Tales of Two Cities:

Urban Surveys of the Hellenistic and Roman Cities of Sikyon and Knossos

Two recent volumes exploring urban survey, ‘Urban Survey in Italy and the Mediterranean’ and ‘Archaeological Survey and the City’ provide a very welcome and useful discussion of the key problems, challenges and benefits of urban survey, which differ considerably from those of non-urban and regional surveys.¹ The aim of this paper is to present and discuss urban surveys from two Hellenistic-Roman urban cities, Sikyon and Knossos from a ceramics perspective. The Sikyon Survey Project (SSP) and the Knossos Urban Landscape Project (KULP) both covered similarly sized urban areas, both employed similar collection strategies, both have a few broadly relevant historical sources, and the large volume of data collected on both is comparable (Fig. 1). With this in mind, we would like to compare some aspects of both projects and to assess some common strengths and challenges relating to surface ceramics from these Hellenistic/Roman urban areas.

Two of the main scholarly issues long associated with urban survey are data resolution and collection strategy:² what should be picked up, what should be left in situ, what should be recorded in the field and what should be studied in more detail (as well as how it should be studied). In designing collection strategies, archaeologists generally seek to strike a balance between higher data resolution with slower collection/recording and higher storage costs on the one end of the spectrum; or lower data resolution with faster collection and recording and lower (or possibly no) storage costs at the other end. Both SSP and KULP were designed to get as high a data resolution as possible, and both collection strategies struck a balance between thoroughness of sampling against the collection of large amounts of data that would not add sufficiently to our overall picture of each urban area.

The Sikyon Survey Project

Sikyon is located on the north coast of the Peloponnese approximately 20km to the west of Corinth. In the Archaic and Classical Period, Sikyon was located on the coastal plain, probably under the modern town of Ciato with an acropolis located on a plateau to the south partially occupied by the village of Archaia Sikyona. In 303 BCE Demetrius Poliorcetes relocated the city to this defensible 250 hectare plateau. Unlike Corinth to the east, there had been comparatively little excavation at Sikyon.

² E.g. Bintliff and Snodgrass 1988; Terrenato 2004; Whitelaw 2012.
aside from a handful of rescue excavations and clearing of monumental architecture in and around the agora.

From 2004-2008 the Sikyon Survey Project (hereafter SSP) led by Yannis Lolos of the University of Thessaly conducted a collection survey across 114 hectares of the plateau of ancient Sikyon. This project followed in the footsteps of Lolos’ extensive survey of the Sikyonia, which elucidated a diachronic picture of regional settlement patterns Lolos 2011. In contrast, SSP was intended to give a detailed look at the arrangement and use of different areas within a city and changes in layout, function, and size over time. As such, it focused on the plateau, already identified as the site of the Archaic and Classical acropolis of Sikyon and the city itself after Demetrius Poliorcetes moved it in 303 BCE.

The Sikyon Survey Project – Collection Strategy

In the hopes of achieving the desired level of resolution, an intensive collection strategy was devised. The survey area was divided into three plateaux (Upper, North and South), onto which a system of tracts was imposed. These tracts were then divided into grid squares of 20 x 20 m and walkers in teams of five were spaced only four meters apart to ensure that representative materials would not be missed in fields with good visibility (Fig. 2). In each square walkers counted all surface sherds and collected all diagnostic sherds that were potentially indicative of vessel shape (e.g., rims, bases, and handles) or sherds with slip or other decoration. Every fifth square was designated a total collection square, from which all pottery detected was collected. In areas of extremely high density only a cross sample of the ‘total collection’ square was collected. The total sherd count from SSP was 739 313; densities across the site varied from few or no sherds per square to 6000+ sherds per square with an average of 260 (2839 squares/739313) sherds per square.

Sikyon Survey Project Ceramic Processing Strategy (Classical through Early Modern)

When we started examining the pottery at the beginning of the survey’s third season (2006) no proper ceramic analysis had been conducted yet. On the one hand, a big backlog of unexamined sherds had piled up, meaning that we were well behind the collection survey itself. On the other, it was clear what we would be facing in terms of quantities and preservation of material so that we could plan around it, rather than designing a theoretically ideal system before the beginning of the survey only to have it prove ill-suited with the practical reality at hand. We knew that there was a lot of

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pottery and that it would continue to pile up, so we designed our analysis accordingly. In order to work quickly through the material our specialists on Classical and Hellenistic (Peter Stone) and Roman and later pottery (Elissavet Tzavella and Matthew Maher) went through all collections and identified and quantified shapes from their period that could be recognized on the basis of published examples from excavations. Each of them put at least one example of each shape they recognized in a labeled slot in a tray of ‘index sherds’ that would serve as a reference and ensure consistency, examples for illustration and cataloguing were selected out of these trays. All of the sherds from the total collection squares were then grouped into common fabrics (Conor Trainor) by piling like with like to isolate commonly occurring fabrics and detailed descriptions of outliers. Like Tzavella and Stone, Trainor kept an index tray of fabrics, from which he selected examples for petrographic analysis to determine their geological composition and check the consistency of groupings.\(^7\)

**Results**

When we started, we saw great quantities of relatively well preserved pottery from squares collected on the south plateau in 2004-2005 and as such had hopes of elucidating discrete functional zones (e.g., domestic, cultic, industrial/commercial) across much of the plateau in different periods. The high concentration of wasters and diagnostics of late Hellenistic and Roman date in these early collection squares on the south plateau suggested large-scale production of transport amphorae, lekanai, jugs, and cooking vessels and more occasional production of plates, bowls, and unguentaria from the 2\(^{nd}\) century BC to the 3rd century AD.\(^8\) After this date ceramic production ceased at Sikyon or moved elsewhere and left no new traces evident in survey collections.\(^9\) However, over the course of our analysis over the next several seasons we encountered few other areas with a sufficient density of recognizable pottery to argue for a specific function absent other evidence like surface architecture or geophysical results.\(^10\) Many squares produced at least some amount of pottery that could be characterized as probably originating from a “domestic” context (e.g., lekanai, chytraei, plate fragments), which accords well with the likelihood that most of the city was covered in housing. But a handful of identifiable sherds of this sort in any particular tract or square, often with a potential date range of more than a century, cannot be considered conclusive proof of a “domestic” function, much less elucidate the character of individual households.

Fortunately, the large sample of pottery collected still permitted us to reach some general conclusions about household activities in the Hellenistic and Roman periods. Geophysical results

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suggested that, as at most sites, much of the surface area of Sikyon was occupied by housing and having the very large total sample collected, it was possible for us to identify much of the typical household equipment used over broad horizons and get a sense of typical habits and preferences. The 3,736 diagnostic sherds of Hellenistic date allowed us to identify several shapes that occurred with great regularity across the site, such as kraters with overhanging rims (940 examples), chytrai with flanged and thickened rims (280 examples), and mold made bowls (144 examples).\footnote{For discussion see Stone forthcoming; Tzavella forthcoming and Grigoropoulos forthcoming.} However, comparisons between the survey assemblage and the material recovered from two rescue excavations at the site suggests that some fine ware shapes from excavated contexts were surprisingly rare in the survey material (e.g., bowls with incurved rim; thin walled ware cups).\footnote{See James forthcoming; Likoudi forthcoming; and Stone forthcoming.} This is in all likelihood a well-known issue of preservation and visibility on the surface and recognizability in the apotheke rather than ancient reality.\footnote{For an exploration and discussion of this problem see Whitelaw 2012a, 88-92.} Thus, while we can say with some confidence that shapes that occurred frequently in the survey were regular components of household assemblages, we cannot be sure that they were the only regular components of those assemblages.

**Knossos Urban Landscape Project (KULP hereafter)**

The Knossos valley is approximately 10km\(^2\) and is bounded by low hills to the west (Monastiraki Kephala- Greek acropolis/Roman aqueduct), south (Gypsadhes) and east (Aillas), with the modern Venezelian Hospital complex to the north. Ancient settlement in the valley extended considerably beyond the bounds of the Minoan palace complex. The valley in its entirety is currently being studied as part of the Knossos Urban Landscape Project, but we want to discuss the urban area of Hellenistic-Roman Knossos.

**Knossos Urban Landscape Project – Collection Strategy**

The project is directed by Todd Whitelaw, Maria Bredaki and Antonis Vasilakis and has been been designed to 'survey intensively and systematically the Knossos valley, documenting the material record of occupation from initial Neolithic colonisation down to the early 20th century.'\footnote{Whitley et al. 2005-2006, 107-8.} KULP explored an 840ha area centred on the Knossos valley, with collection seasons for the project in 2005-2008 and annual study seasons ongoing.

The collection strategy for KULP was systematic and intensive and consisted of over 21,000 20m x 20m collection units around the Knossos valley (Fig. 3).\footnote{Morgan et al. 2008-9, 94.} In total 450 000 sherds were collected, providing
an average density of 21.4 sherds per square. Within each square, a 10m² area was laid out and vacuum collection was conducted in order to provide a fully representative sample of material from each unit. Throughout the rest of each square, grab-sampling was conducted, with feature sherds and ‘exceptional artefacts’ collected. For areas with low find densities beyond the urban core another collection strategy was devised in order to increase speed, while also ensuring that material was spotted. This entailed two walkers investigating each square in two 20-metre transects (usually along the west side and down the centre). A one-metre wide area was investigated intensively along each transect, thus, resulting in a 40m² area in each unit being searched. The thinking behind this two-tiered approach was that each square would yield a fully representative sample of finds, while moderating potential storage problems that would have been associated with a total collection survey.¹⁶

**Knossos Urban Landscape Project – Ceramics Processing Strategy (Classical-Late Roman)**

Once collected, Whitelaw ensured that all sherds were washed, recorded, and sorted into broad chronological categories (Prehistoric, Hellenic, Hell-Rom, Roman, Post-Roman and Modern) that were then bagged separately. This approach made it possible to establish approximate counts and volumes of material that could be broadly assigned to chronological periods, while separating out collected ceramics which were not likely to yield much, if any, chronological or functional information. With these broad categories established, period specialists were then brought in to look at the material again with the aim of refining chronologies and interpreting functions. Each of the ceramicists (Borja Legarra Herrero, Andrew Shapland, Jo Cutler, Antonis Kotsonas, and Conor Trainor) would work through all of the material to which Whitelaw had assigned broad period dates and to add our observations into a central KULP ACCESS database. Ceramics are categorised by findspot; collection method; bag number; fabric name; shape; vessel size; ware; part; date; typology; surface treatment and decoration.

**Results**

Despite being an on-going project, it is possible to make some observations on the Hellenistic-Roman city of Knossos. Whitelaw’s broad period analysis has established that the urban area of Knossos likely reached its greatest extent during Late Classical-Hellenistic times, ca. 130ha, reducing to ca. 70ha during the earlier Roman period, then contracting and moving northward by Late Roman times.¹⁷

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centre of Roman Knossos appears to have been in the area of the Villa Dionysus, below the Hellenic acropolis and the line of the Roman aqueduct that traversed its spine

As pertains to Hellenistic and Roman ceramics specifically, the survey has provided us with an overview of the typical domestic ceramic repertoires across time.

Before the survey the location and extent of the Hellenistic city had been estimated based largely on remains from rescue excavations. The findings of the Knossos Urban Landscape Project, however, have enabled us to present the extent of the Hellenistic urban area. Common ceramic finds - jugs, lekythoi, echinus bowls and shallow bowls, flanged cooking pots and lekanai. Cretan cup forms (high-necked, cylindrical, everted rim) have been identified amongst the survey assemblage, but their numbers are relatively low, surely indicating something approaching the true proportion of cups within these unbiased ceramic assemblages. Imported ceramics indicate exchange connections with Attica earlier, and with the Eastern Aegean, Asia Minor and the Dodecanese post-ca. 250 BC.

The survey results indicated a notable increase in transport/storage vessel production, especially amphorae during Early Roman times (Fig. 4). We do get the full ceramic repertoire often represented at sites in this region (for instance cooking wares, local fine wares, plain wares, transport and storage wares, tiles and imported fine wares), but the spike in the production of amphorae as well as amphora stands and bee hive extension rings is noteworthy. Two clusters of amphorae appear to be located along roads connecting Knossos to the coast in the north, and connecting Knossos to the agricultural hinterlands to the south. As the amphorae found in the cluster to the north are mostly imported, it is possible that warehouses or shops with imported goods were located at the north end of the city. On the other end of the spectrum, given that the amphorae at the south are mostly local, this area may have held establishments that processed and packaged agricultural goods from the city’s hinterland for export. In addition to imported amphorae (i.e. Kos, Rhodes, Knidos, Italy [Dressel 1 & 2-4]), examples of Eastern Sigillata A, Italian sigillata, Eastern Sigillata B and Çandarli ware, suggesting that Knossos was a widely connected Roman city.

**Putting it together**

At this stage it is worth noting some key factors shared by both projects that were of foundational importance for ensuring high data resolution: 1) The location of the sites were more-or-less known prior to the survey. 2) We had access to solid regional ceramic typologies for the analysis of the survey finds. 3) These ancient urban areas had generally not been built over since antiquity.

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18 For an earlier discussion of the topography of Hellenistic Knossos see Callaghan et al. 1981, 105-106.
Functional delineation and the identification of typical assemblages

The results from both sites discussed above point towards some activities or trends that we can reasonably expect to identify on an intensively surveyed urban site.

Pottery production and commercial activities involving pottery seem to leave a fairly clear footprint in the survey collection record. Concentrations of kiln-wasters pottery as were discovered on the South Plateau of Sikyon obviously point to areas of ceramic production while large concentrations of transport amphorae near roads entering and leaving urban Knossos suggest commercial areas for the import, export, and possibly retailing of amphora-borne goods. Because of the nature of such activities - great concentrations of goods - and the nature of the specific ceramic products involved – large, thick walled vessels – it should be little surprise that they are evident in the survey record, which often consists in large part of thick walled coarse ware sherds.

Achieving such spatial precision for the domestic sphere was more difficult. But the large total quantity of pottery at both Sikyon and Knossos survey made it possible to identify some shapes and forms used commonly across the site and as such give us a rough picture of typical household activities, tastes, and trade connections in periods of high visibility; Hellenistic and early Roman in the case of Sikyon and Hellenistic and Roman at Knossos. However, excavation at both sites suggests that some quite common but delicate shapes such as echinus bowls and thin-wall ware cups are underrepresented in survey. Thus, while the accumulated range across the site is good for illustrating many ‘typical’ trends, it is obviously not well suited to picking up variations from household to household.

Considering the sheer volume of ceramics collected during both surveys, one surprising aspect (which may change as reading the KULP material progresses) is the relatively hazy picture that the ceramics present of neighbourhoods. Some categories of ceramics such as lamps, figurines, kiln-wasters and/or amphora finds on both projects formed the basis for the identification of ritual/commercial areas. While the presence of cooking/serving/utility vessels provided evidence for large tracts of each urban area probably being dedicated to domestic activities, proving this hypothesis would likely require clear geophysical results or excavation. Furthermore ceramics were, on the whole, not especially helpful for establishing urban layout (as opposed to establishing urban extent). Indeed, the picture from the ceramics tends to be quite consistent across much of the urban space of both Sikyon and Knossos, and therefore not especially helpful for fine-tuned functional interpretations of domestic space.
At both Knossos and Sikyon, specifics of urban layout in many areas were clarified through surface architecture traces, on-going geophysical prospection\(^{19}\), and analysis of non-ceramic finds, such as millstones, glass, tesserae and marble veneers\(^{20}\).

**Conclusions**

Laying out this combination of positive results and remaining questions can aid in project design. We could envision, for instance, a project in three complementary parts:

1. A systematic, but less-collection intensive survey than described above to gauge the approximate extent of an urban area, likely fluctuations of that extent over time, and document the remains of monuments or surface structures.

2. Upon detection of notable concentrations of wasters or discarded coarsewares, a more intensive systematic collection in the manner of “site collections” would illuminate the range of products and trade goods in industrial or commercial areas that when excavated often produce overwhelming quantities of bulky ceramic finds.

3. To illuminate the lifestyle of the inhabitants of the site a complementary limited program of geophysical prospection and excavation focused on likely areas of housing identified through survey. Such excavation would serve as an important functional and chronological calibration for the surface finds, while the surface survey would provide spatial context for the excavated finds.

A project designed along these lines would enable archaeologists to capture both the diachronic and spatial data that systematic surface survey can provide, while also providing fixed points of chronology for fine-tuning the dating of a historical period site and providing some concrete insights into lifestyle. While these factors were admittedly minimalized at Sikyon and Knossos owing to the presence of regional ceramics chronologies, survey in less well-known areas could significantly increase their data resolution through this combined approach.

**Acknowledgements**
The authors wish to thank the following people, projects and institutions: The Sikyon Survey Project; The Knossos Urban Landscape Project; Yannis Lolos; Todd Whitelaw; The British School at Athens; The Knossos Research Fund; The Institute for Aegean Prehistory; The University of Warwick; Virginia Commonwealth University; Margarita Nazou; Anna Meens and Winfred van de Put.

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\(^{19}\) For an example at Sikyon, see Lolos and Gourley 2007.

\(^{20}\) For an example at Knossos, see Whitelaw 2012b.
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1. Map of Greece showing the locations of Sikyon & Knossos.
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Bibliography


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- P.J. Stone, Department of History, Virginia Commonwealth University. Email - pjstone@vcu.edu
Figure 4. Urban Knossos during Hellenic and Roman times based on the results of the Knossos Urban Landscape Project.
Figure 5. Counts of identified ceramics by functional category by period
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As pertains to Hellenistic and Roman ceramics specifically, the survey has provided us with an overview of the typical domestic ceramic repertoires across time.

Before the survey the location and extent of the Hellenistic city had been estimated based largely on remains from rescue excavations. The findings of the Knossos Urban Landscape Project, however, have enabled us to present the extent of the Hellenistic urban area. Common ceramic finds - jugs, lekythoi, echinus bowls and shallow bowls, flanged cooking pots and lekanai. Cretan cup forms (high-necked, cylindrical, everted rim) have been identified amongst the survey assemblage, but their numbers are relatively low, surely indicating something approaching the true proportion of cups within these unbiased ceramic assemblages. Imported ceramics indicate exchange connections with Attica earlier, and with the Eastern Aegean, Asia Minor and the Dodecanese post-ca. 250 BC.

The survey results indicated a notable increase in transport/storage vessel production, especially amphorae during Early Roman times (Fig. 4). We do get the full ceramic repertoire often represented at sites in this region (for instance cooking wares, local fine wares, plain wares, transport and storage wares, tiles and imported fine wares), but the spike in the production of amphorae as well as amphora stands and bee hive extension rings is noteworthy. Two clusters of amphorae appear to be located along roads connecting Knossos to the coast in the north, and connecting Knossos to the agricultural hinterlands to the south. As the amphorae found in the cluster to the north are mostly imported, it is possible that warehouses or shops with imported goods were located at the north end of the city. On the other end of the spectrum, given that the amphorae at the south are mostly local, this area may have held establishments that processed and packaged agricultural goods from the city’s hinterland for export. In addition to imported amphorae (i.e. Kos, Rhodes, Knidos, Italy [Dressel 1 & 2-4]), examples of Eastern Sigillata A, Italian sigillata, Eastern Sigillata B and Çandarli ware, suggesting that Knossos was a widely connected Roman city.

**Putting it together**

At this stage it is worth noting some key factors shared by both projects that were of foundational importance for ensuring high data resolution: 1) The location of the sites were more-or-less known prior to the survey. 2) We had access to solid regional ceramic typologies for the analysis of the survey finds. 3) These ancient urban areas had generally not been built over since antiquity.

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18 For an earlier discussion of the topography of Hellenistic Knossos see Callaghan et al. 1981, 105-106.
**Functional delineation and the identification of typical assemblages**

The results from both sites discussed above point towards some activities or trends that we can reasonably expect to identify on an intensively surveyed urban site.

Pottery production and commercial activities involving pottery seem to leave a fairly clear footprint in the survey collection record. Concentrations of kiln-wasters pottery as were discovered on the South Plateau of Sikyon obviously point to areas of ceramic production while large concentrations of transport amphorae near roads entering and leaving urban Knossos suggest commercial areas for the import, export, and possibly retailing of amphora-borne goods. Because of the nature of such activities - great concentrations of goods - and the nature of the specific ceramic products involved – large, thick walled vessels – it should be little surprise that they are evident in the survey record, which often consists in large part of thick walled coarse ware sherds.

Achieving such spatial precision for the domestic sphere was more difficult. But the large total quantity of pottery at both Sikyon and Knossos survey made it possible to identify some shapes and forms used commonly across the site and as such give us a rough picture of typical household activities, tastes, and trade connections in periods of high visibility; Hellenistic and early Roman in the case of Sikyon and Hellenistic and Roman at Knossos. However, excavation at both sites suggests that some quite common but delicate shapes such as echinus bowls and thin-wall ware cups are underrepresented in survey. Thus, while the accumulated range across the site is good for illustrating many ‘typical’ trends, it is obviously not well suited to picking up variations from household to household.

Considering the sheer volume of ceramics collected during both surveys, one surprising aspect (which may change as reading the KULP material progresses) is the relatively hazy picture that the ceramics present of neighbourhoods. Some categories of ceramics such as lamps, figurines, kiln-wasters and/or amphora finds on both projects formed the basis for the identification of ritual/commercial areas. While the presence of cooking/serving/utility vessels provided evidence for large tracts of each urban area probably being dedicated to domestic activities, proving this hypothesis would likely require clear geophysical results or excavation. Furthermore ceramics were, on the whole, not especially helpful for establishing urban layout (as opposed to establishing urban extent). Indeed, the picture from the ceramics tends to be quite consistent across much of the urban space of both Sikyon and Knossos, and therefore not especially helpful for fine-tuned functional interpretations of domestic space.
At both Knossos and Sikyon, specifics of urban layout in many areas were clarified through surface architecture traces, on-going geophysical prospection\textsuperscript{19}, and analysis of non-ceramic finds, such as millstones, glass, tesserae and marble veneers\textsuperscript{20}.

Conclusions

Laying out this combination of positive results and remaining questions can aid in project design. We could envision, for instance, a project in three complementary parts:

1. A systematic, but less-collection intensive survey than described above to gauge the approximate extent of an urban area, likely fluctuations of that extent over time, and document the remains of monuments or surface structures.

2. Upon detection of notable concentrations of wasters or discarded coarsewares, a more intensive systematic collection in the manner of “site collections” would illuminate the range of products and trade goods in industrial or commercial areas that when excavated often produce overwhelming quantities of bulky ceramic finds.

3. To illuminate the lifestyle of the inhabitants of the site a complementary limited program of geophysical prospection and excavation focused on likely areas of housing identified through survey. Such excavation would serve as an important functional and chronological calibration for the surface finds, while the surface survey would provide spatial context for the excavated finds.

A project designed along these lines would enable archaeologists to capture both the diachronic and spatial data that systematic surface survey can provide, while also providing fixed points of chronology for fine-tuning the dating of a historical period site and providing some concrete insights into lifestyle. While these factors were admittedly minimalized at Sikyon and Knossos owing to the presence of regional ceramics chronologies, survey in less well-known areas could significantly increase their data resolution through this combined approach.

Acknowledgements

The authors wish to thank the following people, projects and institutions: The Sikyon Survey Project; The Knossos Urban Landscape Project; Yannis Lolos; Todd Whitelaw; The British School at Athens; The Knossos Research Fund; The Institute for Aegean Prehistory; The University of Warwick; Virginia Commonwealth University; Margarita Nazou; Anna Meens and Winfred van de Put.

\textsuperscript{19} For an example at Sikyon, see Lolos and Gourley 2007.

\textsuperscript{20} For an example at Knossos, see Whitelaw 2012b.
List of Figures
1. Map of Greece showing the locations of Sikyon & Knossos.
4. Graphs of identified and dated categories of ceramics from the Knossos Urban Landscape Project.

Bibliography


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Figure 4. Urban Knossos during Hellenic and Roman times based on the results of the Knossos Urban Landscape Project.
Figure 5. Counts of identified ceramics by functional category by period.