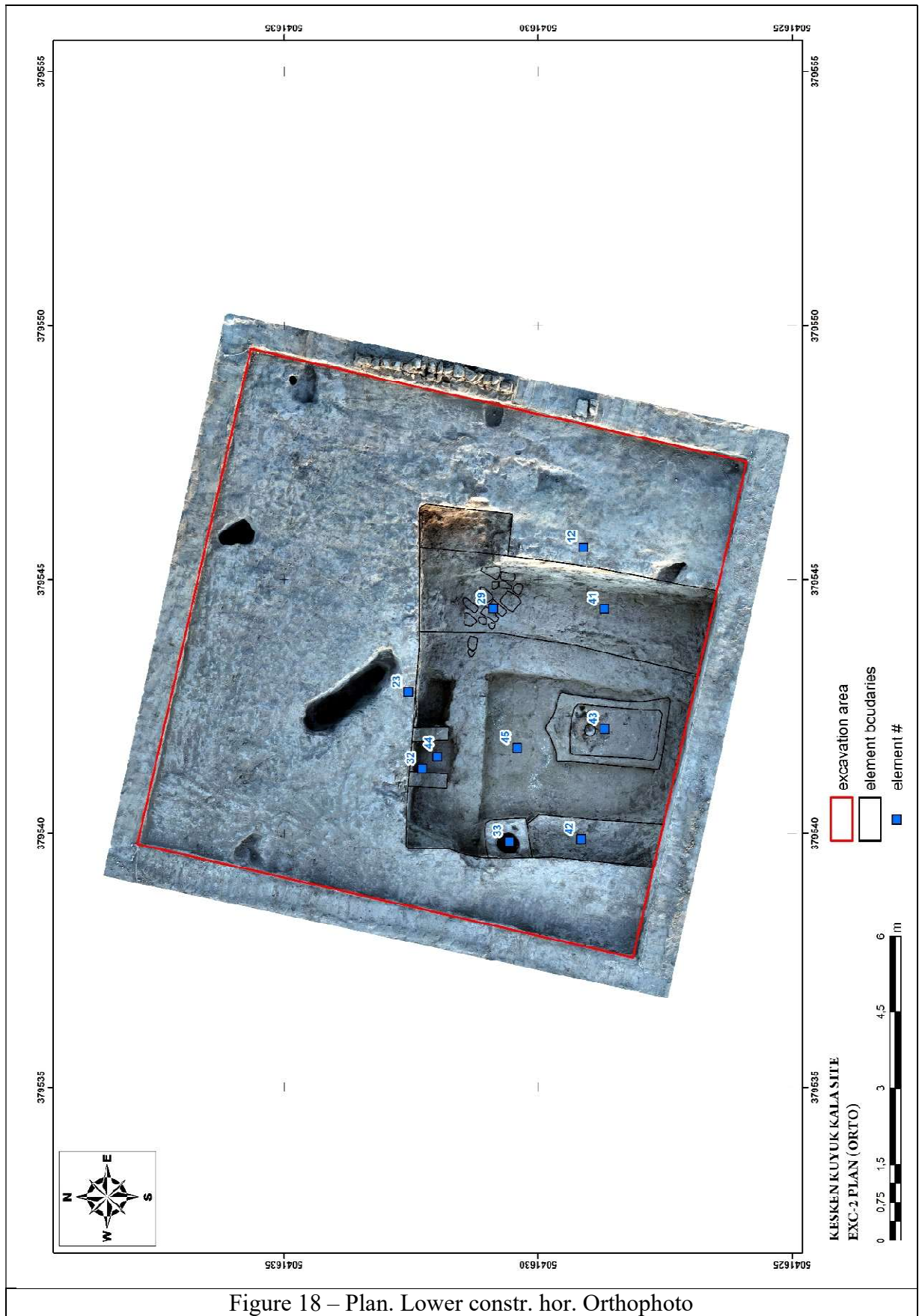


Figure 18 – Plan. Lower constr. hor. Orthophoto

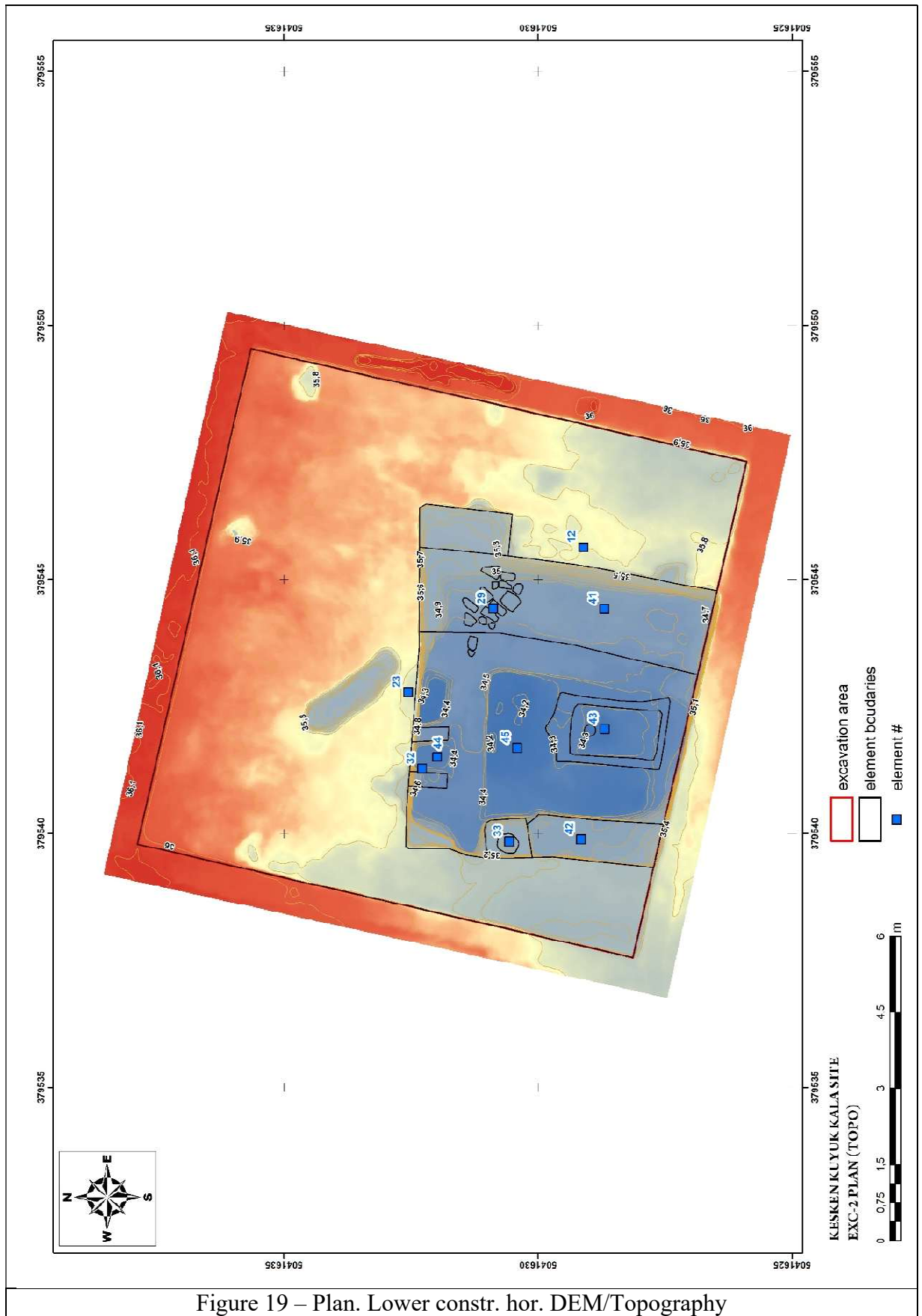


Figure 19 – Plan. Lower constr. hor. DEM/Topography

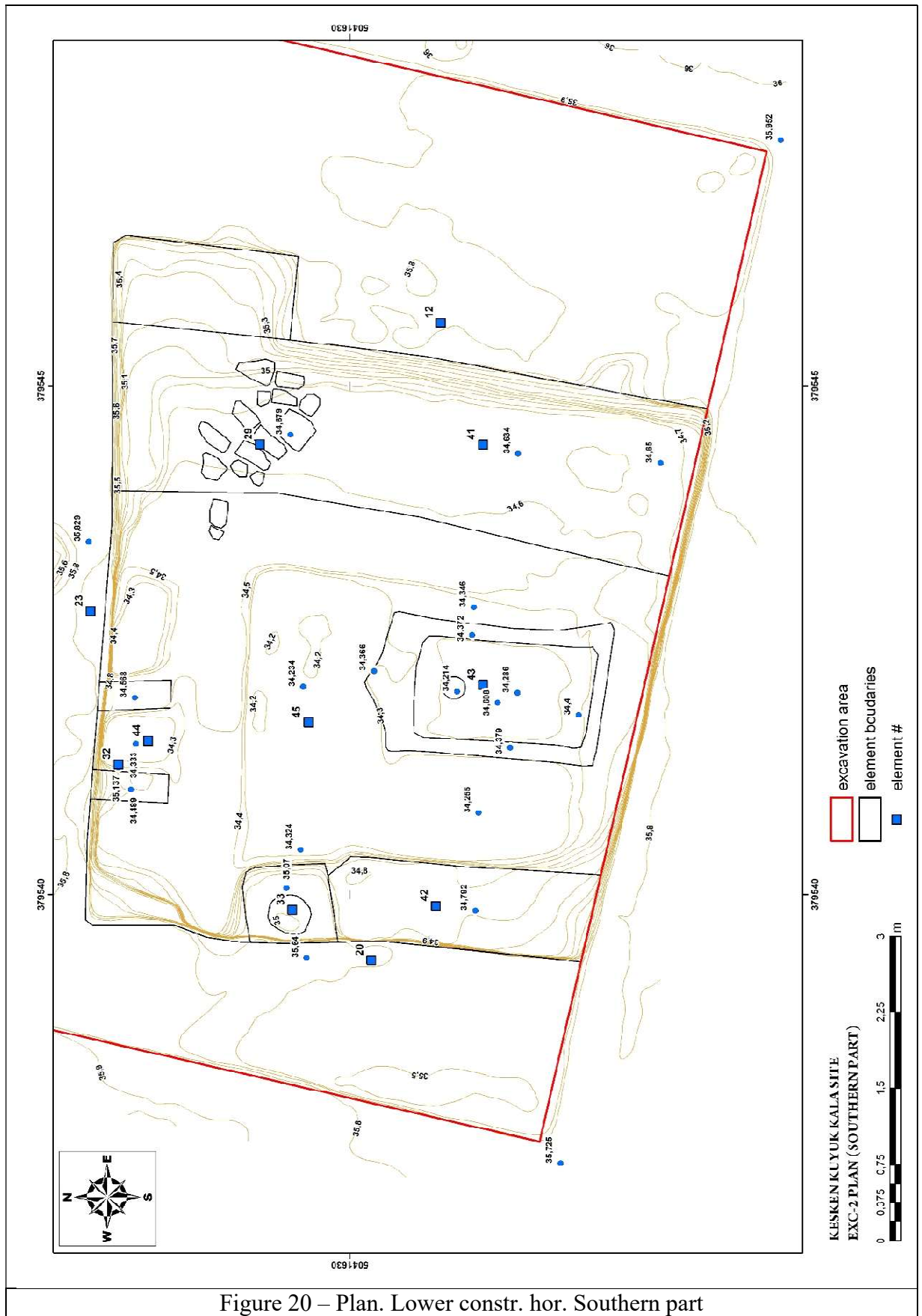


Figure 20 – Plan. Lower constr. hor. Southern part

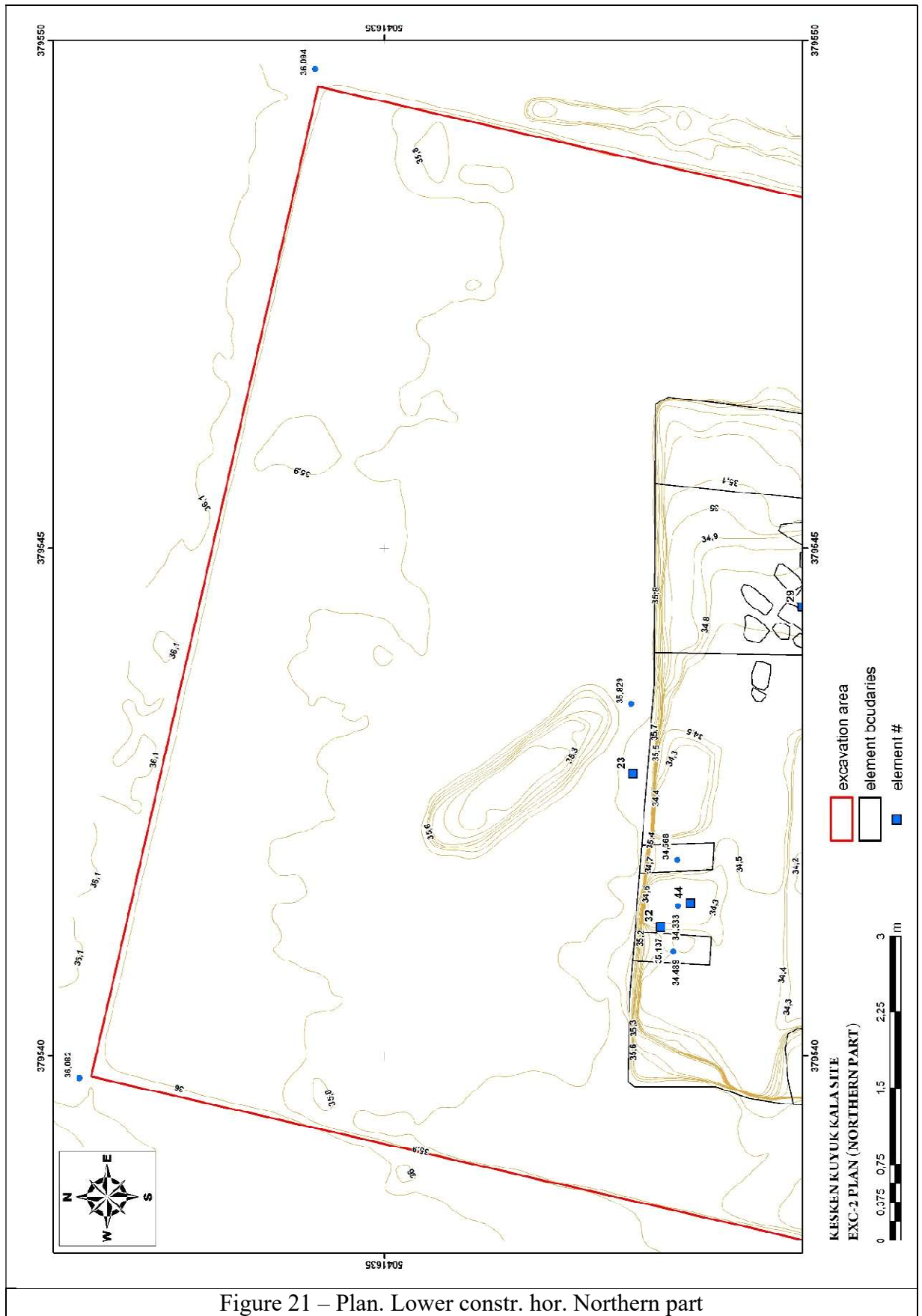


Figure 21 – Plan. Lower constr. hor. Northern part

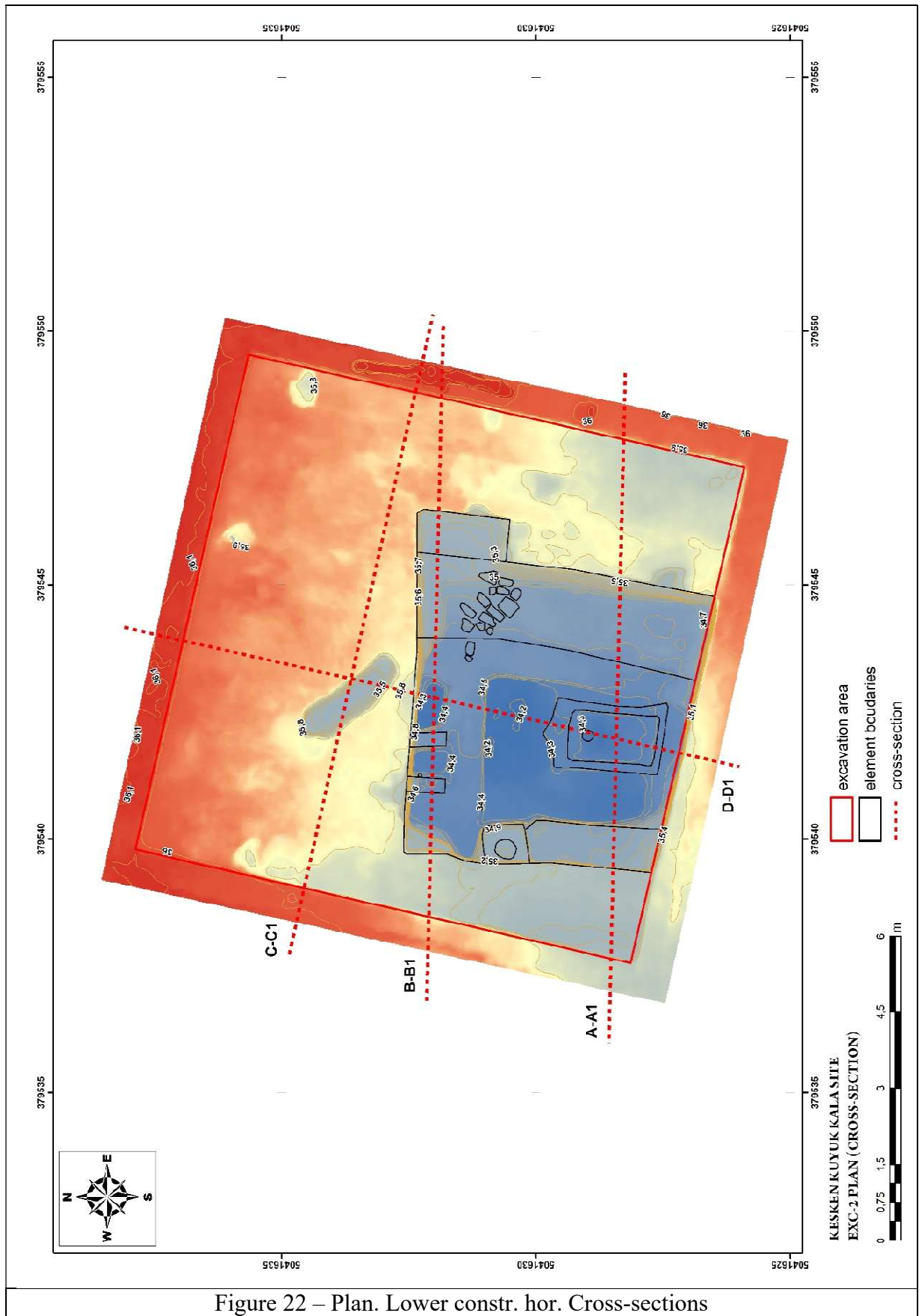


Figure 22 – Plan. Lower constr. hor. Cross-sections

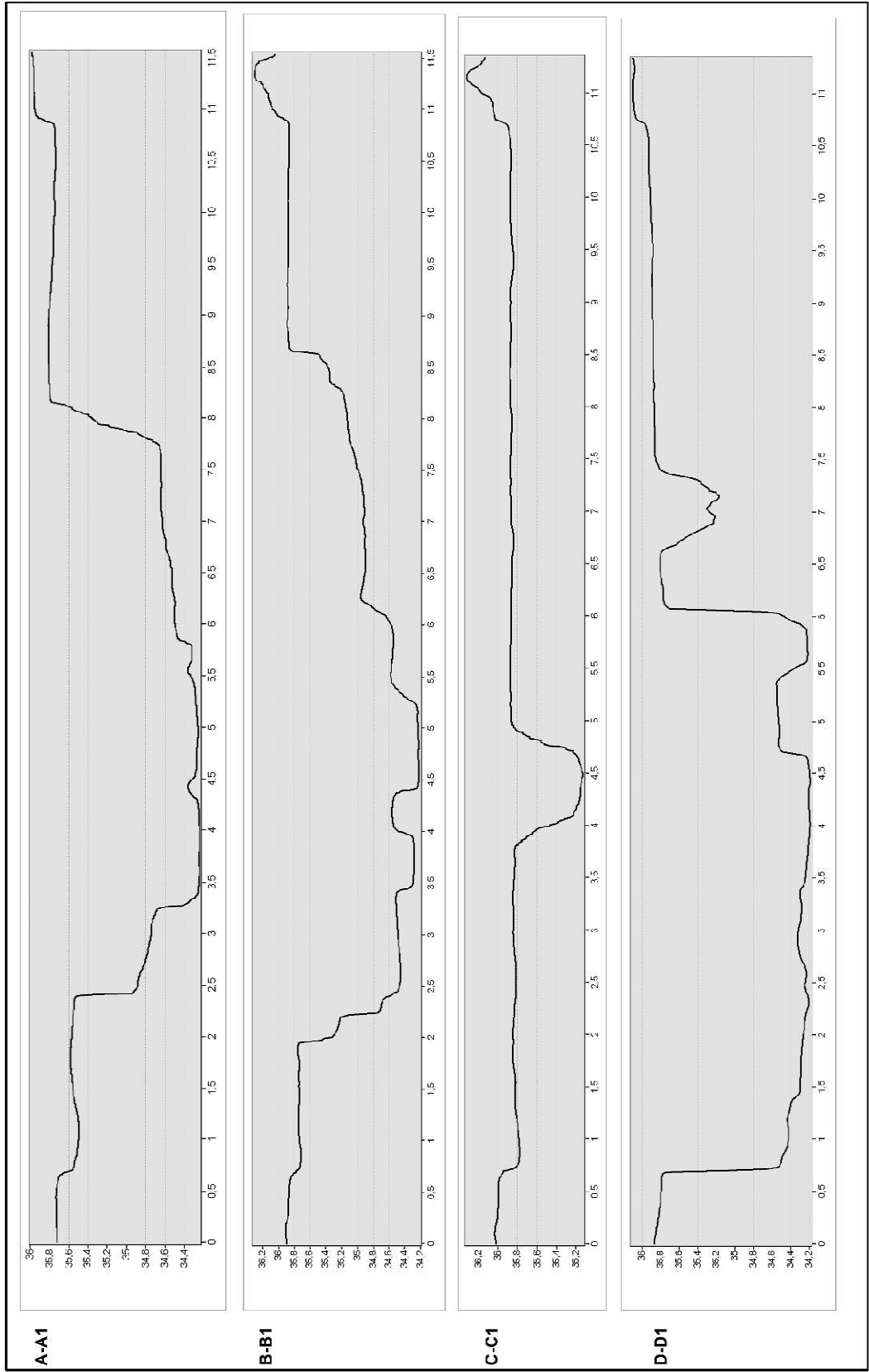


Figure 23 – Lower constr. hor. Cross-sections

Results of ground-penetrating radar (GPR) survey

In 2025, work was concentrated on the citadel area of the fortified site, situated in the southwestern part of the shakhristan.

Geomagnetic scanning was conducted across an extensive area, which encompassed the excavation site. The objective of the work was to identify the overall structural layout of the citadel section immediately adjacent to the fortress walls.

1. Geoarchaeological investigations at the fortified site of Kesken-Kuyuk Kala aim to non-invasively identify buried architectural remains without disturbing the integrity of the cultural layer. Considering the specifics of medieval fortification construction, the primary objective is to map pakhsa and mudbrick masses, which exhibit dielectric properties distinct from the surrounding soil. The application of the ground-penetrating radar method enables the reconstruction of the object's planning structure based on the registration of reflected electromagnetic pulses.

In 2025, a continuous high-resolution ground-penetrating radar survey was conducted for the first time within a significant area of the intra-fortress space at the citadel of the Kesken-Kuyuk Kala site. This involved generating a series of deep horizontal slices and spatially interpreting subsurface architectural structures. The work undertaken constitutes the initial systematic instrumental phase of non-destructive mapping of the layout structure for this sector of the monument.

The research is fundamentally important, as it aims to obtain spatially continuous data on the distribution of buried architectural remains without disturbing the integrity of the cultural layer. The application of the ground-penetrating radar method allowed for a transition from localized excavation observations to an area-wide instrumental reconstruction of the site's structure, the identification of zones with concentrated major constructions, and an analysis of the internal organization of the citadel complex.

During the scanning, a stable system of linear and closed geophysical anomalies was recorded, reflecting the presence of extended wall massifs, rectangular architectural cells, and localized dense objects. The spatial regularity and orientation of the identified structures demonstrate clear signs of organized planning, indicating the preservation of significant fragments of the intra-fortress building layout at the level of foundations and destructive horizons.

The obtained data have not only independent scientific significance, but also practical value for the subsequent planning of archaeological excavations, refinement of stratigraphic models, digital reconstruction of the architectural structure of the citadel, and the development of preservation regimes for the archaeological layer. The survey results provide an instrumental foundation for integrating non-destructive methods into the long-term research strategy for studying the site.

2. Work methodology

To conduct a detailed study of an area measuring 3200 m² (50 × 64 m), a high-resolution survey methodology was developed to ensure maximum data density for subsequent 3D visualization.

2.1. Equipment Used

Central unit: GSSI SIR-3000 — a portable single-channel system that is the industry standard for archaeological investigations.

Antenna unit: Shielded antenna with a central frequency of 270 MHz. This frequency was chosen as the optimal compromise between penetration depth (up to 3–4 meters in dry soils) and the ability to resolve medium and large objects (such as walls and foundations).

2.2. Scanning Parameters

To ensure the level of detail necessary to distinguish individual pakhsa walls, the following settings were established:

Profiling grid: Data collection was performed along parallel lines with a spacing of 50 cm. Such spacing minimizes the risk of missing local structures and allows for the creation of a continuous plan view (time-slice) of the site.

Time window (Range): Set at 40 ns (nanoseconds).

Estimated depth: Given the average dielectric permittivity values of the region's typical loam ($\epsilon \approx 9$), a time window of 40 ns corresponds to a probing depth of approximately 127 cm. This covers the most active part of the cultural layer and the upper horizons of the destruction of adobe walls.

2.3. Sequence of Fieldwork

Grid layout: A baseline is established across a 50×64 m area. Markers are placed along the perimeter every 0.5 m to control operator movement.

Data collection: The antenna is moved at a uniform pace. Positioning is monitored using a survey wheel, which automatically triggers the recording signal at regular intervals along the path.

Calibration: Before commencing work, gain adjustment is performed to compensate for signal attenuation in clay soils, and an 'in-air' test is conducted to eliminate systemic interference.

2.3.1. Methodological Limitations and Interpretative Assumptions

Ground-penetrating radar survey is among the most effective non-destructive methods of archaeological prospection; however, the interpretation of the resulting data is probabilistic in nature and must be considered in the context of the physical and geological properties of the environment and the archaeological specifics of the site. The detected reflections are generated not by the archaeological objects themselves per se, but by contrasts in dielectric properties between different media and materials. Accordingly, ground-penetrating radar anomalies primarily reflect the boundaries of heterogeneities rather than directly indicating the types of structures.

The character of the signal is significantly influenced by soil moisture, degree of salinity, granulometric composition, and the presence of fissuring and redeposited zones. For areas characterized by loess-like and clayey deposits, as well as degraded pakhsa masses, variability in the response is typical, arising from the heterogeneous degree of compaction and secondary processing of the material.

An additional factor is the state of preservation of architectural remains. Destroyed adobe and pakhsa structures that are undergoing degradation form more diffuse and fragmented reflective boundaries compared to monolithic walls. This may result in the segmentation of linear anomalies and their visual discontinuity on time slices.

Accordingly, all interpretations of planning structures derived from ground-penetrating radar survey results are considered working hypotheses and require correlation with excavation data, stratigraphic observations, and other types of instrumental research.

3. Data Processing

- The acquired data (profiles) undergo laboratory processing, which includes:
- Application of filters (Background Removal) to remove horizontal noise.
- Bandpass filtering to eliminate noise.

The construction of horizontal slices (time-slices) enabled the visualization of the site's layout at various depths (from 20 to 127 cm), as clearly demonstrated in the presented plan of Kesken-Kuyuk Kala.

A suite of post-processing verification procedures was employed to enhance the reliability of the interpretation. Analysis of anomalies was conducted not only on horizontal time-slices but also on the original radar profiles, which allowed for the evaluation of the shape of reflecting

boundaries, the continuity of signals, and the nature of their occurrence. Linear and angular structures were examined along several mutually intersecting profiles.

Particular attention was paid to the reproducibility of signatures on adjacent profiling lines. Anomalies exhibiting spatial stability and geometric consistency were prioritized for architectural interpretation. Diffuse and isolated reflections lacking spatial continuity were classified as signals with low interpretative value.

In addition, depth intervals of maximum reflectivity were correlated with the known stratigraphic thickness of the cultural layer in previously excavated areas of the site, which enabled a more precise determination of the likely association of reflections with archaeological horizons.

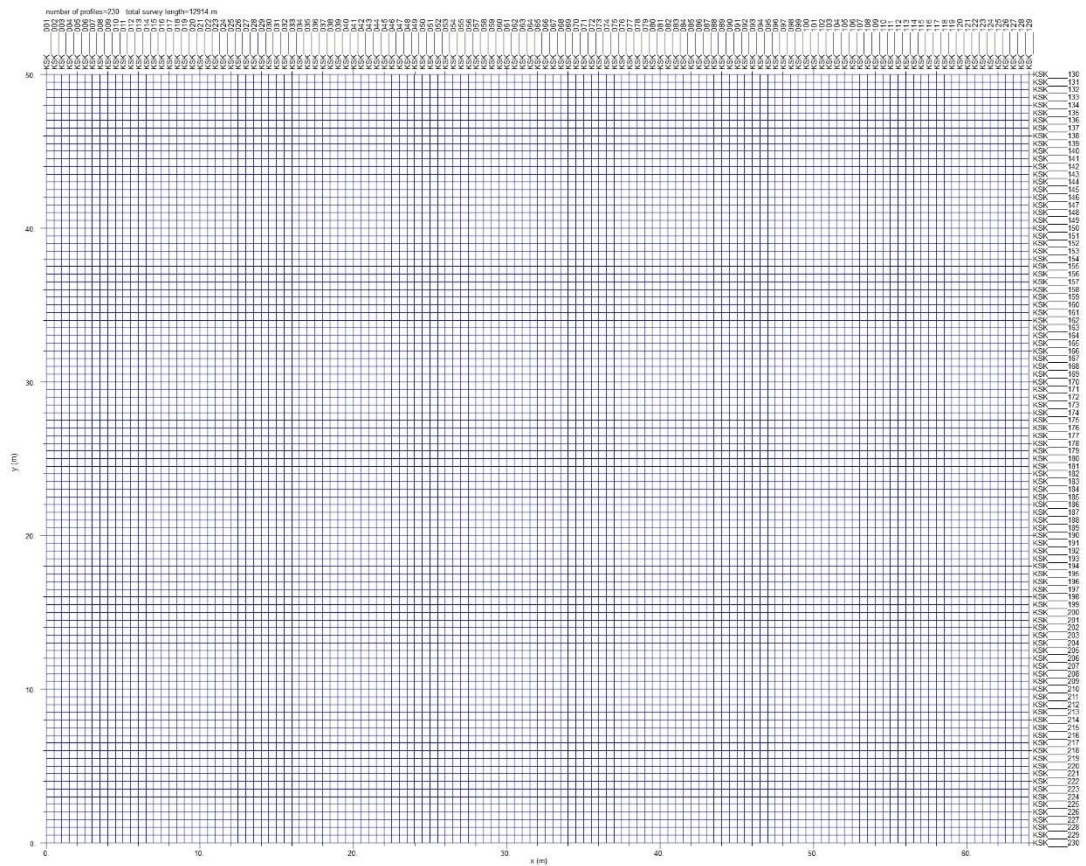


Figure 1 – Diagram of geomagnetic scanning

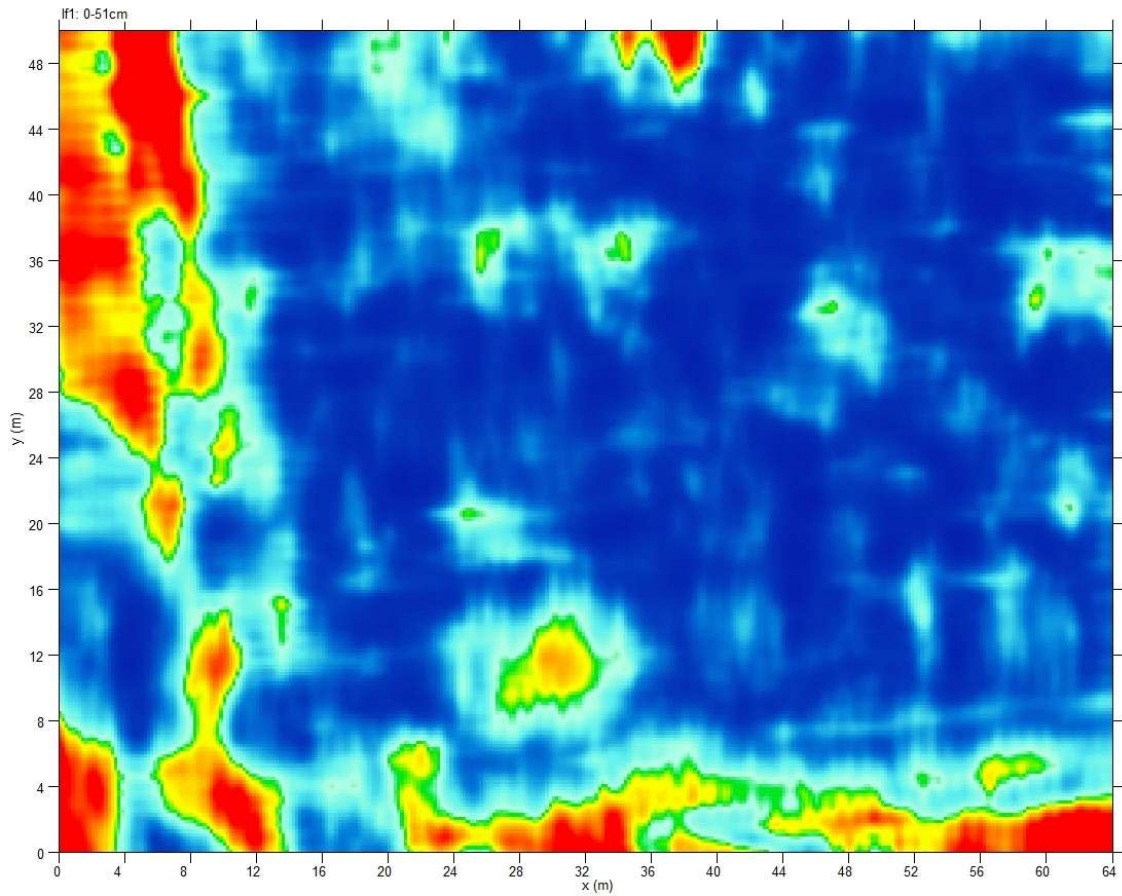


Figure 2 – Plan view of time slice No. 1. Scanning depth from 0 to 51 cm

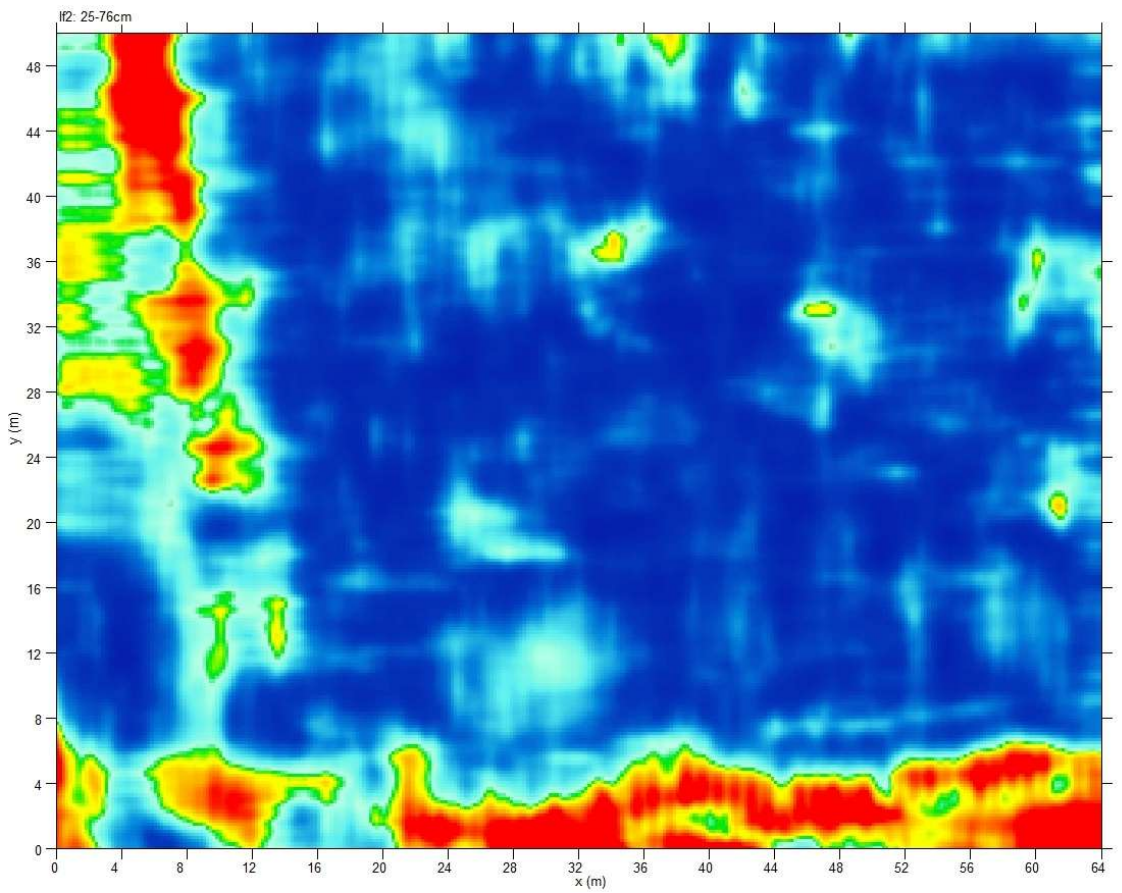


Figure 3 – Plan view of time slice No. 2. Scanning depth from 25 to 76 cm.

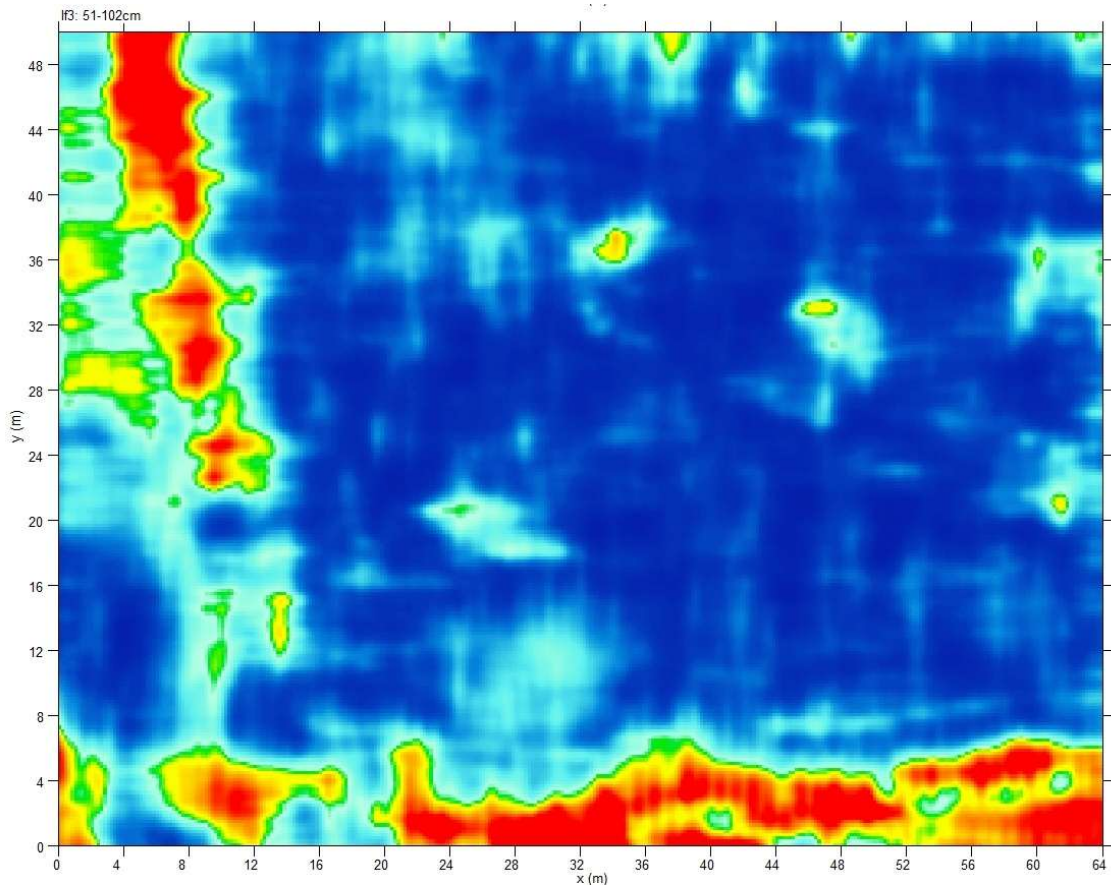


Figure 4 – Plan view of time slice No. 3. Scanning depth from 51 to 102 cm.

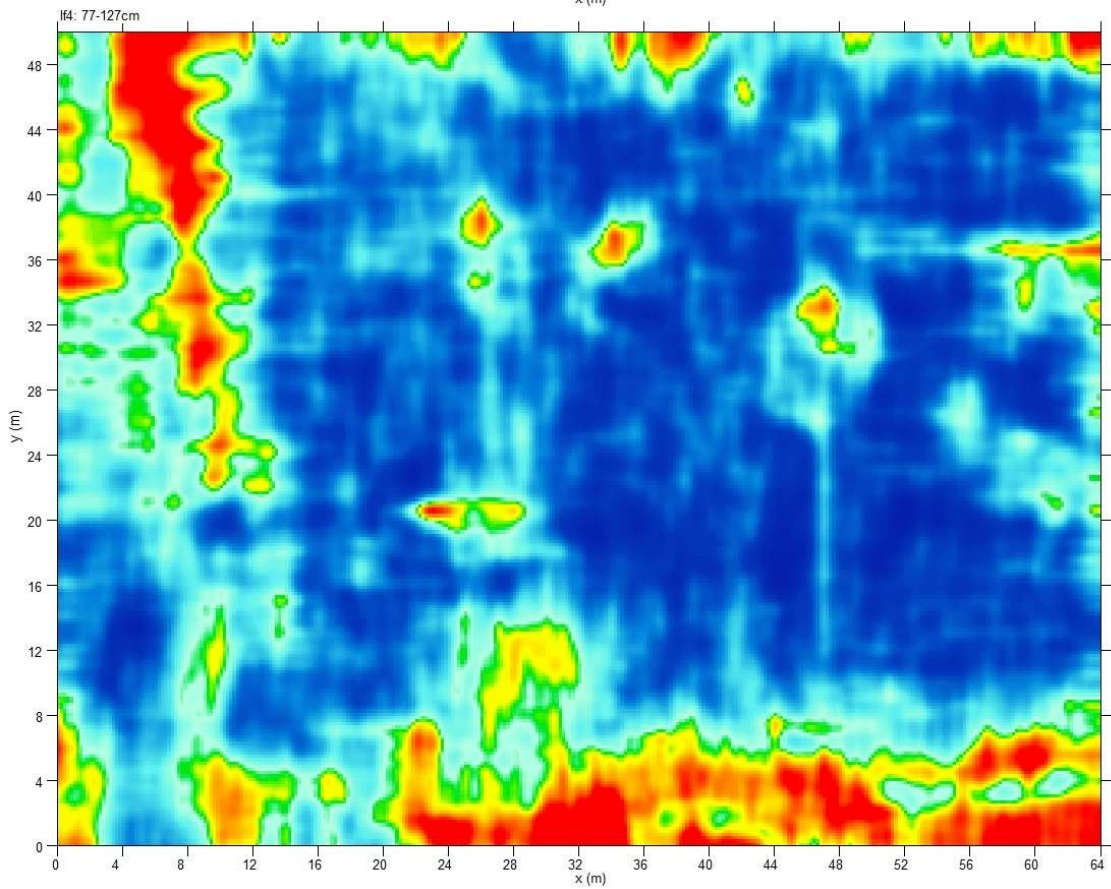


Figure 5 – Plan view of time slice No. 4. Scanning depth from 77 to 127 cm.

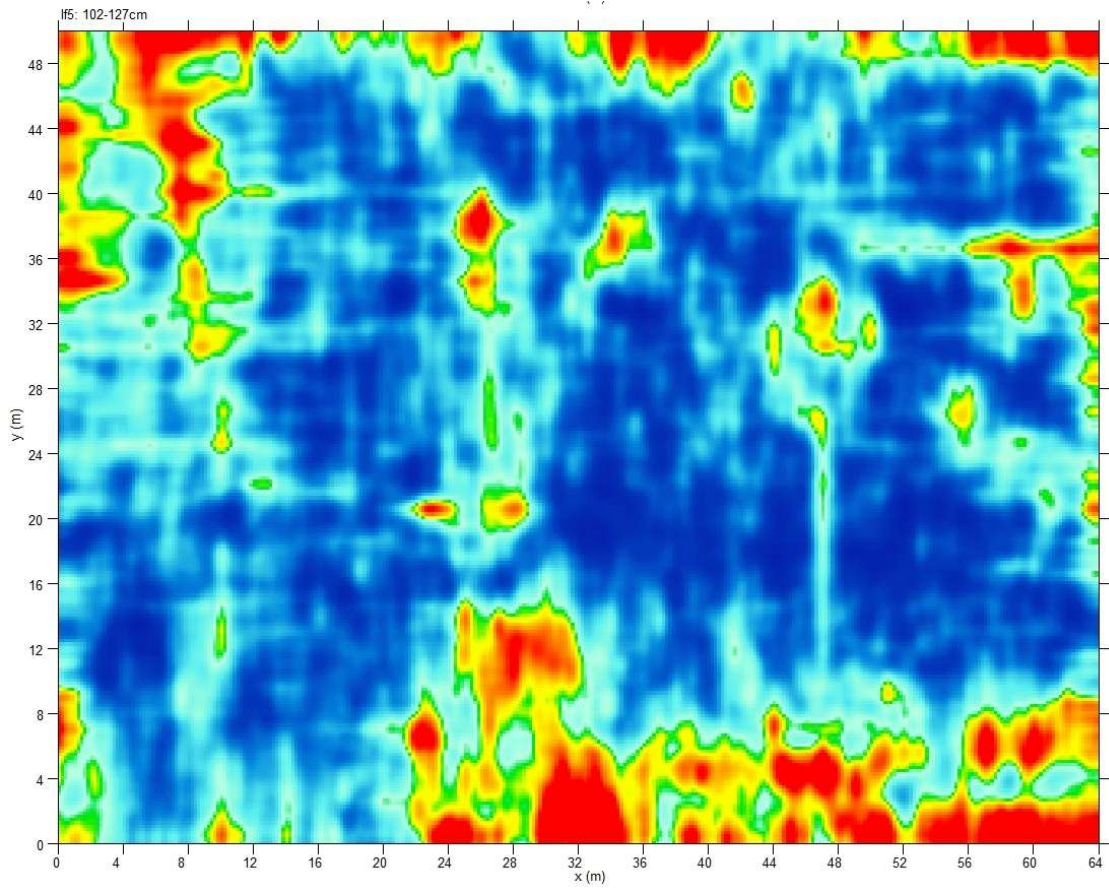


Figure 6 – Plan view of time slice No. 5. Scanning depth from 102 to 127 cm.

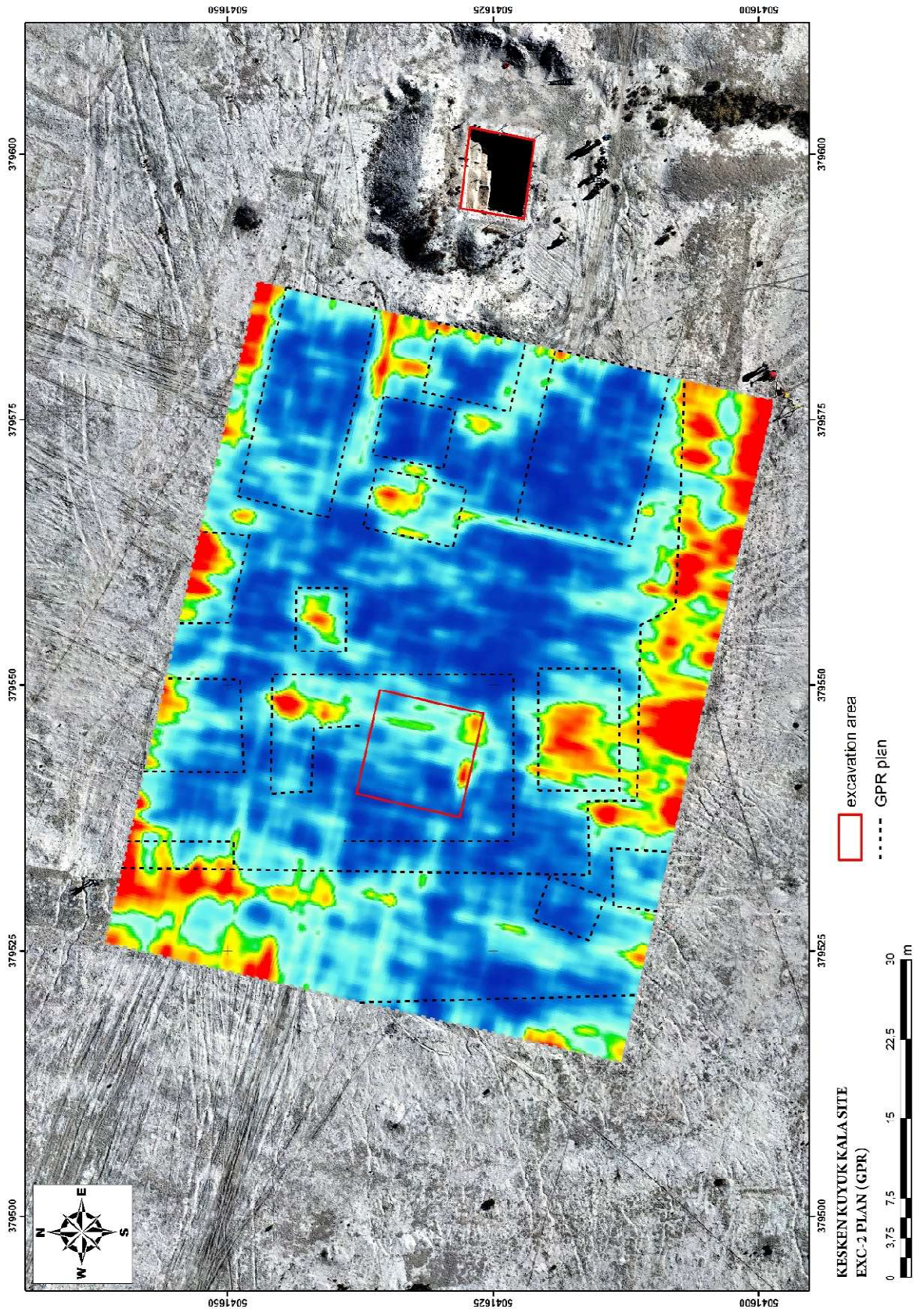


Figure 7 – Diagram of the scanning area with highlighted anomaly zones.

The obtained ground-penetrating radar results demonstrate pronounced structuring of the subsurface space within the investigated area of the citadel and enable a transition from recording individual anomalies to reconstructing elements of the site's urban layout.

The spatial distribution of high-intensity reflective zones forms a system of linear and rectangular outlines, oriented predominantly along two mutually perpendicular axes, closely aligned with the cardinal directions. Such regular orientation is a characteristic feature of organized architectural layouts and reflects the traditions of medieval urban planning in the region.

The most intense and extensive anomalous zones are recorded in the peripheral parts of the investigated area and are interpreted as massive structural elements—presumed sections of fortress walls, reinforced buttresses, or foundations of tower structures. Their increased reflectivity is explained by the considerable density and homogeneity of the pakhsa mass, or by concentrated accumulations of mudbrick debris in the areas where defensive structures have collapsed.

The interior part of the site displays a finer grid of reflective contours, forming a system of closed and semi-open rectangular cells. Such a pattern is characteristic of intra-quarter construction, with subdivision into individual rooms and courtyard spaces. Differences in the intensity of reflections within these cells indicate varying degrees of wall preservation and different patterns of infilling within the interior volumes.

Certain localized, high-intensity anomalies of compact form may correspond to hearths, pillar bases, structural reinforcement nodes, or areas of concentrated collapse of building material. Their morphology and depth position make them promising targets for localized archaeological investigation.

The above illustration represents a horizontal section (time-slice) of ground-penetrating radar scanning at the Kesken-Kuyuk Kala site, overlaid on an aerial photograph of the area. The dashed lines on the plan delineate the contours of buried architectural elements, identified by variations in soil density and construction materials.

A description of the illustration from the perspective of archaeological topography is provided below:

1. Structural zoning and density (dashed contours)

Dashed lines delineate anomalies interpreted as remnants of ancient structures. Their density and geometry allow the site to be subdivided into several functional zones:

Massive pakhsa structures (south and northwest): In the lower (southern) and upper left (northwestern) sections of the plan, the zones of highest density (indicated by bright red and yellow colors) are outlined with dashes. These represent direct evidence of the presence of fortress walls constructed from pakhsa or large defensive towers. The material density here is at its maximum, which is characteristic of monolithic compacted clay.

Residential and utility quarters (central and eastern sections): Medium-sized dashed rectangles delineate the system of internal spaces. In these zones, the density is lower (indicated by blue and green colors), which suggests inner courtyards or residential rooms where the walls are thinner and the infill material is looser compared to the defensive perimeter.

Isolated anomalies: Small dashed squares in the center and east indicate local high-density features—these may be remnants of hearths, postholes, or particularly dense accumulations of mudbrick debris.

2. Geometry of the Layout

The dashed plan clearly demonstrates the regular layout of the site:

The walls are oriented along axes close to the cardinal directions.

A distinct linear structure of streets or passages between buildings is evident (dark-blue zones of low density between the dashed outlines).

Density summary:

Red/Yellow (within the dashed outline): Maximum density. Interpreted as substantial pakhsa walls.

Green (within the dashed outline): Medium density. Remains of mudbrick partitions or a destruction layer (collapse).

Blue/Dark blue: Minimum density. Voids filled with light humus, sand, or inter-wall spaces (streets/courtyards).

A comprehensive analysis of the distribution of ground-penetrating radar anomalies enables the identification of several levels of structural organization within the subsurface of the investigated area.

Firstly, the macrostructural level is identified—extended linear zones of increased reflectivity delineating the contours of large architectural volumes. Their proximity to the presumed perimeter of the citadel and significant signal strength allow them to be interpreted as elements of the defensive perimeter or substantial outer structures. The spatial continuity of these anomalies indicates a relatively good state of preservation of the structural foundations.

Secondly, the mesostructural level is distinguished—a system of interconnected rectangular and L-shaped contours forming a grid of interior spaces. The dimensions of these cells correspond to the typical parameters of residential and economic spaces in medieval sites of the region. The presence of regular passages between them, manifested as zones of reduced reflectivity, may correspond to intra-quarter driveways or courtyard spaces.

Thirdly, a microstructural level is observed—localized point and spot anomalies that do not form extended contours. Their distribution is of a focal nature. Such signatures are characteristic of minor architectural features and engineering elements—stoves, hearths, pits, post bases, repair intrusions, and zones of secondary compaction.

The vertical distribution of reflections across depth intervals indicates that the primary concentration of architectural signals is confined to the upper and middle portions of the cultural layer. This is consistent with the model of gradual destruction of pakhsa (rammed earth) structures, resulting in the formation of a substantial destructive horizon. The deeper levels demonstrate a reduction in anomaly density, which may indicate either a lower building density in the earlier horizons or a decrease in contrast resulting from boundary diffusion.

The comparison of ground-penetrating radar data with the results of previous excavations at the site reveals a fundamental correspondence between instrumental and stratigraphic observations. The depth intervals of maximum reflectivity correspond to areas of concentration of architectural remains documented in the stratigraphic sections. The nature of the signal from large anomalies correlates with the zones of exposed mudbrick walls and accumulations of unfired bricks.

This correlation confirms the applicability of the employed methodology for reconstructing the layout structure without exposing significant areas, and allows the resulting data to be regarded as a reliable basis for spatial modeling of the citadel's development.

Preliminary Archaeobotanical Assessment Report

By Alexandra Slucky (BA, MA, MSc, PhD Candidate)

The following archaeobotanical assessment report discusses the collection and preliminary assumptions from the 2025 archaeological field season at the early medieval settlement of Kesken-Kuyuk Kala in the SW Aral Sea region, directed by Dr Dmitriy Voyakin and Mr Dennis Sorokin. The environmental archaeologist was Alexandra Slucky, PhD Candidate in the Department of Archaeology at BioArCH, The University of York, York, UK, in partnership with the Central Asian Archaeological Landscapes Project (CAAL), hosted at the UCL Institute of Archaeology, London, UK.

The information in this report is preliminary assessment data and will be updated after detailed analysis. It must not be quoted without permission from the author or Head of Service.

1. Introduction

This archaeobotanical assemblage was collected at the medieval site of Kesken-Kuyuk Kala in the Eastern Aral Sea region. There have been stratigraphic excavations that identified eight construction horizons spanning the 5th to the 20th centuries CE (Voyakin et al. 2025, unpublished). The field collection environmental aims of this short, targeted excavation season were the following:

1. To collect samples from each of the eight horizons identified in the stratigraphic trench to develop an understanding of agricultural transformations over time in the settlement.
2. To collect material from identified domestic features in the new trench opened in the citadel. This is the first season of excavation in this region of the city.
3. To take test pit samples from the identified ancient agricultural fields around the city to determine whether they yield information on irrigation, thus facilitating the spread of crops in the first millennium CE.

These environmental research questions are part of the greater investigation examining Kesken-Kuyuk Kala as a “stable urban centre with a history spanning more than six centuries of continuous occupation, construction, and transformation in the context of a changing floodplain landscape” (Voyakin et al. 2025, 8 unpublished).

2. Potential of the data

The environmental samples collected have significant data potential. They can enhance understanding of occupation development at the site and region, while also contributing to the broader narrative of archaeobotanical research in Central Asia. The excavation and processing of archaeobotanical materials support the overall aims of environmental research. These include:

1. To investigate the nature of any identified human settlement activities, domestic / or agricultural and/or industrial.
2. Examine the evidence for agricultural economy and/ or land use during the Arab to Mongol Periods of Central Asia [7-13th centuries CE].
3. Expand current knowledge of patterns of landscape exploitation and settlement.

To meet these three aims, further analysis of the archaeobotanical assemblage is necessary. The

environmental preservation of the archaeobotanical remains seems promising in these samples. The assemblage is significant and, if examined in detail, could offer crucial insights not only into land use and economy but also into food plants that reflect foodways and diet at the time.

3. Field Methodology

The archaeological field season at Kesken-Kuyuk Kala took place from October 2025 to October 12-20, 2025. The area investigated was part of the citadel. The trench opened measured 10m by 10m. Of the 31 archaeobotanical [context/element] samples collected, 11 were from the original stratigraphic trench excavated before this season. Two samples were taken from a test pit in the agricultural fields around the city [test pit #4]. The remaining 13 samples came from the new trench excavated this year [KS-25-01].

A total of 31 environmental samples were collected and assessed for the retrieval of archaeobotanical and other organic remains to assess their potential to contribute to the interpretation of the site. When conducting archaeological excavation, the most common form of plant evidence is charred macrofossils. These carpological fragments are often exposed to fire, primarily elemental carbon, experience size reduction, but retain their original shapes. Through the process of flotation, the primary archaeobotanical sampling techniques are used for investigating ancient plant remains.

A total of 18 environmental samples were floated. A total of 10 samples were not floated due to the nature of the sample. These include plant material pressed into mud brick, plant textile [woven reed mat], ash from an altar vessel, and small samples collected that only required dry sieving. There are 3 samples that have yet to be processed beyond excavation collection, due to being collected on Alexandra Slucky’s final day [19/10/25] and will be floated in Almaty. All these samples in total will be sent to the archaeobotanical specialist [Alexandra Slucky] for further analysis. Analysis will be conducted at the Palaeohub Archaeobotanical Laboratory in the Department of Archaeology with BioArCH at the University of York in the UK. Reference collections from York and the UCL Institute of Archaeology will be consulted for identification support.

Of the 18 samples floated, they produced residues and flots, which will provide information about their botanical composition upon further analysis. Bulk soil samples ranging from 1 to 10 litres were processed by flotation, using a mesh of 1.00mm to catch the flot and residue, respectively. Details of the processed soil samples and volumes are summarised in later sections. The flots and residues were air-dried. They will need to be sorted by eye for any finds or environmental material. All flots and sorted botanical materials from the residue will be scanned briefly, using a low-powered binocular microscope. The abundance, diversity and general nature of plant macrofossils and faunal remains will be recorded using the MOLA Oracle database.

Abundance: Occasional = 1–10 items, Moderate= 11–50, Abundant = 50+ items

Diversity: Low = 1–3 items, Medium = 4–7 items, High = 7+ items

4. Excavation Catalogue

Context AB	Sample	Excavation	Date	Depth	Cultural Horizon	Notes
KS-25- ST-56- AB-01	56	AB 01	12/10/25	32.865	III	Cultural charcoal layer; taken from north wall of stratigraphic trench;

						visible seeds (<i>Hordeum vulgare</i>); dense charcoal material; NE corner
KS-25-ST-65-AB-02	65	AB 02	13/10/25	32.036	IV	From strat trench wall; rich charcoal layer; sampled 10 cm deep from east wall
KS-25-ST-79-AB-03	79	AB 03	13/10/25	31.643	IV	From strat trench wall; rich charcoal layer; sampled 10 cm deep
KS-25-SH4-02-AB-04	02	AB 04	13/10/25	Pending	Pending	Test Pit #4; ancient irrigated fields; 1×1 m trench; outside city walls (1.2 km); dense dark brown cultural layer
KS-25-SH4-03-AB-05	03	AB 05	13/10/25	Pending	Pending	Test Pit #4; ancient irrigated fields; 1×1 m trench; outside city walls; mottled grey-brown loose cultural layer
KS-25-01-01-AB-06	01	AB 06	14/10/25	Pending	I	Citadel trench 1 (10×10 m); cattail reed mat plant impressions in brick
KS-25-01-04-01-AB-07	04	AB 07	14/10/25	Pending	II	Vessel fill, round cooking pot, intact; loose sediment; artefact number included in site code
KS-25-01-04-02-AB-08	04	AB 08	14/10/25	Pending	II	Vessel fill, thin vessel, intact; mixed loose/compact sediment; artefact number included
KS-25-01-04-03-AB-09	04	AB 09	14/10/25	Pending	II	Vessel fill, fragmented vessel; compact sediment with charcoal inclusions
KS-25-01-06-AB-10	06	AB 10	14/10/25	Pending	II	Ashy charcoal-rich layer near altar; burnt wood fragments; C14 suitable
KS-25-01-03-AB-11	03	AB 11	14–15/10/25	35.769	II	Fireplace layer near altar; burnt ashy deposit; collected over two days

KS-25-01-09-AB-12	09	AB 12	15/10/25	35.808	II	Pit fill; charcoal-rich; near burn layer; adjacent AB-13
KS-25-01-09-AB-13	09	AB 13	15/10/25	35.808	II	Pit fill; charcoal-rich; near burn layer; adjacent AB-12
KS-25-01-10-AB-14	10	AB 14	15/10/25	35.772	Modern inclusion	Wood from adult grave; not for flotation
KS-25-01-08-AB-15	08	AB 15	15/10/25	35.834	Modern inclusion	Woven reed material above infant burial; fragile; not for flotation
KS-25-01-05-AB-16	05	AB 16	15/10/25	35.608	II	Ash fill of altar vessel; charcoal-rich
KS-25-01-05-AB-17	05	AB 17	15/10/25	35.636	II	Soil from thin red vessel (cup?) at altar
KS-25-ST-104-AB-18	104	AB 18	16/10/25	Pending	VIII	Bottom of strat trench; west side; charcoal-rich; C14 exists
KS-25-ST-111-AB-19	111	AB 19	16/10/25	Pending	VIII	Ashy layer; east wall bottom
KS-25-ST-100-AB-20	100	AB 20	16/10/25	Pending	VII	South wall floor layer; reddish-orange
KS-25-ST-138-AB-21	138	AB 21	16/10/25	Pending	IV	Pit base; extremely charcoal-rich black soil
KS-25-ST-137-AB-22	137	AB 22	16/10/25	Pending	IV	Pit fill; includes animal bones for isotope analysis
KS-25-ST-160-AB-23	160	AB 23	16/10/25	Pending	V	Grey burn layer; west wall
KS-01-126-AB-24	126	AB 24	16/10/25	Pending	IV-V	Ditch fill; ash-rich; animal bones; loose loam
KS-01-36-AB-25	36	AB 25	16/10/25	Pending	IV	Grey-green carbonate-rich probable floor
KS-01-31-AB-26	31	AB 26	17/10/25	Pending	III	Visible Lagenaria siceraria seeds

KS-01-31-AB-27	31	AB 27	18/10/25	Pending	III	Bottle gourd seeds; east wall
KS-01-34-AB-28	34	AB 28	19/10/25	Pending	III	Ash pit with charcoal; north inner wall
KS-01-33-AB-29	33	AB 29	19/10/25	Pending	III	Tandyr oven base fill; charcoal inclusions
KS-01-35-AB-30	35	AB 30	19/10/25	Pending	III	Fireplace soil from altar; ash + fire brick clay
KS-01-33-AB-31	—	AB 31	19/10/25	Pending	III	Pitch roofing sample

5. Floatation Catalogue

Site Code	Date Done	Floated	Volume Pre-Flotation	Soil Colour	Soil Texture	Method	Preservation	Mesh Size
KS-25-ST-56-AB-01	17/10/25	Yes	5.6 L	Dark grey-brown	Silt clay	Bucket flotation	Charred	100 μ m
KS-25-ST-65-AB-02	17/10/25	Yes	1.2 L	Dark grey-brown	Silty sand	Bucket flotation	Charred	100 μ m
KS-25-ST-79-AB-03	17/10/25	Yes	0.2 L	Dark grey-brown	Silty sand	Bucket flotation	Charred	100 μ m
KS-25-SH4-02-AB-04	17/10/25	Yes	0.2 L	Light grey-brown	Silty sand	Bucket flotation	Charred	100 μ m

KS-25-SH4-03-AB-05	17/10/25	Yes	0.1 L	Light grey-brown	Silty sand	Bucket flotation	Charred	100 μ m
KS-25-01-01-AB-06	17/10/25	No	N/A	Light grey-brown	Mud brick	—	Plant impressions in brick	—
KS-25-01-04-01-AB-07	17/10/25	No	N/A	Light grey-brown	Silty sand	—	Charred	—
KS-25-01-04-02-AB-08	17/10/25	Yes	1.0 L	Light grey-brown	Silty sand	Bucket flotation	Charred	100 μ m
KS-25-01-04-03-AB-09	17/10/25	No	N/A	Light grey-brown	Mud brick	—	Plant impressions in brick	—
KS-25-01-06-AB-10	17/10/25	Yes	2.25 L	Grey with reddish/orange	Sand	Bucket flotation	Charred	100 μ m
KS-25-01-03-AB-11	17/10/25	Yes	3.8 L	Grey with reddish/orange	Sand	Bucket flotation	Charred	100 μ m

KS-25-01-09-AB-12	17/10/25	Yes	2.6 L	Dark grey-brown	Sand	Bucket flotation	Charred	100 µm
KS-25-01-09-AB-13	17/10/25	Yes	4.2 L	Dark grey-brown	Sand	Bucket flotation	Charred	100 µm
KS-25-01-10-AB-14	17/10/25	No	N/A	Light brown	Wood	—	Wood sample	—
KS-25-01-08-AB-16	17/10/25	No	N/A	Light grey	Textile/red	—	Organic material	—
KS-25-01-05-AB-16	17/10/25	No	N/A	Grey	Altar ash	—	Ash	—
KS-25-01-05-AB-17	17/10/25	No	N/A	Light brown	Vessel fill with ash	—	Ash	—
KS-25-ST-104-AB-18	17/10/25	Yes	5.6 L	Dark brown-black	Charcoal silt	Bucket flotation	Charred	100 µm
KS-25-ST-111-	17/10/25	Yes	1.4 L	Grey-mid brown	Ash silt	Bucket flotation	Charred	100 µm

AB-19								
KS-25-ST-100-AB-20	18/10/25	Yes	4.2 L	Grey-mid brown	Clay loam	Bucket flotation	Charred	100 μ m
KS-25-ST-138-AB-21	17/10/25	Yes	5.6 L	Dark brown-black	Charcoal silt	Bucket flotation	Charred	100 μ m
KS-25-ST-137-AB-22	18/10/25	Yes	4.2 L	Grey-mid brown	Silty sand	Bucket flotation	Charred	100 μ m
KS-25-ST-160-AB-23	17/10/25	Yes	0.3 L	Grey-mid brown	Silty sand	Bucket flotation	Charred	100 μ m
KS-01-126-AB-24	18/10/25	Yes	2.3 L	Grey-mid brown	Clay loam	Bucket flotation	Charred	100 μ m
KS-01-36-AB-25	18/10/25	Yes	2.3 L	Grey-mid brown	Clay loam	Bucket flotation	Charred	100 μ m
KS-01-31-AB-26	18/10/25	No	N/A	Light grey-brown	Sand	—	Seeds for ID	—
KS-01-31-AB-27	18/10/25	No	N/A	Light grey-brown	Sand	—	Seeds for ID	—

KS-01-34-AB-28	18/10/25	Pending	TBA	Grey	Ash	—	Ash	—
KS-01-33-AB-29	18/10/25	Pending	TBA	Light grey-brown	Silty sand	Bucket flotation	Charred	100 µm
KS-01-40-AB-30	18/10/25	Pending	TBA	Grey ash + red clay	Ash & sand	Bucket flotation	Charred	100 µm
KS-01-33-AB-31	18/10/25	No	TBA	Black	Pitch (oven)	—	Pitch	—

6. Future Steps

The following steps for archaeobotanical analysis involve sorting the archaeobotanical material under a low-powered microscope, followed by photographing seeds with a Keyence VHXX digital microscope. Creating a catalogue of identifiable seeds will deepen understanding of their presence or absence at the site across different cultural horizons. From this material, bioarchaeological research directions can be developed, such as conducting isotopic analysis on seeds. This approach has not yet been applied to Kesken-Kuyuk Kala or any other site in Central Asia. Stable isotopic analysis (SIA) of archaeobotanical material is a well-established technique for examining crop management and remains unexplored in medieval Central Asia. Three samples [KS-01-34-AB-28, KS-25-01-33-AB-29, KS-25-01-35-AB-30] still need to be floated and should be processed promptly. It would also be advantageous to examine the cooking vessel [KS-25-01-04-01] for residue analysis, especially charred food remains. This methodology was pioneered by Dr Lara González Carretero, who is Alexandra Slucky's archaeobotanical PhD supervisor. BioArCH at York offers the best facilities worldwide for this type of analysis. Such data would significantly enhance our understanding of cooking practices, particularly baking culture, at Kesken-Kuyuk-Kala, enriching our knowledge of domestic life in the city over time.

An exact timeframe for completing the archaeobotanical analysis of the collected material is not fully established. Due to the quantity and quality of samples, at least six months would be necessary to complete the analysis and report in full, though this can be negotiated later for an expedited process. Analysis costs are covered by the UCL CAAL Project and Alexandra Slucky's doctoral funding [WRoCAH UK].

7. Final Thoughts/Comments

The chance to collect archaeobotanical samples from various cultural layers at a Central Asian archaeological site is highly promising. Despite over twenty years of advancing archaeobotanical research in Central Asia, scholars still have limited knowledge about the details of food production, agricultural practices, and water management at different settlements before and after the Arab invasion. Very little archaeobotanical work in Central Asia has extended beyond the first millennium CE. Because of the existence of written sources, the early medieval period has largely been overlooked and lacks the nuanced ecological and cultural distinctions, even though it was a time of cultural richness, expansion, and trade that went beyond the steppe.

Among the archaeobotanical research conducted and published on the Arab-to-Mongol periods in Central Asia, all have concentrated on major cities such as Merv, Bukhara, Afrasiab, Panjikent, and others. Archaeobotanical research at Kesken-Kuyuk Kala offers an intriguing opportunity to highlight an important regional centre on major trade routes, albeit smaller and more localised compared to the megacities typically studied. This adds nuance to the regional diet and provides valuable depth to areas often overlooked. Nonetheless, further investigation is necessary to understand the region's agricultural adaptation and sustainability during this period of increasing urbanisation. It is recommended that environmental archaeology, particularly archaeobotanical, be incorporated into the planning and sampling strategies for all future excavations at Kesken-Kuyuk Kala to facilitate a more comprehensive understanding of daily life during its periods of occupation.

Citations

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Figure 1. Vessel from Excavation 1



Figure 2. Trail trench at the Ancient field plot



Figure 3. Trail trench at the Ancient field plot



Figure 4. Trail trench at the Ancient field plot. Stratigraphy