

The Leukos Survey Project: Report on the 2011 Field Season

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Introduction

The 2011 season began July 15 and finished July 21. The project was carried out under the auspices of the Canadian Institute in Greece and the project staff thanks both Dr. Michaliadou and Ms. Papabasileiou of the 4th Ephorate of Byzantine Antiquities at Rhodes for their invaluable assistance and encouragement. The project staff also thanks the Canadian Institute in Greece for its invaluable advice and assistance throughout the duration of the project. The 2011 season was the last of three successive campaigns of survey archaeology in the Leukos area. Fieldwork this season focused entirely on the small islet of Sokastro.

Work in the field accomplished the following two objectives:

- An intensive topographic and architecture survey of the ancient remains and natural environment of Sokastro, and;
- An intensive surface artifact survey of Sokastro.

Sokastro and the State of Its Remains

Sokastro is a small islet off the west coast of Karpathos just north of the village of Leukos [Fig. 1]. The area of the entire islet is approximately 108,000 sq. m. The topography consists of a relatively level plateau (hereafter acropolis), where the vast majority of medieval remains survive, surrounded on all sides by precipitous cliffs. The acropolis is generally flat with exposed bedrock along the fringes and near the fortification wall. The extreme west side of the acropolis has suffered from wind erosion which has removed much of the architectural and nearly all of the soil cover. There is a large depression on the north side of the rise which is occupied by a subterranean cistern complex. The acropolis, at its highest point, is about 42m above sea level (mASL) and is roughly 20,650 sq. m in area. The south and west sides of the islet have been altered by tectonic activity that fractured off large chunks of bedrock. Thus on the south and west sides, the cliffs drop almost straight down into the sea. On the north and east sides, the cliffs drop down to a narrow and rocky shelf about 20m above sea level. A land bridge once connected Sokastro with Karpathos, but tectonic activity severed the connection sometime in antiquity.

Evidence of human activity concentrates on the acropolis and the material remains are well preserved. Sokastro has been abandoned since the end of the 16th century and its islet position has prevented unwanted and destructive modern and recent human intervention. Thus, only tectonic activity and weather conditions (including wind, sea, heat and rain erosion) have caused damage to the remains. Almost every square meter of the acropolis is strewn with surface artifacts, including potsherds, wasters, glass fragments, slag, and lithics. Large portions of the fortification wall on the south and west sides have fallen into the sea. On the north side, some sections of the *enceinte* have crumbled. Sun and rain has weakened the mortar used in many of the buildings and thus their walls and vaults have partially collapsed. Much of the plaster used to seal the numerous cisterns has disintegrated and accumulated in reddish-colored layers of dust and sediment on the floors.

The Archaeological Survey of Sokastro

The survey methodology, developed in the previous two seasons for fieldwork at Leukos, was used again on Sokastro. With the assistance of handheld Trimble GPS rover units, the topography of Sokastro was traversed and all natural and human-made features were plotted, including contours, scarps, the fortification wall, buildings, walls, roads, and the occasional marble ecclesiastical architectural element. In addition the majority of manmade constructions and features were recorded and hand-drawn. The three-dimensional coordinates collected with the GPS receivers were corrected by both an SBAS (Satellite Based Augmentation System) beacon signal from the Karpathos airport and with rectified satellite (Quickbird) imagery. Furthermore, low-altitude, high-resolution aerial photographs were taken of the entire islet with the use of a kite-mounted digital camera.

Preliminary Survey Observations: Architecture

The acropolis of Sokastro was home to a densely-packed fortified settlement that flourished in the 11th and 12th centuries CE [Fig. 2]. The fortification wall was built with rubble and the occasional use of mortar. It followed the uppermost contours of the acropolis and the builders took advantage of the exposed bedrock especially at the outer fringes and founded the wall directly upon it. The gates of the *enceinte* were not identified in the survey; one or two may have fallen into the sea on the south and west sides. Another gate may have been located on the east side, near the southern return where a portion of the wall has crumbled and fallen away. The thickness of the fort wall originally seems to have been consistent, at about 1.60 m, along its entire circuit. But along some of the preserved stretches there are signs of repair and reinforcing. For example, on the north run, a stretch of the wall was thickened on two separate occasions. Cisterns were also incorporated into the fortification wall, apparently during the time of its construction.

Within the fort wall, narrow streets and a few open areas separate the many individual, freestanding buildings. In general, two types of structures were built within the citadel: 1) small, 2-3 room houses, and 2) large cisterns. The small, 2-3 room structures are the most numerous and account for nearly 70% of the acropolis buildings. They have a footprint (i.e. plan) consisting of 2-3 rooms with one room serving as a cistern. All were generally of equal size. The walls were built of rubble and mortar, into which some broken pot or tile sherds were occasionally inserted or embedded. The cisterns were barrel-vaulted and their interiors typically lined with two coats of thick, hydraulic plaster. The scratch coat was whiter in color than the top coat and contained coarser aggregate. The top coat was the typical red *cocciopesto* hydraulic mortar. Usually a single square opening pierced the vault of each cistern and provided a means of accessing its contents and allowed for aeration. A raised lip surrounded the opening and held in place a stone cover slab. Some of these slabs were observed strewn about the site. Terracotta intake pipes were inserted into the vault near one wall or in a corner of the cistern. On top of one cistern (B1759), a slight funnel-shaped depression directed rain water collected from the roof of the cistern into the pipe. The other 1-2 rooms were built in conjunction with and attached to the cistern. These appear to have been flat-roofed. Some of the cisterns clearly had second floors and no doubt so did their adjoining rooms. Several of the 2-3 room structures were associated or built with bottle-shaped or circular cisterns rather than the usual barrel-vaulted ones, for example building B1481. These too were lined with *cocciopesto* plaster and several preserved terracotta intake pipes. All of these multi-room, small structures, either with a barrel-vaulted or bottle cistern, probably served as houses for family units.

The second type of building is the very large cistern complex which probably served as communal reservoirs. Three were identified by the survey. They consisted of two large barrel-vaulted cisterns built parallel to one another and therefore shared either a party wall or a dividing arcade. The largest of them, BB, was built in the aforementioned bedrock depression along the north edge of the acropolis and was therefore partially subterranean. It also appears to have been built in conjunction with the fortification wall. Cistern BB consists of two barrel-vaulted rooms aligned next to each other along their long sides. There are no openings in the wall that separates the two cisterns. The largest cistern is

the northern one (BB-1) and its vault has collapsed completely. The southern-most cistern (BB-2) is the best preserved and a significant portion of its vault still stands [Fig. 3]. The walls and vault were constructed of rubble and partially-worked rubble masonry set into a mortar of pebble-sized aggregate. At regular, but not precisely laid-out, intervals, internal buttresses were built into the walls and these buttresses sprang from the floor, rose up the wall and continued across the barrel vault as ribs. The entire interior surface of the cistern was coated with the typical hydraulic plaster used throughout the citadel buildings. The east end of the cistern was built against exposed bedrock and this economical building practice was used in several other cisterns. The survey permit granted by KAS did not allow for any excavation or cleaning and thus it was not possible to examine the floor of BB or those of any other cisterns. The southern cistern measures ca. 15.10 x 5.18 m. Although it was not possible to clear the accumulated soil from the cistern floor, the top of the barrel vault rose to slightly more than four meters, allowing for a conservative estimate, the amount of the water BB-2 could hold was about 313,000 liters.

Another large two-cistern building (CC) was located immediately south of cistern BB-2. Brush and fallen rubble prevented a detailed visual inspection and measurement during the survey. Cistern CC had two construction phases: a single large cistern (CC-1) and then the addition of a smaller cistern (CC-2) tacked onto to the south wall of CC-1. The interior space of the CC-1 measures about 9.4m x 4.9m. The interior space of CC-2 measures 9.1m x 1.1m.

The third large cistern (AA) was also subterranean and constructed in the southern portion of the acropolis near its south edge. It was comprised of a two-vault cistern with its northern vault standing entirely intact. About half of the south vault has collapsed. The walls were built in the typical fashion, however, there was a greater use of squared blocks in the rubble matrix. The dividing wall was built as an arcade with three arches. At the top of each pier, between each arch, an opening pierced the wall which allowed water to flow freely between the two barrel vaults when both were full. Here too, the builders took advantage of, and utilized, the raw bedrock whereby it constituted the eastern wall of both cisterns. The west end of the vault of the southernmost cistern (AA-2) stands intact but the east end has collapsed. A square opening pierces the top of the vault at the west end and provided a means of accessing the contents of the cistern from above.

In addition to the small multi-function structures and the cisterns, a triple-apse basilica (B1137) was identified near the eastern stretch of the fortification wall. The lower courses of its four walls survive, but the walls themselves, and much of the interior of the church, are covered with fallen rubble from the upper portions of the walls and heavy brush and therefore the floor plan could not be clearly distinguished. The church was oriented towards the east and the central apse was shallow and protruded externally. The central apse wall stands to a height of c. 1.4m and it incorporated a small rectangular niche [Fig. 4]. The two flanking apses constituted internal, semi-circular niches. Because of collapsed debris and brush, the church's doors and interior features could not be located, but presumably its three aisles were articulated with either piers or columns. A small barrel-vaulted cistern was tacked onto the central apse.

Two other churches may have been built on the acropolis, one at the southeast corner and another at the northeast corner. Although few walls are discernible amid the fallen rubble, marble ecclesiastical elements concentrate in these two areas and include polished grandiorite column drums and white marble double-colonnade window mullions [Fig. 5], an impost block, one column base, a small capital with incised cross, and many veneer fragments.

Preliminary Survey Observations: Surface Artifacts

The area of intensive surface artifact survey was confined to the interior of the fortification wall and the precipitous edges of the cliffs where the fortification wall has fallen away. The total area surveyed measured approximately 17,680 sq.m. Numerous sherds have washed down from the acropolis and lay scattered about the rocky shelf on the north and east side of the acropolis. These areas were not surveyed.

Survey and collection was spatially organized according to a 10m x 10m grid established on the Universal Transverse Mercator (UTM, WGS84, Zone 35 South) system. Within each grid square, one walker traversed the median line and tallied potsherd and other artifact totals with a handheld clicker. All data, including geospatial, artifact typologies, environmental conditions and visibility, was recorded in TerraSync data collection and maintenance software running on Trimble handheld GPS units. Although all visible potsherds and artifacts were tallied to distinguish and plot distribution densities, only a minimal number of datable diagnostic potsherds were collected for the purposes of drawing ceramic profiles, establishing chronologies from comparative material, and further study. In total, 227 diagnostic potsherds were collected. These sherds, along with other diagnostic glass (52 sherds), slag, lithics, one coin, and several fragmentary metals objects were turned over to the Pigadia Museum July 21, 2011. In the storage container, the artifacts are sorted and labeled by grid square.

Visibly dense potsherd clusters were concentrated in open spaces such as streets and the areas between buildings where little or no vegetation grew and where there was little building collapse and fallen debris. Potsherd densities within individual buildings were generally considerably smaller than those in open areas but the interior spaces of most buildings were filled with debris and brush which thereby reduced visibility.

Initial Ceramic Analyses

A large portion of the diagnostic glazed wares dates to the 12th-13th centuries CE. 11th century and 14th-16th century wares were also present, but to a much lesser degree. No Roman or Late Roman sherds were noted at all and their absence marks a distinct contrast between human activity on Sokastro and that on the peninsulas and Lytos Field of Leukos, all of which were surveyed in 2009 and 2010 (see 2009 and 2010 Season Report). From our brief field season it seems that the surface ceramic date range runs from the 11th through to the 13th century, with a concentration in the 12th century. A substantial amount of jar wares and undiagnostic bodysherds of jars, jugs and amphorae were noted. In addition, many waster bodysherds, over-fired bodysherds and over-fired tile fragments were noted and therefore pottery manufacture must have constituted a considerable industry somewhere within the settlement.

Initial Artifact Analyses, non-ceramic

Small glass sherds were found in every surveyed grid square. Most fragments are green, thin-walled bodysherds, however, two glass stems and a range of deep blue strap handle fragments were recovered. A number of metal and metal-related artifacts were tallied: iron slag, iron nails, pieces of copper and bronze sheet. The presence of slag suggests some sort of manufacturing facility within the fortification.

Medieval lithic industrial tools were also noted within the settlement, both in open areas and within rooms of individual buildings, including basalt and limestone rotary querns, grinding basins and oil and wine presses. All were relatively small and thus should be associated with domestic industry.

A concentration of prehistoric lithics was also noted in an open grid square south to cistern BB including a chipped Mesolithic axehead, a polished greenstone axehead and a series of flints.

Preliminary Conclusions from Three Field Seasons

The 2011 season was successful and the survey goals were accomplished in the field. In short, there were three main periods of occupation in the area of Leukos: (Late) Roman, Early Byzantine and 12th – 13th centuries CE with some residual occupation continuing on Sokastro up until the 16th century

CE. As reported in the 2010 Season Report, the rock-cut tombs built into the Ridge and the Roman Cistern up on the Upper Plain (this area was not included in our survey permits) attest to a Roman period settlement. No apparent period of abandonment occurred between the Roman and Early Byzantine settlement at Leukos. The town was considerable in size and centered on the natural harbors. In the 7th century it was abandoned, no doubt because of the Arab invasions into the eastern Mediterranean at this time.

For the next 400 – 500 years, the area was abandoned. Possibly in the 11th century, Sokastro was fortified and a settlement established on the islet. The presence of the basilica and the marble ecclesiastical elements indicates the return of Byzantine sovereignty to the island. The nature of the settlement was visibly defensive as is evidenced by the large number of cisterns, on-site industry (pottery kiln and iron furnace) and the fortification wall itself which all point to defensive concerns and preparation for long term sieges. The settlement also had access to marble and glasswares through seaborne trade.

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Figure 1: The Village of Leukos and the islet of Sokastro

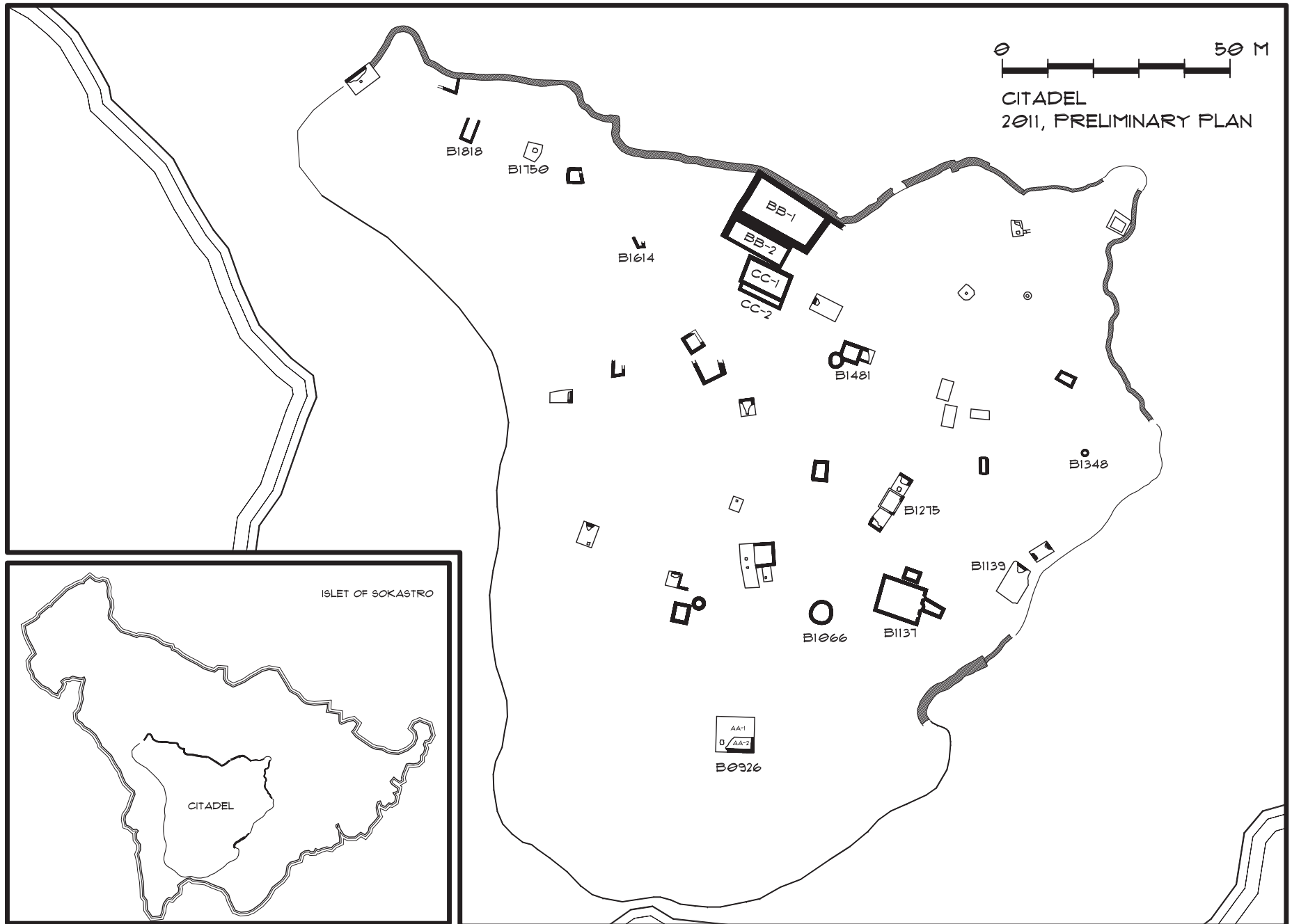


Figure 2: Citadel Settlement of Sokastro



Figure 3: Cistern BB-2



Figure 4: Niche in Apse wall, B1137



Figure 5: White marble window mullion