

APPENDIX B

CERAMIC ANALYSIS: METHODOLOGY AND TYPES DESCRIPTIONS

The fabric or paste types are the result of the classification of tendencies in the association between kinds of clays and tempers (Orton, et al. 1993; Rice 1987). In nature, clays could contain a wide range of non-clay impurities known as inclusions which, depending on their kinds and proportions, could decrease the plasticity of the clay when moisten. This is a desirable property because it increases the resistance of the unfired clay object to plastic deformation. When inclusions are not enough in quantity or lack the desired properties, temper is added, being very common the use of sand, crushed rocks, organic material, etc. The combination of raw clays –with inclusions- and certain kinds of temper are cultural products of recurrent practices –habitus- as well as the result of technological innovation resulted from user's demands, depletion of raw material sources, etc. (Arnold 1988; Braun 1983; Rice 1987; Skibo 1992).

The clay matrix was analyzed according to its texture and compactness or porosity. If the fresh cut of a sherd felt very rough to the touch, it was described as very coarse grain texture. By contrast, if it felt very homogeneous and flat, it was described as fine grain texture. During the analysis, a lot of care was taken to avoid the influence of single large temper grains, or the effects of erosion in the fragments.

The compactness and porosity of the sherds were determined by a quick view of the proportions of holes and pits in the ceramic matrix. Compactness and porosity is used interchangeable considering their opposite relationship. Sometimes the shape of the porous was used to determine the origin of the clays (for instance, tubular porous results from plant structures such as fine roots), or the technique of manufacture (flat porous may result from the application of stress in the surfaces as in the “paleteado” technique).

The classification of the temper was based in their type, quantity or proportion, size and sorting level. The type of temper was determined using the Table A.2 in Orton et. al. (1993). The quantity, size

and sorting were determined using the Sand Grain Size chart designed by Gamma Zeta Chapter of Kent State University.

Surface treatment techniques could modify the properties of surfaces of the vessels. A smoothed finishing can be obtained by the homogenization of the surface using a soft object such as maize cobs, gourd fragments, pieces of cloth or reused sherds (scrapers). Sherds can be also modified by a strong burnishing or polishing - increasing its hardness and light reflection properties-, or by scraping -increasing porosity and roughness-. Both techniques, burnishing and polishing, require the use of an object with a hard surface such as metal polisher, a polished stone, *Pouteria lucuma* seeds, etc., but polishing involves a more time consuming labor. Polishing is used to obtain a very compacted and homogeneous surface, which enhance its reflective properties –brightness-, making vessels highly visible even under conditions of low luminosity. By contrast, burnishing while following similar techniques, it leaves traces of the polishers. Polishing and strong burnishing are ubiquitous in many fine pottery of the Central Andes, and this association was exploited in this dissertation to identify fineware.

Firing conditions is highly dependent of environmental conditions. Natural vegetation, weather conditions –especially moisture and precipitation-, and the physical properties of the vessels –resulted from paste types, manufacture technique and vessel shape- are considered in the potter’s choice of the firing technique. The increased presence of larger vessels, increased hardness and more frequent bright colors through time may be indications of improvements in firing techniques in the region (Ikehara 2010). Firing conditions and clay kind determine the Chroma and value of the colors of the matrix. Higher temperatures produce pottery with higher values colors, while longer times in an oxidizing environment may create ceramics with higher Chroma colors. These variables were determined using a Munsell Soil Color Chart. Additionally, changes of firing atmosphere and the duration was determined observing the layering and coloring of the matrix by comparison with the Figure 11.1 from Orton et al. (1993).

The associated types of ceramic artifacts, vessel forms, and decorative techniques, for each ware type include only the most ubiquitous (proportions higher than 10% of the total of each ware). Examples of the artifact and decoration variability in each ware are presented in the following plates.

B.1 WARE DESCRIPTIONS AND DRAWINGS

*Note: The codes between parentheses are the original code used for each ware during the analysis and those used to tag the bags with the classified sherds in each collection.

Ware I-A (L2)

Paste: The matrix shows a medium grain texture, low porosity and it is tempered with very coarse sand (1-2 mm), fairly sorted, and in proportions between 10 and 20%. The temper is alluvial in origin with a mixed composition of semi-angular quartz/quartzite and very rounded dark volcanic rocks (probably basalt).

Firing: Irregular, with low temperatures and oxidizing atmosphere that produce friable vessels with dull brown to beige colors (core: 5YR 4/2-dark reddish gray, 7.5YR 3/2 dark brown; surface: 5YR 4/2-dark reddish gray, 7.5YR 4/3-brown).

Surface treatment: Exposed surfaces smoothed by hand, internal surfaces smoothed by hand or scraped by a hard object (cf. ceramic scrapers from reused sherds)

Forms: Neckless jars, flat-based bowls and necked jars are common. Bottles (including stirrup-spout), basins, gourd-shaped bowls, carinated bowls and platters were also found. Other objects: scrapers from reused sherds.

Decorative techniques: Textured surfaces with appliqués and/or point and linear incisions, fine grooved incisions, broad grooved incisions delineating figures (probably Cupisnique related), and stamped double circles.

Chronological assessment: 800-450 B.C., Late Formative Period.

Ware I-B (R)

Paste: The matrix shows a very fine texture, high degree of compactness, and it is tempered with very fine sand (up to 1/16 - 1/8 mm), well sorted, and in proportions lower than 5%. The temper seems to be alluvial in origin, with a mixed composition of semi-angular quartz/quartzite and semi-rounded dark volcanic rock (probably basalt). Some specimens have few larger (~2 mm.) rock tempers.

Firing: Regular, with medium to high temperatures and reducing atmosphere that produces a hard Paste with dark to light gray colors (core: GLEY1-5/N-gray; surface: GLEY1-2.5/N-black). Some specimens show an irregular blackening by smoking.

Surface treatment: Heavily burnished and polished.

Forms: Bottles (inc. stirrup spout) and flat-based bowls. Other objects: scrapers from reused sherds.

Decorative techniques: Broad grooved incisions delineating figures (probably Cupisnique related)

Chronological assessment: 800-450 B.C., Late Formative Period.

Ware I-C (A3)

Paste: The matrix shows a medium grain texture, moderate porosity, with inclusions of medium (1/4 - 1/2 mm) to coarse (1/2 - 1 mm) grain size and in proportions higher than 20%. The inclusions may have been present in the clay since its source and it includes angular and semi-angular white and beige rocks (quartzite and/or feldspars), and some scattered tiny dark rocks. This Paste was prepared using natural clays with minimum cleaning and without adding temper. It is similar to the Paste of Ware II-B. An identified clay source of similar composition was found adjacent to the road northwest of Kushipampa site.

Firing: Irregular and incomplete with very low temperatures in an oxidizing atmosphere that produces very dark (Core: 5YR 2.5/2-dark reddish brown, 7.5YR 2.5/1-black; surface: 7.5YR 3/2-dark brown, 7.5 YR 4/3 brown) and friable vessels. The dark colors may be related to residual carbon left by the short firing time.

Surface treatment: Mainly smoothed by hand and some irregular burnishing.

Forms: Bottles (inc. stirrup spout), neckless jars, flat-based bowls, and necked jars are common.

Decorative techniques: Grooved incisions, textured surfaces by point incisions and rocker stamping.

Chronological assessment: 800-450 B.C., Late Formative Period.

Ware I-D (O)

Paste: The matrix shows a very fine grain texture, high degree of compactness, and it is tempered with medium size (1/4 - 1/2 mm) to coarse (1/2 - 1 mm) sand, well sorted, and in proportions lower than 5%. The temper seems to be alluvial in origin, with a mixed composition of semi-angular quartz/quartzite and semi-rounded dark volcanic rock (probably basalt). Because the temper's very low frequency, they may be naturally occurring sand the clay source.

Firing: Regular with medium temperatures, in an oxidizing atmosphere and long periods that produces vessels of medium hardness and dark brown tones (core: 5YR 4/2-dark reddish gray; surface: 5YR 4/1-dark gray)

Surface treatment: Mostly fine finishing between intense burnishing and polishing.

Forms: Bowls, flat-based bowls, and bottles (stirrup-spout) are common. Gourd-shaped bowls and discs were also found.

Decorative techniques: Fine incisions, broad grooved incisions, textured surfaces by point and lineal incisions, appliqués and combing, post-fired incisions and pattern burnished on highly burnished surface.

Chronological assessment: 800-450 B.C., Late Formative Period.

Ware I-E (P)

Paste: The matrix shows a fine grain texture, moderate porosity, and it is tempered with coarse sand (1/2 – 1 mm), fairly sorted, and in proportions between 5 and 10%. The temper seems to be alluvial in origin, with a mixed composition of semi-angular quartz/quartzite and semi-rounded dark volcanic rock (probably basalt).

Firing: Regular, medium temperatures, in an oxidizing atmosphere that produces vessels of moderate hardness and weak to very dark black tones (core: 2.5YR 4/4-reddish brown, surface: 5YR 4/1-dark gray, 5YR 3/2-dark reddish brown).

Surface treatment: Blackness by smoking with intense burnishing and polishing.

Forms: Flat-based bowls, bowls, and dish/plates are common. Bottles and carinated bowls were also found.

Decorative techniques: Pre-fired scratched, combing, and grooved incisions.

Chronological assessment: 800-450 B.C., Late Formative Period.

Ware I-F (Y)

Paste: The matrix shows a fine grain texture, moderate porosity, and it is tempered with medium size (1/4 – 1/2 mm) to coarse (1/2 – 1 mm) sand, well sorted, and in proportions between 5 and 10%. The temper seems to be alluvial in origin, with a mixed composition of semi-angular quartz/quartzite and semi-rounded dark volcanic rock (probably basalt).

Firing: Regular, medium temperatures, in an oxidizing atmosphere that produces vessels of moderate hardness and brown/orange tones (core: 2.5YR 3/2 dusky red; internal surface: 2.5YR 4/2- weak red; external surface: 2.5YR 4/4 reddish brown; slip color: 10R 4/6-red)

Surface treatment: Red slip in the exposed surfaces, and burnishing and/or polishing as final treatment.

Forms: Flat-based bowls.

Decorative techniques: -

Chronological assessment: 800-450 B.C., Late Formative Period.

Ware I-G (X)

Paste: The matrix shows a fine grain texture, moderate compactness, and it is tempered with fine size sand (1/8 – 1/4 mm), well sorted, and in proportions lower than 5%. The temper seems to be alluvial in origin, with a mixed composition of semi-angular quartz/quartzite and semi-rounded dark volcanic rock (probably basalt).

Firing: Regular, medium temperatures, in a reducing atmosphere, and short time that produces vessels with very dark colors in the core (7.5YR 2.5/1-black) and intense black surfaces (GLE Y1-2.5/N-black).

Surface treatment: Blackness by smoking and highly polished.

Forms: Gourd-shaped bowl and flat-based bowl.

Decorative techniques: -

Chronological assessment: 800-450 B.C., Late Formative Period.

Ware II-A (B)

Paste: The matrix shows a medium grain texture, with moderate porosity, inclusions of coarse grain size (1/2 - 1 mm), fairly sorted, and in proportions higher than 20%. The inclusions may have been present in the clay since its source and correspond mainly to angular and semi-angular quartzite, and some scattered tiny dark rocks. This Paste is similar to Ware I-C and II-B.

Firing: Regular, medium to high temperatures, and an initial reducing atmosphere with a rapid exposure to an oxidizing atmosphere that produces a layered coloration with gray or dark brown cores (7.5YR 3/1-very dark gray, 7.5YR 3/2-dark brown, 7.5YR 4/1-dark gray, 7.5YR 5/1-gray) and brown with pinkish and purplish tones deep to 1 to 2 mm from the surface (2.5YR 6/4 light reddish brown-, 5YR 4/2-dark reddish gray, 10R 6/3-pale brown).

Surface treatment: External surfaces have variable treatments from smoothing to burnishing. Some specimens have polished surfaces. The internal surfaces of restricted vessels have a rough smoothing with grooves produced by the use of a hard scraper (see scrapers from reused sherds)

Forms: Neckless jars (including jars with lateral spout) are the main component of this ware. Bottles, basins, necked jars, carinated bowls, pitchers, necked cooking-pots, flat-based jars, and oversized vessels were also found. Other objects are: scrapers, discs, and rectangle-shaped reused sherds.

Decorative techniques: Decoration is uncommon. Mainly scratching, combing, band-appliqués, and incises (banded lozenge), circle impressed, etc.

Chronological assessment: 800-150 B.C., late part of the Late Formative, and Final Formative.

Ware II-B (A1)

Paste: The matrix shows a medium grain texture, moderate porosity, inclusions of medium size (1/4 - 1/2 mm) to coarse (1/2 - 1 mm) grain size, and in proportions higher than 20%. The inclusions may have been present in the clay since its source and it includes angular and semi-angular white and beige rocks (quartzite and/or feldspars), and some scattered tiny dark rocks. This Paste was prepared using natural clays with minimum cleaning and without adding temper. It is similar to the Paste of Ware I-C. An identified clay source of similar composition was found adjacent to the road northwest of Kushipampa site.

Firing: Regular, medium temperatures, in an oxidizing atmosphere that produce vessels slightly friable and reddish brown tones (core: 2.5YR 4/6-red, 5YR 4/3-reddish brown, 7.5YR 6/4-light Brown; surface: 2.5YR 4/4- reddish brown, 2.5YR 6/6-light red).

Surface treatment: Exposed surfaces treatment varies from smoothing by hand to heavily burnished, and some specimens are polished. The internal surfaces have a rough smoothing with grooves produced by the use of a hard scraper (see scrapers from reused sherds)

Forms: Neckless jar (including jars with lateral spout) and flat-based bowls are common. Bowls, bottles, basins, necked jars, carinated bowls, gourd-shaped bowls, platters, short-necked jars, and oversized vessels are also found. Other objects: scrapers from reused sherds, discs and rectangle-shaped reused sherds.

Decorative techniques: Pattern burnished and post-fired scratched were frequently used. Linear incisions and stamping were used for a wide array of designs (sinuous bands, banded lozenge, and circle-and-dot), textile impressed, and appliqués.

Chronological assessment: 450-150 B.C., Final Formative Period.

Ware II-C (A2&L3)

Paste: The matrix shows a medium grain texture, moderate porosity, and it is tempered with very coarse sand (1-2 mm), fairly sorted, and in proportions between 10 and 20%. The temper seems to be alluvial in origin, with a mixed composition of semi-angular quartz/quartzite and semi-rounded dark volcanic rock (probably basalt). In one variant (A2) the temper has only tiny amounts of dark rocks.

Firing: Regular, medium temperatures, in an oxidizing atmosphere that produce vessels with moderate hardness. The final appearance is similar to Ware II-B with reddish brown colors (core: 2.5YR 5/6-red, 2.5YR 5/8-red; surface: 2.5YR 4/4 reddish brown, 2.5YR 4/6 red)

Surface treatment: Exposed surfaces treatment varies from smoothing by hand to heavily burnished, and some specimens are polished. The internal surfaces have a rough smoothing with grooves produced by the use of a hard scraper (see scrapers from reused sherds)

Forms: Neckless jar (including jars with lateral spout) and flat-based bowls are common. Bowls, bottles, basins, necked jars, carinated bowls, gourd-shaped bowls, platters, short-necked jars, and oversized vessels were also found. Other objects: scrapers from reused sherds, discs and rectangle-shaped reused sherds.

Decorative techniques: Pattern burnished and post-fired scratched were frequently used. Linear incisions and stamped were used for a wide array of designs (sinuous bands, banded lozenge, circle-and-dot), textile impressed, appliqués, and point incisions were used to create textured surfaces. One specimen with white and black paint was recorded.

Chronological assessment: 450-150 B.C., Final Formative Period.

Ware II-D (V)

Paste: The matrix shows a medium grain texture, moderate porosity, with inclusions of medium size (1/4 - 1/2 mm) to coarse (1/2 - 1 mm) grain size, well sorted, and in proportions higher than 20%. The inclusions may have been present in the clay since its source and correspond mainly to angular and semi-angular white and beige rocks (quartzite and/or feldspars) similar to II-B. This clay was tempered with sand of probable alluvial or Aeolian origin composed by semi-angular quartz/quartzite and semi-rounded dark volcanic rocks (probably basalt). This Paste is similar to Ware III-F

Firing: Regular, medium temperatures, in an initial short-time reducing atmosphere that leaves a very dark core color (GLE1 3/N-very dark gray, GLE1 2.5/N-black), due the presence of residual carbon, followed by a final sudden short-time exposure to highly oxidizing atmosphere that leave a reddish tone (10R 5/4-weak red, 10R 4/6-red) in the surface. These vessels have a moderate hardness.

Surface treatment: Careful smoothing.

Forms: Bottles, short-necked bowls, plates/dishes and flat-based bowls.

Decorative techniques: -

Chronological assessment: 450-150 B.C., Final Formative Period.

Ware III-A (T)

Paste: The matrix shows a medium grain texture, moderate porosity, with inclusions of medium (1/4 - 1/2 mm) to coarse (1/2 - 1 mm) grain size, well sorted, and in proportions higher than 20%. The inclusions

may have been present in the clay since its source and correspond mainly to angular and semi-angular white and beige rocks (quartzite and/or feldspars) similar to II-B. This clay was tempered with crushed angular shiny black elongated rocks (probably ferromagnesian mineral: hornblende?)

Firing: Regular, medium temperatures, in an oxidizing atmosphere that produces vessels with moderate hardness and brown to dark brown tones (core: 5YR 5/4-reddish brown; surface: 2.5YR 5/6-red)

Surface treatment: Mainly smoothed by hand.

Forms: Bowls, necked jars, neckless jars and flat-based bowls are common. Bottles, basins, carinated bowls, short-necked bowls, gourd-shaped bowls, pitchers, short-necked jars and oversized jars were also found. Other objects: discs and scrapers from reused sherds.

Decorative techniques: Post-fired scratched, fine incisions, textured surfaces by point incisions, and impressed (circle-and-dot)

Chronological assessment: 450 B.C.-A.D. 500, Final Formative Period and Early Intermediate Period.

Ware III-B (S)

Paste: The matrix shows a fine grain texture, moderate compactness, and it is tempered with medium size (1/4 – 1/2 mm) sand, well sorted, and in proportions between 5 and 10%. The temper is pure quartz/quartzite sand or sand of mixed composition of quartz/quartzite and dark volcanic rock, probably of alluvial or Aeolian in origin.

Firing: Regular, medium temperatures, in an oxidizing atmosphere that produces vessels with moderate hardness and light brown to beige tones (core: 10YR 7/2-pinkish gray, 10YR 7/3-pink; surface: 7/5YR 5/4-brown)

Surface treatment: Fine finishing varying from a very careful smoothing to polishing.

Forms: Bowls, small jars and flat-based bowls.

Decorative techniques: Painted with red, white and/or black pigments. Pattern burnished of vertical lines was recorded in the neck of the small jar.

Chronological assessment: 150 B.C.-A.D. 500, Early Intermediate Period.

Ware III-C (C)

Paste: The matrix shows a very fine grain texture, high compactness, and inclusions are scarcely present. Kaolin clay was used and the few very fine (1/16 – 1/8 mm) inclusions have an earthy appearance and vary from white to reddish brown colors and may be hematite impurities from the source.

Firing: Regular, high temperatures, in an oxidizing atmosphere that produces hard brittle vessels with bright white and cream tones (core: 7.5YR 8.5/2-pinkish white, 10YR 9.5/2-pale orange yellow, 2.5Y 9/2-very pale yellow; surface: 10YR 8/2-very pale brown, 10YR 9.5/2-pale orange yellow).

Surface treatment: Fine finishing varying from a very careful smoothing to polishing. Some specimens were covered with a probably brownish orange slip.

Forms: Bowls (including bowls with pedestal base), bottles, small jars and flat-based bowls.

Decorative techniques: Painted with orange, brown and black pigments. Orange and brown pigments were used for slipping the exposed surfaces.

Chronological assessment: 150 B.C.-A.D. 500, Early Intermediate Period.

Ware III-D (Q)

Paste: The matrix shows a very fine grain texture, high compactness, and inclusions are scarcely present. The few very fine (1/16 – 1/8 mm) inclusions have an earthy appearance and vary from white to reddish brown colors and may be hematite impurities from the source

Firing: Regular, medium to high temperatures, in an oxidizing atmosphere that produces hard brittle vessels with orange to brown tones (core: 2.5YR 5/6-red; surface: 2.5YR 4/8-red)

Surface treatment: Fine finishing varying from a very careful smoothing to polishing. White pigment slip has been recorded.

Forms: Bowls and bottles.

Decorative techniques: Painted with black and/or red pigments.

Chronological assessment: 150 B.C. – A.D. 500, Early Intermediate Period.

Ware III-E (N)

Paste: The matrix shows a medium grain texture, moderate porosity, and it is tempered with coarse sand (1 – 2 mm), poorly sorted, and in proportions between 10 and 20%. The temper is sand of probably alluvial origin in which prominent well rounded quartz crystals are visible.

Firing: Regular, medium temperatures, in an oxidizing atmosphere that produces vessels of moderate hardness and beige colors with some weak greenish tones (core: 7.5YR 6/4-light brown, 2.5YR 5/6-red; surface: 5YR 5/6-yellowish red, 2.5YR5/6-red, 5YR 5/2-reddish gray)

Surface treatment: Smoothing using an uneven but soft material (i.e. textile or cob)

Forms: Necked jars, neckless jars, bowls and flat-based bowls are common. Bottles, gourd-shaped bowls, necked cooking-pots, and oversized jars are also found. Other objects: scrapers from reused sherds.

Decorative techniques: Coarse and rough combing, painted with white pigment on red slip, post-fired scratched, and fine incisions.

Chronological assessment: 150 B.C. – A.D. 500, Early Intermediate Period.

Ware III-F (J)

Paste: The matrix shows a medium grain texture, moderate porosity, with inclusions and temper of medium size (1/4 - 1/2 mm) to coarse (1/2 - 1 mm) grain size, fairly sorted and in proportions higher than 20%. The inclusions may have been present in the clay since its source and correspond mainly to angular and semi-angular white and beige rocks (quartzite and/or feldspars) similar to II-B. This clay was tempered with sand of probable alluvial or Aeolian origin composed by semi-angular quartz/quartzite and semi-rounded dark volcanic rocks (probably basalt) of coarse sand size (1/2 – 1mm). This Paste is similar to Ware II-D. This ware seems to be a mixing of the Paste of I-C/II-B/II-C and alluvial/Aeolian sand.

Firing: Regular, medium temperatures, in an oxidizing atmosphere that produces vessels with moderate hardness and brown to dark brown tones (core: 2.5YR 4/4-reddish brown, 2.5YR 4/6-red, 2.5YR 5/6-red; surface: 2.5YR 4/3-reddish brown, 2.5YR 5/6-red, YR 5/3-reddish brown).

Surface treatment: Variable from smoothing to burnishing. Some specimens were polished.

Forms: Necked jars, neckless jars, and flat-based bowls are common. Bowls, bottles, basins, carinated bowls, gourd-shaped bowls, platters, pitchers, necked cooking-pots, plates/dishes, oversized bowls were also found. Other objects: scrapers from reused sherds, discs, trumpets, figurine, and rectangle-shaped reused sherd.

Decorative techniques: Post-fired scratched, appliqués, impressed (circles, broad dots), painting with white pigments, modeled and fine incisions.

Chronological assessment: 150 B.C. – A.D. 500 (Early Intermediate Period)

Ware IV-A (L1)

Paste: The matrix shows a medium grain texture, moderate porosity, and it is tempered with very coarse sand (1 – 2 mm), fairly sorted, and in proportions between 10 and 20%. The temper seems to be alluvial in origin, with a mixed composition of semi-angular quartz/quartzite and rounded dark volcanic rock (probably basalt).

Firing: Regular, medium to high temperatures, in an oxidizing atmosphere that produces durable vessels of orange and beige tones (core: 2.5YR 5/8-red, 5YR 5/4-reddish brown; surface: 2.5YR 5/8-red, 7.5YR 5/3-brown). Some specimens show a grayish core of an incomplete oxidation due a short time firing.

Surface treatment: Mostly smoothed by hand. There are some specimens with polishing, but burnishing is rare. Some vessels have a white/cream slip in their exposed surfaces.

Forms: Necked jar and necked cooking-pots are common. Bowls, carinated bowls, gourd-shaped bowls, bottles, “*cancheros*”, cups with high pedestals, “*floreros*”, graters, pitchers, plates/dishes, short-necked jars, and oversized vessels are also present. Other objects: scrapers from reused sherds, “*platos de alfarero*”, discs, miniatures, molds, and rectangle-shaped reused sherd.

Decorative techniques: Painted with white and black pigments, white/cream slip, modeled and molded (Moche style); painted with white, red and black pigment (Huari Norteño style); triangle-shaped impressions (Gallinazo/Suchimancillo style)

Chronological assessment: 500 B.C. – 800 A.D., Early Intermediate Period (?) and Middle Horizon Period.

Ware IV-B (F3)

Paste: The matrix shows a medium grain texture, moderate porosity, and it is tempered by coarse sand (1/2 – 1mm), well sorted, and in proportions higher than 30%. The temper is sand of alluvial or Aeolian origin of mixed composition of semi-angular quartz/quartzite and semi-rounded dark volcanic rocks (probably basalt).

Firing: Regular, medium temperatures, in an oxidizing atmosphere that produces vessels of moderate hardness and orange to brown tones (core: 2.5YR 4/6-red; surface: 2.5 YR 5/4-reddish brown),

Surface treatment: Rough smoothing by hand or by the use of an uneven soft material (i.e. maize cob or textile)

Forms: Oversized vessels (“*tinajas*” and “*botijas*”), necked jars and basins are common. Necked cooking-pots, neckless jar, flat-based bowl, bottles, dishes/plates were also found. Other objects: scrapers from reused sherds, a disc, “*platos de alfarero*”, miniature and architectural models.

Decorative techniques: Mold impressed, post-fired scratched and painted with red and white pigments.

Chronological assessment: A.D. 500 – 800, Middle Horizon Period.

Ware IV-C (I)

Paste: The matrix shows a very coarse grain texture, very compact, and it is tempered by granules (2 – 4mm) to pebbles (4 mm+) size rocks, moderately well sorted, and in proportions larger than 30%. The temper is a probably crushed rock which was originally composed by large proportions of quartz and quartzite. Because almost no alluvial or Aeolian erosion affected the crushed rock, they have facets and very sharp edges.

Firing: Irregular, medium temperatures, in an oxidizing atmosphere that produces durable vessels of beige to light brown tones (core: 5YR 5/3-reddish brown, 2.5YR 4/4 reddish brown; surface: 7.5YR 5/3 brown, 2.5YR 5/3 reddish brown)

Surface treatment: Rough smoothing by the use of an uneven and textured object (textile or maize cob)

Forms: Oversized vessels (“tinajas”) are common, necked jars were also found.

Decorative techniques: -

Chronological assessment: 150 B.C. – A.D. 800, Early Intermediate Period and Middle Horizon Period.

Ware IV-D (D)

Paste: The matrix shows a fine grain texture, moderately compact, and it is tempered with fine (1/8 – 1/4mm) and medium (1/4 – 1/2mm) size sand, good sorted, and in proportions lower than 5%. The temper seems to be alluvial in origin, with a mixed composition of semi-angular quartz/quartzite and rounded dark volcanic rock (probably basalt).

Firing: Regular, medium to high temperatures, in an oxidizing atmosphere that produces vessels of moderate hardness and orange tones (core: 2.5YR 5/6-red; surface: 2.5YR 4/6 red, 2.5 YR 4/8 red; black slip: 7.5 YR 4/1-dark gray; black paint: 7.5YR 3/1-very dark gray; cream slip and paint: 10YR 8/3-very pale brown).

Surface treatment: Varies between careful smoothing and polishing. IV-D/1 specimens sometimes show red or cream slip.

***Subtype IV-D/1**

Forms: Bottles (stirrup spout, spout with lateral handle, double spout and bridge, and simple spout), necked jars, and flat-based bowls are common. Bowls, “*cancheros*”, gourd-shaped bowl and a plate/dish were also found. Other objects: reused sherd scraper, figurines and miniatures.

Decorative techniques: Impression by mold, painting with mainly red and white pigments, appliques, modeled (Moche and Gallinazo style).

Chronological assessment: A.D. 500-800, Middle Horizon Period, probably beginning around A.D. 400.

***Subtype IV-D/2**

Forms: Bowls, simple spout bottles, plate/dishes, flat-based bowl are common. Necked jars, gourd-shaped bowls, “*keru*” vase were also found. Other objects: scrapers from reused sherds and a whorl.

Decorative techniques: Impression by mold, painting by red, white and black pigments (Huari Norteño style).

Chronological assessment: A.D. 500-1000, Middle Horizon Period.

***Subtype IV-D/3**

Forms: Only small necked cooking-pots were found.

Decorative techniques: Impressed by mold (“*piel de ganso*”)

Chronological assessment: A.D. 1000-1400, Late Intermediate Period.

Ware IV-E (E)

Paste: The matrix shows a fine grain texture, moderately compact, and it is tempered with fine sand (1/8 – 1/4mm), well sorted, and in proportions between 5 and 10%. The temper seems to be alluvial in origin, with a mixed composition of semi-angular quartz/quartzite and rounded dark volcanic rock (probably basalt).

Firing: Regular, medium temperature that produce vessels with hard pastes and beige-orange to light brown tones (core: 7.5YR 5/3-brown, 5YR 5/6-yellowish red; surface: 7.5YR 5/3-brown; engobe rojo: 10R 4/4-weak red).

Surface treatment: Very careful smoothing and polishing. Some specimens have orange or red slip.

Forms: Flat-based bowls, necked jars, and simple spout bottles are common. Bowls, small necked cooking-pots, and plate/dishes were also found. Other object: scraper from reused sherds.

Decorative techniques: Painted with black, white and sometimes red pigments (Huari Norteño style, compare with IV-D/2)

Chronological assessment: 500-1000, Middle Horizon Period.

Ware V-A (K)

Paste: The matrix shows a coarse grain texture, moderately compact, and it is tempered with very coarse (1 – 2 mm) elements, well sorted, and in proportions around 20%. The temper is sand with a mixed composition of crushed quartzite rocks, and sand of mixed composition with semi-angular quartz and black semi-rounded rocks (probably basalt). This is similar than V-B but with lower proportions of temper and different firing.

Firing: Regular, high temperatures, initially with a reducing atmosphere and culminated with a rapid exposure of the vessels to an oxidizing atmosphere, producing a layered effect with gray, brown and

beige cores (7.5YR 2.5/1-black, 5YR 3/3-dark reddish brown), and pinkish, purple and orange surfaces (2.5YR 5/4-reddish brown, 2.5YR 5/8-red) in very durable vessels.

Surface treatment: Rough smoothing by the use of an uneven and textured object (textile or maize cob), which left horizontal striations, mostly visible in the surfaces of the vessels' neck and rims.

Forms: Necked jars and necked cooking-pots are common. Bowls, bottles, gourd-shaped bowls, platter, plates/dishes, flat-based bowl, and oversized vessels were also found. Other artifacts: scrapers from reused sherds, miniatures, and "*platos de alfarero*".

Decorative techniques: Cane coarse impressed, coarse rocker stamping, appliqué, coarse point incisions, incisions and mold impressed (i.e coarse and fine "*piel de ganso*"). Casma style decorations are highly present.

Chronological assessment: A.D. 1000-1530, Late Intermediate Period and Late Horizon Period.

Ware V-B (F2)

Paste: The matrix shows a medium to coarse grain texture, moderate porosity, and it is tempered with very coarse (1 – 2mm) and granule (2 – 3mm) size sand, well sorted, and in proportions between 20 and 30%. The temper is crushed quartzite rocks with/or sand of mixed composition with semi-angular quartz and black semi-rounded rocks (probably basalt). Similar to V-A and V-C.

Firing: Irregular, medium temperatures, in an oxidizing atmosphere that produces a wide variety of beige and brown colors with fire clouds in the surface (core: 2.5YR 4/6-red; surface: 2.5 YR 4/4 reddish brown; fire clouds: 2.5 YR 3/1 dark reddish gray).

Surface treatment: Rough smoothing by the use of an uneven and textured object (textile or maize cob), which left horizontal striations, mostly visible in the surfaces of the vessels' neck and rims.

Forms: Necked jars, necked cooking-pots and oversized vessels ("*tinajas*") are common. Bowls, bottles, graters, neckless jars, plates/dishes and flat-based bowl were also found. Other objects: scrapers from reused sherds, disc, miniatures, "*plato de alfarero*", and molds.

Decorative techniques: Coarse cane impressions, coarse rocker stamping, coarse point incisions in patterns (Casma style). Mold impressions (fine and coarse "*piel de ganso*")

Chronological assessment: A.D. 1000-1530, Late Intermediate Period and Late Horizon Period.

Ware V-C (F1)

Paste: The matrix shows a medium to coarse grain texture, moderate porosity, and it is tempered with very coarse (1 – 2mm) and granule (2 – 3mm) size sand, poor sorted, and in proportions higher than 20%.

The temper is crushed quartzite rocks with/or sand of mixed composition with semi-angular quartz and black semi-rounded rocks (probably basalt). Similar to V-A and V-B.

Firing: Regular, medium temperatures, in a reducing atmosphere that produces vessels of moderate hardness and gray tones (core: GLEY1-5/N-gray, GLEY1-6/N-gray; surface: GLEY1-4/N-dark gray, GLEY1-3/N-very dark gray).

Surface treatment: Rough smoothing by the use of an uneven and textured object (textile or maize cob), which left horizontal striations, mostly visible in the surfaces of the vessels' neck and rims.

Forms: Bowls, necked jars and necked cooking-pots are common. Bottles, gourd-shaped bowls, a platter, short necked jar, neckless jar, plates/dishes, flat-based bowls and oversized vessels ("*tinajas*") were also found. Other objects: scrapers from reused sherds,

Decorative techniques: Appliqués, mold and cane impressions, and some specimens show "*paleteado*" (Casma and Chimú styles).

Chronological assessment: A.D. 1000-1530, Late Intermediate Period and Late Horizon Period.

Ware V-D (H)

Paste: The matrix shows a very fine grain texture, very compact and almost without temper. In those specimens in which temper was added it was of fine size (1/8 – 1/4mm) sand and in proportions lower than 5%.

Firing: Regular, high temperature, in a reducing atmosphere that produces durable but sometimes brittle vessels of gray to black tones (core: GLEY1-5/N-gray, surface: GLEY1-2.5/N-black, GLEY1-3/N-very dark gray)

Surface treatment: Very careful smoothing and polishing. Some vessels were blackened by smoking.

Forms: Bowls and bottles (inc. stirrup spout) are common. Necked jars, plates/dishes, a flat-based bowl, and an oversized vessel ("*tinaja*") were also found.

Decorative techniques: Mold impressions and mold shaping of Chimú or Chimú-Inka style. One specimen is a vessel with a black Middle Horizon style of "*cara-gollete*".

Chronological assessment: A.D. 1000-1530, Late Intermediate Period and Late Horizon Period. May be including gray/black wares of the Middle Horizon Period (A.D. 500-1000)

Ware V-E (G)

Paste: The matrix shows a coarse grain texture, moderately compact, and it is tempered with coarse sand (1/2 – 1mm), well sorted, and in proportions between 10 and 20%. The temper is crushed quartzite rocks with sand of mixed composition with semi-angular quartz and black semi-rounded rocks (probably basalt).

Firing: Regular, high and very high temperatures, in an oxidizing atmosphere that produces very durable vessels of pink, purple and orange tones (core and surface: 2.5YR 5/6-red, 2.5YR 6/4 light reddish brown)

Surface treatment: Rough smoothing by the use of an uneven and textured object (textile or maize cob), which left horizontal striations, mostly visible in the surfaces of the vessels' neck and rims.

Forms: Necked jars and necked cooking-pots are common. Bowls, bottles, plates/dishes and flat-based bowl and an oversized vessel ("*tinaja*") were also found. Other objects: scrapers from reused sherds.

Decorative techniques: Coarse cane impressions, coarse rocker stamping, coarse point incision pattern, mold impressed ("*piel de ganso*", and *appliqué*, Casma and/or Chimú style). Painting with white and black pigments (Huari Norteño style)

Chronological assessment: A.D. 800 – 1530, part of Middle Horizon Period, Late Intermediate Period and Late Horizon Period.

Ware V-F (M)

Paste: The matrix shows a very coarse grain texture, moderately compact, tempered by granule size rocks (4mm +), good sorting, and in proportions higher than 30%. The temper is sand screened to get the larger grains, in which a large quantity of large, rounded rocks (basalt) was present.

Firing: Regular, medium temperatures, in an oxidizing atmosphere that produces durable vessels with beige and light brown colors (core: 7.5YR 4/3-brown, 2.5YR 4/6 red, surface: 10R 4/6-red)

Surface treatment: Mostly rough smoothing.

Forms: Oversized vessels ("*Tinajas*", "*botijas*") and necked jars.

Decorative techniques: -

Chronological assessment: A.D. 1000 – post 1530, Late Intermediate Period, Late Horizon Period and Colonial Period.

Ware V-G (U)

Paste: The matrix shows a medium grain texture, very compact, and it is tempered with very coarse sand (1 – 2mm), good sorting, and in proportions between 10 and 20%. The temper is crushed dull black rock with angular, elongated appearance. It may be "*shashal*", a slate-like rock.

Firing: Regular, high temperatures, with an initial reducing atmosphere and a rapid exposure to an oxidizing atmosphere that produces very resistant vessels. The core is gray (GLE1-6/N-gray, 5B 5/1-bluish gray) and the surface varies between beige and pink (10YR 7/3-very pale brown, 2.5YR 7/4 light reddish brown).

Surface treatment: Rough smoothing and some specimens are especially rugged. One specimen shows glaze.

Forms: Necked jars and necked cooking-pots.

Decorative techniques: -

Chronological assessment: 1000- post 1530, Late Intermediate Period, Late Horizon Period, and Colonial Period.

Ware V-H (W)

Paste: The matrix shows a very fine grain texture, very compact, and with almost no inclusion. When present the inclusions are very coarse (1 – 2mm) and granules (2 – 4mm) size rocks, bad sorting, and in proportions lower than 5%. They may be natural impurities from the clay source.

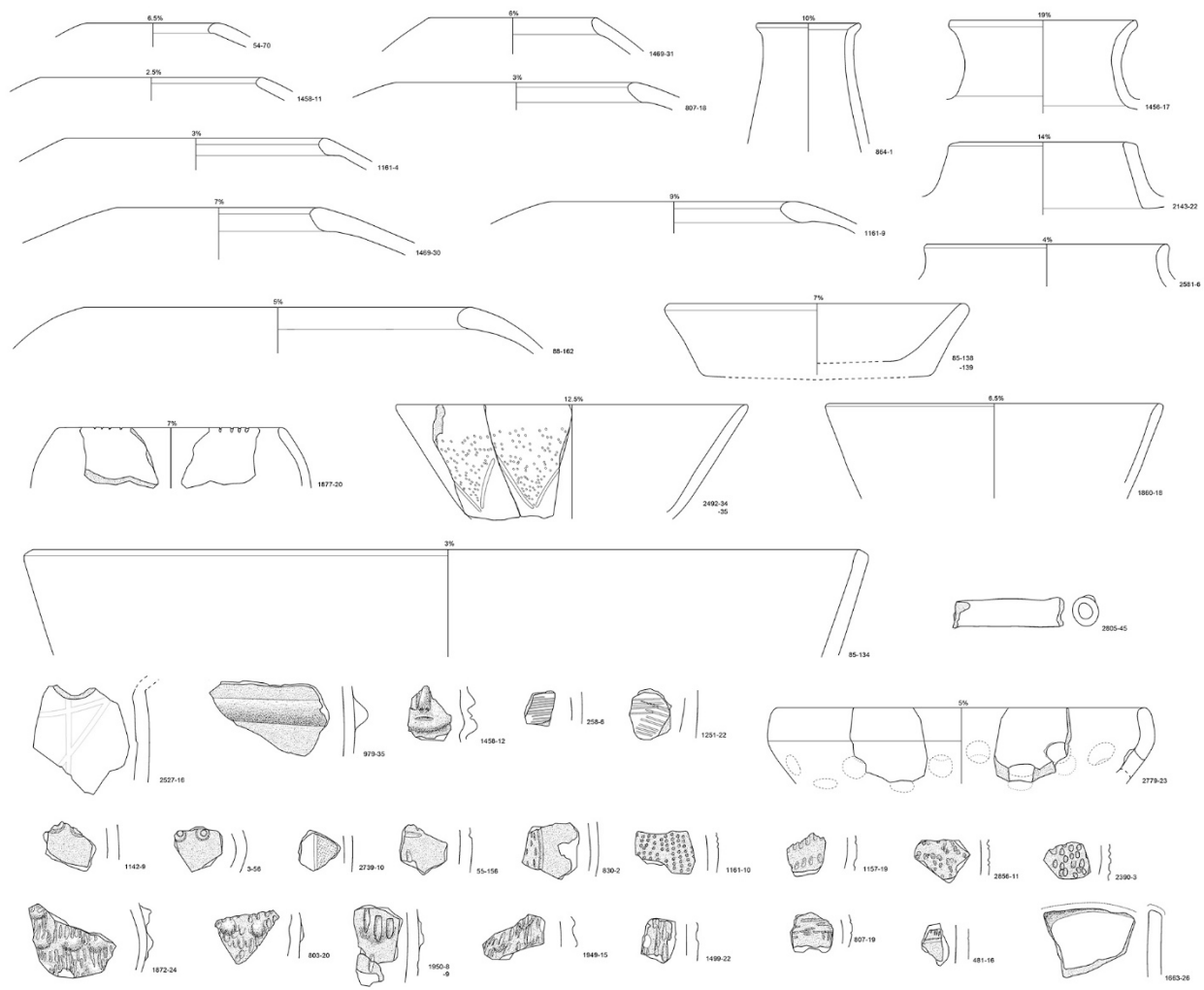
Firing: Regular, very high temperature, in an oxidizing atmosphere that produces very durable vessels with bright red and orange tones (core: 10R 5/8-red, 2.5YR 5/4-reddish brown, 2.5YR 4/3-reddish brown; surface: 2.5YR 5/8-red, 2.5YR 4/4-reddish brown)

Surface treatment: Careful and rough smoothing.

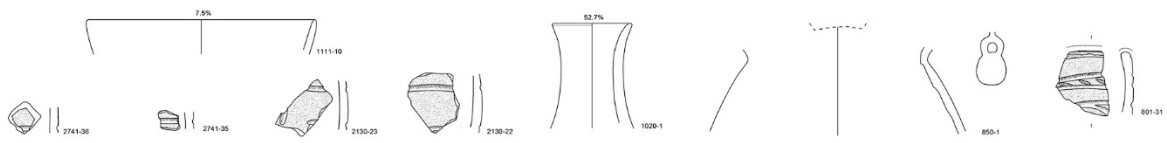
Forms: Oversized vessels ("*tinajas*" and "*botijas*") and necked cooking-pots are common. Bowls, bottles (Chimu Inka style) necked jars (inc. "*aribalo*"), plant-pot, plates/dishes and flat-based bowls were also found. Other objects: scrapers from reused sherds

Decorative techniques: Post-fired scratched, mold impressions, and glaze.

Chronological assessment: 1450-post 1530, Late Horizon Period, Colonial Period, and modern times.



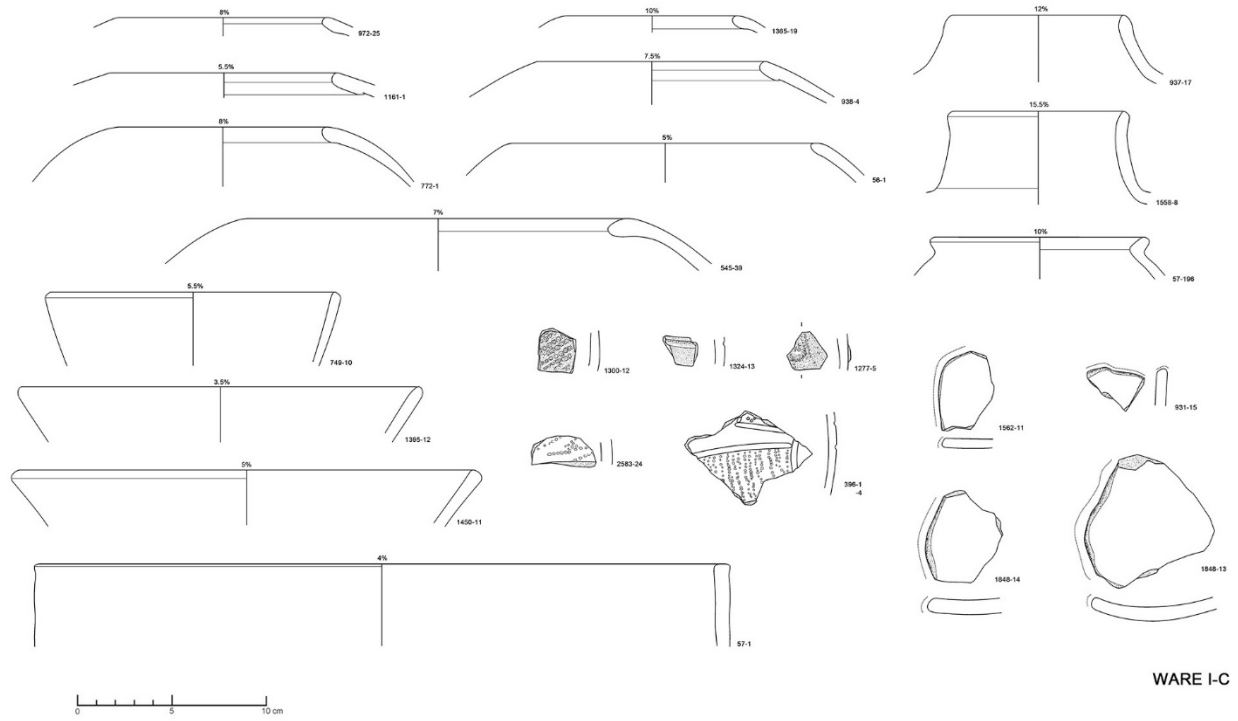
WARE I-A



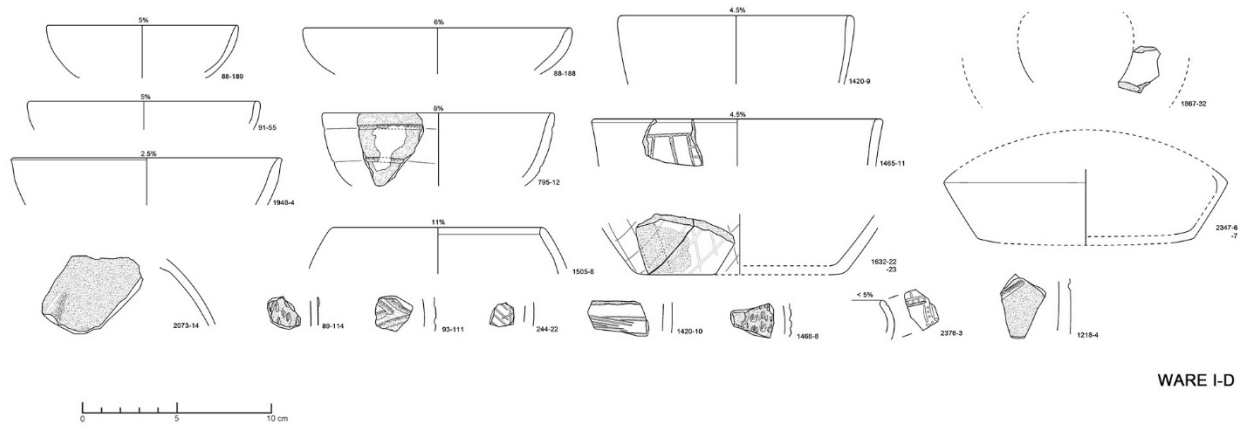
WARE I-B



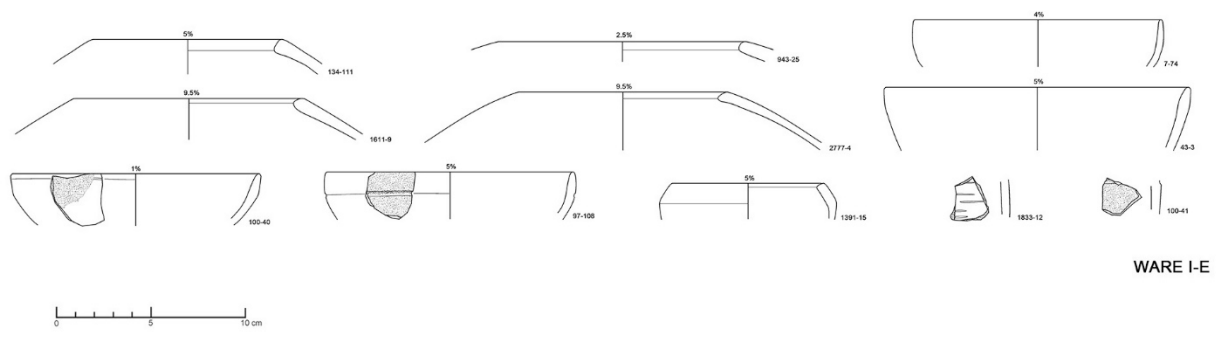
Figure B- 1 Pottery and ceramic artifacts of Ware I-A and Ware I-B.



WARE I-C



WARE I-D



WARE I-E

Figure B- 2 Pottery and ceramic artifacts of Ware I-C, Ware I-D and Ware I-E.

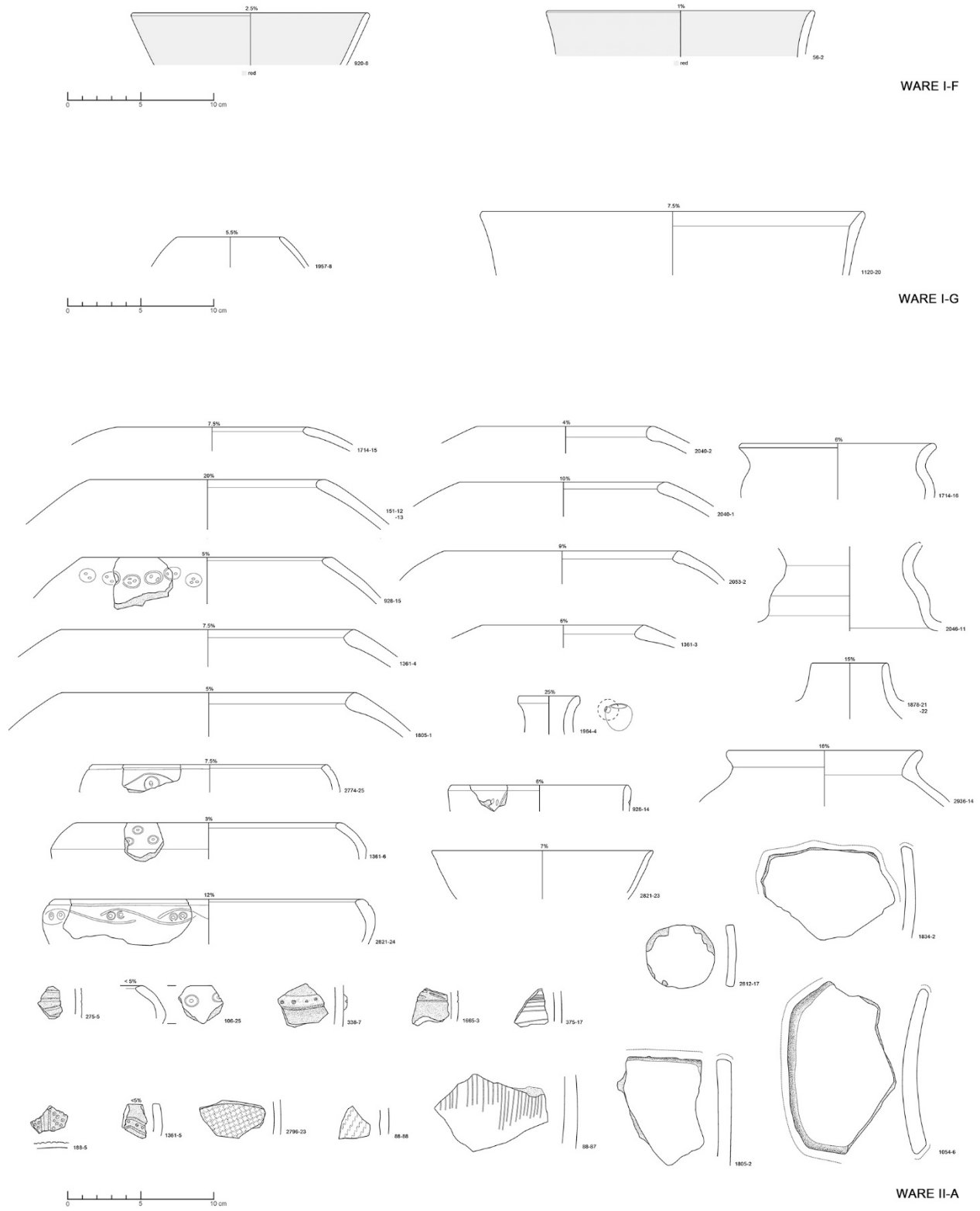
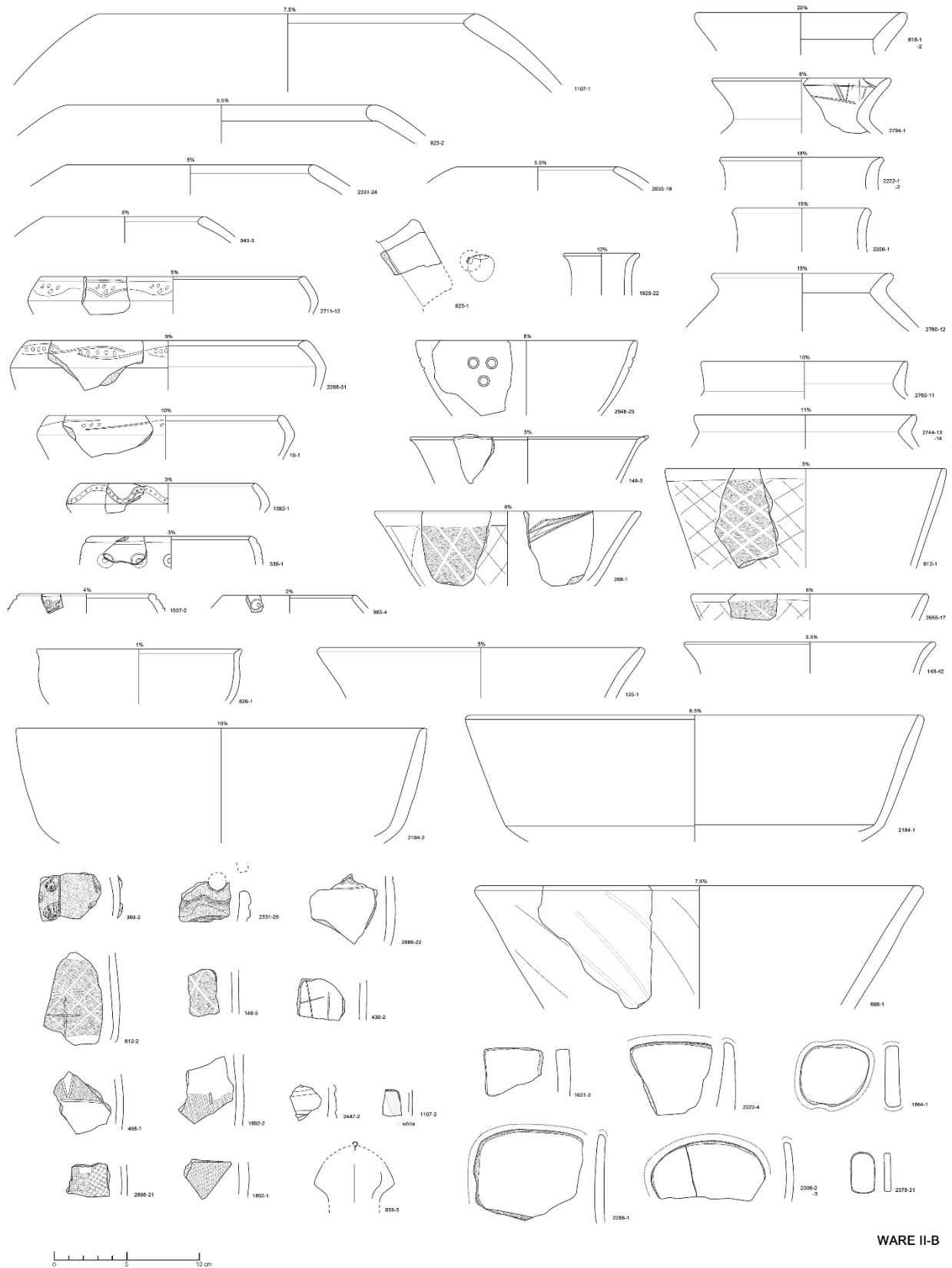


Figure B- 3 Pottery and ceramic artifacts of Ware I-F, Ware I-G and Ware II-A.



WARE II-B

Figure B- 4 Pottery and ceramic artifacts of Ware II-B.

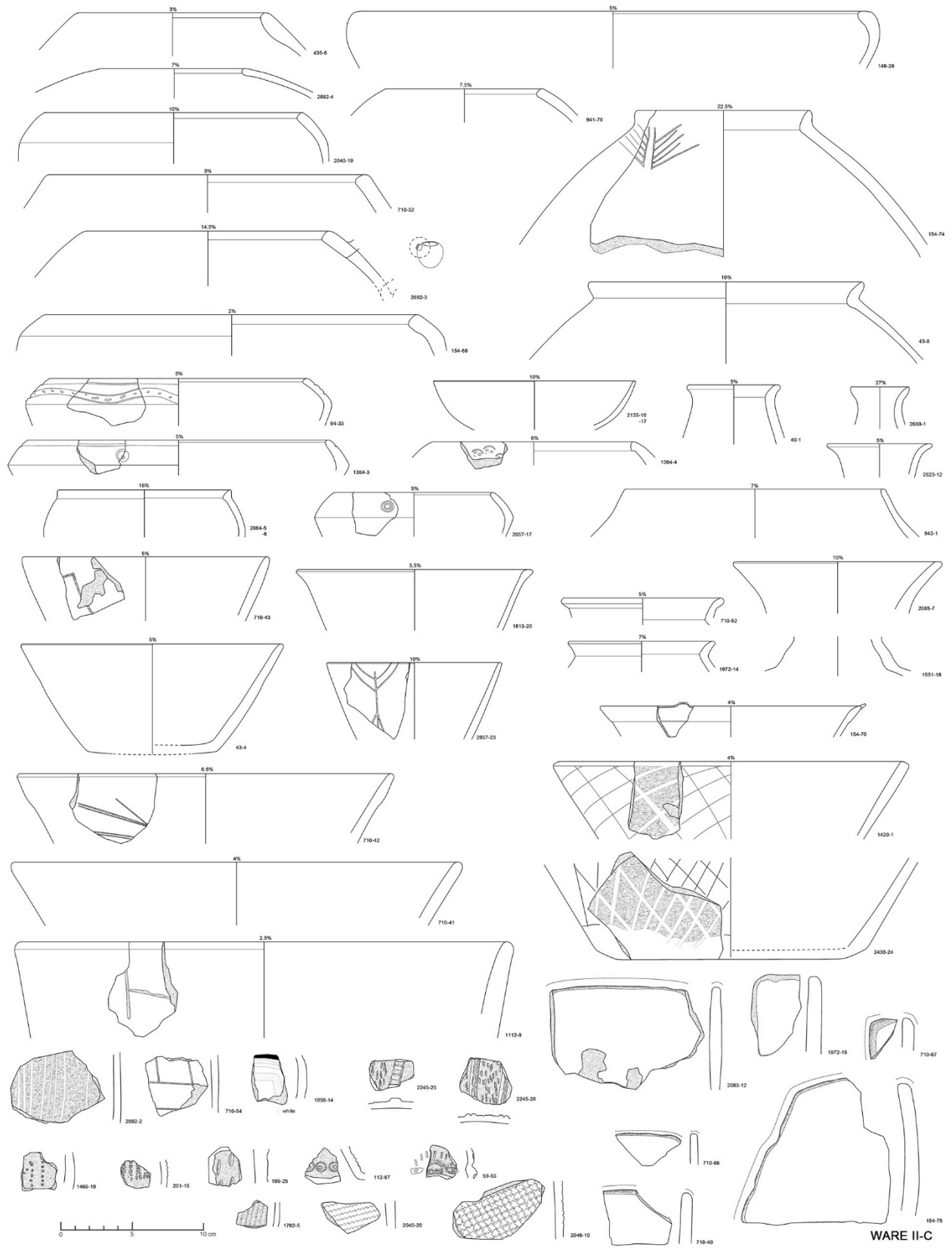
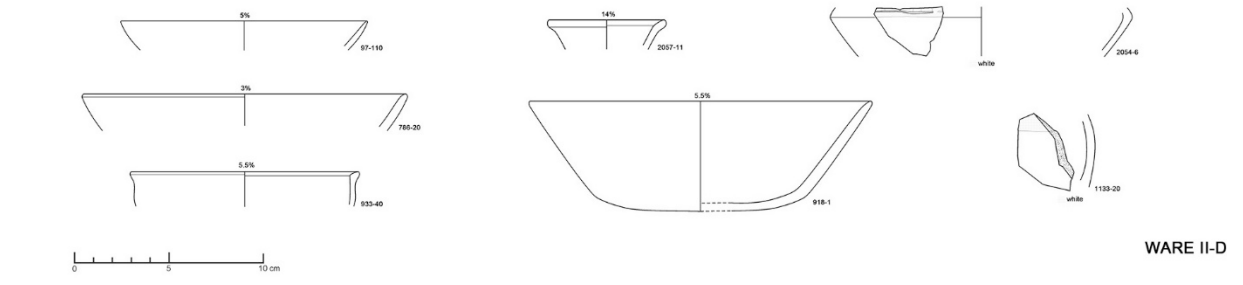
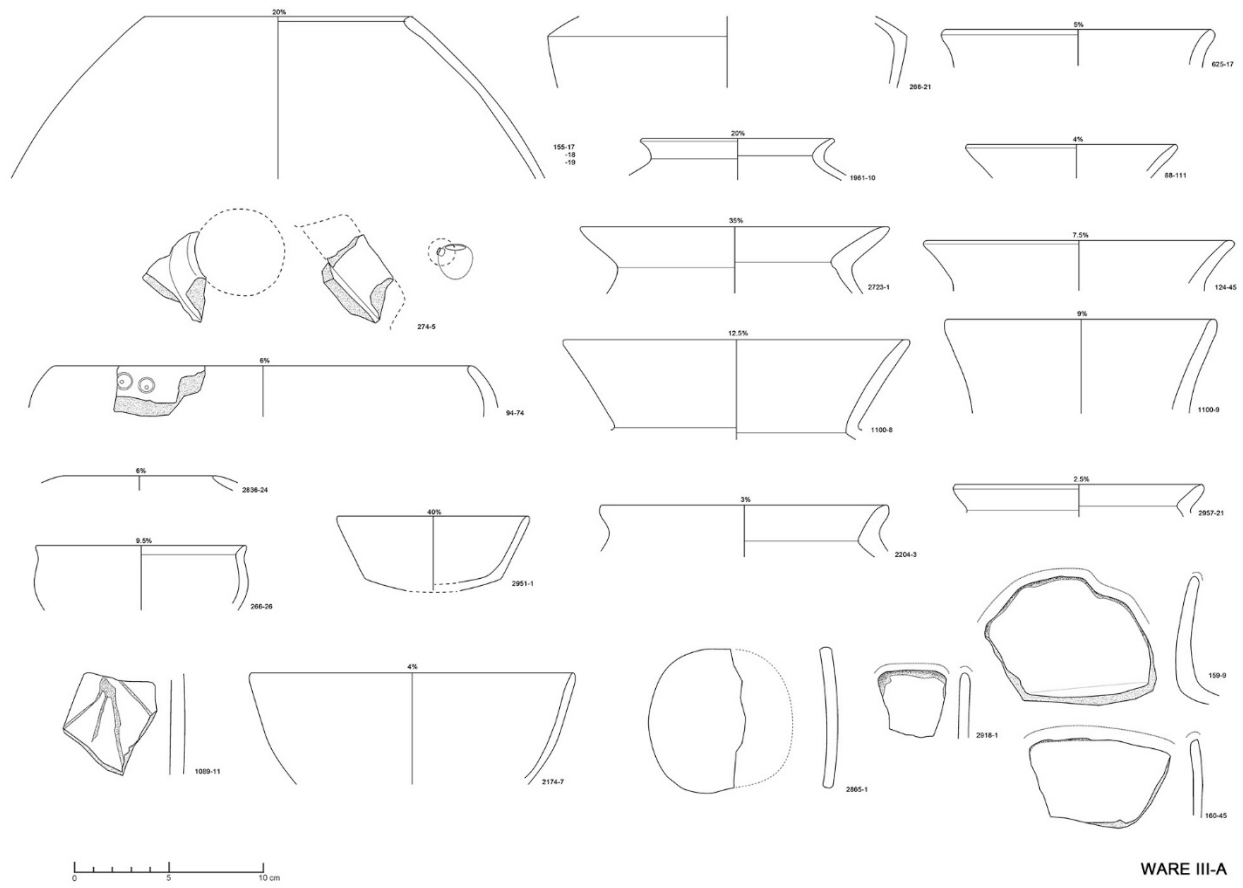


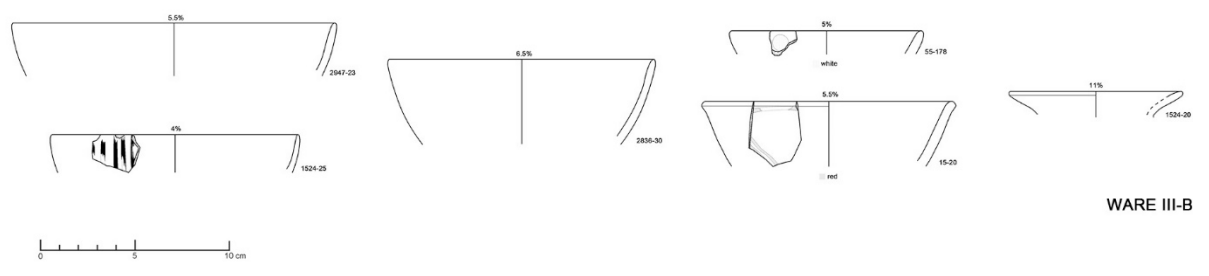
Figure B- 5 Pottery and ceramic artifacts of Ware II-C.



WARE II-D

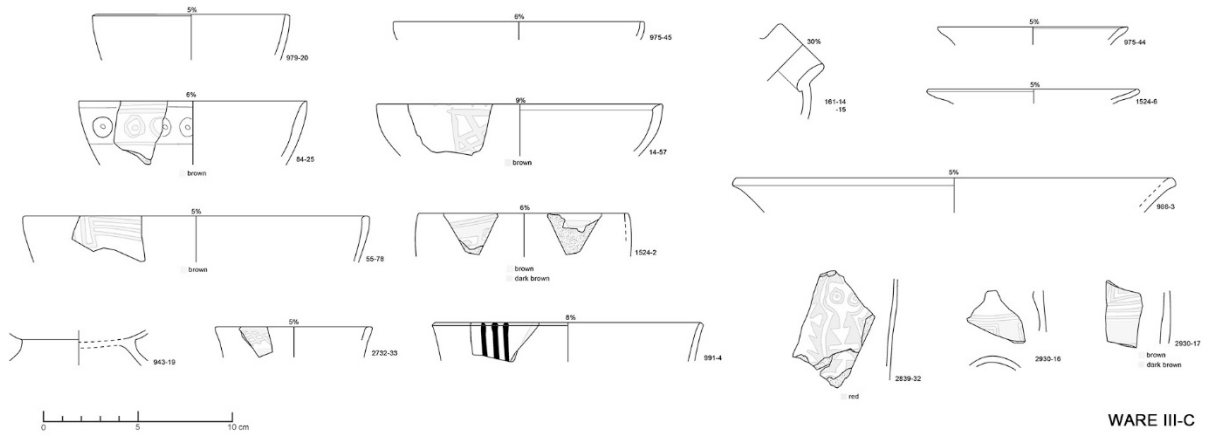


WARE III-A

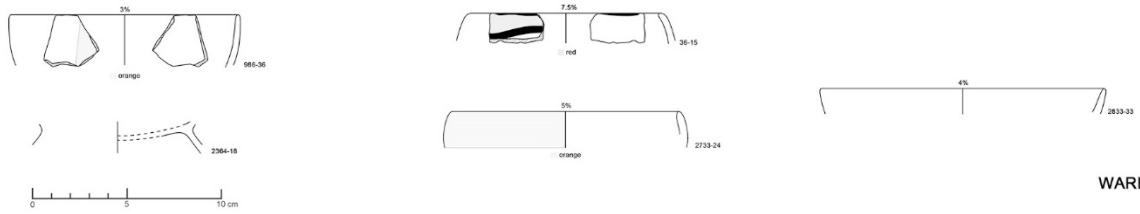


WARE III-B

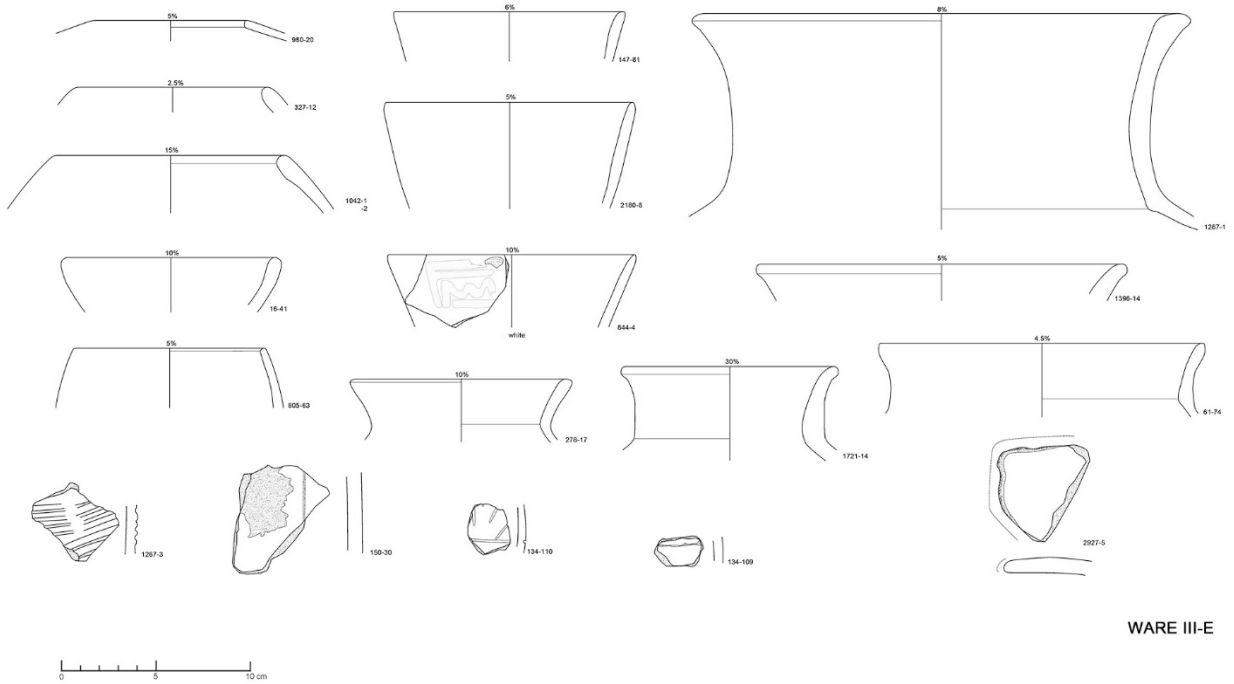
Figure B- 6 Pottery and ceramic artifacts of Ware II-D, Ware III-A and Ware III-B.



WARE III-C



WARE III-D



WARE III-E

Figure B- 7 Pottery and ceramic artifacts of Ware III-C, Ware III-D and Ware III-E.

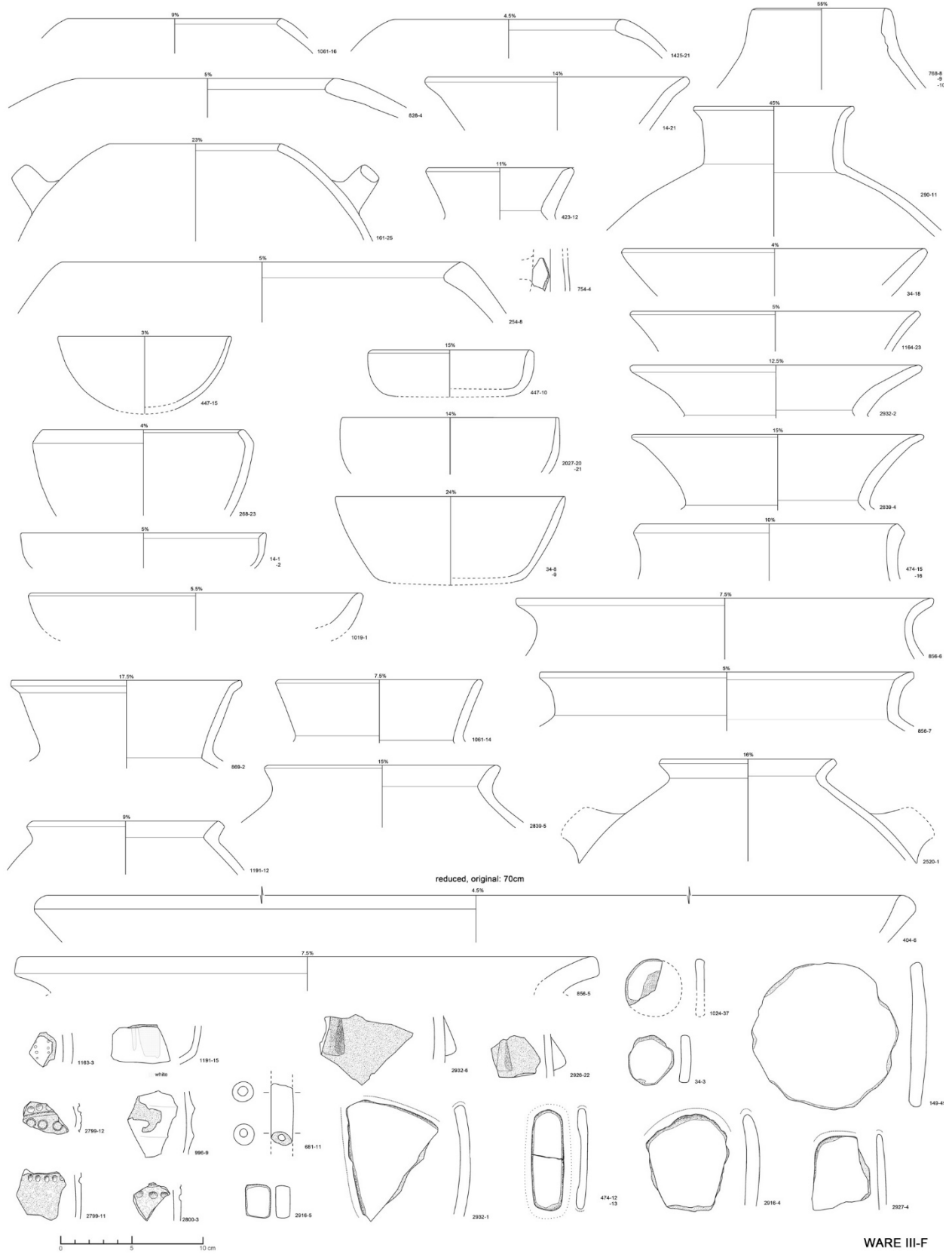


Figure B- 8 Pottery and ceramic artifacts of Ware III-F.



Figure B-9 Pottery and ceramic artifacts of Ware IV-A.

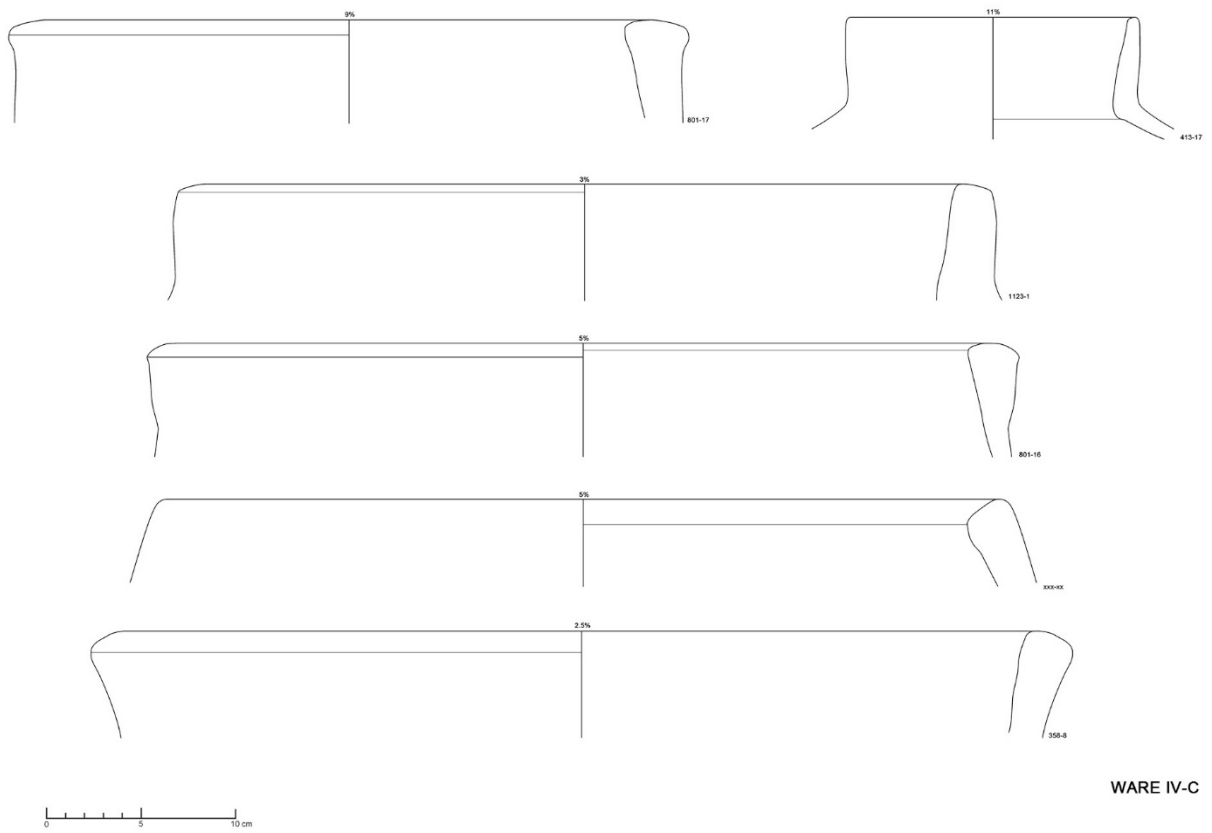
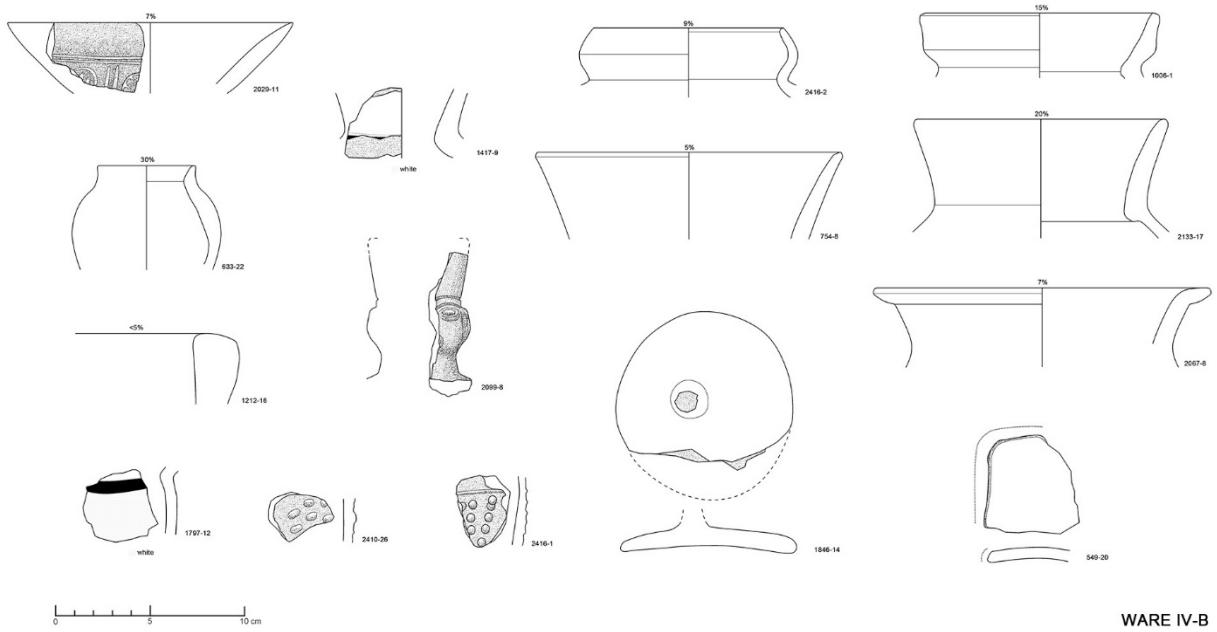


Figure B- 10 Pottery and ceramic artifacts of Ware IV-B and Ware IV-C.

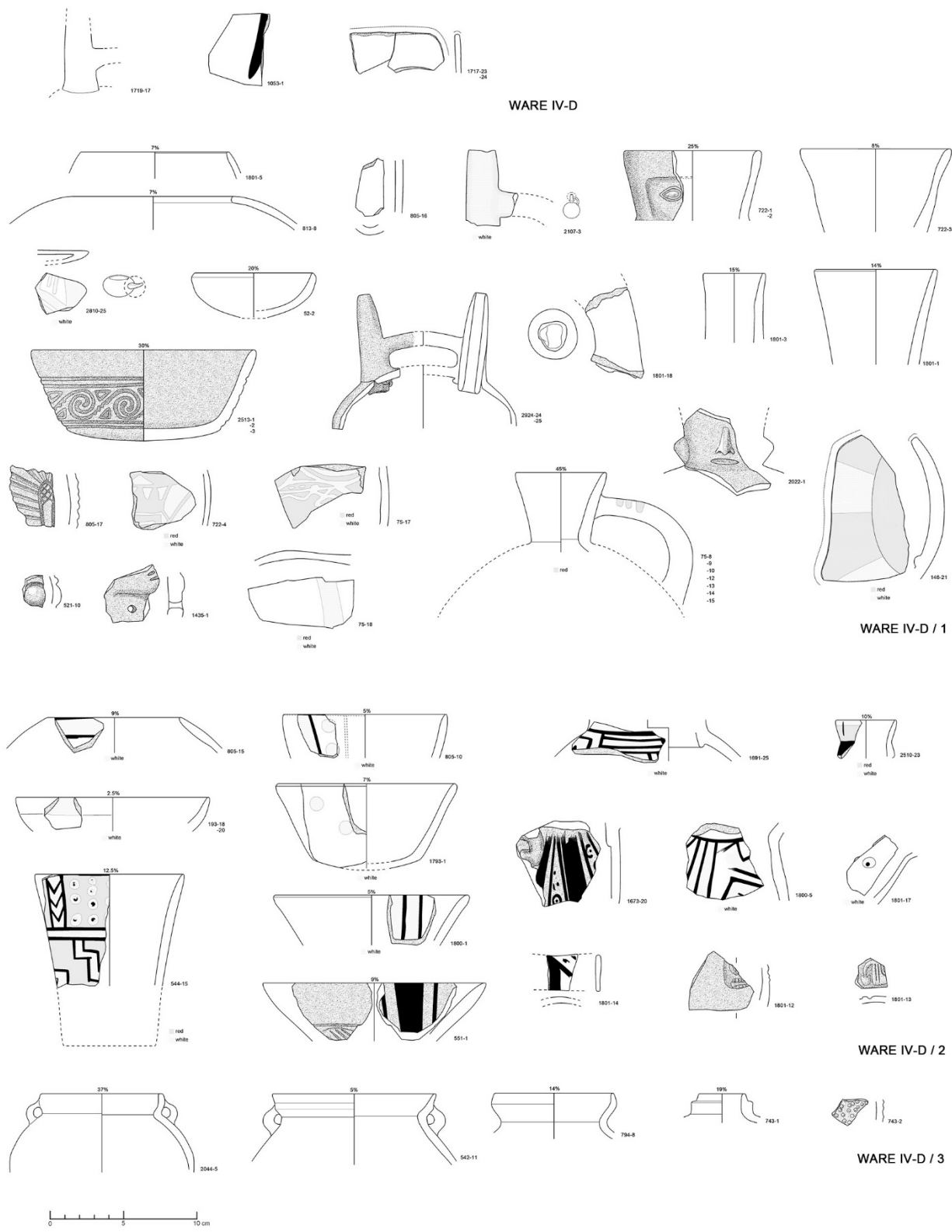
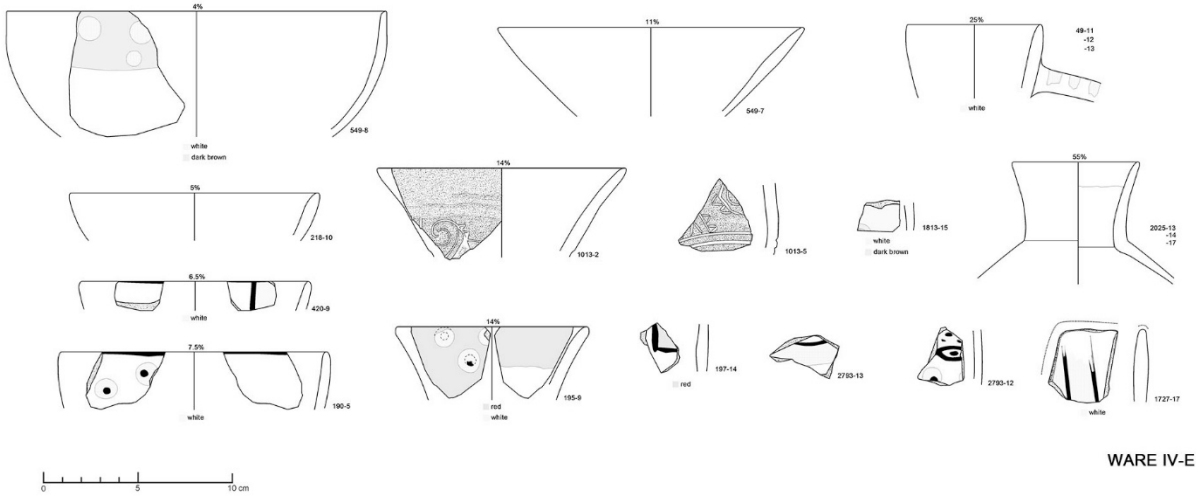
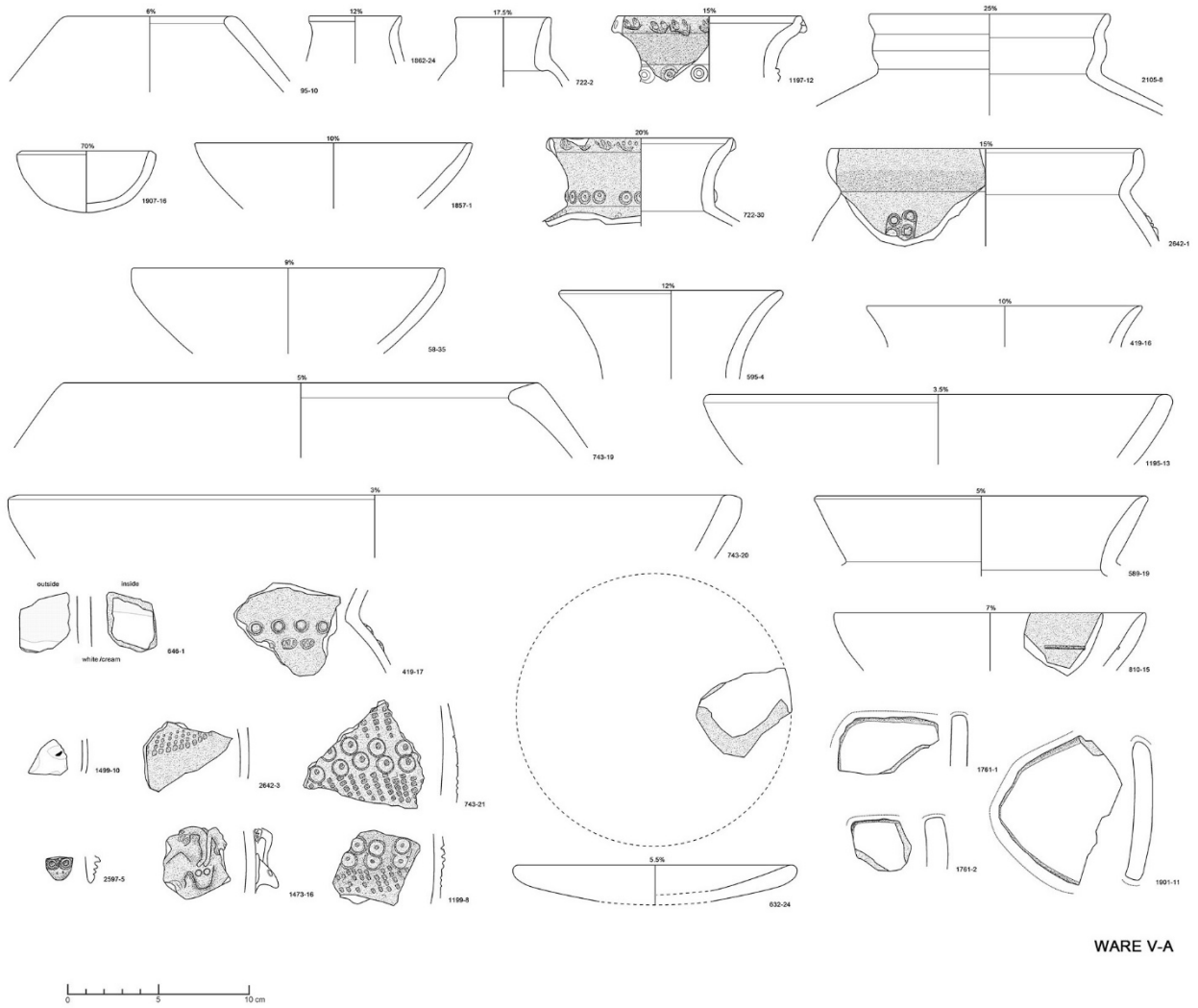


Figure B- 11 Pottery and ceramic artifacts of Ware IV-D.



WARE IV-E



WARE V-A

Figure B- 12 Pottery and ceramic artifacts of Ware IV-E, and Ware V-A.

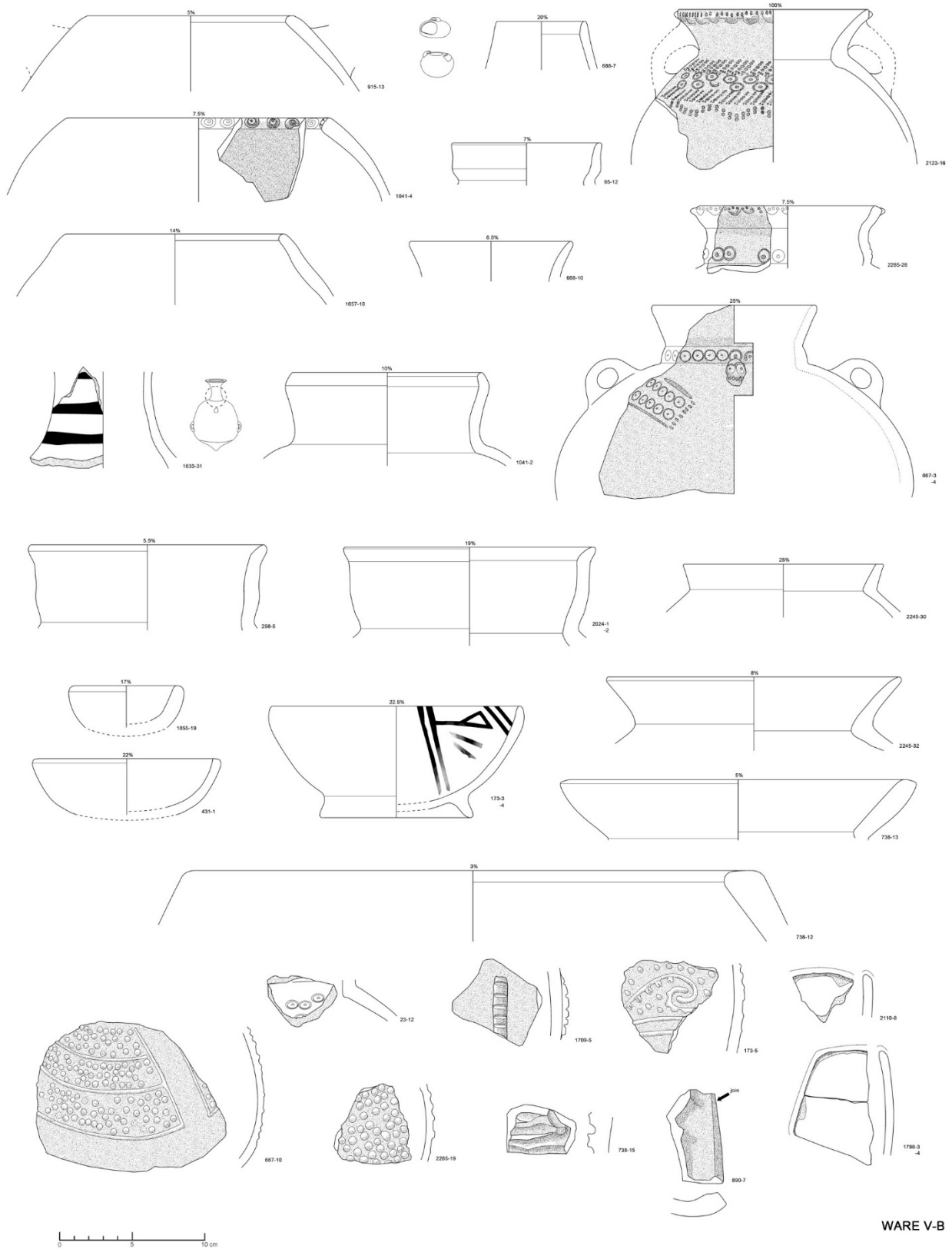


Figure B- 13 Pottery and ceramic artifacts of Ware V-B.

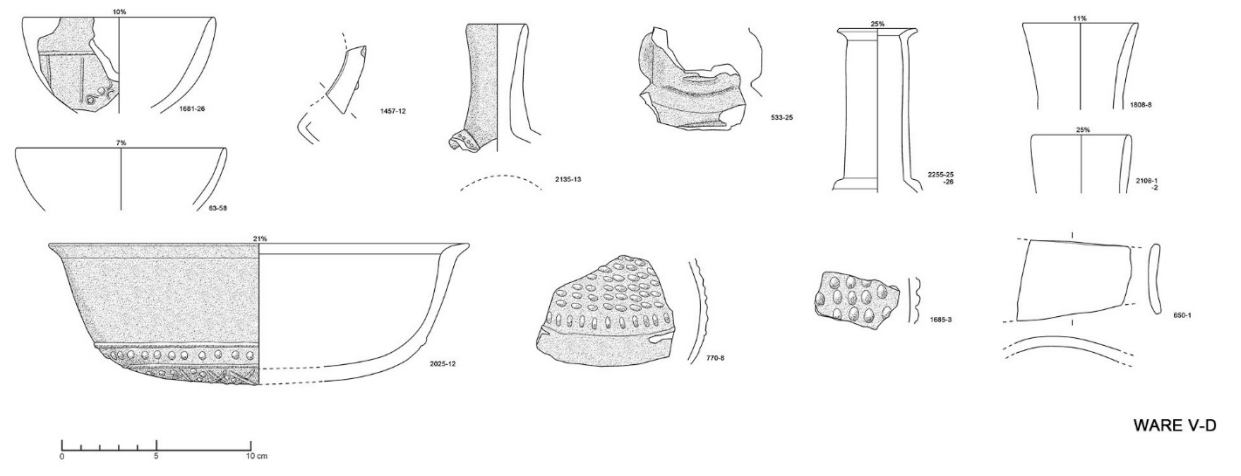
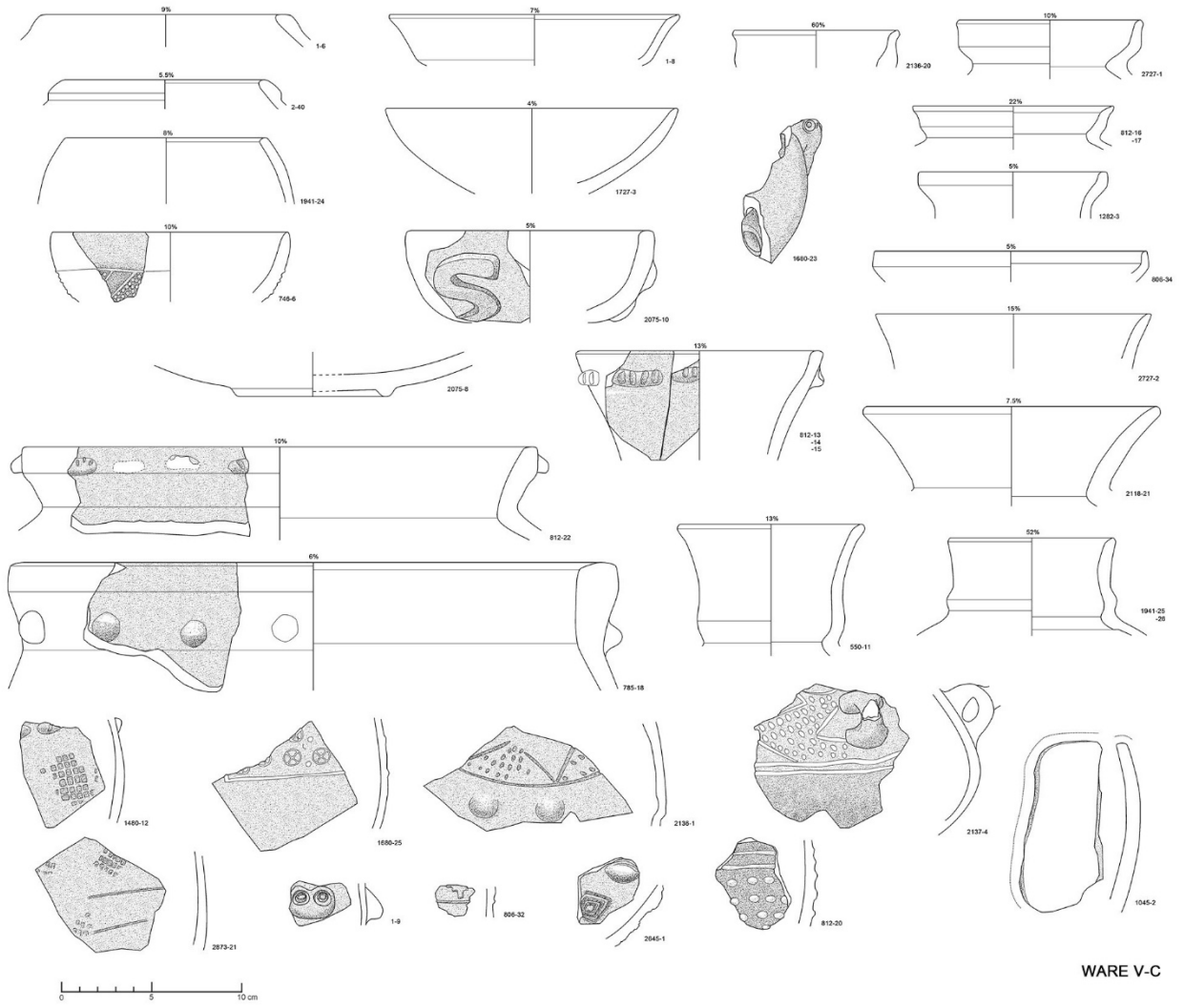
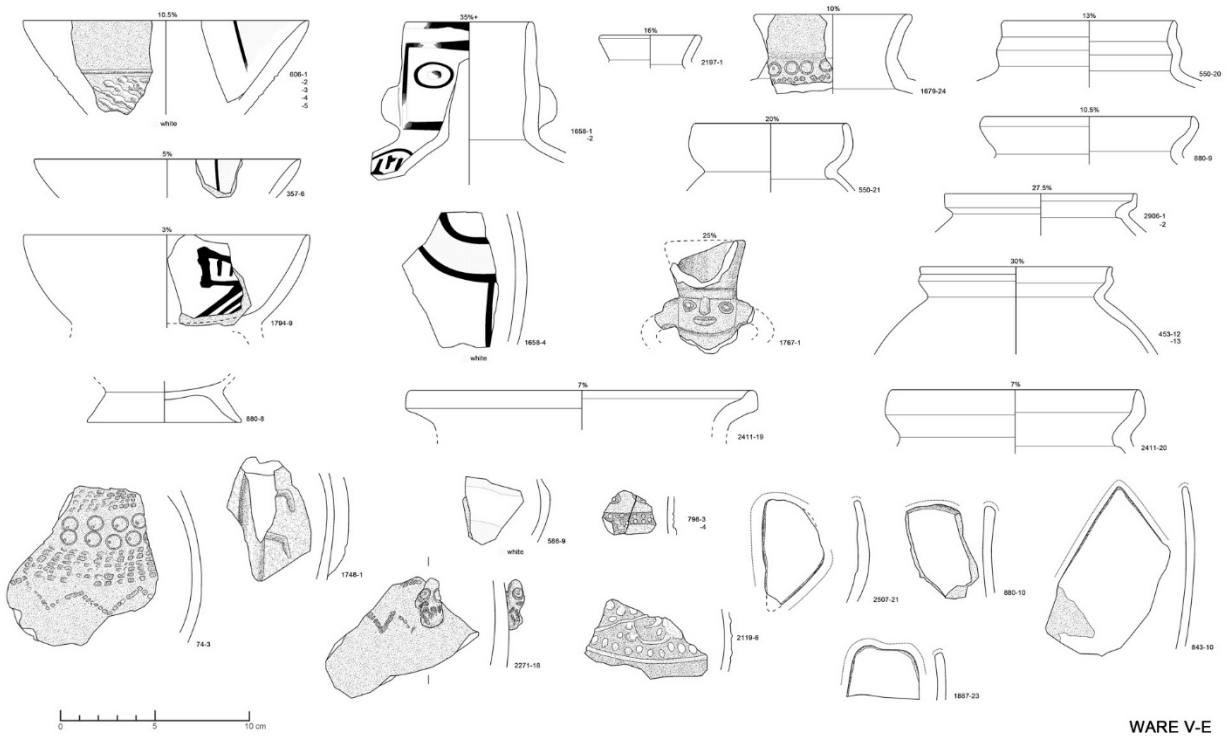
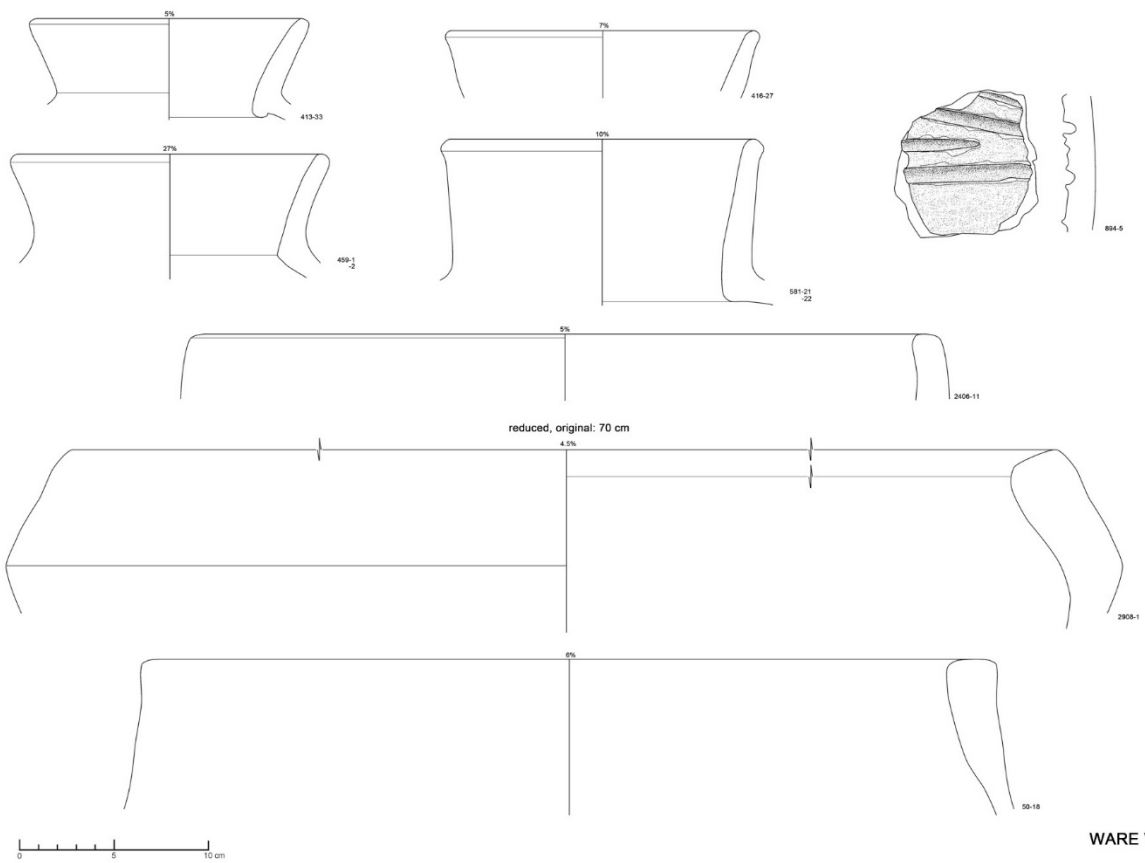


Figure B- 14 Pottery and ceramic artifacts of Ware V-C and Ware V-D.



WARE V-E



WARE V-F

Figure B- 15 Pottery and ceramic artifacts of Ware V-E, and Ware V-F.

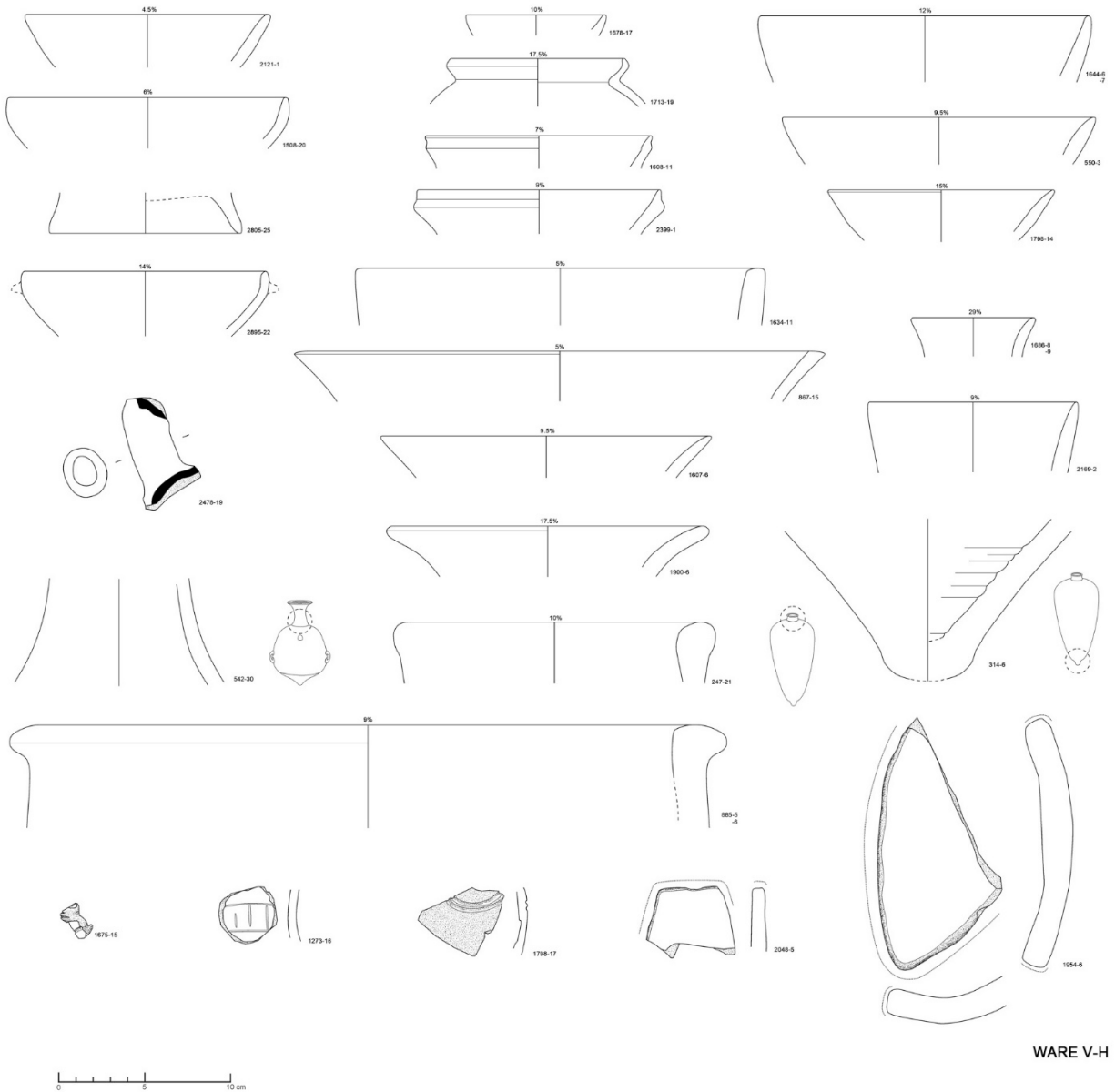
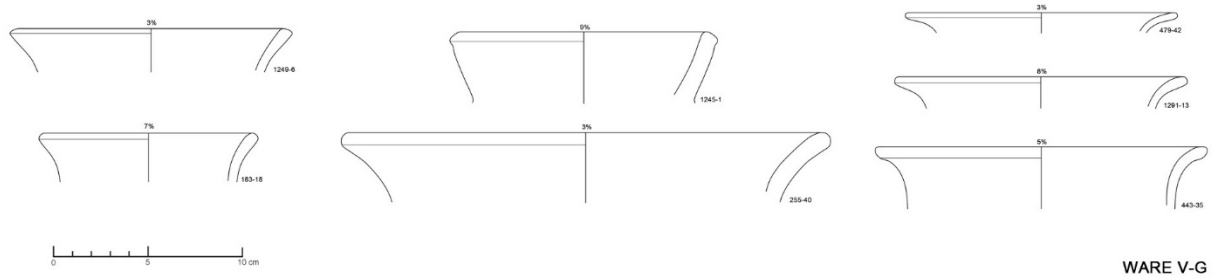


Figure B- 16 Pottery and ceramic artifacts of Ware V-G and Ware V-H.