

***The Belize Valley Archaeological
Reconnaissance Project***

A Report of the 2022 Field Season



**Edited by John P. Walden, J. Britt Davis, Tia B.
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This volume can be found in PDF form online at: www.bvar.org/publications/BVAR2022.pdf

Editors' Note

The 2022 summer field season of the Belize Valley Archaeological Reconnaissance (BVAR) Project marks the 33rd year of field investigations in the upper Belize River Valley. Field research was conducted at Baking Pot, Cahal Pech, Ek Tzul, and Xunantunich, to understand the development and decline of complex societies in the upper Belize River Valley from a broad, regional perspective. Figure 1 shows the location of the sites investigated during the 2022 field season.

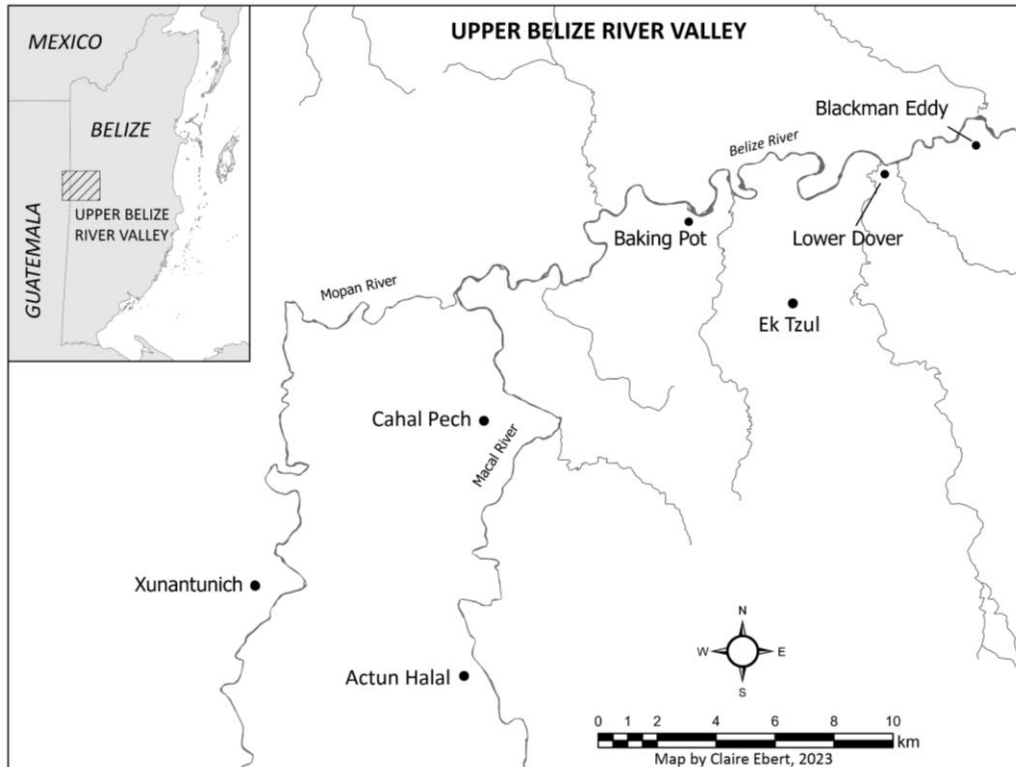


Figure 1: Map of sites investigated during the 2022 BVAR field season (Courtesy of C. Ebert).

The Upper Belize Valley was home to populations prior to the rise of sedentary societies. Montgomery (Chapter 1) presents a GIS analysis of 410 km² of lidar data to identify possible archaic sites including rockshelters, caves and sinkholes, depressions, open-air camps and other locales. In total, a possible 611 points of interest were documented using this approach including several which are already known to have archaic occupations.

Recent BVAR excavations at Baking Pot have focused on the ruling elite palace and associated plazas in Group B. Research to date has focused explicitly on the sizeable peri-abandonment deposits situated on the edges of Plaza B. Davis, Hoggarth, and McGee (Chapter 2) pursued two goals during the 2022 field season, the investigation of the peri-abandonment deposit by the Structure B7 stairside outset and vertical excavations in the center of Plaza B to reconstruct the changing pace and tempo of construction at the center over time. Investigation of the peri-

abandonment deposit revealed three successive layers of deposition. Investigations in the central plaza revealed numerous construction phases extending further back in time than previously documented. Davis and colleagues note the presence of Early Preclassic (1100-900 BC) and Middle Preclassic (900-300 BC) ceramics.

Cahal Pech has seen extensive excavations by the BVAR project over the last 36 years. The 2022 excavations focused on Plaza D, an elite residential courtyard within the palace complex. Ebert and colleagues (Chapter 3) reveal that Plaza D underwent many extensive rebuilding phases in the Terminal Classic period (AD 800-900 AD), and may have been the focus of construction even as other parts of the civic-ceremonial center went out of use. Messinger and colleagues (Chapter 4) ground truth geophysics data in Plazas B and C at Cahal Pech. Excavation of these previously discovered features revealed a series of ritual caches. Investigations of the West Ballcourt at Cahal Pech continued during the 2022 field season. Saunders, Guenter, and Creswell (Chapter 5) report on ongoing work at the West Ballcourt at Cahal Pech, which their investigations have shown was being used in the Late Classic (AD 600-900) period.

The 2022 field season saw the first investigation of the minor center of Ek Tzul. Originally thought to be a smaller major center, survey and excavations revealed the site to be a large secondary minor center with a ballcourt and a *sacbe*. Meyer and colleagues (Chapter 6) document excavations on Str. A1, a large range structure. Initial investigations reveal this structure was likely first constructed around the Late Preclassic/Terminal Preclassic transition. The structure underwent multiple rebuilding phases over the Early and Late Classic periods. Ellis and colleagues (Chapter 7) document test units in the ballcourt playing alley at Ek Tzul. Investigation revealed that the ballcourt, like those present at other large minor centers in the region, was entirely Late to Terminal Classic in date.

Substantial work was carried out at Xunantunich during the 2022 field season. Two reports document work in Plazas A-I, A-II, and A-III. Tia Watkins and colleagues (Chapter 8) report on excavations which documented the pace and tempo of monumental construction in Plaza AIII. This approach, alongside horizontal excavation provided an interesting perspective on changing elite use of residential space over time. Ramirez and colleagues (Chapter 9) document 16 plaza excavations across Plazas A-I, A-II, and A-III in the Xunantunich Civic Ceremonial Center. The goal of the test units was to identify earlier, Preclassic construction phases in the core. Overall, the findings strongly suggest the presence of at least some Preclassic construction at the Xunantunich plazas. Three reports document ongoing work at Group B at Xunantunich. Messinger and colleagues (Chapter 10) excavated peri-abandonment deposits and part of a sweatbath in Group B. These excavations provide a fascinating glimpse into the ritual activities of people living in the vicinity of Xunantunich during the Terminal Classic period. Beardall, Izzo, and Watkins (Chapter 11) describe excavations in Courtyard 2 of Group B and on Str. B6. Beardall and colleagues employ a community driven engagement approach whereby much of the fieldwork was conducted by young Belizeans earning field work credit at Galen University. Saldaña and colleagues (Chapter 12) document the excavation and conservation of a sweatbath which was discovered in Group B at Xunantunich.

Lastly, Green Mink and colleagues (Chapter 13) report on Salvage Operations conducted in 2019 on a series of *chultunes* eroding out of the roadside embankment opposite the San Ignacio

Resort Hotel. These investigations revealed a single burial containing two individuals which had largely been displaced by erosion. Green Mink and colleagues present preliminary osteological analyses of these remains.

The 2022 field season was completed with the generous input of a host of individuals and local establishments. First, we would like to thank the owners and employees of several businesses in and around San Ignacio who were essential in arranging housing, transport, and providing comfort and success in the daily lives of the BVAR Project students and staff. Foremost of these is management and staff at Hode's Place Restaurant, our BVAR "homebase", who are acknowledged for making us feel so at home. We also thank Mana Kai Cabins, and the Shell Gas station, among others, in San Ignacio for logistical support over the course of the summer. The 2022 field school students, staff, and local field crew were instrumental in the fieldwork. Their incredible effort played a pivotal role in our increasing archaeological understanding of the ancient Belize River Valley. We also owe Doug Tilden a huge thanks for supporting the Xunantunich and Cahal Pech excavation and consolidation work. Work at these two sites was funded by the Tilden Family Foundation (San Francisco, CA). Other funding sources are noted in the acknowledgments for individual chapters. Finally, we offer our deep gratitude to Dr. Melissa Badillo and the Belize Institute of Archaeology (NICH) for permission to excavate all four sites and their continued support of BVAR Project research. Our research is a privilege granted by the country of Belize and its people, and therefore one of our primary goals is to actively engage with local communities since they are the stakeholders most impacted by the generation of knowledge of the past. Our ongoing close collaborations with the Institute of Archaeology, Dr. Badillo, and Belizeans generally are very important to us, as we collectively document and protect Belize's cultural heritage.

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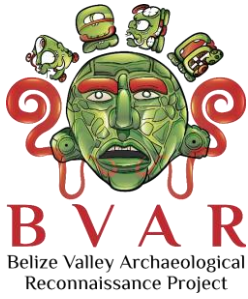
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DOCUMENTING THE ARCHAIC IN THE BELIZE RIVER VALLEY: PRELIMINARY GIS MODELING

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PROJECT AREA ZONES

With the goal of further understanding Archaic (8000-2000 BC) occupations in western Belize, approximately 410 km² of lidar point cloud data were subjected to GIS analyses (slope reclassification, Local Relief Modeling, Topographic Position Index) to identify sites with potential preceramic deposits, with special consideration to rockshelters and protected cave entrances. The larger study region was segmented into four zones based on landscape similarities: 1) Belize River Valley; 2) Interior Basin; 3) Barton Creek; and 4) Macal-Vaca (Figure 1). Four main types of potential sites (rockshelters, caves/sinkholes, depressions, and open-air camps) were documented within the region, resulting in a combined 611 points of interest (Table 1).

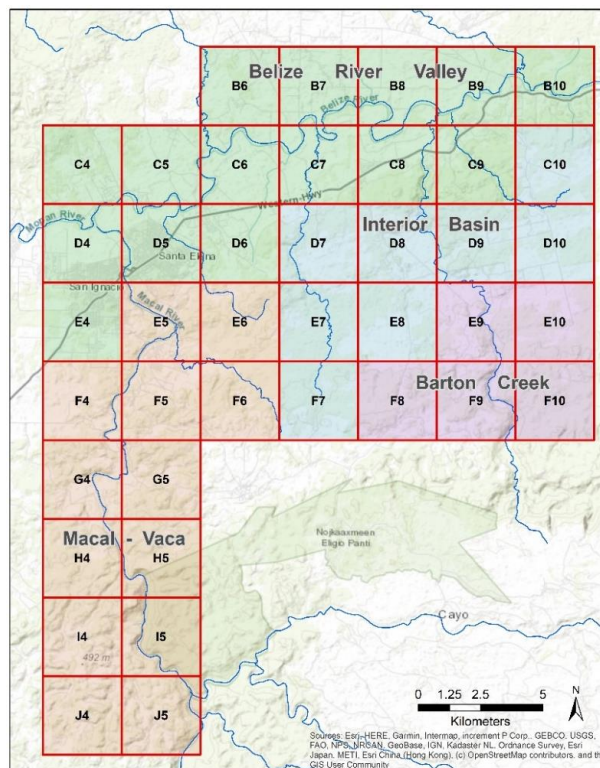


Figure 1: Project area overview showing zones.

Table 1: Points of interest by site type.

	<i>Rockshelter</i>	<i>Cave/Sinkhole</i>	<i>Depression</i>	<i>Open-Air Camp</i>	<i>Misc. (Road Cut)</i>
<i># of Sites:</i>	178	278	129	15	1

BELIZE RIVER VALLEY (BRV)

The BRV Zone (150 km²; 15 grids) spans both sides of the Belize River and contains small portions of the lower Macal and Mopan river systems, stretching from the western extent of San Ignacio east to Ontario Village. Some low foothills to the south of the river are also included, specifically around Floral Park and Blackman Eddy. Lidar coverage is complete except along the northern extent (Grids C4-C5, B6—B10) near Bullet Tree and Spanish Lookout. The BRV Zone displays the highest degree of impacts from modern development and agricultural activities, including over half a decade of mechanical tilling within the valley bottoms. The area also illustrates a complex soil formation history (fluvisols, luvisols, cambisols) due to repeated seasonal flooding events. This has created substantial soil overburden within the valley proper, with Archaic paleosols likely buried by at least 4—6 meters of later sediments. Only 16 potential Archaic sites were identified within the BRV Zone, consisting mainly of open-air locations along abandoned river meanders, low hills, and stream confluences. Several highly eroded areas were noted along Billy White Creek and south of Spanish Lookout that may contain exposed paleosols (Figure 2). Potential rockshelters were detected in the vicinity of Lower Dover and Ontario Village ($n=4$), but overall potential sites remain low within the BRV Zone (Figure 3). Similarly, several low hilltops adjacent to the Belize River have been noted as potential Archaic camps, but most ideal locations in the region have been modified by the ancient Maya or modern populations. Still, Bacab Na, Banana Bank, and the Iguana Creek area may contain remnant banks that retain potential Archaic materials.

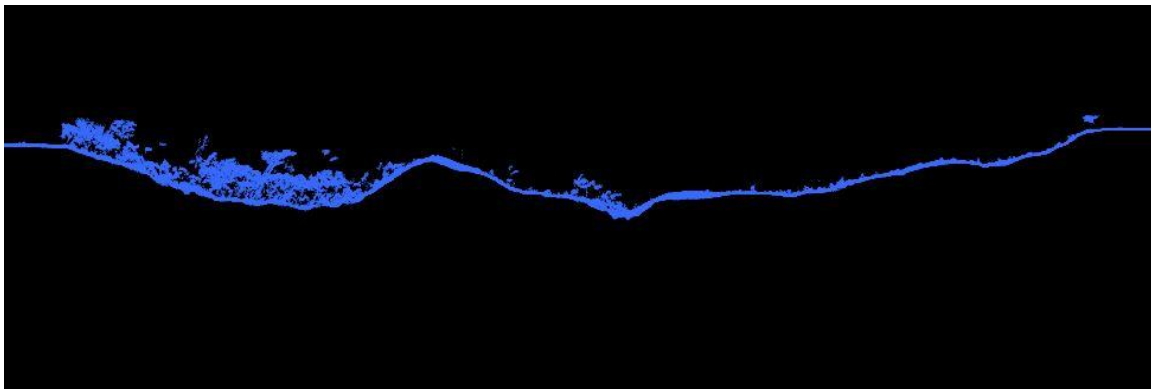


Figure 2: Example of erosional area in Grid B6 (deepest cuts approx. 20 m below present ground surface).

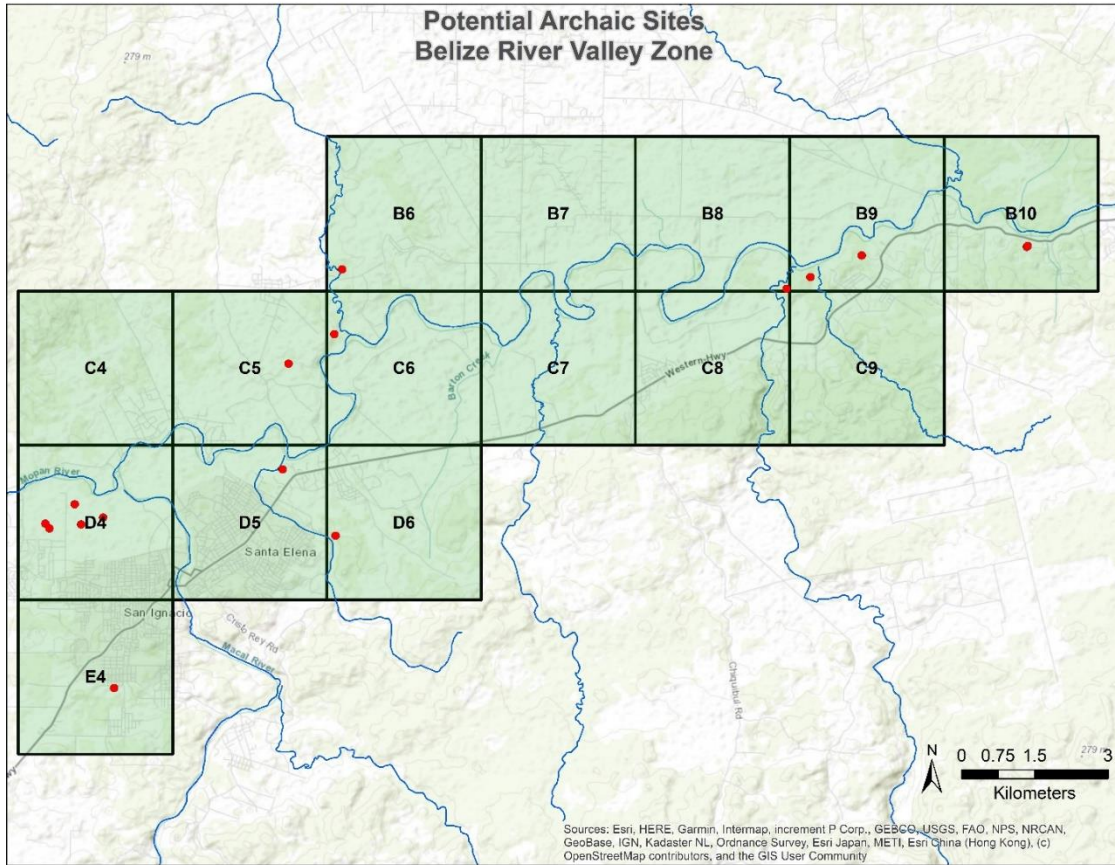


Figure 3: Potential sites within the Belize River Valley Zone.

INTERIOR BASIN (IB)

The IB Zone (80 km²; 8 grids) spans from Hermitage to Society Hall and contains portions of Garbutt and Lower Barton Creeks (Figure 4). The zone is a mixture of low hills, a mostly inwardly-draining basin, and the northernmost foothills of the Maya Mountains. While the zone contains no substantial population centers, much of the basin has been converted to support agricultural and citrus production. Soils are mostly chromic and pellic vertisols, with rendzinas restricted to low hills and ridges. Vertisols are associated with slickensides, deep cracks that form during the dry season as the clay-rich soils drastically lose water content and shrink. As such, shallow depression features are common throughout the IB Zone. A total of 101 potential sites were identified within the IB Zone (80 depressions, 13 caves/sinkholes, 5 open-air, 3 rockshelters). Depressions are characterized as broad (50—200 m), ovaloid to irregular dissolution features usually less than 10 m deep. The features drain at their lowest points and contain standing water only during monsoon months or heavy rainfall if at all (Figure 5). Exposed limestone bedrock may be exposed in association with some depressions (though developed rockshelters within are rare) and soils are generally deeper than surrounding areas, which may prove better in preservation of Archaic cultural and faunal materials. Only those depressions away from major Maya centers (i.e. Lower Barton Creek) were included as potential sites.

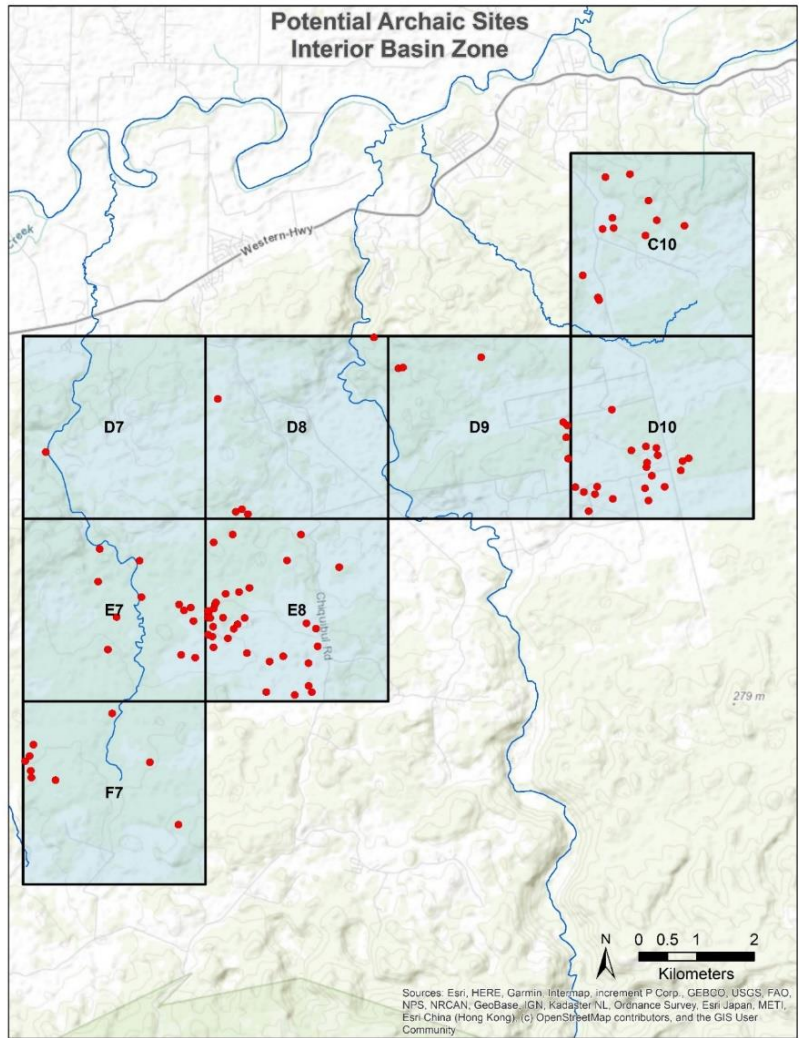


Figure 4: Potential sites within the Interior Basin Zone.

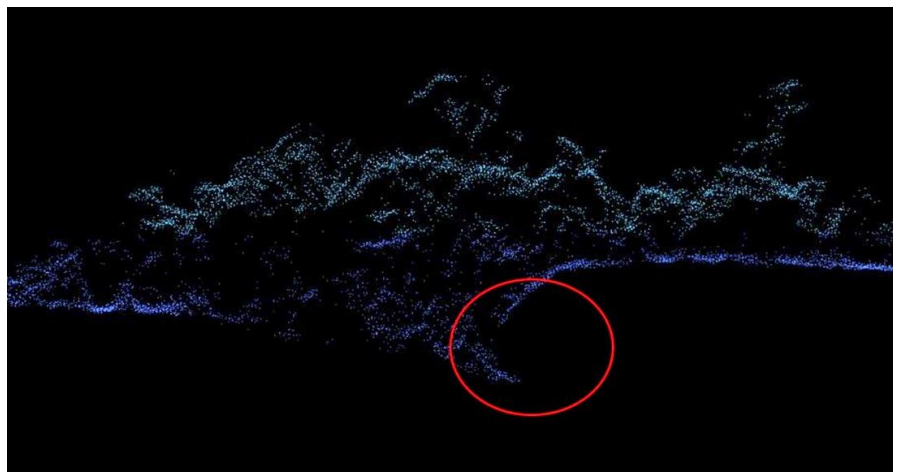


Figure 5: Example of depression and drain (C10.4) at lowest point (exposed rock face/rockshelter measures 5 m from overhand to base).

BARTON CREEK (BC)

The BC Zone (50 km²; 5 grids) follows the course of Barton Creek as it exits the Maya Mountains and occupies a transitional area between pine and broadleaf vegetation (Figure 6). While some of the zone has been impacted by modern settlement and agriculture, the southernmost grids (F8—F10) remain better preserved due to the increasingly rugged nature of the landscape. A total of 120 potential sites (46 sinkholes, 38 rockshelters, 25 depressions, 10 caves, 1 open-air) were identified within the BC Zone, with notable densities in grids F9 and F10 just to the north of Barton Creek Cave (Figure 7). Rockshelters in these grids are generally near toe slopes adjacent to the creek bank, making them easily accessible to past populations traveling along the north-south riparian corridor. Additional rockshelters are located at slightly higher elevations between Barton and Roaring Creeks. Combined with a number of probable dry caves, the BC Zone provides a high potential for the recovery of Archaic period cultural and faunal materials.

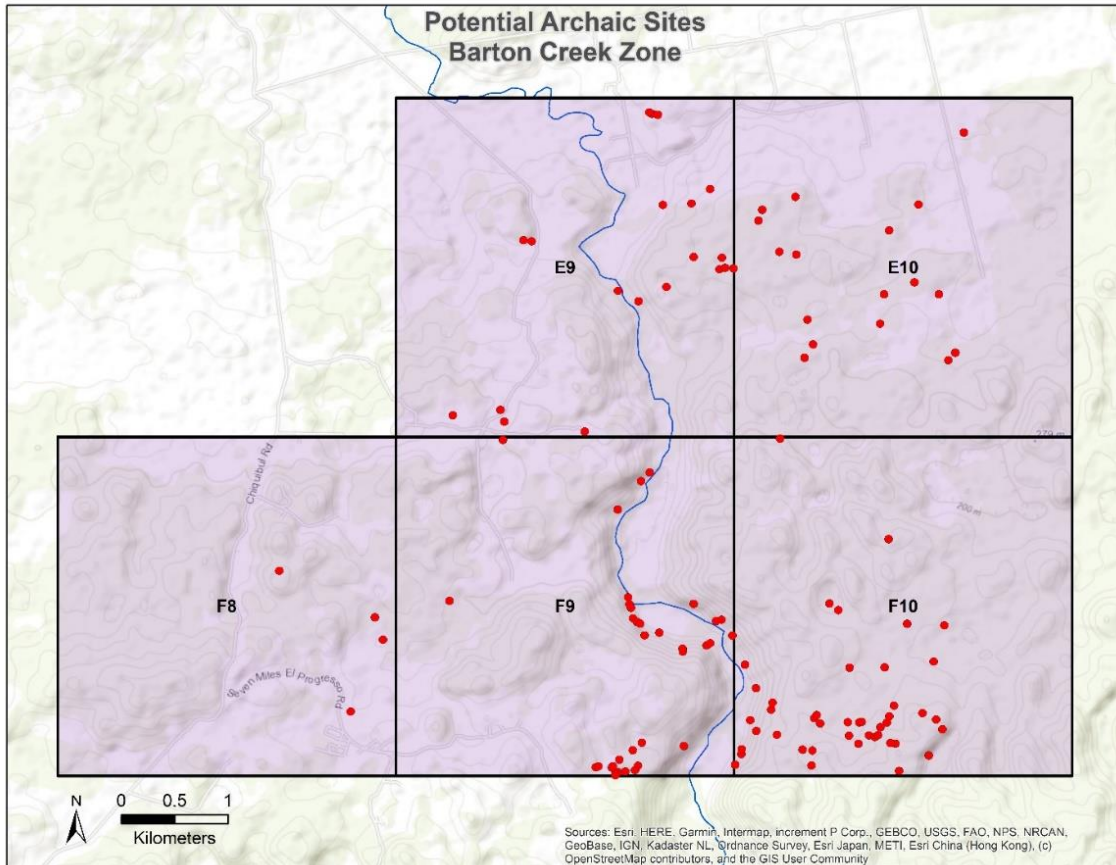


Figure 6: Potential sites within the Barton Creek Zone

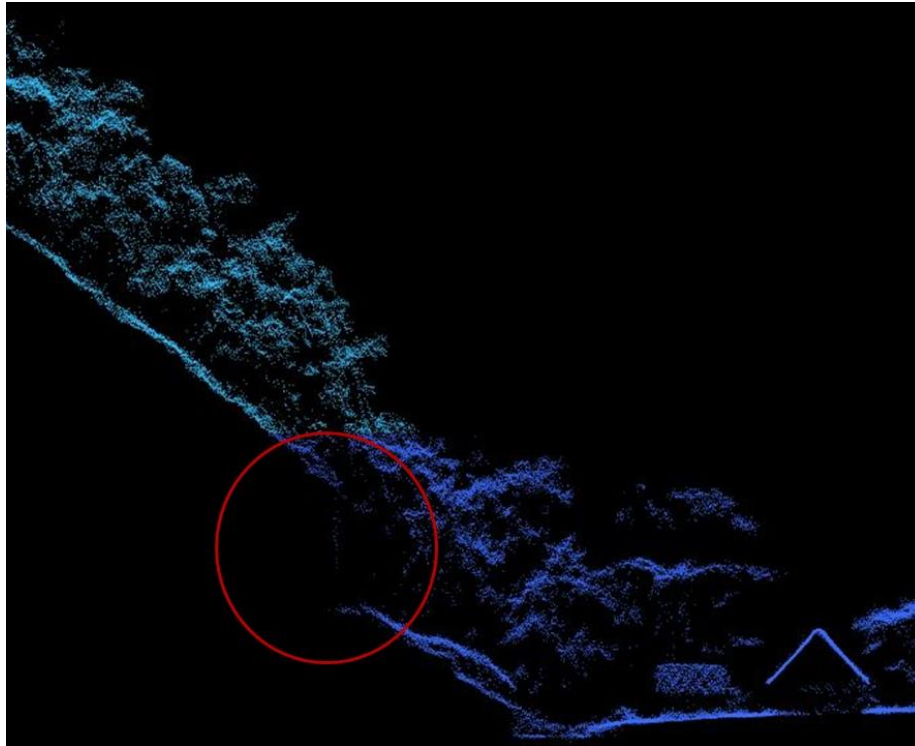


Figure 7: Example of rockshelter in Grid F10 near base of valley just north of Barton Creek Cave.

MACAL-VACA (MV)

The MV Zone (130 km²; 13 grids) contains some of the most rugged terrain in the greater Belize River Valley, including the northern portion of the Vaca Plateau and the Black Rock portion of the Macal River (Figure 8). The potential for rockshelters and developed caves increases to the south of Guacamayo/Tipu, although those directly along the Macal drainage were not likely accessed extensively by prehistoric populations due to extremely steep slopes. Impacts from agriculture and modern settlement are minor; however, construction of the Chalillo Dam (including access roads, borrow pits, and workers' quarters) has damaged some areas likely containing rockshelters or caves. A total of 374 potential sites (208 caves, 133 rockshelters, 24 depressions, 8 open-air, 1 road cut) are located within the MV Zone, including six caves previously documented by the Belize Cave Reconnaissance Project (BCRP) in the mid-2010s (Actun Kitam, Chechem Ha, Horno Cave, Ja' Ha, Nohoch P'ul, Yax Nik). Several other previously documented caves (Actun Chapat, Actun Halal) are within the MV Zone but have been omitted from the list of potential Archaic sites. Grids I4 and J4 are particularly rugged karstic areas with numerous rockshelters, sinkholes, and shallow caves (Figure 9). While the Maya presence in the MV Zone is widespread, arguably resulting the past modification of cave areas, Archaic deposits within rockshelters and cave entrances may remain intact compared to those further within developed karstic systems.

Acknowledgments I would like to thank the Belize Valley Archaeological Reconnaissance (BVAR) Project and its co-directors Drs. Jaime Awe, Julie Hoggarth, and Claire Ebert for their support of my research and Dr. John Walden for assistance with report revisions. I would also like to thank the Institute of Archaeology and Dr. Melissa Badillo for permitting our research.

BEGINNINGS, ENDINGS, AND EVERYTHING IN-BETWEEN: RESEARCH IN PURSUIT OF THE OCCUPATION AND CONSTRUCTION HISTORY OF BAKING POT, BELIZE

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INTRODUCTION

During the 2022 summer field season of the Belize Valley Archaeological Reconnaissance (BVAR) Project, work at Baking Pot consisted of two excavation projects: **1)** a horizontal excavation of a peri-abandonment deposit in Plaza B on the south side of the Structure B7 stairside outset (E.U. PLB-2022-1), and **2)** a vertical excavation in the center of Plaza B to further assess construction phases and chronology at the site (E.U. PLB-100). J. Britt Davis oversaw the excavation and mapping of the peri-abandonment deposit from June 11 – July 22; Julie A. Hoggarth oversaw the remainder of this excavation from July 26- July 27. Julie A. Hoggarth oversaw the entirety of the excavation of the Plaza B unit from July 5 – July 22. James McGee assisted in overseeing field and laboratory work.

The goal of the PLB-2022-1 unit was to better understand the nature of abandonment at Baking Pot during the Terminal Classic period (AD 700-900), which is part of an ongoing research project (Davis 2018a, 2018b; Hoggarth et al. 2014, 2016, 2020, 2021; Lonaker et al. 2017a, 2017b). The goal of the PLB-100 unit was to gain insights into the chronology and tempo of occupation and construction at the site.

BACKGROUND AND RESEARCH QUESTIONS

E.U. PLB-2022-1

After decades of research in Belize, Awe (2012; see also Awe et al. 2020) noted patterns of artifact accumulation in the corners of courtyards and plazas, flanking stairways, and along alleyways which correspond to the final events associated with the occupation of site cores during the Terminal Classic period. These deposits usually consist of decorated and non-decorated pottery including censers, flaked and ground lithic

materials, jade, pyrite, human and faunal remains, and various other artifacts. Previous researchers have noted similar patterns in the Maya lowlands and have attributed these deposits to various behaviors such as *de facto* refuse (Chase and Chase 2004; Inomata et al. 2002), feasting (Sagebiel and Haines 2017), primary or transposed middens (Clayton et al. 2005), termination rituals (Garber et al. 1998; Guderjan 2004; Stanton et al. 2008), squatter refuse (Harrison 1999; O’Mansky and Dunning 2004), and post-abandonment rituals (Awe 2012). With these theories in mind, various BVAR researchers sought to test these hypotheses through targeted excavations and material analyses of these deposits in the Belize Valley (Alvarado 2019; Davis 2018a, 2018b; Romih 2019; Stricklin 2019; Tappan 2020). Based on the results of these studies, it is likely that these deposits represent ancestor veneration and/or petitioning of deities to deal with worsening climactic conditions. Hoggarth and colleagues (2018, 2020, 2021) using a Bayesian approach to reconstruct the chronology of these events suggest that they represent a protracted rather than rapid abandonment process, and thus more accurately should be called “peri-abandonment” deposits.

Of particular note, 2015 excavations of the B7-100 deposit exposed what has become known as the “Komkom Vase,” an incomplete Chinos Black-on-cream cylinder vase with 202 extant glyphic elements (Helmke et al. 2018; Hoggarth et al. 2016). Helmke and colleagues (2018) present a translation of the vessel which highlights the tumultuous events between warring polities during the Late Classic period (AD 550-900; for details of the text see Helmke et al. 2018). Importantly for this research, the text provides a long count date of AD 812, which gives us a *terminus post quem* for the associated peri-abandonment deposit, which Hoggarth and colleagues (2021) were able to use for Bayesian modeling of the chronology of these events.

Following Awe’s (2012) locational insights, targeted excavations have been placed in the southwestern corner of Courtyard 3 (Hoggarth et al. 2014), the northeastern corner of Plaza B at the intersection of and along Structures B6 and B7 (Hoggarth et al. 2016; Lonaker et al. 2017a), and the southeastern corner of Plaza B at the intersection of Structures B2 and B21 (Hoggarth et al. 2016). Peri-abandonment deposits were found in all of these locations, and a targeted excavation on the southside of the Structure B7 stairside outset was initiated in Summer 2022.

On-going questions for peri-abandonment deposit research include:

1. What do the peri-abandonment events at Baking Pot tell us about the behavior of the Terminal Classic Maya during a period of site abandonment and societal collapse?
2. What was the nature of abandonment at the site of Baking Pot, and when during the Terminal Classic period did abandonment occur? How does the chronology for deposits relate to political and demographic collapse across the Belize Valley?

E.U. PLB-100

Excavations in 2003 were conducted in the center of Plaza B in Group B at Baking Pot by Carolyn Audet. Little information is known from these excavations, so one purpose of the 2022 excavations was to identify the sequence of construction of plaza floors from Audet's unit, to record the amount of construction in each time period. The 2022 research is part of a National Science Foundation grant (to Hoggarth and Awe) that seeks to identify changing land use and political decision-making at Belize Valley sites. Since Baking Pot's monumental center has been significantly less excavated than other centers, we needed to excavate in the plaza to identify the amount of architectural volume associated with each construction episode. This will serve as a proxy for leaders' ability to command manual labor forces for constructing monumental architecture during good and bad periods.

On-going questions for the plaza excavations include:

- 1) How did political decision-making of rulers change during climatically good and bad times?
- 2) How many people participated in the construction of monumental architecture during each construction episode?
- 3) How do changes in land-use associate with changes in political decision making?

METHODS

Excavation methods for the peri-abandonment deposit (E.U. PLB-2022-1) followed BVAR guidelines presented in Lonaker and colleagues (2017b). Briefly, the humus and architectural collapse layers are removed as one bulk lot with picks and trowels. All removed sediments and soils are screened through ¼ inch mesh screens, and artifacts are bagged according to their lot and artifact type. When the top layer of the deposit is exposed a 1 m x 1 m grid is arranged over the deposit. Each 1 m square is assigned a subplot designation (e.g., PLB-2022-1-2A, PLB-2022-1-2B, PLB-2022-1-2C, etc.). Every artifact is mapped, and then artifacts are removed and bagged according to their subplot and artifact type. Then all sediment is removed and screened until the next layer of artifacts is exposed. A new lot is created, new sublots assigned, and mapping and artifact collection proceeds as previously indicated. This process is repeated until the entire deposit is excavated. If human remains are located, 1/8 inch mesh screens are used instead.

Excavation of the plaza unit (E.U. PLB-100) followed BVAR excavation guidelines, where all sediments and soils are removed with picks and trowels, then screened through ¼ inch mesh screens. All artifacts are collected and sorted based on lot and artifact type. Charcoal samples are collected *in situ*, with depths recorded, and are given a sample ID number. All charcoal samples that will be dated are included on both of the profiles (northern and southern baulks) for Bayesian modeling. All artifacts are then cleaned in the laboratory. Ceramic, lithic, and shell materials are washed with water and lightly scrubbed

with a toothbrush. Bone of any kind is lightly dry brushed with a toothbrush or wooden dowel to remove soils and sediments. All artifacts are logged according to lot, type, and number, and special finds are given a specific number and photographed.

EXCAVATION RESULTS

E.U. PLB-2022-1

The humus and collapse layers were removed until the peri-abandonment deposit was fully exposed. Three charcoal samples were collected from this humus and collapse lot (RC-PLB-2022-1-1, RC-PLB-2022-1-2, and RC-PLB-2022-1-3). Four special finds were located within this lot as well: 1) a broken ground limestone hemisphere (SF-PLB-2022-1-1), 2) the right side of an anthropoid ceramic figurine face (SF-PLB-2022-1-2), 3) a Cabrito Cream polychrome ceramic sherd with a possible glyph block (SF-PLB-2022-3), and 4) a ceramic ocarina fragment (SF-PLB-2022-4). Then the exposed deposit was subdivided into 12 sublots (PLB-2022-1-2A through PLB-2022-1-2L; Figure 1). After the deposit was mapped and photographed, the artifacts were removed and bagged by subplot and type. Three charcoal samples were collected from the second lot (RC- PLB-2022-1-4, RC- PLB-2022-1-5, and RC- PLB-2022-1-6). Excavations continued until the second layer of the deposit was fully exposed. The second layer was mapped and photographed, and the artifacts were removed like before. Eight charcoal samples were collected from this lot (RC- PLB-2022-1-7, RC- PLB-2022-1-8, RC- PLB-2022-1-9, RC- PLB-2022-1-10, RC- PLB-2022-1-11, RC- PLB-2022-1-12, RC- PLB-2022-1-13, RC- PLB-2022-1-14). Excavations continued until a third and final layer was exposed. Of particular note, disarticulated human remains were revealed within the layer. One charcoal sample was recovered from this lot (RC- PLB-2022-1-15). Artifacts of note within the third layer are a Cabrito Cream plate with cormorant imagery and a Puhui-Zibal Composite cylinder vase.



Figure 1: Sub-lot system for unit PLB-2022-1.

E.U. PLB-100

Audet's previous unit was located by identifying the location of the center of the plaza, in addition to the presence of a slight dip in the terrain. Using this information, we set up a 2 m (N/S) x 3 m (E/W) unit (Figure 2). Excavations in the uppermost layer yielded modern material including plastic, metal, and modern faunal remains, indicating that we were, indeed, in the backdirt of Audet's excavation. As we continued to excavate in the western end of the unit we began finding pebbles and small limestone pieces, indicating we had reached Floor 1 at approximately 89 cm below datum (Figure 3 and 4). Excavations continued through the first floor until small limestone pieces indicated the second floor was reached at approximately 100 cm below datum. Excavations continued until approximately 110 cm below datum, when we began encountering limestone and ballast associated with Floor 3. We continued excavations until we identified a low platform that was running diagonal to the unit, cutting through the center, with a plaster floor only present in the area associated with the platform, at approximately 130 cm below datum. We called this Floor 4. Given that Floor 4 was intact, we assume that the two burials that Audet identified in her excavations were likely atop this platform.

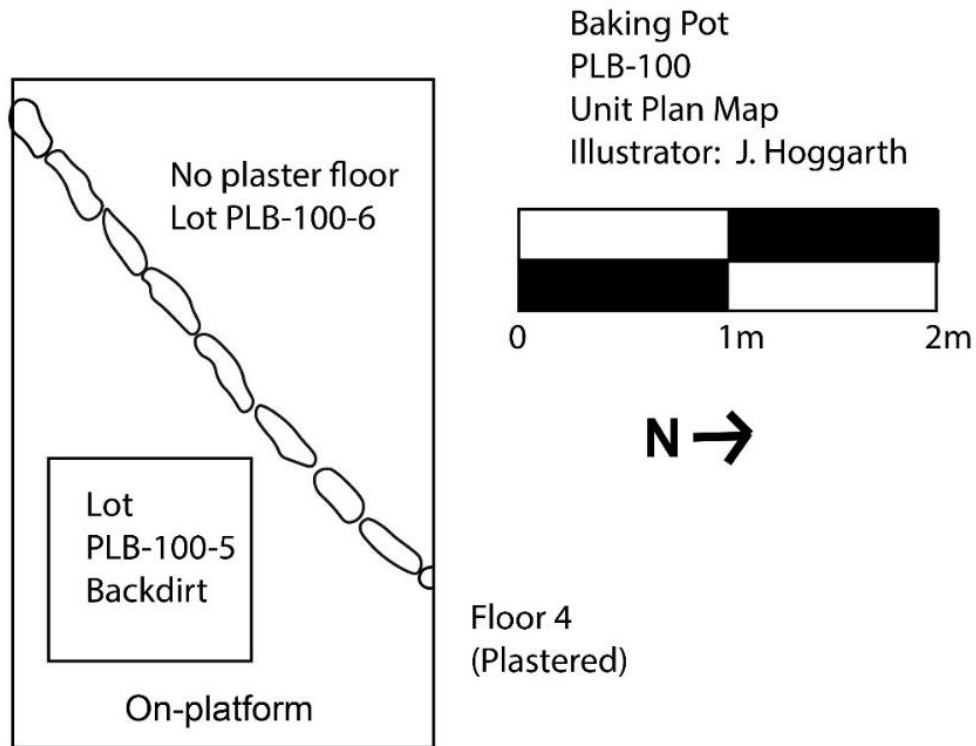


Figure 2: Plan view of unit PLB-100.

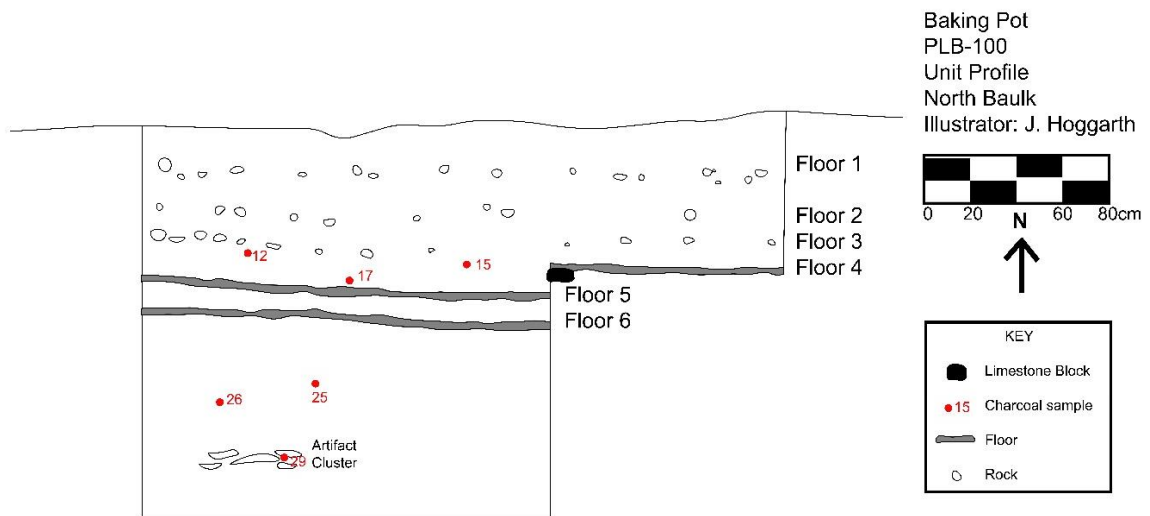


Figure 3: Profile of northern baulk of PLB-100

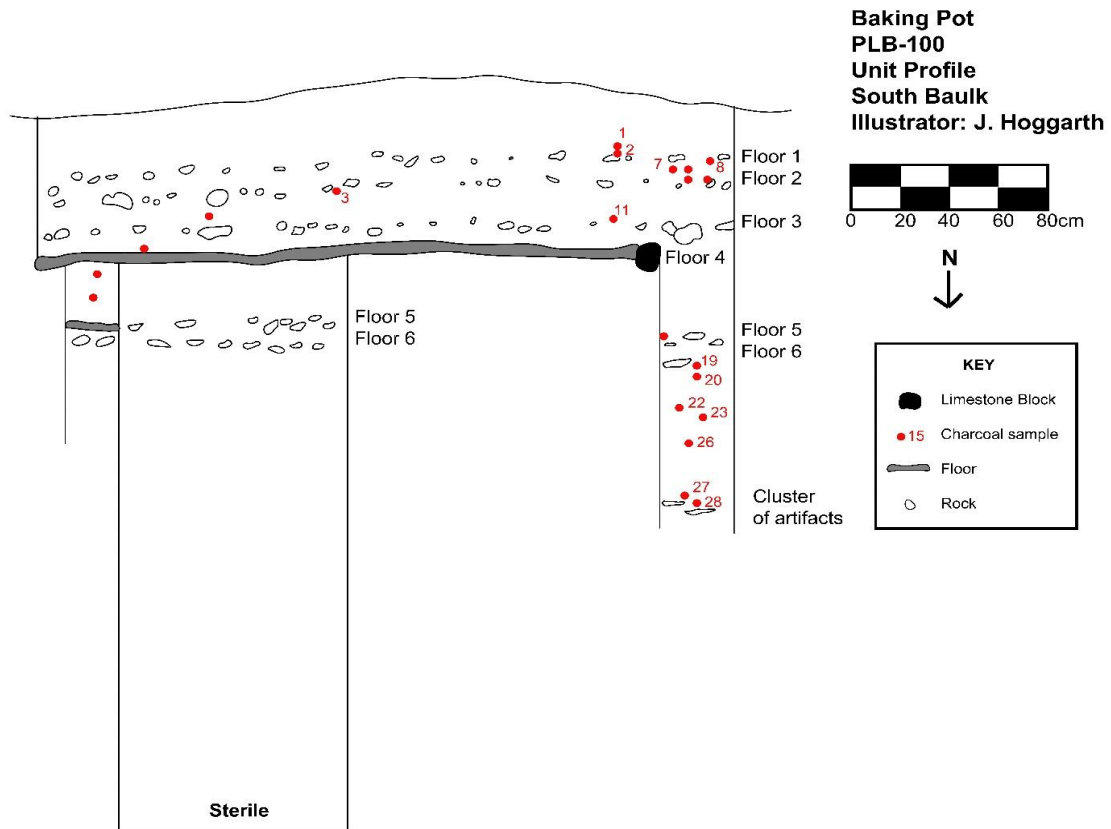


Figure 4: Profile of southern baulk of PLB-100.

At this point, we sub-divided the unit into two different areas for continuing excavations. The first was a 1 x 1 m unit into the platform (Lot PLB-100-5), where it was obvious Audet had continued to excavate. The second was in the triangular section of the unit west of the platform (Lot PLB 100-6, Figure 2). Excavations within the platform identified a plaster floor (Floor 5) at approximately 142 cm below datum, which was also identified in the western section of excavations. Excavations continued in both areas when the poorly preserved Floor 6 was identified at approximately 148 cm below datum. Off-platform excavations below Floor 6 continued until we encountered multiple layers of an artifact cluster at 239 cm below datum. Excavations continued approximately 10 cm below this level when we closed the unit due to time issues. It is possible that we did not reach culturally sterile layers at this point, which will be tested in up-coming field seasons. However, despite possibly not reaching sterile layers, we did recover several Cunil sherds (Early Preclassic (1100-900 BC), suggesting that we were in the earliest occupational level. Excavations on-platform continued below Floor 6 until the lack of artifacts indicated that we were below Audet's excavations, and we continued excavations, not finding any other artifacts, which suggested that Audet was in sterile levels when she closed her unit, at approximately 380 cm below datum (Figures 3 and 4). Furthermore, Davis collected several Savana Orange dish sherds and Jocote Orange-brown jar sherds from below Floor 6 for a regional Early/Middle Preclassic Neutron Activation Analysis study.

CONCLUSION

Laboratory analyses of the peri-abandonment deposit materials will occur in the future. These materials will enhance our understanding of cultural behaviors during the final decades of the Terminal Classic period at the site core of Baking Pot. Like the rest of the southern Maya lowlands, the Terminal Classic inhabitants at Baking Pot were likely trying to negotiate with ancestors and deities to face an uncertain future brought about by degrading climactic, political, and social conditions. Future analyses of material culture, associated iconography, contextual information, and a refined chronology will allow us to deepen our understanding of ancient Maya responses to environmental and social stressors.

Much like their Late Classic descendants, the Preclassic and Early Classic Maya at Baking Pot subsisted off the landscape in multi-faceted ways that were influenced by environmental, political, and social conditions. Understanding the tempo and chronology of occupation and construction at Baking Pot will allow future researchers to explore questions related to increasing social, political, and economic complexity, adaptation to environmental stress, and general culture history.

Acknowledgments We would like to thank the 2022 BVAR field school students for their dedication and hard work this summer as well as our local assistants including Eduardo Cunil and Albert Patt. We would like to thank the men and women at Central Farm for their assistance and coordination. We especially want to thank the Belize Institute of Archaeology for permission to conduct research at Baking Pot. The 2022 research was funded in part by BVAR, School of Human Evolution and Social Change Research Award, Dr. George L. Cowgill Teotihuacan Research Lab Award, and the National Science Foundation (SBE-UKRI-2136662 to Hoggarth and Awe).

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TERMINATION, RECONSTRUCTION, AND ABANDONMENT OF THE CAHAL PECH PALACE COMPLEX: RECENT RESEARCH IN PLAZA D

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INTRODUCTION

During the 2019 field season of the Belize Valley Archaeological Reconnaissance (BVAR) Project and field school, our excavations at Cahal Pech, Belize focused on clearing terminal architecture for conservation in Plaza D, part of the site's Late-to-Terminal Classic (AD 500-900) palatial complex (Figure 1). Plaza D is a small, elevated courtyard on the western edge of the Cahal Pech acropolis, enclosed by four palace-style vaulted buildings. Str. A1, the largest pyramidal structure at the site, forms the eastern side of Plaza D, and acts as the group's eastern structure (Figure 1). Because access to Plaza D is highly restricted, it likely functioned as an elite residence or private administrative sector during the Classic period (see Awe 1992:155). Composed of both Plaza D and E, the Cahal Pech palace is elevated approximately 12 m above the western ballcourt, suggesting that its construction involved substantial labor investment to build the site up vertically from bedrock.

Initial explorations in Plaza D were undertaken between 1988-1991 by Awe (1992:155-158) for his dissertation research where he first documented Terminal Classic palace occupational phases. Operation 1 consisted of a 1.5 x 1.5 m unit placed in the center of the courtyard plaza. Excavations documented at least three plaster floors. The unit terminated approximately 3.7 m from surface. Pottery recovered below all three floors suggests that they were all constructed during the Late Classic period. Operation 2 exposed the terminal architecture on Str. D2 to assess its preservation. The unit also produced high frequencies of Spanish Lookout phase (Late/Terminal Classic) pottery, which suggested that this part of the site was still in use between the eighth and early ninth centuries AD.

half of the ninth century (see Awe et al. 2020; Douglas et al. 2021), the palace complex became the focus of intensive construction activity. These new data also suggest that the Cahal Pech epicenter may have not been abandoned until the early tenth century, much later than previously thought.

THE 2019 PLAZA D EXCAVATIONS

The 2019 excavations in Plaza D included two large, contiguous units, with the goal of clearing collapsed debris from western side of Plaza D prior to conservation. PLD-2019-1 was 13 m x 3 m and ran north-to-south. PLD-2019-2 was 10 m x 2 m and ran east-to-west. Excavations removed humic debris and stopped at the terminal plaza floor, located ~30 cm below the modern ground surface. While relatively few artifacts were recovered from humic and collapse contexts, ceramics were primarily Terminal Classic types (Spanish Lookout Phase; AD 750-900). Clearing also exposed a low step on the south side of Plaza D, associated with an entrance into the adjacent palace buildings in Plaza E. Clearing also concentrated on Str. D2, on the west side of Plaza D, and revealed that the small room's floor had collapsed inward (Figure 2). Additional exposure of deposits below floor level exposed a vaulted room (Str. D2-sub 1), which was buried and sealed prior to the construction of terminal phase architecture (Figures 3 and 4). While the western wall of the room had been dismantled (or perhaps had collapsed outwards), the others were intact. Sitting just above bench level within the room was a dense deposit identified as Feature 1. The deposit was placed on top of fill above the room's floor (~75 cm) and consisted of ceramic sherds ($n=2432$), representing complete and fragmentary polychrome and undecorated vessels, lithic artifacts ($n=353$), and faunal remains ($n=92$). Feature 1 was approximately 30 cm thick but was horizontally bisected by a ~10 cm lens of charcoal.



Figure 2: Terminal architecture of Str. D2, showing collapsing floor. Photograph facing south.



Figure 3: Structure from Motion (SfM) reconstruction of Str. D2-Sub 1 showing approximate location of the deposit (model by Adam Jurský, 2019).

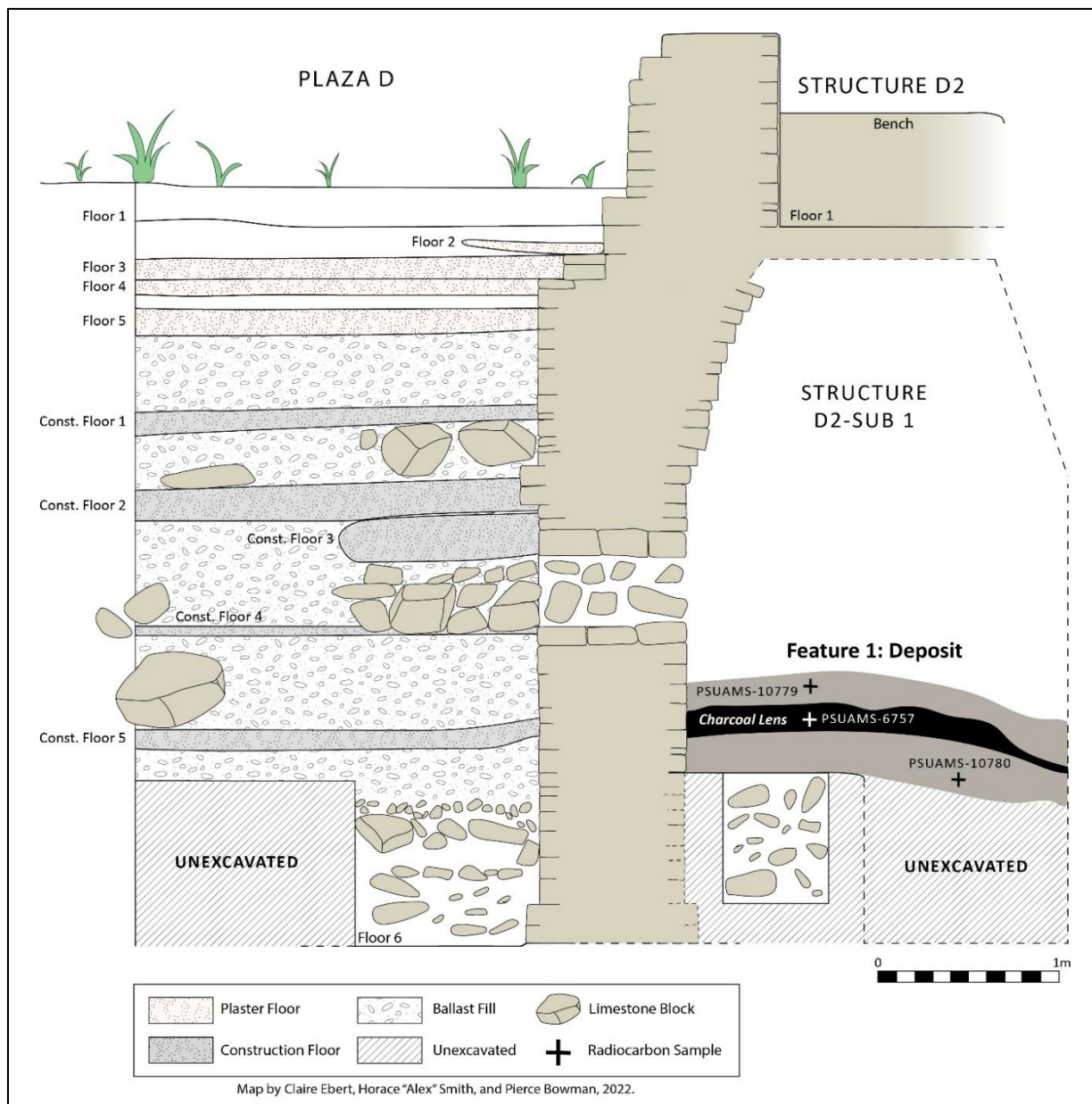


Figure 4: South profile of Str. D2-sub 1 excavations (2019) and adjacent Plaza D excavations (2022).

Common polychrome types include Benque Viejo ($n=18$) and Cabrito Cream ($n=14$) Polychromes (Figure 5 and Table 1). Decorated Cabrito Cream Polychrome vessels depict both animals, primarily water birds, and human forms identified as the “Holmul Dancer” representing the Maize God (Figure 6; Callaghan 2016; Reents-Budet 1994). Less intricately painted Cabrito Cream vessels found at Belize Valley sites were likely locally produced (Baraciel Almada 2019; Davis 2018; Reents-Budet 1994:96-99). Both styles of vessels were identified in the deposit’s assemblage, suggesting the import of some objects for inclusion in the deposit. Two sherds with glyphs were also identified in the deposit, and future work will focus on deciphering their meanings.

Table 1: Frequencies of ceramic vessel types recovered from the Str. D2-Sub 1: Feature 1 deposit.

<i>Cahal Pech Ceramic Complex</i>	<i>Approx. Date Range</i>	<i>Surface Treatment</i>	<i>Plate</i>	<i>Dish</i>	<i>Bowl</i>	<i>Jar</i>	<i>Vase</i>	<i>Other</i>	<i>Totals</i>
Kanluk (Jenney Creek)	900-300 BC	Plainware				1			1
Xakal (Barton Creek)	300 BC-AD 300	Plainware		15	5				20
Hermitage	AD 350-550	Plainware			4				4
Tiger Run	AD 550-700	Decorated					1		1
		Plainware				1	3		4
Tiger Run/ Spanish Lookout	AD 550-900	Polychrome					2		2
Spanish Lookout	AD 700-900	Decorated		1	3	1	1		6
		Plainware	10	19	41	77	1		148
		Polychrome		1	2	0	47		50
Unknown	--	Plainware						65	65
		Polychrome				1			1
Totals			10	36	55	81	55	65	302



Figure 5: Examples of Spanish Lookout complex vessels from Str. D2-sub 1 Feature 1. Top row, left to right: Xunantunich Black-on-orange jar, black slipped spouted vessel, and Puhui-zibal Composite vase. Bottom row: all vessels are Benque Viejo Polychromes.



Figure 6: Spanish Lookout phase Cabrito Cream Polychrome vessels with water bird and human imagery.

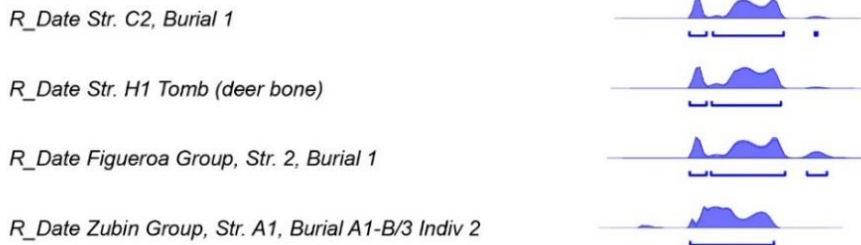
The Chronology of the Feature 1 Deposit

Relative chronological data provided by pottery analyses were corroborated by a preliminary program of radiocarbon dating. One charcoal sample and two faunal samples were selected for AMS ^{14}C dating, which was conducted at the Penn State Radiocarbon Lab. Faunal bone samples were chosen for dating to eliminate problems of old charcoal. All calibrated dates fall within the Terminal Classic (Figure 7 and Table 2). Radiocarbon dates also place the deposit and subsequent palatial construction, which was quite substantial, around the same time as the last known elite burial in the Cahal Pech epicenter (Plaza H1 tomb) around cal AD 770-890 (Awe 2013; Ebert et al. 2019). The Str. D2-sub deposit is also contemporaneous with ^{14}C dates from peri-abandonment deposits associated with the disuse of monumental buildings in some parts of the site (Awe et al. 2020; Hoggarth, n.d.). The results suggest that Plaza D was a focus of construction activity in the last 50-100 cal years of the site's occupation.

Table 2: Radiocarbon dates from Str. D2-sub 1: Feature 1 Deposit. All dated calibrated with the IntCal20 calibration curve (Reimer et al. 2020).

<i>PSUAMS Lab #</i>	<i>Sample Type</i>	<i>Calibrated 2σ Range</i>
PSUAMS-6757	<i>Pinus</i> sp. (pine) charcoal	AD 880-995
PSUAMS-10779	<i>Odocoileus virginianus</i> (deer), r. tibia	AD 770-975
PSUAMS-10780	Lagomorph (rabbit), l. tibia	AD 770-950

Site Core and Settlement Burials (primary)



Site Core Peri-Abandonment Deposits



Str. D2-sub 1: Feature 1 Deposit

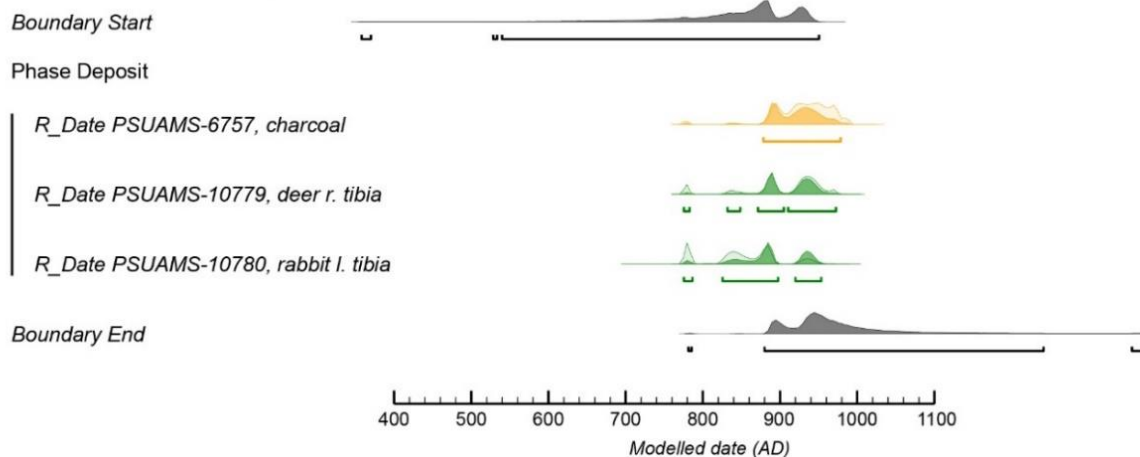


Figure 7: Calibrated AMS ¹⁴C dates for Str. D2-sub 1: Feature 1 deposit, plotted against dates for Terminal Classic burials and peri-abandonment deposits at Cahal Pech (Ebert et al. 2019; Douglas et al. 2021; Hoggarth, n.d.). All dates modeled OxCal v.4.4.4 (Bronk Ramsey 2009) using the IntCal20 calibration curve (Reimer et al. 2020).

Faunal Analysis

Zooarchaeological analysis of faunal remains from Feature 1 was conducted in 2019 by Dr. Martin Welker at the Arizona State Museum in Tucson, Arizona. A total of 106 specimens were recovered from Feature 1. These included at least one adult and one juvenile deer (*Odocoileus virginianus*, Table 3) and two rabbits (*Sylvilagus* sp.). The remaining faunal remains recovered from this context could not be identified to species but include fragments of at least one turtle (NISP: 25), unidentified fish (NISP: 3), two specimens which resemble a small heron (possibly a green heron or night heron), and several fragments of bone that belong to other water bird taxa (possibly a cormorant and a duck). These bones exhibited little evidence of burning ($n=2$) and no cut marks. With such a small assemblage it is difficult to draw any conclusions about the processes which led to the deposition of these materials or their use by the site's inhabitants. The presence of herons, ducks, cormorants, turtles, and fish in this assemblage does, however, suggest the occupants of Cahal Pech were familiar with, and exploited, local bodies of water where these species could be found. Alternatively, these species could have been imported to Cahal Pech from elsewhere, though the prevalence of avian foot bones among this component of the assemblage would strongly suggest that the importation of these specimens was not subsistence motivated.

Table 3: Faunal remains from Str. D2: Feature 1 Deposit.

<i>Common Name</i>	<i>Scientific Name</i>	<i>NISP (MNI)</i>
White-tailed Deer	<i>Odocoileus virginianus</i>	14 (2)
Rabbit species	<i>Sylvilagus</i> sp.	11 (2)
Turtle	<i>Testudines</i>	24 (1)
Heron sp. (?)	<i>Ardeidae</i> sp.	2
Bird		12
Fish		3
Large Mammal		1
Medium Mammal		14
Small Mammal		5
Unknown		20
	Total	106

Special Finds

In addition to the large amount of pottery and faunal remains recovered from the Str. D2 deposit, several other special finds were documented. These included a red stone spindle whorl, bone needles and pins, a marine shell ear flare, a partial stingray spine, and a chert point (Figure 8). Analyses of these objects are ongoing.

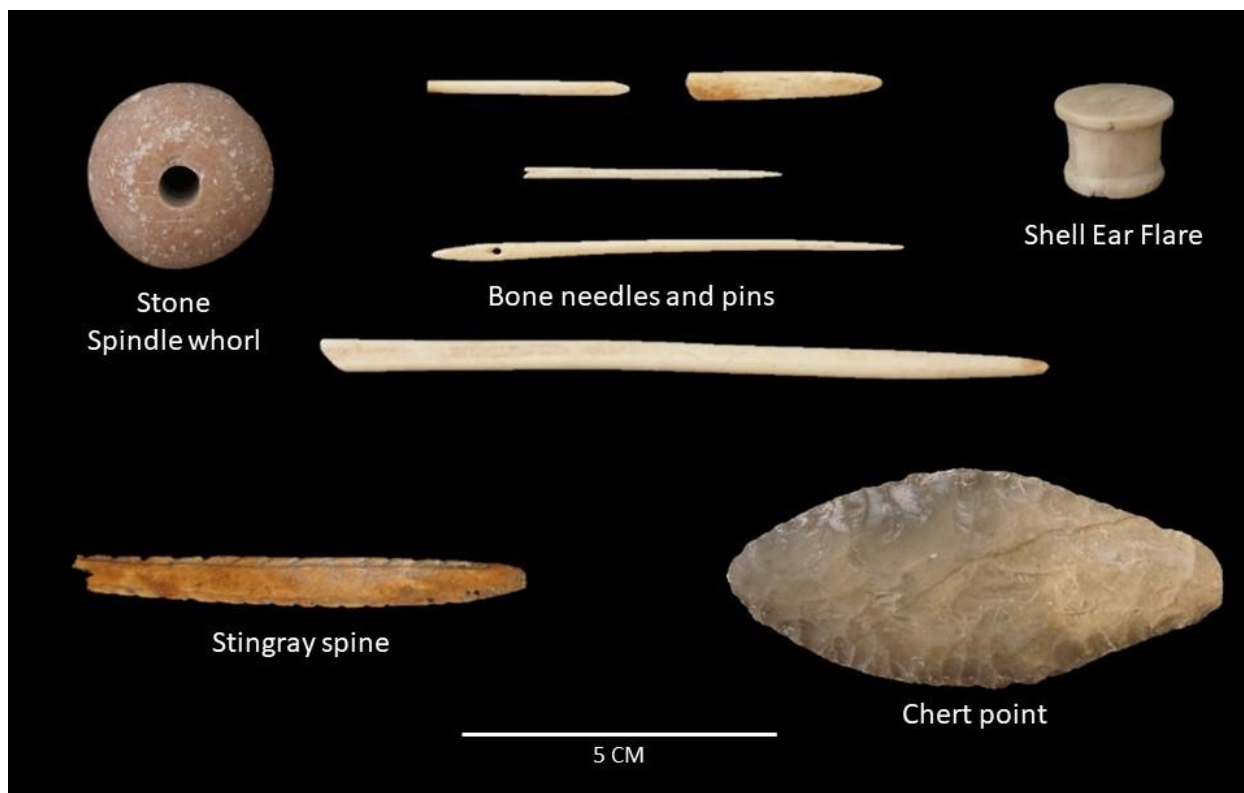


Figure 8: Special finds from Str. D2-sub 1: Feature 1 Deposit.

Geophysical Survey

The 2019 excavations at Str. D2, along with previous work in Plaza D, suggested that additional architecture may be buried beneath the terminal plaza floor. To help strategically plan future excavations, geophysical survey was carried out by Drs. Bryan Hanks and Marc Bermann (University of Pittsburgh) (Figure 9). The Plaza D surveys used two instruments: a Noggin Smart Cart 500 MHz Ground Penetrating Radar (GPR) System and a GF Instruments CMD Multi-depth Electromagnetic Conductivity Meter (EM). GPR is an active method that is typically employed using parallel survey traverses within a grid either starting all traverses from the same grid edge or using a zig-zag pattern. GPR antennas transmit electromagnetic pulses into the ground as the instrument is pushed along the traverse and then measures the time from when these pulses are emitted until they are reflected back to the unit receivers (Conyers 2012:13). GPR data have the potential to provide both spatial location and characterization of subsurface anomalies. The use of low-frequency EM methods has been common in archaeological survey since the 1960s (Gaffney and Gater 2003:42-44). In more recent years, archaeologists have used the CMD mini-explorer instrument for shallow depth sub-surface EM surveys (Bonsall et al. 2013). This instrument has an effective depth range of 0.25 m, 0.5 m, and 0.9 m for the VCP horizontal coil dipole orientation. This can be extended to 0.5 m, 1.0 m, and 1.8 m by rotating the orientation of the probe to use HCP in the vertical coil dipole orientation (Bonsall et al. 2013:222). The instrument simultaneously measures both apparent magnetic susceptibility and apparent electrical conductivity of subsurface soils and has the potential to identify discrete subsurface features.



Figure 9: Approximate location of 2019 geophysical survey grid within Plaza D (photograph taken facing south).

Both GPR and EM surveys indicated variation in results both horizontally and vertically in Plaza D. This was most visible in the CMD apparent electromagnetic conductivity as compared to GPR reflections (Figure 10). Based on the comparison of the data from the two methods, it seems probable that infilled voids exist near the center of the surveyed area where there are strong contrasts in both high-low apparent conductivity and strong-weak GPR reflections. These appear as both a linear anomaly running from the northwest to southeast in the lower third of the survey and as a curvilinear anomaly in the northern area of the survey. These may be interpreted as defining the edges/walls of voids and associated transitions in the architecture and surrounding fill of the cavities.

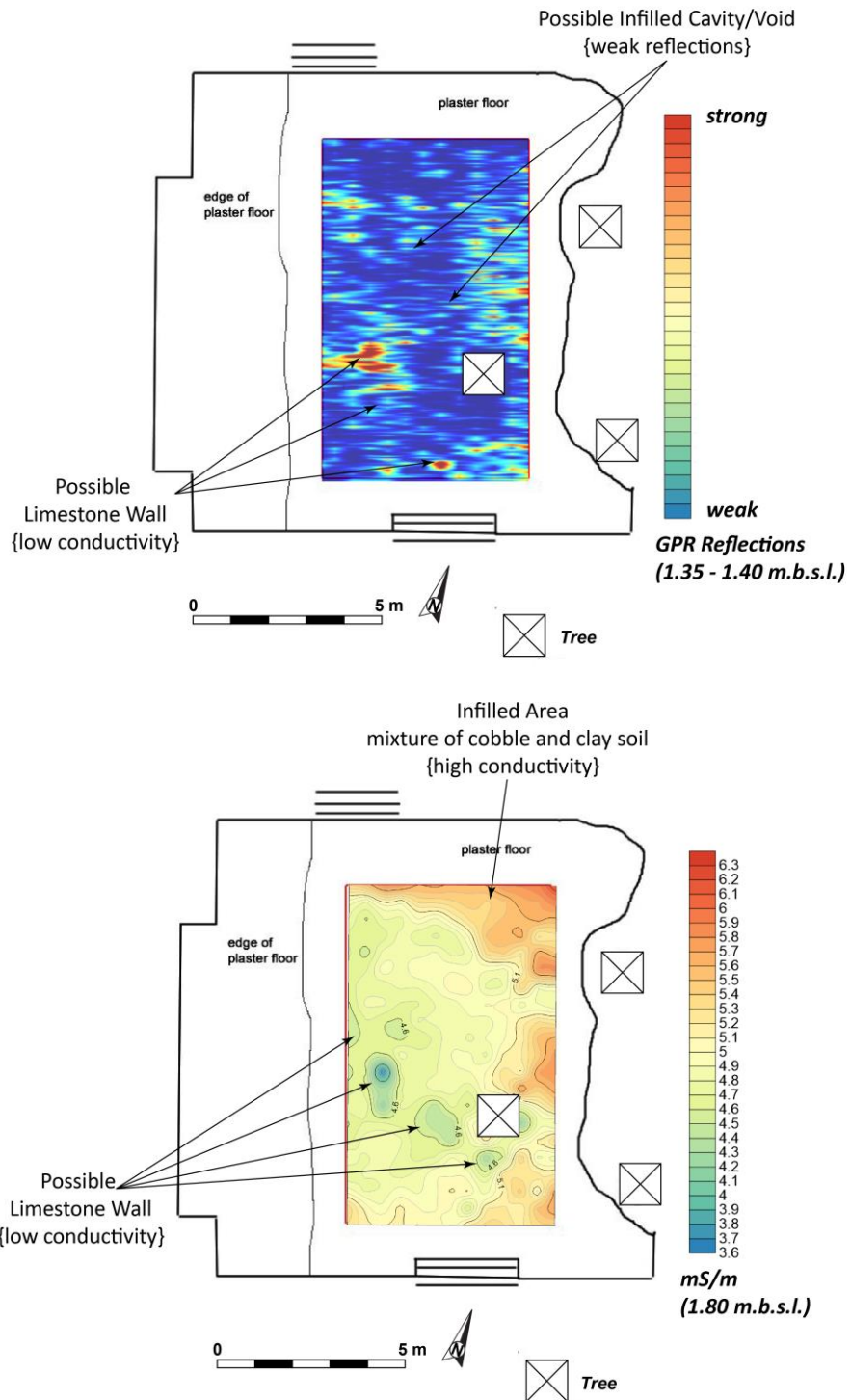


Figure 10: Top: Ground Penetrating Radar slide view showing reflections at approximately 1.30-1.40 m below the surface. Bottom: CMD Mini-explorer EM quadrature conductivity survey at a depth of 1.80 m from the surface.

THE 2022 PLAZA D EXCAVATIONS

Excavation during the 2022 field season had two goals. The first was to define the pre- and post-depositional sequence associated with the deposit's placement, including the subsequent dismantling and interment of Str. D2-sub 1 during the Terminal Classic. The second goal was to contextualize these events, which occurred at the end of the Cahal Pech occupational sequence, through additional excavations of surrounding architecture in Plaza D. The goals were accomplished through the excavation of two units in Plaza D (PLD-2022-2 and PLD-2022-3) and described below. A third unit (PLD-2022-4) was also placed in Str. D3 to define the terminal architecture of this building. Unfortunately, clearing of humic debris and collapse quickly revealed that this building was no longer intact, perhaps due to previously unreported excavations or root damage, and further excavation ceased.

Units PLD-2022-2 and PLD-2022-3

Relying on the results of geophysical analyses, unit PLD-2022-2 (the "Vaulted Chamber Unit") was placed in the southwest portion of Plaza D, immediately to the east of Str. D2. The 2019 excavations had previously cleared humic debris and collapse from this location. Therefore, the unit was placed directly on top of Floor 1. Unit PLD-2022-2 measured 3 x 1.5 m, running north-to-south, parallel with the outer wall of Str. D2.

While previous excavations in Plaza D documented three plaster floors, our 2022 excavations documented a total of six plaster floors. Floors 1 through 5 were located within the first 80 cm below the modern ground surface. Based on previous excavations, in addition to new work from the 2019-2022 field seasons, Floor 1 appears to cover the entirety of Plaza D and is associated with its terminal construction phase, though it was poorly preserved. Floor 2 was also poorly preserved and was only visible near the Str. D2 wall. Previous excavations did not document this floor. Floors 3 and 4 were thick plaster floors (12 and 7 cm thick, respectively), and placed directly on top of one another. It is likely these correspond to the second plaster floor previously documented by Awe (1992:155-158), but they are likely better preserved closer to Str. D2 than in the center of the plaza. Floor 5 (~12 cm thick) recorded in the 2022 excavations also corresponds to Awe's Floor 3 recorded in the 1988-1991 excavations (Awe 1992:155-158). The sixth and final plaster floor was located approximately 4.3 m below the modern ground surface and corresponds with the floor of Str. D2-sub 1 encountered during the 2019 excavations of the building. Excavations ceased upon reaching this floor.

Unlike previous plaza units, excavation of PLD-2022-2 recorded construction activity below the plaster floors in more detail (see Figure 3). Excavations documented a total of five construction floors between Floors 5 and 6 (total vertical depth of 3.45 m). Construction floors consisted of tamped marl surfaces measuring between 7-20 cm thick interspersed between ballast fill episodes. They formed the foundations for construction pens, which consisted of square stone alignments that were two or three courses high, and likely functioned as fill stabilizers (Figure 11). Based on excavations and geophysical surveys, we suggest that construction pens are present across Plaza D, represented by walls and voids documented by both GPR and EM surveys. Stratigraphic placement suggests that construction pens and floors were created after the Str. D2-

sub 1 deposit, suggesting that the deposits placement is likely associated with the termination of that building and subsequent infilling of Plaza D.

Unit PLD-2022-3 was placed adjacent to PLD-2022-2 to expose two terraces of the Str. D2 wall running north-to-south across Plaza D to measure their extent across the plaza. While the upper terrace articulated with the top of Floor 3, the lower articulates with the top of Floor 4. Excavations concluded that both terraces extended from the southwest to the northwest corner of Plaza D and mark the western edge of the Plaza D courtyard.



Figure 11: Construction pens in unit PLD-2022-2 on top of Construction Floor 1.

DISCUSSION AND FUTURE DIRECTIONS

Recent research at Cahal Pech has expanded our understanding of the construction history of the royal palace complex as well as the site's Terminal Classic activities and occupation. Previous research focusing on Terminal Classic Cahal Pech indicated that elite mortuary activity and monumental construction programs in some parts of the site (e.g., public plazas and the *audiencia*) largely ceased during the middle of the ninth century, signaling the site's socio-political disintegration shortly thereafter (Awe et al. 2020; Ebert et al. 2019). At least eight Terminal Classic

burials have been recorded at Cahal Pech (Awe 2013). Of these, five have been radiocarbon dated (Ebert et al. 2019). The latest burial is in the Str. H1 Tomb (cal AD 770-890), which was the interment of an elite adult male associated with a variety of grave goods including polychrome ceramic vessels and a censor, animal bone and tooth adornments, and jade jewelry, among other items.

The disuse of monumental buildings is marked by the placement of peri-abandonment deposits throughout the Cahal Pech site epicenter (Awe et al. 2020; Douglas et al. 2021). Peri-abandonment deposits are characterized by dense concentrations of ceramic, lithic, and faunal artifacts in the corners of plazas and courtyards, flanking stairways, and placed within narrow passageways. These deposits were created around the time of the site's abandonment, suggested by a thin lens of sediment between terminal floors and the deposits (see Aimers et al. 2020). Awe and colleague (2020:175) suggest that, at Cahal Pech, "deposits likely represent cultural remains associated with propitiation rituals or pilgrimage activities that were conducted by remnant local populations during a protracted period of site abandonment." Previous AMS ¹⁴C dating of peri-abandonment deposits indicate that their creation spans the Terminal Classic (~705-950 cal AD), marking successive disuse of specific site core locations (Hoggarth, personal communication).

The 2019 and 2022 field work in Plaza D revealed that while burial activity ceased and some parts of the Cahal Pech core fell into disuse, construction activity shifted to the site's royal palace complex. The Str. D2 deposit, associated with the penultimate construction phase of Plaza D (Figure 12), is the last directly dated event within the Cahal Pech epicenter, suggesting that its placement and successive large-scale palace construction occurred prior to site abandonment. Building efforts in the second half of the ninth century were large-scale. Estimates based on the 2020 excavations in Plaza D suggest that over ~590 m³ of fill was placed between Floors 5 and 6. Infilling occurred in at least four phases in which carefully laid out construction pens were placed across the courtyard to stabilize ballast fill.

Several pieces of evidence suggest the infilling on Plaza D occurred relatively rapidly. First, the outer façade of Str. D2-sub 1 was very well preserved, with remnants of plaster, some of which was painted red, still adhering to the cut limestone blocks. Additionally, there was no evidence for collapse of the architecture, which would be if infilling of the plaza occurred over a longer duration. Second, Spanish Lookout phase polychrome sherds were collected from directly on top of Floor 6, suggesting a Terminal Classic date for the event. Finally, no formal plaster floors were found between construction floors or pens. A total of 12 charcoal samples were collected from throughout the PLD-2022-2 sequence for additional AMS ¹⁴C dating and will help assess this hypothesis.

The Late-to-Terminal Classic construction history of Plaza D may reflect broader regional trends since similar infilling of royal compounds has been documented during the Terminal Classic. At Minanha, for example, destruction of the royal court is represented by the infilling of the penultimate courtyard and vaulted buildings in the early ninth century (Iannone 2010:363). Like Str. D2-sub at Cahal Pech, the palace buildings at Minanha were carefully filled from the inside, keeping their vaults intact. Large boulders and cobbles were also placed inside well-built construction pens to raise the courtyard. Similarly, the Late Classic palace (the Ottawa Group) at Lamanai was partially razed and infilled with large boulders during the early Terminal Classic

(Graham 2004). Radiocarbon dates suggest that this phase (the “Boulders phase”) was underway just after cal AD 700-815, following the placement of several Late and Terminal Classic ceramic caches (Hanna et al. 2016:787). At Xunantunich, excavations by the Xunantunich Archaeological Project (XAP) in Str. A11, located in the northern palace compound Plaza A-III, documented the intentional dismantling and sealing of the central room at the base of the building (see LeCount et al. 2002). Yaeger (1997:36) suggests that this building was “terminated”, either for subsequent construction that was never completed or for ritual purposes, sometime between AD 780-890. Patterning in these events may suggest that infilling is often associated with specific ritual or termination events. While Minanha, Lamanai, and Xunantunich experienced no or very limited activity after the infilling of royal compounds, Cahal Pech experienced continued and intensive construction. Nakum provides a similar example of continued Terminal Classic expansion. At this site, all structures in the Acropolis were infilled by the middle of the ninth century to expand the number of living quarters in palace buildings (Żrałka and Hermes 2012:166).



Figure 12: View of penultimate phase of Str. D2 from the Plaza D courtyard.

The new data from the 2019 and 2022 excavations at Plaza D also suggest that the Str. D2 deposit represents a distinct set of activities when compared to Terminal Classic peri-abandonment deposits. In other words, the deposit is more likely associated with purposeful building destruction,

or “termination”, aimed at symbolically removing the building’s life force rather than abandonment (Mock 1998:10; Tsukamoto 2017). While termination is often perceived as a single event that is both spatially and temporally discrete, deposition of the penultimate Plaza D courtyard at Cahal Pech was preceded by the assembly of materials and followed by new construction. These discrete events form a continuous sequence of cultural practices, all of which held significance for the actors involved (e.g., Clarke et al. 2020; Harrison-Buck 2018). Future studies of the deposit’s artifact assemblage will aim to identify reworking/reuse, burning, or weathering of sherds, indicating if objects had already been broken, burned, or exposed to the elements prior to their deposition. While the intentional breakage and the subsequent distribution of fragmented objects has been documented for contexts across the Maya lowlands (e.g., Morton et al. 2019; Tsukamoto 2017), items that had ceased functional use were often recycled in ceremonial contexts (Chase and Chase 2004; Hayden and Cannon 1983). Closer examination of the deposit’s assemblage, in addition to a more extensive radiocarbon dating program, will help clarify the timing and nature of termination, reconstruction, and final abandonment of the Cahal Pech palace complex.

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APPENDIX A: CERAMIC COUNTS FROM STR. D2-SUB 1: FEAT. 1 DEPOSIT

<i>Complex</i>	<i>Group</i>	<i>Type</i>	<i>Category</i>	<i>Plate/Dish/ Bowl</i>	<i>Jar</i>	<i>Vase</i>	<i>Other</i>	<i>TOTAL</i>
Jenney Creek	Jocote	Jocote Orange-brown	Plainware		1			1
Barton Creek	Sierra	Sierra Red	Plainware	20				20
Hermitage	Balanza	Unknown	Plainware	3				3
Hermitage	Pucte	Pucte Brown	Plainware	1				1
Tiger Run	Sotero	Silkgrass Fluted	Decorated			1		1
Tiger Run	Sotero	Unknown	Plainware		1	3		4
Tiger Run/ Spanish Lookout	Palmar	Saxche/ Palmar Orange Polychrome	Polychrome			2		2
Spanish Lookout	Belize	Gallinero Fluted	Decorated			1		1
Spanish Lookout	Belize	McRae Impressed	Decorated	1				1
Spanish Lookout	Belize	Platon Punctated Incised	Decorated	1	1			2
Spanish Lookout	Dolphin Head	Silver Creek Impressed	Decorated					2
Spanish Lookout	Belize	Belize Red	Plainware	37	12	1		59
Spanish Lookout	Cayo	Alexanders Unslipped	Plainware		31			31
Spanish Lookout	Cayo	Alexanders Unslipped: Croja	Plainware		1			1
Spanish Lookout	Cayo	Cayo Unslipped	Plainware		29		2	29
Spanish Lookout	Cayo	Cayo Unslipped: Red	Plainware		1			1
Spanish Lookout	Dolphin Head	Dolphin Head Red	Plainware	6				6
Spanish Lookout	Garbutt	Garbutt Creek Red	Plainware	4				4
Spanish Lookout	Garbutt	Unknown	Plainware	1				1
Spanish Lookout	Mount Maloney	Mount Maloney Black	Plainware	13				13
Spanish Lookout	Vaca Falls	Vaca Falls Red	Plainware		3			3
Spanish Lookout	Belize	Puhui-zibal Composite	Polychrome			2		2

<i>Complex</i>	<i>Group</i>	<i>Type</i>	<i>Category</i>	<i>Plate/Dish/ Bowl</i>	<i>Jar</i>	<i>Vase</i>	<i>Other</i>	<i>TOTAL</i>
Spanish Lookout	Chunhuitz	Benque Viejo Composite	Polychrome			1		1
Spanish Lookout	Chunhuitz	Benque Viejo Polychrome	Polychrome			18		18
Spanish Lookout	Chunhuitz	Xunantunich Black-on-orange	Polychrome			1		3
Spanish Lookout	Palmar	Cabrigo Cream Polychrome	Polychrome			14		14
Spanish Lookout	Palmar	Central Farm Composite	Polychrome			1		1
Spanish Lookout	Palmar	Palmar Orange Polychrome	Polychrome			3		3
Spanish Lookout	Palmar	Zacatel Cream Composite	Polychrome			3		3
Spanish Lookout	Palmar	Zacatel Cream Polychrome	Polychrome			4		4
Spanish Lookout	Vaca Falls	Roaring Creek Red	Polychrome	1				1
Unknown	Unknown	Unknown	Plainware				65	65
Unknown	Unknown	Petroglyph Red Rim	Polychrome		1			1
TOTAL				82	81	55	67	32

**INVESTIGATING EARLY RITUAL AT CAHAL PECH, BELIZE:
A REPORT OF THE 2022 EXCAVATIONS IN PLAZAS B & C**

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INTRODUCTION

Documenting the timing and nature of the emergence of social inequality remains an important topic for archaeological research in the Maya lowlands. One of the clearest indicators of the emergence of institutionalized inequality among ancient Maya communities during the Preclassic period (~1000 BC-AD 300) was the appearance of monumental architecture within civic-ceremonial centers (Doyle 2017; Inomata et al. 2021). Often associated with these large masonry buildings is evidence for ceremonial activity, which reflects the development of structured ritual traditions and socio-political integration (Estrada-Belli 2011; Ringle 1999; Triadan et al. 2017). Since 1988, archaeological research conducted by the Belize Valley Archaeological Reconnaissance (BVAR) Project at the site of Cahal Pech, located in west-central Belize, has concentrated on understanding emergence of complexity during the Preclassic period. Excavations in the site's epicenter center have intensely focused on large open plazas where monumental buildings and other evidence for ceremonial events are found (e.g., Awe 1992; Ebert 2017; Garber et al. 2010; Horn 2015; Peniche May 2016).

The 2022 excavation at Cahal Pech built upon previous research to target ceremonial contexts for excavation. Previous excavations in Plaza B, the largest open plaza in the Cahal Pech monumental epicenter, documented at least 21 caches on the east, west, and north sides of the Plaza B, most of which date primarily to the Middle and Late Preclassic. Early caches were located along the centerline of or buried within early monumental buildings (Figure 1; see also Horn 2015: Appendix C; Porter 2020: Appendix D; Peniche May 2016:180). These caches consisted of whole and fragmented ceramic

vessels and figurines, jade beads and other greenstone objects, chert microdrills, marine shell beads and debitage obsidian blades, human bone fragments, and marine and freshwater shell artifacts. The placement of these caches may have played important roles in building dedication and the development of leadership strategies (Clark and Blake 1994). In order to detect subsurface anomalies that could potentially represent additional caches and deposits, during the 2019 field season Drs. Bryan Hanks and Marc Bermann (University of Pittsburgh) conducted a multi-instrument geophysical survey of Plaza B and Plaza C in the site core of Cahal Pech, using single axis fluxgate gradiometry, multi-depth electromagnetic conductivity, magnetic susceptibility, and ground penetrating radar (Figure 2). The fluxgate gradiometry survey identified positive anomalies along the centerline of Structure B1 where previous caches have been found (Ebert 2017; Porter 2020), in the northeast entrance, and the southeast corner of Plaza B. Excavations during 2022 ground-truthed the anomalies to determine their form and function, with the goal of understanding Preclassic ritual behavior during the early occupation at the site. The results of this ground-truthing indicate archaeological geophysical survey can be effective in identifying pit features in Maya plazas like those typically containing caches and dedicatory offerings. In the southernmost unit, where a subsurface anomaly was detected in front of Structure B4, excavators located a chert cache likely dating to the Middle Preclassic.

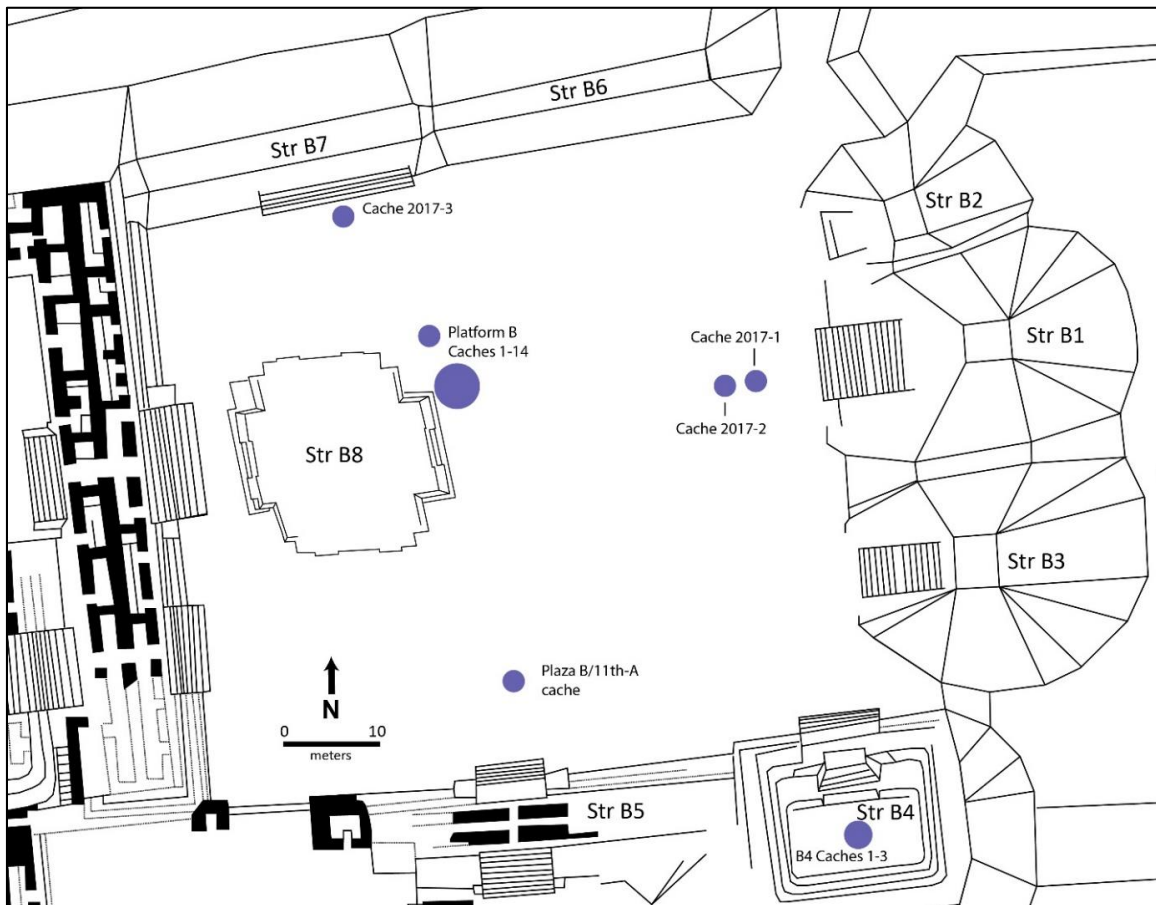


Figure 1: Location of previously excavated caches in Plaza B.

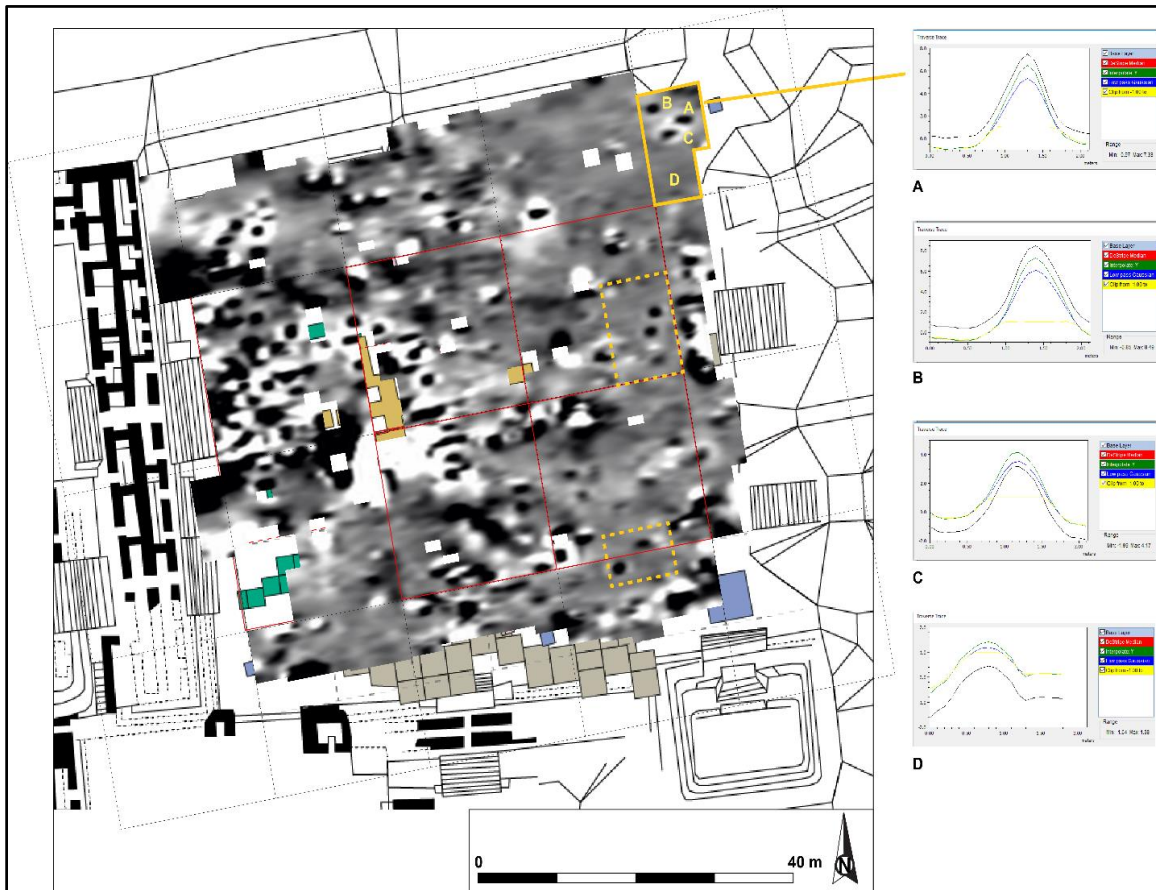


Figure 2: Results of 2019 fluxgate gradiometry survey in Plaza B with subsurface discrete positive anomalies (possible caches) in the northeast, central-east, and southeast highlighted.

PLAZA B EXCAVATIONS

Excavation Unit PLB-2022-1

An initial 2 x 2 m unit was opened in the northeastern corner of Plaza B in the approximate location of several round subsurface anomalies detected with magnetic susceptibility. Excavators recovered infrequent cultural material throughout the vertical excavation, predominantly consisting of ceramics interspersed with chert, freshwater and marine shell, and obsidian. A total of nine floors were encountered with consistently low frequencies of artifacts in the construction fill between floors. Between Floors 4 and 5, the ceramic frequency increased ($n=75$) with some sherds belonging to Savana Orange vessels, according to preliminary analysis by Davis. These vessels are from the Jenney Creek/Kanluk ceramic complex dating to the Middle Preclassic (900-300 BC). A radiocarbon sample was taken at a depth of 65 cm below datum for AMS ^{14}C dating. Between Floors 7 and 8, the ceramic frequency increased again ($n=163$), interspersed with a higher volume of chert ($n=86$) and freshwater shell ($n=59$), and three more radiocarbon

samples were recovered in addition to chert drills typically found in Middle Preclassic contexts. Excavation uncovered a highly eroded possible cache of a Savana Orange vessel with two jute shells and two river clams below Floor 8, but there were no additional artifacts to indicate the function of the



Figure 3: Possible cache of a Savana Orange vessel.



Figure 4: North profile closing photo of Unit PLB-2022-1.

incomplete vessel (Figure 3). Unit excavations concluded when bedrock was reached at a depth of 140 cm below datum (Figure 4).

Excavation Unit PLB-2022-2

A second 2 x 2 m unit was opened in the east-central portion of the plaza, in front of the steps of Structure B1, to investigate two subsurface anomalies depicted in the 2019 survey results. PLB-2022-2 is located 3 m east of previous Plaza B units excavated by BVAR in 2017, two center-line caches were exposed (Ebert 2017). The caches contained 13 and 26 vessels, respectively, placed lip-to-lip. The number of vessels is likely symbolic, perhaps reflecting a layered view of the Maya cosmos that included an upperworld with 13 levels (Schele and Freidel 1990:67). Both caches were also aligned with the central axis of the Plaza B West platform, perhaps suggesting a relationship with a Middle Preclassic E-Group architectural assemblage at the site (Ebert et al. 2021). Radiocarbon dates their placement during the Middle Preclassic, contemporaneous with the construction of early phases of Structure B1 and the E-Group (Porter 2020:50).

Unit PLB-2022-2 exposed a long cultural sequence from the Middle Preclassic to the Terminal Classic. Approximately 15 cm below the ground surface, excavators revealed large paving stones in the south side of the unit, like the stones marking the terminal floor across Plaza B (Ebert 2017). Ceramics from this context belonged to the Spanish Lookout ceramic complex (AD 750-900), but a Postclassic (New Town ceramic complex, AD 900-1200) Augustine Red scroll foot was found in association with the first floor. To the

authors' knowledge, this is the only such example from Cahal Pech. The fill below the first floor also contained Spanish Lookout pottery, though some modern artifacts were also recovered, suggesting that this area of Plaza B was subject to high levels of modern disturbance. A concentration of refitting sherds was found below Floor 3, under 5-8 cm of thick plaster. Excavators pedestaled and photographed the ceramics before proceeding into the fill below, where the density of artifacts notably decreased. Excavators reached a typical Middle to Late Preclassic context in the darker, compact fill below Floor 4, which consisted of higher frequencies of Kanluk/Jenney Creek pottery, interspersed with some Early Preclassic (1200-900 BC) Cunil sherds, marine shell beads, and chert drills. This stratigraphy matches previous excavations in the eastern part of Plaza B (see Ebert 2017:7). A figurine fragment was also recovered from this level, in addition to several radiocarbon samples for AMS ¹⁴C dating.

Unlike the anomaly in unit PLB-2022-1, excavation located a feature in PLB-2022-2 that may have accounted for the round subsurface objects detected with magnetic susceptibility in 2019. Excavators revealed a cut in Floor 4 in the eastern portion of the unit. Excavation into this feature revealed a pit measuring approximately 30 x 30 cm (Figure 5). Middle Preclassic ceramics were found in the matrix at this level, though no artifacts appeared to be *in situ*. A similar pit was recorded in the 2017 Plaza B excavations, approximately 6 m to the west. While it may have functioned as a cache or possibly a burial cist, this association with caches found in 2017 (also located ~6 m to the west), suggests a ceremonial function. It is possible that other anomalies in Plaza B documented by geophysics are similar pit features. Excavators reached bedrock in Unit PLB-2022-2 at 150 cm below the datum. Directly on top of bedrock was a thin plaster floor (Floor 5). Two stone alignments, one running east-to-west, and another running north-to-south, were placed on Floor 5 (Figure 6). These are interpreted as architectural features; though additional excavation is necessary to confirm this.



Figure 5: Feature PLB-2022-2-1 exposed pit.



Figure 6: Unit PLB-2022-2 Floor 5 exposed in southeastern unit corner.

Excavation Unit PLB-2022-3

A third unit measuring 2 x 3 m was opened to explore the two dark circular anomalies appearing in the southeastern corner of Plaza B in front of Structure B4. Structure B4 is one of the oldest buildings in the site core, radiocarbon dated to ~1200-950 cal BC (Ebert et al. 2017). Excavators attempted to align the southeastern units with Structure B4, based on the assumption that any Preclassic caches might have been placed at the centerline in front of contemporaneous structures. However, the third unit was concluded shortly after it was opened due to the presence of modern refuse from previous excavations below the terminal plaza floor in the southeastern corner of the unit. Prior to closing, excavators encountered frequent chert artifacts (cores, flakes, and debitage) interspersed with infrequent ceramics, freshwater shell, and quartz. A single marine shell bead was recovered from the humic level above floor 1, and a Preclassic figurine fragment was found in the fill below Floor 1.

Excavation Unit PLB-2022-4

Unit PLB-2022-4 was a 2 x 2 m unit placed directly to the west of the closed and backfilled PLB-2022-3 when excavators reexamined the geophysics greyscale plot, produced from the fluxgate gradiometer survey (Figure 2), in a final attempt to locate the two subsurface anomalies in front of Structure B4. The initial floors in both PLB-2022-3 and PLB-2022-4 appear at the same depths, with the terminal plaza floor constructed only a few centimeters above Floor 2. Through the humic layer and the fill of these primary lots, excavators recovered frequent ceramics and chert, interspersed with infrequent freshwater

shell, slate, faunal remains, and quartz artifacts. The fill below Floor 4 revealed the first evidence of Preclassic occupation, including several chert drills. A partial floor with an intrusive cut was found at a level of 100-110 cm below datum in the northern half of the unit. Excavators encountered a well-preserved square of plaster in the southwestern corner of the unit at this level, distinguishable from the surrounding poorer plaster. The unit was bisected to explore the cut in the northern half of the unit, which was subsequently revealed as three overlapping floors (Floor 5 at 99 cmbd, Floor 6 at 114 cmbd, and Floor 7 at 120 cmbd; see Figure 7). Because of the paucity of cultural material between them, the three floors were excavated in a single lot and later tagged in the baulk. A Preclassic anthropomorphic figurine face and a shell bead were recovered in the fill, in addition to ceramics, chert, marine shell, fauna, and obsidian, and freshwater shell at a higher volume than preceding lots.



Figure 7: PLB-2022-4 floor 5 exposed, well-preserved in the southwest corner, cut to floor 6 in the north.



Figure 8: Units PLB-2022-4 and PLB-2022-4 Ext. closing photo, bedrock exposed.
Feature PLB-2022-4-1: Cache

In the dark loam-clay matrix below Floor 7, at a depth of 154 cm below datum, excavators encountered a dense concentration of chert flakes and debitage measuring several cm in depth and surrounded by a semi-circle of paving stones against the northeastern wall of the bisected unit PLB-2022-4. The unit was extended by 1.5 x 1 m to allow excavators to define the extent of the cache (Figures 8 and 9). Late Classic burial traditions include the practice of layering chert flakes and eccentrics over burials (Audet 2006), but no human remains were found in the fill below the cache in either the original unit (PLB-2022-4) or the extension (PLB-2022-4 Ext.). In the Classic period, chert caches are often thought to symbolize the different levels of the underworld, or the elite's association with deities (Andrieu 2020; Audet 2006). It is evident that this cache was created by knapping chert directly into the surrounding circular depression. At least 6500 chert flakes were collected (Figures 10 and 11). Other artifacts associated with this level included a fragment of a granite *mano*, a ceramic censer prong or salt pot foot, and 13 chert drills. We believe that this may be one of the earliest examples of a chert cache from the Belize Valley, and radiocarbon dating is ongoing to assess this hypothesis. The lot associated with the chert cache concluded when Floor 8 was uncovered at a depth of approximately 190 cm below datum. The floor was partially eroded and further compromised by heavy rainfall during excavation. Cultural materials decreased at this level before excavators encountered a compact marl layer above Floor 9, after which bedrock was exposed at a maximum depth of 310.5 cm below datum.



Figure 9: Feature PLB-2022-4-1 visible in the E.U. PLB-2022-4 Ext. southern baulk.



Figure 10: Feature PLB-2022-4-1 partially exposed, prior to eastern extension.



Figure 11: Sample of chert flakes from Feature PLB-2022-4-1.

PLAZA C EXCAVATIONS

Limited test excavations were also carried out in Plaza C to ground truth geophysical data. GPR data revealed a large rectangular anomaly approximately 0.5-0.80 m below the ground surface, which was interpreted as a possible square platform. A 1.5 x 5 m unit (Unit PLC-2022-1) was placed running east-to-west to expose the anomaly. Excavations revealed that the terminal plaza floor (Floor 1) was located at a very shallow depth, approximately 5 cm below the modern surface. Excavations encountered alignments of cut stone blocks encountered approximately 25 cm below surface level, likely representing alignments documented by GPR, associated with Floor 2. Ceramic associations date this context to the Early Classic period. Below Floor 2 at approximately 50 cm below the surface, excavations exposed a second surface, Floor 3. Larger cobbles were present in the western portion of the unit, directly on top of Floor 3 (Figure 12), which may be associated with one of the building's walls. Excavation exposed ballast fill composed of very small stones likely representing the fill inside the structure.



Figure 12: Unit PLC-2022-1, showing ballast fill and wall of possible structure identified by GPR.

DISCUSSION AND CONCLUSIONS

The 2019 geophysical survey of Plaza B was the first effort to employ single axis fluxgate gradiometry, and multi-depth electromagnetic conductivity, and the second application of ground-penetrating radar at Cahal Pech (see Haley and Wrobel 2006). Other research documented the success of using gradiometry and ground-penetrating radar at neighboring sites in the Belize River Valley (LeCount et al. 2019), particularly to outline architectural layouts without intrusive excavation. Clay attenuation may have impacted the efficacy of ground-penetrating radar, which failed to identify any subsurface anomalies in Plaza B. Haley (2006) documented how limestone bedrock could produce strong anomalies in GPR surveys, but limestone is magnetically neutral, so this does not account for the inconsistencies between the magnetometry survey and ground-truthing in units PLB-2022-1 and PLB-2022-2.

Although the anticipated caches were not present in units PLB-2022-1 or PLB-2022-2, the 2022 excavations in Plaza B revealed new evidence of Middle to Late Preclassic activities at the site. Excavators noted a high level of continuity between the floor elevations across these units, and the presence of several rapid replastering events in the Late to Middle Preclassic and Late Classic may indicate periods when communal rituals were prioritized at Plaza B. The chert drills retrieved from each of the Plaza B units may indicate the manufacture of marine shell artifacts was practiced across the site (Horn 2015; Powis 2009). Although marine shell artifacts only appeared in low frequencies in our excavations, their manufacture is often associated with Middle Preclassic occupation at Cahal Pech (see Ebert 2017; Ebert and McGee 2019) and may represent a temporally diagnostic pattern in the upper Belize River Valley (Awe 1992:340).

To our knowledge, the chert cache in unit PLB-2022-4 is the earliest of its kind in the Belize River Valley. The cache is located immediately north of Structure B4 and preliminary relative dates indicate it was placed in the Middle Preclassic. Although there are other examples of Middle Preclassic lithic layers from plazas in the region (see Horowitz et al. 2020), this context appears unique as it is composed entirely of chert and is not associated with burials. Cahal Pech, and particularly Structure B4, has housed some of the earliest examples of ritual caches of their kind, including a Late Preclassic jadeite dedicatory or termination cache (see Awe 1992). It is also notable that this chert cache appears during the third to fourth construction phase at the site, similar to the Cunil-phase cache associated with the fourth phase of construction in Structure B4 (Awe 1992:340). At this time, early elites at Cahal Pech were investing in monumental construction and consolidating ritual authority in large ceremonial events, which involved caches interred in public architecture and gathering spaces like Plaza B. Additional ceramic analysis and AMS ^{14}C dating will help us compare caching and ritual behavior from Cahal Pech and other Preclassic centers.

Acknowledgments The BVAR Project recognizes the continued support by the Belize Institute of Archaeology (NICH) and their Director, Dr. Melissa Badillo, who granted us permission to resume excavations at Cahal Pech in the 2022 field season. We also acknowledge the BVAR Project co-directors, Drs. Jaime Awe, Claire Ebert, and Julie Hoggarth. This project received support from many faculty at the University of Pittsburgh (Pitt), in addition to a generous summer fieldwork grant from the Pitt Department of Anthropology and the Kenneth P. Dietrich School of Arts and Sciences in support of costs associated with the geophysical survey. We acknowledge Dr. John Walden for providing revisions and edits to this report. Finally, we would like to express our appreciation for the hard work and enthusiasm of the excavators, students, and staff at Cahal Pech.

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APPENDIX A: OP PLB-2022 SPECIAL FINDS INDEX

<i>SF#</i>	<i>Lot</i>	<i>Special Find Description</i>
PLB-2022-1-1	PLB-2022-1-8	Chert drill
PLB-2022-2-1	PLB-2022-2-6	Chert drills
PLB-2022-2-2	PLB-2022-2-6	Chert drills
PLB-2022-2-3	PLB-2022-2-8	Chert drills
PLB-2022-2-4	PLB-2022-2-8	Figurine fragment
PLB-2022-3-1	PLB-2022-3-2	Preclassic figurine fragment
PLB-2022-4-4	PLB-2022-4-1	Figurine fragment
PLB-2022-4-2	PLB-2022-4-5	Chert drill
PLB-2022-4-3	PLB-2022-4-3	Preclassic anthropomorphic figurine frag.
PLB-2022-4-4	PLB-2022-4-7	Censer/salt pot fragment
PLB-2022-4-5	PLB-2022-4-8	Figurine foot fragment
PLB-2022-4-6	PLB-2022-4-7	Chert drills
PLB-2022-4-7	PLB-2022-4-8	Chert drill
PLB-2022-4-8	PLB-2022-4-8	Censer fragment
PLB-2022-4-9	PLB-2022-4-8	Savana Orange figurine fragment
PLB-2022-4-10	PLB-2022-4-13	Chert drill
PLB-2022-4-11	PLB-2022-4-8	Chert drill
PLB-2022-4-12	PLB-2022-4-8	Metate fragment
PLB-2022-4-13	PLB-2022-4-13	Chert drill
PLB-2022-4-14	PLB-2022-4-14	Chert drill
PLB-2022-4-15	PLB-2022-4-14	Chert point

APPENDIX B: OP PLB-2022 LOT INDEX

<i>Lot</i>	<i>Lot Description</i>	<i>Notes</i>
PLB-2022-1-1	Humus and modern fill	
PLB-2022-1-2	Fill below floor 1	
PLB-2022-1-3	Fill below floor 2	
PLB-2022-1-4	Fill below floor 3	
PLB-2022-1-5	Fill below floor 4	RC-PLB-2022-1-1
PLB-2022-1-6	Fill below floor 5	
PLB-2022-1-7	Fill below floor 6	
PLB-2022-1-8	Fill below floor 7	SF-PLB-2022-1-1
		RC-PLB-2022-1-2
		RC-PLB-2022-1-3
		RC-PLB-2022-1-4
PLB-2022-1-9	Fill below floor 8	
PLB-2022-1-10	Fill below floor 9	
PLB-2022-2-1	Humus	
PLB-2022-2-2	Fill below floor 1	
PLB-2022-2-3	Fill below floor 2	
PLB-2022-2-4	Feature 1: Pit	
PLB-2022-2-5	Fill below floor 3	
PLB-2022-2-6	Fill below floor 4	SF-PLB-2022-2-1
		SF-PLB-2022-2-2
		RC-PLB-2022-2-1
		RC-PLB-2022-2-2
		RC-PLB-2022-2-3
		RC-PLB-2022-2-4
PLB-2022-2-7	Fill below floor 3	
PLB-2022-2-8	Fill below floor 4	SF-PLB-2022-3 SF-PLB-2022-4
PLB-2022-2-9	Fill below floor 5	
PLB-2022-3-1	Humus	
PLB-2022-3-2	Fill below floor 1	SF-PLB-2022-3-1
PLB-2022-4-1	Humus	
PLB-2022-4-2	Fill below floor 1	
PLB-2022-4-3	Fill below floor 2	
PLB-2022-4-4	Fill below floor 3	SF-PLB-2022-4-1
		RC-PLB-2022-4-5
PLB-2022-4-5	Fill below floor 4	SF-PLB-2022-4-2
PLB-2022-4-6	Below floors 5-6	SF-PLB-2022-4-3
		RC-PLB-2022-4-6
		RC-PLB-2022-4-7
		RC-PLB-2022-4-8
PLB-2022-4-7	Fill below floor 7	Feature PLB-2022-4-1
		SF-PLB-2022-4-4
		SF-PLB-2022-4-6
		RC-PLB-2022-4-9

<i>Lot</i>	<i>Lot Description</i>	<i>Notes</i>
PLB-2022-4-8	Feature PLB-2022-4-1: Cache	SF-PLB-2022-4-5
		SF-PLB-2022-4-7
		SF-PLB-2022-4-8
		SF-PLB-2022-4-9
		SF-PLB-2022-4-11
		SF-PLB-2022-4-12
		RC-PLB-2022-4-10
		RC-PLB-2022-4-11
		RC-PLB-2022-4-12
		RC-PLB-2022-4-13
		RC-PLB-2022-4-14
		RC-PLB-2022-4-15
PLB-2022-4-9 (Ext)	Humic	
PLB-2022-4-10 (Ext)	Fill below floor 2	
PLB-2022-4-11 (Ext)	Fill below floor 3	
PLB-2022-4-12 (Ext)	Fill below floor 4	
PLB-2022-4-13 (Ext)	Below floors 5-6	SF-PLB-2022-4-13
		RC-PLB-2022-4-16
PLB-2022-4-14	Fill below feature PLB-2022-4-1	SF-PLB-2022-4-14
		SF-PLB-2022-4-15
PLB-2022-4-15	Fill below floor 8	RC-PLB-2022-4-17
PLB-2022-4-16	Fill below floor 9	RC-PLB-2022-4-18

FURTHER INVESTIGATIONS OF THE WESTERN BALLCOURT, CAHAL PECH, BELIZE

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INTRODUCTION

The Western Ballcourt is the westernmost structure that appears on the map of the site core of Cahal Pech and, since 2016, has been the focus of excavations for the American Foreign Academic Research (AFAR) field school project that operates under the aegis of the Belize Valley Archaeological Reconnaissance Project (BVAR). AFAR's work on the Western Ballcourt has been protracted and greatly impacted by outside environmental, climatic, and global human health factors. While excavations began with a season in 2016, for the 2017 season AFAR had to move its attention to another part of the site due to damage from Hurricane Earl covering the Western Ballcourt. AFAR returned to work on this ballcourt in 2018. Work continued in 2019 but was paused again during the summers of 2020 and 2021 due to travel and safety precautions arising from the COVID-19 pandemic. This report summarizes the work carried out by AFAR in July of 2019 and July of 2022. Dr. Jaime Awe and C. Mathew Saunders oversaw all aspects of the project with the support of Christy W. Pritchard, James C. Pritchard, Dr. Stanley Guenter, Dr. Marc Zender, and L. Michael Creswell. Five Belizean archaeologists and thirty-six students were instrumental in the success of the project over the two seasons of work.

The site of Cahal Pech was built atop a hill overlooking the Macal River in western Belize (Figure 1) and is today on the edge of the modern town of San Ignacio, the second largest urban area in the country. Due to its location and ease of access, the archaeological site has been the focus of investigations and excavations for five decades now, the most important being those by the BVAR Project (see Awe 1992, 2008, 2013; Awe and Campbell 1989, among others). The Western Ballcourt is located just below the ancient royal palace of Cahal Pech, which is composed of the structures surrounding Plazas A, D, and E (Figure 2). Like its eastern counterpart, the Eastern Ballcourt, the Western Ballcourt is situated on a lower elevation than the rest of the site core. However, while the Eastern Ballcourt is surrounded by other low structures forming Plaza C, the Western Ballcourt stands relatively isolated and no other major structures are found nearby other than the

massive platform on top of which the palace itself is built. This liminal nature of the Western Ballcourt and its connection with, yet clearly separate position from the palace make it an object of special interest in attempting to understand the ancient site of Cahal Pech. Since 2016, the AFAR project has focused its attention on the many questions surrounding the Western Ballcourt, including the construction history of the ballcourt, the means of access (stairway) from the palace, and any potential architectural decoration of the platform terrace immediately to the east of the ballcourt. In addition to the desire to answer research questions, AFAR's excavations have also been designed with site preservation and consolidation for tourism purposes in mind and the two buildings of the Western Ballcourt, namely Structures WBC-1 and WBC-2, have now been conserved courtesy of Jorge Can and are on display and accessible to tourists via a modern staircase providing access from the western edge of the royal palace.

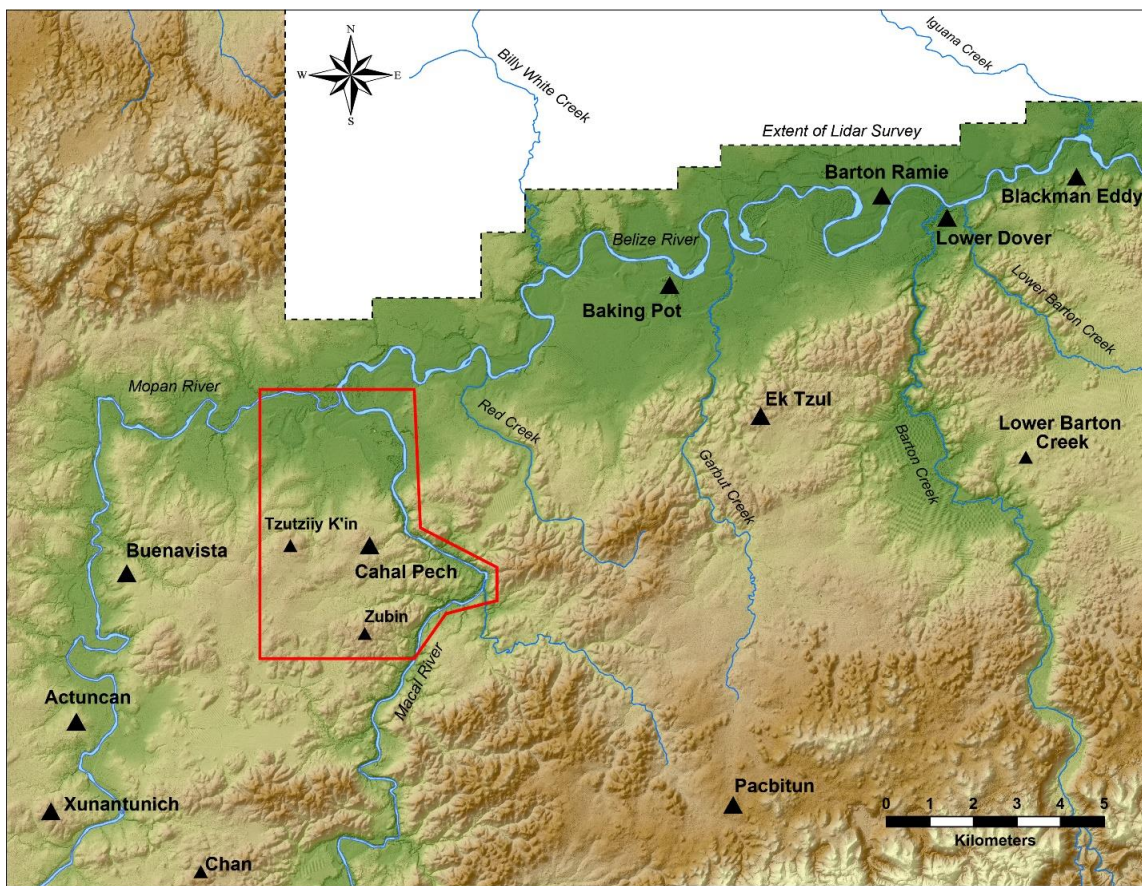


Figure 1: Map of Sites in Western Belize (Map by C. Ebert, 2018, courtesy of the BVAR Project).

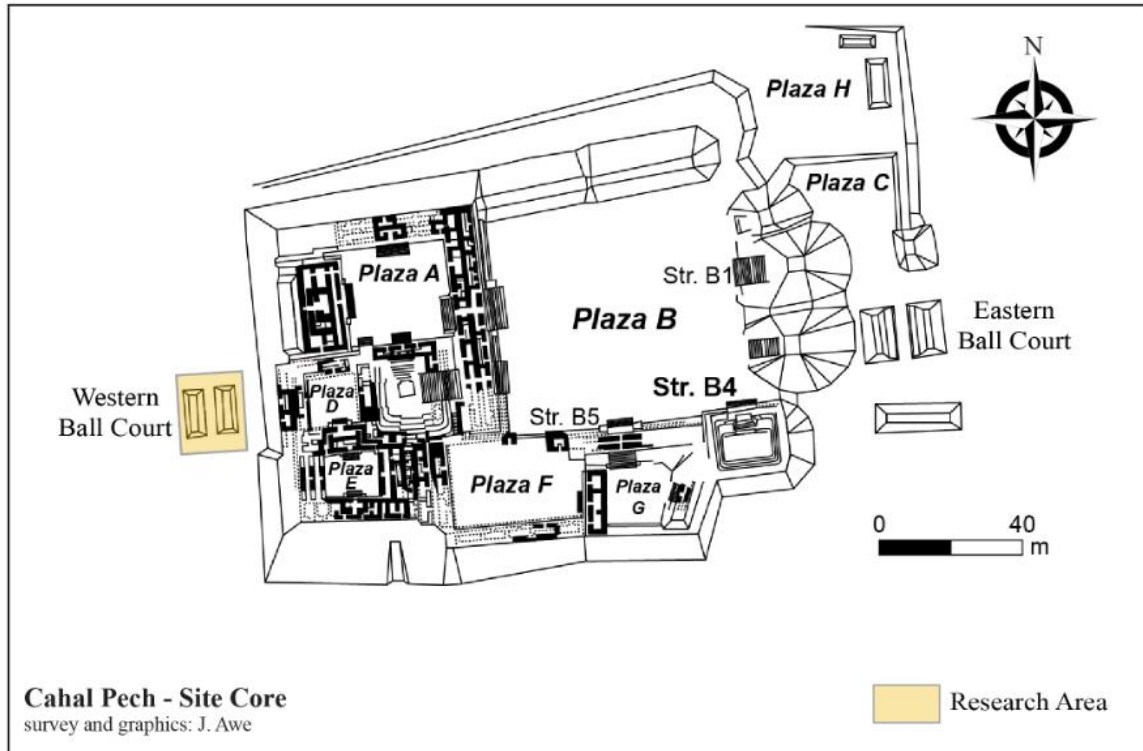


Figure 2: Map of Cahal Pech. Map of Cahal Pech Site Core (Map by Jaime Awe, 2010, courtesy of the BVAR Project).

BACKGROUND

Like a number of other archaeological sites in the region, Cahal Pech has two ballcourts. The Eastern Ballcourt is located just east of the site’s main temples, the eastern triadic complex of Structures B1, B2, and B3. Like the Western Ballcourt, it is located on a lower level than the main plaza of the site center, though the difference in elevation is considerably less and Plaza C, surrounding the Eastern Ballcourt, is much more integrated into the site center. For these reasons, the Eastern Ballcourt saw investigation and excavation earlier than the Western Ballcourt. As part of the Belize Valley Preclassic Maya Project, James Garber conducted excavations of the Eastern Ballcourt in 1995 (Santasilia 2013), the investigation of which was expanded in 2012 by further excavations carried out by Catharina Santasilia (*ibid*). These provided considerable data on the construction history of the area, though it suggested that the ballcourt was built in a single phase in the Late Classic period (*ibid*, Ball and Taschek 2001). Following the excavation of the ballcourt and surrounding structures and platforms, almost all of the structures of Plaza C were consolidated and restored for tourism purposes.

AFAR began its excavations of the Western Ballcourt in 2016. Prior to this, as reported by Ball and Taschek (2001:185), there was a preliminary test pit placed in the center of the court, which discovered no center-court cache, indicating at least one fundamental difference between the Eastern and Western Ballcourts at Cahal Pech. The Eastern Ballcourt had produced a number of caches in the center of the playing court, the

most important of which consisted of two secondarily interred infants, marine shells, and five obsidian eccentrics (Ball and Taschek 2001:183, Santasilia 2013:51). While no centerline cache was found, AFAR's 2016 season did recover a *mano* and *metate* left on the northern side of the playing alley, perhaps as a termination desanctification offering (Pritchard et al. 2017).

While the 2016 season was designed to find the latest preserved architecture of the ballcourt (or the penultimate one if the ultimate phase was too badly preserved) in the center and edges of the playing court, the next season intended to clear the playing court entirely and one further season was used to uncover the lowest level of architecture around the entirety of Structures WBC-1 and WBC-2. These investigations revealed that Structure WBC-1, the western structure of the ballcourt, is approximately 16.5 m long and 7 m wide, while its mate, Structure WBC-2, the eastern structure, is approximately 15 m long and 7.5 m wide (Figure 3). The two structures of this ballcourt are thus not identical and the remaining bulk of Structure WBC-2 is slightly higher than WBC-1. Unfortunately, the upper sections of both structures are so poorly preserved that it is impossible to determine whether this reflects an original difference in height between the two structures that comprise the Western Ballcourt. The playing field itself is approximately 4 m wide.

Very few complete artifacts were found during the excavations of 2016 and 2018. This is unsurprising as the excavations have proceeded only to the first phase of architectural remains evident and so these artifacts were found within humic layers and have thus been subject to considerable disturbance and erosional pressures over the last millennium. While much of this material is likely from structural fill, infiltrating the humus after natural deterioration of the structures, some of it may not be from the ballcourt structures themselves but may have fallen from the palace above. Other material may have been deposited by very late visitors to the site, in the years immediately after the abandonment of the site and others, perhaps, visiting an already jungle-enshrouded site in the centuries afterwards.

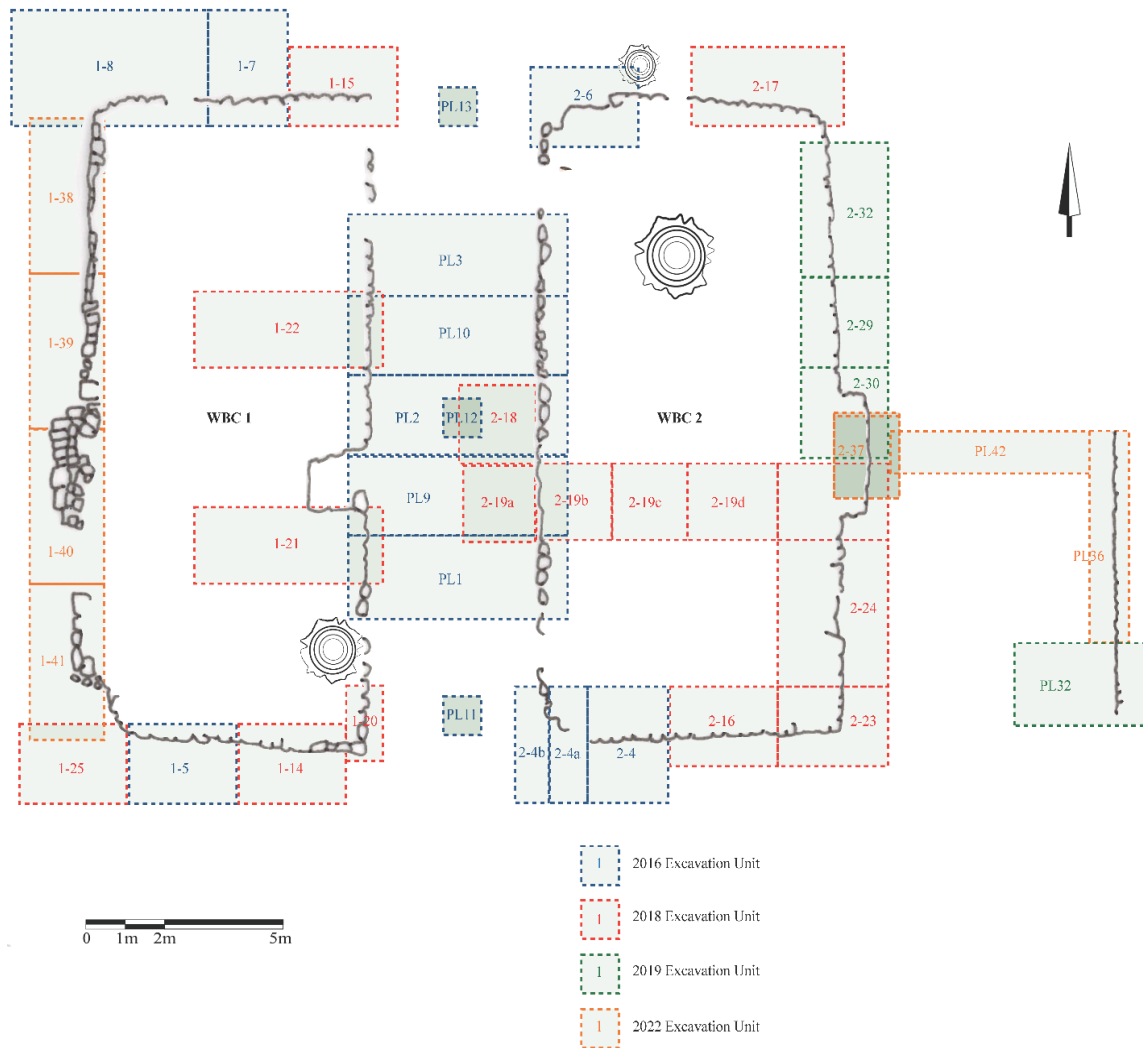


Figure 3: Plan map of excavation units associated with the Western Ballcourt of Cahal Pech.

METHODS

The AFAR excavations of the Western Ballcourt involve four separate foci of investigation. These are, from west to east: 1) Structure CHP-WBC-1, which is the structure to the west of the playing alley; 2) the playing alley of the ballcourt itself; 3) Structure CHP-WBC-2, which is the structure to the east of the playing alley; 4) the area between Structure WBC-2 and the terrace of the platform on top of which the royal palace above is located. Excavations began in 2016 in the playing alley and progressively moved outwards, around and over each of the structures that comprise the Western Ballcourt over the following seasons. These helped to define the structures and their relationship to the playing alley that unites them. As our work continued on to the back (east) side of Structure WBC-2 a well-preserved outset staircase was discovered, which would have provided a

walking route onto this structure from the east. That is to say, from the direction of the palace, up above and to the east. In the 2019 season work was continued on completing the excavations around WBC-2 and, in addition, a small 2 x 3 m unit was placed four meters east of the western wall of WBC-2 to begin investigating the liminal space between the ballcourt and the steeply-sloped platform on which the palace is located. Within this exploratory unit, a plaster floor consistent with the depths of the terminal floor found associated with WBC-2 was found.

As in our previous seasons, we excavated all units by cultural levels. Due to time constraints, our seasons being a mere ten working days, our excavations aimed simply to reach the ultimate construction episode and thus we have encountered mostly only eroded and fragmentary artifacts in the humus or sub-humus layers. All of this material was screened using ¼ inch mesh. Artifacts and cultural materials were collected and bagged by class and unit and these have been processed through washing, sorting, and counting, and these materials await future analysis, although, as noted above, their fragmentary and eroded nature and the fact that they were recovered from the humus means they have little use to our attempts to understand the construction history of the ballcourt, although they do have the possibility of providing information on the history of usage of the ballcourt and, especially, post-abandonment visits to the site as well as the taphonomic processes associated with the gradual disintegration of the structures in the vicinity of the ballcourt. The artifacts that have been recovered include ceramics, chert flakes, freshwater and marine shell, as well as quartzite, obsidian, and granite *mano* fragments. Documentation of our excavations includes not only written records, but also photographs as well as plan and profile drawings of architectural features.

EXCAVATIONS

Structure CHP-WBC-1 Excavations

Western Wall

The western wall of Structure CHP-WBC-1 was first defined by excavations in 2016 with the excavation of Unit 1-8, which was placed along the northern wall and where the archaeologists encountered the northwest corner of Structure CHP-WBC-1. The southern end of the western wall was encountered by archaeologists with the excavation of the unit 1-25 in 2018 which contained the southwestern corner of that same structure. The 2019 field season focused efforts on Structure CHP-WBC-2 so no work was undertaken on CHP-WBC-1 between 2018 and 2022. The 2022 excavations along the western wall consisted of four units, each measuring 2 meters from east to west and 4 meters from north to south (1-38, 1-39, 1-40, 1-41). Unit 1-38 was the northernmost unit, encompassing the northwest corner of Structure CHP-WBC-1, and the four units ended with Unit 1-41, which connected with the previously excavated Unit 1-25 and included the southwest corner of the structure. The soil profile within each of the units contained three strata which included dark grayish-brown overburden, which was underlain by light gray collapse, and was in turn underlain by light gray collapse with broken plaster. Artifact classes contained within the excavated soils included the ubiquitous badly eroded ceramic sherds, chert fragments,

as well as freshwater shell. Special finds contained within the units included obsidian blades, an early-stage chert biface, and two chert projectile points, likely dating to the Late Classic (AD 600-900) period (Figure 4). A very high frequency of limestone rubble was also removed by the field crew during the excavation of the units. This limestone rubble represents the totally destroyed and crumbled upper parts of Structure CHP-WBC-1. No clearly carved stones were found, suggesting that any decoration of the structure was likely very basic and/or made out of stucco that has subsequently totally eroded away.

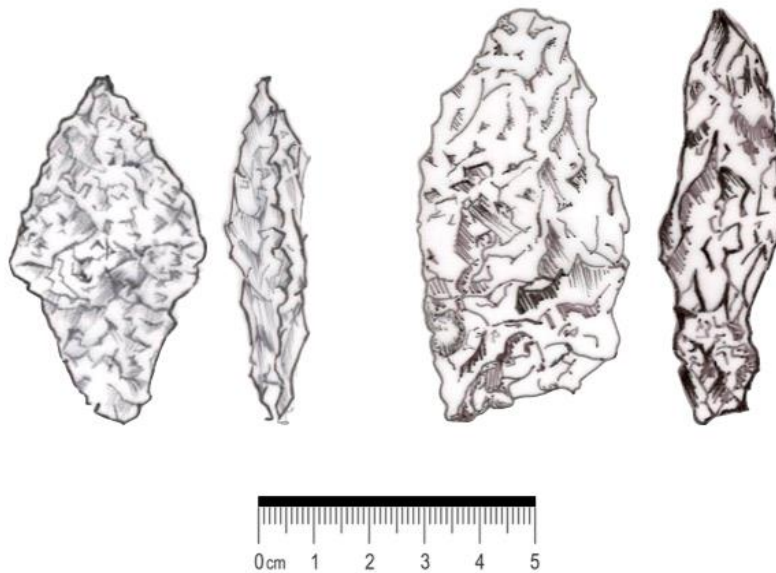


Figure 4: Projectile points found in the 2022 season in excavations on the west side of Structure CHP-WBC-1 (Illustration by Emma Lippiner).

Excavation of the units revealed that a very large amount of the western wall of Structure CHP-WBC-1 remains intact and includes approximately four to five courses of stone, with the exception of the southern end, within Unit 1-41, which has been disturbed by the growth of a large tree. Additionally, the excavation of the units revealed an outset staircase in the approximate center of the western wall of Structure CHP-WBC-1 which extends to the west. This staircase mirrors the one identified on the eastern wall of Structure CHP-WBC-2 which was identified during excavations during the 2019 field season.

Structure CHP-WBC-2 Excavations

Outset Staircase

During the 2019 field season AFAR investigations of the Western Ballcourt were focused entirely on Structure CHP-WBC-2 and the area immediately to its east. In order to finish uncovering the eastern wall of this building and reveal the northern section of the

outset staircase found at the end of the previous season, a number of units were laid out north of the centerline of the structure. Units 2-29 and 2-30 both measured 2 x 2 m and were placed immediately north of the staircase. Completing the units in this area was Unit 2-31, which measured 2 m east-west by 3 m north-south and it was placed immediately north of Unit 2-29 and cleared the northernmost section of the east wall of Structure CHP-WBC-2. The outset staircase was revealed in its entirety and determined to be 3 meters wide and set astride the central axis of the eastern side of the building. Although the blocks of the upper steps were found thoroughly dislodged and out of place, all of the basal staircase stones were in place as well a number of other stones making up additional courses. From these remains we were able to safely determine that the staircase had at least four steps. Due to the great preservation of the staircase and the regional pattern of placing dedicatory caches beneath such structures, we decided to place a 2 m north to south by 1.6 m east to west penetrating excavation unit in the heart of the staircase (Figure 5). We established the unit in a position that would allow us to not only investigate below the staircase but also explore the plaza floor to the east of the staircase limits. We separated the area within the staircase and the area east of the staircase, treating these areas as two separate units and gave each layer within the units unique lots despite the fact that many layers matched those found in the neighboring unit.

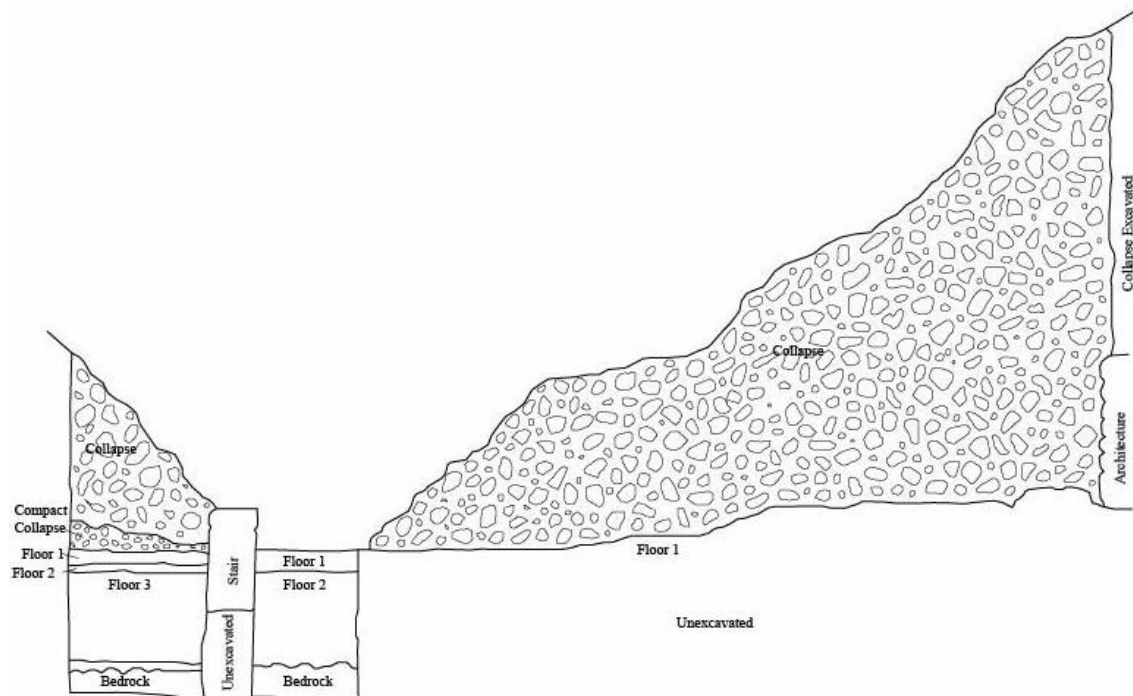


Figure 5: Profile view of the north wall of Units 2-37 and PL-42.

Within the units, patches of plaster floor were consistently found. In total, three unique floors were found throughout both units. Due to the placement of the basal stair stones, it appears that the staircase was likely constructed at the same time as the penultimate plaza floor was added. The staircase being added during the same building phase as the terminal floor is also a possibility but there were no obvious signs of the floor

being broken through in order to place the stones at the lower depth and their alignment with the penultimate floor seem more likely. No caches of any sort were found during the excavations. A high frequency of ceramic sherds and unfinished lithic debris were all that were present and the distribution of the cultural material lends itself to the idea that these items were used for construction fill only. Once we reached the depth of 68cm below ground surface, we reached bedrock and the units were closed.

While most of the artifacts found in our excavations of Structure CHP-WBC-2 were fairly generic, two are worthy of mention. Both notable artifacts were found in our 2019 excavations in the area just north of the staircase of the structure. The first find is a set of nine reworked sherds that were clearly designed to function as sinkers on a fishing net (Figure 6). The sherds are not of uniform size and vary from 3 to 4.5 cm long and from just under to just over 2 cm wide. Notches are found on almost all of the shorter sides of these sherds. Although we were not able to map out the positions of each of these nine sherds, they were found very close together and must have originally been deposited or fallen together and it is highly likely that they were still connected on a net when they landed in this location next to what must have already then been a crumbling ballcourt. Maya net sinkers are fairly common in Postclassic contexts in riverine and lacustrine environments. Examples are found nearby at Baking Pot and Barton Ramie (see Hoggarth 2012: 200; Willey et al. 1965: 408; Fig. 260). A set of 28 were found at the site of Trinidad de Nosotros, on the northern shore of Lake Peten Itza (Moriarty 2004:21). Interestingly, these net sinkers from Central Peten dated to the Early Postclassic period and this would be a plausible date for the ones we found by the Western Ballcourt of Cahal Pech as well since they were found above the terminal floor. It is possible that the net sinkers were from construction fill but, if so, one would expect the sinkers to have been more widely dispersed than they were.



Figure 6: “Net sinkers” found in 2019 next to Structure CHP-WBC-2 (adapted by Tia Watkins).

The second special find from this area of our excavations in 2019 is an anomalous ceramic sherd that has the general shape of a spearpoint (Figure 7). It is 12 cm long by 6 cm wide and made of a perfectly flat piece of ceramic. Unless this was specially made, it must have been reshaped from a large, flat sherd. This could only have come from the bottom of a plate or perhaps a *comal* but a special production must be considered as well. The edges are not perfectly smooth and the shape not perfect but it is clearly not the product of natural taphonomic processes and must represent a willful production of this shape. While it could be a work of whimsy, it could also have been a child's toy. We are unaware of any similar ceramic artifact and this piece certainly bears further investigation.



Figure 7: Ceramic “spearpoint” found in 2019 next to Structure CHP-WBC-2 (adapted by Tia Watkins).

Acropolis West Wall

During the 2019 field season, a 2 x 3 m test unit was placed 4 meters west of western wall of CHP-WBC-2. This unit, Unit PL-32, was placed in its chosen location in hopes of catching the same plaza floor associated with CHP-WBC-2 as well as any architectural features underneath the extreme slope, which was assumed to be collapse from either the construction elements of Plazas A, D, or E or some form of transitional architecture between the Western Ballcourt area and the acropolis.

The excavations resulted in the exposure of a pristine plaster floor which ran from the western unit wall for two meters east where it terminated in a clearly defined row of

finished stones. The presence of these stones were evidence that the liminal space between the western ballcourt and the acropolis was comprised of additional finished architectural features and not just collapse from the acropolis above. Two additional complete courses of finished facing stones were found above the basal course and a portion of a potential fourth and fifth course were present in the northernmost section of the wall. Due to time limitations, the area was secured with the intent to reopen and expand these excavations in future seasons.

In 2022, after much anticipation, we were able to reopen the investigation into the west wall of the acropolis. The original 2 x 3 m unit was cleaned to the previously exposed floor and a 1-meter-wide exploratory unit, PL-36, was established to follow the known wall northwards. The goal of the unit was to see how far the wall continued to the north but also to ascertain whether several of the larger stones found in the fourth and fifth courses were collapse or original masonry. It was quickly determined that there were two separate lots within the 1-meter-wide unit. The topmost lot was comprised of material from the surface to roughly 1 meter above the floor. The soil consistency and matrix of this lot was made up of loose, powdery, fill with core stones. The lot below this was considerably denser and contained more ceramic sherds than the lot above. It was lighter in color, with an almost marl-like consistency. It was in this lower lot that the majority of cultural material was found, including hundreds of ceramic sherds, most noteworthy being seven pieces of a Late Classic polychrome bowl with a number of glyphs and pseudoglyphs, including a clearly-legible painted head variant hieroglyph of the logogram K'INICH (Figure 8) The exploratory excavation of the western wall continued northward for 5 meters before the decision was made to pause for the season. The termination of the acropolis west wall was not present in the unit, so it is certain that it continues to run north. The wall was present throughout the entire five-meter unit, reaching as many as six courses high in some locations. The plaster floor was also found intact throughout the entirety of the unit.

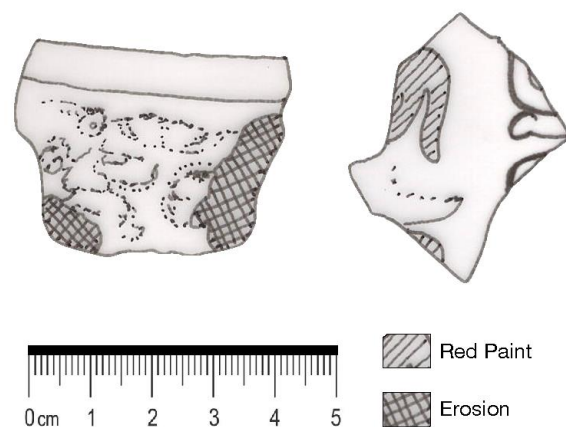


Figure 8: Sherds bearing fragmentary hieroglyphs found in the 2022 season in excavations between the Western Ballcourt and the terrace wall of the Cahal Pech acropolis (Illustration by Marc Zender).

DISCUSSION AND CONCLUSIONS

Four seasons of excavations at the Western Ballcourt of Cahal Pech have revealed much about this, the second ballcourt of the site, despite the considerable natural destruction of both of its component structures. The two structures are similar, but not perfect mirrors of each other. Structure CHP-WBC-1, the western structure, is approximately 16.5 meters long (north-south) and 7 meters wide (east-west) while Structure CHP-WBC-2, the eastern structure, is approximately 15 meters long (north-south) and 7.5 meters wide (east-west), and the playing alley that divides them is approximately 4 meters wide. The latter structure has a staircase of at least 4 steps on its back (eastern) side, which is approximately 3 meters wide. There is an analogous staircase on the back of Structure CHP-WBC-1 that is also approximately 3 meters wide. Severe damage to the upper sections of both structures precludes our ability to say much about this area of the buildings but the lack of any vault stones and the general lack of well-dressed wall stones anywhere in this area suggests that these structures had either no superstructures or that these were made wholly of perishable materials, such as pole-and-thatch constructions.

To date, we have made only minor investigations below the terminal floors that we have uncovered and so we are not yet able to say much with certainty about the construction history in this area of Cahal Pech. Three floors are found immediately east of Structure CHP-WBC-2, between the ballcourt and the large platform on which the rest of the site center is built, and the staircase of Structure CHP-WBC-2 appears to have been built coeval with the second of these three floors. Whether the ballcourt itself predates the staircase or was built at the same time remains to be tested, but contemporaneous construction of both the ballcourt structure and its access staircase seems most likely and logical.

No major caches or burials have been found in our excavations to date; their absence likely being the result of our limited penetrating excavations we have done to date. However, testing in the playing alley in the most common areas in which caches are often found in other ballcourts has revealed nothing to date. The only special deposit we have discovered is the mano and metate left on the northern side of the playing alley at some point during the abandonment process of this area of the site.

Considerable work had been done in conserving and displaying the Western Ballcourt prior to the 2022 field season, as outlined in previous reports (Pritchard et al. 2017, Saunders and Guenter 2019). Following the 2022 season and the uncovering of the entire western wall of Structure CHP-WBC-1 and the staircase on the east side of Structure CHP-WBC-2 were conserved by Jorge Can and his team and these buildings are now on display for tourists (Figure 9). In addition, in 2019 park authorities built a modern staircase leading down to the Western Ballcourt from the back (western) side of the Cahal Pech palace, making this second ballcourt of the site accessible to tourists for the first time.



Figure 9: View looking southwest of the Western Ballcourt of Cahal Pech following 2022 consolidation (Photo by Jorge Can.)

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INVESTIGATING EK TZUL: EXCAVATIONS OF STRUCTURE A2

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INTRODUCTION

Technological innovations over the past few decades have revolutionized the way archaeology has been done. Primary among these has been light detection and ranging (lidar). Lidar allows archaeologists to peel back the forest cover to reveal the ground surface below and any structures that may be present on it. This is incredibly valuable as it saves enormous amounts of time that would otherwise have been spent surveying the forest on foot to locate the structures. A Lidar survey in 2013 expanded an earlier survey done at Caracol in 2009 (Chase et al. 2014; Chase et al. 2011; Weishampel et al. 2010). This new survey covered a large swath of western Belize from Caracol in the south to El Pilar in the north, and from the Guatemalan border east to Blackman Eddy. The lidar data uncovered previously unknown architecture at Xunantunich, Pacbitun, and other sites in the Belize River Valley (Chase et al. 2014; Ebert et al. 2016). Unexpectedly, the site of Ek Tzul was detected southeast of Baking Pot on the foothills running along the southern flank of the valley.

Ek Tzul and the Belize River Valley

The Belize River flows from the confluence of the Mopan and Macal Rivers eastwards towards the coast. The river is framed by alluvial bottomlands which were the location of many of the polity capitals during the Classic period. This flat, valley bottom slowly transitions into rolling hills that eventually connect with the Mountain Pine Ridge

and the Maya Mountains. Ek Tzul is in these rolling foothills on the southern side of the valley (Figure 1). Positioned on the top of a hill, Ek Tzul has a view of the valley to the north and the Mountain Pine Ridge to the south (Figure 2). Nestled in these hills, the site would have inhabited a geospatially liminal zone between the sites of the valley and those further south, such as Pacbitun.

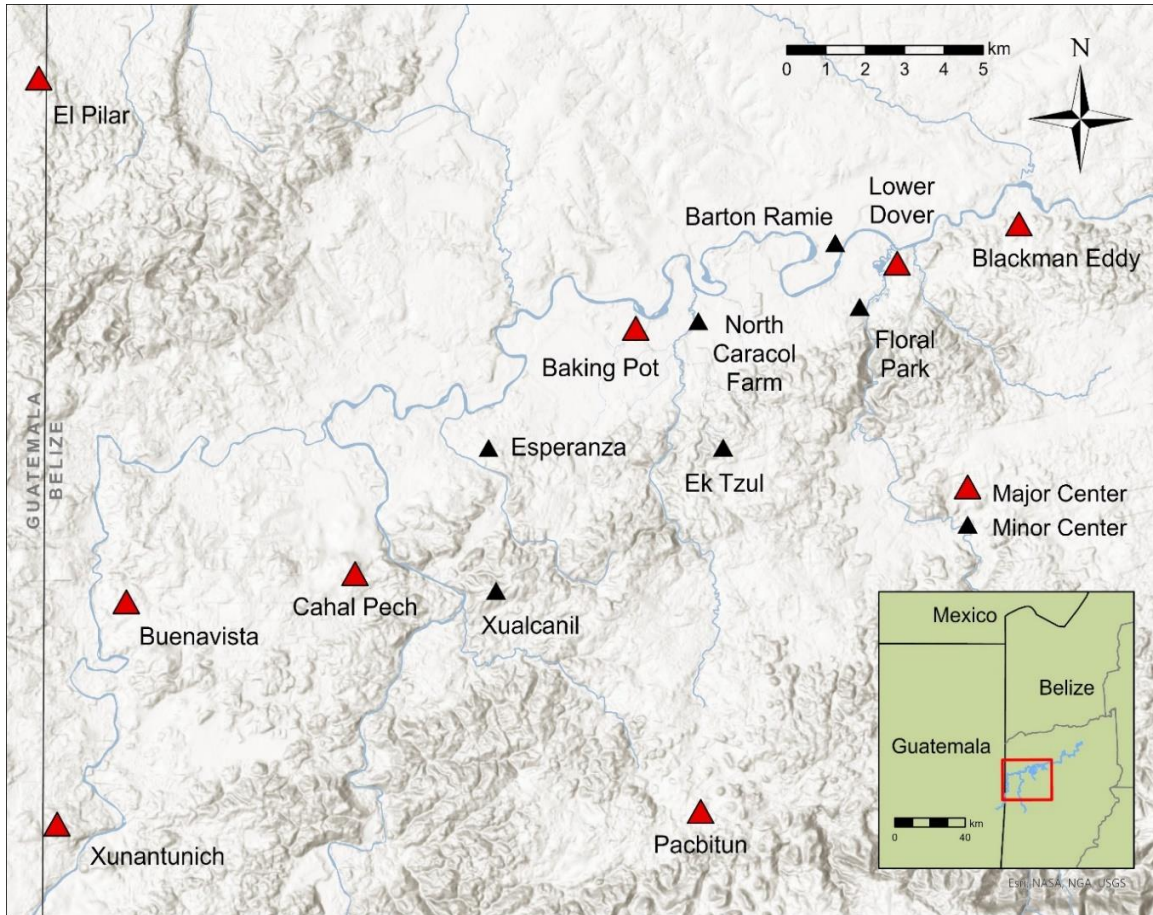


Figure 1: Map of Upper Belize Valley indicating location of major and minor centers.

Today, Ek Tzul lies near the modern town of Georgeville, Cayo District. It is surrounded today by wamil (dense secondary growth) pastures, agricultural fields, and the village dump. The terrain consists of limestone hills covered in dense forest and coconut palms, though the hillside leading up to the site is covered mostly in a fern-like grass. No rivers flow near the site, but a few creeks originate at springs to the north and flow into the valley, ultimately emptying into the Belize River. To the south of Ek Tzul, the landscape levels out somewhat before rising again in a second band of foothills running east/west to the south of Pacbitun.

Polity Capitals and Minor Centers

Within the Belize Valley, there is a diversity of site forms from the polity capitals (Tier 1 sites), such as Baking Pot and Cahal Pech, to the small house mounds found scattered throughout the valley. This variation can be categorized into tiers of political hierarchy in which the apical elite inhabited the polity capitals at the top of the hierarchy and commoners lived in the dispersed plazuelas and house mounds at the bottom (Awe et al. 2014; Bullard 1960; Helmke and Awe 2012; Hoggarth et al. 2010). Occupying the middle tiers (Tier 2-5) of this hierarchy are minor centers of varying size which were inhabited by intermediate elites as well as high-status commoners (Walden et al. 2019).



Figure 2: View from Plaza B looking south.

Polity capitals are characterized by Eastern Triadic Structures (or assemblages), ballcourts, palaces, stelae, altars, large temples with corbel vaulting, large plazas, and other features not replicated at every level of the polity hierarchy (Awe et al. 2017; Helmke and Awe 2012). The minor centers that surround these polity capitals are scaled-down versions, often containing various degrees of monumental architecture that characterize the Tier 1 sites (Walden et al. 2019).

Despite initial interpretations that Ek Tzul represented a major center based on lidar data (Awe et al. 2015; Ebert et al. 2016; Walden et al. 2019), archaeological investigation shows that Ek Tzul was one of the larger minor centers, or Tier 2 sites, in the valley, comparable to North Caracol Farm, Floral Park, and Xualcanil. These large minor centers

are essentially miniature administrative centers but not polity capitals, though they contain many of the same architectural characteristics. Like the other minor centers, intermediate elites resided at these Tier 2 centers. However, unlike the others, the larger minor centers are located further away from the capital sites, though not far enough as to be administratively autonomous. The placement of these sites, the architectural similarities to the polity capitals, and the presence of intermediate elite residences suggest that these sites served as intermediaries between the elites living in the capital and the commoners living in the hinterlands (Walden et al. 2019).

Site Overview

Since Ek Tzul was first identified on the lidar in 2013, no survey or excavation had been undertaken. The 2022 field season was the first year of excavations conducted at the site. Prior to the start of the season, the lidar was ground-truthed to determine the accuracy of the survey data. While ground-truthing required substantial effort to maneuver through the brush, the results verified that the lidar data was fairly accurate in portraying actual structures on the ground. Further ground-truthing is needed at some parts of the site as they were not able to be reached during this season.

Based on the Lidar and ground-truthed structures, Ek Tzul consists of three plazas (Figure 3). The southwest plaza, Plaza A, is the larger of the two plazas in the western group and served as the public plaza. On the north end sits Structure A1 which has been heavily looted. To the north of Structure A1 is the ballcourt. During our excavation in the ballcourt, Hart Robato, one of our local excavators, mentioned that a rockshelter was not too far from the ballcourt. Robato proceeded to relocate the rockshelter which was only a few meters downhill from the ballcourt. This rockshelter was likely used by the Maya in connection with the ballcourt (see Ellis et al., this volume). On the east side of the plaza lies Structure A2, the focus of our excavations during the 2022 field season. This structure was believed to be an Eastern Triadic Structure as it is located on the eastern edge of Plaza A and is the tallest structure at the site standing roughly seven meters high. Eastern Triadic Structures formed the nexus of Classic Maya ancestor veneration (Awe et al. 2017; Brown 2017). Therefore, this structure is important for understanding the social and political organization of Ek Tzul. Additional structures also delimit the western and southern sides of the plaza.

Plaza B lies to the northeast of Plaza A and was presumably used as a noble or elite residence, because it seemingly has more residential than ceremonial architecture, access to it is more restricted, and it is positioned higher on the hill overlooking Plaza A. On the north side of this plaza is Structure B1 which has also been heavily looted. Bordering the other two sides of the plaza are the remains of two low structures (B2 and B3). Behind these structures, the hill drops off sharply to the settlement area beyond. In the center of Plaza B lies a chultun (an underground storage pit) which had been carved into bedrock. Running directly east from Plaza B is a sacbe (causeway). While sacbeob are common at Tier 2 minor centers (Walden et al. 2019), this instance seems particularly ephemeral. While seemingly clear on the lidar, the sacbe was difficult to detect through pedestrian survey and it remains possible that much of it is fashioned from modified bedrock.

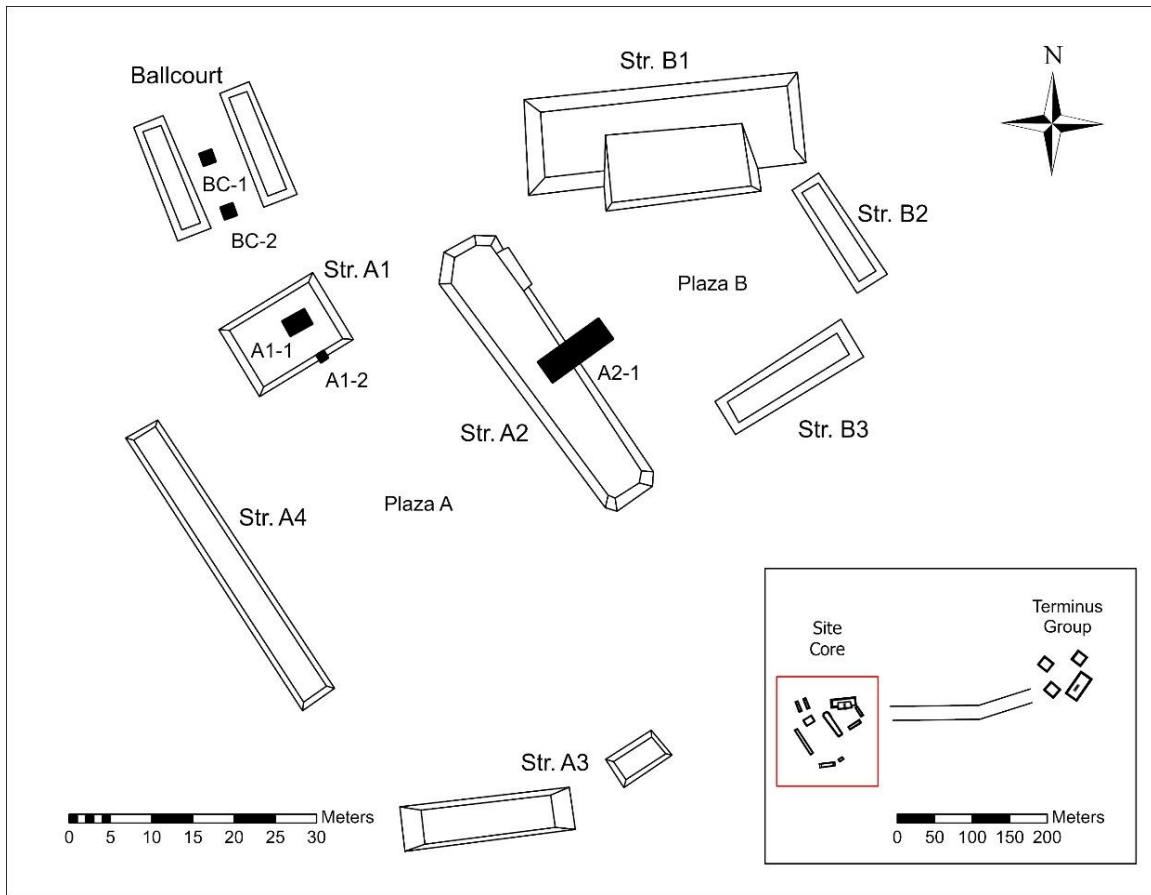


Figure 3: Site map showing Plazas A and B at Ek Tzul. Excavation units of 2022 field season labeled in black.

Plaza C comprises the sacbe terminus group. It appears to be surrounded by four structures, one at each cardinal direction. The tallest, the eastern structure, is heavily looted with a sizeable hollow shaft running down its center. It remains highly likely that this structure contained elaborate elite interments (see Cheetham 2004). However, this area is still covered by dense vegetation. Additional work is needed to ground-truth the lidar in the terminus group.

The lidar also shows an extensive settlement around the site core, most of which has not been ground-truthed at this time. However, three commoner house mounds located on the property of Galen University to the north were brought to our attention by faculty. These mounds were visited, and tentative plans were made to excavate these mounds in collaboration with Galen University. Pedestrian survey revealed all three of these structures to be Late Classic in date (based on surface ceramics from two tree bowls).

Research Questions

The excavations into Structure A2 were the primary focus of the 2022 excavations. These excavations were driven by three research questions:

- 1) **What was the architectural construction sequence at the center? How do labor costs chart diachronically?**
- 2) **Did Structure A2 serve as an elite eastern triadic structure, and if so, how wealthy were the elite interments?**
- 3) **How did the wealth, status, and activities of elite occupants of the center change over time based on artifacts redeposited from middens into architecture?**

Structure A2 was targeted for excavations because it was believed to be an Eastern Triadic Structure which often contain evidence of the earliest occupation of a site (Brown 2017; Chase and Chase 2017; Chase et al. 2017; Estrada-Belli 2010; Freidel 2017). This is because these structures contain the burials of lineage heads and important ancestors (Awe et al. 2017; Brown 2017). Lineage status is often based on the principle of first occupancy where the founders of the site were able to select the best land and resources which in turned are passed down through the generations (McAnany 2013:96-97). In this way, the initial occupants of the site were able to acquire more resources and increase their status over later settlers. As a visible reminder that their ancestors first occupied the land and passed it down to them, the descendants built these structures containing the remains of these ancestors. This internment in structures created a “genealogy of place” that materialized the chain of continuity of inheritance in resources (McAnany 2013). Therefore, eastern triadic structures often represent some of the earliest architecture at the site, constructed by descendants of the first occupants as a way to enshrine their position on the landscape.

Initial investigations of looter’s trenches in Plaza A and test units in the ballcourt (see Ellis et al. this volume) revealed that much of this construction appeared to be single component Late to Terminal Classic. In contrast, Structure B1 was riddled with looter’s trenches which revealed the presence of corbelled vault architecture and Terminal Preclassic and Early Classic ceramics. Based on these features, this structure is assumed to be the elite residence. Moreover, we might expect the initial founders to situate themselves on this prominent hilltop (Plaza B) and not slightly downslope (Plaza A). Excavations into Structure A2 sought to identify these earliest phases to construct the site’s chronology. Additionally, these earliest phases would represent the organization of the site in its earliest form before it gained political prominence. Understanding the growth and transformation of Ek Tzul through time is critical for examining sociopolitical transitions in the valley.

METHODS

To answer these questions, a 3 x 9 m trench was placed on the eastern side of Structure A2 (Figure 3). The eastern side was chosen as the western façade was too large

to excavate at this time. The trench was placed to excavate what appeared to be the back staircase of Structure A2 from Plaza B. It was placed along the centerline, where most burials occur, and extended from the midline of the structure's apex to the base in Plaza B. The unit also extended slightly out into Plaza B to provide data on the associated construction sequences of Plaza B. The east side of the trench opened unto Plaza B to examine how the plaza floor surfaces intersected with internal structural construction phases. This trench approach also helped mitigate issues of baulk collapse.

Within this larger unit, a smaller 1 x 1 m unit was placed in the plaza in the southeast corner of the larger unit (Figure 4). This unit was terminated after roughly 1.5 m once bedrock was encountered. This was done to quickly assess the construction sequence of the plaza and to ascertain the potential depth of the larger unit. The 3 x 9 m unit had to be extended to the west in the southwest corner while excavating the terminal and penultimate construction phases. This was done to expose a vessel rim that was present on top of a floor and extended into the baulk. A small 1 m by 30 cm extension was excavated but was terminated after the vessel rim was removed. After removal of the penultimate phase, the larger unit was bisected into northern and southern halves. The north half was excavated first, until the boulder fill used by the ancient Maya became a cause for concern as the northern, southern, and western baulks were prone to collapse. At this time, the southern half was removed up to the previously identified cultural strata, until it reached the same level as the northern half of the unit. The bisection was then ended, and excavations continued throughout the entire unit. As the excavations progressed further, the issue of baulk collapse became a recurrent concern. For safety purposes, the larger unit was bisected into a small 1.5 by 2.5 m unit placed 2.5 m from the west baulk and 75 cm from the north and south baulk to guard against the danger of collapse.

Overall, excavations followed cultural strata. New lots were started when new cultural strata were encountered. In some cases, changes in cultural strata were not recognized until after the fact. In these cases, lots may encompass more than one construction episode. However, once a change in strata was determined, lots were changed so that artifacts from each distinct phase were separated. This approach allows diachronic artifactual analysis. Instances when lots may contain more than one construction episode were noted in the field. It is also important to note that weather conditions at the site had an effect on how excavations were conducted and data was recorded. The excavation unit was placed on the apex of the hill. To facilitate excavations, the vegetation in Plaza B and on Structure A2 was removed resulting in an exposed hilltop. Therefore, tarp covers were set up to protect us and the unit from the sun and rain. The conditions in Plaza B varied depending on the time of day. During the morning, the weather was hot, humid, and there was little to no wind. However, by noon, the wind picked up and became gusty during the afternoon. This resulted in many tarp tear-outs, which, at times, led to rainwater flooding the unit.



Figure 4: Exploratory 1 x 1 m unit in southeast corner of larger unit.

STRUCTURE A2

Structure A2 was built in six major construction phases (Figures 5 and 6). Based on ceramic sequences, initial construction began in the Late/Terminal Preclassic with a small structure which grew over time, ultimately resulting in a sizeable Late/Terminal Classic monumental structure. Nineteen radiocarbon samples were recovered, but they have not been analyzed yet. These will be used to refine the chronology at a later date.

Construction Phase 1

The initial settlement at Ek Tzul focused on the apex of the hill in Plaza B. At this time, it appears that the area suitable for construction was rather small requiring these first inhabitants to level out the hilltop and fill in lower areas. Bedrock was first encountered on the eastern side of the unit roughly 2.2 meters below the current ground surface of Plaza B and four meters below datum in the 1.5 x 2.5 m bisection. The bedrock sloped downward toward the west side of the unit, reaching a maximum depth of roughly three meters below the modern plaza surface. This slope of nearly one meter over a 2.5 m span indicates that the original hill surface in this area would have been unsuitable for habitation. However, it is possible that there are earlier structures located nearer the apex of the hill under the center of the plaza.

To remedy the slope of the bedrock, the hill was built up by several layers of soil, cobble fill, and marl. Directly on top of the bedrock, a layer of dark, loamy-clay soil (Lot EKT-A2-1-24) was deposited. This soil contained lots of charcoal, and five radiocarbon

samples were taken. Two were recovered directly above bedrock (RC-EKT-A2-1-16 and RC-EKT-A2-1-19) and three others were taken from higher in the profile (RC-EKT-A2-1-14, RC-EKT-A2-1-15, and RC-EKT-A2-1-17). As this deposit was being removed, a lighter, plastery matrix was encountered. Lots were not changed as the matrix was spotty and did not extend through the entire unit. This plaster did not seem to be the remains of a floor but rather an inclusion in the darker soil matrix.

In the southeast corner, a small cluster of items was uncovered. These include a pinch pot (Figure 7; SF-EKT-A2-1-34), a few large ceramic sherds, a marine shell, and bone fragments. There does not seem to be any special arrangement to these items, but they were all found in immediate proximity to one another. Charcoal was collected from next to this cluster for radiocarbon dating (RC-EKT-A2-1-17). A second cluster of artifacts was encountered roughly 20 cm below the first. Artifacts from this cluster include a rim and shoulder sherd as well as numerous other sherds around it. Ceramics from this lot date to the Late and Terminal Preclassic (Barton Creek, Mount Hope, and Floral Park complexes). Also recovered from this layer were a chert biface tip, six obsidian blade fragments, and 18 faunal remains. The fauna includes 16 unidentified large mammal long bone fragments, an unidentified marine gastropod, and a spire-lopped jute shell (*Pachychilus indiorum*).

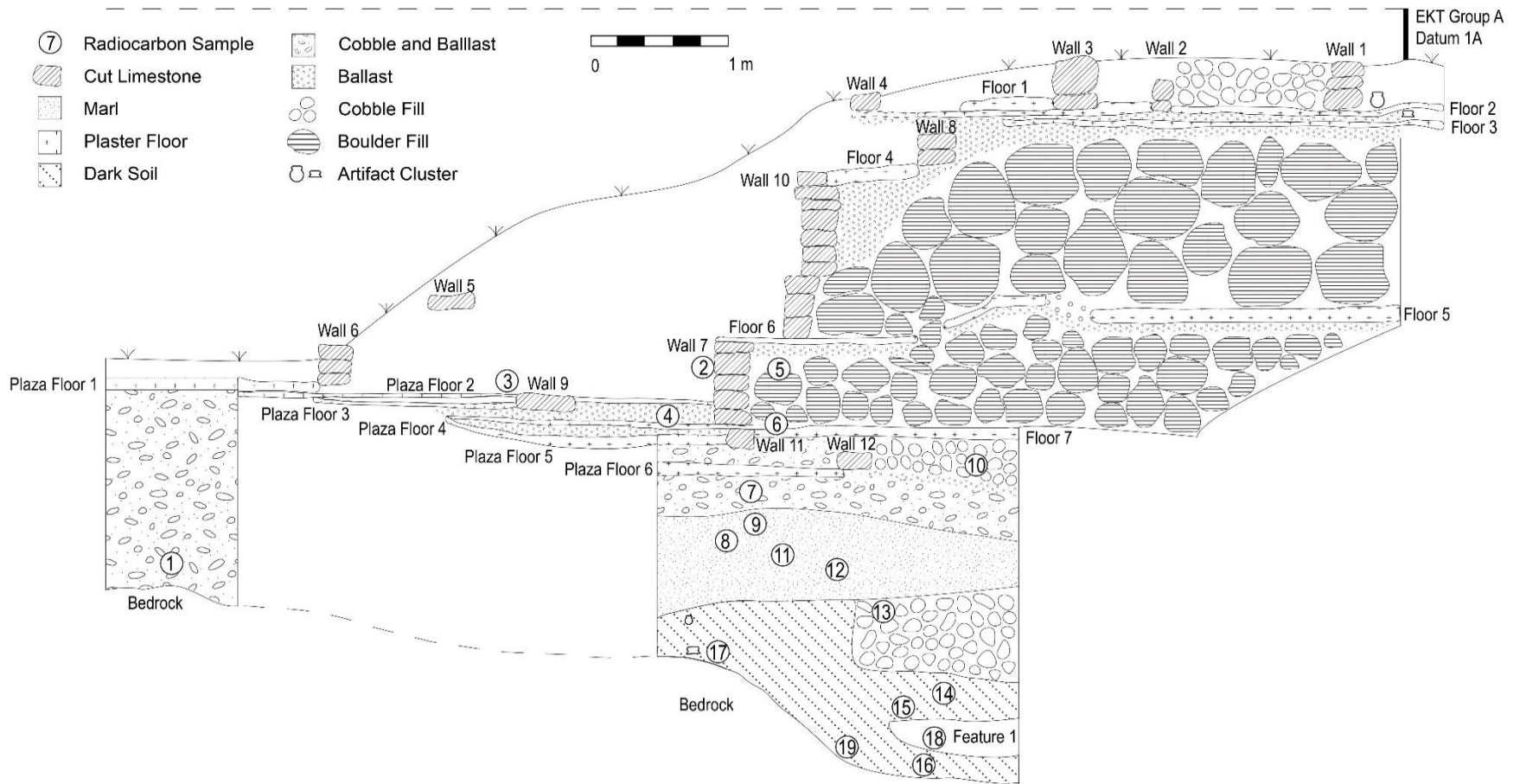


Figure 5: Profile map of south baulk.

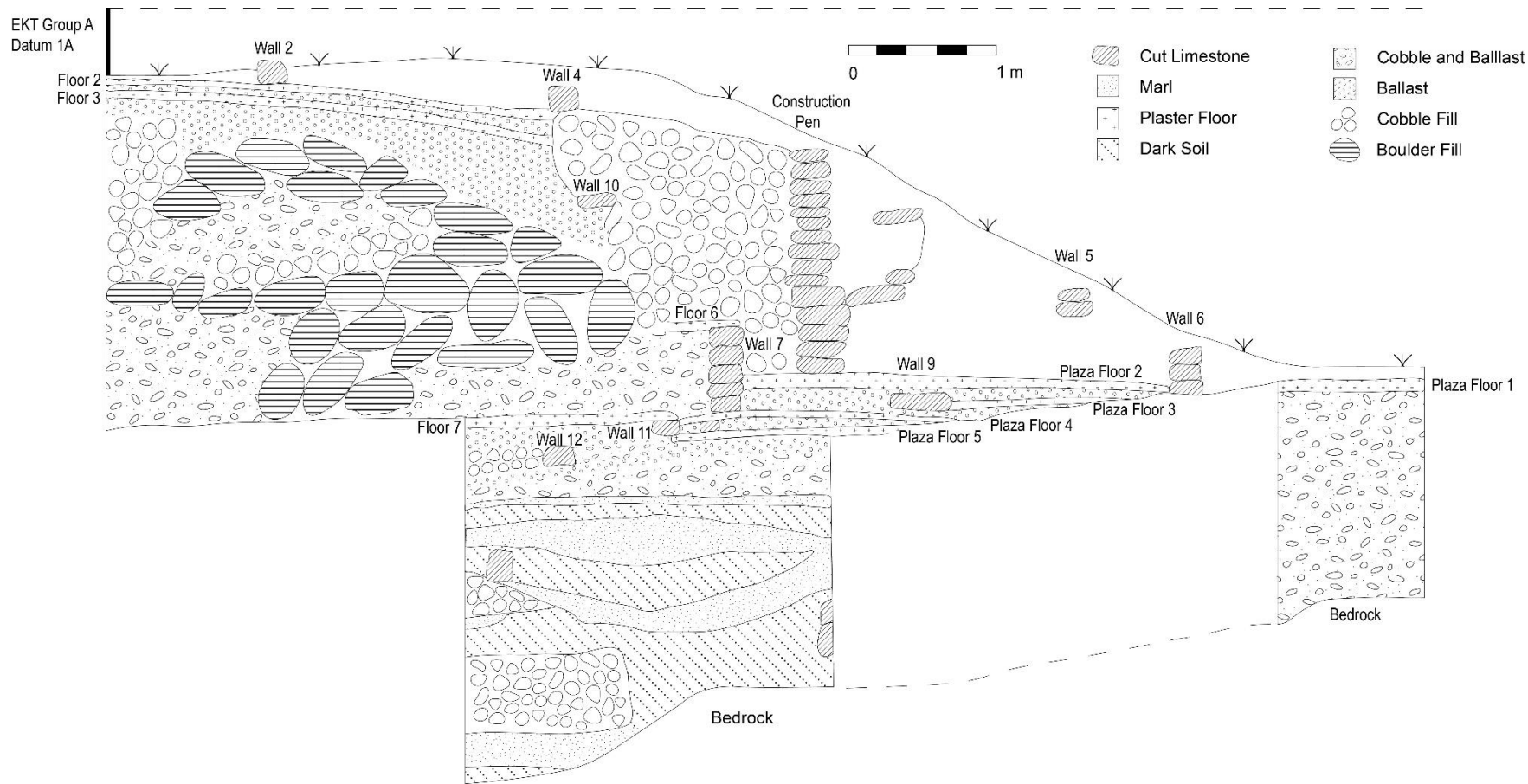


Figure 6: Profile map of north baulk.



Figure 7: Pinch pot found in upper artifact cluster just below the marl.

Feature 1 (Figure 8; Lot EKT-A2-1-25) was apparent within the dark matrix. Feature 1 was a deposit of even darker soil that was rich in charcoal. This feature seems to be cut into the plaster matrix (Figure 9). Feature 1 originated within the western baulk and extended 105 cm to the east and extended 60 cm north from the southern baulk. No cultural material was found within the feature, but a matrix sample and radiocarbon sample (RC-EKT-A2-1-18) were taken. Feature 1 was a deposit of burned material dumped into the dirt fill as the hill was being leveled. Analysis of the matrix sample will hopefully reveal what material was being burned. The profiles of this lowest level are convoluted as the south baulk shows the dark soil matrix as 75 cm thick in the southwest corner. The southern baulk clearly shows a marl layer (the plaster matrix) extending from Feature 1 to the north with small cobble fill above. The north baulk seems to confirm this. This is indicative of multiple deposition events of different materials as the hill was being built up. Above the dark soil was a thick layer of cobble fill that is only present in the western part of the unit (Lot EKT-A2-1-23). Here, the cobble fill appeared to top Feature 1 and a layer of darker soil separated another layer of cobble fill above. These three deposits still appear to be fill which was deposited to level the hill. All these fill episodes were included in the same lot as the variation was not apparent until the profiles were visible in the baulks. A single radiocarbon sample was taken from this lot (RC-EKT-A2-1-13). Other artifacts from this layer include Late and Terminal Preclassic ceramics (Barton Creek and Mount Hope complexes) and chert flakes. In the eastern part of the unit, the dark soil from below continues.

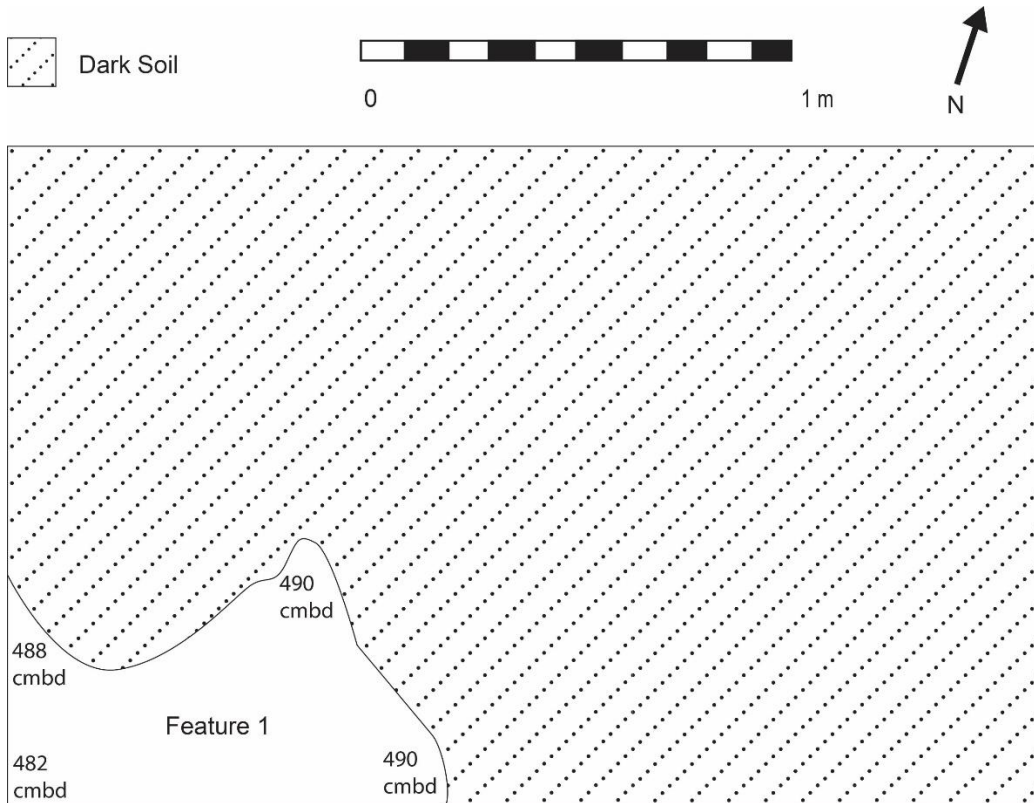


Figure 8: Plan map of Feature 1.



Figure 9: Feature 1 indicated by the dark stain to the left of the unit.

In this cobble fill layer squarish stones protruded from both the northern and southern baulks. It was not possible to tell if these cut stones comprised a wall as they were embedded in the baulk and could not be removed for fear of collapse. However, no cut stones were found within the unit connecting these square stones, so it is unlikely that they formed a wall. Above the cobble fill, a thick layer of marl was encountered (Lot EKT-A2-1-22). Upon initially reaching this layer, it was thought that it was bedrock. However, subsequent excavation revealed that the darker layers of dirt below undercut it. This marl layer was thickest in the southeastern corner where it was 76 cm deep. It tapered to roughly 12 cm on the western baulk. In the northern half of the unit, the stratigraphy became more confusing. Here, there is a lower marl layer that dips down and under the square stone mentioned above. There is also a marl layer higher up which is separated from the lower marl layer by a swath of soil. These two marl bands join at the northeast corner to form a 20 cm thick band. This marl was likely a material dump resulting from leftover marl, possibly from creating plaza floors near the apex of the hill.

Few artifacts were recovered within this marl deposit. Two obsidian blades and a few Late and Terminal Preclassic ceramic sherds (Barton Creek, Mount Hope, and Floral Park complexes) along with two radiocarbon samples were recovered (RC-EKT-A2-1-11 and RC-EKT-A2-1-12) as part of this lot. Two additional radiocarbon samples (RC-EKT-A2-1-8 and RC-EKT-A2-1-9) were recovered from the marl layer in the eastern half of the unit, but these were recovered as part of Lot 18 due to a mixing of lots while investigating Wall 11. Interestingly, the depth of this marl dump matches the supposed bedrock that was hit in the 1 x 1 m unit sunk in the southeast corner of the larger unit. Therefore, it is possible that this was not bedrock but rather a continuation of the marl dump to level the hill. Though, if the bedrock drops off consistently from the top of the hill, the bedrock in the smaller unit matches what would be expected given its depth in the bisected unit. This is curious since the aforementioned chultun in the center of the plaza, which is carved into bedrock, is only a few meters from the excavation unit, meaning that the hill slope must drop off sharply from the chultun to the base of Structure A2. This would also corroborate the large number of fill episodes required to level the hill.

Overlying the marl layer was a layer of cobble fill topped with ballast (Lots EKT-A2-1-18 and EKT-A2-1-21). There was some mixing of lots on the eastern edge of the unit resulting from investigating the depth of Wall 11. During this investigation, Plaza Floor 6 was missed due to its poor preservation. While it was poorly preserved in the southern half of the unit, it was completely missing in the northern half either due to erosion or structural modification.

Therefore, Lot 18 includes materials from below Plaza Floors 5 and 6. Plaza Floor 6 and Wall 12 covered the cobble fill and ballast layer. Despite the mixing of lots, a radiocarbon sample (RC-EKT-A2-1-7) and an obsidian blade were isolated from below Plaza Floor 6 in the cobble fill in front of the wall. Wall 12 is a single course wall running roughly 50 degrees west of north (Figure 10). It sits directly on top of the ballast with Plaza Floor 6 lapping up against the front. The plaza floor does not continue behind the wall, though the ballast layer does (Figure 11). Within the ballast and cobble fill, chert flakes, Late and Terminal Preclassic ceramics (Barton Creek, Mount Hope, and Floral Park complexes), and a single calcined long bone fragment from an unidentified medium mammal were recovered.

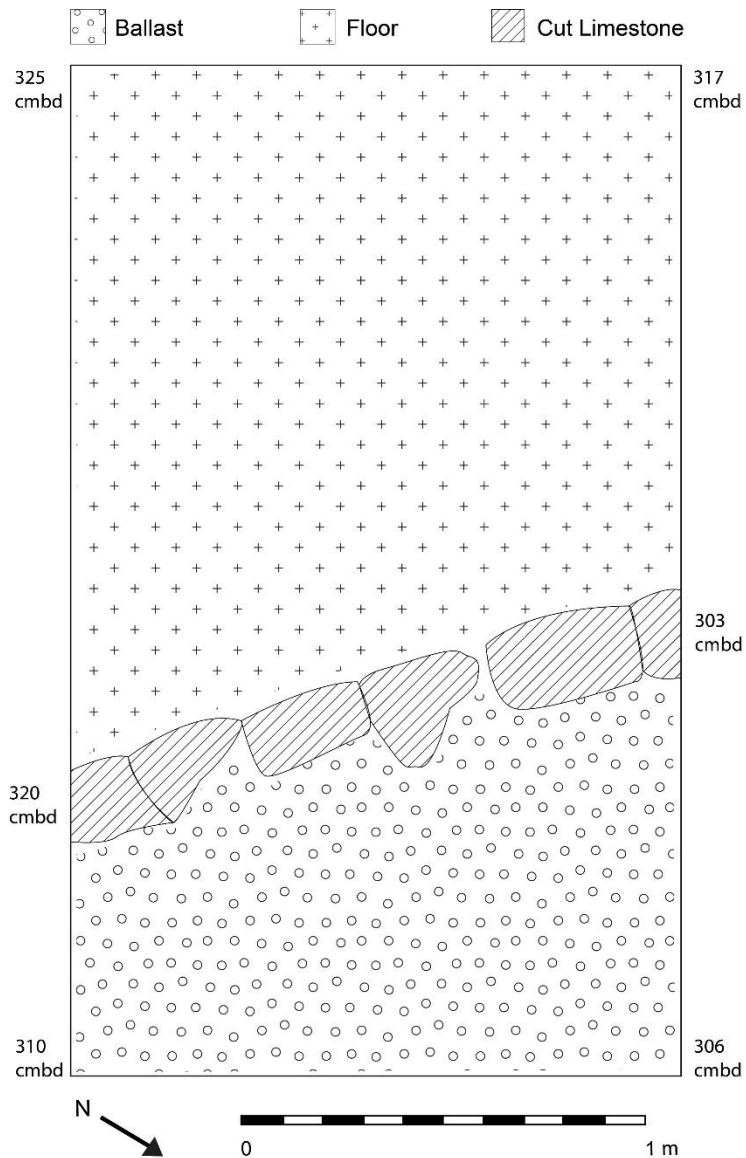


Figure 10: Plan map of Wall 12.

Behind Wall 12 was fill consisting of cobbles and boulders (Lot EKT-A2-1-20). Mixed in this fill were large quantities of ceramics and a chert biface (SF-EKT-A2-1-30). This contrasts with the few ceramics that were recovered from in front of the wall. The ceramics consisted of mainly body sherds as well as a bowl rim, but they were unable to be identified to the type-variety level. The chert biface appears to be a preform as it is roughly worked and does not show signs of use. Also recovered from the fill behind Wall 12 was a single radiocarbon sample (RC-EKT-A2-1-10).

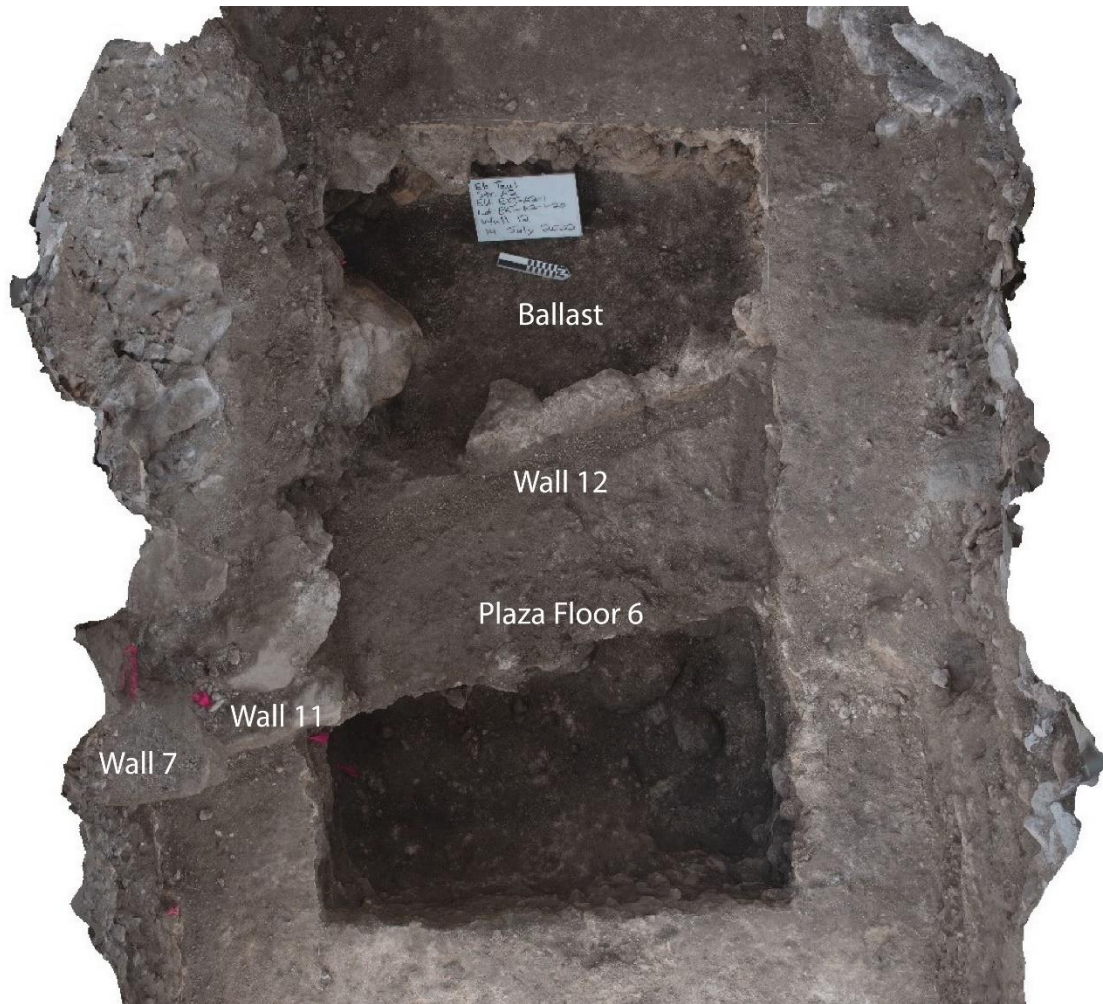


Figure 11: Photogrammetric plan view of Wall 12.

Construction Phase 2

Covering Wall 12 was a layer of ballast and cobble fill which served as the foundation for Wall 11 and Floor 7 (Lot EKT-A2-1-19). Wall 11 was a four-course wall built 60 cm to the east of Wall 12 and was oriented roughly 32 degrees west of north (Figure 12). This contrasts with the 50-degree orientation of Wall 12 and suggests that the structure may have shifted orientation over time. The southern section of the wall contained a false step comprised of the lower two courses jutting out to the east. The northern section was a single line of stones. Floor 7 topped Wall 11 and continued to the west baulk, covering Wall 12. A layer of loamy-clay soil was directly covering this floor. Abutting the base of Wall 11 was Plaza Floor 5 which continued to the east baulk. It appears as if Wall 12 was originally more than one course high and was dismantled for reuse at the time Wall 11 and Floor 7 were built because there is no architecture separating the fill behind Wall 12 and the ballast in front of it. Once Wall 12 was uncovered, the previous lot was ended, and a new lot was started to record the fill behind the wall (Lot EKT-A2-1-20) as the matrix was obviously different. However, some of the fill behind the wall was included in the previous lot as no architecture was encountered within five to ten centimeters of Floor 7. A radiocarbon sample

(RC-EKT-A2-1-10) was taken as part of this lot but should be associated with the construction of Wall 12.



Figure 12: Photograph of Wall 11 and Plaza Floor 6.

It was noted during excavations that the matrix from the western side of the unit contained more ceramics than the eastern side. It turned out that these ceramics were from the fill behind Wall 12 but were included in the previous lot until Wall 12 was encountered. Ceramics continued to be abundant behind the wall. In front of the wall and below the floors, additional ceramics, chert flakes, and a granite mano fragment (SF-EKT-A2-1-31) were recovered. Some of the ceramics, which range from the Late and Terminal Preclassic (Barton Creek, Mount Hope, and Floral Park complexes) to Early Classic (Hermitage) and the Late/Terminal Classic (Spanish Lookout I [700-800] and II [800-950]), are probably associated with the earlier construction. It is probable that the later ceramics belong to the fill under Wall 11 and the floors, while the Late and Terminal Preclassic originated from behind Wall 12 but were mixed in by accident.

Construction Phase 3

Wall 11 was also likely originally taller but was dismantled for reuse. At this time, a layer of ballast was laid, and Plaza Floor 4 was placed on top (Lot EKT-A2-1-13). Plaza Floor 4 was a well-preserved plaster floor running from Plaza B over Wall 11, terminating somewhere behind it. The exact edge was unable to be located due to poor preservation. In the ballast below the plaza floor, Late/Terminal Classic ceramics (Spanish Lookout I and II) and chert flakes were recovered. A radiocarbon sample was also taken from within the plaster floor above and behind Wall 11 (RC-EKT-A2-1-6). Constructed on top of this plaza floor and over the remains of Floor 7 was a platform roughly 60 cm tall. The front of the platform consisted of a five-course wall (Wall 7) of cut

limestone blocks topped with Floors 5 and 6 (Lot EKT-A2-1-17). Wall 7 was built nearly directly on top of Wall 11 (Figure 13). In the southern baulk, the two walls were neatly stacked, but in the northern baulk, Wall 11 veers toward the west and sits 20 centimeters behind Wall 7. Therefore, Wall 7 demonstrates another shift in orientation, albeit to a smaller degree.

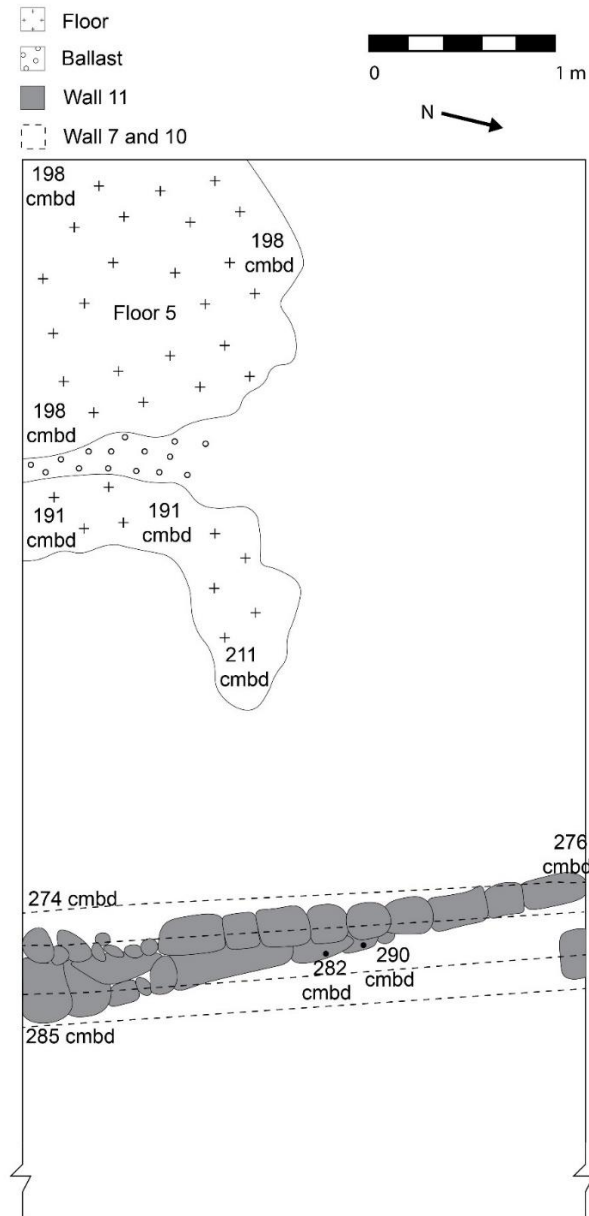


Figure 13: Plan map of Wall 11 and Floor 5. Orientation of Wall 7 and 10 superimposed over Wall 11.

Wall 7 supported Floors 5 and 6 which sat on a foundation of ballast and boulder fill. There was no architecture to separate these two floors though they were at different levels within the stratigraphy. Therefore, the lots for these two architectural features were combined as it was nearly

impossible to keep these separate during excavation. Floor 6 extended from Wall 7 to the west before terminating at a line of boulders cutting down through the floor. Behind this line of stones, Floor 5 begins higher up and slants upward before leveling off, disappearing, and then reappearing toward the western baulk (Figure 14). Directly underneath the plaster of the floor was a layer of loamy-clay soil. This same layer of soil was also directly covering Floor 5. It is unclear whether Floor 5 was a later floor that destroyed the western half of Floor 6, or if Floor 5 was only poured as a base for the structure that was to be built atop it. If this scenario was the case, then it would be coeval with Floor 6.



Figure 14: Photograph of Floor 5. Note the slope in the foreground.

Ceramics from a mixture of time periods were recovered from the fill behind Wall 7 and below these floors. Late to Terminal Preclassic (Barton Creek, Mount Hope, Floral Park), Early Classic (Hermitage), and Late/Terminal Classic (Spanish Lookout I and II) ceramics were all present. It is also believed that there is an early Late Classic component though no Tiger Run ceramics were recovered. This mixture of ceramics from multiple time periods has less to do with the unintentional mixing of lots than from the reuse of fill material by the Maya as they were constructing this platform. Chert flakes, a radiocarbon sample (RC-EKT-A2-1-5), an unidentified large mammal long bone fragment, and two gastropods were also recovered. The gastropods include a spire-loped jute shell (*Pachychilus indiorum*) and an unidentified marine mollusk.



Figure 15: Photogrammetric model of Walls 7, 9, and 10. Ancient Maya dismantling is obvious on the right side of Wall 10.

It is difficult to determine if the next construction episode took place concurrently with the building of the platform or if it occurred at a later time. Regardless, a large number of boulders were piled on top of the platform. In front of these boulders, a wall (Wall 10) was erected that was inset from Wall 7 by 50 cm (Figure 15; Lot EKT-A2-1-8). As this wall was erected, wet fill was dumped behind it and over the boulder fill. In this manner, Wall 10 was erected, first by building a section of the wall and then by adding wet fill behind it to give it support. Wall 10 was ten courses high with both basal and superior moulding. Covering the wall was Floor 4 which was only about 65 centimeters wide before abutting the base of Wall 8, a two-course wall near the top of the boulder pile. The wet fill observed behind Wall 10 continued behind Wall 8 and over the boulder fill. Capping this off was Floor 3 (Lot EKT-A2-1-5) which would have served as the summit of Structure A2 at this time. Within this mass of construction fill were ceramics, chert flakes, and a quartz grooved stone fragment. The ceramics are dominated by later, Late/Terminal Classic types (Spanish Lookout I and II), though there are a sizable quantity of Tiger Run ceramics and earlier types present as well (Jenney Creek, Barton Creek, Mount Hope, and Floral Park). Unfortunately, no radiocarbon was recovered from this construction episode, so directly dating it will not be possible. However, the Late/Terminal Classic ceramics provide a terminus post quem for this phase.

Construction Phase 4

Sometime after the construction of Walls 7 and 10, Wall 9 was erected one meter to the east of the platform. At the time of excavation, only three adjacent cut stone blocks remained in situ, though it is likely the line of stones previously extended to the north and south. Articulating with the back of this wall is a floor, originally thought to be a plaza floor. However, it is probable that this floor was a structural floor associated with Wall 9 that was later scraped and replastered as part of Plaza Floor 2. This floor ran to Wall 7, and together with Wall 9 was likely a riser added

to the structure after the completion of Wall 7. Under this floor (Lot EKT-A2-1-10), chert flakes, a shaped piece of limestone (SF-EKT-A2-1-22), and Late/Terminal Classic ceramics (Spanish Lookout I and II) were recovered from the ballast. A radiocarbon sample (RC-EKT-A2-1-4) was also taken from directly on top of the underlying Plaza Floor 4. As for Wall 9, it was built atop a layer of ballast covering Plaza Floor 4 and was abutted to the east by Plaza Floor 3. Behind the wall, the ballast was thick from leveling out the previous floor. In front of the wall, the ballast was much thinner as the plaza floors sloped up toward the east. In the ballast below Plaza Floor 3 (Lot-EKT-A2-1-12), Early to Late/Terminal Classic ceramics (Hermitage and Spanish Lookout I and II), chert flakes, and a fragment of what appears to be a drilled limestone ball (SF-EKT-A2-1-26) were recovered.

Construction Phase 5

When the fifth phase of construction at Ek Tzul began, the top of Wall 9 and the floor covering it were scraped down to level it with the new plaza floor. Plaza Floor 2 articulates with the top of Wall 9, though the wall was poking through the plaza floor. Underneath Plaza Floor 2 (Lot EKT-A2-1-11), unidentifiable ceramics, chert flakes, a drilled and etched limestone ball fragment (SF-EKT-A2-1-25), and a granite ground stone fragment (SF-EKT-A2-1-16), possibly from a ball or mano were recovered. Directly on top of Plaza Floor 2, in front of Wall 9, a radiocarbon sample (RC-EKT-A2-1-3) was taken. On top of Plaza Floor 2 and midway between Walls 7 and 9, a construction pen (Figure 16) was built following the removal of the northern section of Wall 10. This likely occurred so that the Maya could reuse the cut limestone blocks. Wall 7 and Floor 7 that covered it were left in place as well as the two courses of Wall 10 on top of Floor 7. Since the boulders were piled before Wall 10 was erected, they remained in place when the wall was removed. After the construction pen was built, fill was added behind it. While this occurred on the northern section of the wall, the southern section was completely intact, and no sign of a construction pen was evident.



Figure 16: Photograph of construction pen (stacked stones in center of photo) in north baulk.

Construction Phase 6

The terminal construction phase saw another large expansion of the structure. The final form of Structure A2 was difficult to determine as this phase of architecture was poorly preserved due to slumping and bioturbation resulting from roots. However, it looks like there were multiple terraces leading up to the summit which was crowned by a set of low walls (Figure 17 and 18). Walls 5 and 6 represent the lower terraces joining Plaza B (Lot EKT-A2-1-4). Wall 6 was a four-course wall, but no remains of a floor covering it were detected. Wall 5 was a single course, though it was presumably taller at one time. Like Wall 6, no associated floor was found. Behind these walls, Late/Terminal Classic ceramics (Tiger Run and Spanish Lookout I and II), chert flakes, two spire-lopped jute shells (*Pachychilus indiorum*), a radiocarbon sample (RC-EKT-A2-1-2), and numerous special finds were recovered. The special finds include two mano fragments (SF-EKT-A2-1-12 and SF-EKT-A2-1-13), three drilled limestone ball fragments, and nine grooved stones. One limestone ball (SF-EKT-A2-1-7-2) was etched with concentric rings and an inset zigzag pattern. Another one (SF-EKT-A2-1-9) had a pointed top with two drill holes set at an angle to the point so that they met near the center of the ball. It was also etched with two concentric rings but was inset with a crosshatch pattern. The last one (SF-EKT-A2-1-7-1) was only a small fragment with a small section of drilling preserved. Of the grooved stones, six of them are made from granite (SF-EKT-A2-1-8-1, 2, and 3; SF-EKT-A2-1-15-1, 2, and 4), two from andesite (SF-EKT-A2-1-10 and SF-EKT-A2-1-14), two from limestone (SF-EKT-A2-1-11 and SF-EKT-A2-1-37), and one from quartz (SF-EKT-A2-1-15-3). The measurements of the drilled limestone balls and the grooved stones can be found in the appendix.



Figure 17: Photogrammetric model of terminal architecture.

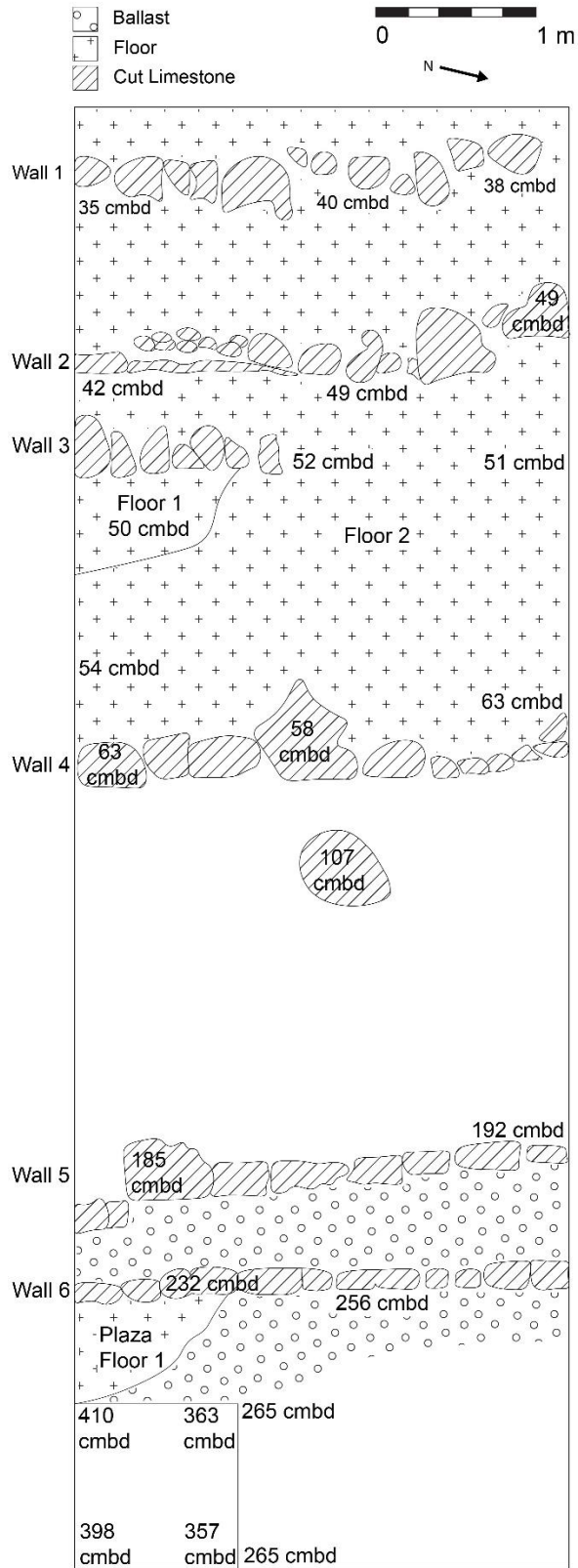


Figure 18: Plan map of terminal architecture.

On the apex of the structure, Walls 1 and 2 and Floor 2 capped the summit (Figure 19). Wall 1, a three-course wall, sat on top of Floor 2 just to the east of the west baulk. Wall 2, a two-course wall, was embedded in the floor but did not articulate with Floor 3 below. Rather, it sat on the ballast underlying Floor 2. It is unclear if Wall 1 was erected when Wall 2 and Floor 2 were built or if this was a later addition. Wall 1 was likely associated with Walls 3 and 4 located roughly 1.6 and 3.2 m to the east, respectively. Wall 3 was a two-course wall 38 cm to the east of Wall 2. Floor 2 was poorly preserved and disintegrated further to the east. Though Floor 2 was badly eroded near Wall 4 and did not extend under it, the position of Wall 4 within the stratigraphy suggests that it sat on top of Floor 2 at one point. Wall 4 was a single course wall, but like Walls 5 and 6, was probably dismantled by the Maya in prehistory. It is difficult to determine if Walls 1 and 4 are outside walls with Walls 2 and 3 being inner (spine?) walls, or if these walls represent multiple summit structures. Embedded in Floor 2 and just to the west of Wall 1, a large vessel rim was recovered (Lot EKT-A2-1-8). This rim was resting on Floor 3 but was poking through Floor 2 (Figure 20). Above it, sitting directly on Floor 2, was a smashed Late/Terminal Classic vessel (Figure 21; Spanish Lookout). Additionally, a mano fragment (SF-EKT-A2-1-29) and a limestone grooved stone fragment (SF-EKT-A2-1-27) were found. Between Walls 1 and 2 (Lot EKT-A2-1-9), another limestone grooved stone fragment was recovered (SF-EKT-A2-1-21). Between Walls 2 and 3 (Lot EKT-A2-1-14), ceramics and a limestone ball fragment (SF-EKT-A2-1-28) were recovered.



Figure 19: Photograph of the summit of Structure A2 with Walls 1, 2, and 3 visible.

The last architectural modification to Structure A2 was the replastering of Floor 2 between Walls 3 and 4. Floor 1 was laid directly on Floor 2 and abutted Wall 3. Like Floor 2, it was not preserved well enough to determine if it abutted Wall 4. In the humic and collapse overlying this terminal architecture a large quantity of artifacts was found (Lot EKT-A2-1-2). Numerous Late/Terminal Classic ceramics (Tiger Run and Spanish Lookout I and II) were recovered, though a single Middle Preclassic sherd (Jenney Creek type) was also identified. A relatively large number of fauna was also found. This included two unidentified marine gastropods, one of which was modified into a small gorget with a single biconically drilled hole near each end (SF-EKT-A2-1-1); a gastropod identified to the Strombidae family; an Olividae tinkler (SF-EKT-A2-1-6); and an apple snail (*Pomacea* sp.).



Figure 20: Photograph of vessel rim on Floor 3.



Figure 21: Photograph of smashed vessel on Floor 2.

Lithics included chert flakes, two obsidian blades, five drilled limestone balls, one mano and one metate fragment, and four grooved stones. Three of the limestone balls had a single drilled hole (SF-EKT-A2-1-17, SF-EKT-A2-1-3-2, and SF-EKT-A2-1-5-2), while the other two had no drill marks present (SF-EKT-A2-1-3-1 and SF-EKT-A2-1-5-1) but were similar to the other artifacts that show drilling. All four grooved stone fragments (SF-EKT-A2-1-2, SF-EKT-A2-1-23-1 and 2, and SF-EKT-A2-1-33) were made of granite. A single chert biface fragment (SF-EKT-A2-1-32) was also found on the surface before excavations started (Lot EKT-A2-1-1).

DISCUSSION

The initial construction of Structure A2 at Ek Tzul appears to be aimed at leveling the hilltop. This was done through multiple episodes of fill deposition, ranging from loamy-clay soil to marl. The artifacts from these fill episodes demonstrate access to obsidian and marine shell. They also show possible ritual activity as evidenced by the two small clusters of artifacts below the marl layer, one of which included a pinch pot. Based on the ceramics, these initial construction episodes occurred during the Late or Terminal Preclassic. Once completed, a modest structure was erected on the recently leveled hill and the plaza was plastered over. The second phase of construction at Ek Tzul was still relatively minor. Low walls with moderate fill indicated a small labor investment. While the artifact inventory is small in comparison to the earlier phase, this has more to do with the volume of fill material than any substantial social changes. However, the reorientation of the structure at this time does indicate that changes were taking place at the site. Perhaps the population was growing larger and the site needed to be reoriented to accommodate new structures, or perhaps to adhere to the prevailing ideology. During the third construction episode, Structure A2 was reoriented toward the east again, though to a much smaller degree. This phase also experiences the first major construction effort at Ek Tzul. The platform would have required substantial labor to construct. The structure built on top of this platform is even more impressive. The core of this structure is large boulder fill. These boulders were hauled into a pile roughly 1.5 m high. To pile these large boulders, significant labor input and material would be needed. Most of these boulders likely came from the surrounding hillside and would have had to be hauled up the hill before being placed in the platform. The limestone blocks are also more finely cut at this time demonstrating a greater investment of time and energy in constructing this phase of architecture.

Interestingly, the plaza floors associated with these construction phases are sloped and decline from the apex of the hill toward Structure A2. While subtle, it would have been noticeable during the rainy season. During our excavations, the base of the platform would flood whenever it rained. This was remedied when Plaza Floors 2 and 3 were laid which substantially leveled the plaza at the base of the structure. This is evident in the thickness of the ballast behind Wall 9. The purpose of Wall 9 is still unclear, though it may have served as a riser leading up to the platform. It is also possible that this was once a taller wall that was dismantled, which is evident in other phases of Structure A2, that functioned as part of the expansion of the structure possibly connected to the construction pen. The timing of the dismantling of Wall 10 and the subsequent erection of the construction pen is also unclear. This remodeling may have been done to expand the footprint of Structure A2, though it would not make sense to leave a large portion of the wall intact if that were the case. Another possibility is that this construction pen is tied to a construction episode not

visible in the unit but which occurred just north of the north baulk. The terminal phase of architecture is even more difficult to assess given the poor state of preservation. It is possible that the low walls on the summit were the base of a perishable superstructure, but given the high winds at the site, it is also possible that the superstructure was made of stone. If Walls 2 and 3 constitute a spine wall, then this superstructure would have had corbelled vaults. On its flanks, Structure A2 appears to have had a series of terraces descending to Plaza B, which by this time was level and replastered with Plaza Floor 1.

Despite excavating the center of the structure, there was no evidence of a stairway descending to the plaza. Additionally, no burials were found within the structure, which was originally thought to be an eastern triadic structure. Rather, Structure A2 appears to have shifted in function over time from a small village residence to a more secular, possibly administrative, building (Iannone 2003). The earlier phases are characterized by small deposits of ceramics and other artifacts in close association as well as a relatively high amount of obsidian blades. Once construction increases, these small deposits disappear, and the frequency of obsidian vastly decreases. In its place, grooved stones and drilled limestone balls appear (Figures 22 and 23). While the function of these artifacts is unknown (Aimers et al. 2011; Meyer et al. 2022), they appear to be associated with the shift that took place during the Late/Terminal Classic at Ek Tzul. The presence of obsidian during the earliest phases at the site demonstrate access to trade networks. These networks are typical of sites during the Preclassic and consisted of household exchange similar to what was present at Cahal Pech (Ebert and Awe 2018). The marine shell also indicates trade connections to the east which supplied Ek Tzul with raw material for ornamentation. Granite, another non-local material, first appears during the second construction phase as a mano in the fill behind Wall 11. The nearest source of granite is over 20 km to the south in the Mountain Pine Ridge and Maya Mountains. Therefore, the presence of granite is further evidence of trade relationships. During the Late/Terminal Classic, this granite becomes prevalent in the form of grooved stones, which are first found in the fill of the platform.

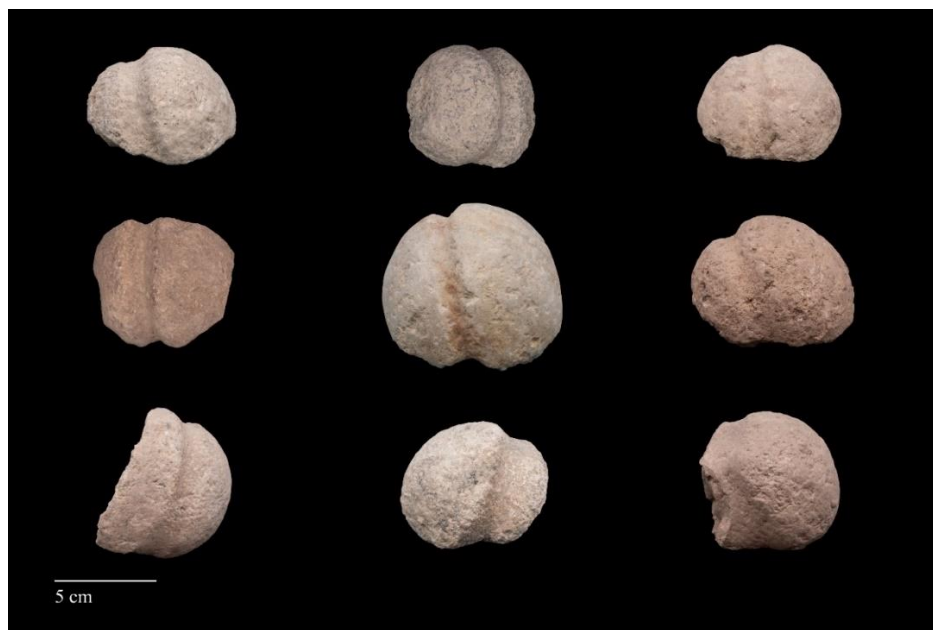


Figure 22: Photograph of select grooved stones from Structure A2.

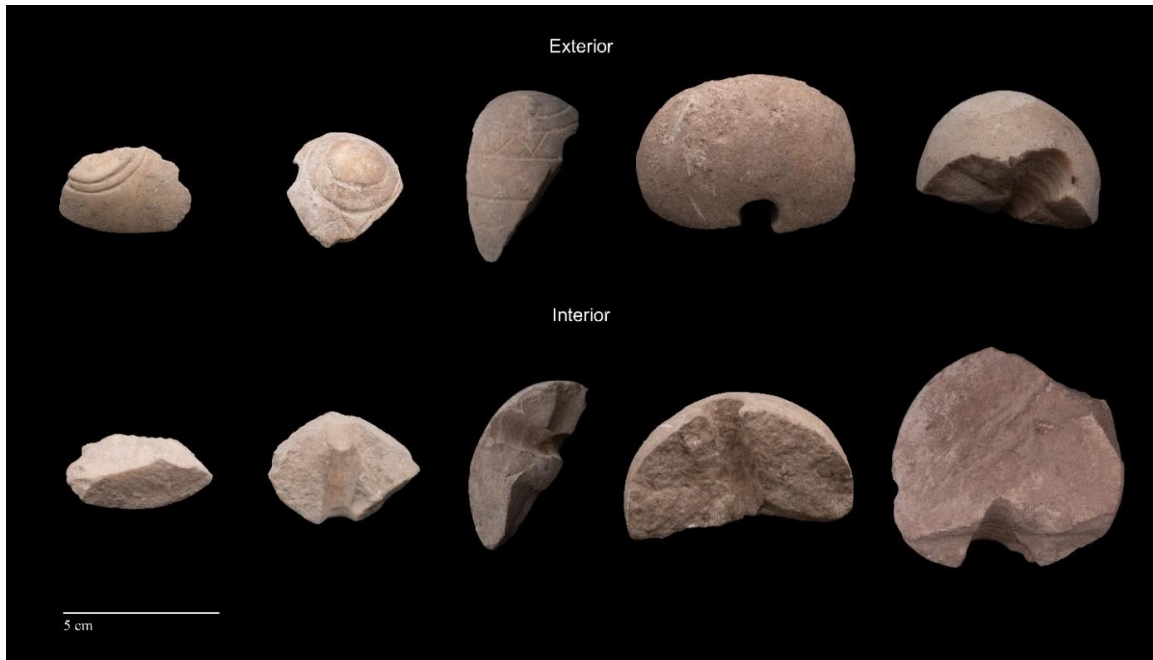


Figure 23: Photograph of select drilled limestone balls from Structure A2.

These artifacts suggest that the inhabitants of Ek Tzul had access to non-local materials from early on and continued through its occupation. However, the prevalence of these imports varies over time. Obsidian is almost exclusively found in the early occupation layers. This is likely due to the shifting function of Structure A2 rather than a loss of access to obsidian. As the function shifts during the Late/Terminal Classic, a less domestic-residential artifact assemblage is expected. Granite, which first appears as manos and metates, becomes more prevalent as grooved stones over time. This shift also mirrors the changing function of Structure A2. Marine shell, while found in both earlier and later phases, is not common at any time. Therefore, little can be said about its importance at this time.

Given the shifting nature of Structure A2 and the changing artifact assemblage through time, a few competing hypotheses emerge for the role of Ek Tzul in the Belize Valley. Based on the layout, the type of structures present, and the size of its plazas, it was believed that Ek Tzul may have been the seat of a quasi-autonomous elite lineage during the Preclassic and Early Classic that expanded during the Late/Terminal Classic. The ancestors of these elite lineages are often buried in an eastern structure as a way to create a genealogy of place and to reify claims to power through visually invoking ancestors (McAnany 2013). This hypothesis seems unlikely since no burials were found in the eastern structure.

Instead, Ek Tzul exhibits features like those noted by Iannone (2003) at Xualcanil. Located near Cahal Pech, Xualcanil was a Tier 2 site that also lacks an ancestral shrine. Other traits shared by these two sites include the presence of a ballcourt which lacks caches and a ballcourt marker, a sacbe, a terminus group, a relative paucity of dedicatory caches, and a primarily Late Classic occupation. The dearth of ritual caching and ancestor burials suggests that the typical means of creating a “genealogy of place” were not used and that the activities at the site were being sanctioned elsewhere (Iannone 2003). For Xualcanil, this meant Cahal Pech; for Ek Tzul, it may

have meant Baking Pot which was the nearest and largest major center. Under the tutelage of these capitals, Xualcanil and Ek Tzul would likely have served managerial functions.

Therefore, an alternative hypothesis proposes that Ek Tzul was incorporated into Baking Pot in the late Early Classic or early Late Classic resulting in the increased construction at Structure A2. The dearth of ritual deposits and the reorientation of the structure as the function of Ek Tzul changed could reflect co-option by Baking Pot. Likewise, the labor required to build Structure A2 could have been supplied by Baking Pot as the elites at the polity capital sought to co-opt Ek Tzul as a Tier 2 center. This would also account for large quantity of grooved stones that appeared at this time as these stones have been found in large quantities at Baking Pot (Aimers et al. 2011; Willey et al. 1965). However, grooved stones have also been found at Actun Nak Beh (Mirro et al. 1999), Lower Dover (Romih et al. 2018), Tutu Uitz Na (Biggie et al. 2019), Zopilote (Ferguson et al. 1994), and Zubin (Hodgson 1993), so they are not exclusive to Baking Pot and Ek Tzul. Greater chronological control at Ek Tzul is needed to verify possible incorporation into the Baking Pot polity. Currently, there is not enough evidence to support that the rapid growth of Ek Tzul coincides with Baking Pot's rise to power.

A final scenario involves Ek Tzul rising as a buffer site between valley sites, such as Baking Pot, and centers to the south. Baking Pot may have backed the inhabitants of Ek Tzul through labor, materials, and other means to build the site as a buffer between sites such as Pacbitun and themselves. Conversely, Pacbitun could have backed them for similar reasons. Ek Tzul's location within the foothills would also provide a trading partner through which to acquire materials from the Maya Mountains. Granite manos and metates at Baking Pot have been sourced to outcrops on the southern edges of the Maya Mountains along the Bladen Branch (Abramiuk and Meurer 2006) and to Mountain Pine Ridge sources on the northern edges of the Maya Mountains (Tibbitts 2016). Not only could Ek Tzul serve as a conduit for raw granite into the valley, but it may also have funneled in finished products from Pacbitun which has the only known granite workshop in Belize (Ward 2013). If Ek Tzul was backed as a buffer site, it would also explain the presence of grooved stones, increased labor for construction, and the shifts in architecture and artifact assemblages seen at Structure A2.

CONCLUSION

The 2022 excavations provided solid initial data for the founding of Ek Tzul and its growth through time. The investigations into Structure A2 helped to clarify what the earliest construction episodes looked like and have supplied radiocarbon samples which will aid in constructing a chronology of the site's occupation. The results have led us to reject the initial hypothesis that Ek Tzul was a polity capital complete with an eastern triadic structure housing venerated ancestors. While the lack of burials within Structure A2 has made it impossible to draw any conclusions regarding the connectedness of Ek Tzul and other sites within the valley, it was possible to make some tentative conclusions about interregional interaction through trade and possible political intervention.

Future excavations in the site core and the settlement will add to these initial data and clarify Ek Tzul's position within the valley. Building on the radiocarbon samples collected during this season, a reconstruction of the site's chronology will refine our hypotheses regarding if and

why Ek Tzul was involved with Baking Pot. Burial data will also be useful in refining the potential scenarios and answering this season's second research question.

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APPENDIX A: STRUCTURE A2 SPECIAL FINDS INDEX

<i>SF#</i>	<i>Lot</i>	<i>SF Description</i>
SF-EKT-A2-1-1	EKT-A2-1-2	Marine shell gorget
SF-EKT-A2-1-2	EKT-A2-1-2	Granite grooved stone
SF-EKT-A2-1-3	EKT-A2-1-2	Two limestone ball fragments
SF-EKT-A2-1-4	EKT-A2-1-2	<i>Metate</i> fragment
SF-EKT-A2-1-5	EKT-A2-1-2	Two limestone ball fragments
SF-EKT-A2-1-6	EKT-A2-1-2	Olive shell tinkler
SF-EKT-A2-1-7	EKT-A2-1-4	Three limestone ball fragments
SF-EKT-A2-1-8	EKT-A2-1-4	Three granite grooved stones
SF-EKT-A2-1-9	EKT-A2-1-4	Limestone ball fragment
SF-EKT-A2-1-10	EKT-A2-1-4	Andesite grooved stone
SF-EKT-A2-1-11	EKT-A2-1-4	Limestone grooved stone
SF-EKT-A2-1-12	EKT-A2-1-4	<i>Mano</i> fragment
SF-EKT-A2-1-13	EKT-A2-1-4	<i>Mano</i> fragment
SF-EKT-A2-1-14	EKT-A2-1-4	Andesite grooved stone
SF-EKT-A2-1-15	EKT-A2-1-4	Three granite and one quartz grooved stones
SF-EKT-A2-1-16	EKT-A2-1-11	Groundstone/ball fragment
SF-EKT-A2-1-17	EKT-A2-1-2	Limestone ball fragment
SF-EKT-A2-1-18	EKT-A2-1-6	Granite/basalt grooved stone
SF-EKT-A2-1-19	EKT-A2-1-6	Granite grooved stone
SF-EKT-A2-1-20	EKT-A2-1-8	Quartz grooved stone
SF-EKT-A2-1-21	EKT-A2-1-9	Limestone grooved stone
SF-EKT-A2-1-22	EKT-A2-1-10	Unknown limestone fragment
SF-EKT-A2-1-23	EKT-A2-1-2	Two granite grooved stones
SF-EKT-A2-1-24	EKT-A2-1-2	Granite <i>mano</i> fragment
SF-EKT-A2-1-25	EKT-A2-1-11	Limestone ball fragment
SF-EKT-A2-1-26	EKT-A2-1-12	Limestone ball fragment
SF-EKT-A2-1-27	EKT-A2-1-7	Limestone grooved stone
SF-EKT-A2-1-28	EKT-A2-1-14	Limestone ball fragment
SF-EKT-A2-1-29	EKT-A2-1-7	<i>Mano</i> fragment
SF-EKT-A2-1-30	EKT-A2-1-20	Chert biface frag
SF-EKT-A2-1-31	EKT-A2-1-19	<i>Mano</i> fragment
SF-EKT-A2-1-32	EKT-A2-1-1	Chert biface frag
SF-EKT-A2-1-33	EKT-A2-1-2	Granite grooved stone
SF-EKT-A2-1-34	EKT-A2-1-24	Pinch pot
SF-EKT-A2-1-35	EKT-A2-1-24	Chert biface frag
SF-EKT-A2-1-36	Backdirt	Andesite grooved stone
SF-EKT-A2-1-37	EKT-A2-1-4	Limestone grooved stone
SF-EKT-A2-surface-1	Surface	Spindle whorl

APPENDIX B: LOT INVENTORY

<i>Lot</i>	<i>Lot Description</i>	<i>Class</i>	<i>Notes</i>
EKT-A2-1-1	Ground surface	Ceramic	
		Chert	SF-EKT-A2-1-32
		Greenstone	SF-EKT-A2-1-36
		Limestone	SF-EKT-A2-surface-1
EKT-A2-1-2	Humic and collapse	Ceramic	
		Chert	
		Obsidian	
		Marine Shell	
		Worked Shell	SF-EKT-A2-1-1
		Quartz	SF-EKT-A2-1-2
		Limestone	SF-EKT-A2-1-3
		Granite	SF-EKT-A2-1-4
		Limestone	SF-EKT-A2-1-5
		Worked Shell	SF-EKT-A2-1-6
		Limestone	SF-EKT-A2-1-17
		Granite	SF-EKT-A2-1-23
		Granite	SF-EKT-A2-1-24
		Granite	SF-EKT-A2-1-33
Charcoal	RC-EKT-A2-1-3		
EKT-A2-1-3	Plaza Floor 1 ballast and fill	Ceramic	
		Freshwater Shell	
		Charcoal	RC-EKT-A2-1-1
EKT-A2-1-4	Architectural fill behind Walls 5 and 6	Ceramic	
		Chert	
		Freshwater Shell	
EKT-A2-1-4	Architectural fill behind Walls 5 and 6	Basalt	
		Limestone	SF-EKT-A2-1-7
		Granite	SF-EKT-A2-1-8
		Limestone	SF-EKT-A2-1-9
		Greenstone	SF-EKT-A2-1-10
		Limestone	SF-EKT-A2-1-11
		Granite	SF-EKT-A2-1-12
		Granite	SF-EKT-A2-1-13
		Greenstone	SF-EKT-A2-1-14
		Granite/Quartz	SF-EKT-A2-1-15
		Limestone	SF-EKT-A2-1-37
		Charcoal	RC-EKT-A2-1-2
EKT-A2-1-5	Floor 3	Ceramic	
		Chert	
EKT-A2-1-6	Architectural fill behind Wall 7	Ceramic	
		Chert	
		Granite/Basalt	SF-EKT-A2-1-18
		Granite	SF-EKT-A2-1-19
EKT-A2-1-7	Floor 2 and fill below	Ceramic	
		Limestone	SF-EKT-A2-1-27

<i>Lot</i>	<i>Lot Description</i>	<i>Class</i>	<i>Notes</i>
		Granite	SF-EKT-A2-1-29
EKT-A2-1-8	Ballast and fill below Floor 3	Ceramic	
		Chert	
		Quartz	SF-EKT-A2-1-20
EKT-A2-1-9	Fill between Walls 1 and 2	Ceramic	
		Limestone	SF-EKT-A2-1-21
EKT-A2-1-10	Fill below Plaza Floor 2	Ceramic	
		Chert	
		Limestone	SF-EKT-A2-1-22
		Charcoal	RC-EKT-A2-1-4
EKT-A2-1-11	Fill in front of Wall 9, below Plaza Floor 2	Ceramic	
		Chert	
EKT-A2-1-11	Fill in front of Wall 9, below Plaza Floor 2	Granite	SF-EKT-A2-1-16
		Limestone	SF-EKT-A2-1-25
EKT-A2-1-12	Fill in front of Wall 9, below Plaza Floor 3	Ceramic	
		Chert	
		Limestone	SF-EKT-A2-1-26
EKT-A2-1-13	Plaza Floor 4	Ceramic	
		Chert	
		Charcoal	RC-EKT-A2-1-6
EKT-A2-1-14	Fill between Walls 2 and 3	Ceramic	
		Limestone	SF-EKT-A2-1-28
EKT-A2-1-16	Ext. 1, fill below Floor 2	Ceramic	
EKT-A2-1-17	Fill below floor 5	Ceramic	
		Chert	
		Fauna	
		Freshwater Shell	
		Marine Shell	
		Charcoal	RC-EKT-A2-1-5
EKT-A2-1-18	Plaza Floors 5 and 6 in front of Wall 11	Ceramic	
		Chert	
		Obsidian	
		Charcoal	RC-EKT-A2-1-7
		Charcoal	RC-EKT-A2-1-8
		Charcoal	RC-EKT-A2-1-9
EKT-A2-1-19	Behind Wall 11 and Below Floor 7	Ceramic	
		Chert	
		Granite	SF-EKT-A2-1-31
		Charcoal	RC-EKT-A2-1-10
EKT-A2-1-20	Fill behind Wall 12	Ceramic	
		Chert	
		Chert	SF-EKT-A2-1-30
EKT-A2-1-21	Below Plaza Floor 6 and Wall 12	Ceramic	
		Chert	
EKT-A2-1-21	Below Plaza Floor 6 and Wall 12	Fauna	
EKT-A2-1-22	Marl Dump	Ceramic	

<i>Lot</i>	<i>Lot Description</i>	<i>Class</i>	<i>Notes</i>
		Chert	
		Obsidian	
		Charcoal	RC-EKT-A2-1-11
		Charcoal	RC-EKT-A2-1-12
EKT-A2-1-23	Cobble Fill Below Marl	Ceramic	
		Chert	
		Charcoal	RC-EKT-A2-1-13
EKT-A2-1-24	Darker Soil	Ceramic	
		Ceramic	SF-EKT-A2-1-34
		Chert	
		Chert	SF-EKT-A2-1-35
		Obsidian	
		Fauna	
		Freshwater Shell	
		Marine Shell	
		Charcoal	RC-EKT-A2-1-14
		Charcoal	RC-EKT-A2-1-15
		Charcoal	RC-EKT-A2-1-16
		Charcoal	RC-EKT-A2-1-17
		Charcoal	RC-EKT-A2-1-19
EKT-A2-1-25	Feature #1	Matrix	
		Charcoal	RC-EKT-A2-1-18

APPENDIX C: GROOVED STONE METRICS

<i>SF#</i>	<i>Specimen #</i>	<i>Material</i>	<i>Width of Groove (mm)</i>	<i>Approximate Diameter (mm)</i>
SF-EKT-A2-1-2		Granite	14.9	76
SF-EKT-A2-1-8	1	Granite		
SF-EKT-A2-1-8	2	Granite	13.6	70.1
SF-EKT-A2-1-8	3	Granite	17.4	
SF-EKT-A2-1-8	4	Granite	11.6	
SF-EKT-A2-1-10		Andesite	14.6	86.3
SF-EKT-A2-1-11		Limestone	15.7	95
SF-EKT-A2-1-14		Andesite?	14.6	58.9
SF-EKT-A2-1-15	1	Granite		
SF-EKT-A2-1-15	2	Granite	12	
SF-EKT-A2-1-15	3	Quartz	17.8	
SF-EKT-A2-1-15	4	Granite	18.5	
SF-EKT-A2-1-18		Granite/Basalt?	14.9	75
SF-EKT-A2-1-19		Granite	17.8	
SF-EKT-A2-1-20		Quartz	15.3	88.3
SF-EKT-A2-1-21		Limestone	16.9	
SF-EKT-A2-1-23	1	Granite		
SF-EKT-A2-1-23	2	Granite	10.9	
SF-EKT-A2-1-27		Limestone	13.3	
SF-EKT-A2-1-33		Granite	20.9	70.8
SF-EKT-A2-1-36		Andesite?	13.7	59.4
SF-EKT-A2-1-37		Limestone		80

APPENDIX D: DRILLED LIMESTONE BALL METRICS

<i>SF #</i>	<i>Specimen #</i>	<i>Diameter (mm)</i>	<i>Drilling Evident?</i>	<i>No. of Holes</i>	<i>Hole Depth (mm)</i>	<i>Hole Exterior Diameter (mm)</i>	<i>Hole Interior Diameter (mm)</i>	<i>Notes</i>
SF-EKT-A2-1-26			No					
SF-EKT-A2-1-25			No					Etched with two concentric rings 3 mm apart.
SF-EKT-A2-1-9			Yes	2	26	12.22	9.44	Holes meet in middle and are spaced 36 mm apart. Diameter of holes at junction is 7.05 mm. Exterior etched with 2 concentric rings 7.67 mm apart and bordered by crosshatching.
SF-EKT-A2-1-28		76	No					Diameter of complete ball is an estimate.
SF-EKT-A1-1-2		>100	Yes	1	>30			Slight drill mark where two holes likely meet. Diameter of ball and depth of hole approximate due to breakage.
SF-EKT-A2-1-17		77.94	Yes	1	42.62	12.43	10.18	Drill hole not terminated, so depth not maximum.
SF-EKT-A2-1-3	1		No					
SF-EKT-A2-1-3	2		Yes	1	14.4	11.85	10.69	Hole not terminated, so depth not maximum.
SF-EKT-A1-1-3	1	62	No					Slight depression on exterior. Possible start of drill hole?

<i>SF #</i>	<i>Specimen #</i>	<i>Diameter (mm)</i>	<i>Drilling Evident?</i>	<i>No. of Holes</i>	<i>Hole Depth (mm)</i>	<i>Hole Exterior Diameter (mm)</i>	<i>Hole Interior Diameter (mm)</i>	<i>Notes</i>
SF-EKT-A1-1-3	2	65.1	Yes	2	21.6	7.1	3.1	Etched ring 31.5 mm in diameter. Drill holes join in middle.
SF-EKT-A1-1-3	3	65	Yes	1	20.1			Measurements of hole diameters not possible due to breakage. Etched with three concentric rings, two of which are 24.3 mm and 43.3 mm in diameter and are 9.5 and 4.4 mm apart.
SF-EKT-A1-1-3	4		Yes	1	17.9			Measurements of hole diameters not possible due to breakage. Drill hole not terminated, so depth not maximum.
SF-EKT-A2-1-5	1		No					
SF-EKT-A2-1-5	2		Yes	1	25.9	8.6	7.6	Drill hole not terminated, so depth not maximum.
SF-EKT-A2-1-7	1	86.6	?					One drill hole is possible but indeterminate.
SF-EKT-A2-1-7	2	67	Yes	2	22.2	11.8	8.8	Diameter approximate. Etched with 4 concentric rings. Top one is 33.6 mm in diameter. Rings 1 and 2 are 5.8 mm apart. Rings 2 and 3 bound a zigzag pattern 9.3 mm wide. Ring 4 is 14 mm below ring 3.
SF-EKT-A2-1-7	3	64.7	Yes	1	35.4	16.2	8.1	Drill hole not terminated, so depth not maximum.

REPORT ON THE 2022 EXCAVATIONS AT THE EK TZUL BALLCOURT

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INTRODUCTION

Ek Tzul is a large minor center located in the Belize River Valley (Walden et al. 2019; see also Meyer et al., this volume). The site was discovered following analysis of the 2013 Western Belize lidar survey (Chase et al. 2014; Ebert 2015), but ground truthing and excavation was not conducted until the 2022 field season. Investigations during the 2022 field season sought to better understand the construction and role of the ballcourt in relation to the rest of the site. Excavation units were placed with the intention of finding any potential ballcourt markers in the center and at either end of the ballcourt alley and dating the construction sequence of the ballcourt. Ballcourt markers or the ritual caches commonly positioned beneath these contain an array of items which may provide an understanding of the relative affluence and political connections of the elite who commissioned the ballcourt (for ballcourt caches see Fox 1996; Kurjack, Maldonado C., and Green Robertson 1991).

Understanding the construction chronology of the ballcourt was also important, while ballcourts appear at major centers in the Late Preclassic to Early Classic period, the ballcourts at larger minor centers in the region, such as Ontario and Xualcanil are entirely Late Classic constructions (Garber et al. 1994:14; Iannone 2003:16), and this pattern tentatively also holds for the plowed ballcourt at North Caracol Farm (Golden and Conlon 1996:26; Walden et al. 2023). Understanding the temporal sequence of construction at the Ek Tzul ballcourt would allow us to draw regional comparison regarding the timing of ballcourt construction at different minor centers.

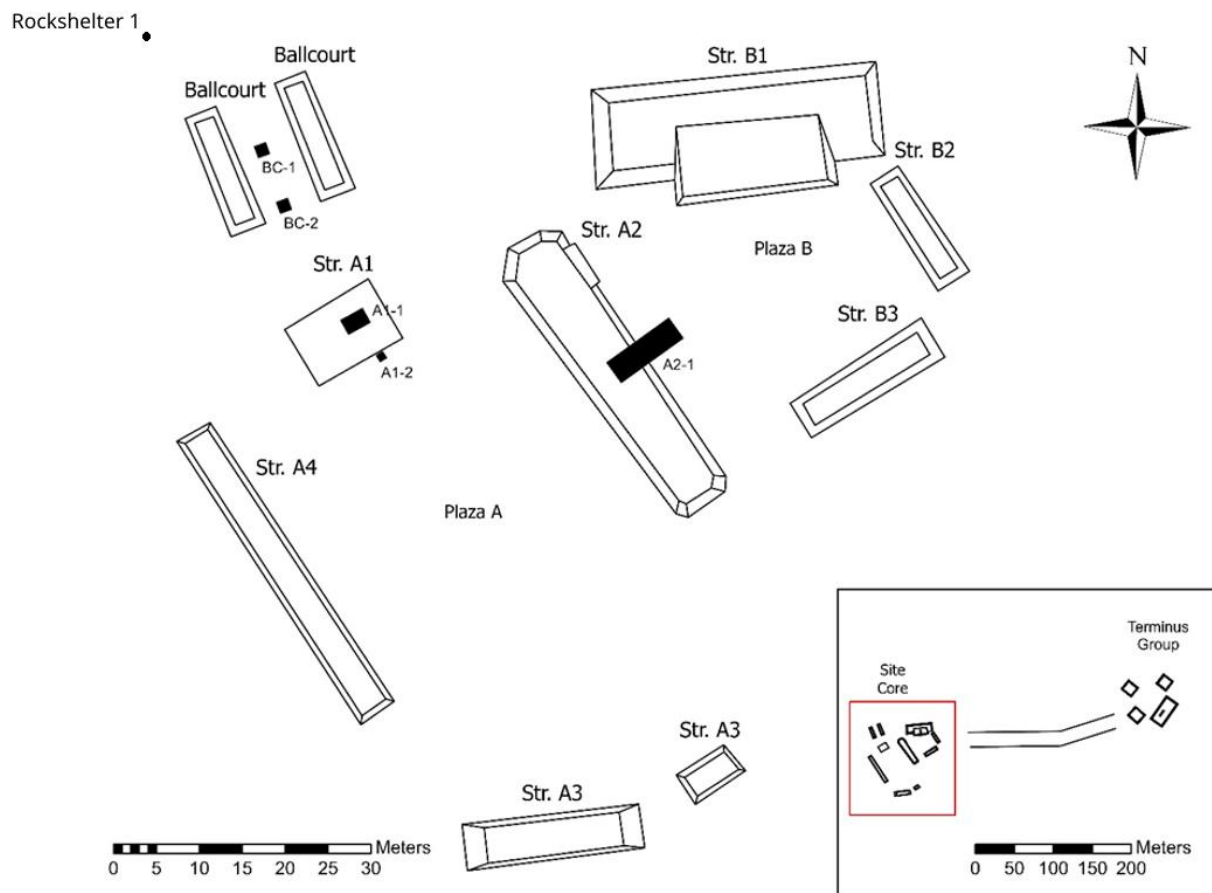


Figure 1: Map of Ballcourt Excavations (E.U. BC-1 and BC-1) at Ek Tzul.

METHODS

Excavations of Ballcourt 1 in the Ek Tzul site core began with the goal of investigating potential ball court markers and construction chronology in the ballcourt alley, with a plan to place three excavation units on either end of the alley and one in the center (Figure 1). These locations were chosen because of regional trends in the placement of ballcourt markers at either end and the center of the playing alley (Feely 2019; Ferguson et al. 1996; Kollias and Biggie 2016). Two 2 x 2 m units were placed along the middle of the ballcourt alley. The first unit (EKT-BC1-1) was placed in the center of the ballcourt alley. The second unit (EKT-BC1-2) was placed on the south/southeast end of the ballcourt alley. After the completion of these two units, it seemed unlikely that a ballcourt marker would be found on the other end of the ballcourt alley, so no third unit was placed.

RESULTS

E.U. EKT-BC1-1

Both ballcourt units were limited in depth and cultural materials. Both consisted only of two lots, a surface lot and a humic layer on top of bedrock. The first of these units, EKT-BC1-1, was the most limited in its materials. One piece of obsidian was found on the surface of this unit. Excavations revealed approximately 30 cm of matrix on top of bedrock, though the depth varied across the unit (Figure 2). Within the lot (EKT-BC1-1-2), few artifacts were found. Artifacts consisted mainly of ceramic sherds and a few pieces of chert. In addition to these, there were two fragments of grooved granite stones (SF# SF-EKT-BC1-1-1) as well as a possible speleothem fragment. Only a single ceramic sherd from this unit was diagnostic, a Yaha Creek Cream jar rim, and it belonged to the Spanish Lookout I-II phase.



Figure 2: Bedrock exposed across EU EKT-BC1-1.

E.U. EKT-BC1-2

Similar to the first unit, depths of the humic layer on top of bedrock varied across EU EKT-BC1-2. Generally, bedrock was about 30 cm below the ground surface (Figure 3). A plaster ballcourt floor was not visible within the lot (EKT-BC1-2-2), but remains of a plaster floor seemed to be mixed into decomposing bedrock that permeated the humic layer of this unit. Within the humic layer, 13 grooved stone fragments were found, some composed of granite and others of quartz (Figure 4). Other artifacts included ceramic, chert debitage and a chert biface, and a single piece of daub. No ceramics from this unit were diagnostic.



Figure 3: Bedrock exposed across EU EKT-BC1-2.



Figure 4: Two of the grooved stones fragments found in EKT-BC1-2.

DISCUSSION AND CONCLUSION

Though there was only one ceramic sherd in both of these units that could accurately be typed, it would seem likely that this ballcourt was constructed during the Late-Terminal Classic period. This dating is also corroborated by inspection of a looter's trench on the northwest side of the ballcourt platform. Additionally, much of the monumental architecture across the rest of the center dates to this time period (see Meyer et al. this volume). The ballcourt likely was constructed during this same period of architectural expansion at the site, around AD 700-900 during the Late or Terminal Classic period (Spanish Lookout I-II). This shift also ties in with the aforementioned regional patterns.

A sizeable rockshelter approximately 50 meters downslope to the southwest of the ballcourt was brought to our attention by a local informant, Hart Robato. It is possible the ballcourt was constructed in association with this rockshelter (see Figure 1). There is a cosmologically significant relationship between ballcourts and the Maya underworld based on the story of the Hero Twins in the Popol Vuh (Christenson 2007). It is possible the ballcourt was constructed in proximity to this rockshelter due to these cosmological referents, although it could also simply be a coincidence. Initial investigations into the rockshelter did show some ceramic and lithic debitage on the surface, but it appeared the cave ceiling had collapsed, covering what would have been the ancient rockshelter floor surface. Further investigations in this rockshelter might reveal more information on possible connections with the ballcourt. Based on its size the speleothem present in the ballcourt alley construction fill probably was not from the small rockshelter.

Initial investigations at the Ek Tzul ballcourt reveal that it was most likely constructed in the Late or Terminal Classic period alongside other expansion at the site. However, the cultural materials found during excavations were minimal, and largely non-diagnostic. While there are some potential threads to investigate, like the rockshelter found nearby, the minimal construction phases on the ballcourt and its limited diagnostic materials suggest a Late or Terminal Classic date which correlates with other ballcourts at secondary minor centers like North Caracol Farm, Ontario, and Xualcanil.

Acknowledgments We would like to thank the Belize Valley Archaeological Reconnaissance (BVAR) Project and its co-directors Drs. Jaime Awe, Julie Hoggarth, and Claire Ebert for their support of our research. We would also like to thank the Institute of Archaeology and Dr. John Morris for permitting our research. This research was not possible without financial support from the Archaeological Institute of America – National Endowment for the Humanities (Hoggarth) and the Max Planck Institute for Evolutionary Anthropology (Walden), as well as the excavation assistance of Michael Biggie, Julio Trujillo, Saul Castenada, Carlos Mendez, and Hart Robato.

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APPENDIX A: BALLCOURT 1 ALLEY SPECIAL FINDS INDEX

<i>SF#</i>	<i>Lot</i>	<i>SF Description</i>
SF-EKT-BC1-1-1	EKT-BC1-1-2	Two granite/quartz ground stone fragments
SF-EKT-BC1-2-1	EKT- BC1-2-1	Quartz ground stone fragment
SF-EKT-BC1-2-2	EKT- BC1-2-2	13 granite/quartz grooved stone fragments
SF-EKT-BC1-2-3	EKT- BC1-2-2	Quartz grooved stone fragment

APPENDIX B: BALLCOURT 1 ALLEY ARTIFACT INDEX

<i>Lot</i>	<i>Lot Description</i>	<i>Class</i>	<i>Frequency</i>	<i>Index #</i>
EKT-BC1-1-1	Ground Surface	OB	1	
EKT-BC1-1-2	Humic	CE	3/30	
EKT-BC1-1-2	Humic	CH		
EKT-BC1-1-2	Humic	GR	2	
EKT-BC1-1-2	Humic	SP	1	SF-EKT-BC1-1-1
EKT-BC1-2-1	Ground Surface	QZ	1	
EKT-BC1-2-2	Humic	CE	10	SF-EKT-BC1-2-1
EKT-BC1-2-2	Humic	CH	2	
EKT-BC1-2-2	Humic	DB	1	
EKT-BC1-2-2	Humic	SP	1	
EKT-BC1-2-2	Humic	QZ/GR	13	
EKT-BC1-2-2	Humic	CE	4	SF-EKT-BC1-2-2

APPENDIX C: GROOVED STONE METRICS

<i>SF #</i>	<i>Specimen #</i>	<i>Material</i>	<i>Width of Groove (mm)</i>	<i>Approximate Diameter (mm)</i>
SF-EKT-BC1-1-1	1	Granite	18.9	
SF-EKT-BC1-1-1	2	Granite	18.6	75.2
SF-EKT-BC1-2-1		Quartz		79.5
SF-EKT-BC1-2-2	4	Granite	12.6	74.9
SF-EKT-BC1-2-2	5	Granite		
SF-EKT-BC1-2-2	6	Granite		
SF-EKT-BC1-2-2	7	Granite	15.8	64.7
SF-EKT-BC1-2-2	8	Granite		
SF-EKT-BC1-2-2	9	Granite	11.3	
SF-EKT-BC1-2-2	10	Granite		
SF-EKT-BC1-2-2	11	Granite		
SF-EKT-BC1-2-2	12	Granite	13.8	75.5
SF-EKT-BC1-2-2	13	Granite	16.2	73
SF-EKT-BC1-2-2	1	Granite	18.3	
SF-EKT-BC1-2-2	2	Granite	16	
SF-EKT-BC1-2-2	3	Granite	12.1	
SF-EKT-BC1-2-3		Granite	11	

**INVESTIGATIONS OF THE NORTHERN PALACE COMPOUND
AT XUNANTUNICH, BELIZE: STRUCTURES A10 AND A13**

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INTRODUCTION

The Xunantunich Archaeological and Conservation Project (XACP) is an ongoing multiyear project focused on documenting and preserving the architecture present within the Xunantunich central precinct (Zanotto and Awe 2017:289). Since its inaugural season in 2015, this project has been operating under the aegis of the Belize Valley Archaeological Reconnaissance (BVAR) project. Excavations conducted at Xunantunich, Belize, during the 2022 field season, continued to investigate Plazas A-I, A-II, A-III, and the Group B residential compound (Figure 1). This report presents a detailed description of all archaeological operations within the Plaza A-III palatial compound. One goal of the 2022 investigations was to contribute to the established chronology of Plaza A-III (see LeCount et al. 2002), which required the implementation of vertical excavations for the potential recovery of charcoal and other organic remains for absolute dating. In addition, horizontal excavations were implemented to increase our understanding of the palatial compound's architectural composition, which later provided an opportunity to test 3D documentation methods on the architecture itself. These excavations have allowed the authors to gain a better understanding of the architectural layout and construction sequence of Plaza A-III, to further elaborate how the Late Classic Maya modified the landscape through monumental construction, and how the built environment reflects commemoration, cooperation, and physical

manifestations of power across the Maya lowlands (Awe 2008, Awe et al. 2020a). This report provides a detailed synthesis on the history of archaeological investigation at Xunantunich, the authors' approach to the 2022 operations, results deduced from that work, and a discussion on potential future research in Plaza A-III.

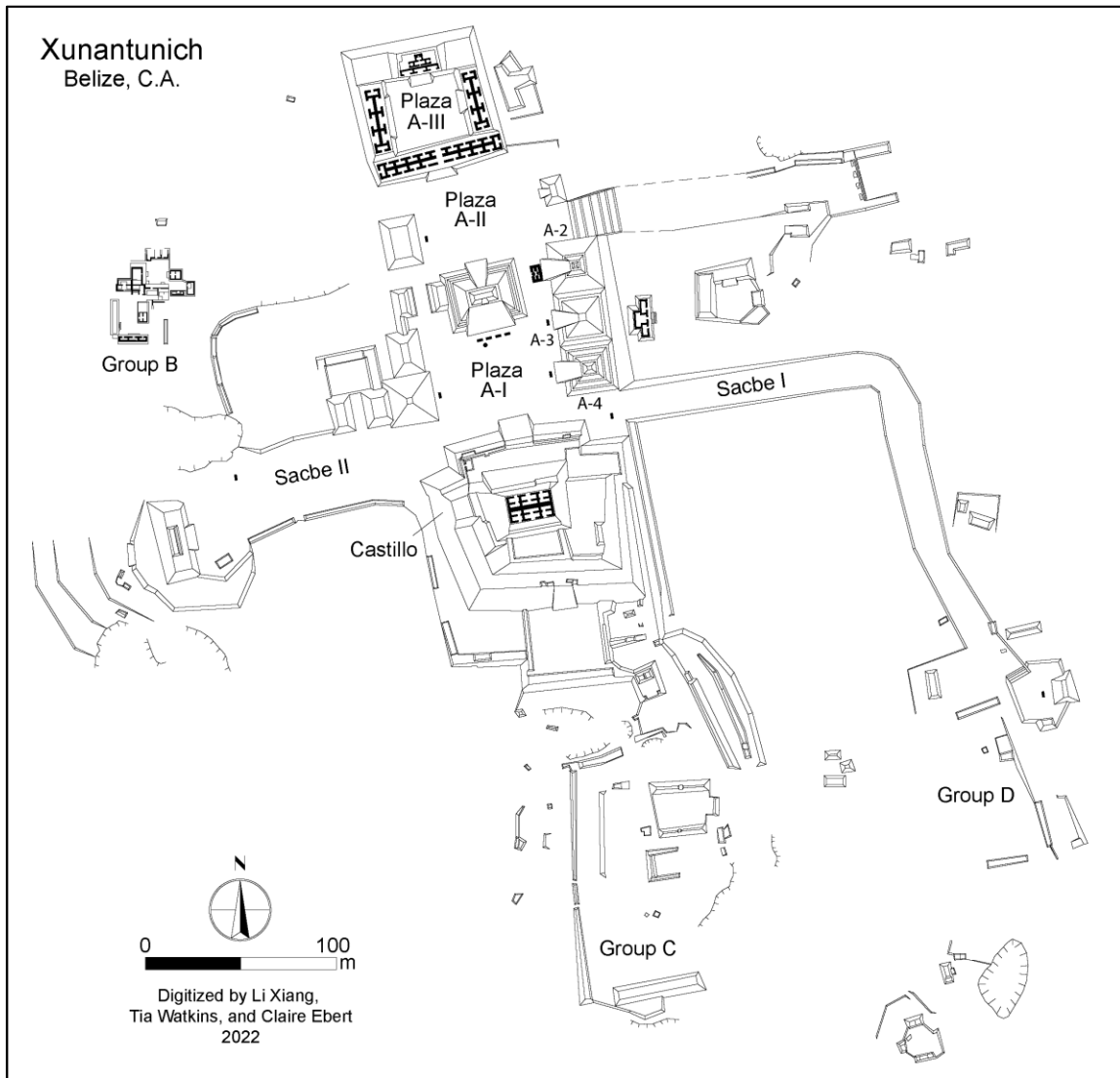


Figure 1: Map of Xunantunich epicenter.

BACKGROUND

The Xunantunich civic-ceremonial center is located in present-day west-central Belize, approximately 1 km east of the modern Belize-Guatemala border. The site core is situated atop a large limestone hill that overlooks the Mopan River to the south and east. The site's sustaining comprises alluvial river valley with karstic outcrops and foothills of the Maya Mountain range to the east and south. These diverse geological and environmental features would have presented an

ideal and resource rich environment for sedentary living amongst the region's earliest settlers. The Xunantunich site core is composed of six architectural groups, Groups A, B, C, D, E, and F. Of these six groups, Group A is the largest, containing approximately 26 monumental buildings around several courtyards that served as the civic and ritual center of the city. Plaza A-III, the focus area for this report, is a palatial complex situated at the northernmost boundary of Group A. The palace complex, like elite residences at most Maya sites, is elevated above Plazas A-I and A-II and provides limited or controlled access from the latter, more public, courtyards.

Plaza A-III is enclosed by four main structures (Structures A10, A11, A12 A13, which are roughly aligned to each cardinal direction. For this report, we focus on Structures A10 and A13. Structure A10, situated on the western boundary of the courtyard, is a double vaulted range structure likely consisting of eight rooms in total (three rooms on the eastern side facing the plaza; three rooms on the western side, overlooking Group B to the west; and two individual rooms on either end of the building). Structure A13 is an *audiencia* style building that is double vaulted and consists of 18 rooms. Structure A13 forms the southern boundary of the Plaza A-III compound and acts as the primary and constricted accessway into the courtyard, a standard function of *audiencia* buildings (Loten and Pendergast 1984).

Archaeological investigations at Xunantunich were first conducted in the mid-1890s by medical doctor Thomas Gann (1925). During the late 1930s, archaeologist Sir J. Eric S. Thompson re-surveyed the site, excavated several buildings in Group B, and published one of the first ceramic reports for Xunantunich (Thompson 1942). Formal archaeological inquiry at Plaza A-III commenced in 1959 under the direction of Euan MacKie, whose investigations primarily targeted the most prominent building, Structure A11 (Figure 2; MacKie 1985). During the late 1980s, the Belize Department of Archaeology helped facilitate the development of the Xunantunich Archaeological Project (XAP) to continue the archaeological investigation of the site, including further excavations at the Plaza A-III palace (Harrison 1996, Yaeger 1997). In 2002 and 2003, the Belize government implemented the Tourism Development Project (TDP) under the direction of Jaime Awe. The goal of this project was to conserve the ceremonial center of Xunantunich for tourism purposes, to increase job opportunities for the local Maya in the village of San Jose Succotz, and to enhance the overall tourism potential of western Belize. During the 2003 field season, TDP collaborated with several international archaeologists and researchers who helped to further MacKie's work at Structure A11 (Yaeger 2005). Subsequently, Structure A11 was fully stabilized and conserved for public use. In 2008, the Mopan Valley Preclassic Project (MVPP), directed by M. Kathryn Brown and Jason Yaeger, expanded on previous efforts in Plaza A-III by implementing several test units into the palace's central plaza in front of Structures A11 and A12 to identify Preclassic activity in the courtyard (Brown, personal communication, 2022). From 2015 onward, the site has been under investigation by the Xunantunich Archaeology and Conservation Project (XACP) under the aegis of the BVAR project.

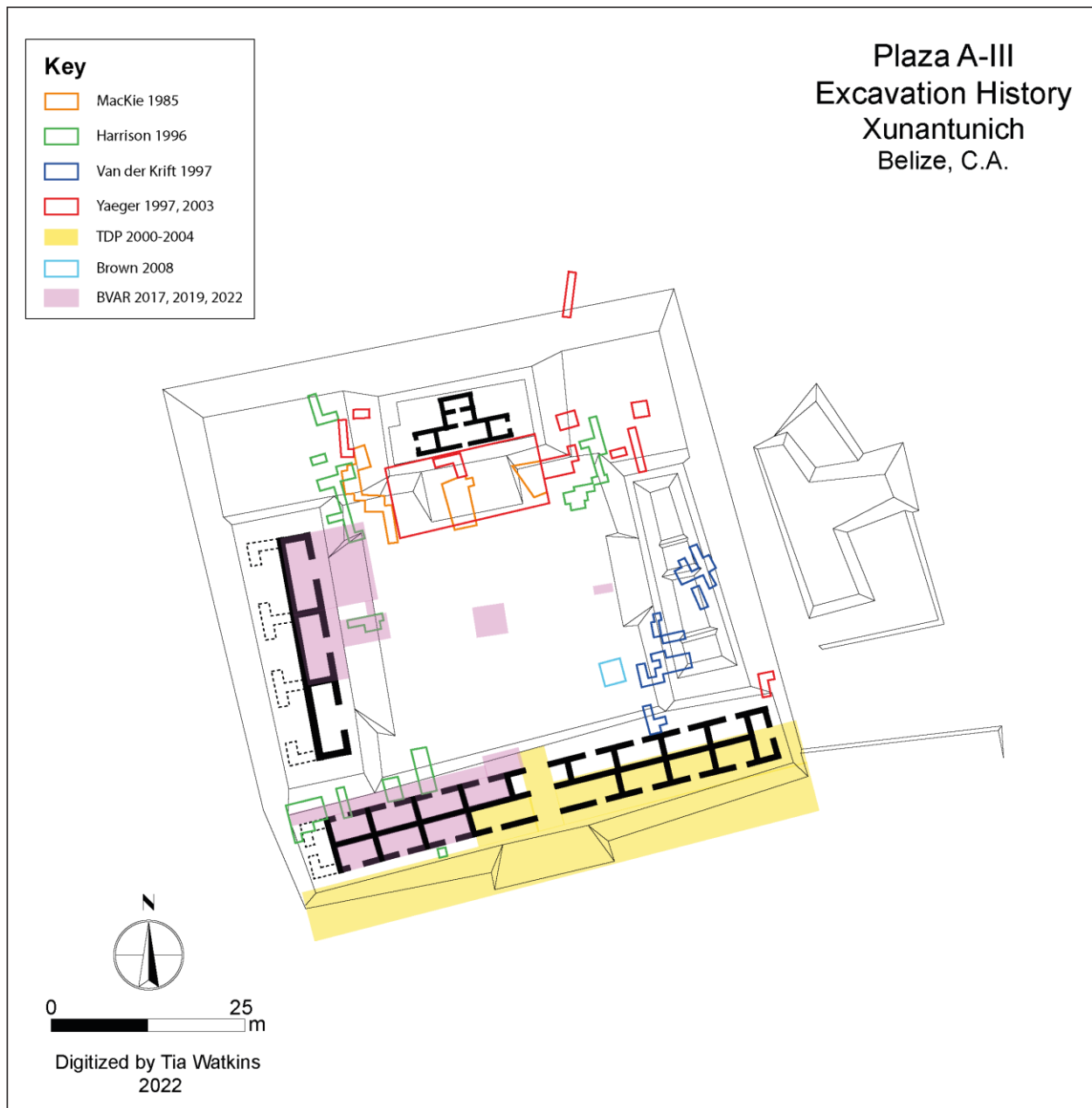


Figure 2: Map of Plaza A-III showing the location of previous and current excavations.

RESEARCH OBJECTIVES

Archaeological investigations for the 2022 field season focused on the excavation of Structures A10 and A13, located at the eastern and southern boundary of Plaza A-III. These investigations aimed to better understand the timing and tempo of monumental construction at Xunantunich. These goals were achieved through the detailed documentation of the architectural layout and construction episodes of Structures A10 and A13. In addition, the 2022 investigations at Plaza A-III contribute to the broader BVAR Project research agenda of examining the growth and decline of ancient Maya communities throughout the Belize Valley.

To document the architectural morphology and chronology of Structures A10 and A13, the 2022 field investigations addressed three primary research questions:

1. What is the architectural layout of Structure A10? How many doorways, rooms, and stairs make up the building and how does this organization compare to other structures in Plaza A-III?
2. What is the construction sequence of Plaza A-III and what is the earliest evidence for occupation in the courtyard?
3. How do construction episodes in Plaza A-III compare to other sequences documented in Plazas A-I and A-II?

METHODS

This research employs a systematic program of excavations to obtain new primary data, reflecting architectural construction and function over time. All excavations and data recovery were conducted in compliance with BVAR protocols and procedures following those established by the Belize Institute of Archaeology. The excavations described below were part of a continued effort to stabilize and conserve more of the architecture in Xunantunich's Group A, which hosts thousands of national and international visitors during peak tourism season. These excavations also aid in providing the local tour guide association with new and up-to-date information, ultimately providing a unique experience to visitors and encouraging them to revisit the site.

During the 2022 field season, three operations (OP) were established in Plaza A-III, OP A10-2022, OP A13-2022, and OP XUN-2022 (see also Ramirez et al. this volume). All three operations involved several archaeological methods to answer the questions discussed above. These methods include horizontal and vertical excavation, mapping, 3D modeling and photogrammetry, artifact analysis, and architectural conservation (see Saldaña et al. this volume). The implementation of horizontal excavation units aimed to expose the architecture's terminal (or final) construction phase to allow for a better understanding of structural layout and composition. Vertical excavations (test-units) were implemented at Structure A10 under Operation XUN-2022 (see Ramirez et al. this volume) to record data about the construction sequence of the structure, aiding in the reassessment of the site's chronology and development. A total of four excavation units were opened under Operation A10-2022, and one excavation unit was opened under Operation A13-2022. All excavations reported here fall into the category of horizontal exposure.

To document our excavations throughout the field season, we used photogrammetric methods to create scaled 3D models of each excavation unit. The programs used to create the models include the Polycam application and Agisoft Metashape Pro. Polycam is a 3D scanning application available on iOS, Android, and web platforms (www.poly.cam). Agisoft Metashape Pro is a software that can process a series of images and generate 3D geospatial data (www.agisoft.com). For the 2022 field season, Polycam was applied using iOS devices containing handheld lidar technologies (iPhone 12 Pro, iPhone 13 Pro, and iPad Pro 12.9"). These technologies enabled the creation of high-accuracy 3D documentation to preserve the archaeological process and data.

All artifactual materials recovered from the excavations described below were analyzed at the most basic level involving inventory and documentation, photography, and measurements. All artifacts were stored on-site in the designated Xunantunich bodega. Basic lab work (artifact processing, washing, and inventory) was carried out throughout the field seasons and completed by BVAR field school students as part of their required laboratory analysis instruction. Ceramic materials will be analyzed and compared to the established type variety for the Belize Valley and for Xunantunich (Awe 1992, Gifford 1976, LeCount 1996). Lithic materials, including chert and obsidian tools, flaked stone debitage, and groundstone, were documented according to raw material and any notable tool forms. Shell and other faunal remains were inventoried and analyzed using standard morphometric methods of analysis.

OPERATION A10-2022

Investigations of Structure A10 during the 2022 field season were recorded as Operation A10-2022. Watkins and Ramirez both supervised excavations under this operation as the data pertained to both their forthcoming graduate research (see Ramirez n.d.).

Excavation Unit A10-2022-1

The goal of the Excavation Unit (E.U.) A10-2022-1 was to locate and expose the terminal phase of the architecture of the northernmost room (Room 1) on the eastern side of Structure A10. This unit was strategically placed to align with previous excavations conducted by Harrison (1996) and measured 7.5 m E/W and 9 m N/S. EU A10-2022-1 consisted of three lots, Lot A10-2022-1-1, Lot A10-2022-1-2, and Lot A10-2022-1-3, which divided the unit into three contextual levels indicating a change in cultural context (i.e. Humus/sterile, Architectural Collapse/Terminal Architecture, Below Terminal Architecture). Lot A10-2022-1 was used to record artifacts from the humic layer (Level 1) of our excavations. The humic layer was moderately disturbed through bioturbation and consisted of dark brown soil, pebbles, cobbles, high root activity from nearby trees, and grasses. Lot A10-2022-1-1 was closed when we reached a dense layer of collapsed architectural material approximately 20 cm from the surface level.

Lot A10-2022-1-2 recorded artifacts and data collected from within the layer of collapsed architecture exposed in the previous lot. Excavations in the lot ceased after we removed approximately 2 m of collapsed materials, including large limestone cut-stones, vault stones, and cobbles that had eroded from the exposed architectural core. Once we carefully removed the architectural collapse, we could document the terminal architectural features of Room 1 and the northern segment of the structure's central stair and terrace. The terminal architecture was poorly preserved, and much of the stair's terminal phase had eroded or been displaced by nearby tree roots. The central stair was outset (meaning the stair protrudes out from the building) with a conjoined stair-side outset (see Loten and Pendergast 1984). It was not possible to determine the exact number of stairs constructed during the terminal phase as the majority of the stairs were eroded in antiquity. However, when observing the incline to the terrace surface, it seems likely that the central stairway was comprised of no more than five steps. In Room 1, much of the plastered floors and surfaces displayed large cracks and pitting from the impact of architectural collapse and perhaps from being exposed to natural forces such as rainfall, earthquakes, and hurricanes. The room dimensions for Room 1 measured 7.35 m N/S by 2.5 m E/W. The

architectural features of Room 1 include a large, angled U-shape bench that spans the entire room length and is accompanied by a bench platform, a raised surface built atop the bench surface (Figure 3). The bench platform measured 23 cm above the bench surface and spanned 2 m N/S by 1 m E/W. Because the bench platform was mostly eroded, closer observation revealed that the bench platform was a later addition to the bench. The room walls were well preserved, measuring ~2 m at the highest point, however the back wall was significantly disturbed in the center due to movement from tree roots. No plaster remained on any of the room walls.

Lot A10-2022-1-3 was designated to record artifacts and data collected from the layer of construction fill beneath the terminal phase of architecture (Figure 4). Lot A10-2022-1-3 investigated the contexts beneath the terminal stair and was confined to a small test area or "sub-lot" measuring 1.5 m N/S by 4.2 m E/W. Excavations were discontinued approximately 30 cm below the starting elevation of the lot. These excavations did not locate an earlier phase of construction however, this will be further explored during the 2023 field season as early architecture was located in other associated units (see E.U. A10-2022-3).



Figure 3: Photo showing birds-eye view of Room 1.



Figure 4: Photo of Lot A10-2022-1-3.

E.U. A10-2022-1 Artifact Assemblage

A total of 1,365 artifacts were documented and recovered from E.U. A10-2022-1 and are discussed in detail here alongside their associated Lot context. Artifacts recorded in Lot A10-2022-1-1 consisted of a minor frequency of Late Classic ceramic sherds and a few chert fragments. In addition, two Special Finds (See Appendix A for Special Finds Table) were documented in this humic layer, including a silver metal cross (SF# A10-22-001, Figure 5a) and a carved marine shell disk (*Gastropoda* spp., SF# A10-22-002, Figure 5b). This disk was ground into a rough circle with a diameter of 1.5 cm, flat on one face and rounded on the other.

Artifacts recorded in Lot A10-2022-1-2 consisted of ceramic, chert, a single cobble, a granite fragment, one obsidian prismatic blade fragment, several curiously shaped short and narrow limestone dowels or pins (possibly used in some form of craft production), and one unknown object. In addition, three Special Finds were identified in this lot, including a marine shell pendant (SF# A10-22-003, Figure 5c), a chert biface (SF# A10-22-004, Figure 5d), and finally, a limestone bark-beater preform (SF# A10-22-009, Figure 5e). The shell pendant (SF# A10-22-003) is a modified spire of a true conch (*Strombidae* spp.) that was trimmed at the base and the apex. The protrusions on the spire have been ground or worn down, and two conically drilled holes were created on one edge, indicating where it would have been strung.

Lot A10-2022-1-3 yielded a total of 92 artifacts, including ceramic and chert materials. A total of 84 ceramic sherds were recovered, but only 16 displayed an identifiable diagnostic element (rim). Ramirez will report on the ceramic types in his upcoming Master's Thesis (see Ramirez n.d.). Seven chert fragments were identified as debitage from different cores. No Special Finds were recovered or identified in this lot.



Figure 5: a) Front and back view of the historic period silver cross. b) Dorsal and ventral view of shell *adorno*. c) Dorsal and ventral view of conch shell pendant. d) Dorsal and ventral faces of the Lanceolate biface. e) Top and side view of possible bark beater.

Excavation Unit A10-2022-2

Excavation Unit A10-2022-2 was implemented to expose the terminal architectural features of the central room (Room 2) on the eastern side of Structure A10. This unit was placed directly south of E.U. A10-2022-1 and measured 8 m E/W and 6.5 m N/S. Unit A10-2022-2 consisted of a single lot, Lot A10-2022-2-1, due to the exposed collapsed materials visible within the surface humic layer. Excavations ceased approximately 2.25 m from the surface level once we carefully removed the architectural collapse and exposed the terminal architecture of the room.

The preserved architecture of Room 2 (Figure 6) revealed an identical layout as Room 1, which was to be expected as Classic Maya architectural construction practices involved strategic planning for the creation of symmetrical space (Wernecke and Ford 1993:4). Room 2 was much better preserved than Room 1 however, plastered surfaces still contained cracks and evidence of erosion. The dimensions for Room 2 measured 7.9 m N/S by 2.6 m E/W. The architectural features of Room 2 include a large, angled U-shape bench that spans the entire room length and has a platform constructed on the northern section of the bench, mirroring that in Room 1. The bench platform in Room 2 was also eroded however, a preserved plaster lipping on the bench surface revealed the N/S measurement of the bench platform to be 2.6 m and likely spanned the room depth (2.6 m E/W). The room walls were very poorly preserved, measuring ~1.5 m at the highest point. The back wall was heavily disturbed due to movement from tree roots, causing most of the wall to buckle around the third and fourth course of stone from the bench surface.



Figure 6: Birds-eye view of Room 2.

E.U. A10-2022-2 Artifact Assemblage

EU A10-2022-2 yielded 851 artifacts with materials consisting of ceramic, chert, faunal remains, marine shell, obsidian, and one unknown material. Ceramic sherds and chert fragments were distributed consistently throughout the lot. Of the 803 ceramic sherds recorded, only 114 displayed diagnostic features, and Watkins will analyze these in 2024. Within the architectural collapse a thin grey chert biface (SF# A10-22-005, Figure 7a) was recovered. The biface appears

to be missing the distal and proximal ends and resembles a spear point with a lanceolate shape. Sitting directly on the bench surface and abutting the north face wall in Room 2 was A10-2022-2 Cache 001. It consisted of a metate fragment (SF# A10-22-006, Figure 7b) of unknown material (possibly hard limestone or quartzite) with fossilized shell impressions on both the ventral and dorsal surfaces. In addition, eight ceramic body sherds and one rim sherd were located under the metate. Artifacts recorded in this unit also include an orange marine shell flower *adorno* (*Spondylus* spp.) (SF# A10-22-007, Figure 7c), which is finely worked on the ventral side and unfinished on the dorsal side. The flower *adorno* displays five petals and a conically drilled hole in the center, drilled from the dorsal side, which is bounded by a circular incision. The delicate piece could have functioned as an ornament for clothing, jewelry, or a headpiece. In addition, a worked olive shell (*Olividae* spp.) tinkler (SF# A10-22-008, Figure 7d) was collected. The tinkler was partially broken and was conically drilled on the lateral surface. Finally, three unidentified medium and medium-large mammal long bone fragments were also recovered.



Figure 7: a) Dorsal and ventral faces of the thin grey biface. b) Top and bottom view of metate fragment. c) Front and back of shell *adorno*. d) Both sides of olive shell tinkler.

Excavation Unit A10-2022-3

Excavation Unit (E.U.) A10-2022-3 was designated to test the Structure A10 central stair in hopes of locating a better-preserved segment than that in E.U. A10-2022-1. Unit A10-2022-3 measured 1.5 m N/S by 7.5 m E/W and was strategically aligned with the doorway of Room 2, marking the central axis of the structure (Figure 8). This unit took the form of a trench and its

purpose was to record a clear stratigraphic sequence of Structure A10'. EU A10-2022-3 contained two lots, Lot A10-2022-3-1 and Lot A10-2022-3-2 which helped organize materials collected from two distinct cultural contexts encountered throughout our excavations. Lot A10-2022-3-1 was designated as the humic layer, which was moderately disturbed through bioturbation processes and consisted of dark brown soil, pebbles, and grasses. Lot A10-2022-3-1 was closed when we reached a change in context indicative of architectural collapse approximately 15 cm from the surface level.

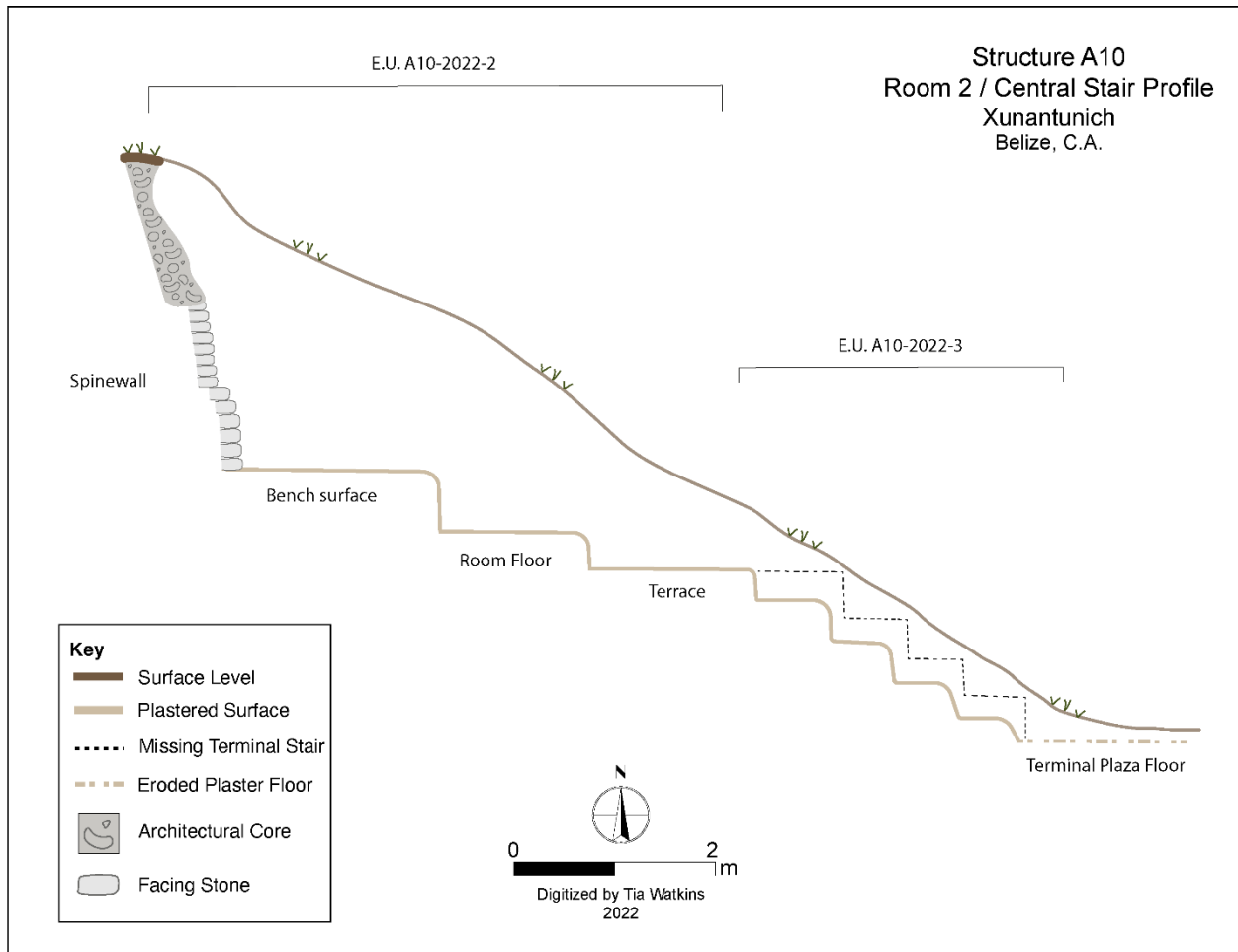


Figure 8: Profile of both EU A10-2022-2 and A10-2022-3.

Lot A10-2022-3-2 was used to record data collected from below the humic layer and within the layer of architectural collapse. Excavations ceased approximately 32 cm from the surface level after revealing nearly pristine plastered steps (Figure 9), unlike the typical style of Late and Terminal Classic construction. The good quality of the preserved steps in E.U. A10-2022-1 indicated that these plastered stairs were much deeper from the surface and, as such, are likely part of an earlier (penultimate) construction phase. The preservation of the terminal stair was so heavily eroded that no cut stones or alignment pattern could be discerned, leading us to designate this feature as "architectural collapse". Although our efforts during the 2022 field season could not fully expose the penultimate stair, it contained four steps, each measuring an approximately 20 cm

in height. Further excavation identified that the penultimate stair is not aligned with the terminal phase center of Structure A10. The fact the penultimate stair was off center probably indicates that Structure A10 was extended to the south during its terminal phase of construction, possibly at the same time as the reconfiguration of Structure A11 (Yaeger 2005).



Figure 9: Photo of exposed penultimate stair on Str. A10.

E.U. A10-2022-3 Artifact Assemblage

No artifacts were recorded in Lot A10-2022-3-1. Lot A10-2022-3-2 yielded a total of 17 ceramic sherds and only two displayed an identifiable diagnostic element (rim). No Special Finds were recovered or identified in this unit.

Excavation Unit A10-2022-4

Excavation Unit A10-2022-4 was opened to locate and expose the first (bottom) step of the penultimate stairway documented in E.U. A10-2022-3. Unit A10-2022-4 was placed directly north of E.U. A10-2022-3 and measured 7 m N/S and 4.2 m E/W. This unit was situated to locate the northern limit of the penultimate stair. E.U. A10-2022-4 consisted of two lots, Lot A10-2022-4-1 and Lot A10-2022-4-2.

Lot A10-2022-4-1 was designated as the humic layer. The humic layer was moderately disturbed through bioturbation processes throughout and consisted of dark brown soil with high levels of root activity from nearby trees and grasses. Lot A10-2022-4-1 was closed when we reached the few remnants of the terminal stair, which looked like architectural collapse. Lot A10-2022-4-2 was established to record artifacts and data from below the level of the remnants of the terminal stair in the area adjacent to Harrison's (1996) previous excavation. Excavations ceased when we located more of the penultimate stair, which partially displayed signs of previous excavation, including the presence of sterile backdirt and a layer of plastic.

E.U. A10-2022-4 Artifact Assemblage

Lot A10-2022-4-3 yielded 43 artifacts. Within the excavated matrix, artifacts consisted primarily of ceramic and chert remains. A total of 40 ceramic sherds were recovered, and only five displayed an identifiable diagnostic element (rim). No special finds were recovered or identified. Lot A10-2022-4-2 yielded approximately 74 artifacts, including ceramic and chert materials. Artifacts documented in this lot consisted primarily of ceramic sherds ($n = 64$) and 10 chert fragments were identified as debitage, which had each come from different cores. Of the 64 ceramic sherds, 11 were diagnostic fragments (rim sherds). No Special Finds were recovered or identified in this lot. Excavations in Lot A10-2022-4-3 yielded a total of seven artifacts. Within this small-sized vertical test pit, there was a low frequency of ceramic and chert artifacts. Four ceramic sherds were recovered, none of which were diagnostic. Three chert fragments were identified from different core sources and no Special Finds were recovered or identified in this lot.

OPERATION A13-2022

Excavation Unit A13-8

Excavation Unit (E.U.) A13-8 was established to expose the terminal phase of architecture in Room 10 of Structure A13, the *audiencia* structure which forms the southern boundary of Plaza A-III. Measurements were taken from the adjacent room and the measurements were then used to determine the placement of this unit. The unit measured 3.5 m N/S by 6.5 m E/W and was placed directly west of Room 11. Note the EU A13-8 designation does not contain the year as it conforms to the designation format used at the building previously (see Watkins et al. 2018, 2020). Excavation Unit A13-8 consisted of a single lot, Lot A13-8-1 as there was exposed collapsed materials that were visible at surface level. Excavations ceased approximately 2.3 m from the surface level once we were able to locate the terminal phase of architecture. The preserved architecture of Room 10 proved to be identical in architectural form and layout as the other rooms in Structure A13. Room 10 was very well preserved, with most of the wall facing stones intact and the wall plaster preserved ~1.25 m at its highest point, from the bench surface (Figure 10). The dimensions for Room 10 measured 2.5 m N/S by 4.6 m E/W. The architectural features of Room 10 include a large, angled U-shape bench which also spans the entire length of the room and measures 30 cm in height from the room floor surface. The bench and the walls that had good plaster preservation displayed a series of Classic Maya graffiti elements including two *patolli* boards (a Maya dice game) incised into the plaster, anthropomorphic figures, and hieroglyphic text. These graffiti elements are very common at Xunantunich, particularly on the floors of palace

rooms (Watkins et al. 2018, 2020). The complete graffiti corpus from Plaza A-III will be addressed in Watkin's thesis.

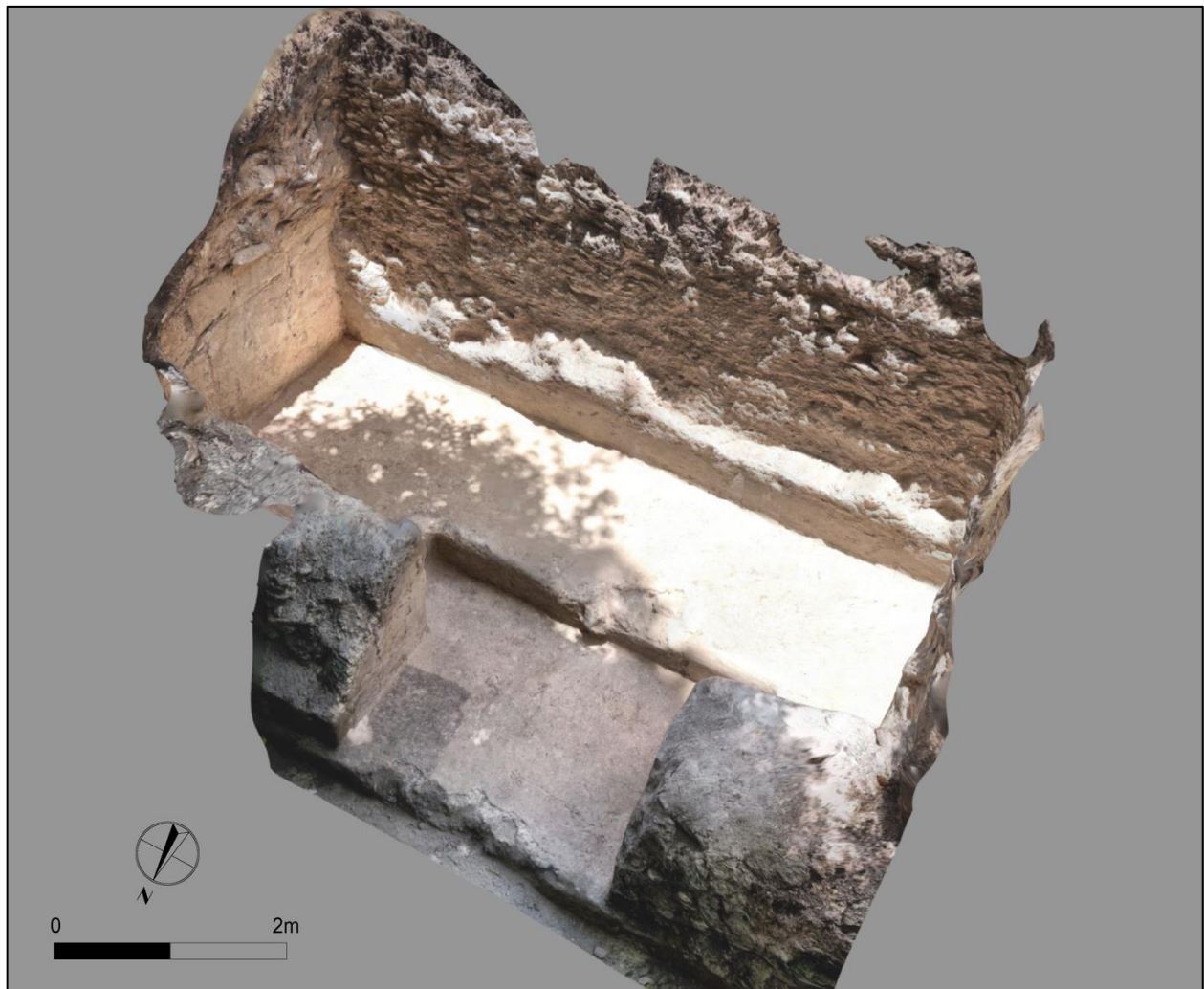


Figure 10: Overview of Room 10 in Structure A13.

E.U. A13-8 Artifact Assemblage

Unit A13-8 yielded a total of 574 artifacts. The artifacts associated with Room 10 included ceramics, chert, obsidian, and granite. Ceramic sherds and chert fragments (mostly core chunks and debitage) were recovered consistently throughout the unit. A thick maroon chert biface fragment (SF# A13-22-001, Figure 11a) was retrieved from the humic layer, the fragment is a possible axe or adze and shows signs of step fracture termination along the lateral margins on the dorsal side. Right below the humic layer, mixed in with collapse, we discovered a ceramic phallus (SF# A13-22-002, Figure 11b) that likely dates to the Terminal Classic Period (AD 750-900). A prismatic obsidian blade fragment was also recovered from the humus and collapse. Closer to the architecture in the collapse, a chert bifacial medial fragment (SF# A13-22-003, Figure 11c) was

recovered. Missing its distal and proximal ends, the biface is a formalized tool in the form of a spear point showing characteristics of later stages of production that could have been used for cutting, slicing, or scraping. A fragment of granite was recovered about 20 cm from the room's bench surface, as well as another prismatic obsidian blade. A total of 481 ceramic sherds were recovered and only 58 displayed diagnostic elements (i.e. vessel rim, paint, decoration).



Figure 11: a) Dorsal and ventral faces of red chert biface. b) Various views of phallic shaped ceramic figure, top, bottom, side and front views. c) Dorsal and ventral faces of medial biface fragment.

DISCUSSION AND CONCLUSION

The 2022 field season offered new perspectives on our understanding of the Plaza A-III palace complex, including the use of space and possible construction sequences. Excavations conducted in Plaza A-III will provide new evidence on the timing and tempo of monumental construction at the site once ceramic analysis and radiocarbon data has been analyzed. Structures A10 and A13 show clear architectural differences which likely speak to the distinctive functions of each space. Whereas Structure A13 has smaller rooms (~ 5 m in length) and short (30 cm), regular benches, Structure A10 has large rooms (~ 8 m in length) and tall (1 m), complex benches which have multiple tiers. The more complex architecture present in Structure A10 demonstrates

that its space was organized in different ways from Structure A13. It is unknown what these bench platforms were used for exactly, although Structure A10 is presently the only known building at the site to display this style of “tiered” bench. The bench style observed at Structure A13, in contrast, are simple angled U-Shaped benches with no evidence of bench platforms, however some rooms do exhibit cord holders which suggest the occupants of Structure A13 were organizing or delineating space within each room (see Watkins et al. 2018). Another architectural feature of note is the abundance of graffiti documented in Structure A13. The *patolli* indicates gameplay, possibly of a ritual nature (Fitzmaurice et al. 2021). No graffiti has yet been documented in Structure A10, but this is not clear evidence that graffiti was absent from Structure A10, as graffiti is fragile and often preserves poorly. The last architectural observation of note is the penultimate stair which was exposed in E.U. A10-2022-3. The discovery of an off-center penultimate stair on Structure A10 (A10-2022-3) shows that the structure was likely extended to the south during its terminal phase of construction during the Late Classic period (see Yaeger 2010). Future excavations at the structure will examine the significance of this possible extension more closely.

Artifacts documented and collected primarily consist of Late Classic ceramic sherds and some chert fragments/pieces of debitage. It is worth noting the presence of adornments found throughout the excavations in both Rooms 1 and 2 at Structure A10, all made from marine shell and intricately modified in some way. None of the adornments were found in direct association with one another, perhaps suggesting personal effects, such as clothing and jewelry, were left in the rooms. Alternatively, these objects could have been deposited in the rooms during peri-abandonment activities at the site, much like those reported in Plaza B, the Castillo, at the summit of Str. A4, and across Plaza A-III in the eastern room of Str. A11 (see Awe et al. 2020b). Other artifacts of note were obsidian prismatic blades and two unbroken finely made thin lanceolate chert bifaces that were found in each room. Both of these hypotheses are plausible given the fact these artifacts were directly on the floor and there was collapse above them. At the same time, the placement of unbroken high-quality lanceolate bifaces, and shell adornments in architectural fill seems unlikely, suggesting that these artifacts may very likely reflect activities around the time of abandonment.

Finally, we were surprised by the discovery of the silver cross pendant in the humus layer of Str. A10 (see E.U. A10-2022-1). The pendant is clearly associated with Catholicism and was likely left at the site during recent or colonial times. The pendant has two faces that depict narrative scenes common in Catholic religious practice. On the front of the pendant, the upper section of the upright post depicts what appears to be God, “the Father”. The lower section of the upright post depicts the Virgin Mary with her arms outstretched toward the bottom of the cross, which is stamped with a date of 1830. On the left section of the crosspiece, Saint Joseph is shown holding the Child Jesus, and on the right section, Saint Christopher is shown with his staff carrying a child a child on his shoulder. The border which encircles the lower section of the upright post reads, “*O Mary, Conceived Without Sin, Pray for Us Who Have Recourse to Thee*”. On the back side of the cross, the upper section of the upright post depicts Mary and the Child Jesus, and the lower section shows an insignia of a cross with a superimposed M positioned above two small hearts. The insignia on the back of the pendant identifies this piece as a version of the Virgin Mary of the Immaculate Conception of the Miraculous Medal also known as The Virgin Mary of the Miraculous Medal (Polistena 2012:105). Further on the back side of the pendant, the crosspiece is incised with a statement that reads “I AM A CATHOLIC PLEASE CALL A PRIEST”. The text

and the date stamp, suggests that this pendant was likely dropped or left at the site during the nineteenth or twentieth centuries. The mid 19th century saw a Marian revival across Europe. The date of 1830 refers to a series of visions of the Virgin Mary witnessed by a young nun, Catherine Labouré, which inspired the commissioning of millions of metal pendants with the key features of Mary, the date, the cross, and "M" insignia with two hearts beneath, and the prayer to Mary. At the same time, the inscription of the back side of the pendant, which requests that a priest is called because the owner is catholic, suggests that the pendant could be more recent, postdating the availability of telephones. If this is accurate, then it is likely that the pendant was lost by a recent visitor to the site, or that it was purposely left there as a modern offering. The deposition of talismans and offerings at ancient and sacred landscapes is a recurring practice in the Maya area and it is often associated with pilgrimages to ancient sites.

The investigations discussed above have provided new evidence for earlier construction episodes at the Plaza A-III locale, a better understanding of the architectural variation present at Plaza-AIII, and some insight into how spatial function can be determined through the methodical assessment of archaeological materials. Furthermore, this research employed new digital documentation techniques to preserve architecture and for educational purposes. Future investigations in Plaza A-III will provide more evidence of construction efforts, architectural composition, and the use of space in elite Maya residences, and this data will subsequently be incorporated in Watkins' doctoral research.

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APPENDIX A: SPECIAL FIND LOG

<i>Operation</i>	<i>Excavation Unit</i>	<i>Lot</i>	<i>Artifact Class</i>	<i>SF Number</i>	<i>Description</i>
<i>A10-2022</i>	A10-2022-1	A10-2022-1-1	Mt	A10-22-001	Metal Cross Pendant 1830
<i>A10-2022</i>	A10-2022-1	A10-2022-1-1	Sh	A10-22-002	Shell <i>Adorno</i>
<i>A10-2022</i>	A10-2022-1	A10-2022-1-2	Sh	A10-22-003	Shell Pendant
<i>A10-2022</i>	A10-2022-1	A10-2022-1-2	Ch	A10-22-004	Biface
<i>A10-2022</i>	A10-2022-2	A10-2022-2-1	Ch	A10-22-005	Biface
<i>A10-2022</i>	A10-2022-2	A10-2022-2-1	Uk	A10-22-006	<i>Metate</i> Fragment
<i>A10-2022</i>	A10-2022-2	A10-2022-2-1	Sh	A10-22-007	Flower <i>Adorno</i>
<i>A10-2022</i>	A10-2022-2	A10-2022-2-1	Sh	A10-22-008	Shell Tinkler
<i>A10-2022</i>	A10-2022-2	A10-2022-2-1	Ls	A10-22-009	Limestone Bark Beater
<i>A13-2022</i>	A13-8	A13-8-1	Ch	A13-22-001	Biface Fragment
<i>A13-2022</i>	A13-8	A13-8-1	Ce	A13-22-002	Phallic Figurine Fragment
<i>A13-2022</i>	A13-8	A13-8-1	Ch	A13-22-003	Biface, Medial Fragment

THE ORIGINS OF SOCIO-POLITICAL COMPLEXITY IN WESTERN BELIZE: INVESTIGATING PRECLASSIC OCCUPATION IN THE SITE CORE OF XUNANTUNICH

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INTRODUCTION

This report details the findings of the 2022 Belize Valley Archaeological Reconnaissance (BVAR) Project excavations within Plaza A-I, A-II, and A-III, at the site core of Xunantunich. A total of sixteen units were placed in the site core focusing on determining the extent of Preclassic occupation. Previous studies in the Maya lowlands indicate many site cores developed gradually with continuous construction and modifications extending back to the Preclassic era (1200 BC–AD 300). Despite this developmental sequence, few sites with Preclassic components have seen these earlier phases intensively investigated. One example is the Xunantunich site core, where more than a century’s worth of research has been dedicated primarily to interpreting the political and socio-economic role of the site during the Late to Terminal Classic period. This research focus has resulted in less being known about the Preclassic occupational component of the site core. The primary goal of these excavations was to enhance our understanding of the construction and development of the site core of Xunantunich during Preclassic times.

BACKGROUND

Xunantunich Background

Xunantunich sits atop a ridge overlooking the Mopan River in western Belize (Ashmore 2002). The Mopan and the Macal Rivers to the east are the two major branches of the Belize River, a waterway that links the Belize River Valley subregion to the Caribbean coast to the east. In ancient times, the Belize River Valley witnessed the rise of several major centers during the Middle

to Late Preclassic period, extending between 900 BC to 300 AD. Based on current evidence, Xunantunich, does not appear to fit the pattern. In the 1990s, the Xunantunich Archaeology Project (XAP) concluded that Xunantunich developed rapidly during the Late Classic period, between AD 600-900 (LeCount et al. 2002; Leventhal et al. 2010). The rapid development of Xunantunich during the seventh to the ninth century occurred when larger centers to the west and north were declining (Ashmore 2002). At its peak during the 8th and early 9th centuries, the central area of Xunantunich consisted of four architectural groups: Groups A, B, C, and D (Awe 2008). Group A, which encompasses three large plazas, Plazas AI, AII, and AIII, all served as the core administrative center of the polity. The plaza in Group A are bordered by the largest buildings, including a massive acropolis known as the Castillo to the south (Structure A6), the north palace complex (Structures A10, A11, A12, and A13), an eastern triadic structure (Structures A2, A3, and A4), and Ballcourts 1 and 2. By the late ninth or early 10th century, there was a marked drop in civic construction, which may be indicative of the decline and eventual abandonment of the site (LeCount 2002). LeCount (2002) proposed that Xunantunich displayed considerable resilience for more than 100 years after the onset of the collapse of nearby sites.

Regional Background

Evidence for Preclassic occupation in the Maya lowlands is significant because this era is associated with the rise of socio-political complexity. The Preclassic era saw the development of sedentary village life, the first appearance of ceramic technology, and increased reliance on maize agriculture (Ebert and Awe 2020). Elsewhere in the Belize River Valley, there has been extensive archaeological excavation dedicated to understanding the Preclassic at sites such as Blackman Eddy (Brown 2003), Cahal Pech (Awe 1992; Awe et al. 2021; Ebert and Awe 2020), and Pacbitun (Powis 2009). Keller (1995: 102-104) documented Late Preclassic ceramic deposits in a *chultun* (an underground storage pit) on the periphery of Xunantunich. More recently, research at Actuncan (two kilometers to the north of Xunantunich), revealed evidence supporting major development in the Late Preclassic (LeCount et al. 2016), with initial settlement of that site extending back into the terminal Early Preclassic (1200-1000 BC). Closer to the center of Xunantunich, about a kilometer east of the site core, ongoing research has recorded a significant Preclassic component in Group E or “Early Xunantunich” (Brown 2008; Brown et al. 2011). The evidence found in Group E includes architecture in the form of flat-topped platforms bounding three formal plazas and an E-Group (Brown et al. 2017; Rawski 2020), one of the earliest monumental forms present in the Maya lowlands (Doyle 2012). In contrast to the work in Group E, evidence for Preclassic occupation in the Xunantunich site core remains limited and ephemeral. As early as the 1940s, J. Eric S. Thompson (1942:8, 38) reported finding Middle and Late Preclassic ceramics during excavations of Structure A-8. LeCount and Yaeger (2008; see also Leventhal 2010) recovered ceramics dating to the terminal Early Preclassic (1200-900 BC) in a tunnel that penetrated the Castillo from the south. Due to the dimensions of the tunnel, it was not possible to tell whether the pottery was directly associated with Early or Middle Preclassic platforms or whether the pottery was brought into the site core from some other location at the site.

Other XAP excavations conducted near Structure A1 by Zeleznik (1993: 35-36) exposed an early low platform that contained ceramics dating to the Late Preclassic and Early Classic. Yaeger (1997: 42) also reported evidence of occupation below Plaza A-III, adjacent to Structures A11 and A12, in the form of a platform that contained Middle Preclassic ceramics. Middle to Late

Preclassic ceramics were found in association with a small platform beneath the playing alley of Ballcourt 2 (Feely 2019; Leventhal 2010). Austin (2019: 44; see also LeCount et al. 2002) identified Middle Preclassic ceramics in mixed contexts below the lowest plaza floors of Plaza A-I. Watkins (2018: 259, 264-265), uncovered evidence of a small Preclassic platform partly constructed from modified bedrock in Structure A7. The BVAR project designated the platform as Structure A7-1st. The second construction phase of Structure A7 is represented by a 2.3-meter-tall platform with a central stairway consisting of four steps. Ceramics recovered in the fill of both platforms (A7 1st and 2nd) dated to the Middle and Late Preclassic.

RESEARCH OBJECTIVES

Archaeological investigations from the 2022 field season focused on identifying Preclassic period contexts in Xunantunich Plazas A-I, A-II, and A-III (Figures 1 and 2). The goal of this research was to understand the different factors which structured Preclassic Maya decisions about where to locate their communities in this landscape. The research also aimed to better understand the role of the site core during Preclassic times. Furthermore, the research contributes to a larger body of work focusing on the comparison of Preclassic settlements within other sites located in the Belize River Valley. To examine Preclassic occupation in the site core, the 2022 field research focused on four primary objectives.

1. Determine whether there is evidence for Preclassic occupation in the site core.
2. Determine the spatial distribution of this Preclassic occupation.
3. Assess possible evidence about the early socio-political development of the site core.
4. Comparing Xunantunich with other Preclassic settlements in the Belize River Valley.



Figure 1: Photograph of Plaza A-1 (Courtesy of Tia Watkins).

orthomosaic images assisted in displaying the excavated contexts and architectural footprint of structures based on accurate UTM coordinates (Figure 3).



Figure 3: Digital surface model produced from a drone survey depicting the architectural footprint of structures in the site core. Map produced by E. Ramirez.

The study primarily focuses on distinguishing Preclassic occupation phases through vertical excavations. The collection of charcoal samples was important for accurately determining the dates of the archaeological contexts. Previous studies of ceramics in the Belize River Valley (Awe 1992; Gifford 1976; LeCount 2015; Willey et al. 1965) have developed a well-established

ceramic sequence and chronology for the region. A general artifact analysis was conducted in the field. Thorough ceramic analysis is currently ongoing and will be reported in the first author's forthcoming master's thesis (Ramirez 2023). Preliminary results are discussed throughout this chapter. Special finds and charcoal samples recovered from this operation are listed in Appendix B.

OPERATION XUN-2022

Under the designation of Operation XUN-2022, 16 excavation units were placed in the site core with a focus on investigating the extent of Preclassic occupation during the 2022 field season. Six units were placed in Plaza A-I (Figure 4), seven were placed in Plaza A-II (Figure 10), and three were placed in Plaza A-III (Figure 39).

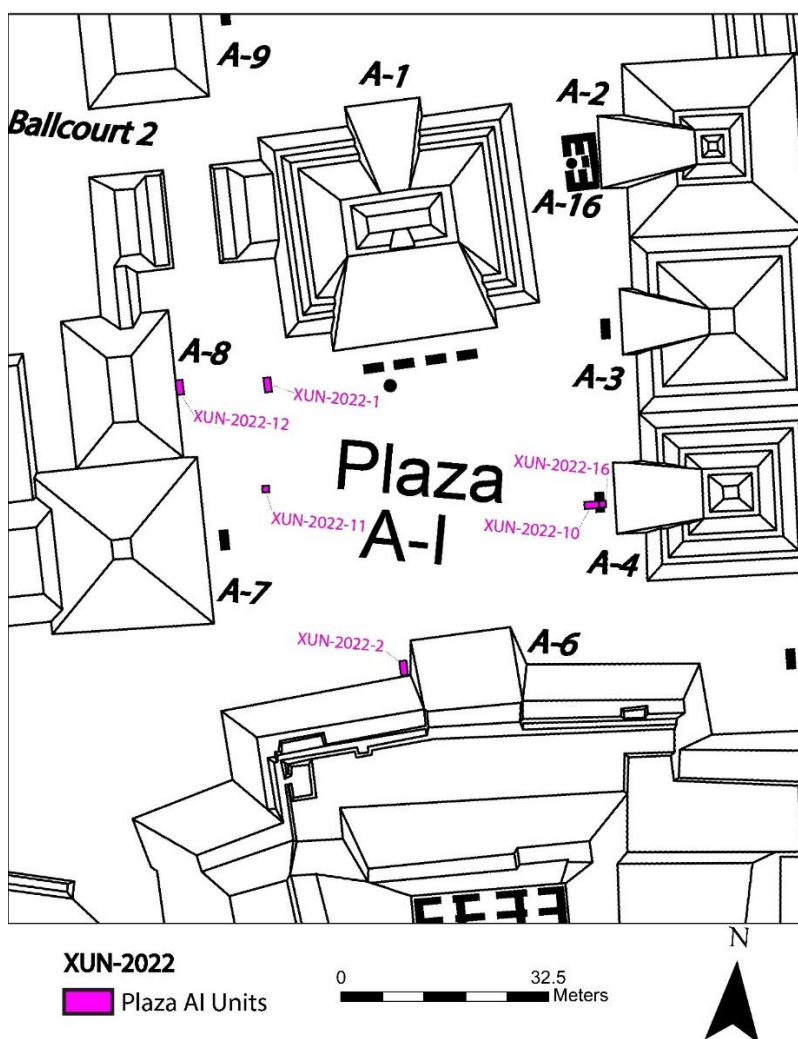


Figure 4: Image depicting Plaza A-I excavation units. Map digitized by Li Xiang, Tia Watkins, and Claire Ebert, modified by E. Ramirez.

Excavation Unit XUN-2022-1

EU XUN-2022-1 was a 1 x 2 m unit placed at an arbitrary near Structure A1. The excavation unit consisted of three lots and two layers. The purpose of this unit was to locate Preclassic architecture on the southwest axis of Structure A1 based on previous excavations (see also Austin 2019), which revealed evidence of a Terminal Classic platform and a mixed deposit of Late Classic and Middle Preclassic ceramics on the southwest axis. The unit was closed when bedrock was reached at 60 cm below datum (Figure 5). No evidence of Preclassic architecture was found in this unit. The unit was placed in a location impacted by bioturbation and erosion from nearby trees. A layer of plaster floor was exposed less than 10 cm from the surface, right underneath the humic layer. However, it was heavily eroded.

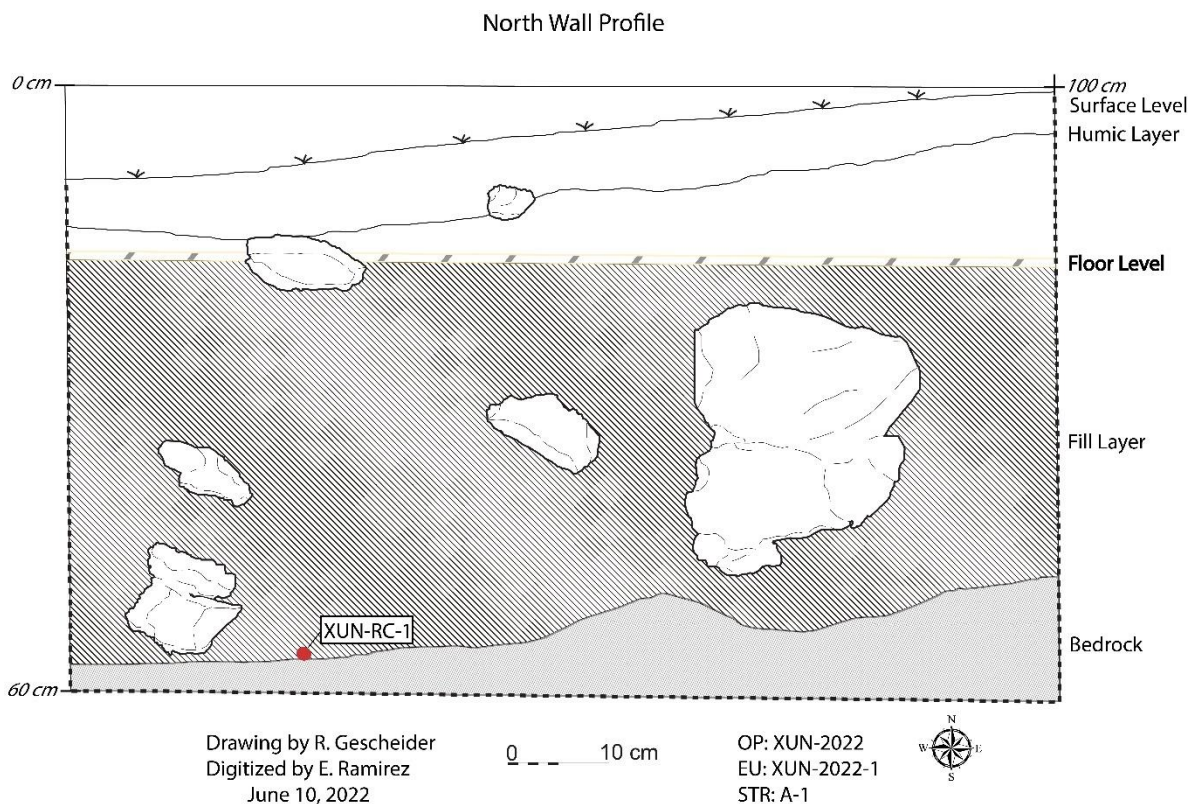


Figure 5: North wall profile of EU XUN-2022-1.

A total of 417 artifacts were documented and recovered from EU XUN-2022-1, including ceramics, chert, jute (*Pachychilus* spp.), groundstone, modified limestone, marine shell (*Gastropoda*), and slate materials. We recovered 209 ceramic sherds, and only 50 displayed an identifiable diagnostic element (rim). EU XUN-2022-1 yielded a total of 69 Preclassic ceramic sherds, the majority identified as Middle Preclassic (Savana Orange). No special finds were identified or recovered in this unit. A single charcoal sample for ¹⁴C dating was recovered from the excavation in XUN-RC-1.

Excavation Unit XUN-2022-2

EU XUN-2022-2 was a 1 x 2 m unit placed on a north-south axis along the western inset corner of the Structure A6 stairway. This unit was placed to investigate the presence of a mixed deposit like that found in the previous unit in the southwest corner of Structure A1 (Austin 2019). Vertical excavation recorded three well-preserved floors, with a series of replastering events. The top of the last floor (Floor 3) was exposed 65 cm below the surface (Figure 6). This unit closed upon exposing bedrock 2 m below the surface (Figure 7). Ceramics and chert were found in layers of construction fill.



Figure 6: Final floor (Floor 3) in EU XUN-2022-2, viewed from the south.

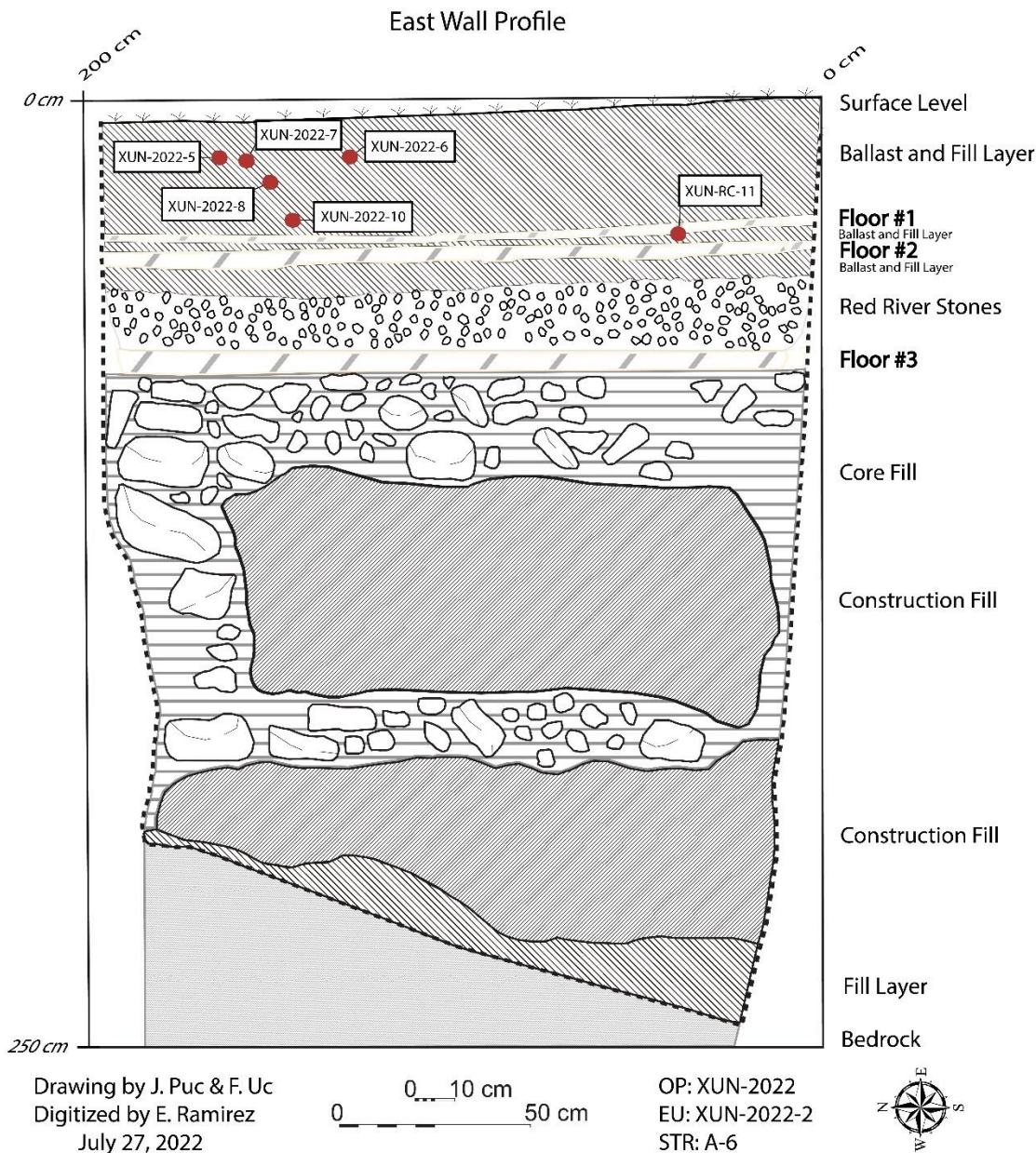


Figure 7: East wall profile of EU XUN-2022-2.

A total of 1,237 artifacts were recovered from EU XUN-2022-2, including ceramics, chert, *jute* (*Pachychilus* spp.), marine shell (*Gastropoda*), groundstone, and modified limestone material. A total of 788 ceramic sherds were recovered, and only 376 sherds displayed an identifiable diagnostic element (rim). 307 were determined to be Preclassic ceramic sherds, including Jocote and Reforma Incised sherds. Two special finds were found in the construction fill layers of this unit, a fragmented *metate* (SF# XUN-22-002; Appendix A: Figure 8) and a finished shell bead (SF# XUN-22-008; Appendix A: Figure 9) was documented. Six charcoal samples for ¹⁴C dating were recovered from the excavation in XUN-RC-5, XUN-RC-6, XUN-RC-7, XUN-RC-8, XUN-RC-10, and XUN-RC-11.

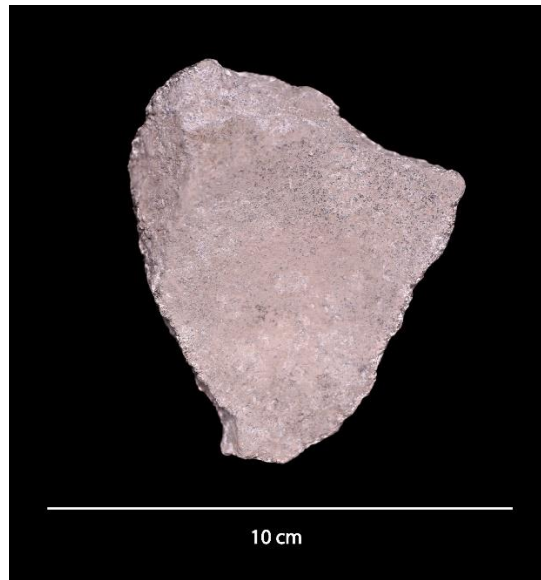


Figure 8: A metate fragment found in the construction fill of EU XUN-2022-2 (SF# XUN-22-002). Photo by E. Ramirez.

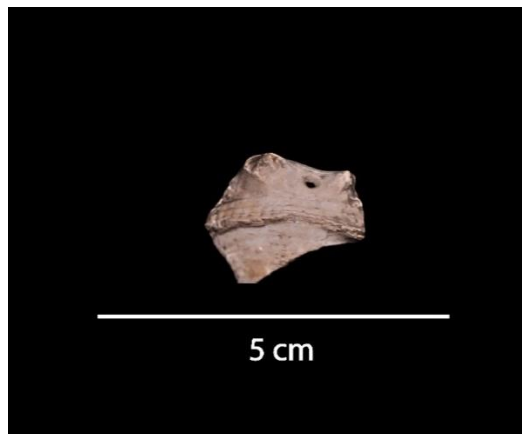


Figure 9: A finished shell bead found in the construction fill of EU XUN-2022-2 (SF# XUN-22-008). Photo by E. Ramirez.

Excavation Unit XUN-2022-3 through XUN-2022-9

Excavation units XUN-2022-3 through XUN-2022-9 were placed at arbitrary locations in relation to Ballcourt 2 (Figure 10). Previous exploration in this area of Plaza A-II by Feely (2019) exposed remnants of Preclassic architecture and ceramics (see Figure 11; Jamison and Wolff, 1994). XUN-2022-3 was placed along the Northwest wall of Ballcourt 2, then was extended to create XUN-2022-4 when a Preclassic wall was located in the center of XUN-2022-3. The Preclassic wall continued south of these units; we extended one more unit (XUN-2022-6) west of XUN-2022-4 that reached the western wall of Ballcourt 2.

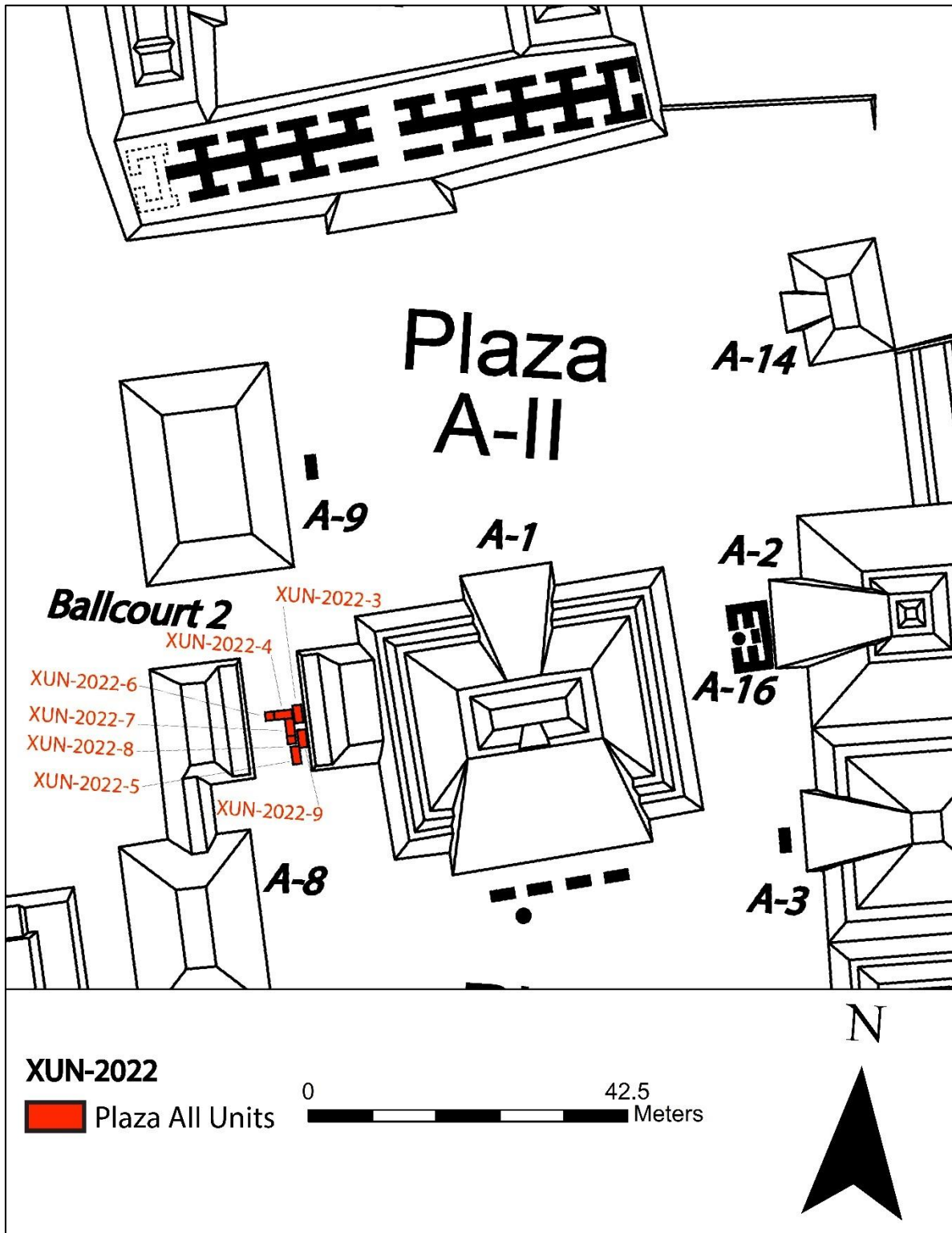


Figure 10: Image depicting Plaza A-II excavation units. Map digitized by Li Xiang, Tia Watkins, and Claire Ebert, modified by E. Ramirez.

Ballcourt 2 Plan View

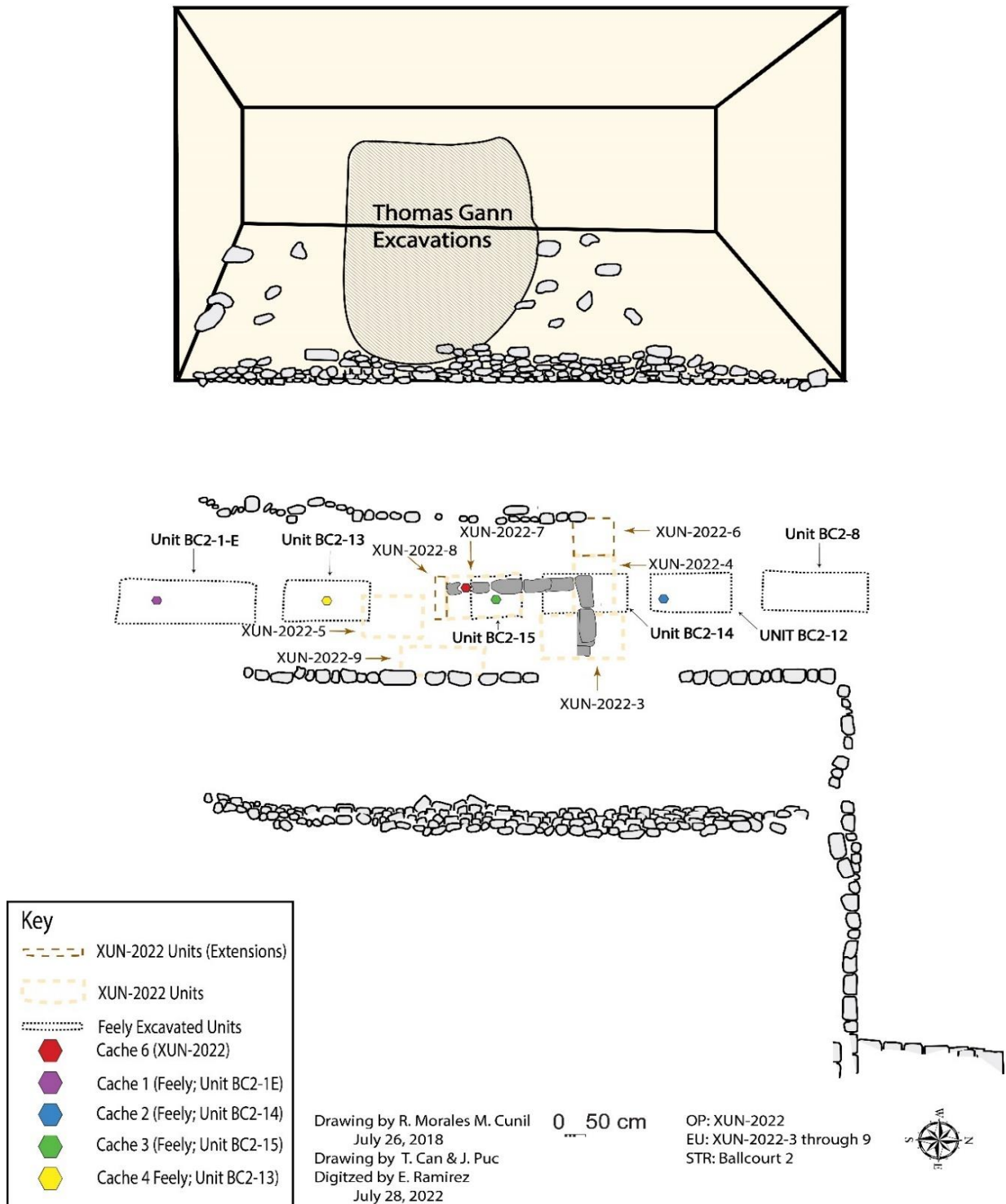


Figure 11: Plan view map displaying the architecture exposed by Feely’s (2019) excavations, including the 2022 units that exposed the extent of this Preclassic wall.

Excavation Unit XUN-2022-3

EU XUN-2022-3 was the first unit placed in Ballcourt 2 during this 2022 field season. This unit measured 1 x 2 m and was placed on a north-south axis. The purpose of this unit was to expose the previously reported Preclassic architecture (Feely 2019). The placement of this unit was located in the space east of Feely's (2019) Ballcourt 2-14 unit (Figures 12 and 13). Vertical excavation identified two poorly preserved floors (Figure 14). The top of the last floor (Floor 2) was exposed 105 cm below the surface. The unit was closed at bedrock, which was approximately 2.6 m from the surface.

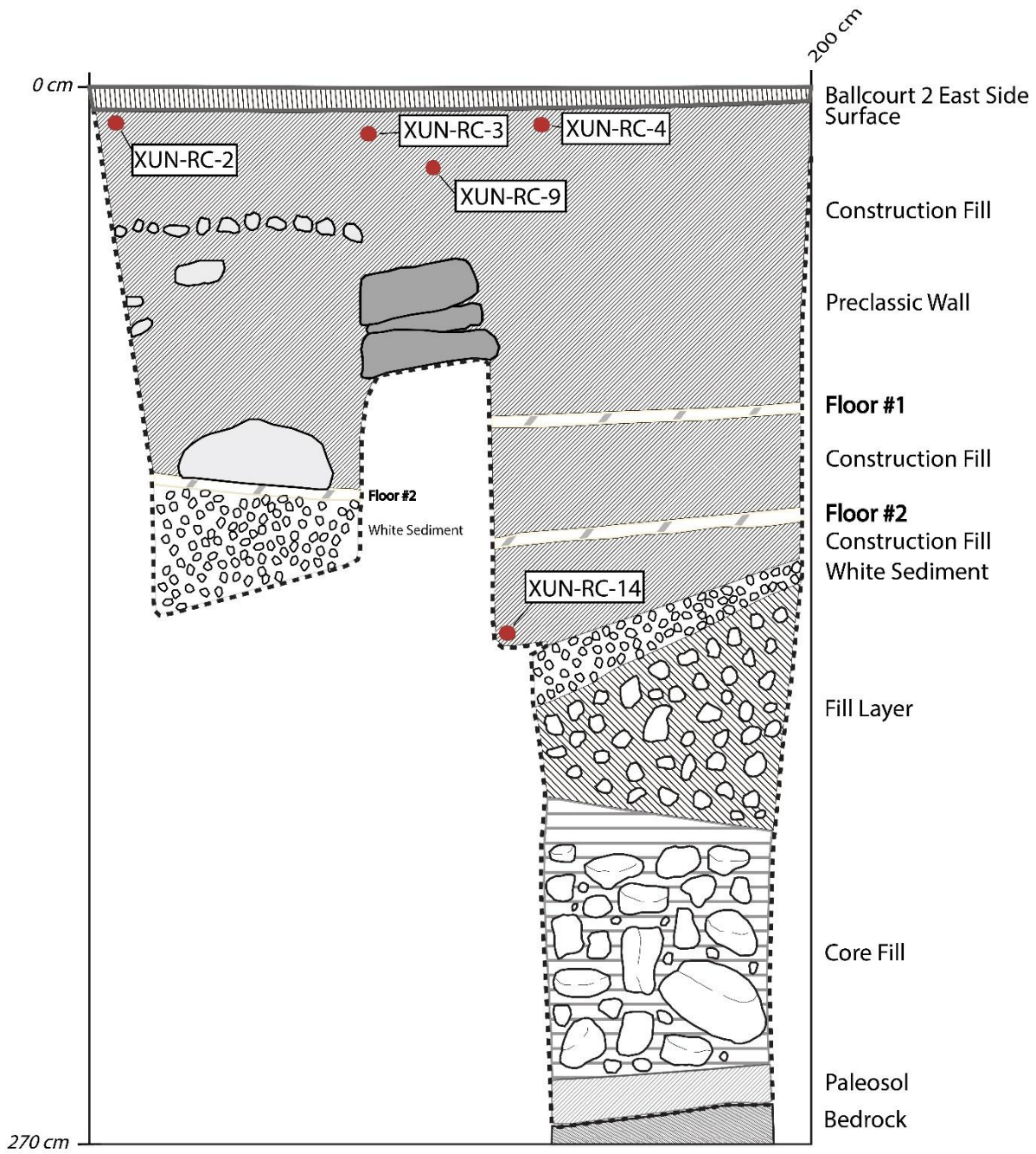


Figure 12: EU XUN-2022-3's plaza fill revealing the extension of Preclassic architecture found in Feely's (2019) investigations, viewed from the south.



Figure 13: Image depicting the western extension of the Preclassic architecture found in EU XUN-2022-3 into Feely's (2019) investigations, viewed from the east.

East Wall Profile



Drawing by J. Puc & F. Uc
 Digitized by E. Ramirez
 July 28, 2022

0 10 cm 50 cm

OP: XUN-2022
 EU: XUN-2022-3
 STR: Ballcourt 2



Figure 14: East wall profile of EU XUN-2022-3.

A total of 560 artifacts were documented and recovered from the construction fill layers of EU XUN-2022-3, including ceramics, chert, faunal bone, *jute*, greenstone, marine shell, quartzite, modified shell, and slate. A total of 189 ceramic sherds were recovered, and only 94 displayed an

identifiable element. EU XUN-2022-3 yielded a total of 89 Preclassic ceramic sherds, including Middle Preclassic Jocote and Reforma Incised sherds. Three special finds were found in the construction fill layers of this unit, a modified flat shell bead (SF# XUN-22-001; Appendix A: Figure 15), an anthropomorphic Savana Orange paste (Middle Preclassic) figurine head (SF# XUN-22-010 Appendix A: Figure 16), and a zoomorphic Savana Orange paste figurine head (SF# XUN-22-011; Appendix A: Figure 17). Five charcoal samples for ^{14}C dating were recovered from the excavation in XUN-RC-2, XUN-RC-3, XUN-RC-4, XUN-RC-9, and XUN-RC-14.

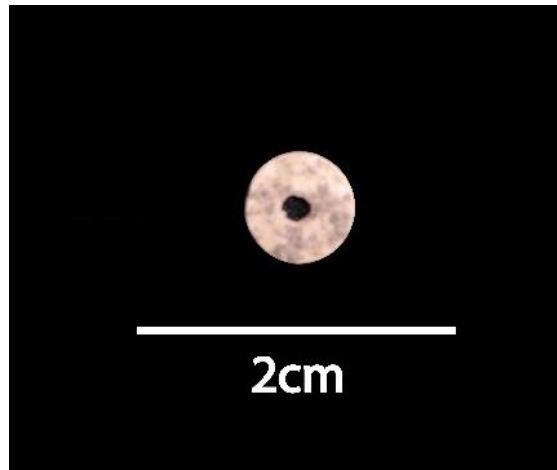


Figure 15: A modified flat shell bead found in the construction fill (SF# XUN-22-001)



Figure 16: An anthropomorphic Middle Preclassic figurine head found in construction fill (SF# XUN-22-010).

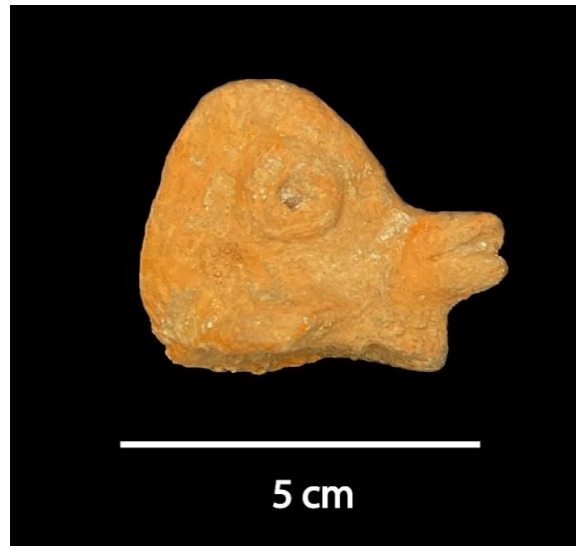


Figure 17: A zoomorphic Middle Preclassic figurine head found in construction fill. (SF# XUN-22-011)

Excavation Unit XUN-2022-4

EU XUN-2022-4 was placed east of EU XUN-2022-3, located in Ballcourt 2 (Figure 18). The unit measured 2 x 1 m and was placed on an east-to-west axis. The purpose of this unit was to reveal the western extension of the Preclassic wall initially reported in 2019 (Feely 2019). The unit's matrix consisted of backdirt. The unit was closed at bedrock in the northeastern corner. The unit exposed mortar fill in the northwestern corner. Artifacts identified in this excavated context were collected and labeled as backfill deposits and not included in the general count of recovered artifacts from the XUN-2022 project.



Figure 18: EU XUN-2022-4 excavated extent, viewed from the south.

Excavation Unit XUN-2022-5

EU XUN-2022-5 was placed close to the center of the ballcourt. This unit measured 1 x 2 m and was placed on a north-south axis. The purpose of this unit was to investigate the presence of Preclassic architecture and expose more of Preclassic wall identified by Feely (2019). However, the wall did not extend to this unit. The unit was closed at bedrock, which was approximately 3 m from the surface. Evidence of paleosol was exposed close to bedrock. The unit did reveal evidence of modified bedrock, where the hillside was altered which may demonstrate that Xunantunich was occupied much earlier than previously thought (Figure 19). A total of 447 artifacts were found, including ceramics, chert, *jute*, slate, quartzite, and faunal artifacts. We recovered 200 ceramic sherds, and only 81 displayed an identifiable diagnostic element (rim). This unit yielded a total of 70 Preclassic ceramic sherds, including Reforma Incised sherds. No special finds were identified or recovered in this unit.

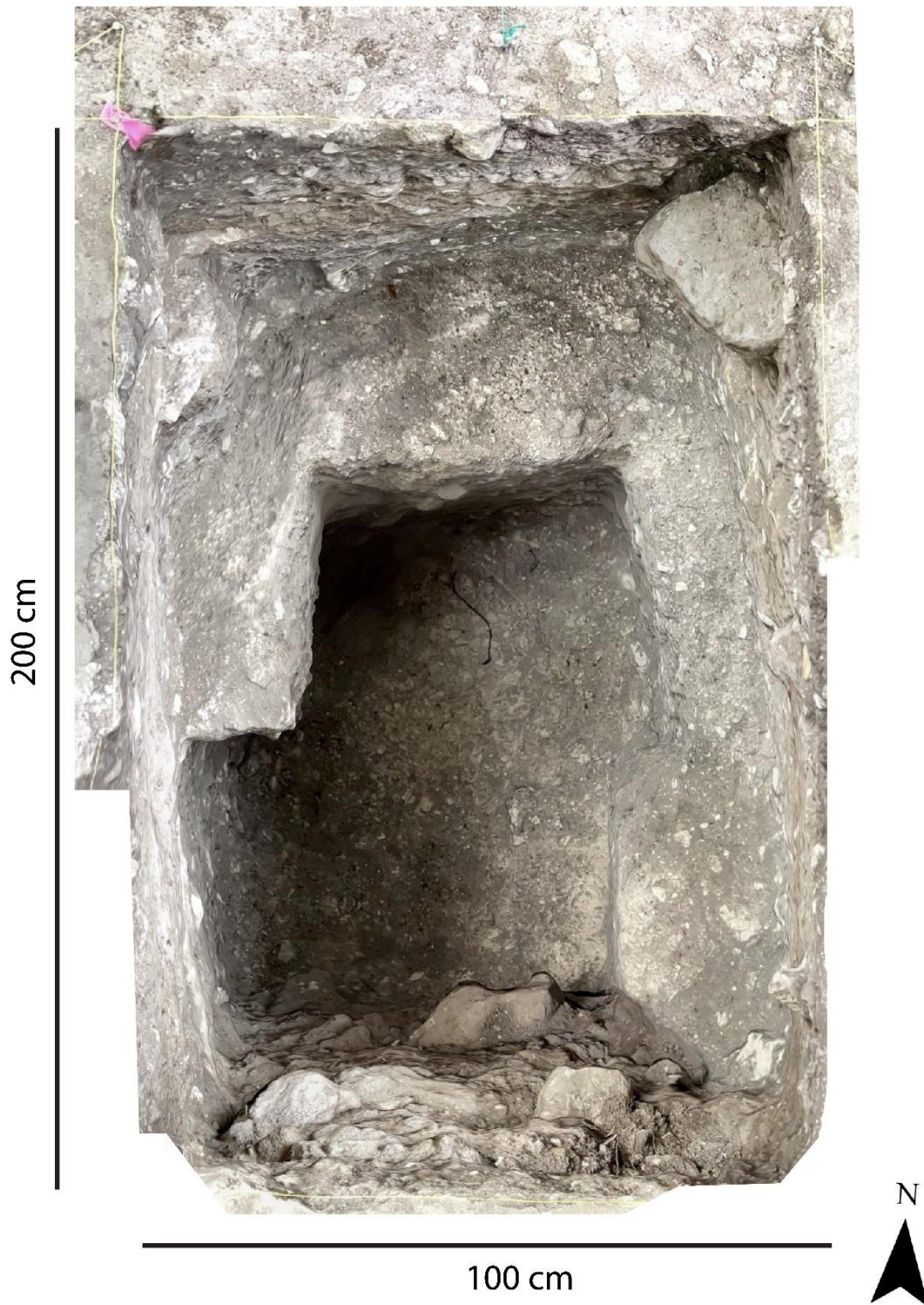


Figure 19: 3D model produced plan view of the excavated extent for EU XUN-2022-5, viewed from the south.

Excavation Unit XUN-2022-6

EU XUN-2022-6 was an extension placed adjacent to XUN-2022-4 that reached the western wall of Ballcourt 2. This unit measured 1 x 1 m and was placed on an east-to-west axis. The purpose of this unit was to determine whether the previously recorded Preclassic wall extended in the westward orientation. Remnants of a *marl* floor were identified within the extent of the excavation (Figure 20). A total of 278 artifacts were found, including ceramics, chert, *jute*, and marine shell. We recovered 124 ceramic sherds, and only 64 displayed an identifiable diagnostic element (rim). This unit yielded a total of 51 Preclassic ceramic sherds, including Reforma Incised sherds. No special finds were identified or recovered in this unit.



Figure 20: EU XUN-2022-6 excavated extent, viewed from the south. The image displayed the top of what was determined to be a marl floor.

Excavation Unit XUN-2022-7

EU XUN-2022-7 was excavated just east of the center of Ballcourt 2. This unit measured 1 x 2 m and was placed on a north-south axis. The purpose of this unit was to continue exposing the southern extent of the Preclassic wall identified by Feely (2019; Figure 21). The Preclassic wall measured 350 cm from north to south and 200 cm from west to east. The entirety of this wall was found in EU XUN-2022-3, XUN-2022-4, XUN-2022-7, and XUN-2022-8. A total of 83 artifacts were found, including ceramics, chert, marine shell, and *jute*. We recovered 10 ceramic sherds, and four displayed an identifiable diagnostic element (rim). Including the Preclassic wall, this unit yielded a total of three Preclassic ceramic sherds, all determined to be Savana Orange

(Middle Preclassic) sherds. A cache of 55 eccentrics was exposed within a man-made hole in the top of the wall, determined to be a ritual deposit made by the Maya. Previous excavations had revealed a child burial in this location, above where the cache was found (Jamison and Wolf 1994). The 55 eccentrics were placed in a circle with an exhausted obsidian core in the middle. In total, 18 of the eccentrics were obsidian, 33 were made of chert, three were made of granite or limestone, and one was made of chalcedony (SF# XUN-22-012; Appendix A: Figure 22). A layer of *jute* (*Pachychilus* spp.) shell was discovered beneath the cache.



Figure 21: EU XUN-2022-7 viewed from the south. The image displayed the full extent of the Preclassic wall's north to south portion.



Figure 22: Plan view of the eccentrics from cache 6 found in XUN-2022-7. Image by Ebert, 2022. (SF# XUN-22-012)

Excavation Unit XUN-2022-8

EU XUN-2022-8 was a 1 x 1 m extension placed south of EU XUN-2022-7. The purpose of this unit was to examine whether Preclassic structures existed prior to the construction of Structure A1 and whether the Preclassic architecture that had been exposed in adjacent units extended to the western edge of the ballcourt. We determined that the Preclassic wall did not extend further south of this set perimeter (Figure 23). No special finds or artifacts were recovered from this unit.



Figure 23: EU XUN-2022-8 excavated extent, viewed from the south.

Excavation Unit XUN-2022-9

EU XUN-2022-9 measured 1 x 2 m and was placed on a north-south axis, east of EU XUN-2022-8. The purpose of this unit was to determine whether the Preclassic architecture extended towards the eastern wall of Ballcourt 2. The excavation revealed there was no continuation of the Preclassic wall found in this unit (Figure 24). A total of 281 artifacts were found, including ceramics, chert, and *jute* artifacts. We recovered 116 ceramic sherds, and only 43 displayed an identifiable diagnostic element (rim). This unit yielded a total of 45 Preclassic ceramic sherds, all determined to be Savana Orange (Middle Preclassic) sherds. One special find was found in the construction fill layer of this unit, a figurine leg (SF# XUN-22-004; Appendix A: Figure 25).



Figure 24: EU XUN-2022-9 excavated extent, view from the south.

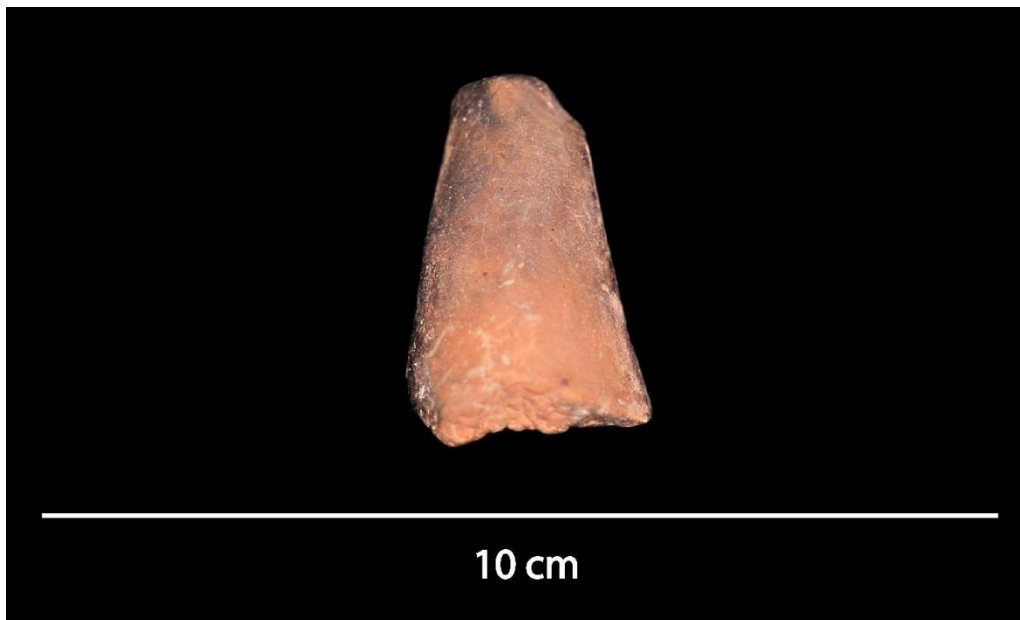


Figure 25: A fragmented figurine leg that was found in the construction fill layer. (SF# XUN-22-004)

Excavation Unit XUN-2022-10 and XUN-2022-16

Excavation Unit XUN-2022-10

EU XUN-2022-10 was a 1 x 2 m unit placed at an arbitrary location in close proximity to Structure A4 (Figure 26). The purpose of XUN-2022-10 was to find further evidence of early construction phases associated with Structure A4 that predated the other structures in Plaza A-I. A4, A6, and A7 are the only three structures with multiple construction phases in this plaza (Slocum 2018). Excavations revealed a portion of an altar protruding from the 1 x 1 east unit wall, closest to the structure and on the central axis, aligning with the Structure A4 stela on the central axis of Structure A4 (Figure 27). The portion of the altar was exposed 22 cm from the surface. A total of 287 artifacts were found, including ceramics, chert, *jute*, slate, and obsidian artifacts. We recovered 142 ceramic sherds, and only 45 displayed an identifiable diagnostic element (rim). This unit yielded a total of 28 Preclassic ceramic sherds, the majority identified as Savana Orange (Middle Preclassic) and a single Reforma Incised sherd. One special find was found in the construction fill layer of this unit, a hammerstone (SF# XUN-22-005; Appendix A: Figure 28).



Figure 26: EU XUN-2022-10 extent, viewed from the south.



Figure 27: Altar exposed in XUN-2022-10, view from the west.



Figure 28: A hammerstone found in the construction fill layer. (SF# XUN-22-005)

Excavation Unit XUN-2022-16

EU XUN-2022-16 was a 1 x 1 m extension of Excavation unit XUN-2022-10. XUN-2022-16 was placed to extend XUN-2022-10 one meter east to expose the remainder of the altar. A total of 125 artifacts were found in this unit, including ceramics, chert, and *jute* artifacts. We recovered

86 ceramic sherds, and only 32 displayed an identifiable diagnostic element (rim). This unit yielded a total of ten Preclassic ceramic sherds, all determined to be Savana Orange (Middle Preclassic) sherds. Special finds include a circular altar found in close spatial proximity to the stelae in front of A4 (SF# XUN-22-013; Appendix A: Figure 29) and approximately 10 to 20 cm below the altar, Cache 7 consisting of nine flint eccentrics (SF# XUN-22-014; Appendix A: Figure 30 and Figure 31).



Figure 29: Altar fully exposed in EU XUN-2022-10 and 16. (SF# XUN-2022-13).



Figure 30: Cache 7 fully exposed and pedestaled in XUN-2022-16. (SF# XUN-2022-14).

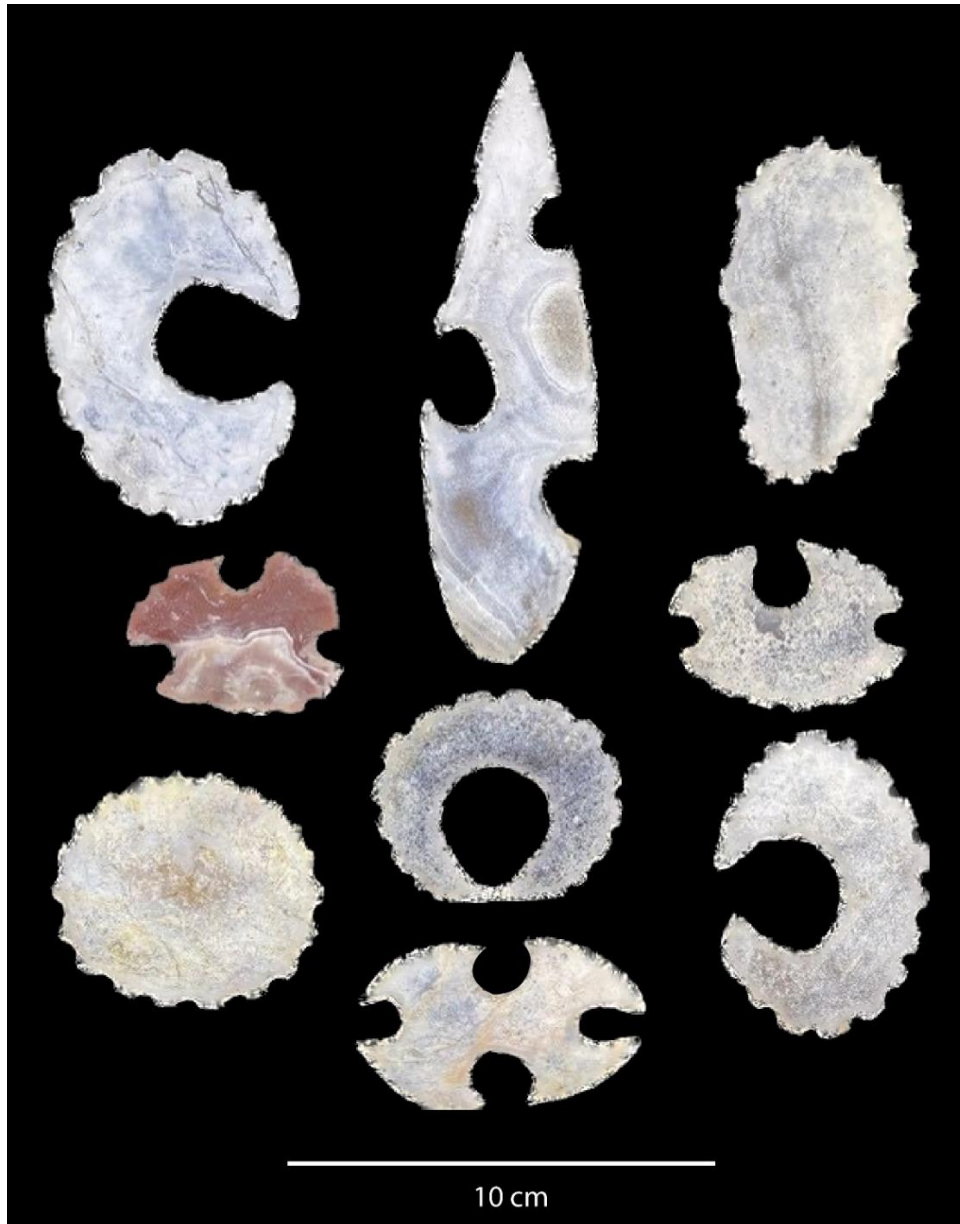


Figure 31: Plan view of cache 7, discovered under A4 Altar in Unit XUN-2022-16 (SF# XUN-22-014).

Both units were closed when bedrock was reached. Above bedrock in XUN-2022-10, a layer of paleosol was exposed (Figure 32). The only other evidence of paleosol found during these excavations was in Ballcourt 2 in EU XUN-2022-3 and XUN-2022-5.

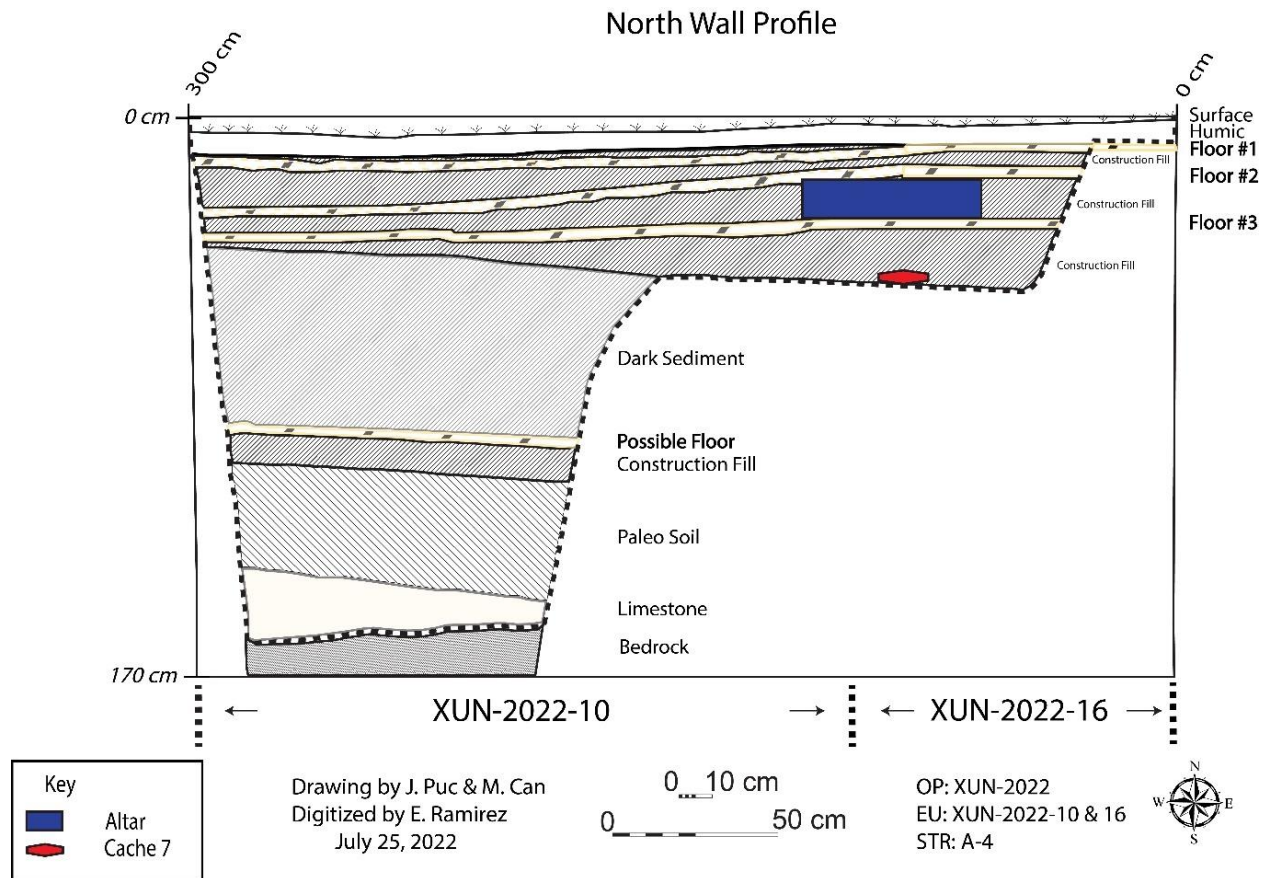


Figure 32: North wall profile of EU XUN-2022-10 and XUN-2022-16.

Excavation Unit XUN-2022-11

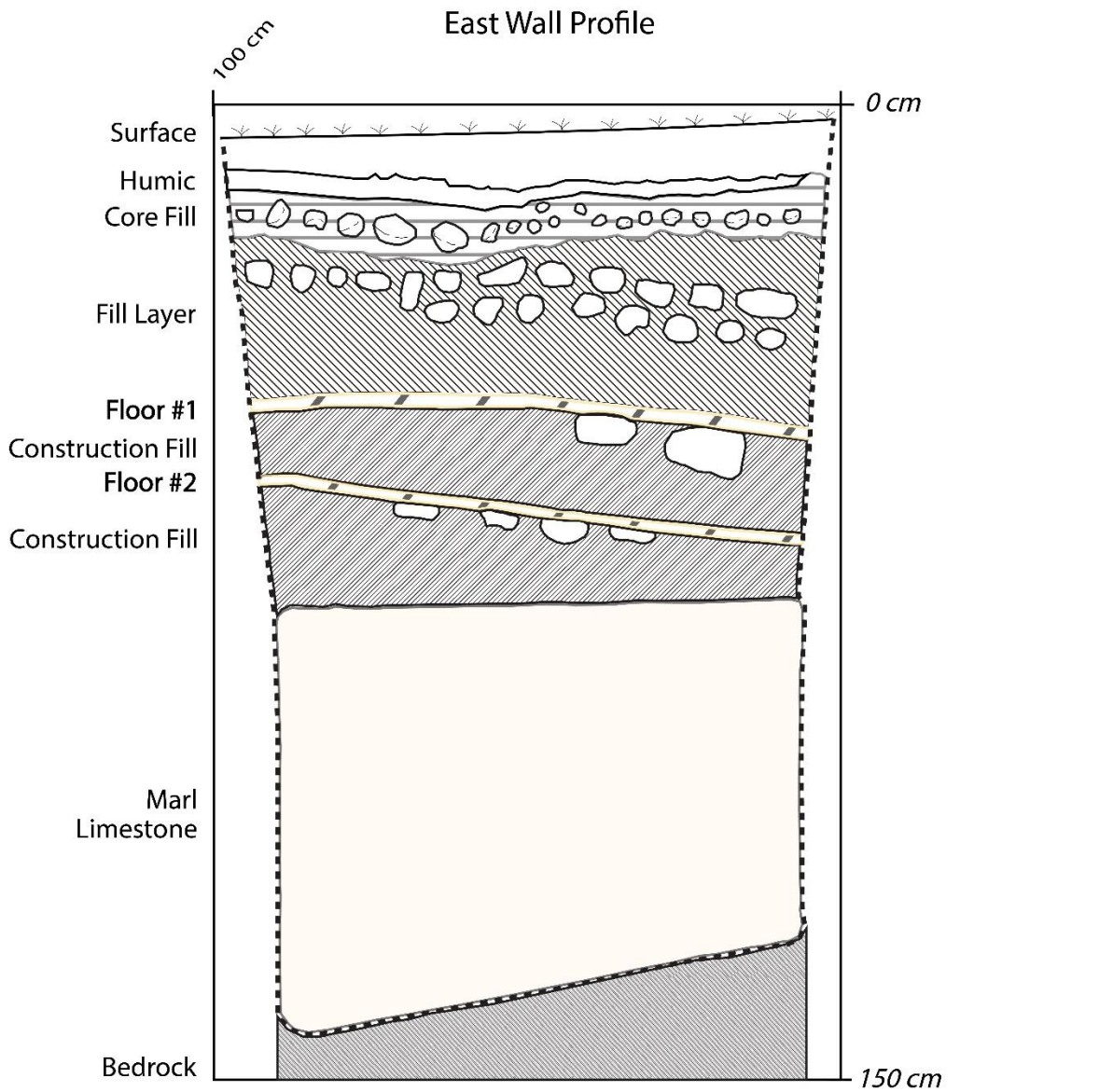
EU XUN-2022-11 was a 1 x 1 m unit placed at an arbitrary location in close proximity to Structure A7 (Figure 33). The purpose of this unit was based on the reporting of a Preclassic platform within this area of Plaza A-I, as noted from personal communication between Dr. Maurer and Dr. Awe (Unpublished). The excavation revealed no evidence of a Preclassic platform. Two floors were recorded, Floor 1 was exposed at 50 cm, and Floor 2 was exposed at 62 cm below surface. The unit was closed when bedrock was exposed at 130 cm below the surface (Figures 34 and 35).



Figure 33: EU XUN-2022-11 extent, viewed from the south.



Figure 34: Bedrock exposed in EU XUN-2022-11, viewed from the south.



Drawing by J. Puc & M. Can
Digitized by E. Ramirez
July 25, 2022

Figure 35: East wall profile of EU XUN-2022-11.

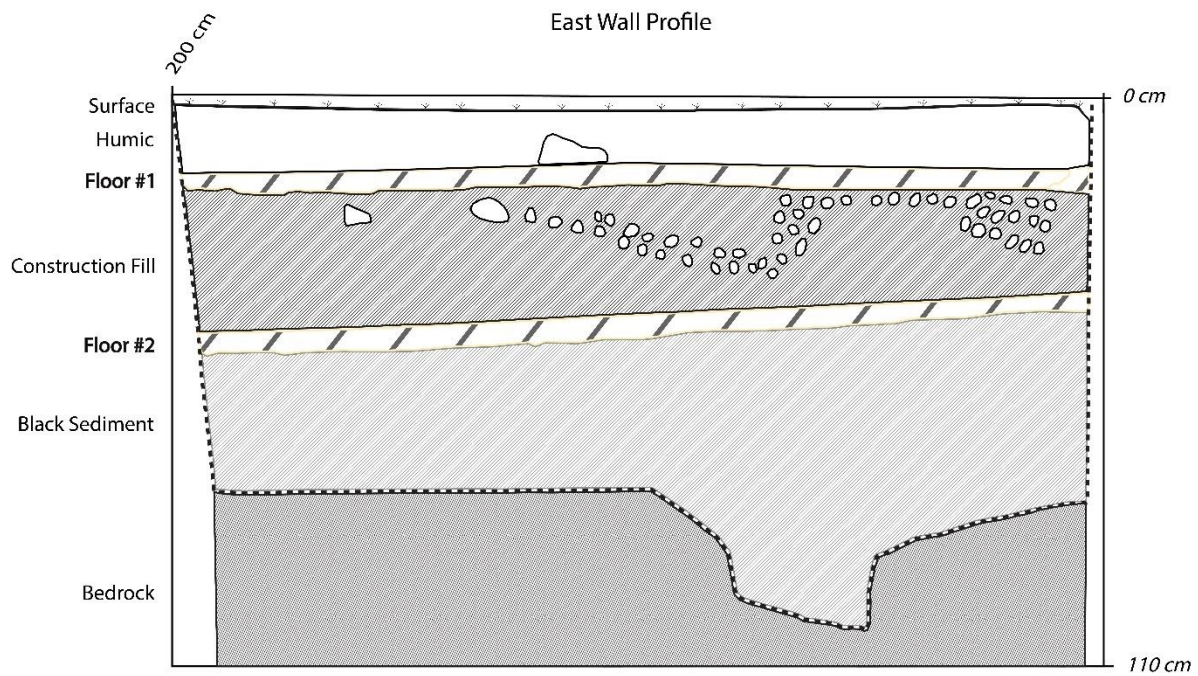
A total of 316 artifacts were found in this unit, including ceramics, chert, *jute*, and slate artifacts. We recovered 200 ceramic sherds, and only 98 displayed an identifiable diagnostic element (rim). This unit yielded a total of 87 Preclassic ceramic sherds, including Jocote and Reforma Incised sherds. No special finds were identified or recovered in this unit.

Excavation Unit XUN-2022-12

EU XUN-2022-12 was placed at an arbitrary location in close proximity to Structure A8. This unit measured 1 x 2 m and was placed on a north-south axis to the east of the base of the structure (Figure 36). The purpose of this unit was to investigate the presence of Preclassic evidence documented during Thompson's excavations of Structure A8. Thompson (1942: 8 and 38) noted that he had encountered Middle and Late Preclassic ceramics. The excavation revealed two floors, Floor 1 was exposed at 10 cm, and Floor 2 was exposed at 35 cm below the surface (Figure 37). The unit was closed when bedrock was exposed at 71 cm below the surface (Figure 38). A total of 304 artifacts were found in this unit, including ceramics, chert, *jute*, faunal bone, slate, and obsidian artifacts. We recovered 212 ceramic sherds, and only 83 displayed an identifiable diagnostic element (rim). This unit yielded a total of 56 Preclassic ceramic sherds, the majority identified as Savana Orange (Middle Preclassic) and a single Reforma Incised sherd. No special finds were identified or recovered in this unit.



Figure 36: EU XUN-2022-12 extent, viewed from the south.



Drawing by J. Puc & F. Uc
 Digitized by E. Ramirez
 July 28 2022

0 10 50 cm

OP: XUN-2022
 EU: XUN-2022-12
 STR: A-8



Figure 37: East wall profile of EU XUN-2022-12.



Figure 38: Bedrock exposed in EU XUN-2022-12, viewed from the east.

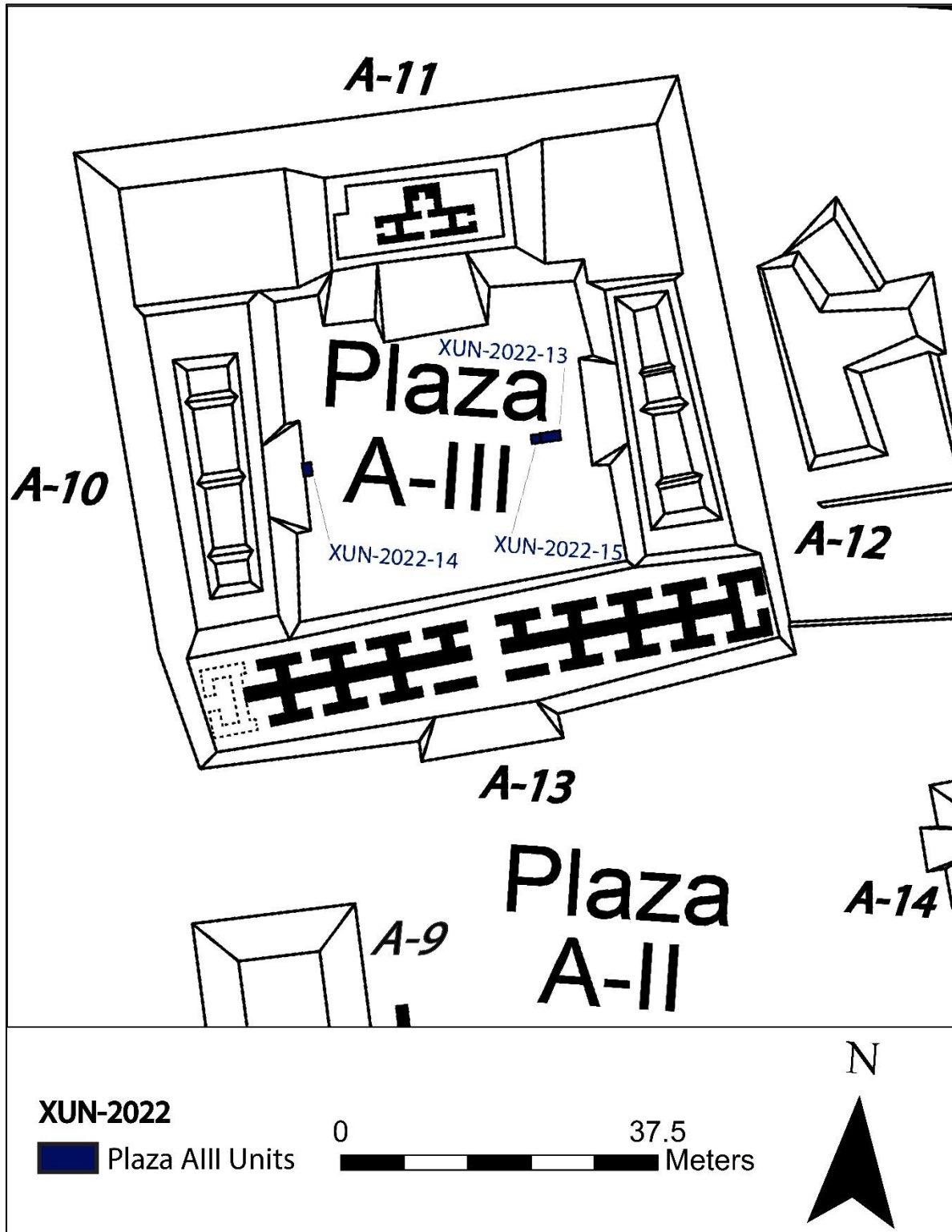


Figure 39: Image depicting Plaza A-III excavation units. Map digitized by Li Xiang, Tia Watkins, and Claire Ebert, modified by E. Ramirez.

Excavation Unit XUN-2022-13 and XUN-2022-15

EU XUN-2022-13

EU XUN-2022-13 was placed at an arbitrary location in close proximity to Structure A12. This unit measured 1 x 2 m and was placed on an east-west axis to the west of the base of the structure (Figure 39). The purpose of this unit was to investigate the presence of Preclassic evidence documented during Yaeger excavations near Structure A12. Previous studies have indicated the presence of Middle Preclassic ceramics (Yaeger 1997: 42). The excavation revealed three floors, Floor 1 was exposed at 26 cm, Floor 2 was exposed at 42 cm below the surface, and Floor 3 was exposed at 63 cm. The excavation also revealed a platform 40 cm below the surface, the accurate date of construction is unknown (Figure 40). The unit was closed after exposing the start of the marl layer below the platform, which measured 109 cm below the surface.



Figure 40: Platform exposed in EU XUN-2022-13, viewed from the south.

A total of 454 artifacts were found, including ceramics, chert, *jute*, and marine shell. We recovered 401 ceramic sherds, and only 137 displayed an identifiable diagnostic element (rim). This unit yielded a total of 34 Preclassic ceramic sherds, all identified as Savana Orange (Middle Preclassic). One special find was found in the humic layer of this unit, a brown chert biface (SF# XUN-22-003; Appendix A: Figure 41). The other two special finds were found in the unit's small pebble cobble fill, a chert core (SF# XUN-2022-007; Appendix A: Figure 42), and a Savana Orange paste anthropomorphic figurine fragment, displaying a side face profile (SF# XUN-2022-009; Appendix A: Figure 43).



Figure 41: A brown chert biface found in the humic fill layer of EU XUN-2022-13. (SF# XUN-22-003)



Figure 42: A brown chert core found in the small pebble cobble fill layer of EU XUN-2022-13. (SF# XUN-22-007)



Figure 43: Side profile of a Savana Orange anthropomorphic figurine discovered in construction fill in EU XUN-2022-13. (SF#XUN-22-009).

EU XUN-2022-15

EU XUN-2022-15 was a 1 x 1 m extension of EU XUN-2022-13. XUN-2022-15 was placed to extend XUN-2022-13 one meter west to expose the remainder of the platform (Figure 44). The excavation revealed three floors, Floor 1 was exposed at 34 cm, Floor 2 was exposed at 40 cm below the surface, and Floor 3 was exposed at 63 cm. The platform found in XUN-2022-13 did not continue into EU XUN-2022-15, a layer of large cobble fill was found 47 cm below the surface. We determined that this cobble fill layer under Floor 2 was an intentional modification replacing what would have been the western extension of the platform (Figure 45). The fill layer was leveled to the height of the platform found in EU XUN-2022-13, recorded at 40 cm below the surface. The unit was closed after exposing the top of bedrock, which measured 203 cm below the surface (Figure 46). A total of 433 artifacts were found, including ceramics, chert, and granite. We recovered 336 ceramic sherds, and only 70 displayed an identifiable diagnostic element (rim). This unit yielded a total of 48 Preclassic ceramic sherds, the majority identified as Savana Orange (Middle Preclassic) sherds and a single Reforma Incised. One special find was found in the large cobble fill, a fragmented mano (SF# XUN-22-006; Appendix A: Figure 47).



Figure 44: EU XUN-2022-15 extent, viewed from the south.



Figure 45: Image depicting the large cobble fill layer and the surface of Floor 2 found in EU XUN-2022-15, viewed from the east (On platform).



Figure 47: A fragmented mano found in the large cobble fill layer of EU XUN-2022-15. (SF# XUN-22-006)

Excavation Unit XUN-2022-14

EU XUN-2022-14 was placed at an arbitrary location in close proximity to Structure A10. This unit measured 1.5 x 1 m and was placed on a north-to-south axis to the east of the base of the structure (Figure 48). The purpose of this unit was to investigate the presence of Preclassic evidence near Structure A10. The excavation revealed three floors, Floor 1 was exposed at 19 cm, Floor 2 was exposed at 32 cm below the surface, and Floor 3 was exposed at 64 cm (Figure 49). The excavation also revealed a layer of red river stones 78 cm below the surface. The unit was closed after bedrock was exposed at 174 cm below the surface (Figure 50). A total of 434 artifacts were found, including ceramics, chert, *jute*, and obsidian. We recovered 285 ceramic sherds, and only 88 displayed an identifiable diagnostic element (rim). This unit yielded a total of 35 Preclassic ceramic sherds, the majority identified as Savana Orange (Middle Preclassic) sherds and a single Reforma Incised. No special finds were identified or recovered in this unit. Two charcoal samples for ¹⁴C dating were recovered from the excavation in XUN-RC-12 and XUN-RC-13.



Figure 48: EU XUN-2022-14 extent, viewed from the south.



Figure 49: Bedrock exposed in EU XUN-2022-14, viewed from the south.

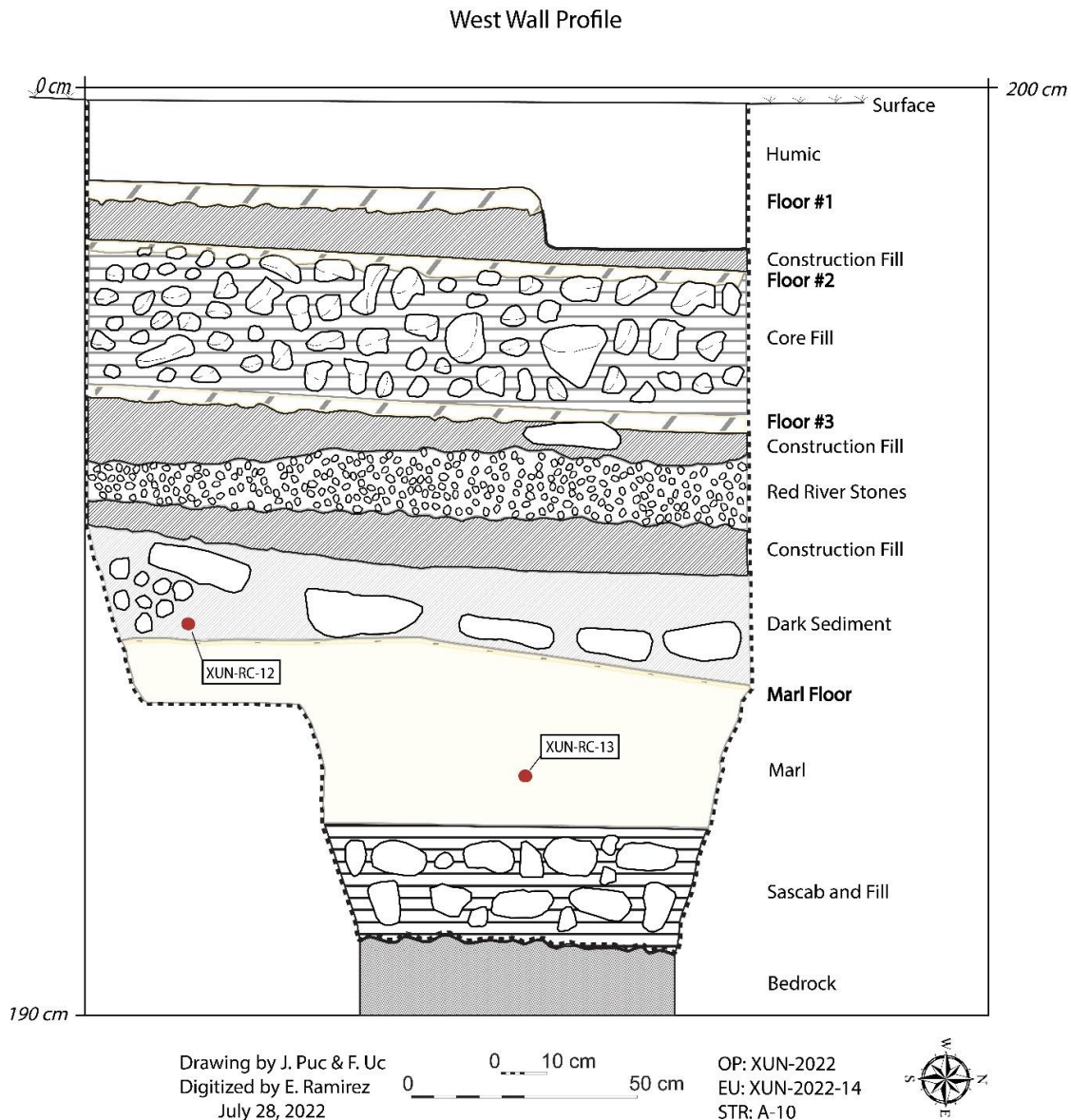


Figure 50: West wall profile of EU XUN-2022-14.

DISCUSSION AND CONCLUSION

A century's worth of previous archaeological excavations at Xunantunich provided limited information of the Preclassic occupation within the site core. The preliminary results of our investigations in Plaza A-I, A-II, and A-III assist in understanding the construction and development of the site core of Xunantunich during Preclassic times. The implementation of vertical excavations and the recovery of charcoal samples for radiocarbon dating benefit the study by enhancing the full chronological phases of the excavated context in the site core. The 2022 excavations have provided sufficient Preclassic data. All 16 excavation units recovered deposits of Preclassic ceramics (Figure 51), including three ceramic figurines. Preclassic architecture, in

the form of small platforms, was also recovered by excavations beneath the playing alley in Ballcourt 2, and in Plaza A-I and A-II (Figure 52).

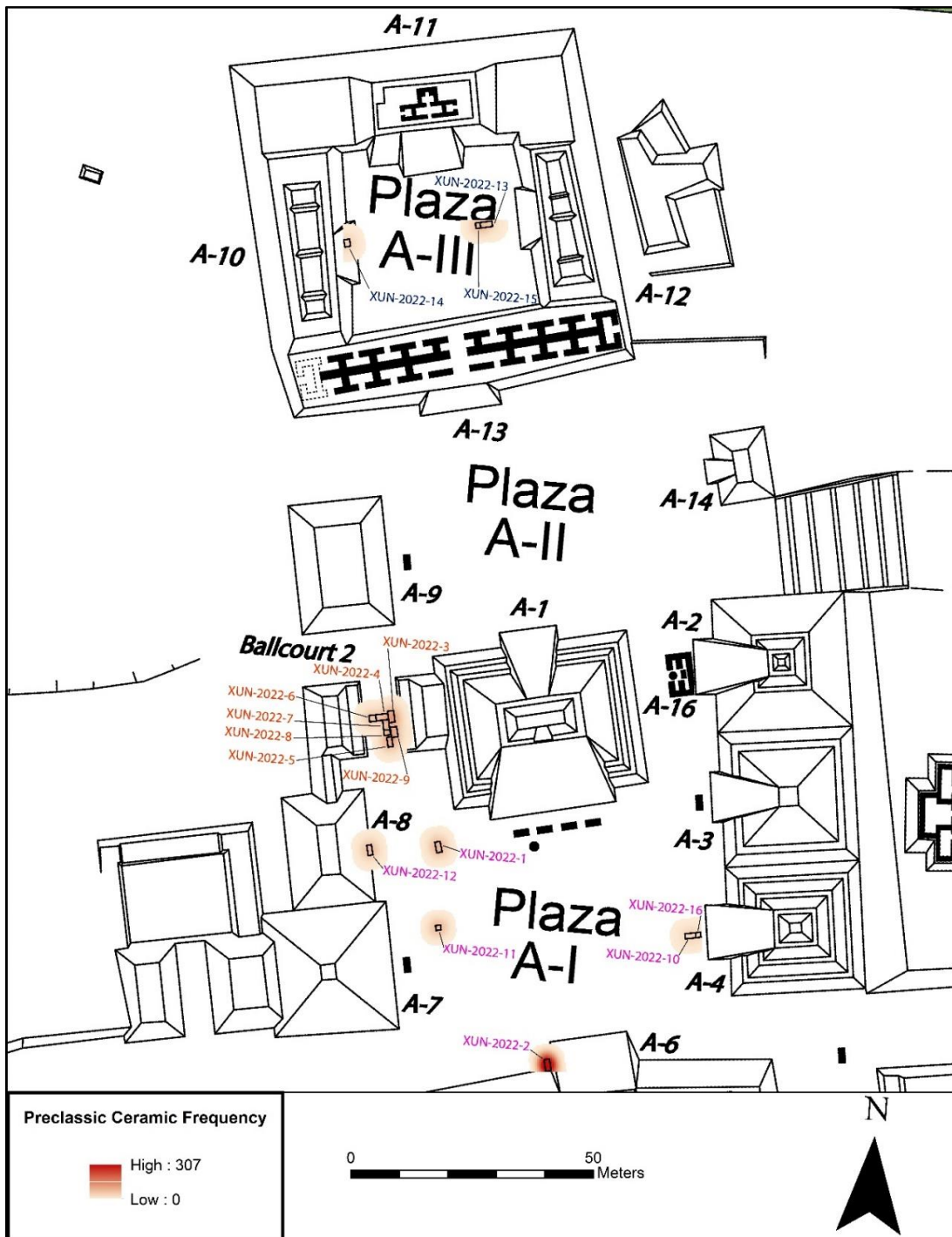


Figure 51: Kernel Density Heat map displaying the Preclassic ceramic frequency associated with excavated units located in the site core. Map produced by E. Ramirez



Figure 52: Image displaying the full extent of the Preclassic wall, viewed from the west. Units XUN-2022-3, XUN-2022-4, XUN-2022-7, and XUN-2022-8.

Our excavations revealed that the site core of Xunantunich was first occupied during the late Early and Middle Preclassic periods. Other investigations by the BVAR Project also noted that the earliest evidence for modest monumental architecture, Str. A7-4th dates to the Late Preclassic period (Watkins 2019). Despite this early occupation and development, however, true monumentality in the site core does not flourish until the Late to Terminal Classic period. Future research will continue to investigate the role of Xunantunich during the Preclassic period and its position within the political landscape of the upper Belize River Valley. The presence of Preclassic architecture in Ballcourt 2 warrants more study. Excavations north of XUN-2022-3, XUN-2022-4, and XUN-2022-6 could present further evidence of the purpose of Preclassic architecture (Figure 53). Also, in our excavations, three units presented evidence of ritual deposits, two caches, and an altar (Figure 54).



Figure 53: 2022 excavation units in Ballcourt 2, viewed from the east.

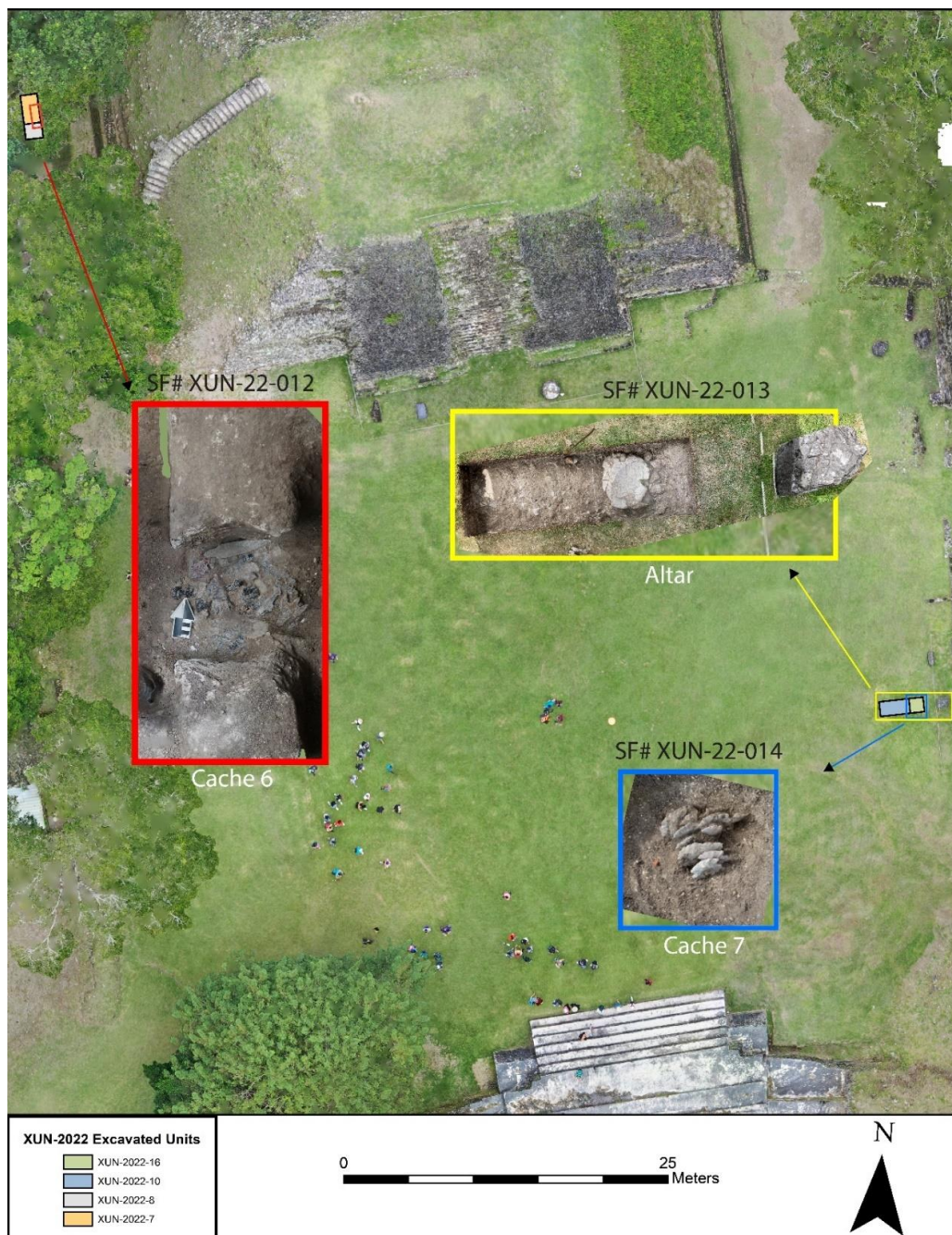


Figure 54: 3D orthomosaic map produced from a drone survey depicting the geospatial contexts of Cache 6, Cache 7, and Altar. Map produced by E. Ramirez.

At most Belize River Valley centers, the site cores represent the first sections of a polity to be occupied (Awe 1992). Additional documentation of stratified contexts in the site core will provide a more precise understanding of the extent of Preclassic occupation residing on the site core. Our findings help enhance the understanding of the construction and development of the site core of Xunantunich during Preclassic times. Moreover, future research would continue to

investigate the role of Xunantunich in the Preclassic landscape compared to other sites of the Belize River Valley.

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APPENDIX A: SPECIAL FINDS INVENTORY

<i>Operation</i>	<i>Str/Area</i>	<i>EU</i>	<i>Level</i>	<i>Lot</i>	<i>SF#</i>	<i>Description</i>
XUN-2022	BC2	XUN-2022-3	3	XUN-2022-3-4	XUN-22-001	Modified flat shell bead
XUN-2022	A-6	XUN-2022-2	8	XUN-2022-2-9	XUN-22-002	Fragmented Metate
XUN-2022	A-12	XUN-2022-13	1	XUN-2022-13-1	XUN-22-003	Chert Biface
XUN-2022	BC2	XUN-2022-9	2	XUN-2022-9-2	XUN-22-004	Figurine Leg
XUN-2022	A-4	XUN-2022-10	7	XUN-2022-10-7	XUN-22-005	Hammerstone
XUN-2022	A-12	XUN-2022-15	5	XUN-2022-15-5	XUN-22-006	Fragmented Mano
XUN-2022	A-12	XUN-2022-13	7	XUN-2022-13-7	XUN-22-007	Chert Core
XUN-2022	A-6	XUN-2022-2	8	XUN-2022-2-9	XUN-22-008	Finished Shell Bead
XUN-2022	A-12	XUN-2022-13	8	XUN-2022-13-8	XUN-22-009	Ceramic Figurine Head (Side Profile)
XUN-2022	BC2	XUN-2022-3	2	XUN-2022-3-3	XUN-22-010	Ceramic Figurine Head
XUN-2022	BC2	XUN-2022-3	2	XUN-2022-3-3	XUN-22-011	Ceramic Figurine (Bird Head)
XUN-2022	BC2	XUN-2022-7	2	XUN-2022-7-3	XUN-22-012	Cache 6 (55 Eccentrics)
XUN-2022	A-4	XUN-2022-16	4	XUN-2022-16-3	XUN-22-013	Circular Altar
XUN-2022	A-4	XUN-2022-16	4	XUN-2022-16-4	XUN-22-014	Cache 7 (9 Eccentrics)

XUN-2022: Charcoal Samples

<i>Op</i>	<i>Str</i>	<i>EU</i>	<i>Level</i>	<i>Lot</i>	<i>Sample</i>	<i>Provenience</i>
XUN-2022	A1	XUN-2022-1	2	XUN-2022-1-2	XUN-RC-1	95.5cm below D A1
XUN-2022	BC2	XUN-2022-3	1	XUN-2022-3-1	XUN-RC-2	78.5cm below D BC2
XUN-2022	BC2	XUN-2022-3	1	XUN-2022-3-1	XUN-RC-3	85.5cm below D BC2
XUN-2022	BC2	XUN-2022-3	1	XUN-2022-3-1	XUN-RC-4	81cm below D BC2
XUN-2022	A6	XUN-2022-2	2	XUN-2022-2-2	XUN-RC-5	67cm below D A6
XUN-2022	A6	XUN-2022-2	1	XUN-2022-2-1	XUN-RC-6	64.5cm below D A6
XUN-2022	A6	XUN-2022-2	1	XUN-2022-2-1	XUN-RC-7	79.5cm below D A6
XUN-2022	A6	XUN-2022-2	3	XUN-2022-2-3	XUN-RC-8	89.5cm below D A6
XUN-2022	BC2	XUN-2022-3	1	XUN-2022-3-1	XUN-RC-9	103cm below D BC2
XUN-2022	A6	XUN-2022-2	3	XUN-2022-2-4	XUN-RC-10	89cm below D A6
XUN-2022	A6	XUN-2022-2	6	XUN-2022-2-7	XUN-RC-11	126cm below D A6
XUN-2022	A10	XUN-2022-14	10	XUN-2022-14-10	XUN-RC-12	105cm below D A10
XUN-2022	A10	XUN-2022-14	10	XUN-2022-14-10	XUN-RC-13	170cm below D A10
XUN-2022	BC2	XUN-2022-3	5	XUN-2022-3-9	XUN-RC-14	222cm below D BC2

THE FIFTH SEASON OF THE XUNANTUNICH ARCHAEOLOGICAL AND CONSERVATION PROJECT (XACP): A REPORT OF THE 2022 EXCAVATIONS AND CONSERVATION AT GROUP B

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INTRODUCTION

The 2022 excavations at Group B were part of the ongoing Xunantunich Archaeological and Conservation Project (XACP). Group B is an elite residential compound, also termed a *plazuela* group, located approximately 130 m west of the Xunantunich site core (Figure 1). XACP research began in 2016 to reveal, document, and conserve the terminal structural layout of the group. Excavations have revealed much about the ritual behavior of the residents of Group B before and after the Terminal Classic period (AD 750-900), particularly through the documentation of extensive peri-abandonment deposits (see Alvarado et al. 2018; Ebert et al. 2020; Messinger et al. 2019; Sullivan et al. 2017). Here we report the preliminary results of our 2022 field season and contextualize them within previous XACP excavations at Group B.

PREVIOUS RESEARCH AT GROUP B

Prior to XACP research, Group B was the focus of several archaeological projects over the last century (Figure 2). Sir J. Eric S. Thompson (1942) used excavations at Group B in Structure B1 and Structure B3 to develop a preliminary regional ceramic chronology. Thompson's research supported current theories about the residential compound's affiliation with the adjacent monumental site core. For example, there was no evidence of occupation at Group B before the construction of Plaza A-III, indicating the residents were likely important relatives of the ruling family during the site's apogee in the Hats' Chaak phase (~AD 570-780; Yaeger 2010:75). A salvage project by David Pendergast and Elizabeth Graham took place in the 1970s following the looting of Courtyard B2, including Structure B5 (Pendergast and Graham 1981). Excavation of looters' backdirt and documentation of Structure B5 revealed a high quantity of human remains and the sherds of reconstructible vessels, in addition to an undisturbed burial (Pendergast and

Graham 1981:17-18). This research identified the building's final construction phase dating to the late ninth to early tenth century BC.

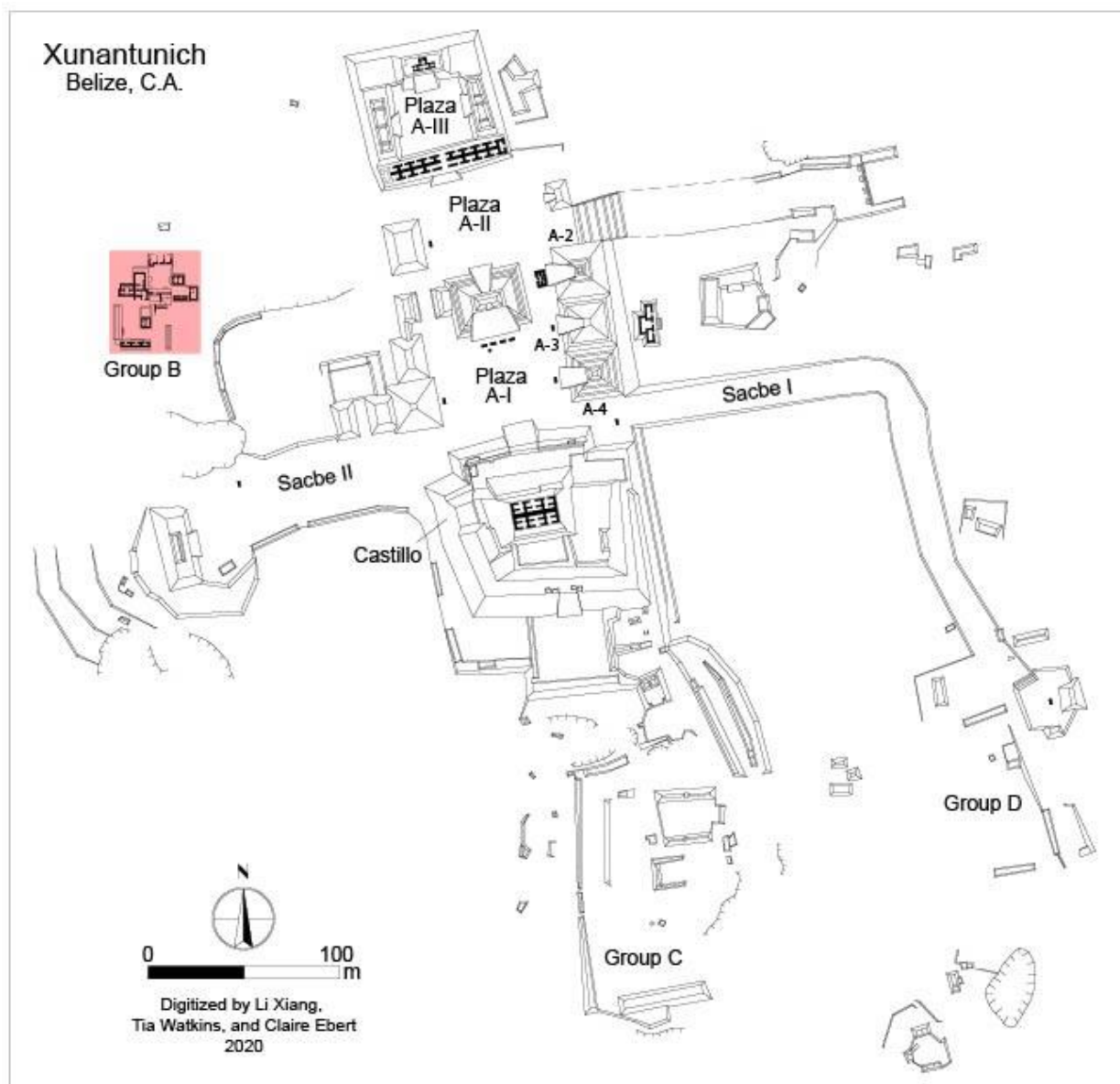


Figure 1: Map of Xunantunich epicenter with location of Group B highlighted.

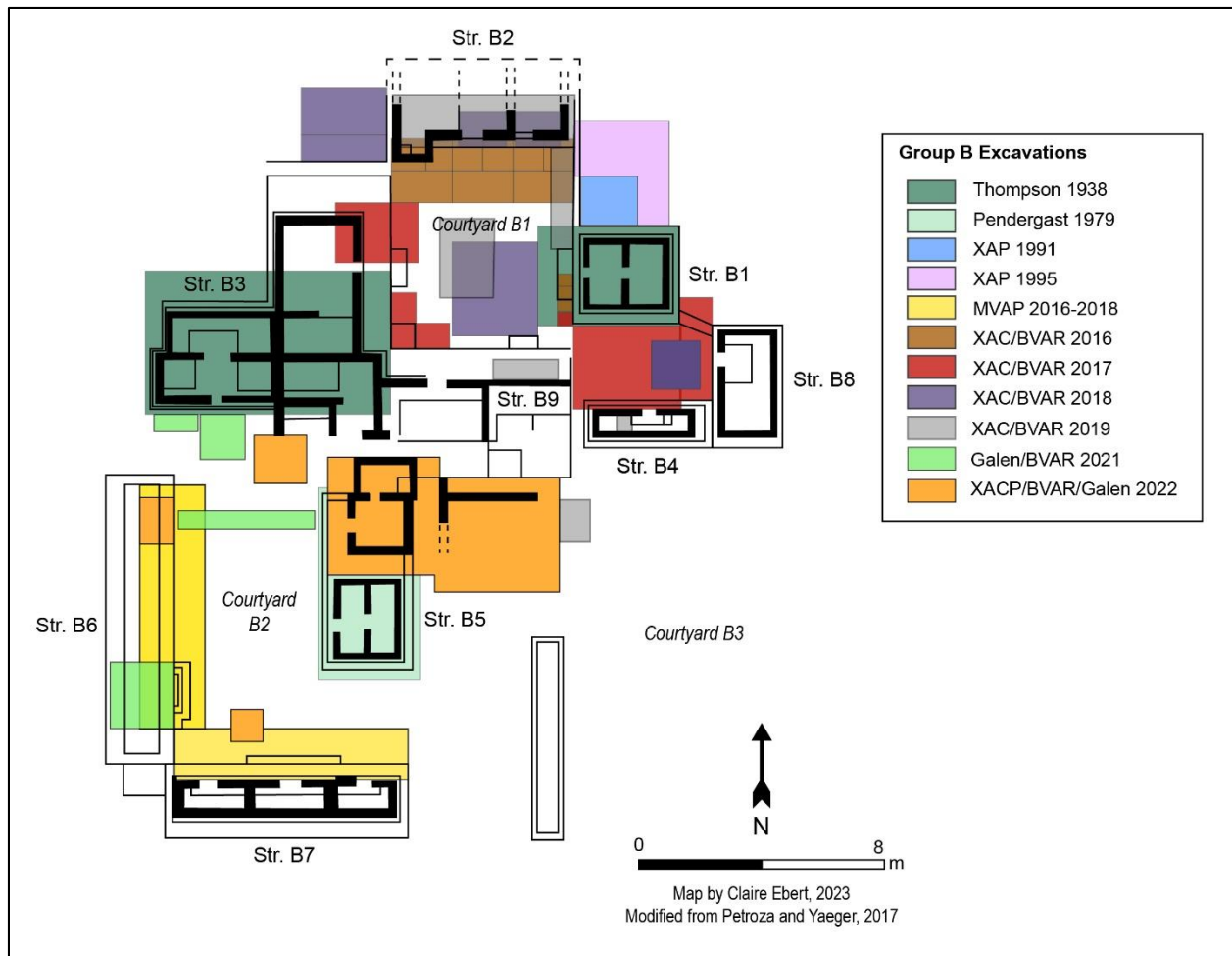


Figure 2: Plan of Group B showing the structures as well as the extent and distribution of the various excavations (map by C. Ebert, 2023).

The Xunantunich Archaeological Project (XAP), directed by Richard Leventhal, began systematic test pitting and excavations across the site's four monumental groups in 1991 (Yaeger 2010). This included several test pits at Group B, which documented a "dense concentration of sherds, possibly a midden" between Structure B1 and B2 (Etheridge 1995:72). The inclusion of two whole ceramic vessels in this cultural level instigated a larger excavation effort to document the deposit (Etheridge 1995:72). In 1995, excavations extended the 1991 test pits, identifying what was interpreted as evidence of a termination ritual and an overlying midden. The location of the deposit and associated artifacts indicate it likely belonged to a larger and well-documented pattern of multi-episodic ritual events, now termed peri-abandonment deposits (Awe et al. 2018; Sullivan et al. 2017; see also Awe et al. 2020). These ritual deposits often consist of a dense layer of ceramics interspersed with faunal remains, obsidian, chert, and groundstone tools. They have been documented at several sites across the Belize River Valley (Awe et al. 2020), and radiocarbon dating reveals their creation during the Late to Terminal Classic period as centers were depopulated. Therefore, peri-abandonment deposits were likely part of a pilgrimage tradition in the decades following abandonment. The deposits documented by previous researchers at Group B are now known to continue across the entirety of the group.

Since 2016, excavations to conserve the masonry structures and courtyards of Group B have been undertaken by the Xunantunich Archaeology and Conservation Project (XACP), jointly with the BVAR Project and in cooperation with members of the Mopan Valley Archaeological Project (MVAP), Dr. Jason Yaeger, and Michael Petrozza. In 2016, XACP research began by investigating Courtyard B1 in front of Structures B1 and B2 to expand the knowledge of the *plazuela* group's chronology and terminal layout (Sullivan et al. 2017). In 2016 and 2017, defining the boundaries and masonry structures surrounding Courtyard B1 resulted in the discovery of several peri-abandonment deposits. Excavations in 2017 proceeded to define terminal architecture in Courtyard B1, focusing on the corners of the Courtyard where peri-abandonment deposits are commonly found (Sullivan et al. 2017). These efforts revealed the previously undocumented Structure B8 (see Figure 2; Alvarado et al. 2018). During the 2018 field season, units were strategically placed to define the layout of Structure B8 and the extent of Structures B3 and B4, while an additional two units were opened to explore the doorways of Structure B2, and the south-central portion of Courtyard B1 (Messinger et al. 2019). This research was aimed at understanding the construction sequence at Group B, which aligned with the rapid construction of the Xunantunich monumental site core in the Late Classic period. Entrances to the restricted residential group were defined, and lab work consisted of cleaning and cataloguing the massive volume of ceramic and lithic material contained in peri-abandonment deposits across Courtyard B1.

In 2019, research prioritized the conservation of previously documented structures around Courtyard B1, and continuing excavations in areas of dense artifact concentrations in Structures B2 and B4 (Ebert et al. 2020). Excavators revealed another previously undocumented building, Structure B9, located to the south of the southern stairway entrance into Courtyard B1. Structure B9 was associated with a large ceramic deposit (Feature B9-2019-1) and a burial (Burial B9-2019-1). Units placed in Courtyard B1 also located several disarticulated clusters of human remains and another burial (CTB1-2019-1; Ebert et al. 2020:110), possibly disturbed by the incomplete XAP burial excavations (Etheridge 1995:74). Units were also placed in the three rooms of Structure B2, and a single exploratory 1x1 m unit was placed in the western bench of Structure B4. Finally, excavations moved south to Courtyard B3, where it appears another peri-abandonment event occurred, resulting in the deposition of thousands of sherds interspersed with faunal remains and lithic artifacts (Ebert et al. 2020:116). The 2019 field season allowed the project to finish conserving the six structures surrounding Courtyard B1 and set up a new objective to explore the terminal architecture and peri-abandonment activity associated with Courtyards B2 and B3.

After a research hiatus during the COVID-19 pandemic, Antonio Beardall conducted additional XACP excavations of Courtyard B2 during the summer of 2021, while supervising students from Galen University. This research focused on excavating Structure B6 for conservation and documenting additional peri-abandonment deposits associated with this building, as well as with Structure B3 and Courtyard B2. Beardall's excavations also expanded previous work on Structures B6 and B7 by MVAP from 2016-2018.

Excavations in 2022 focused on defining the terminal architecture and substructures of Structure B5, including a Late to Terminal Classic sweatbath (Structure B5A), to prepare for conservation (see Saldaña et al., this volume). Salvage operations by Elizabeth Graham and David Pendergast (1981) suggested Structure B5 may represent one of the latest construction and

occupation episodes at Group B, possibly dating to the Postclassic period. Throughout the 2022 excavation, organic material was collected for radiocarbon dating to confirm these dates, and units were strategically placed to define the construction sequence. Excavations also targeted the peri-abandonment deposits in Courtyard B3 identified by previous excavations (Figure 3; see also Ebert et al. 2020). The preliminary results are documented here.

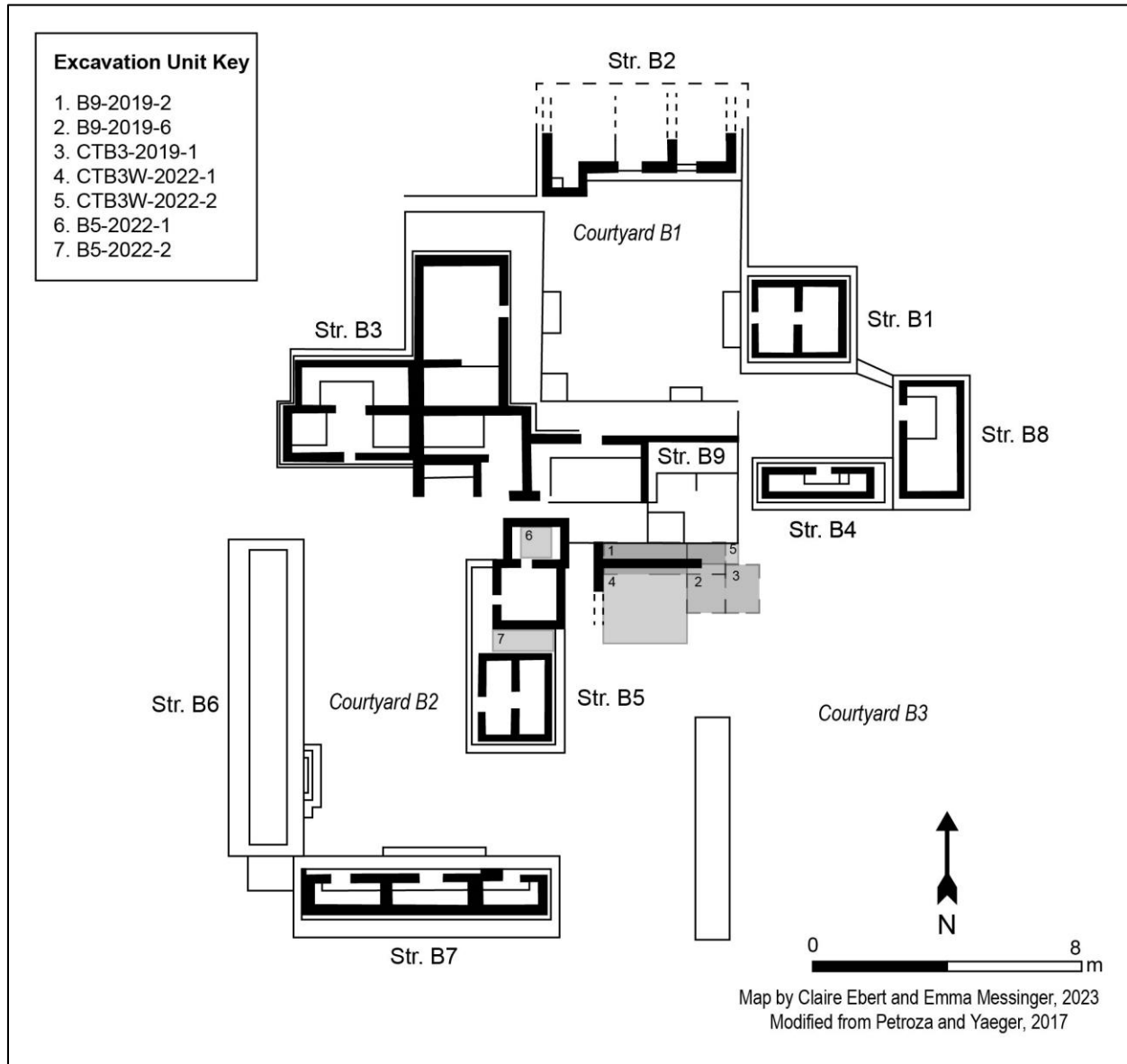


Figure 3: Map of 2022 units and associated 2019 units in Group B.

METHODS

The majority of 2022 excavations focused on revealing the terminal layout of architecture and the extent of peri-abandonment deposits. To expose *in situ* deposits, units were excavated

horizontally in cultural levels to target specific regions of the *plazuela* group where unexcavated clustered artifacts remained. This research expanded on previous work by BVAR/XACP in 2019, as well as the salvage efforts of Elizabeth Graham and David Pendergast (1981). Units were aligned with architecture and often subdivided. These subdivisions were excavated vertically to bedrock, to clarify the occupational sequence at Group B. When peri-abandonment deposits were identified, excavation methodology followed BVAR Project protocol (Lonaker et al. 2017). Clustered material was carefully pedestaled to reveal its horizontal extent and the associations of artifacts. After exposure, photography and plan-view mapping were employed to document the deposit. Often, multiple depositional events are marked by soil lenses between one deposit layer and the preceding layer, where individual excavation lots mark different episodes of ritual activity. In other cases, no notable soil lens exists, resulting in a discrete deposit layer excavated in a single lot.

As in previous years, the excavation of Group B results in a backlog of artifacts in need of detailed analysis. Excavators analyzed diagnostic ceramics according to ceramic the local typology (Gifford 1976; LeCount 1996). Daily lab work consisted of washing and cataloguing the high volume of artifacts from peri-abandonment contexts, in the order in which they were removed. Future field seasons will emphasize the completion of artifact analyses.

RESULTS

Courtyard B3 West

The western portion of Courtyard B3 was selected for additional excavation based on the presence of an extensive peri-abandonment deposit located during Ebert and colleagues' (2020) excavations in 2019 (Units CTB3-2019-1 and B9-2019-6). Ebert and colleagues' (2020:116) believed the deposit was placed during a single event. Artifacts consisted of high frequencies of pottery, deer bones, and obsidian blades, in addition to several partially intact vessels. First, a 6 x 5 m unit (CTB3W-2022-1) was placed directly west of previous excavations (Unit B9-2019-6) to define the terminal plaza floor and the form and function of an east-west running wall revealed during 2019 operations. The wall is located directly south of the southernmost wall of Structure B9 (referred to as the "wall of two faces"), and connects with the easternmost wall of Structure B5. This wall of Structure B5 was a later addition, likely built concurrent with the filling in of the B5 alley (Unit B5-2022-2). The unit was strategically placed to reveal the construction sequence of the structure and Courtyard B3. We hypothesize this construction phase coincided with the reconstruction of the sweatbath in Room 5BA when the entrance and hearth were relocated (see also Saldaña et al., this volume).

A second 1.6 x 4.4 m unit (CTB3W-2022-2) was established to investigate the extent of the peri-abandonment deposit directly south of the southernmost wall of Structure B9, below previous excavations (Units CTB3-2019-1 and B9-2019-6). Excavators immediately encountered high frequencies of artifacts (Feature CTB3W-2022-2: Deposit), likely the continuation of the deposit identified in 2019, consisting of ceramics, chert, obsidian, and granite. This level concluded with the discovery of a modified bedrock drain approximately 15 cm wide, running directly along the outer southern wall of Structure B9 (Figure 4). Excavations in 2017 also identified a modified bedrock drain south of Structure B1, which included a tunnel through the

building foundations, routing water downhill to the north of the compound (Alvarado et al. 2018). The drain found in 2022 is possibly a connecting drain skirting the entrance to Courtyard B1, to prevent flooding in the lower area of the compound.



Figure 4: Modified bedrock drain exposed in Unit CTB3W-2022-2, along the southern wall of Structure B9.

Feature CTB3W-2022-1: Deposit

In CTB3W-2022-1, excavators encountered high-density ceramic clusters in the south, center, center-west, and center-east of the unit (Figure 5). This part of Courtyard B3 is likely the unexcavated extent of the peri-abandonment deposit initially encountered by Ebert and colleagues in 2019 (2020). Peri-abandonment deposits are often located in corners of plazas and courtyards (Awe et al. 2020). The deposit was named Feature CTB3W-2022-1 and was collected as a single cultural level between the humic layer and the terminal plaza floor, including sections of the deposit north and south of the east-west wall bisecting the unit. Based on preliminary ceramic analysis, artifact clusters contained vessels from the Spanish Lookout II ceramic complex, including Mount Maloney and Belize Red rims, diagnostic of the Terminal Classic period (Gifford 1976; LeCount 1996). The deposit was approximately 20-30 cm thick and consisted of densely layered artifacts, including a high volume of ceramics (e.g., censer prongs, multiple fragmented anthropomorphic figurines, and a crocodile figurine), chert (mostly primary flakes), cobbles, faunal remains, freshwater and marine shell, obsidian, quartz, slate, granite, limestone, charcoal, and some disarticulated human remains. Special finds include a worked shell pendant, multiple bifaces, a bark beater, several spindle whorls, worked marine shell, a bowl awl, worked slate, shell beads, and several mano and metate fragments (see Appendix B). As with previously excavated deposits at Group B, the deposit also contained a high volume of whole and partial mano and metate fragments ($n=6$) and bifaces ($n=4$).



Figure 5: Feature CTB3W-2022-1: Deposit exposed.

In the northern section of Unit CTB3W-2022-1, excavators found the western extent of the drain initially uncovered in Unit CTB3W-2022-2, which ended approximately 16 cm from the eastern baulk of the unit. Once Feature CTB3W-2022-1 was removed, the unit was subdivided to bring portions down to bedrock. Between the terminal plaza floor and the undulating bedrock foundations, artifact frequency decreased significantly. The fill contained only minimal amounts of ceramics, chert, faunal remains, freshwater and marine shell, obsidian, granite, and limestone. A single special find (a partial figurine fragment) was found below the floor.

Structure B5

The units in Structure B5 (and its substructures) were placed to outline the architectural sequence and consolidate the architecture prior to conservation (see Saldaña et al., this volume). The first unit, B5-2022-1, measured 1.35 x 2.6 m and was opened to clear the alleyway to the north of the sweatbath (Structure B5A). It was closed after approximately 30 cm of construction fill was removed, containing ceramics, chert, and granite. Special finds included a worked marine shell button and a fragmented limestone biface. It is possible the alleyway north of Room B5A is the structure's third room, but it is too early to determine the function of the space as the majority remains unexcavated.

A second unit was opened to clear the collapse and fill in the alley between B5A and B5B and explore the final phase of occupation at the structure. The unit initially began near the western

alley entrance, and measured 1.1 x 1.55 m, but was later extended east and west to 3.2 m. Once the construction fill was removed, excavators identified another deposit level (Feature B5-2022-1: Deposit; Figures 6). Unlike the neighboring deposit in Courtyard B3, it was difficult to discern if the stratigraphy in the alleyway represented multiple episodes of peri-abandonment rituals, or only appeared this way due to taphonomic processes. We determined that the first level of construction fill was an intentional effort to close off this alleyway in the Terminal Classic period. From approximately 90 cm below datum to a maximum depth of 170 cm at the terminal plaza floor, B5 alley excavations consisted of dense artifact layers characteristic of typical peri-abandonment deposits.



Figure 6: Feature B5-2022-1 exposed.

Although additional artifacts were visible in the baulk, the excavators switched lots after removing approximately 20 cm of the deposit level, at which point they encountered a soil lens where Feature B5-2022-1 appeared to end. The western side of the unit was initially block excavated to expose a stratigraphic profile of the construction fill overlying deposit levels. Excavators noted this deposit appeared more layered than in the unit in Courtyard B3, suggesting deposition may have occurred over the course of multiple events. As a result, layers of deposit were collected over three separate lots (Figures 6, 7, and 8) above the level of the terminal plaza floor. Artifacts appeared to be deposited directly onto the floor (Figure 9), although this may also have been the result of compaction due to the weight of the construction fill.



Figure 7: Feature B5-2022-2 exposed.



Figure 8: Feature B5-2022-3 exposed.



Figure 9: Alleyway between Structure B5A and B5B (E.U. B5-2022-2), closing photo, Floor 1 exposed.

Artifact classes included high frequencies of ceramic sherds, interspersed with chert, freshwater shell, faunal remains, granite, quartzite, obsidian, and daub. Unarticulated fragments of human cranium were also recovered. Special finds included granite manos and metates and bifaces, two adzes, spindle whorls, fragments of red-painted stucco, multiple fragmented anthropomorphic and animal figurines (including some painted with Maya blue pigment), and modified shell and faunal bone (several bone needles). We believe the red-painted stucco was likely removed from a decorative stucco façade on one of the structures in Group B. As with the feature in Courtyard B3 and previously exposed peri-abandonment deposits at the site, the frequencies of manos, metates, and bifaces are notably high.

DISCUSSION AND FUTURE DIRECTIONS

Structure B5 contains the first sweatbath found at Xunantunich and has one of the most storied histories in the residential complex, both in its architectural lifespan during Maya occupation, and as a subject of looting and archaeological interest. The XACP excavations during the 2022 field season confirmed there were multiple phases of construction at Structure B5 and at least one period of reoccupation during the Terminal Classic, aligning with previous excavations in the lower Courtyard B1. The ten radiocarbon samples collected in the Courtyard B3 units and

B5-2022-2 (see Appendix A) will help confirm the sequence and enable researchers to hypothesize about the construction timeline for the eastern wall of Structure B5, the peri-abandonment deposit, and the deposition of construction fill to enclose the alleyway between Structures B5A and B5B. The east-west wall in Courtyard B3 may be a retaining wall.

In upcoming field seasons, researchers will continue to explore the construction episodes of Structure B5 to understand how the building and its substructures were modified over its use-life, particularly during the Terminal Classic. The final construction phase at Structure B5 may abandon standardized architectural layouts to create more space, potentially to accommodate a larger family. Excavators believe this final occupation coincides with the intentional filling-in of the alleyway between Rooms B5A and B5B, in addition to the relocation of the sweatbath entrance and hearth to make the northern alley (unit B5-2022-1) into a living space. The easternmost wall of Structure B5 forms a low platform abutting Courtyard B3, which is another departure from the symmetry of the rest of the residential complex and was a later addition.

Our plans for future research in Group B involve excavating beneath the terminal plaza floor in the alleyway between rooms B5A and B5B and the B5B northern wall for radiocarbon samples and diagnostic artifacts, which will generate dates to confirm the theories about the construction timeline at Structure B5. Researchers hope to understand more about the passageway between Courtyard B2 and B3, and why it may have been blocked off in the final construction phase. Additional excavations in the alley north of the sweatbath (Structure B5A) would also help to confirm how the space was altered in the Terminal Classic or Postclassic to suit the changing needs of its residents.

Acknowledgments The XACP/BVAR Project would like to thank several important individuals for their contributions to the 2022 field season. First, we appreciate the continued investment by the Belize Institute of Archaeology (NICH) and their Director, Dr. Melissa Badillo, who granted us permission to conduct excavations at Xunantunich. We recognize the BVAR Project co-directors, Drs. Jaime Awe, Claire Ebert, and Julie Hoggarth, for their ongoing support and logistical prowess. The Can family welcomed us back for another year of operations and delicious lunches, and they have our gratitude. Funding for the research came from a generous donation by the Tilden Family Foundation, and graduate student research was additionally subsidized by a summer fieldwork grant from the University of Pittsburgh Department of Anthropology. Finally, we would acknowledge the students, staff, and excavators who worked with us this season; their dedication, patience, and enthusiasm made for another successful summer after the long hiatus!

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APPENDIX A: GROUP B-2022 LOT INVENTORY

<i>Lot</i>	<i>Lot Description</i>	<i>Radiocarbon Samples</i>
CTB3W-2022-1-1	Humus	
CTB3W-2022-1-2	Feature CTB3W-2022-1: Deposit	
CTB3W-2022-1-3	Feature CTB3W-2022-1: Deposit	RC-CTB3W-2022-1-01
		RC-CTB3W-2022-1-02
		RC-CTB3W-2022-1-03
		RC-CTB3W-2022-1-05
CTB3W-2022-1-4	Feature CTB3W-2022-1: Deposit	RC-CTB3W-2022-1-04
CTB3W-2022-1-5	Cut into tamped marl	
CTB3W-2022-1-6	Fill below floor 1	
CTB3W-2022-1-7	Fill below tamped marl	
CTB3W-2022-2-1	Feature CTB3W-2022-2: Deposit	RC-CTB3W-2022-2-01
B5-2022-1-1		
B5-2022-2-1	Collapse and construction fill	RC-B5-2022-2-01
		RC-B5-2022-2-02
B5-2022-2-2	Feature B5-2022-1: Deposit	
B5-2022-2-3	Feature B5-2022-2: Deposit	RC-B5-2022-2-03
B5-2022-2-4	Feature B5-2022-3: Deposit	RC-B5-2022-2-04

APPENDIX B: GROUP B 2022 SPECIAL FINDS INDEX

<i>Special Find Number</i>	<i>Lot</i>	<i>Description</i>
GB-2022-001	CTB3W-2022-1-1	Worked marine shell pendant
GB-2022-002	CTB3W-2022-1-1	Limestone biface fragment
GB-2022-003	CTB3W-2022-1-1	Quartzite bark beater
GB-2022-004	CTB3W-2022-1-1	Limestone biface
GB-2022-005	CTB3W-2022-1-1	Chert biface
GB-2022-006	CTB3W-2022-1-1	Limestone spindle whorl
GB-2022-007	CTB3W-2022-1-1	Ceramic spindle whorl
GB-2022-008	CTB3W-2022-1-2	Worked marine shell pendant
GB-2022-009	B5-2022-1-1	Limestone biface fragment
GB-2022-010	B5-2022-1-1	Worked marine shell button
GB-2022-011	CTB3W-2022-1-2	Worked slate
GB-2022-012	B5-2022-2-1	Limestone spindle whorl
GB-2022-013	CTB3W-2022-1-3	Worked marine shell
GB-2022-014	CTB3W-2022-1-3	Granite mano
GB-2022-015	CTB3W-2022-1-3	Bone awl
GB-2022-016	B5-2022-2-2	Granite mano
GB-2022-017	B5-2022-2-2	Ceramic spindle whorl
GB-2022-018	CTB3W-2022-1-2	<i>Pulidor</i> (polisher)
GB-2022-019	B5-2022-2-2	Figurine head
GB-2022-020	CTB3W-2022-1-2 Ext.	Figurine crocodile
GB-2022-021	CTB3W-2022-1-2	Figurine fragment
GB-2022-022	CTB3W-2022-1-2 Ext.	Shell bead
GB-2022-023	CTB3W-2022-1-4	Granite mano
GB-2022-024	CTB3W-2022-1-4	Shell bead
GB-2022-025	CTB3W-2022-1-4	Carved faunal bone
GB-2022-026	B5-2022-1-1	Chert biface
GB-2022-027	CTB3W-2022-1-2	Chert hammerstone/core
GB-2022-028	CTB3W-2022-1-3	Worked shell
GB-2022-029	B5-2022-2-4	Ceramic figurine fragment
GB-2022-030	CTB3W-2022-1-4	Metate fragment
GB-2022-031	CTB3W-2022-1-4	Mano fragment
GB-2022-032	CTB3W-2022-1-4	Biface
GB-2022-033	CTB3W-2022-1-3	Biface
GB-2022-034	CTB3W-2022-1-3	Wood bead
GB-2022-035	CTB3W-2022-1-4	Metate fragment
GB-2022-036	CTB3W-2022-1-4	Biface fragment
GB-2022-037	B5-2022-2-4	Metate fragment
GB-2022-038	B5-2022-2-4	Mano fragment
GB-2022-039	B5-2022-2-4	Worked shell
GB-2022-040	B5-2022-2-1	Jaguar figurine fragment
GB-2022-041	CTB3W-2022-1-3	Anthropomorphic figurine fragment
GB-2022-042	B5-2022-2-3	Mano fragment
GB-2022-043	B5-2022-2-4	Faunal needle
GB-2022-044	B5-2022-2-4	Carved faunal bone
GB-2022-045	CTB3W-2022-1-3	Perforated potsherd disc

<i>Special Find Number</i>	<i>Lot</i>	<i>Description</i>
GB-2022-046	B5-2022-2-3	Mano fragment
GB-2022-047	B5-2022-2-4	Figurine fragment
GB-2022-048	B5-2022-2-3	Red-painted stucco
GB-2022-049	B5-2022-2-4	Ceramic applique
GB-2022-050	CTB3W-2022-1-5	Ceramic figurine fragment
GB-2022-051	B5-2022-2-3	Mano fragment
GB-2022-052	B5-2022-2-4	Preform adze
GB-2022-053	B5-2022-2-3	Mano fragment
GB-2022-054	B5-2022-2-4	Red-painted stucco
GB-2022-055	B5-2022-2-4	Bone needle
GB-2022-056	B5-2022-2-4	Mano
GB-2022-057	B5-2022-2-3	Stucco applique
GB-2022-058	B5-2022-2-4	Marine shell bead
GB-2022-059	CTB3W-2022-1-6	Modified marine shell adornment
GB-2022-060	B5-2022-2-4	Bone needle
GB-2022-061	B5-2022-2-3	Stucco fragments
GB-2022-062	B5-2022-2-3	Ceramic figurine
GB-2022-063	B5-2022-2-4	Antler needle
GB-2022-064	CTB3W-2022-1-2	Worked slate knife
GB-2022-065	B5-2022-2-4	Faunal needle
GB-2022-066	B5-2022-2-4	Mano fragment
GB-2022-067	B5-2022-2-4	Chert adze

THE BVAR/GALEN COLLABORATIVE INVESTIGATIONS IN COURTYARD 2, GROUP B AT XUNANTUNICH

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INTRODUCTION

The 2022 Belize Valley Archaeological Reconnaissance/Galen University collaborative fieldwork focused on Courtyard 2, Group B, at the Xunantunich Archaeological Reserve (Figure 1). This fieldwork expanded on excavations carried out in the summer of 2021 by Belizean Galen University students, focusing on excavating Structure B6 for future conservation efforts and uncovering and documenting Terminal Classic (AD 750-900) peri-abandonment deposits (Beardall 2022). The fieldwork is building upon tenets of public archaeology to increase local involvement in archaeological investigations and knowledge production, a premise that has been a part of BVAR's growth as a project since its inception (Beardall 2021; Hoggarth et al. 2020).

PREVIOUS RESEARCH IN COURTYARD B2

The 2021 excavations in Courtyard B2 focused on two locations, directly south of Structure B3, and in the courtyard surface. The focus of the excavation south of B3 was to expose more of the peri-abandonment deposits (B3S, B3S-1) (Figure 1), while the courtyard surface excavations were to locate the terminal surface of the plaza (C2-1, C2-2) (Beardall 2021). These deposits showed higher concentrations nearer to the southern edge of Str. B3 and the northeastern edge of Str. B6, tapering off as deposits neared the courtyard. These deposits have been interpreted in several ways, including destruction relating to warfare, rapid abandonment and the resulting de facto refuse, and evidence of ritual activity resulting from pilgrimage (Awe et al 2020a; 2020b).

Previous work on Structure B6 by Petrozza and Yaegar focused on the front of the structure in relation to the courtyard surface. In 2021, excavations focused on the southern portion of the structure, west of a previously discovered stairway. This location was chosen to investigate the condition of terminal phase architecture for future conservation efforts. While the terminal phase staircase on the southern portion of Str. B6 was not well preserved, the terraces of the penultimate phase were in good condition. The plaster on the summit exhibited evidence of having had a doorjamb that was removed in antiquity.

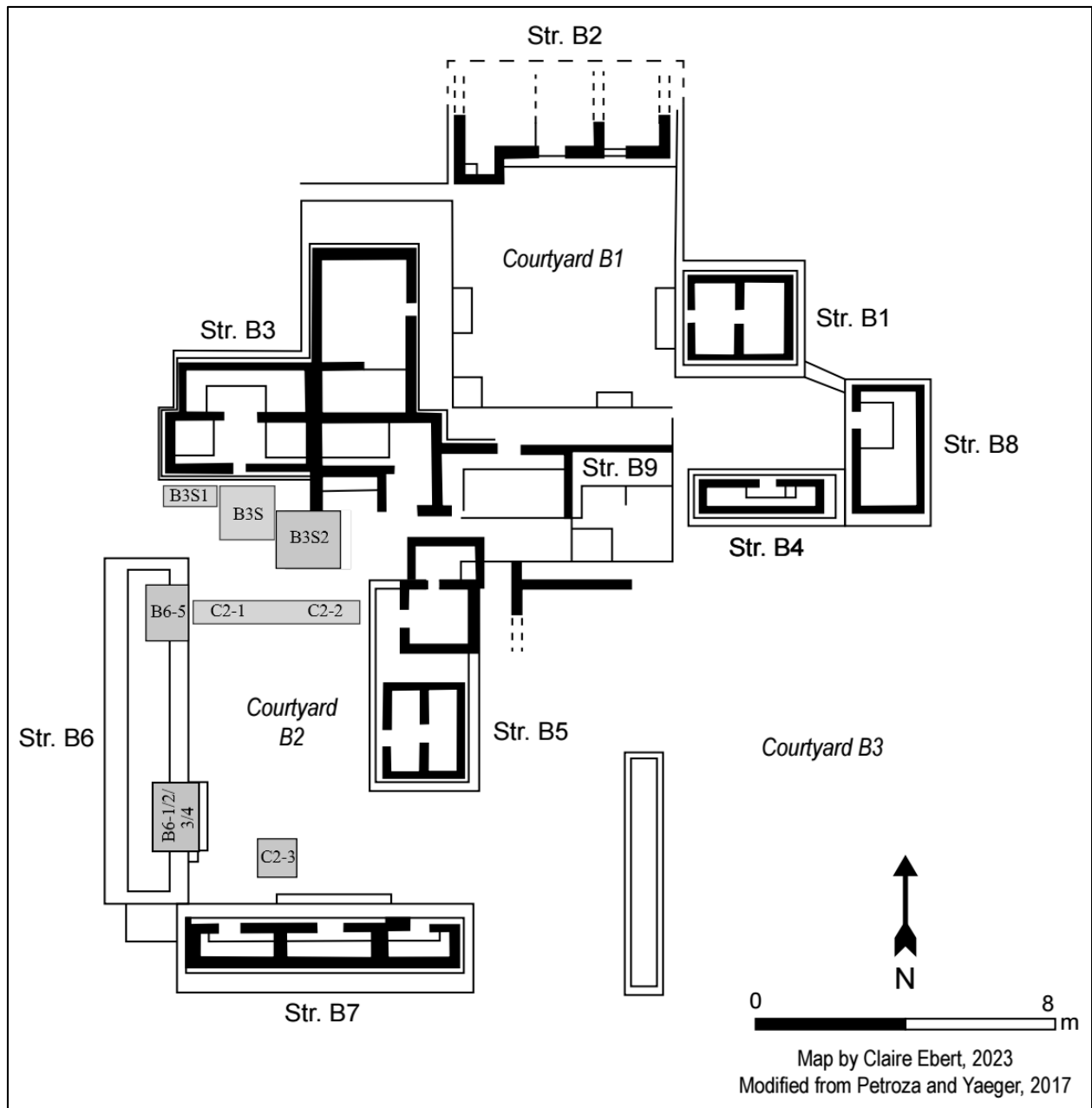


Figure 1: Map of Courtyard B2 showing 2021 and 2022 excavation units of XACP/BVAR/Galen (adapted from Ebert 2023).

2022 INVESTIGATIONS IN GROUP B

Courtyard B2

While the original plan was to open a single excavation unit in Courtyard 2, just south of Str. B3, another unit was opened just east of Str. B6 and north of Str. B7. The goal for both units was to examine the distribution of peri-abandonment deposits noted in previous research in Group B, including similar deposits documented by Alvarado et al. (2018), Ebert et al. (2020), Messinger

et al. (2019), and Sullivan et al. (2017) in Courtyard B1 and adjacent to Courtyard B1, and by Beardall (2022) in Courtyard B2.

A single excavation unit was opened south of Str. B3 called B3 South 2 (B3S2), measuring 3.3 m n/s and 2.2 m e/w. These measurements reflect the working space available, considering that the north of the unit had previously been excavated, and conservation efforts were being carried out on Str. B5, to the southeast of the unit. A single tree occupied the southwest corner of B3S2. The humic layer was shallow and did not yield many artifacts nor exhibited an identifiable collapse layer, the matrix consisted mostly of small and medium limestone cobbles and a few cut stones without any discernible alignment (Figure 2). The goal was to arrive at the same relative depth containing the deposit layer discovered to the west and northwest of B3S2 in 2021. After removing about 80 cm of matrix, a small concentration of sherds was exposed, leading to the conclusion that we had uncovered the top layer of the expected deposit (Figure 3). The concentration was minimal and proved not to be part of a deposit, as there were similar small concentrations of sherds throughout the rest of the layer.



Figure 2: B3S2 Level 2 showing unaligned collapse.



Figure 3: B3S2, top of perceived deposit.

Continued excavation of EU B3S2 did not uncover any significant deposits as was expected. While ceramic and chert were uncovered, these artifacts were not encountered in any significant concentrations or layers similar to the deposit found in 2021 in the same area. Apart from a chert biface fragment (Figure 4a), limestone spindle whorl (Figure 4b), unifacially worked burin (Figure 4c), and a perforated pot disk (Figure 4d) no other significant artifacts were found until the tree in the southwest corner of the unit fell, resulting in the removal of soil from the unit and the shallow bedrock of the area. A chert lenticular biface (Figure 4e) and a broken tip of a thin biface (Figure 4f) were recovered from near tree, alongside 235 ceramic sherds and 49 chert pieces.

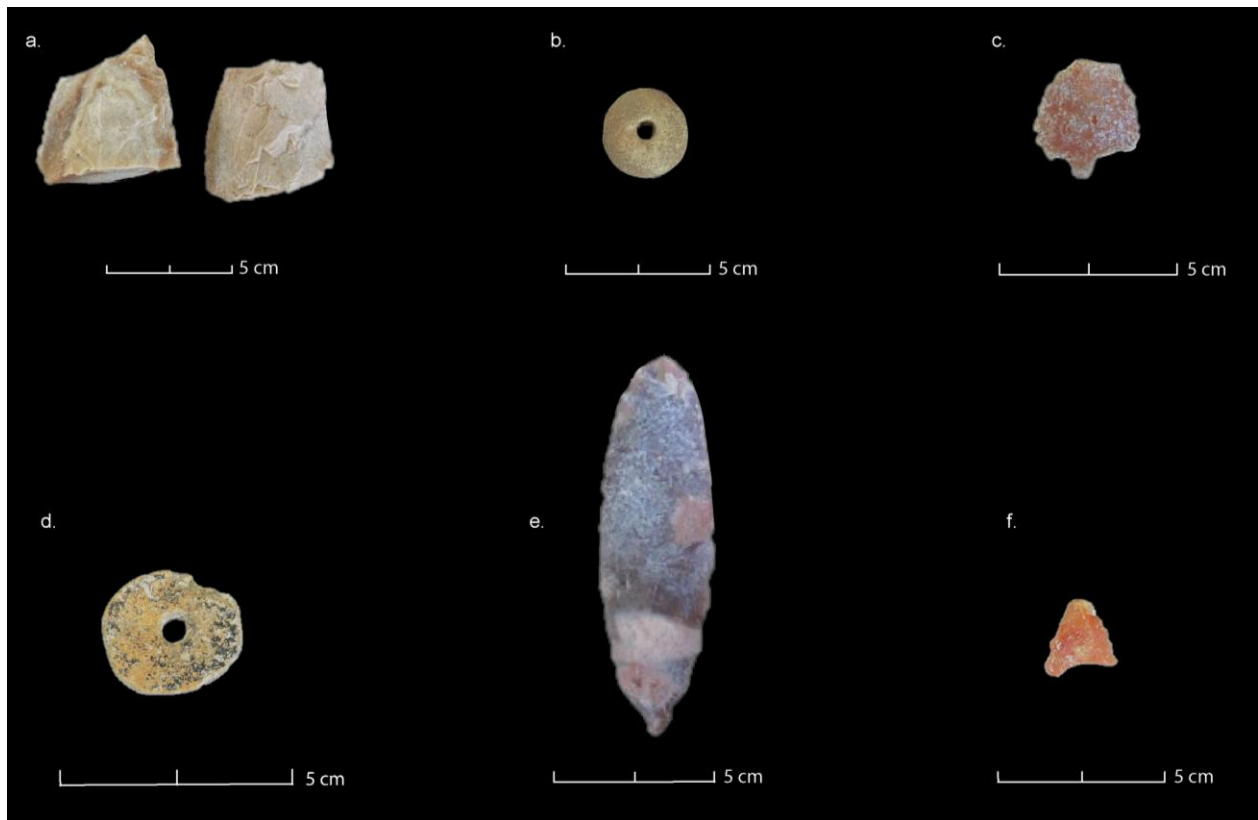


Figure 4: a) Chert biface fragment. b) Limestone spindle whorl recovered from B3S2. c) unifacially worked burin. d) Perforated pot disk Chert laurel leaf biface. e) Chert laurel leaf biface. f) thin biface tip fragment.

While B3S2 did not yield any comparable deposits like those found previously, it did reveal a small alignment/arrangement of cut stone in the northwestern corner of the unit, constructed on a poorly preserved floor built on bedrock (Figure 5). While this corner abuts open excavations from 2021, nothing alike to this alignment was found previously, nor were remnants of a floor previously found in this area. The northern extent of the unit also showed a layer of marl approximately 14 cm thick, likely built on the floor above bedrock to elevate the courtyard following modification (Figure 6). It is likely, then, that the feature is just a collection of stones utilized to raise the level of the courtyard, much like other seemingly cut stones in the center of the unit on top of where the floor would have been.



Figure 5: B3S2 showing architectural feature in northwest corner, built on the plaster floor.



Figure 6: B3S2 layer of marl in the northern profile of unit.

Table 1: Artifact counts for EU B3S2.

<i>Artifact Type</i>	<i>Count</i>
Ceramic (Non-diagnostic)	1925
Ceramic (Diagnostic)	315
Chert	373
Granite	4
Obsidian	15
Marine Shell	1
Quartz	2

EU C2-3, a 2 x 2 m unit was opened in the southern portion of Courtyard 2 (Figure 1). The purpose was to check for evidence of a deposit on the southern portion of the courtyard near Str. B6 and B7. Bedrock was also shallow in this area; ~45 cm under the modern courtyard surface (Figure 7). No floors were discovered in this unit. During excavations we assumed that this unit may be mixed with backfill from previous excavations due to the presence of both glass and a rusted nail. However, this unit yielded almost as much ceramic ($n=1226$) and chert ($n=232$) as B3S2 and an equal amount of obsidian fragments ($n=6$). Nonetheless, there was no evidence of a deposit or floors.



Figure 7: EU C2-3 in Courtyard 2, showing shallow bedrock under the surface.

The lack of significant deposits in either unit is not unexpected. Other peri-abandonment deposits in Group B at Xunantunich, as well as similar deposits from Cahal Pech, were uncovered in the corners of courtyards, or on the flanks of stairside outsets (Awe et al. 2020a; 2020b). Such deposits, also noted at sites like Caracol, Baking Pot, and Pook's Hill, usually contain similar assemblages of cultural remains, and are "most likely associated with ritual activity during and after the abandonment of sites in the region" (Awe et al. 2020a:122). The lack of significant deposits in either unit in Courtyard 2 might simply reflect the choices made by ancient ritual practitioners to the site, choosing to smash or scatter cultural remains nearer to architecture, in this case the southern doorway and porch of Str. B3, the southern staircase of Str. B6, and the southwestern corner of Courtyard 2. Much like other deposits found at the site, the deposit in Courtyard 2 is most likely a remnant of pilgrimage activity and not evidence of warfare or rapid abandonment by the inhabitants of Group B. EU C2-3 yielded some special finds, including a small unifacially worked chert point (Figure 8a), a ceramic incensario foot (Figure 8b), and a chert adze (Figure 8c). Table 2 lists the artifact count for this unit.

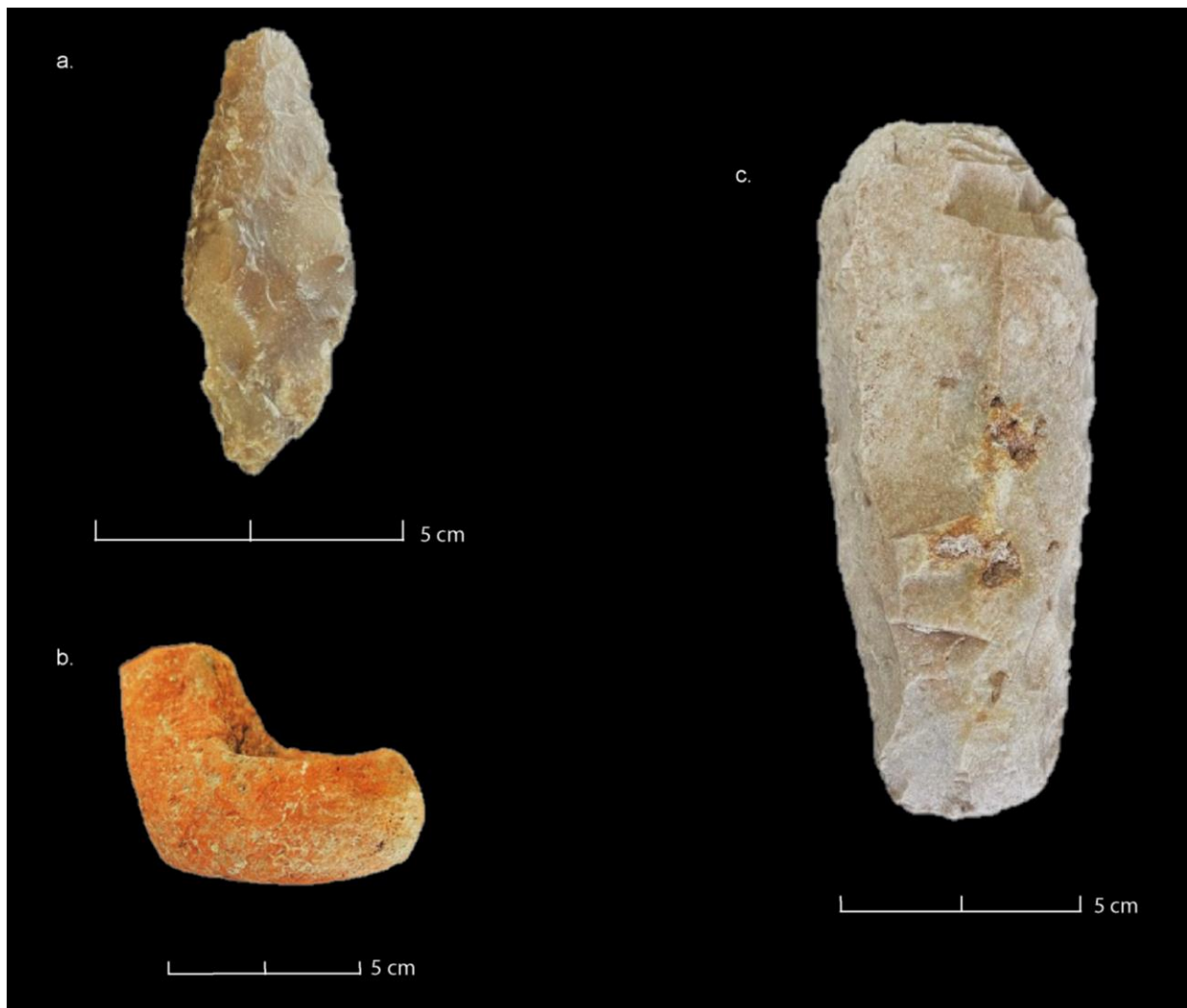


Figure 8: a) Small unifacially worked chert point. b) Ceramic incensario foot. c) a chert adze.

Table 2: Artifact Count for EU C2-3.

<i>Artifact Type</i>	<i>Count</i>
Ceramic (Non-diagnostic)	1021
Ceramic (Diagnostic)	205
Chert	232
Slate	1
Obsidian	6
Freshwater Shell	1
Quartz	1

Str. B6

Excavation Unit B6-5 was opened on the northern portion of Str. B6 with the hopes of finding similar levels of architectural preservation as those noted in the 2021 excavations on the southern portion of Str. B6. This portion of the structure had more tree and root growth than elsewhere and the unit, measuring 2 m n/s x 3 m e/w, was placed between two trees on the summit of the structure. While the trees and roots limited what could be exposed leading up to the summit (Figure 9), an alignment of cut stones (Figure 10) was eventually uncovered, with further excavations revealing portions of the plastered terrace floor intact (Figure 11).



Figure 9: EU B6-5, looking west up to summit of Str. B6 (north).



Figure 10: Top of EU B6-5 showing alignment of cut stones with construction fill behind it to the left.



Figure 11: Exposed terrace with single course of cut stones on top of fragmented plaster floor.

Excavations on the southern portion of Str. B6 during 2021 revealed well preserved terraces and plaster floors including on the summit of the structure (Beardall 2022). However, during the 2022 season no preserved floor was found on the summit of the structure leading from the terrace. Initially, we thought that the lack of a floor resulted from structural damage caused by the trees and their roots. Removal of cobble and boulder fill revealed an intrusive cut through the terminal phase construction on the summit of the structure. The unit was extended 45 cm to the west to better expose the cut. Removal of more fill revealed human remains (Burial B6-1, Individual 1). Although osteological analysis has not been completed for this individual, preliminary observations suggest that the individual was an adult male, based on the absence of unfused epiphyses and secondary sexual characteristics of the cranium, respectively. Further clearing revealed the remains of a badly eroded plaster floor, all approximately 40cm below the summit of the structure. The floor had likely been cut through where the human remains were situated, (Figure 12) with a possible alignment of boulders leading south from the femur.



Figure 12: B6-5 after extension showing femur by photo board, red lines indicating floor intrusion, and blue showing alignment south of the femur.

The burial was located approximately 55 cm under the surface of summit, head to the south and facing west. During excavation of Burial B6-1, Individual 1 (Figure 13), redundant elements were identified directly below the pelvis, representing a second individual. Individual 2 of Burial B6-1 was excavated by Victoria Izzo and Kasey Corey (Figures 14 and 15). Individual 2 was highly fragmentary but mostly complete, and located approximately 63 cm below the surface of the summit (and 8 cm below Individual 1). Individual 2 was placed with their head to the west in a tightly flexed position with the face up. Due to the fragmentary nature of Individual 2, specific

bodily position was difficult to discern, but in situ observations suggest that the individual was positioned face up, and slightly turned on their right side so that the posterior aspect of the vertebral column was facing northward. The position of Individual 2 is distinct from Individual 1, who was oriented with the head to the south, facing west, in an extended prone position. The remains of Individual 2 were associated with ceramic sherds and chert flakes. Individual 1 had no associated artifacts. It is likely, however, that any associated artifacts for Individual 2 were just from the surrounding fill.



Figure 13: Burial B6-1, Individual 1 (Clusters 1a, b, c).



Figure 14: Burial B6-1, Individual 2, showing the tightly flexed body position (Clusters 2a, b, and c).

As stated, both individuals from this burial context were impacted by extensive root damage, the weight of overlaid rock, and general poor preservation. Individual 2 exhibited significant fragmentation, which necessitated in situ identification of fragments when possible because they would otherwise crumble upon removal from matrix. This issue was further compounded by the relatively young age of the individual, estimated to have been approximately 10-13 years old at age-of-death based on observed dental eruption of the mandibular dentition (AlQahtani et al. 2010).

Burial B6-22-1, Individuals 1 and 2
Group B, Structure B6
Xunantunich, Belize

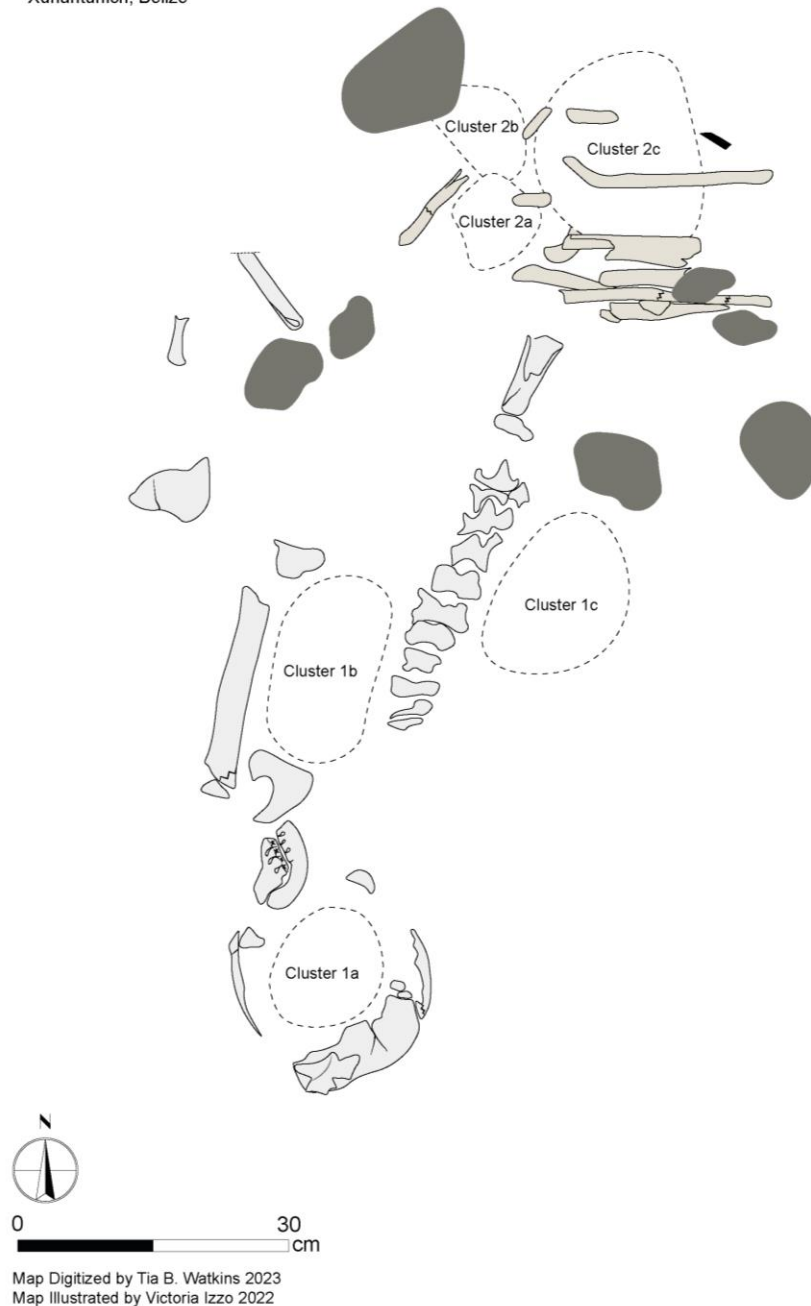


Figure 15: Plan map of Xunantunich Burial B6, Individuals 1 and 2.

Consistent with the general state of preservation for this burial, the mid-face of Individual 2 was highly fragmented, but the inferior aspect of the left eye orbit was intact and observable, which aided the identification of body and face position. The mandible was found approximately 10 cm north of the cranium and was not in articulation. Due to the tightly flexed supine position of Individual 2, the long bones of the legs overlaid the thorax, which were further commingled by the weight of overlaying stones and bioturbation processes. Excavation of Individual 2 was

completed using a cluster method, where clusters of human remains were delineated and recorded based on what region or individual elements were positively identified in situ. The clusters were mapped, and associated remains were collected with their respective clusters. Due to temporal constraints and inclement weather, osteological analysis has not yet been completed for Individuals 1 and 2 and is expected to be completed during the 2023 field season.

Expanding the unit also revealed a construction pen under the summit immediately south of the burial (Figure 16). Large cut stones, approximately 50 cm long and 20 cm high formed the single course of the eastern edge of the pen, while two courses of boulders formed the western edge. The floor on the exposed construction pen is the same floor, which was intrusively cut to enter the burial, approximately 40 cm below the summit of the structure. There was nothing of significance found within the pen itself. It is likely there are more construction pens in this on this structure, but the burial became the focus of our excavation.



Figure 16: Construction pen exposed south of the burial on Str. B6.

Special finds were found throughout the excavation of EU B6-5, included the tips of two broken chert points (Figure 17a), fragments of two chert drills (Figure 17b), a broken chert biface point (Figure 17c), a chert adze (Figure 17d) and a chert tranche tool (Figure 17e). Table 3 presents the complete artifact count for 2022 excavations on Str. B6.

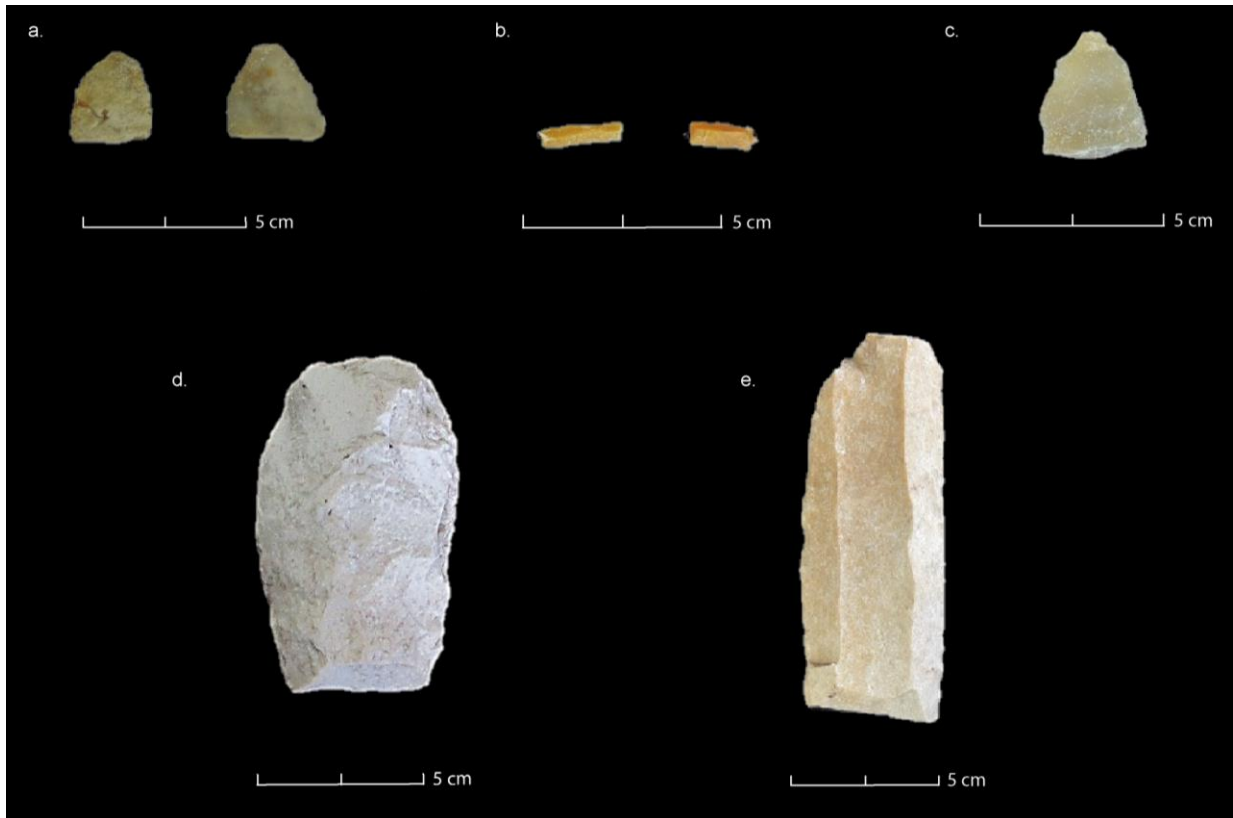


Figure 17: a) Broken chert point fragments. b) Chert drill fragments. c) Broken chert biface tip fragments d) Chert Adze. e) Chert tranchet tool.

Table 3: Artifact count for EU B6-5.

<i>Artifact Type</i>	<i>Count</i>
Ceramic (Non-diagnostic)	2079
Ceramic (Diagnostic)	527
Chert	365
Obsidian	16
Freshwater Shell	1
Quartz	9

Public Archaeology and Engagement

BVAR has conducted archaeological investigations in Belize for over three decades and has in that time contributed to the growth of public archaeology, archaeological education, and cultural heritage management initiatives in Belize (Hoggarth et al. 2020). It is noteworthy that the founding principles of BVAR in 1988 was to develop and protect the site of Cahal Pech from further looting, to map and provide site demarcation for development of a national park and archaeological reserve, and to publish data for use in guidebooks and schools (Awe and Campbell 1989). BVAR also remains one of the only projects in Belize with local representation in supervisory positions, with Belizean directors, and other Belizean project staff/supervisors.

In the mid to late 2010's, BVAR's contribution to archaeological inclusivity has grown considerably, collaborating with Galen University in Central Farm, Cayo to conduct archaeological fieldwork with Belizean students wanting to earn field credits. The existence of a Belizean collaboration under BVAR's umbrella created the opportunity not just for Belizeans to be trained in archaeological field methods, but for Belizean volunteers of varying ages to participate in fieldwork and archaeological education. Previous sessions of fieldwork with Galen University at Cahal Pech and the seasons at Xunantunich in Group B have all operated under the banner of archaeological education and engagement. It is important to mention that in these contexts, the hired laborers are also participants in field education and discussions, moving away from the notion that local communities are just "reservoirs of cheap labor for fieldwork rather than consumers of knowledge of the past" (Chirikure and Pwiti 2008:467; Delmont 2004; Ferguson 1996; Marshall 2006; Ndoro 2001; Shepherd 2003; Watkins 2003).

Teaching archaeological field methods to non-academics and volunteers is an effective way to demystify archaeology. This experience showcases that excavation is within their grasp as Belizeans. However, the Belizean students (Figure 18) and volunteers learn more than just archaeological fieldwork. During excavations, students and volunteers learn about how the ancient Maya built their structures, what items they used in both utilitarian and ritual contexts, trade systems, religious ideology, and necessary cultural heritage management measures such as the importance of archaeological context and the damage caused by looting and vandalism. Most discussions happen organically from the discovery of an artifact or architectural feature, where work is temporarily halted to discuss the presence of a plaster floor perhaps, or the purpose of a spindle whorl.



Figure 18: Belizean students, Katherine Coye assisting with burial excavations; Kristen Nicholson writing notes on her fieldwork activities.

Joint discussions on archaeological interpretation helps to develop critical thinking that can be useful in other facets of a Belizean's life. While we discuss known interpretations of archaeological contexts, such as a deposit (or lack thereof), the students and volunteers are encouraged to think of other possible interpretations. Since the fieldwork occurs at a site which is open for tourism, interacting with visitors is a common occurrence. Both students and volunteers had the opportunity to enhance their public speaking skills by talking about what they were doing, what they were finding, how it ties into the site, and how it fits into the concept of a Belizean national and cultural identity. While most students are shy at first, after a few practices they develop more confidence. Interacting with tourists helps to demonstrate the changing image of archaeology in Belize to both tour guides and visitors alike, moving away from the stigma that archaeological fieldwork is for foreigners only. While most, if not all, foreign projects that work in Belize hire local laborers, not many are positioned in a capacity to share their interpretations. Thus Belizean involvement with BVAR is an important step in decolonizing archaeology in Belize.

In 2022, fieldwork was also made possible with volunteers, particularly members of the Belize Scouting Association. Their inclusion not only facilitated community service hours for the scouts but increases Belizean representation in archaeology. The posting of images of Belizean students and scouts participating in fieldwork on social media contributes to changing the narrative surrounding Belizean archaeology. Not only were the students and scouts the focus of posts shared on social media platforms, but also of a lecture at the Belize Archaeology Symposium in 2022 that highlighted the need for greater Belizean inclusion on projects. It is worth noting that opening the projects to Belizean volunteers and students can have a lasting impact beyond just increasing representation. Rumari Ku, employed by the Belize Institute of Archaeology, graduated from Galen University and received her field credits at Xunantunich working with BVAR. Her interest in archaeology started by simply attending a lecture on archaeology in Belize where she learned she could volunteer and where she could study.

Adrian Gutierrez (Figure 19) started volunteering with BVAR at the age of 13 and has continued to do so every summer since (not including 2020 due to Covid 19). He was responsible for getting the Belize Scouting Association involved. "I wanted to introduce them to the world of archaeology that I had found so alluring. I wanted to give young Belizeans a chance to have the same hands-on experience that I did and maybe spark a passion for archaeology" (A. Gutierrez, personal communication, 2022). Gutierrez also claims that being able to have "hands-on experience at such an early age really made me appreciate the history and culture of the Mayan people. There is tremendous pride for me as a Belizean to have the privilege to unearth some my country's artifacts and to do so in an academic setting where the respect for the historical narrative and learning takes precedence." Gutierrez has been instrumental in helping to teach other volunteers as well as students the lessons he learned doing fieldwork, including the importance of cultural heritage, and the reasons for proper field methods. There is no doubt that his volunteering on BVAR has helped him clarify his career path in archaeology.



Figure 19: Adrian Gutierrez (middle) excavating with Belizean students Kristen Nicholson (left) and Katherine Coye (right).

CONCLUSIONS

Excavations in the courtyard did not reveal similar deposits to those found in 2021. There was a 56% decrease in the total amount of non-diagnostic sherds (Table 1, Appendix B) and a 72% decrease in diagnostic sherds. All other artifact types, including obsidian, chert, and quartz also declined sharply, while others such as faunal remains were completely absent. If the deposit reflects post-abandonment pilgrimage activity, the waning numbers of artifacts makes sense as excavations moved away from the corners and staircases of Strs. B3 and B6. The presence of just two chert points does not convincingly demonstrate the presence of warfare in Group B of Xunantunich. Future excavations leading east toward Str. B5 may yield an increase in artifacts, or perhaps a discernible deposit, nearer to the entrance way of the newly discovered room just north of the sweat bath in Courtyard 2.

The northern portion of Structure B6, while in a poorer state of preservation than the southern portion of this structure (excavated in 2021), revealed more insight into the construction of the building and possible use post-abandonment. The trees and roots contributed considerable damage to the terraces and plastered floors leading up to the summit. The lack of an identifiable surface on the summit made sense with the discovery of the burials. The penultimate and poorly preserved floor of this portion of Str. B6 was cut to inter two individuals, with moderate size boulders used to cover them and fill in the burial. Expanding the unit to uncover the burial revealed the use of construction pens on Str. B6. While only one was found intact, possible remnants of

another indicate that the ancient Maya used construction pens while building Str. B6. Other pens likely existed above where the burial was found but were dismantled for the purpose of interring the two individuals, using the same boulders that formed the pens to cover the interments.

The BVAR/Galen collaboration provided an opportunity for young Belizeans to take part in archaeological investigations. This is important as it allows the chance to expose their own history and heritage, moving away from the notion that public archaeology and outreach is a mere addendum to an archaeological project to boost the social profile of that project. The involvement and education of students, volunteers, and hired hands pushes Belizean archaeology further along the spectrum of public archaeology and engagement, from being a buzzword with minimal efforts, to action that can have a transformative impact in the lives of these young Belizeans and thus Belizean society (Almansa-Sanchez 2018; Shai and Uziel 2016).

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CONSERVATION OF THE STRUCTURE B5 SWEATBATH, GROUP B, XUNANTUNICH

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INTRODUCTION

Conservation work during the 2022 field season of the Xunantunich Archaeological and Conservation Project (XACP) focused on the restoration of Room B5A in Structure B5 at Group B, and Room 13 located in the northern gallery of Structure A13 at Plaza A-III (see Watkins et al., this volume). This preliminary report summarizes work conducted at Group B, specifically Str. B5, outlining the results of excavations, consolidation efforts, and describing some of the salient architectural features of the structure, now conclusively identified as a sweatbath, the first of its kind documented at Xunantunich.

BACKGROUND

Although often overlooked and little visited, Group B (an elite residential compound associated with the Xunantunich epicenter), has an extensive history of archaeological investigation (Figure 1). The first formal excavations undertaken at Group B were those conducted by Sir J. Eric S. Thompson (1942) in 1938. Excavations targeted two structures bordering the northern courtyard (Courtyard B1), namely Structure B1 and the series of adjoining rooms collectively designated as Structure B3.

Following Thompson's initial investigations, Group B would once more garner the attention of archaeologists acting in response to the efforts of looters. While looters could operate at Group B given its relative distance from the monumental epicenter, their activities were quickly identified, and archaeological interventions rapidly followed at the behest of the Commissioner of Archaeology, Dr. Elizabeth Graham. The salvage work, conducted jointly with Dr. David Pendergast, concentrated on Str. B5 (the eastern structure of Courtyard B2) because this was the structure that had been affected by the looting (Pendergast and Graham 1981). As part of this salvage work, Pendergast and Graham (1981) recovered a fragmentary painted polychrome cylinder vessel (likely Zacatel Cream-polychrome), effigy-head censers (Cayo Unslipped; for analogous examples see Aimers and Awe 2020:152), and a small flute retrieved from a burial.

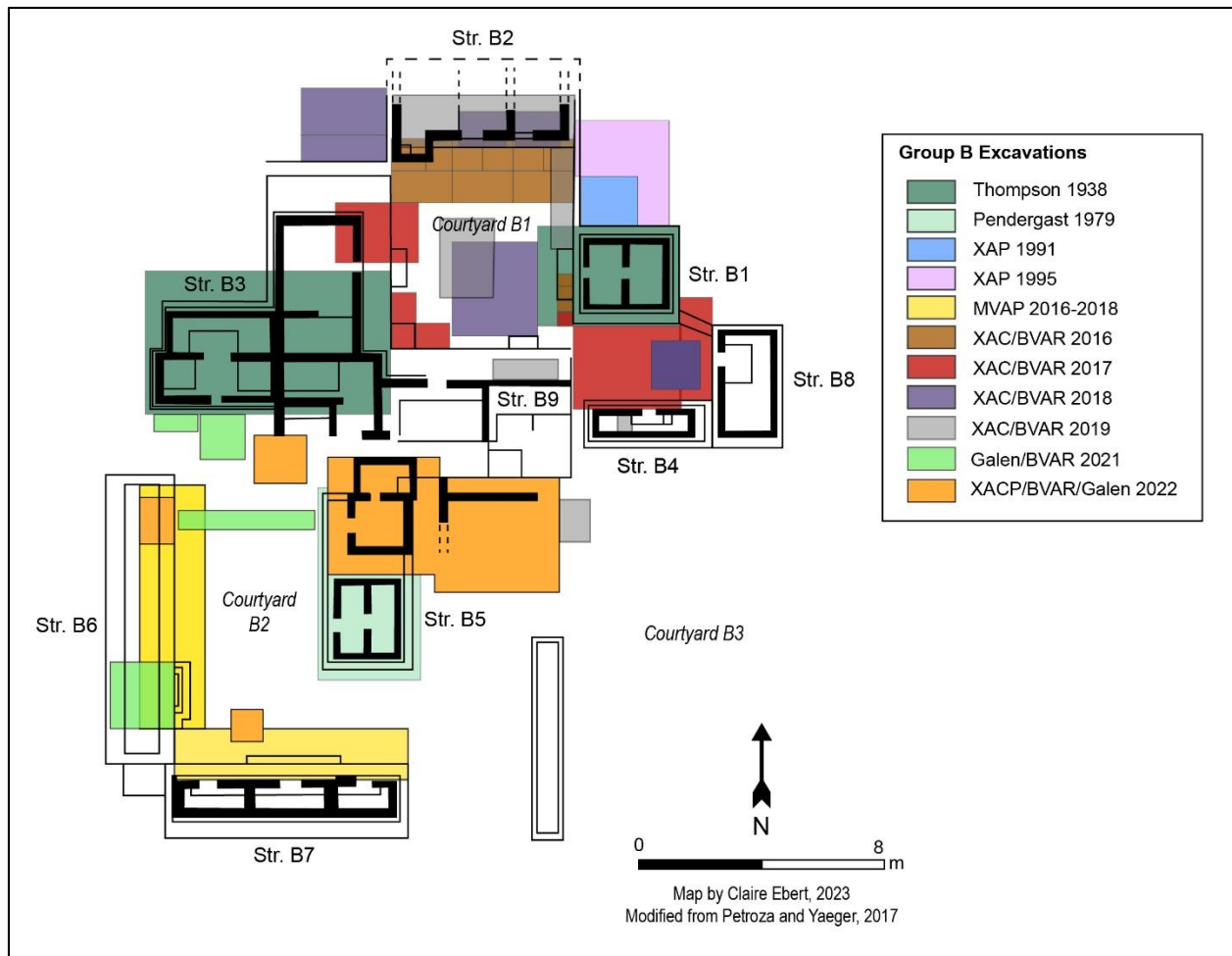


Figure 1: Plan of Group B showing the structures as well as the extent and distribution of the various excavations (map by C. Ebert, 2023).

Conservation of the standing architecture at Xunantunich began during the Tourism Development Project (TDP) under the direction of Dr. Jaime Awe between 2000 and 2004, which concentrated on the Castillo (Structure A6) and major public plazas (Plazas A-I and A-II). Group B was targeted for conservation beginning in 2015 with the initiation of the XACP, a collaborative effort focused on documenting and preserving structures within the central precinct of Xunantunich (Zanotto and Awe 2017:289). Initial work at Group B was focused on clearing structures that had already been partially exposed as part of earlier investigations, and in more recent field seasons, clearing previously unexcavated sections. The goals of ongoing XACP work at Group B are to complete a systematic excavation of the entire group, and to conduct detailed architectural documentation and consolidation of the group's structures to expand this part of the site's tourism potential (Sullivan et al. 2017). Table 1 lists the structures investigated by XACP (and other collaborating projects) by year from 2016 through 2022, which is also discussed by Messinger and colleagues (this volume).

Table 1: Summary of XACP research at Group B listed by year and structure.

<i>Year</i>	<i>Structures</i>	<i>XACP Investigators</i>
2016-2018	Courtyard B2: <ul style="list-style-type: none"> Excavation of Str.s B6 and B7 	Petrozza and Yaeger (MVAP)
2016	Courtyard B1: <ul style="list-style-type: none"> Defining the southern base of Str. B2 Clearing west base of Str. B1 	Sullivan et al. 2017
2017	Courtyard B1: <ul style="list-style-type: none"> Defining western and southwestern extent of courtyard Defining the courtyard between Strs. B1, B4 and B9 	Alvarado et al. 2018
2018	Courtyard B1: <ul style="list-style-type: none"> Clearing of central portion Defining western base of Str. B2 Clearing in front of Str. B8 	Messinger et al. 2019
2019	Courtyard B1: <ul style="list-style-type: none"> Clearing of rooms in Str. B2 Clearing central portion of Courtyard B1 Defining northern base and southeast corner of Str. B9 Tests excavations in Str. B4 	Ebert et al. 2020
2021	Courtyard B2: <ul style="list-style-type: none"> Test trench in the northern half of the courtyard Clearing the southern base of Str. B3 Partial exposure/clearing of Str. B6 	Beardall 2022
2022	Courtyard B3W: <ul style="list-style-type: none"> Clearing of northwestern corner of courtyard Courtyard B2: <ul style="list-style-type: none"> Clearing of northern side courtyard Clearing of sweatbath of Str. B5 Excavations in Str. B6 	Beardall et al., this volume Messinger et al., this volume

The planned work for the following 2020 season was disrupted by the global Covid-19 pandemic, and the work that resumed in 2021 was led by Antonio Beardall with Galen University students, under the supervision of Dr. Jaime Awe (XACP) in collaboration with the Belize Valley Archaeological Reconnaissance Project (BVAR) and the Belize Institute of Archaeology (IA). That work was concentrated mostly in and around the structures of Courtyard B2. Excavations helped to define the southern extent of Str. B3, tested the northern part of Courtyard B2 (see Figure 1), and partially exposed and tested Structure B6 (Beardall 2022). Following these excavations, the XACP returned to Group B in 2022. The results of this most recent work are presented in Messinger and colleagues (this volume) and this report. A detailed description of the 2022 work at Str. B5 is discussed below.

EXCAVATION AND CONSERVATION OF STRUCTURE B5

During June 2022, conservation efforts at Str. B5 were supervised by the authors of this report. Str. B5 is located on the eastern portion of Courtyard B2 and was targeted to follow up on

the salvage excavations by Pendergast and Graham (1981). Based on its position in relation to the southern courtyard at Group B and because it is the eastern structure of the courtyard, it was suspected that the structure faced west, looking out onto Str. B6. XACP worked first to relocate the extent of the salvage excavations by clearing the entirety of the structure. Excavations revealed that the Str. B5 platform measures approximately 4 m (E/W) by 8 m (N/S) and is a relatively higher than the adjoining structures.

Room B5A, the northern room of Str. B5, was cleared and documented, and the architecture encountered was subject to consolidation. Approximate measurements for the room are listed in Table 2 and will be verified in upcoming field seasons with additional excavation and consolidation. All remaining artifactual deposits associated with this building were documented. Future analyses of these materials will assist with dating the building's use as well as potentially clarifying its function. Photogrammetry was used to create a high-resolution, scaled 3D model of the structure (Figures 2 and 3) using the Polycam program (www.polycam.com). Polycam was applied using a portable iOS iPhone 13 Pro device equipped with handheld lidar (light detection and ranging) technology, which rendered a visualization of the current architectural layout of the room, as excavated, while also documenting evidence of architectural modifications implemented over time.

Table 2: Approximate measurements of Room B5A.

<i>Room B5A Dimensions</i>	
Interior width of Room B5A (N-S)	3.94 m
Interior depth of Room B5A (E-W)	4.12 m
Width of earlier (penultimate) doorway	0.85 m
Width of later (terminal) doorway	1.01 m
Width of interior passage (E-W)	0.96 m
Northern interior bench, width (N-S)	1.50 m
Northern interior bench, length (E-W)	4.10 m
Southern interior bench, width (N-S)	1.35 m
Southern interior bench, length (E-W)	4.12 m
Average wall thickness	1.03 m



Figure 2: 3D model of Structure B5, showing exposed architecture of Room B5A on the northern portion of the platform.

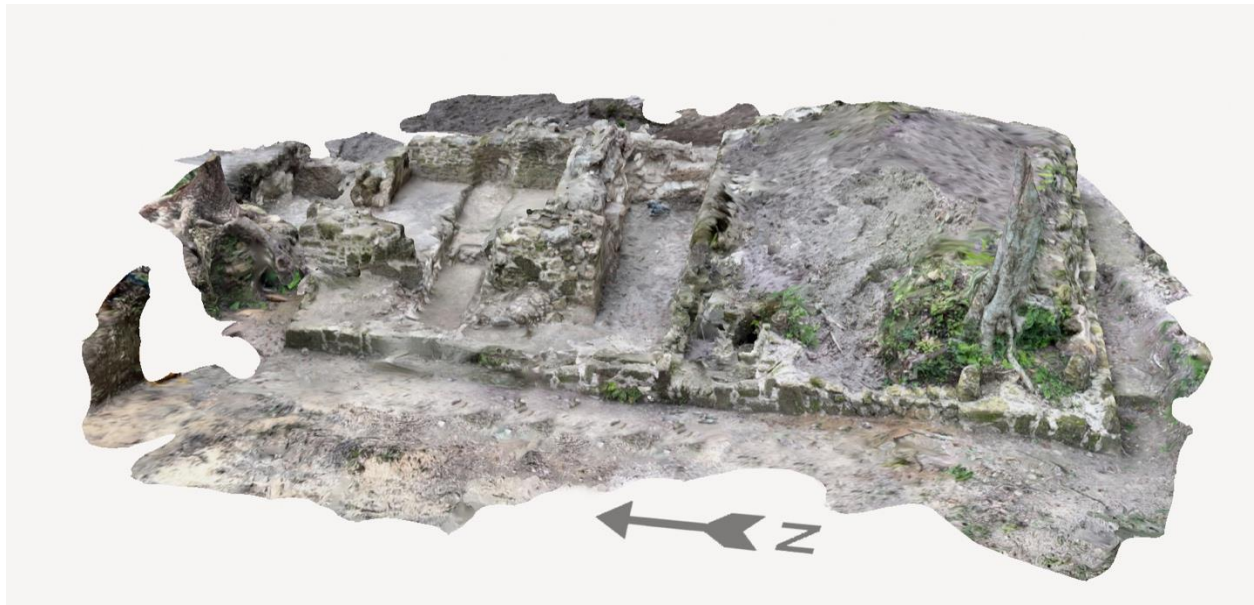


Figure 3: 3D isometric model of Structure B5.

Room B5A has been identified as a sweatbath since it exhibited the following features: a small room compared to others in Group B; a narrow (and possibly low doorway); a narrow passageway leading from the exterior to near the middle of the room, where small steps lead to the surface of the interior benches; two large and relatively high benches; two exterior benches by the northern entrance—although poorly preserved—and a fire box at the end of the passageway against the wall opposite that of the western doorway. These are the most characteristic features of sweatbaths in the Maya area (Satterthwaite 1952) and have been confirmed by more recent discoveries of similar buildings in the upper Belize River Valley region at Pook’s Hill (Helmke 2006; Helmke and Awe 2005) and Baking Pot (Hoggarth and Sullivan 2015).

Excavations also revealed evidence for architectural modifications that were implemented over various phases. In Str. B5’s original layout, the main entrance into Room B5A was located on the northern side of the building. Two interior lateral benches on the eastern and western sides of the room created a small passageway aligning with and leading to the main entrance. Stratigraphic associations suggest that the fire box, which was located directly opposite the main entrance at the base of the southern wall, is contemporaneous with this phase of use. The room was subsequently modified by blocking the northern doorway and adding a new entrance on the room’s west side, which overlooks Courtyard B2. The passageway that divided the eastern and western benches was also filled in, and two benches were added to the northern and southern parts of the room. Finally, the fire box was relocated and was placed directly east of the western doorway, preserving the same internal arrangement as in the initial phase, but with all architectural features rotated 90 degrees east of north. Interestingly, the edge of the new fire box exhibited a concave inner eastern wall, like that of the original construction. Although Str. B5 was modified after its initial abandonment, the final architectural layout of Room B5A indicates that the room’s function as a sweatbath remained the same. Moreover, excavations in the alleyway between Room B5A and Room B5B revealed an interesting stratigraphic profile that contained a peri-abandonment deposit, which appeared between a plaster floor and construction fill of the

subsequent phase. Therefore, the later architecture inherently post-dates the artifactual materials contained in the peri-abandonment deposit (see Messinger et al. this volume).

Following excavation, Room B5A was subject to consolidation. This work included repointing between the exposed facing stones to maintain their structural integrity. The architectural features that were less well-preserved were consolidated following partial dismantlement and rearticulation. The mortar used for consolidation work followed the same recipe as all consolidation work undertaken since 2000. The mortar consists of equal parts calcium hydroxide ($\text{Ca}(\text{OH})_2$), or slaked lime, and locally mined white marl (*sascab*). This mixture is curated for two to three days, before adding ten percent (of the wet mass) of Portland cement to serve as a binding agent. This recipe has the advantage of closely following the Precolumbian mortar recipe used in the area, with added strength provided through the binding agent. It also matches the coloration of the local stones, allows the buildings to respond to changes in precipitation and temperature, and the cement portion is so minimal that it does not result in visible discoloration.

The 2022 XACP field season of the conservation of Room B5A at Str. B5 provided new insights that shed light onto the room's primary function as a sweatbath. Although the layout of Room B5A was modified over time, refurbishments were carried out so that the room's function as a sweatbath remained the same. To expose the earlier fire box in future seasons, we suggest minor excavations of the benches. During this time, we will also produce plans and sections to better demonstrate the architectural features and modifications exhibited in the structure. Dating of modifications to Room B5A also remain unclear, thus it is unknown whether these modifications took place during the earlier stages or during the final phase of occupation. Previous work at Group B, however, suggests most of the architectural modifications likely took place during the Terminal Classic (see Ebert et al. 2020). It is hoped that these efforts will form part of a larger comparative study on the sweatbaths to see which features these share as regional traits and how these differ in terms of diachronic and site-specific expressions.

Acknowledgments We would like to thank the local Belizean community of San José Succotz, especially Minel Camal, Eduardo Cunil, and Jorge Itzá for their collaboration and expertise in the excavation and conservation of Structure B5. Thank you also to Doña Paula for providing the wonderful meals. Everyone at the XACP greatly looked forward to them every day. We would also like to thank the BVAR directors, Drs. Jaime Awe, Julie Hoggarth, and Claire Ebert for the opportunity to conduct this work. Finally, we would of course like to thank the Belize Institute of Archaeology (NICH) and its director, Dr. Melissa Badillo, for continued support and permission to conduct the work reported upon herein.

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SAN IGNACIO RESORT SALVAGE BURIAL 1: THE EXCAVATION AND ANALYSIS OF A COMMINGLED BURIAL ASSEMBLAGE

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INTRODUCTION

In the summer of 2019 the Belize Valley Archaeological Reconnaissance (BVAR) Project continued excavations at the site of Cahal Pech, located in the upper Belize River Valley. Cahal Pech consists of a site core, where the archaeological park is located, as well as numerous peripheral sites and house mound groups extending over ~25 km² around the civic-ceremonial core. Much of this dispersed settlement lies beneath the modern town San Ignacio and it is common for artifacts, burials, and architecture to be unearthed during building projects or day to day activities. During the first session of the BVAR Project field season in 2019, an employee of the San Ignacio Resort found human remains and artifacts on their property immediately opposite the front entrance of the hotel on the other side of Buena Vista Road. The Institute of Archaeology and Dr. Jaime Awe were alerted to the finds by an employee of the San Ignacio Resort Hotel. The following report overviews salvage excavations conducted by Beardall in 2019, recovery of human remains by Green Mink in 2019 and the analysis of these remains by Green Mink and Izzo in 2022.

BACKGROUND

The area of this salvage excavation is located approximately 980 meters northeast of the site core of Cahal Pech (Figure 1) and approximately 200 meters west of the Macal River. The protocol for alerting the authorities of archaeological finds is to report such discoveries within fourteen days to the Director of the Institute of Archaeology, NICH. At this point the Director will decide if further exploration of the site is necessary. Any permits for further exploration of the site will be granted by the Director (NICH Act). The location of the San Ignacio Resort falls under the permitted area of the BVAR Project.

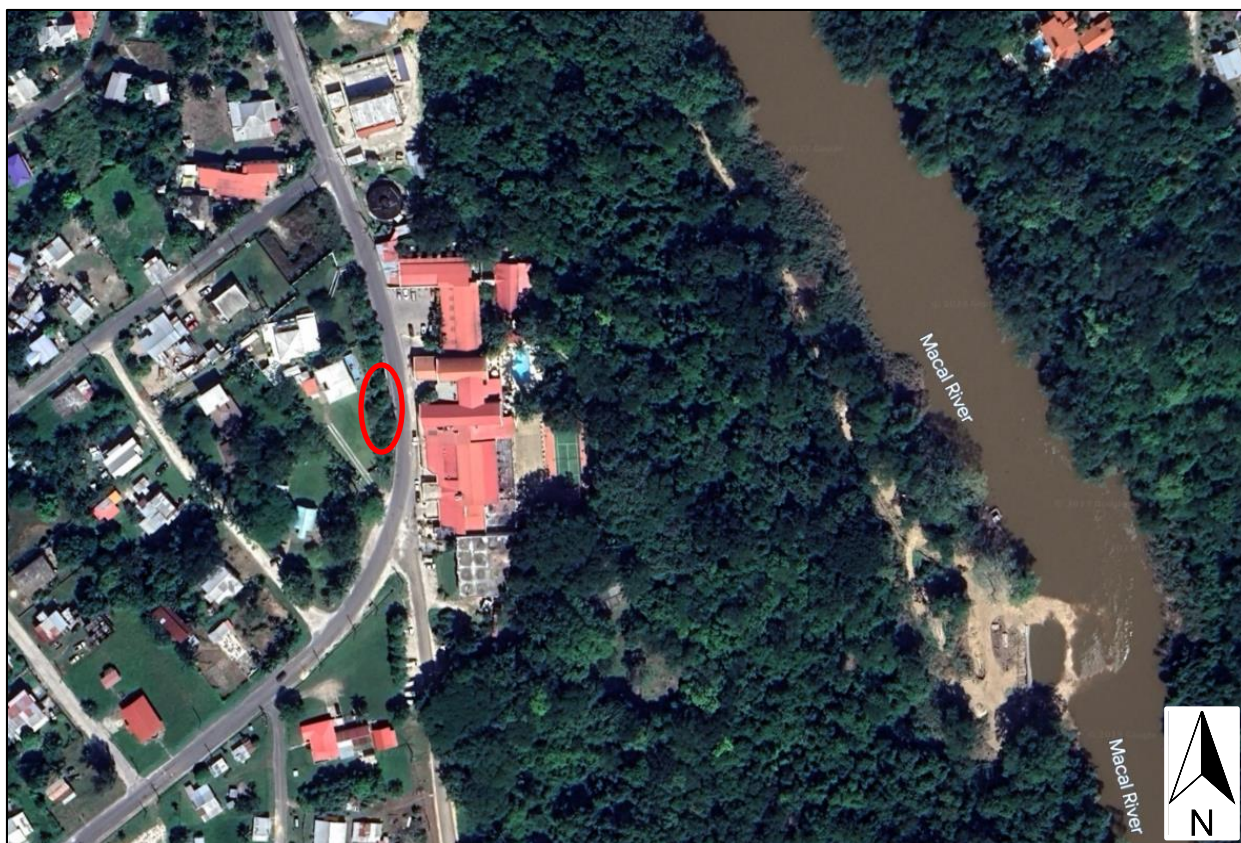


Figure 1: Aerial view of the approximate location (red circle) of the find in relation to the Macal River and the San Ignacio Resort. (<https://earth.google.com>).

Previous excavations in the town of San Ignacio have unearthed Classic (AD 300-900) architecture and burials. For instance, the downtown rehabilitation and beautification project led by the Ministry of Tourism and Culture unearthed human remains and unlike the burials on Burns Avenue, San Ignacio Resort Burial 1 (documented in this report) was largely disturbed and was displaced from its primary context. Two *chultunes* or *chultuneob* (Classic Maya storage pits) were present at the apex of the hill opposite the San Ignacio Resort Hotel. The San Ignacio Resort Hotel was constructed in 1973 and officially opened its doors in 1976. An image from this period shows the road cut where this burial would eventually be found, a limestone outcrop, and some vegetation. (Figure 2). Modern excavation of the road cut associated with the construction of Buena Vista Road effectively cut through this hill and the *chultunes* in question, resulting in both features eroding in the profile of the roadside embankment, roughly two meters above the surface of the road (Figure 3). The roadside embankment is covered in foliage and it seems that these features had remained unknown for quite some time, until erosion had resulted in human remains, ceramics, and lithics appearing along the road embankment. *Chultunes* are a common among the dispersed households of the Cahal Pech polity, especially in the upland zones surrounding the core. The placement of human remains within *chultunes* is also relatively common in the area. To date, 13 individuals (interred in nine burials) have been encountered at settlement groups throughout the Cahal Pech polity (see Aylesworth 1993:82, Gray 2001:103-104,106-108,147; Iannone, Ford, and Stevens 1994: 214,218; Powis 1992:45-46). While the house mound group associated with

chultunes opposite the San Ignacio Resort Hotel is not clearly apparent, this is unsurprising given modern construction at the apex of the hill.



Figure 2: San Ignacio Resort entrance looking northwest, circa 1970's. (<https://www.sanignaciobelize.com/san-ignacio-resort-hotel-about-us/>)

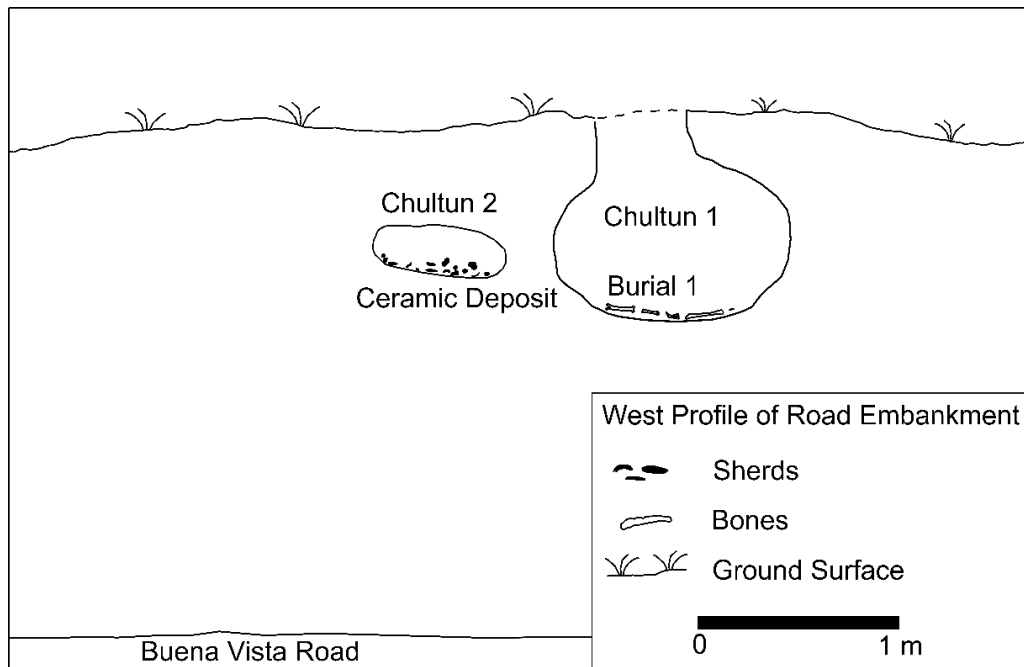


Figure 3: Schematic profile of the roadside embankment with location of two *chultunes* shown.

2019 SALVAGE EXCAVATION

Decades of erosion led to the exposure of the two *chultunes* opposite the San Ignacio Resort. It is assumed that a significant amount of cultural material was already lost to erosion. Archaeological bone and ceramics were first noticed by Rhabin Braddick (an employee of the Hotel) who alerted Awe and Green Mink, who subsequently identified the remains as poorly preserved, fragmentary human remains. Salvage excavations commenced on June 11th 2019. Initial work involved clearing foliated areas of the roadcut to expose the profile of the *chultunes* in the embankment. Removal of foliage revealed substantial amounts of both human remains and ceramics which had eroded down the roadside embankment. The two features were evident in the embankment. Chultun 1 was 122 cm long (n/s) and roughly 1 m deep. A clear *chultun* shaft was evident in the profile of the road cut, running to the modern ground surface, although this had seemingly been backfilled with limestone, marl, and soil in antiquity. Roughly 30 cm south of Chultun 1, was Chultun 2. Unlike Chultun 1 which was clearly cut in half by the road cut, Chultun 2 had largely been destroyed with the shaft entirely missing. All that remained of Chultun 2 was a small recess in the embankment, approximately 90 cm wide by 45 cm high. The base of both *chultunes* were approximately 190 cm below the modern ground surface at the apex of the embankment (Figure 3). Chultun 1 seemingly had contained the human remains which had eroded down the embankment (Burial 1), while Chultun 2 contained a medial fragment of an obsidian blade and a high density of predominantly Late Classic (Spanish Lookout I-II) sherds, including a Mount Maloney jar rim. Investigation of the human remains in Chultun 1 revealed that the majority of the remains associated with this context had already eroded down the hillside. All that remained in situ were several heavily fragmentary bone fragments which tentatively indicated the individual was a primary interment with the head to the south, and a pyrite inlaid incisor (Figures 4 and 5). An attempt to plan map and photograph these remains in situ was hampered by the collapse of the side of the limestone embankment and the base of the *chultun*. Like the fragmentary, poorly preserved remains originally identified by Braddick, the remains found on the embankment and protruding from the eroding *chultun* profile were also poorly preserved and were calcified to the base of the *chultun* and were encased in limestone laden dirt that was difficult to remove (Figure 6). These remains were cleaned and catalogued by Green Mink, who identified the remains of two individuals (Individuals 1 and 2) although full osteological analysis was delayed until 2023 due to Covid 19.



Figure 4: Right central incisor with pyrite inlay.



Figure 5: Long bones in the process of being excavated, encased in limestone.

2022 BURIAL ANALYSIS

Limited cleaning of the human remains took place by several BVAR students during the June 2019 field session. During that time Green Mink noted that the minimum number of individuals is two (MNI = 2) based on repeating elements, the age of one of the individuals is potentially young adult or older subadult (<18), and likely one individual is male (Ind. 1) while one is female (Ind. 2). A comprehensive cleaning, inventory, and analysis were planned for the field season of 2020, but due to the COVID 19 pandemic, this would not take place until the 2022 field season.

Osteological analysis was conducted during the June session of the 2022 BVAR field season by Green Mink and Izzo. This involved extra cleaning, inventorying, and analysis of the skeletal elements. The goal was to complete an inventory in order to obtain an accurate MNI, and conduct preliminary analysis for trauma and pathology. As mentioned above, the burial was located within dense limestone, which contributed to poor preservation. The remains were highly fragmented, friable to the touch, and lacked bone density. Moreover, they seemingly had very little collagen preserved. There were some elements that exhibited differential preservation based on

color such as Teeth #14 and #31 as well as several cranial fragments (for a complete inventory see Appendix A).

The process of segregation began with removing all elements from the commingled bags. All diagnostic elements were identified to the most specific level possible and were arranged in standard anatomical order. During this process, refitting of the elements was attempted when possible which allowed for several mostly complete long bones to be sided (Appendix A). Pair matching was then attempted, again when possible, with larger bone fragments. A marked size difference was observed in muscle attachments as well as overall size of the elements which suggested the presence of two individuals. The final segregation technique involved identification of repeated elements. The MNI for this burial is two based on the aforementioned segregation methods including the presence of two right tali, right patella (Figure 6a), left femora (Figure 6b), right and left ilium, and left mandibular first molars (tooth #20) (Figure 6c).

Both of the individuals are estimated to be of adult age based on the complete fusion of observed epiphyses. Sex was tentatively estimated as one male (Ind. 1) and one female (Ind. 2) based on size and robusticity of the skeletal elements. The sciatic notch was also scored for one right and two left ilia fragments (Figure 7). All sciatic notches were scored as 4, probably male. It should be noted that this feature alone is not enough to confidently estimate sex.

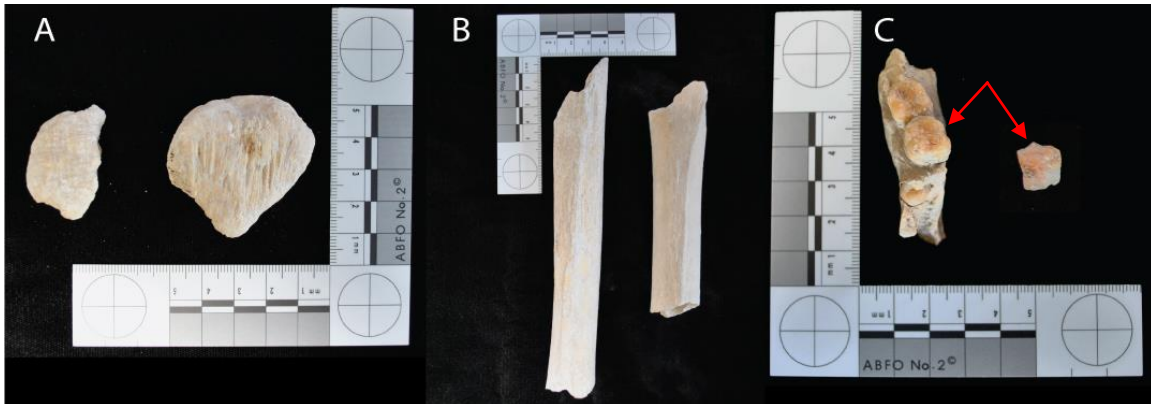


Figure 6: a) Right patella, b) Left femora, c) Left M₁'s (red arrows).



Figure 7: Left pelvis fragment with sciatic notch.

Unfortunately, no other sexually dimorphic features were present. Numerous dental pathologies were noted including an impacted tooth #20 (Figure 8a and b), calculus, dental wear, and the presence of carious lesions (Figure 9a). Tooth #9 exhibited shoveling (Figure 9b). An unisided M³ was found with an incomplete root approximately $\frac{2}{3}$ which may indicate an individual between the ages of 16-23 years old (AlQahtani et.al 2010). Third molars are highly variable in their eruption timing, presence, and number, therefore this was not used in the above MNI analysis. No trauma was observed on either individual. The two individuals were separated based on observed redundant elements. Considering the commingled nature of this burial context, only elements that were able to be identified were kept separate as Individual 1 and Individual 2. In this vein, miscellaneous bone fragments were assumed to be from multiple individuals and therefore are designated as “Unassigned”.

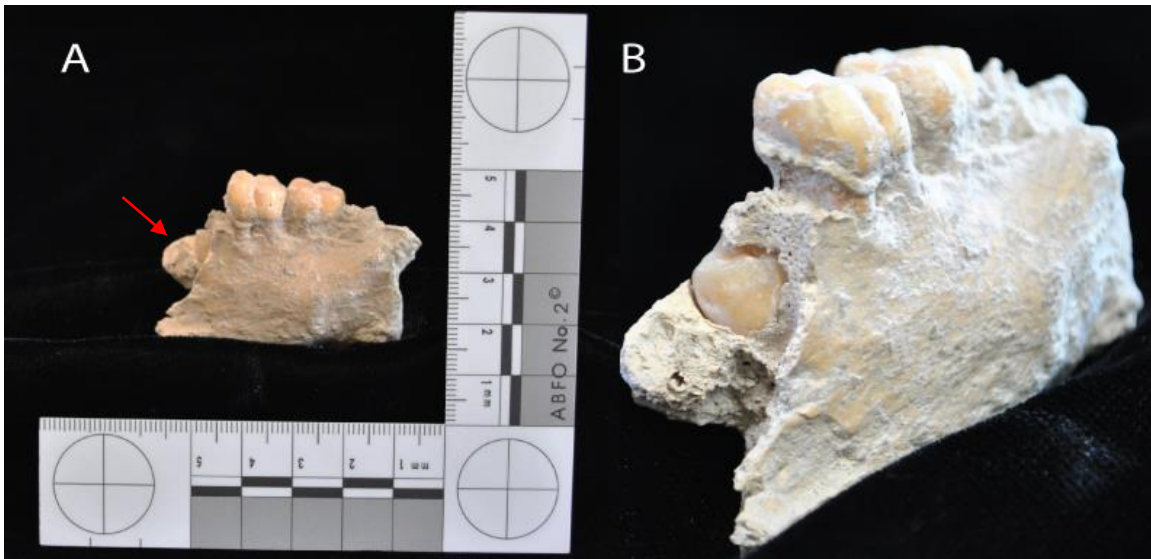


Figure 8: a) Buccal view (red arrow) Impact tooth #20; b) distobuccal view.



Figure 9: a) Maxillary premolar with carious lesion, b) left I¹ lingual view with shoveling.

CONCLUSION AND FUTURE ANALYSIS

The excavation of the San Ignacio Resort burial was a salvage operation where the commingled remains of at least two adult individuals were recovered. Interment of individuals within *chultunes* is a relatively common practice at Cahal Pech. The interment of individuals in these contexts may be associated with cave symbolism and underworld themes although this remains somewhat speculative. It seems likely that the individuals were of commoner status, and

that the residence associated with the two *chultunes* is now destroyed by modern construction. The presence of the jade inlaid tooth might suggest that this individual was of higher status, as this treatment is usually only afforded to intermediate and apical elites in the region, although a commoner interred at BR-123 does exhibit this treatment (see Willey et al. 1965: 549). The dating of the burial remains unclear, while the ceramics present in Chultun 2 suggest a Late Classic date, it remains possible that the deposition of these sherds in this context was not contemporaneous with the placement of Burial 1 in Chultun 1. Future radiocarbon dating of the remains will provide information about whether the interment of the two individuals was contemporaneous, and whether they were coeval with the placement of the ceramics in Chultun 2.

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APPENDIX A: SAN IGNACIO RESORT COMPLETE SKELETAL INVENTORY

Burial 1

Skeletal Inventory:

Cranium:

- 39 count
- Left, Zygomatic (x1)
- Misc. Cranial Vault Bones (x38)

Mandible:

- 6 count
 - Left, Gonial angle with mylohyoid line present
 - Right, Mandibular Condyle
 - Left, Mandibular corpus fragment with alveoli present including associated dentition:
 - #18, 19, and 20 present
 - #20 is present, but is impacted. This observation was made by KGM, and is described as being complete in the alveoli.
 - Left, Mandibular corpus fragment
 - Does not re-fit with above left mandibular corpus and lacks alveoli.
 - Right, Mandibular Condyle fragment
 - Inferior Mandibular corpus fragments (x2, re-fit) that represent the more anterior aspect, just posterior to the beginning of the mental eminence.

Dentition:

- 17 total teeth observed that are complete and present.

The following section will be outlined per tooth and element. Specific attention is focused on dental pathologies specifically related to diet. Thus, the presence, location, and size of dental caries, dental calculus, and degree of dental wear was observed and recorded.

- #18 –
 - present and in occlusion; No caries observed, No calculus observed, wear – n.a.
- #19 –
 - present and in occlusion
- #20 –
 - present, crown complete, but impacted in alveoli. (Score 7, Buikstra and Ubelaker, 1994).
 - This crown was only able to be identified and observed due to the taphonomic breakage that exposed the crypt
- #20 – redundant tooth:
 - Complete
 - Not in alveoli
 - Approximately 75% of CEJ exhibits minimal calculus
 - Dental wear is described as moderate with most significant wear present on the two buccal occlusal cusps
- #21 –
 - Present, not in occlusion and not in alveoli

- Complete
- Associated mandibular alveolar bone present and surrounding root
- Calculus present and moderately present, circumscribed to approximately 50% of the CEJ circumference.
- #23 -
 - Present, not in occlusion and not in alveoli
 - Complete, with postmortem break of root apex
 - Minimal calculus present on lingual surface
 - Minimal degree of occlusal wear
- #26 -
 - Present, not in occlusion and not in alveoli
 - Only crown present, post-mortem break at CEJ
 - Minimum dentin exposure present on occlusal surface
- #27 -
 - Present, not in occlusion and not in alveoli
 - Present apical ½ of the dental root with postmortem break
 - Minimal occlusal wear
 - No calculus present
- #29 -
 - Present, not in occlusion
 - Complete
 - Minimal calculus present on the lingual aspect of the CEJ
- #31 -
 - Present, not in occlusion and not in alveoli
 - Significant wear, enamel loss on occlusal surface exposing dentin with 4 pin-head caries on 4 main cusps
 - Post-mortem breakage of ½ of root apex
 - This tooth was unique because it exhibited differential coloration than the rest of the dentition (caramel color)
- #14 -
 - Present, not in occlusion and not in alveoli
 - Significant wear present with enamel loss of occlusal surface with dentin exposure
 - Approximately 5 pin-head caries on the occlusal aspect
 - This is an estimate considering the significant occlusal wear with enamel loss and significant dentin exposure
 - Postmortem break at CEJ with the root absent
 - This tooth was unique because it exhibited differential coloration than the rest of the dentition
- #11 -
 - Present, not in occlusion and not in alveoli
 - Postmortem break is present and tooth in two fragments
 - Two fragments refit and represent a complete tooth
 - Calculus present on the lingual aspect of mesial and distal aspects of the cingulum
- #9 -
 - Present, not in occlusion and not in alveoli

- Approximately $\frac{1}{3}$ of apical root exhibits a postmortem break
- Shoveling present
- #7 -
 - Present, not in occlusion and not in alveoli
 - Moderate dentin exposure on the occlusal surface
 - No caries or calculus present
- #6 -
 - Present, not in occlusion and not in alveoli
 - Complete
 - Moderate wear on the mesial and distal aspect of the occlusal surface
 - Significant calculus observed on the lingual surface, with marked concentration near the cingulum
 - Minimal calculus observed at the cemento-enamel junction (CEJ) on the labial most aspect, just below the neck of the tooth
- #5 -
 - Present, not in occlusion and not in alveoli
 - Incomplete
 - Post-mortem break of the distal occlusal surface
 - Calculus present on the labial aspect of the cemento-enamel junction (CEJ), extending mesial-distal and terminating on the distal most aspect
- #3 -
 - Present, not in occlusion and not in alveoli
 - Only the lingual and mesiobuccal roots present, with postmortem break of mesiolingual root
 - The two present root apices exhibit postmortem breakage
 - Alveolar bone is present and confounded some observations
 - Minimal wear observed on the distal occlusal cusp
 - No caries present
- Unsided, Maxillary M3
 - Present, not in occlusion and not in alveoli
 - Development is incomplete with only $\frac{2}{3}$ of root developed
- Unsided, tooth root
 - Possibly a maxillary premolar root
 - KGM observed atypical thickness which may suggest a possible unsuccessful bifurcation

Post-Crania:

- Miscellaneous vertebrae fragments
 - 15 count
- Miscellaneous rib fragments
 - 26 count
 - 21 count of body fragments
 - 5 count of head and neck fragments
- Left, Clavicle
 - Medial most aspect of left clavicle with postmortem break of medial epiphysis
- Unsided, Clavicle fragment

- Body fragment
- Right, Scapula
 - 2 count
 - One fragment represented by inferior coracoid process fragment
 - One fragment represented by a mostly complete glenoid fossa
- Unisided, Scapula
 - 4 count
- Right, Humerus
 - 4 count
 - One fragment is represented by a distal diaphysis fragment with absent epiphysis
 - One fragment is represented by a capitulum fragment
 - One fragment is represented by a proximal diaphyseal fragment, just inferior to the lesser tubercle with the inferior intertubercular sulcus
 - One fragment was previously bagged with the unisided humeral fragments, but was later identified as a re-fit by KGM, and moved into the right humerus bag on June 23, 2022
- Left, Radius
 - 3 count, all fragments re-fit
 - All fragments represent the radial diaphysis with both proximal and distal epiphyses absent
- Left, Ulna
 - 2 count
 - One fragment represented by approximately $\frac{1}{3}$ of the ulnar diaphysis with a present interosseous crest
 - One fragment represented by approximately $\frac{1}{3}$ of the proximal most aspect of the ulnar diaphysis
- Right, Ulna
 - 3 count, 2 re-fits
 - One fragment represented by a distal epiphysis fragment with present particular facet and ulnar notch
 - Two re-fit fragments that together represent $\frac{1}{2}$ of the proximal ulnar diaphysis
- Left, Scaphoid
 - $\frac{2}{3}$ complete
 - Absent tubercle
- Right, Lunate
 - Complete
- Right, Capitate
 - Complete
- Right, Trapezoid
 - Mostly complete
- Right, Trapezium
 - $\frac{2}{3}$ complete
- Unisided, Proximal manual phalanges
 - 20 count

- Unsided, Intermediate manual phalanges
 - 17 count
- Unsided, Distal manual phalanges
 - 7 count
- Right, 1st proximal phalanx
 - Mostly complete with absent distal head
- Left, Miscellaneous metacarpal fragments
 - 2 count
- Unsided, Miscellaneous metacarpal fragments
 - 13 count
- Unsided, Ischium
 - 3 count
 - One fragment represents the inferior most aspect of the ischium, possibly belonging to the inferior ischiopubic ramus
- Left, Ilium
 - Partial acetabulum present and auricular surface is present
 - Auricular surface was degraded so observation of this feature was not possible
 - KGM and VSRI scored for sciatic notch = 4 (Buikstra and Ubelaker, 1993)
- Right, Ilium
 - Partial acetabulum present

- Left , Ilium
 - Single fragment
 - KGM and VSRI scored for sciatic notch = 4 (Buikstra and Ubelaker, 1993)
- Right, Ilium
 - KGM and VSRI scored for sciatic notch = 4 (Buikstra and Ubelaker, 1993)
- Unsided, Humerus
 - Humeral head fragment with the articular surface present
- Left, Femur
 - Femoral fragment representing approximately $\frac{2}{3}$ of the diaphysis with a present linea aspera
 - Platymeria present
- Left, Femur
 - Femoral fragment representing approximately $\frac{1}{2}$ of the proximal diaphysis with the linea aspera and superior spiral line
- Right, Femur
 - 2 count
 - One fragment is represented by a mostly complete femoral head with an intact fovea capitis
 - One fragment is represented by a distal diaphysis fragment with the most inferior most aspect of the linea aspera present.

- The medial-lateral mid-diaphysis diameter was able to be measured, 41.5mm
- Unsided, Femur
 - 25 count
 - 2 fragments refit, however poor cortical bone preservation confounded estimation of element side
- Right, Patella
 - Mostly complete with breakage on the posterior most aspect of the apex
- Right, Patella
 - Partially complete represented by approximately $\frac{1}{3}$ of the superior lateral body with an intact lateral facet
- Left, Patella
 - 3 count
 - No re-fits
- Left, Tibia
 - 5 count
 - One fragment represented by approximately $\frac{1}{4}$ of the diaphysis with a distinct anterior crest
 - One fragment represented by the left tibial tuberosity
 - Three fragments represented by the left proximal tibial diaphysis with slight anterior crest
- Unsided, Tibia
 - 5 count
 - Four fragments represent tibial diaphysis with present anterior crest
 - One fragment represents a single fragment with poor preservation
- Unsided, Fibula
 - 11 count
 - Two fragments of the diaphysis re-fit
 - Three fragments of the diaphysis re-fit
 - Four fragments of the diaphysis re-fit
 - Two fragments that do no re-fit
- Left, Fibula
 - Fragment represents the distal epiphysis with an intact lateral malleolus
- Right, Talus
 - Mostly complete, superior most aspect
- Right, Talus
 - Smaller element than the above right talus
 - Redundant trochlea and medial most aspect
- Right, Talus
 - Non-redundant fragment
- Left, Calcaneus
 - 4 count
 - No re-fits
- Right, Calcaneus
 - Fragment represents the superior-medial most aspect of the calcaneus with an intact sustentacular sulcus

- Unsided, Calcaneus
 - Fragment possibly represents the posterior most aspect
- Right, Navicular
 - Mostly complete, with approximately $\frac{2}{3}$ of the element present, and absent navicular tubercle
- Right, MT #2
- Left, MT #4
- Right, MT #4
- Unsided, MT #2-5
 - 7 Count
- Unsided, Intermediate Pedal Phalanges #2-5
 - 4 count
- Unsided, proximal pedal phalanges #2-5
 - 3 count