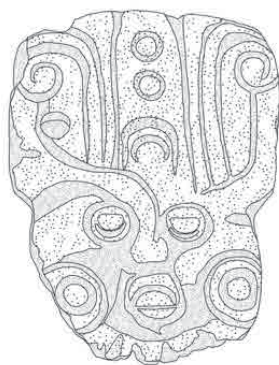


***Investigations of the Belize River East
Archaeology Project:
A Report of the 2014 and 2015 Field Seasons***



Volume 1

Eleanor Harrison-Buck, Editor

Occasional Paper, No. 7

**Department of Anthropology
University of New Hampshire**

Report submitted to the Institute of Archaeology,
National Institute of Culture and History, Belmopan, Belize

2015

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Preface and Acknowledgements

Eleanor Harrison-Buck

The Belize River East Archaeology (BREA) project was initiated in January 2011. In the last five years of fieldwork, our investigations of the BREA study area—a 6000 km² region encompassing the lower half of the Belize Watershed—has proven to be an extraordinary research area rich with pre-Hispanic and Colonial history. This report details our survey, mapping, excavation, and analytical findings from three short field seasons that ran for three weeks in January 2014, six weeks in the summer of 2014 and another 6 weeks in January-February 2015. Despite the short seasons, our work in the middle and lower reaches of the Belize River valley has been tremendously productive and, as usual, the results surpassed all my expectations, namely due to the perseverance and incredible expertise of our talented field crew.

I am indebted to the loyal group of BREA staff (aka. “the Dream Team”) who have participated in the BREA project since its inception in 2011 and made season after season so successful over the last five years. I wish to thank each of them—David Buck, Marieka Brouwer Burg, Brian Norris, Adam Keading, Satoru Murata, and Astrid Runggaldier. The incredible results of the BREA project are the result of their range of skills and expertise—from survey to excavation to lab analysis. We have also been fortunate over the last few years to have a talented new group of staff join our project as BREA continues to grow. I wish to acknowledge the contributions of Kelin Flanagan, Kate Frederick, Brett Houk, Joe Nigro, Hugh Robinson, and Alex Gantos and volunteers Joshua Beaucher and Mari Isa. Each of these staff members offered different areas of expertise—from survey and mapping to excavation—and I am grateful for all their help.

Thanks to the efforts of our amazing recon team, just this year we doubled the total number of mounds (over 2000!) now recorded in the BREA study area! I am incredibly grateful to this team for their unbelievable work and wish to thank Alex Gantos, David Buck, Brian Norris, and Joe Nigro... You guys rock! During January 2014 Alex Gantos braved remote conditions and an overnight in the swamps, adding a whole new string of sites to our north-south overland route. During the summer 2014, David kept up the search for the elusive Married Woman’s Point site, again using every mode of transport (and survived the boat trip!), and we finally think we have narrowed down the location thanks to his persistence! Brian and Joe initiated the recon in the lower part of the Belize Watershed, and Satoru and Hugh also assisted as a second recon team. Together, these guys found roughly 20 new sites and upwards of a thousand new mounds to add to our total! They covered a huge terrain and have laid the groundwork for our future research in this new part of the BREA study area.

Using our two Total Stations, Satoru Murata and Brett Houk produced a beautiful topographic map of the Saturday Creek site core during the January 2014 season, which Satoru finished up with the help of BREA volunteer Josh Beaucher and undergraduate student Molly

Quinn during the summer 2014 season. During the January-February 2015 season, Satoru and Hugh Robinson spent six straight weeks tirelessly mapping the sites of More Tomorrow, Ma'tunich and Jabonche. These guys persisted despite numerous challenges, from the wet and muddy conditions of More Tomorrow to the mosquito filled jungle of Jabonche and I am eternally grateful for their persistent efforts—the incredible results of which are presented herein.

Digitizing and map-making in GIS was greatly facilitated by the masterful work of Dr. Marieka Brouwer Burg, our GIS specialist on the BREA project. I am truly grateful for the countless hours she has spent on numerous aspects of the BREA project, from digitizing to organizing all the digital files (GIS, photos, drawings, etc). Her contributions to BREA are instrumental in more ways than I could even describe and I thank her for her deep commitment to the project, both in the field and back at UNH. During the summer season in Belize, she also helped to keep us organized by processing and recording all our incoming artifacts, an enormous task in the lab, which she co-directs with Dr. Astrid Runggaldier. I am grateful to both of them for the endless amounts of time they spent processing countless numbers of artifacts with non-stop attention to detail, catching even the smallest of errors. Their diligence in the lab and artifact database organization has both short- and long-term benefits, greatly facilitating our present and future artifact analyses conducted by students, staff, and specialists on the project. Astrid not only co-directed the lab but also served as an excavation director during the summer 2014 field season and, as always, did a superb job of training our undergraduate students in both field and lab techniques.

I also want to thank the many interdisciplinary specialists who have joined the BREA project during the 2014-2015 seasons. Dr. Gabriel Wrobel offered his valuable time and energy in analyzing the burials from Hats Kaab and Kaax Tsaabil and we greatly appreciate his expertise and valuable insights. During January and February 2014, Ms. Lori Phillips joined BREA as our faunal specialist and has begun a long-term study of the BREA animal remains as part of her dissertation research. We are happy to have her on board and grateful for the assistance of her mentors Dr. Erin Thorton of Washington State University and Dr. Kitty Emery of the University of Florida. During the summer 2014 season, we were happy to have Ms. Tawny Tibbits join the BREA project. She is conducting a chemical sourcing project using pXRF on the BREA groundstone as part of her dissertation research at the University of Iowa.

In the summer of 2014, UNH undergraduate Eric Van Dam joined the BREA project as part of a Research Experience and Apprenticeship Program (REAP) that he was awarded through the UNH Hamel Center. We are grateful to the Hamel Center for this award. As part of his REAP fellowship Eric carried out a study for BREA involving contemporary Neotropical animal ecology and examined habitat preferences for the range of taxa identified in the BREA zooarchaeological collections. Eric was mentored by Dr. David Buck of the Biodiversity Research Institute (BRI) and Judy Chupasko of the Museum of Comparative Zoology (MCZ) at Harvard University. I wish to thank BRI and MCZ for offering the *pro bono* assistance of their employees. University of Belize undergraduate student, Denver Cayetano, joined the project and offered valuable assistance. I am grateful to this all-star team of biologists for all their efforts in

collecting and processing a large number of specimens. This project involved long days and late nights checking traps, along with long hours of post-processing samples. Finally, I am grateful for the assistance of Harvard University's Concord Field Station where specimens were shipped and processed in their 'bug tanks.'

Other scientists who have been part of interdisciplinary research on the BREA project include soil scientists Drs. Serita Frey and Melissa Knorr of the University of New Hampshire (UNH). This past year they continued to offer their valuable time analyzing a new collection of soil samples in their efforts to develop a new method for identifying a cacao biomarker in soils. Additional soils studies were carried out by UNH undergraduate student Alan Jones who was awarded a SURF grant by the UNH Hamel Center. We are grateful to the Hamel Center for their continued support of BREA and UNH undergraduate students like Alan. During January and summer of 2014, I served as Alan's mentor in a clay study that he carried out in Belize. David Buck and Alex Gantos provided crucial assistance to Alan in the collection of clays. All clay samples were shipped to UNH and Alan is helping Dr. Julia Bryce of UNH to test a new method for sourcing clays and ceramics using Neodymium isotopes. I am grateful to Julie for leading this exciting collaboration with the BREA project. I also wish to thank Dr. Janne Blichert-Toft and ENS-Lyon for the isotopic analyses, as well as Florencia Prado and Philippe Telouk for technical and analytical assistance on this project.

I would especially like to thank Blanton & Associates, Inc and Archaeo-Geophysical Associates for their support of the BREA project by kindly offering the *pro bono* assistance of their archaeologists who are also drone specialists: Mark Wills and Chet Walker. I am grateful for their time in the field and the endless amount of time they spent post-processing the data. These guys are incredibly talented and efficient. Mark was instrumental in developing the beautiful maps and I am grateful for the hours and hours of time he spent to make this project such a success. The results (presented herein) are nothing short of incredible!

I owe a large note of appreciation to the entire BREA staff for sharing their expertise and offering our students valuable training during both January field schools in 2014 and 2015 and the 2014 summer field school, sponsored by UNH. During the January 2014 season, eight undergraduate students from the University of New Hampshire (UNH)— Sarah Bakman, Wyatt Berrier, Amelia Croteau, Miranda Derby, Katelyn Monroe, Dylan Kelly, Dylan Schiff, and Victor Sherpa—joined the BREA project as part of an "Archaeological Survey and Mapping in Belize" course. During the summer of 2014, we offered an "Archaeological Field School in Belize" course that was more heavily focused on excavation and artifact analysis. Five undergraduate students—Leslie Duff, Skye Jones, Holly Linseman, Molly Quinn, and Cody Whelan—joined the project and were trained by BREA staff in excavation and lab analysis. Finally, in January of 2015, we had another great group of seven students--Ellis Codd, Steven Cowley, Grace Dietz, Candace French, Brian Melesciuc, Heather Sweeney, and Liam Tanner—who joined us for the survey and mapping course. All of the student participants during 2014-2015 offered an enormous contribution to the field project, and some produced final reports that are published here as individual chapters in the 2014-2015 BREA Interim Report.

I am particularly grateful to the two youngest members of the BREA team—my daughters Eliza & Natalie—who joined us during all three field seasons (despite missing a little bit of school). In addition to a good daily swim in the pools at Banana Bank and Jungle Dome, they climbed pyramids, helped wash artifacts, and, as always, provided much joy in our camp, making us laugh each day! Our work in Belize would not have gone so smoothly without the tireless efforts of our hosts at Banana Bank Lodge. The Carr Family and all their wonderful staff took great care of us throughout the January and summer 2015 field seasons, getting up at the crack of dawn each day to prepare us a pack breakfast and lunch. They kept us well fed and provided us with delicious meals (even hosting a New Years Eve bash, which some of the BREA staff got to enjoy!). We are truly grateful for all their unending hospitality. We also would like to thank Andy and Simone Hunt and their staff at the Jungle Dome who hosted us for meals during the January 2015 season. We looked forward to their delicious dinners each night and are grateful for their warm and friendly hospitality.

Our fieldwork was assisted by many local Belizeans. Our work in the middle Belize Valley was greatly facilitated by field assistance by many members of the Martinez family (Wilbur, Nelson and Michael, Justin, Raymond, and Junior, among others). We also appreciated additional field assistance from Elder Barrera, Manuel Gomez, Jonathon Giron, and members of the More Tomorrow community (Terrence and Charles Sutherland, Michael and Marvin Myvette, Marcelo Kuz, and Mario Orellana). In the lower Belize Valley, we were assisted by Mr. Godfrey Smith, James Seguro (Snapshot), Orlando Seguro (Yellow Mon), Lawrence Baptist (Daytime), Cardinal Baptist, David Domingez, Kenny Wade, and Carl White who welcomed us to their communities. We are grateful for all their hard work, rain or shine, during the January and summer field seasons. We also wish to thank the many landowners who granted us permission to investigate archaeological sites on their property. Santander Farms (formerly Green Tropics, Ltd.) kindly granted us permission to enter their property to perform recon. Mr. Albert Reimer, owner of the property where Hats Kaab is located, allowed us to perform multiple test excavations at this site during the summer 2014 field season and Mr. Issac Dueck granted us permission to map the site of Ma'tunch on his property in the middle Belize Valley. Mr. John Carr and Mr. Toni Martinez welcomed us onto the property of Saturday Creek where they both farm and were kind enough to let us excavate at different parts of the Saturday Creek site core during the 2014 and 2015 field seasons. Additionally, the village of More Tomorrow and the Chairmen Mr. Mike Myvette welcomed us into their community and permitted us to map and excavate the site by the same name during the January 2015 season.

Moving down river, the BREA team was introduced to a whole new part of the study area where we met numerous people living in the communities of Biscayne, Boston Village, Burrell Boom, Crooked Tree, Davis Bank, Double Head Cabbage, Flowers Bank, Grace Bank, Isabella Bank, Lemonal, Rancho Delores, Sand Hill and Scotland Half Moon. It is impossible to name each and every person who assisted us in our work, but we want you all to know how much we appreciate you welcoming us into your communities and entrusting us with the documentation of the cultural heritage that surrounds this beautiful part of Belize. One community I would

particularly like to thank is the village of Biscayne, where BREA devoted significant time documenting the site of Jabonche, located just off the Northern Highway. I would like to acknowledge the support of the community members, Teacher Dorla (Principal of the Biscayne Govt School), as well as the Town Council of Biscayne for being actively involved and interested in our research. I thank the many landowners who permitted us to come on to their property (most who are mentioned in Chapter 6 of this volume). We appreciate the many people who took time out of their schedules to show us around and share with us the sites on their property. I am particularly grateful to Mr. Godfrey Smith for entrusting us with the documentation of the rich cultural heritage that surrounds their wonderful community of Biscayne. We look forward to coming back in the future!

None of the research conducted during the 2014-2015 seasons would have been possible without the generous support of the Alphawood Foundation and I am deeply grateful for their continued support. In addition, the University of New Hampshire (UNH) sponsored the BREA archaeological field school, which provided additional support for the project. Many individuals from UNH deserve a large note of thanks for their help in facilitating the logistics and finances of this research project, namely Cindy Corriveau, Angele Cook, Kay Cichon, and many others in the Purchasing Department and Office of Financial Affairs at UNH. I also appreciated all the efforts and hard work of Lisa Mulvey, who formerly served as the Director of the COLA Center for Study Abroad and managed a slew of wonderful programs sponsored through UNH, including this one. We enjoyed her visit to our field site in summer 2014! I also wish to thank Dr. Lisa Lucero who encouraged me to start a project in this part of Belize and who continues to serve as a valued colleague, mentor, and friend. I am especially grateful to Carolyn Stolzenburg who provided continuous administrative support before, during, and after the three field seasons in 2014 and 2015. I also wish to thank Dr. Meghan Howey, the Chair of the Anthropology Department and a valued colleague and friend. She has supported the project over the years in various ways, including letting me borrow her Top Con Total Station every season – thank you! I also wish to acknowledge my colleague and former Department Chair, Dr. Joe Lugalla, who has been incredibly supportive of my research over the years and is leaving UNH for an exciting director position in his home country of Tanzania. I will miss him dearly when he goes as he has offered constant encouragement since I arrived at UNH. My permit for the BREA study area was granted by the Belizean Institute of Archaeology as part of the National Institute of Culture and History. I am grateful to the Institute staff, particularly the former Director of the Institute, Dr. Jaime Awe, and the current Director Dr. John Morris, for all their guidance, encouragement, and continued support for my BREA project.

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*Investigations of the Belize River East Archaeology Project:
A Report of the 2014 and 2015 Field Seasons*

Volume 1

Edited by Eleanor Harrison-Buck

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Chapter 1

BREA 2014-2015 Seasons: Investigations in the Middle and Lower Reaches of the Watershed

Eleanor Harrison-Buck

The Belize River East Archaeology (BREA) study area encompasses the watershed of the eastern Belize Valley, between Belmopan and Belize City, and represents an area measuring roughly 6,000 sq. km (**Figure 1.1**). This report of the BREA project documents our most recent archaeological investigations in the middle and lower reaches of the Belize Watershed. Here we report on our finds from three different field seasons that were conducted in the course of a little over a year, between January 2014 and February 2015. The three field seasons reported on here include a three-week January 2014 season, which extended from January 1-21. Fieldwork continued during a six-week summer season from May 28-July 12, 2014. A final season reported on herein extended from January 2-February 10, 2015. While each of the three field seasons was relatively brief, they were all incredibly productive. During this time, the BREA team identified over 1000 mounds that were not previously recorded, doubling the total number of structures recorded since the project's inception in 2011. In the last five years of fieldwork, the BREA team has devoted most of its time to documenting the archaeology in the middle Belize Watershed, between Banana Bank and where the Belize River meets the confluence with Labouring Creek. Beginning in 2015, the BREA project shifted downriver in the second half of the field season and expanded our investigations into this eastern part of the study area with investigations focusing around the site center of Jabonche and around the hinterlands of Altun Ha (refer to **Figure 1.1**). This report is divided into two volumes, with Volume 1 detailing the results of our survey, mapping, excavations, and Volume 2 documenting our analytical studies that were undertaken between 2014-2015.

Background to the Research

Over the course of five years (2011-2015), our investigations of the BREA study area have identified a dense occupation and a long history of settlement in the eastern Belize Valley (**Figure 1.2**), extending from Formative to Colonial times, ca. 900 BC-AD 1900 (Brouwer Burg et al. 2014; Harrison-Buck, ed. 2011, 2013; Harrison-Buck, Murata, and Kaeding 2012; Harrison-Buck, Kaeding, and Murata 2013; Runggaldier et al. 2013). Between 2011-2015, the BREA project has identified roughly 2000 mounds representing around 80 different sites in the middle and lower Belize Valley, the majority of which were not previously reported or

documented archaeologically. These sites range in size, from small house lots to larger centers with ballcourts and pyramidal architecture. We have mapped a number of these sites, including some of the larger centers (Kaax Tsaabil, Saturday Creek, Hats Kaab, Ma'xan, More Tomorrow, and Jabonche) and smaller plaza groups (Hum Chaak, Ik'nal, Ta'as Mul [Banana Bank], and Ma'tunich) using a Total Station, while most of the other smaller sites have been sketch mapped and located with our handheld GPS unit. All site data has been then inputted into our master BREA GIS database.



Figure 1.1 Map of Belize showing BREA study area (map prepared by M. Brouwer Burg).

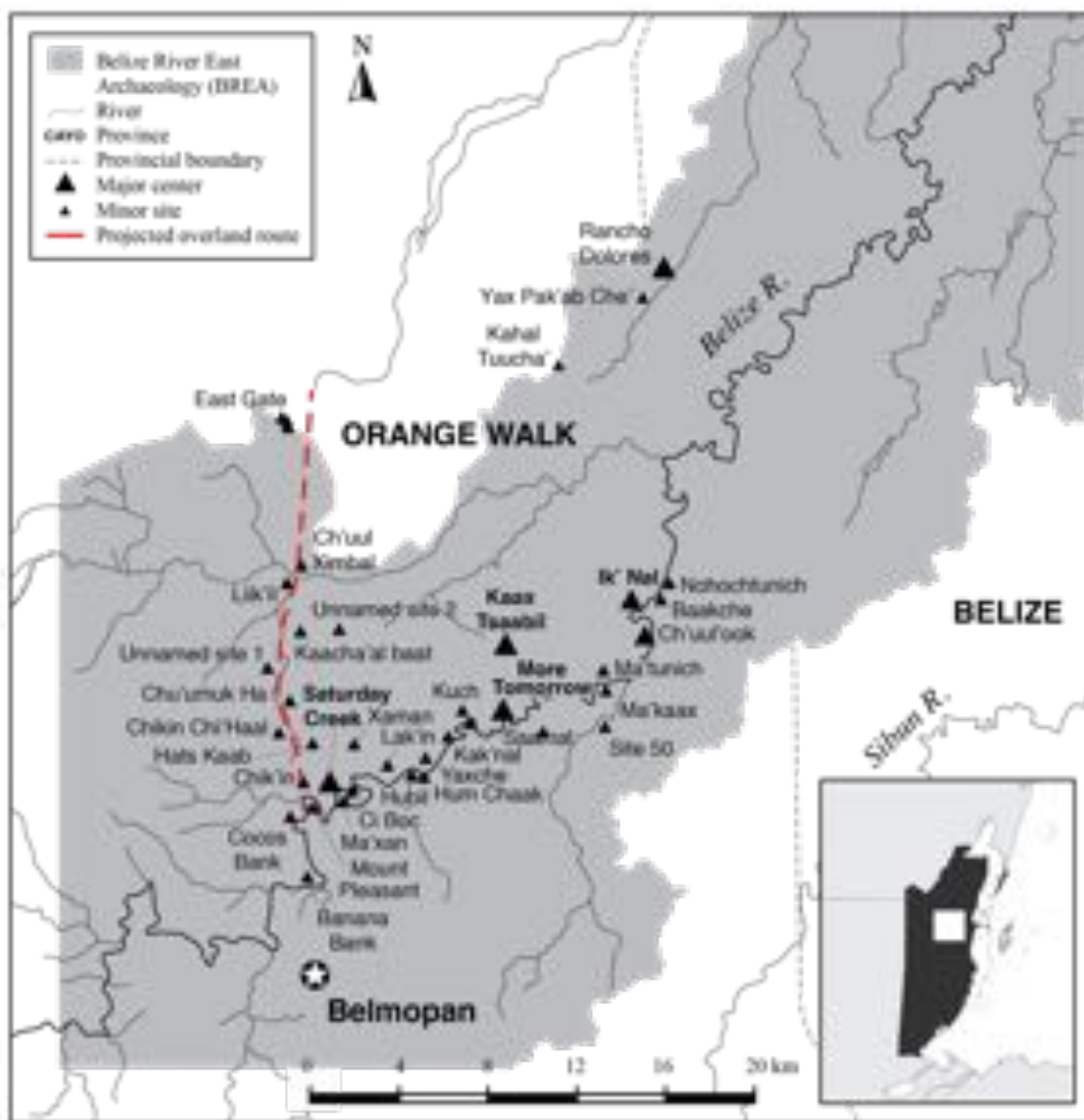


Figure 1.2 Western half of the BREA study area. Projected north-south overland route in dashed red line and our survey transects in solid yellow lines (map prepared by M. Brouwer Burg).

The sites are primarily located along the main trunk of the Belize River, but some sites also have been found along tributary creeks and lagoons to the north and south of the river. For instance, during the 2014 season we identified the location of the large center of Jabonche located on the Black Creek tributary (see **Figures 1.1 and 1.2**). Although rare, some sites have been identified at some distance from major rivers and creeks. For instance, our survey team identified a string of settlement running in a roughly linear (north-south) arrangement between the Belize River and Labouring Creek drainage that may reflect a north-south overland route

documented by the Spanish in the 16th century (Jones 1989 [see **Figure 1.2**]). Most of the sites in the BREA study area are ancient Maya settlements dating to the pre-Hispanic period, but several sites that have been investigated contained colonial artifacts dating between the sixteenth and nineteenth centuries (Buck, Harrison-Buck, and Divoll 2013; DeGennaro and Kaeding 2011; Harrison-Buck et al. 2014; Kaeding and DeGennaro 2011).

2014-2015 Field Work

Volume 1 of the report is divided into two sections detailing the fieldwork conducted during the 2014-2015 seasons. The chapters in “Section I” discuss fieldwork involving our archaeological survey, mapping and reconnaissance efforts over the last year and chapters in “Section II” report on our site investigations carried out in the middle and lower Belize Watershed. Below, I provide an overview of the chapter contributions that make up these two sections of the report.

Section I: Survey, Mapping and Reconnaissance

Mapping the Saturday Creek Site Core

During the 2014 season, we continued the survey, mapping, and excavation of select sites in the BREA study. We devoted three weeks in January 2014 and another four weeks in the summer surveying and mapping the site core of Saturday Creek using a Total Station and GPS (**Murata, Houk, and Beaucher, Chapter 4**). This has allowed us to record detailed topographic information for the site core and more accurately tie in the site to our existing GIS map of the BREA study area. Saturday Creek is one of the largest centers in the BREA study area, with a main elite residence to the north, three large pyramids in a central plaza area, including a smaller pyramid attached to a ballcourt. In surveying the southern section of the site we identified another plaza group and several large structures, two of which may represent a second ballcourt at the site.

Drone Mapping Over Saturday Creek

While much of the site core of Saturday Creek is in bush, most of the area outside the site core has been cleared for agriculture. The clearing makes for good visibility but unfortunately, the mounds in this area have been victims of extensive bulldozing and repeated plowing over the years and are at high risk of destruction. Our aim has been to document the settlement before further destruction occurs. In an effort to more accurately and efficiently map the areas in cleared fields around Saturday Creek, we had two specialists join the BREA project for three

days in the January 2014 season and fly drones over this 7 square km area (**Willis and Walker, Chapter 5**). The resulting map surpassed our expectations, revealing hundreds of mounds and showing subtle variations in surface topography that are not readily visible on the ground due to the extensive plowing. The densest settlement appears to be to the north of the site core just east of Hats Kaab, an E-Group shrine complex where we conducted test excavations in 2014 (see below). A cursory inspection of the mounds shows that many of these structures were continuously occupied with ceramics dating from Preclassic to Postclassic times found on the surface. It is clear from the imagery that this location served as a key crossroads in the middle Belize Valley, likely beginning as early as the Preclassic and continuing into the colonial period when the Spanish arrived in the early sixteenth century (Harrison-Buck 2010; Harrison-Buck et al. 2014).

Reconnaissance Along a North-South Overland Route

Our investigations in January and summer of 2014 focused primarily in the vicinity of Saturday Creek, but also devoted time to expanding our archaeological reconnaissance farther afield in the BREA study area (**Gantos and Buck, Chapter 3**). We performed our most intensive reconnaissance to the north of the Saturday Creek site and identified a string of settlement running in a roughly linear (north-south) fashion between the Belize River and Labouring Creek drainage (**Gantos, Chapter 2**). We believe this marks an ancient north-south overland route that the Spanish documented when they arrived in the area during the sixteenth century (see **Figure 1.2**). According to ethnohistoric accounts, the route headed overland from Labouring Creek south to a site on the Belize River known as Chantome, which we believe may be the ancient site of Saturday Creek (Brouwer-Burg, Harrison-Buck, and Runggaldier 2014; Harrison-Buck 2010; Harrison-Buck, Kaeding, and Murata 2013).

Mapping the Sites of More Tomorrow and Ma'tunich

During January 2015, we survey and mapped with a Total Station two other sites in the middle Belize Valley, More Tomorrow and Ma'tunich (**Murata and Robinson, Chapter 7**). Both sites are located right on the north bank of the Belize River. Ma'tunich is a small, enclosed plaza complex that has been disturbed by modern agriculture. Our goal was to map the site before further destruction occurs and it served as a good mapping exercise for the UNH undergraduate students participating in a mapping course during the January 2015 season. More Tomorrow is one of the larger centers next to the sites of Saturday Creek and Kaax Tsaabil (see **Figure 1.1**). More Tomorrow contains two major plaza groups and at least 23 discrete structures were mapped across the site with a Total Station, including one pyramidal structure situated on the Structure 1 complex, the largest platform group at the site.

Mapping Jabonche and Performing Initial Reconnaissance in the Lower Belize Watershed

During the 2014 field season, we conducted initial reconnaissance in the lower half of the Belize Watershed, where we identified several large Maya centers, including Jabonche. We returned in January 2015 to map this site with a Total Station (**Murata and Robinson, Chapter 6**). This site is located on the east side of Black Creek, just off the Northern Highway around the village of Biscayne. It is one of the largest centers within the area between Chau Hiix and Altun Ha (**Figure 1.1**). The center consists of several large, contiguous plaza groups, including a central plaza with a pyramid and ballcourt, large range structures, and a sizeable elite residential plaza to the south. Three *sacbeob* (stone roads) radiate out from the site center, one to the south extending from the southern plaza to the bank of Black Creek and another two radiating out to the north and northwest of the site (see **Murata and Robinson, Chapter 6**). The January-February 2015 season also involved intensive reconnaissance of this eastern part of the Belize Watershed, which added about 20 more sites to our total count (**Norris, Nigro, Murata, and Robinson, Chapter 6**). The sites range in size, but generally consist of average size house mounds with pyramidal architecture being a rare occurrence. Sites range from single house mounds to groups of mounds, on average between 5-25 mounds. While these sites do not tend to have large ceremonial complexes, there are a few sites that consist of dense settlement. The largest settlement is the Canton site and its size is likely due to its close proximity to Altun Ha, located on the road (the Old Northern Highway) leading to this site center. A total of 385 mounds were identified primarily in open pasture on the Canton property. The total number of mounds documented during the 2015 season (~1000) doubled the total number of mounds identified thus far in the BREA study area.

Section II: Site Investigations

During the field seasons from 2014-2015, BREA carried out an extensive program of test excavations at four sites, three of which we mapped with a Total Station during 2014-2015. Sites that were investigated include Saturday Creek, More Tomorrow, Hats Kaab, and Jabonche. The findings from these excavations are presented in the chapters in this report and are summarized below.

Excavations at Saturday Creek

We devoted a substantial amount of time carrying out test excavations at the site core of Saturday Creek. One of our goals this year was to further refine our understanding of the Saturday Creek chronology and to investigate the possibility of Spanish Contact in this area. As others have noted, evidence of Spanish Contact is elusive at best and rarely visible on the surface prior to excavation. Therefore, we set up several test excavations in two different plaza groups at

Saturday Creek to better understand the chronology and to test for evidence of Spanish Contact. Four units were placed in the north plaza (Operations 17, 18, 19, and 20). Operations 17 and 18 were focused on and around Structure 20 with the latter operation revealing a large portion of an alleyway located between Structures 20 and 21 (**Flanagan and Harrison-Buck, Chapter 8**). Operation 19 defined the walls of a large “looters pit” in Structure 25 that was made with a bulldozer that bisected the structure, revealing several discrete construction phases including one that was filled with re-deposited midden material (**Runggaldier and Isa, Chapter 10**). The fourth excavation unit (Operation 20) was placed on the central axis of Structure 23 where we tested for the presence of any termination deposits and to determine the construction history of the main elite residence (**Runggaldier, Isa, and Harrison-Buck, Chapter 9**).

Our excavations in the North Plaza group revealed a primarily Classic period (AD 200-800) occupation with a small amount of terminal debris dating to the Terminal Classic period (ca. AD 800-950). In contrast, our excavations in the Southwest Plaza group (Operations 23 and 24) revealed a later occupation beginning in the Terminal Classic and continuing through Late Postclassic times to the time of Spanish Contact. Operation 23 examined Structure 11, a small radial shrine structure (**Harrison-Buck and Flanagan, Chapter 12**). The associated ceramic material consisted mostly of smashed incense burners, including a Chen Mul Modeled censer, which suggests that the structure at least in its final phase served as a Late Postclassic shrine building (see Linesman and Harrison-Buck, Volume 2). Operation 23 revealed a cache deposit in the southeast corner of Structure 11, an east-west platform located adjacent to the Structure 10 shrine. This cache contained a crystal historic object and represents our first definitive evidence of Spanish Contact in this area.

During the 2015 season, Operation 24 was placed on Structure 11 and was aimed at further testing for evidence of Spanish Contact period occupation in this part of the Saturday Creek site (**Kaeding and Harrison-Buck, Chapter 13**). Investigations revealed another cache deposit in the northeast corner of Structure 11 that consisted of a small incised Postclassic bowl with three jade beads and another crystal object that is arguably historic in date. This large piece of crystal has been reworked and its function is more difficult to ascertain, but the crystal objects in the Operation 23 cache is the top of a bottle stopper. It resembles those still used today in the Catholic church as stoppers for spouted sacred vessels containing holy water or for chrismal bottles used for holy anointing oil. Both are essential for baptisms and other blessings for healing and purifying persons, places, and objects and were used by the Spanish Catholic priests during the early Colonial period. The deposits at Saturday Creek found during the 2014-2015 field seasons represent our first clear evidence of Spanish Contact at this site, which we believe is the Contact period site of Chantome (Harrison-Buck 2010; Jones 1989).

Excavations at Hats Kaab and More Tomorrow

During the summer of 2014, we conducted two excavations at Hats Kaab, a ceremonial group is located about a kilometer to the north of the site core of Saturday Creek that resembles the configuration of an E-Group (Brouwer-Burg et al. 2015; Runggaldier et al. 2013). E-Groups are complexes that typically date to the Preclassic period and are thought to have been used as solar observatories in ancient times (Chase and Chase 1995). Our main goals were to identify the building's size, orientation and its earliest occupation, namely if there is a Middle-to-Late Preclassic phase. Such dates would align with other E-Group complexes found throughout the Maya Lowlands, as well as other ceremonial complexes found in the upper Belize Valley referred to as "In-line Triadic Eastern Shrines" (Aimers 1998; Aimers and Rice 2006; Awe 2008; Chase and Chase 1995). We placed a 1 x 1m test excavation (Operation 21) in the center of the large plaza at Hats Kaab that extended over 2m in depth, aimed at gauging the extent of occupation in the area (**Brouwer Burg and Astrid Runggaldier, Chapter 11**). Cultural material was still found even at the lowest depth and the artifacts suggest that the core of this complex may date as early as Middle-to-Late Preclassic times.

During the summer of 2014 another excavation unit (Operation 22) was placed along the western structure of Hats Kaab to determine the structure's size, orientation, extent of occupation, and its degree of post-depositional disturbance (local informants tell us that this pyramidal structure was much higher until the area was cleared about ten years ago and a large portion of the building's top was bulldozed and pushed into the main plaza area). We placed a 1m (E-W) x 3m (N-S) trench along the southeastern corner of the main western platform (**Brouwer Burg and Astrid Runggaldier, Chapter 11**). Although there was evidence of disturbance, it was not to the extent reported. Our excavations provide greater insight into the site's post-occupational destruction, as well as its construction history. While no intact stone walls were found, intact floor surfaces constructed of re-deposited midden were identified. Within these contexts several discrete deposits of disarticulated human remains were identified along with associated grave goods, including a jade bead as well as ceramics that appear to date to the Late Preclassic (500 BC-AD 150). Osteological analysis of the Hats Kaab burials revealed that at least five individuals were represented and at least two were in primary contexts (see Volume 2, Wrobel 2015).

Excavations at More Tomorrow and Jabonche

During the January 2015 season, our investigations in the middle Belize Valley also included a test pit (Operation 25) at the site of More Tomorrow, located just downstream from Hats Kaab and the site of Saturday Creek (**Figure 1.1**). Operation 25 was placed to the east of Structure 7 where a roughly hewn stone monument was identified on the surface, along with an associated line of stones thought to represent a wall (**Flanagan and Frederick, Chapter 14**). The configuration of the wall and the rough cut of the stone monument resembles other re-

erected monuments from the Postclassic period found elsewhere in the Maya Lowlands. However, our excavations revealed a highly disturbed context with no Postclassic diagnostics and this enigmatic context was difficult to interpret as we found no other wall clear orientation to the line of stone wall or the associated monument.

Excavations during the second half of the January 2015 season shifted further downstream to the site of Jabonche, located on Black Creek just off the Northern Highway in the village of Biscayne. While mapping was underway, the BREA team conducted several excavations including one on Structure 13, a building containing large stone columns that was placed in the center of the southernmost plaza group (**Harrison-Buck, Chapter 15**). This building appears to have been terminated in antiquity as the stone columns were broken and found strewn about and very little in the way of intact walls were found despite our broad horizontal exposure. Two smaller 1 x 2 m test excavations also were conducted at Jabonche in the northernmost part of the site where a series of smaller residential-style plazuela groups were targeted for midden deposits, aimed at better understanding the occupation, diet, and resource-use of the inhabitants over time (**Flanagan, Frederick, and Harrison-Buck, Chapter 16**).

Conclusions

This report offers a comprehensive look at the results of our year of field and lab work on the BREA project. In my final chapter of this report, I discuss our future directions and goals of the BREA project, both long-term and immediate plans for the upcoming season, which will build upon our work from 2014-2015. While we do not plan to hold an excavation season in the summer of 2015, we plan to carry out a short lab season for artifact processing and analysis. Our plan for 2016 is to continue with the survey, mapping, and excavation of select sites in the middle and lower reaches of the Belize Watershed.

One of our long-term research objectives is to develop a more comprehensive settlement history for the eastern Belize Watershed and better understand its broader relationship with other parts of the Maya Lowlands, including the upper Belize Valley and Peten region to the west, as well as areas to the north where some of the largest tracts of perennial wetlands exist in all of Belize. Here, modified wetland features have been recorded (Pyburn 2003) and our own inspection of satellite imagery has revealed much more extensive wetland modification than previously known, with extensive canals, ditched fields, and hydrological features that will be the focus of future BREA investigations (Harrison-Buck 2014).

Our research is revealing a deep history of the eastern Belize Valley, which begins in the Preclassic and continues through Colonial times (Harrison-Buck et al. 2012, 2014). Given the continual occupation, this area offers an ideal context in which to review the changes taking place during periods of significant cultural transformation in Maya history—first during the Preclassic-Classical transition, then later during the so-called Classic Maya “collapse” period, and finally during the Spanish Conquest in the sixteenth and seventeenth centuries. Through our

continued investigations in the eastern Belize Valley, we aim to expand our understanding of the social, political, and economic changes that occurred in this area through time and reveal the rich cultural and environmental diversity that this area has to offer.

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Section I

Survey and Mapping

Chapter 2

Filling in the Gaps along the “Overland Route: Further Survey and Reconnaissance Between Saturday and Labouring Creek

Alex Gantos

The primary objective of the June 2014 reconnaissance and survey team was to further investigate the area around the north-south overland route connecting the Yucatan Peninsula in the north with central Belize. This transportation corridor known from colonial times continued to be used until the late 19th century, and it is possible that it has greater antiquity, into the pre-hispanic period, for connecting the Chetumal and Dzuluinicob Maya provinces. Recent GIS-based analysis by BREA team member Marieka Brouwer Burg has provided potential courses of this overland route between the Belize River and New River Lagoon and has identified two most likely paths (Brouwer Burg et al. 2014). The first route travels southward through New River Lagoon to its headwaters (Ram Goat Creek) then crossing overland to Labouring Creek with its shallow ford at a natural travertine bridge near the confluence with Cut-and-Throw-Away Creek then continues overland skirting the large and small Colorado Lagoons before arriving at the Belize River near Saturday Creek (**Figure 2.1**). A second route may leave New River lagoon without entering Ram Goat Creek and traversing overland east and south through pine ridge, or *pinal*, until crossing Labouring Creek at a point lower down from the “travertine bridge”, perhaps nearer to Whitewater Lagoon (**Figure 2.1**).

In addition to ground-truthing the results of the GIS Least Cost Path (LCP) analysis we felt it important to record all cultural remains due to destructive agricultural practices now taking place in this part of the BREA project study area. We specifically targeted the areas on the Norris 1/50,000 map shown as McRae (to the south) and Meditation (to the northeast), which has recently been clear-cut and bulldozed in preparation for sugar cane cultivation (**Figure 2.2**).

This approximately 15 sq. kilometer pedestrian survey area is bounded on the north by Labouring Creek, to the west around the Colorado Lagoons and their north flowing drainage towards Cut-and-Throw-Away Creek, on the east a transect running north-south along a line from the modern quarry, and on the south by the BREA project site of Hats Kaab (**Figure 2.3**). This area comprises several ecological zones including *bajo* (wetland), hilly limestone outcrops, dense forest vegetation (previous to the clear-cutting), and riverine/lacustrine wetlands. The effects of the bulldozing has caused much of the bajo area to dry, and has also altered the flow of the Colorado Lagoon drainage as well as possibly restricting the flow of Cut-and-Throw-Away Creek. In terms of research it has provided excellent visibility for subtle topographic gradations, mounds and structure platforms, and surface artifacts.

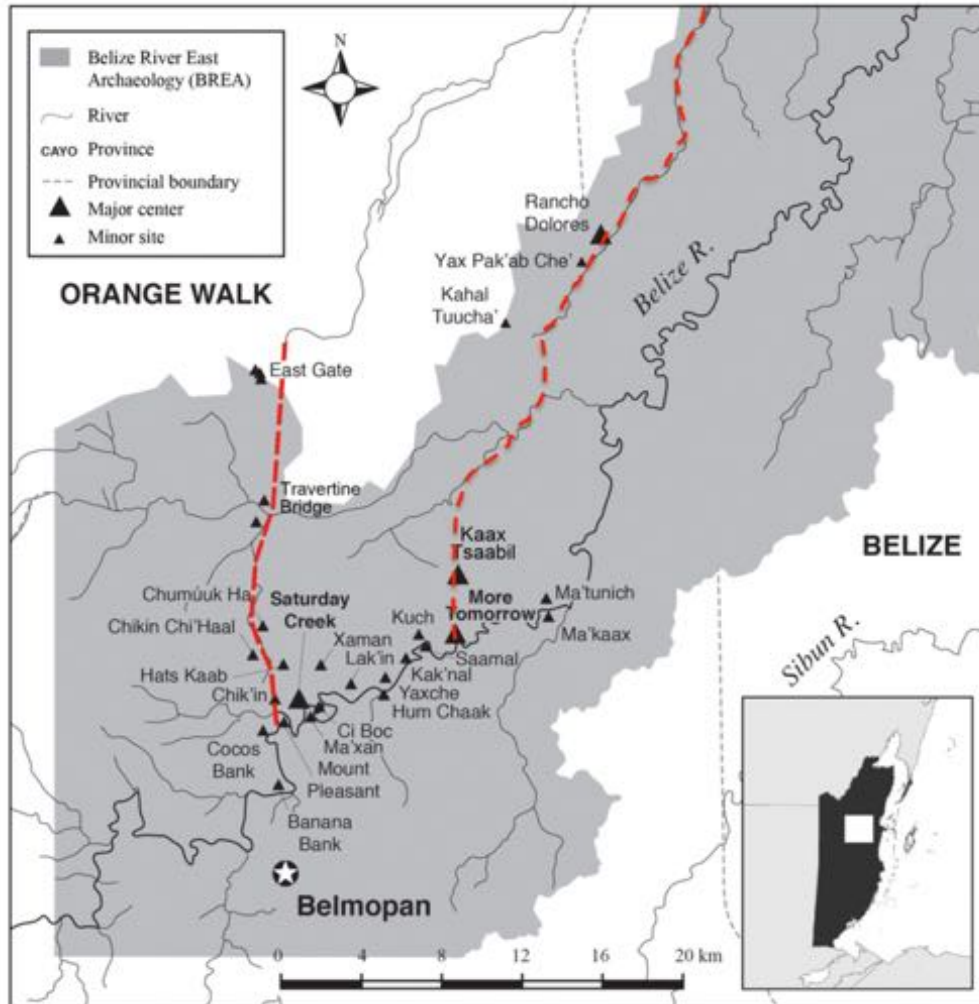


Figure 2.1 BREA map showing the two GIS Least Cost Paths (LCPs) (LCPs and Map prepared by M. Brouwer Burg).

The primary goals of the 2014 pedestrian survey and reconnaissance were to:

1. investigate the area around the confluence of Labouring Creek and Cut-and-Throw-Away Creek for historic/colonial evidence, particularly for evidence of the short-lived 19th century ex-confederate settlement of New Richmond;
2. locate the previously recorded site of Chu'umuk Ha and expand the survey around the settlement now that the area has been cleared for agriculture in order to determine how it articulates with the E-Group at Hats Kaab; and
3. record ancient Maya settlement and associated surface artifacts within the areas called McRae and Meditation which has recently been cleared for agriculture and cultural remains are now considered to be at high risk of destruction.



Figure 2.2 Photograph showing the clear-cutting destruction and surface visibility (photo by A. Gantos).

The ethnohistoric literature and colonial history relating to this area has been summarized in previous BREA publications (Buck, Harrison-Buck, and Divoll 2013) and therefore will not be discussed in this report. The report of earlier investigations at the site of Chu'umuk Ha can be found in Chapter 6 of the 2011 BREA field report (Kaeding and Murata 2011).

Investigations of New Richmond

The reconnaissance team was composed of Alex Gantos and two local men, Antonio Martinez and Wilbur Martinez, who are from the Saturday Creek area and are familiar with the forests and hunting paths around our destination of the confluence of Labouring Creek and Cut-and-Throw-Away Creek. Our goal was to follow up on David Buck and Tim Divoll's investigation in the same area conducted during the January 2012 field season. At the time Buck and Divoll were at the end of a long SE-NW overland transect and where they recorded both ancient settlement and intriguing scattered historic remains, but they were not able to identify any particular artifact locus that might suggest the location of the 19th century settlement of New Richmond founded by former U.S. Confederate Rev. B.R. Duval in 1867 (Buck, Harrison-Buck, and Divoll 2013). They had been particularly hampered by storm damaged and fallen trees and subsequent wildfires, as well as swampy areas to the east, and had not been able at the time to expand the investigation. In 2014 we chose to approach the area from the north, locate and cross at the travertine bridge then investigate the higher areas left unexplored in 2012.

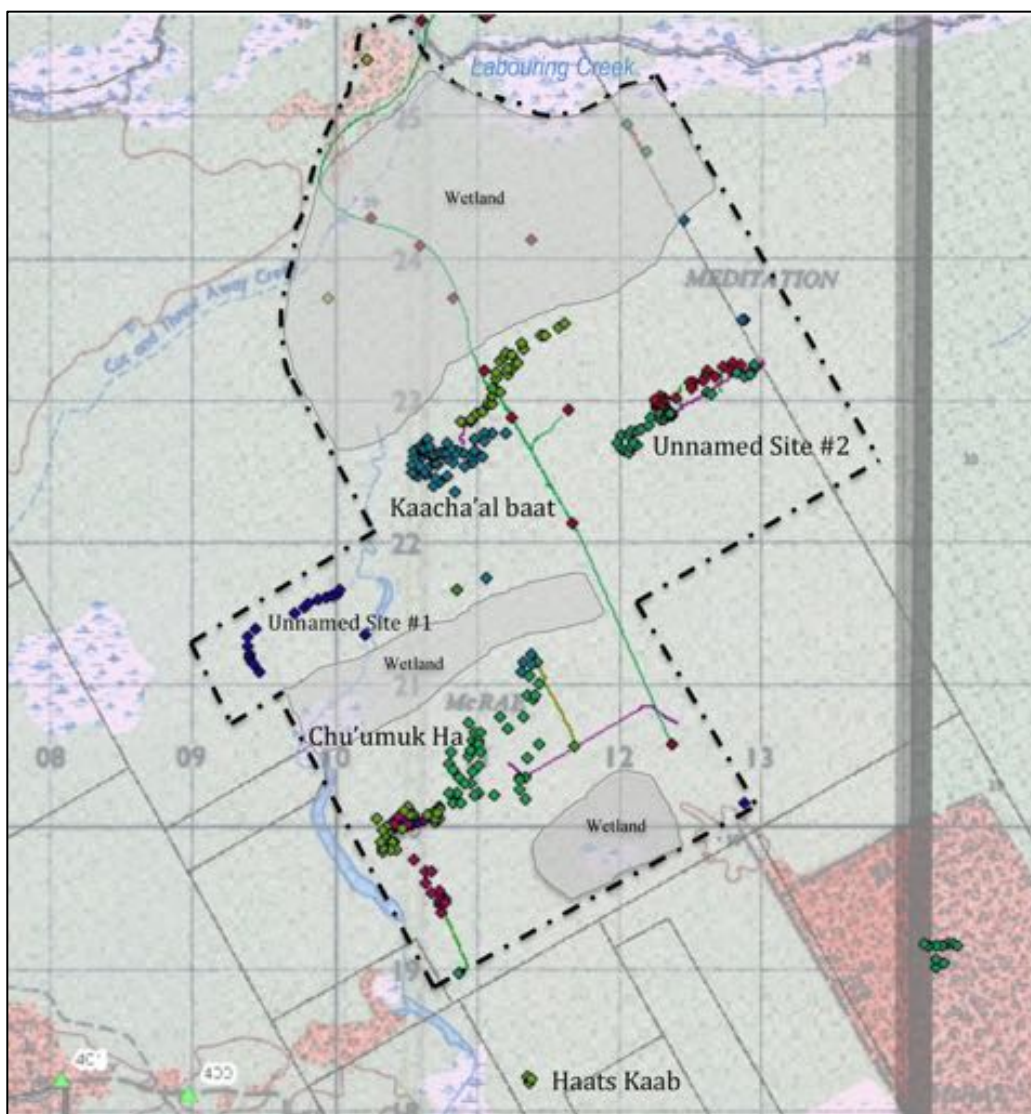


Figure 2.3 Map showing the survey area- with boundaries marked, mounds, locations of platform/elite groups, and locating the wetland areas (Map prepared by A. Gantos).

Cut and Throw Away Creek Area

On our approach from the north we crossed a small stream over a ruined modern bridge and encountered the group of mounds located in 2012 by Buck and Divoll, which we named Chu'ul Ximbal (Buck, Harrison-Buck, and Divoll 2013). At the approximate location of Mound 8 we relocated the chamber pot mentioned in that previous account. The area was very overgrown with grassy underbrush making visibility poor and no other colonial artifacts were noted. Further to the SE we encountered the travertine ford of Labouring Creek and crossed to the point of land inside its confluence with Cut-and-Throw-Away Creek (**Figure 2.4**). We

proceeded upstream along the right bank of Labouring Creek penetrating inland (south) from the bank whenever there was a break in the brush. No mounds or other ancient materials were visible but there was evidence of colonial presence in the form of several dark glass bottles. One in particular had a concave base but was very small with only a 9 cm dia. There was no other evidence of settlement and this may have been random refuse associated with crossings of the creek. Of particular interest were the multiple beddings of travertine that were identified on this reconnaissance trip, which provide more than one crossing point over Labouring Creek (**Figure 2.4**). Pictured are two of the shallow edges that could have been fords of the creek.



Figure 2.4 Two crossings of Labouring Creek using travertine beddings (Photos by A. Gantos).

As we moved toward the site named Liik'il by Buck and Divoll (2013), we encountered numerous rocky mounds, although many did not have a clear mound-like articulation. Several had eroded ceramic material but many did not. In this area the fallen trees encountered during the previous survey were still a significant obstacle and in addition the thorny regrowth from the fire damage made many of the mounds impenetrable in any systematic way. On the mounds that we were able to investigate more fully there appeared at first sight to be numerous mounds on irregular platforms but on closer investigation they often appeared to be natural formations of large limestone rocks. As we moved further inland toward higher ground, where Buck had suggested potential colonial settlement, we found only more irregular stone piles but without accompanying artifacts. As we proceeded further south and west around these rocky areas we did find that the elevation did increase but the undergrowth made investigation extremely difficult. While the elevation increased to the west, and may have the characteristics of a satisfactory location for settlement: elevation, acreage, and access to water, it nevertheless is upstream of the shallows and rapids of Labouring Creek, which would have limited transportation and commerce for a community of over 200 families (Duval 1879:41-42). Any further investigation of the area, we surmised from our coordinate location, would best be

accomplished by an approach from the town of Valley of Peace as hunters from that town have made paths to that higher ground.

Considering the stony and hummocky landscape directly around the confluence of Labouring Creek and Cut-and-Throw-Away Creek, we could not envision this landscape to be suitable for the laying out of a town such as Duval envisioned for New Richmond in 1867. As we continued then to follow the course of Cut-and-Throw-Away Creek we found a dense and marshy bajo that was cut by numerous streambeds. There did not appear to be any consistent geography that would suggest a regular and straightforward transportation corridor through this area. At the time of our visit we were only able to make progress of about 100 meters per hour across the bajo which extended for nearly 500 meters from the high ground to the solid ground to the south. During this passage we were not even able to reliably identify the bed of Cut-and-Throw-Away Creek. It is possible that land changes, including the recent agricultural clearing, has affected the flow of the creek but there is no evidence that this ground was ever consistently solid.

Downstream along Laboring Creek

As part of investigations in this area, in particular to understand the landscape that would support the founding of a town like New Richmond as envisioned by B. R. Duval, we followed Labouring Creek downstream along the right bank. Once beyond the bajo areas around the confluence of Cut-and-Throw-Away Creek we found the river slowed, was generally open and free of shallows caused by the travertine beddings. In this area the ground elevation opened onto a wide fertile plain which today has been cleared and under mixed agriculture. In one locale in particular, at the end of the road north of the watch house on Jimmy Dueck's property was a modern drainage canal emptying into Laboring Creek but on closer inspection appears to be a *barkadare*, or ramp-like entry point into the river for logwood or mahogany logs. Just 100 m S of this we found, in the plow zone of the fields, a broad area of artifacts that included fragments of many hand-blown black glass bottles, high-fired ceramic jars, fine decorated ceramics, and also an iron scissor. The lip and base forms of the bottles suggest that they may be late 18th or early 19th century, while the ceramics correspond to a similar time period. The small scissors may be a part of a traveler's kit, or *necessaire*, which were common around this time.

Local informants spoke of an area just east of this point as containing many artifacts of glass and iron, including a 6 foot length of hand-wrought chain and bottles similar to above, but at the time we were unable to secure permission to investigate those fields. The conditions of the landscape in this area include a slight elevation above the creek and fertile well-drained soils. If B. R. Duval had envisioned New Richmond to grow to the size of its namesake, it is quite possible he would have selected a broad plain such as this. While this area is somewhat to the east of the McRae tract of land, it is not so distant (only 1-2 km. east of McRae's NE boundary) and the transportation corridor might conform to a variant of Overland Route 1 or may connect to Overland Route 2, as proposed by Brouwer Burg (Brouwer Burg et al. 2014 [**Figure 2.1**]). As

Brouwer Burg and colleagues point out, a low but elevated area continues to the SW at least as far as the Colorado Lagoon system at Chu'umuk Ha and provides a dry corridor between Labouring Creek and the Belize River. This area, circumscribed by bajo, has evidence of dense settlement during pre-colonial times (as discussed below) and may well represent the path of the overland route (see **Figures 2.1** and **2.3**). In this interpretation the crossing of Labouring Creek would be several kilometers downstream of Cut-and-Throw-Away Creek and lead north to the pine ridge areas to the New River Lagoon (Lamanai) and/or to Chau Hiix via Spanish Creek.

A final note on the possible location of Duval's New Richmond settlement. In Duval's own travelogue published in 1879 he described the location he had selected: "About one hundred and forty miles above Belize the northern [Labouring Creek] and southern branches [Belize River] unite, and about three miles above the fork, on the northern branch, is the place I selected..." (Duval 1879:41) Duval's distances may be seen as the imperfect measuring as he traveled upstream on the meandering Belize River because in fact the E-W width of the country of Belize is only about 70 miles while the channel of the Belize River is at least 170 miles long. Although some of his distances may be exaggerated, it is curious that he writes that his settlement was located just three miles upriver from the confluence. The location as identified by Simmons (2001:87) at the confluence of Labouring Creek and Cut-and-Throw-Away Creek is nearly eleven miles from the confluence and it seems contradictory to Duval's published description.

While our own research into private and government archives have so far failed to turn up unequivocal evidence of the exact location of the land deeded to Duval by Lt. Governor John G. Austin in 1867, it remains quite possible that New Richmond was founded further downstream. The location then, as described by Duval, places the site on the lower navigable section of Labouring Creek just east of Whitewater Lagoon and a short distance (about 2.5 km) away from Spanish Creek. It is most likely that he settled on the southern bank of Labouring Creek as the property to the north had in 1860 been transferred from owners Tillets and Potts to Sheldon, Byars and Co. (London Gazette November 23, 1860). Very interesting to this is the proximity of the large area (>2.5 square km) of open savanna (now largely part of the Jaguar Corridor Wildlife Sanctuary) that may have appealed by its location close to the two rivers and unforested acreage to Duval's vision of a site to establish the city New Richmond. This area corresponds to the Brouwer Burg's GIS Least Cost Path Route 2 (Brouwer Burg et al. 2014) connecting Chau Hiix with More Tomorrow and Saturday Creek on a path leading south along the Pine Ridge then crossing Labouring Creek and skirting Whitewater Lagoon on the savannas and higher trending elevations to cross over to the Belize River. I predict that when BREA project activities identify the location of New Richmond on the ground it will to the east, or downriver, from the area that this year's research has focused on, and closer to the confluence between Labouring Creek and the Belize River in accordance with Duval's own published account. It is perhaps significant that this year's survey and reconnaissance in this very area of Meditation has shown a clear trending of settlement distribution spreading from SW to NE toward the lower reaches of Labouring Creek.

Settlement Distribution at Meditation and McRae

Due to the clear-cutting and bulldozing of nearly 10 square kilometers of forested land to convert it to sugar cane cultivation the team set a high priority on conducting surface reconnaissance while there was clear surface visibility but before plowing blurred the shape and articulation of any anthropogenic landforms. This survey zone is located in the areas of McRae and Meditation as noted on the Norris 1/50,000 map. The area studied is important because it expands previous reconnaissance conducted to the south and west, and would produce a research transect extending from the Belize River north to Labouring Creek. This district, in addition to having close proximity to the Saturday Creek site core and the E-Group at Hats Kaab, would allow the project to test the hypothesis that a major north-south overland transportation corridor passed through (Brouwer Burg et al. 2014; Buck, Harrison-Buck, and Divoll 2013; Harrison-Buck 2010; Harrison-Buck, Kaeding, and Murata 2013; Harrison-Buck, Murata, and Kaeding 2012).

The research was conducted over a total of 11 days during June, during which the weather was generally clear and dry allowing broad foot coverage of much of the area. The general land elevation did not vary more than several meters allowing for excellent visibility of any surface relief. With the exception of several possible colonial sites noted above the archaeological evidence was in the form of man-made platform and house-mounds along with any associated small artifacts disturbed by the bulldozer. Artifact categories included coarse and slipped ceramics, lithic blades, tools and debitage of chert and obsidian, and *manos* and *metates* of granite. No figurines, beads, carved stone, or worked shell were observed. Only small samples were collected, and each mound location was recorded using the Trimble GeoHX handheld GPS unit. Overall more than 215 mounds were recorded included those of 7 large platform or plaza groups. In addition the articulated distribution of the mounds clearly identified individual settlement groups. Of the four main settlements, two have been named from previous exploration: Chu'umuk Ha (Kaeding and Murata 2011) and Kaacha'al baat (Buck, Harrison-Buck and Divoll 2013), while the other two remain as yet unnamed and will be referred to as "Unnamed Site #1" and "Unnamed Site #2."

East of the Colorado Lagoon System

Chu'umuk Ha area

In 2011 the BREA reconnaissance team investigated an area around the Colorado Lagoons north of Saturday Creek and Hats Kaab (Kaeding and Murata 2011). At the time the east side of Colorado Grande had just begun to be cleared for small scale farming. They recorded several individual mounds and one large plaza group, and assigned the name Chu'umuk Ha (Kaeding and Murata 2011:35). It was unclear to the team at the time to what extent the

settlement continued into the forested area to the north and east although they had noted that there were mounds continuing into the brush. Over several research days during the 2014 season, the reconnaissance team, consisting of Alex Gantos, Astrid Runggaldier, Marieka Brouwer Burg, Alan Jones and Antonio Martinez Jr. returned knowing that the recent bulldozing had cleared up to that area. We located the plaza group Kaeding and Murata called the “West Plaza,” and with greater surface visibility we were able to understand the layout of this settlement.

We approached from the south, departing from Hats Kaab and crossing flooded rice fields for about 800 m in a N-NW direction. In the rice fields we noted continuous ceramic and lithic fragment scatter but the fields had been completely artificially flattened for rice agriculture and no mounds or other constructions were seen. As we moved from the rice fields into the recently cleared and bulldozed areas we did not see any mounds or stray artifacts for nearly 500 m. Then, when we came to a point just east of the southern reach of Colorado Lagoon we began to encounter isolated mounds that were not arranged in any kind of plaza group. We recorded data from 12 mounds distributed along an axis of about 300 meters SE to NW which were part of a group that included many more visible mounds to the west along the banks of Colorado Grande. We were unable to access that area due to livestock grazing but there were at least another 12 to 15 visible mounds. Each of the mounds investigated had a similar profile although the diameter ranged from 8 m. to 17 m. dia. with the elevation at the highest point being between 0.5 m. and 1.5 m. Because this area had recently been bulldozed the surfaces of the mounds were disturbed and most mounds had visible construction debris in the form of irregular stones as well as artifact scatters. The artifact categories included slipped and unslipped ceramic sherds, lithic debitage of chert, and groundstone mano and metate fragments. Samples such as seen in **Figure 2.5** were collected and recorded for analysis.



Figure 2.5 Typical artifact assemblage from exposed mounds (Photo by A. Runggaldier).

From this point we noted to the SE on the summit of the hill on the property of Gallardo a large pyramidal mound perhaps 15-18 m in height at the top of a natural rise visible from other areas east of the Colorado Lagoon, as well as other mounds and perhaps an artificially leveled platform (**Figure 2.6**). The scale of this plaza group suggests a major public center which unfortunately we did not have permission of the owner to investigate. This possible acropolis settlement should be a future objective of research in this area in order to more fully understand its articulation with the smaller settlements or surrounding residential areas, its relationship with the E-Group at Hats Kaab, and its role as a major node in the transportation corridors through this region.



Figure 2.6 Pyramidal mound, level platform and associated mounds on hilltop of Gallardo property (Photo by A. Runggaldier).

As we proceeded N we encountered the West Plaza of Chu'umuk Ha recorded in 2011 and expanded the survey to the north and east. The West Plaza group is located about 350 m. east of Colorado Grande Lagoon and the area between the two contained an additional 14 mounds. Most were isolated mounds, but one was a small platform group of three mounds sitting on a low platform that measured roughly 13-x-20 m. The West Plaza group has been described and illustrated previously (Keading and Murata 2011: 35-37) as having a high platform of about 38-x-38 m with a large elevated platform building on the west and lower range buildings on the south and east sides. On the north side was a freestanding small pyramidal

structure. During our investigation, due to recent land clearing, we were able to further record a second plaza group and a large residential platform group that consisted of clusters of structures at either end separated by a low terrace (Figure 2.7).

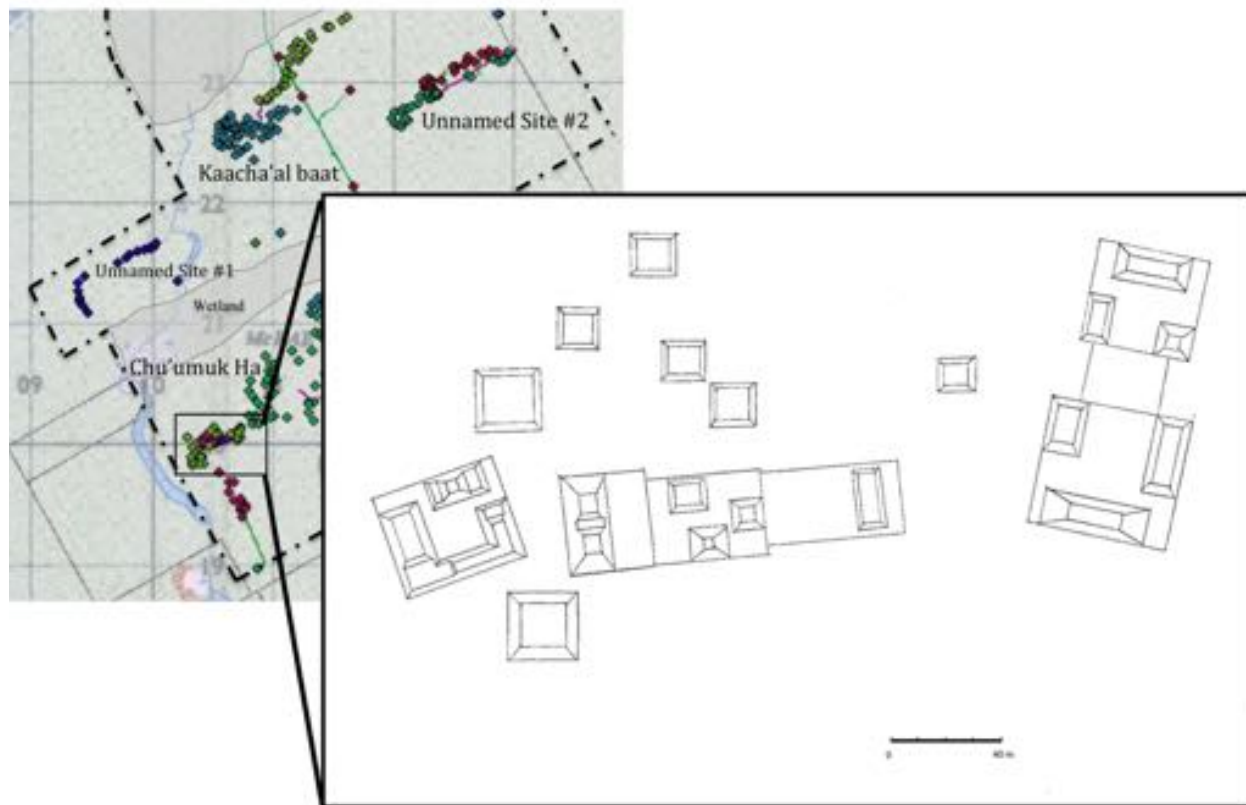


Figure 2.7 Chu'umuk Ha rectified drawing (oriented north) of the site core (Map prepared by A. Gantos).

The second plaza group at Chu'umuk Ha, which we call the “East Plaza” was also on a raised platform that measured about 35 m. N-S and 125 m. E-W. Like the West Plaza, the East Plaza has a large elevated platform building on the west and a clearly articulated range building but on the north. In addition, it has a large pyramidal structure of about 5 m. high on the south, and smaller isolated mounds on the east. This core area extended only for about 35 m. E-W and the remaining area (90 m.) of the platform has no visible mounds. Only at the far eastern end of the platform did we encounter a dense scatter of ceramics, debitage and groundstone fragments along with stone construction debris.

On the north side and south sides of the plaza groups at Chu'umuk Ha there were several very large isolated mounds measuring up to 25 m. in diameter, each with a dense scatter of ceramic artifacts on the surface. To the east the natural elevation dropped several meters to a wetland. Rising out of the wetland about 50-70 m. to the east of East Plaza is a long N-S platform of about 100 m. having structures at either end. On the north there was a high platform structure with a lower range building on the west. On the east side, across an open patio, is a

free standing perhaps pyramidal mound. The structures on the southern end consist of a low range building on the west with two single structures to the SE and E, respectively. Between these is a wide terrace, lower than each end, which connects the north and south platforms into two facing U-shaped groups of structures. This concentration of two plaza groups and large elite platform group clearly marks the core of a settlement on the banks of the Colorado Grande Lagoon.

Further survey of the Chu'umuk Ha area to the north and east confirmed that this settlement was much more extensive than initially thought. To the east is a group of eight mounds, four individual mounds and two groups of two mounds on a small platform, and to the NE are 36 single mounds or two-mound groups extending in a loose line over the distance of a kilometer with the northern-most six mounds being at the edge of a long SW-NE ranging bajo. This linear distribution of mounds does not appear to be a sampling bias because during pedestrian survey transects we covered areas to the west, including the approximately one kilometer of dry ground to the Colorado Lagoon, and to the east for at least a kilometer. In those areas there were no mounds visible and no stray artifacts encountered. In summary, the settlement distribution of the Chu'umuk Ha site (comprising two plaza groups, one large platform group and more than 90 isolated mounds or small groups along the banks of Colorado Grande Lagoon and stretching NE until the bajo zone, with clear delineation from the transect evidence) indicates a linear layout suggesting that the structures would have been located loosely along a transportation corridor (see **Figure 2.1**). As will be discussed below, this linear SW-NE configuration, corresponding with higher ground, is repeated at least four other times between the Chu'umuk Ha settlement site and Labouring Creek.

Expanding on what Kaeding and Murata had recorded previous to land clearance, this season's investigations revealed that the site of Chu'umuk Ha now appears to be of significantly large size, having a complex configuration of platforms and structures that may represent a long occupational history perhaps beginning as early as the Preclassic based on preliminary analysis of surface collection (Astrid Runggaldier, personal communication 2014).

Kaacha'al baat

Investigation into the NW sector of the study area revealed another settlement concentration with characteristics similar to Chu'umuk Ha. This site, called Kaacha'al baat by Buck and Divoll, was crossed along its narrow section during their January 2012 reconnaissance in this area (Buck, Harrison-Buck, and Divoll 2013). At the time they recorded and noted several isolated mounds and some surface artifacts, but the area had not yet been cleared and they had very low visibility in the thick vegetation. The 2014 clearing and bulldozing exposed the entire site of Kaacha'al baat. The site core, identified by its large plaza group, lies about 2.5 km. north of Chu'umuk Ha and 300 m east of the creek draining the Colorado Lagoons. The surrounding settlement extends in a SW-NE trending line for more than a kilometer (**Figure 2.3**). Kaacha'al baat settlement is separated from Chu'umuk Ha to the south by low bajo area about

500 m. wide. Interestingly, the northernmost six mounds of Chu'umuk Ha cluster along the edge of the bajo but to the north on the Kaacha'al baat side there is only a single mound and 600 m separating it from the core settlement of Kaacha'al baat. Extensive transects to the east and west, in areas of similar visibility, failed to identify any mounds or any artifacts on the surface. This relationship is curious as it may suggest a point of contact between the two settlements. The northern boundary of the Kaacha'al baat settlement appears to be determined by bajo area between it and Cut-and-Throw-Away Creek. It is unclear whether this bajo was the same in pre-modern times. It is quite possible that this area is draining and drying out due to the recent destruction of its forest and subsequent preparation for agriculture. The center of this site certainly is around the only plaza group of the settlement. It is a large, multi-level platform consisting of seven structures over three patio groups (**Figure 2.8**). The upper level group measures about 48 m. E-W by 38 m. N-S and has an overall N-S length of 90 m. Similar to the plaza groups at Chu'umuk Ha, the largest structure (about 4 m. in height) is on the west with a lower range structure attached to its south side. On the north side of the core is a large (about 3 m. in height) range structure, then a single perhaps pyramidal structure closing off the east side of the core. Around this core to the north, south, and east are wide circular mounds suggesting free-standing structures on each of the outer terraces.

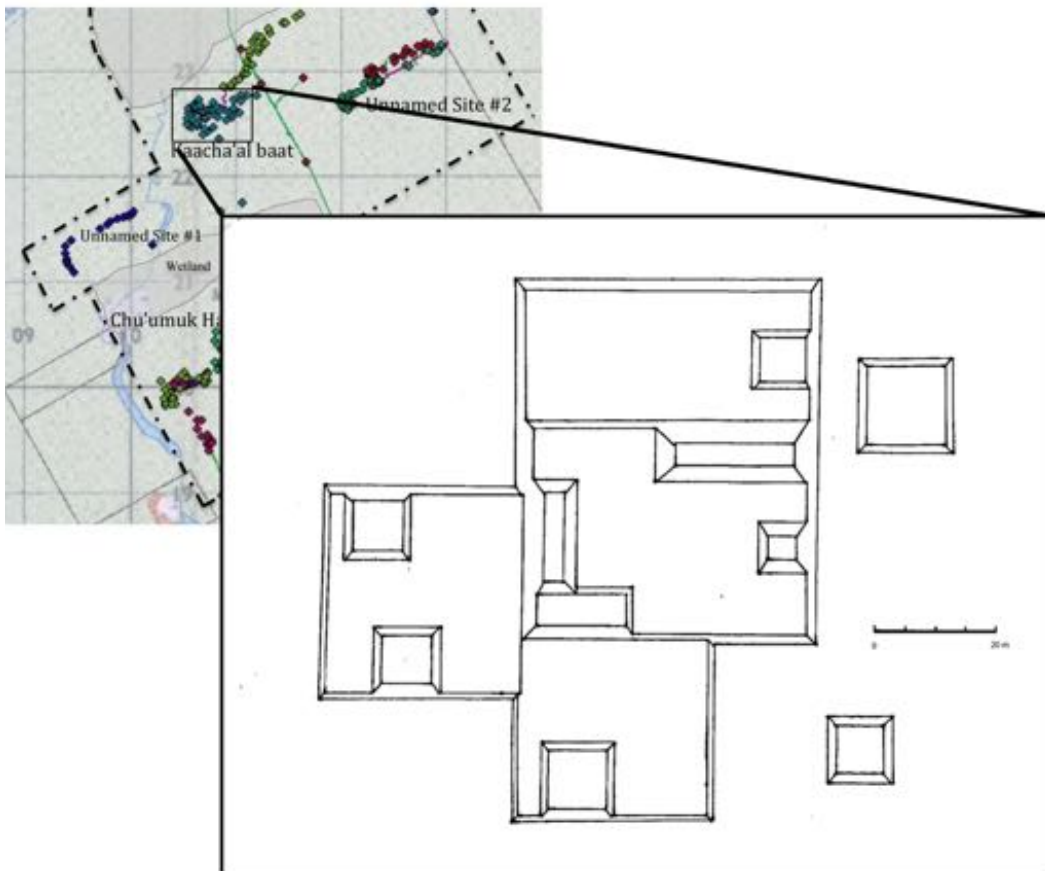


Figure 2.8: Kaacha'al baat rectified drawing (oriented north) of the site core (Map prepared by A. Gantos).

There was a considerable amount of destruction to these mounds from the action of the bulldozers, perhaps due to their height, and in the debris of the construction materials there were large quantities of accretionary travertine limestone nodules and tubes resembling speleothems (**Figure 2.9**). Rather than cave formations, these were more likely quarried from Unnamed Site #1 (1.5 km SW), as will be discussed below. The use of this material was also noted farther to the east at the plaza of Unnamed Site #2 (3 km from the quarry).



Figure 2.9 Travertine limestone used as construction fill at Kaacha'al baat (Photo by A. Jones).

In addition to the plaza group a further 79 mounds were recorded in the Kaacha'al baat area, distributed along a SW-NE axis over a distance of 1.7 kilometers. The artifacts of all the sites in this area had similar characteristics, with large concentrations of ceramic sherds and lithic material at the core and on many of the isolated mounds, but also clear indications (from bulldozer gouging) that some mounds had few or no artifacts suggesting alternate use spaces distributed around the settlement. While it was noted that sometimes a mound with artifacts would be in close proximity to one without, this was not always the case. One artifact category to note is granite groundstone tools, in particular manos and metates, which are found in large quantities. On many mounds the fragments of multiple manos and metates (roughly differentiated by the different granite types, size and shape, and break patterns) would suggest more than just food production was taking place at these locations (**Figure 2.10**).



Figure 2.10 Granite groundstone artifacts from a single mound at Kaacha'al baat (Photo by A. Gantos).

Like the pattern of distribution of the mounds of the Chu'umuk Ha settlement there is a long linear pattern suggesting settlement along a transportation corridor. Many mounds are clustered around the site core but the rest are strung out in a 200 m. wide swath extending in a SW-NE direction for about 1.7 kilometers. The site skirts the edges of bajo on the north but does not, even with random mounds, push out into the 600-800 m. higher and dryer area to the south. It is tempting to think that given the large populations of these towns they would have needed extensive land dedicated to agricultural production. If there was broad scale land clearance then there would have been clear inter-site visibility in this landscape whose relief does not exceed 3-4 meters in elevation. The inhabitants of Kaacha'al baat could have been able to feasibly see Hats Kaab, the Saturday Creek site core, and Chu'umuk Ha to the south. To the SE and at a distance of about 1.7 kilometers from the plaza group of Kaacha'al baat, and clearly visible, are the mounds of the site core of Unamed Site #2. The NE-most mounds, however, are only about 1 km. N of that site. It is curious to note that the intervening high fertile ground in between would have to have been divided between the two settlements, although no evidence was recorded that might suggest boundaries.

Unnamed Site #2

To the E and SE of Kaacha'al baat we recorded another settlement concentration comprising a large plaza, residential platform groups, and isolated mounds distributed in a SW-NE axial orientation. This mirrors the settlement pattern seen at Chu'umuk Ha and Kaacha'al baat in both layout and scale. Reconnaissance of Unnamed Site #2 has not yet been completed due to time constraints, but it was noted that mounds continue to the north and northeast of the site plaza, although it was clear that there was no other group with a high elevation profile. More likely, and in keeping with the pattern, single and double mounds will continue for up to 600 m. in a NE direction. There was a clear drop-off in density at the easternmost end of the settlement, which corresponds, I believe coincidentally, with the road that marks the boundary between this recently cleared area and Jimmy Dueck's property to the east (**Figure 2.3**). The plaza group of this settlement had some unusual features, discussed further below (**Figure 2.11**).

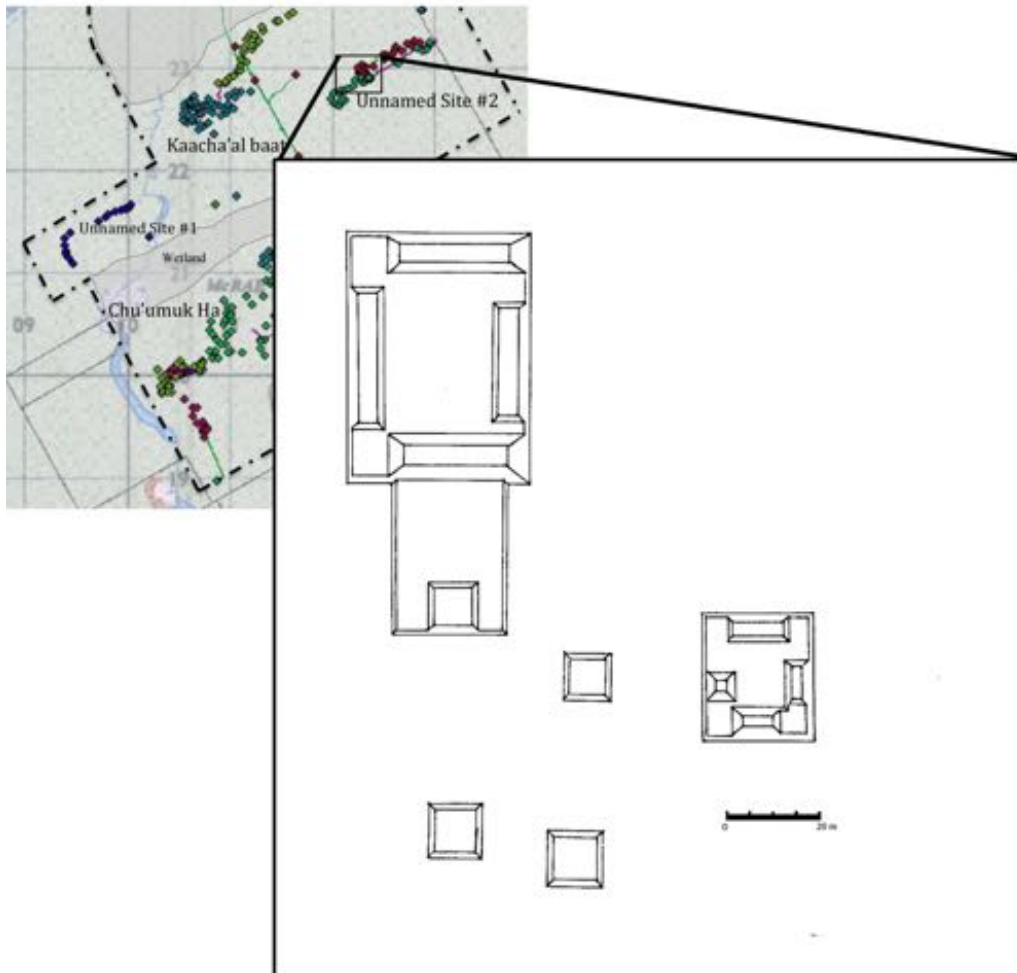


Figure 2.11 Unnamed Site #2 rectified drawing (oriented north) of the site core (Map prepared by A. Gantos).

In size the plaza was larger than those at the other settlements with a main platform measuring 72 m. E-W by 60 m. N-S. The largest structure is a long range structure on the south side, perhaps having a tall structure at the east side of an elevated platform. On the east and west sides of the plaza there are range structures, and the north side was closed by another long range structure. In summary, these four range structures enclosed a large rectangular plaza area that appeared to be entirely paved with small fist-sized stones. There was no evidence for plaster or any binding material, it mostly had the look of very coarse limestone gravel. This curious feature was not seen at any other location in the study area. To the SE of the plaza is a large platform residential group. The platform measures about 24 m. E-W by 20 m. N-S, and the group is composed of an L-shaped range structure on the south and east, a range structure on the north, and a free-standing possibly pyramidal structure on the west side. Along with these two complex groups we recorded another 42 mounds as part of this settlement.

Visible from this site was another group. This was not surveyed this season but was located to the south just outside our survey area. The settlement, even at a distance of about 500 m. away, was clearly also following the pattern of a long linear distribution of low mounds with one area of higher mounds. The orientation of the group would have paralleled Unnamed Site #2 and can be considered a fourth SW-NE trending settlement. During the course of broader recon outside of our survey area we revisited a settlement group further to the east. This site was visited by Kaeding and Murata in 2011 and at that time they documented several of the mounds. Its location is about 2.5 km NE of Unnamed Site #2 in the slightly elevated land between Labouring Creek and Freshwater Creek. During our visit in 2014 we noted a large plaza group, one or two residential platform groups, and numerous mounds in roughly the same SW-NE distribution. Although this site is more than 2 km. from Unnamed Site #2 I am confident that it is another of the settlements sharing the same patterned characteristics, and there may have been other settlements in between. At the time Kaeding and Murata visited the property, the land had just been cleared for agriculture. In 2014 we witnessed the mounds being flattened with a combination of plows and dragged rollers. It is quite possible that these will be obliterated and perhaps other settlement groups in this area have been similarly destroyed.

West of the Colorado Lagoon System

Unnamed Site #1

West and north of the Colorado Lagoon settlement area there are a series of three hills rising out of a generally flat plain. The land elevation in this area is high enough for it to remain dry except as it slopes east down to the Colorado Lagoon drainage. The team, having heard from a local informant that there was a tomb on one of the hills, approached the area from the east crossing the bajo areas of McRae then fording the Colorado Creek between Colorado Grande Lagoon and Little Lagoon (also called Flower Camp). It is worth noting that the recent clearing

of the forest in this area has pushed soil and trees into the creek effectively blocking its course and disrupting the flow and drainage of the area. The three hills are peculiar to the area. While there are general limestone hills and ridge to the north and south, these outcrops contain large amounts of accretionary travertine nodules and tubes. In fact, we assume that this is the quarry source for the similar travertine used as construction fill at Kaach'al baat and Unnamed Site #2.

Settlement in this area differed widely from the sites to the east of the lagoons. For instance, there were no obvious mounds although visibility was very clear, especially since there had been recent burning of all vegetation on and around the hills. It appears that the settlement of Unnamed Site #1 was on natural terraces and slopes of the two northern hills, including the saddle between (**Figure 2.3**). We encountered dense distributions of materials including slipped and unslipped ceramics, chert and obsidian chipped tools and debitage, but recorded few granite groundstone fragments as compared to the large quantities found at sites in the flatter terrain to the east. The quantities of artifacts and thickness of visible strata (cut by the bulldozer) suggest a long occupation in this area.

Interpretations and Conclusions

The overall distribution of the settlements in and around McRae and Meditation, lands in between the Belize River and Labouring Creek, are distributed across the landscape in a general north-south linear fashion although the patterned configuration of the settlements show a SW to NE trending trajectory (see **Figure 2.3**). While there are bajo areas around these settlements that may have contributed to this configuration, there are also many acres of unoccupied fertile ground that could have provided suitable land for more widely dispersed settlement and small-scale farming. However, our survey indicates a series of linear strings of concentrated settlement groupings and this consolidated configuration suggests the presence of a well-trafficked transportation corridor running through this area. In each case, these strings of settlement consist of mounds, both isolated and grouped, which were clustered around a larger residential complex. This series of patterned settlement appears to stretch from the area of Chu'umuk Ha (and Saturday Creek) northeast to a crossing of Labouring Creek somewhere north of Whitewater Lagoon (see **Figure 2.3**). We have indications of dense settlement and land use in that area and propose further recon in the future to refine the settlement data and narrow the location of the north-south overland route using a combination of ground-truthing and Least Cost Path analyses.

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Chapter 3

Additional Reconnaissance of the Kaax Tsaabil Hinterlands

David Buck and Alex Gantos

The site of Kaax Tsaabil was first surveyed and mapped by the BREA team in January 2012 (Kaeding et al. 2013). The site is located on top of a large limestone outcrop and includes three major plaza groups, a small *aguada* and several terra-formed features (Kaeding et al. 2013:Fig. 2.1). In addition, several smaller mounds and settlements were recorded in 2012 immediately to the north and southeast of the site center (Kaeding et al. 2013:Fig. 2.5). The focus of reconnaissance during the January 2015 field season was to extend the survey for settlements around Kaax Tsaabil further to the north, towards Labouring Creek, and also to the south and southwest of the site center (**Figure 3.1**), near the area locally referred to as Brown Water Lagoon, also referred to by some as Black Water Lagoon.

Between Kaax Tsaabil and Labouring Creek

During January 2015, a total of 7 mounds were identified by David Buck during reconnaissance between Kaax Tsaabil and Labouring Creek. Two survey lines were walked north of the main site of Kaax Tsaabil through recently cleared land that was scheduled for sugar cane planting (**Figure 3.1**). Of the seven mounds recorded, they ranged in size from 1m-high platforms with visible stone retaining walls to amorphous earthen mounds less than 0.5m in height. All mounds showed evidence of plow damage with construction material scatter and artifacts disbursed on the surface across a broad area.

The first mound identified included a low rectangular (15-x-6m) platform standing 0.5m in height. The short axis of the platform was oriented approximate 345°. The northeast portion of the platform had a 3-x-3m structure on top of it, standing approximately 1m in height. Ceramic scatter was visible on the surface of this structure. Two other smaller structures (approximately 5-x-6m in dimension; <0.5m in height) were also associated with this structure.

A fourth structure was found directly along the plow line created for the future planting of cane. This structure was approximately 1m in height with a top surface dimension of 4-x-5m. The short axis of the structure was oriented cardinally. A series of three other mounds, also located along the plow line were found further to the north. All three were oriented cardinally along their shorter axis with dimensions ranging from 12-x-5m to 14-x-6m. No cultural material was observed on the surface but their height (and shape) above the surrounding landscape were suggestive of house-mounds or other type of Maya architecture.

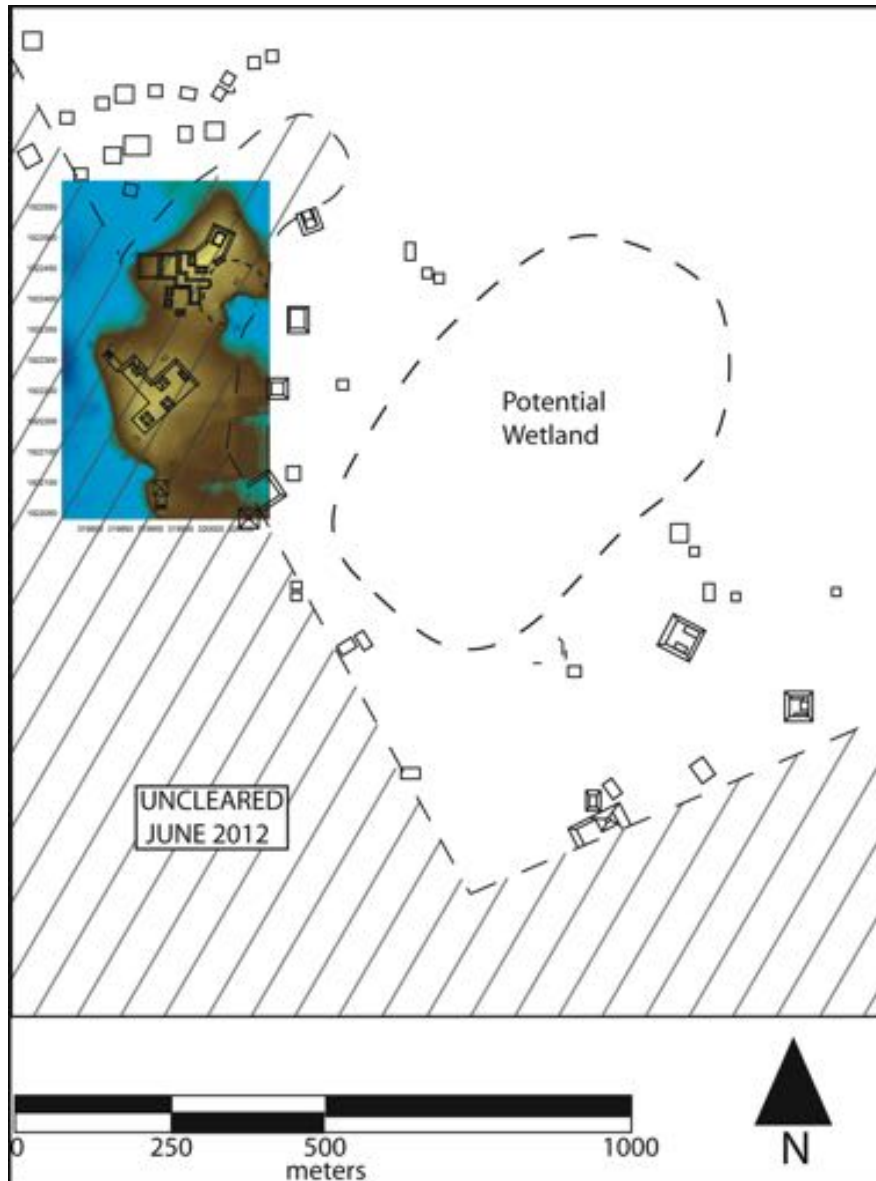


Figure 3.1 Hinterland Settlement in the vicinity of Kaax Tsaabil (map prepared by M. Brouwer Burg).

A second plow line located approximately 50m to the west of the first plow line surveyed also revealed three additional structures. The first structure was a large rectangular platform 1m in height with a basal dimension of 8-x-10 m. The platform was oriented cardinally along its short axis. Lithic material, ceramic sherds, and limestone were all visible on the surface.

Further to the north along this second plow line, two additional structures were found. The first mound, approximately 0.75m, was heavily impacted by the plow and difficult to ascertain an accurate dimension or orientation of the structure. The second mound also was heavily plowed but included limestone construction material on the surface as well as dense scatter of ceramics and lithic debris. In addition, two large metate fragments were observed in

the northeast corner of the structure (**Figure 3.2**).



Figure 3.2 Two large metate fragments found in the northeast corner of structure.

The pedestrian survey northward from Kaax Tzaabil ended at the edge of an extensive wetland area, associated with the riparian zone of Labouring Creek. Future reconnaissance in this sector of the BREA study area will focus to the east and north along the edge of Labouring Creek and along higher ground within the future cane fields scheduled to be planted in 2015.

Additional Recon South of Kaax Tsaabil

The original settlement reconnaissance conducted in 2012 was extended further to the south by approximately 200 meters during summer 2014 by Alex Gantos. Two additional structures as well as a larger platform group were identified within the forested area (see Kaeding et al. 2013:Fig. 2.5). Two structures were located immediately to the south of the

cleared land. Both structures were heavily looted with crisscrossing looters pits and two shallow tunnels entering from the NW side of the structures. Multiple rim sherds, body sherds and what appeared to be historic earthenware sherds were observed on the surface. Further to the south within this forested area, a patio group of two mounds situated on a platform structure also were observed.

South and West of Kaax Tsaabil - Brown Water Lagoon

Informants living within the study area had previously reported mounds located on the banks of an area locally referred to as Brown Water Lagoon (**Figure 3.1**). A visit to the area by David Buck in January 2015 revealed two large, heavily looted structures built upon a large platform. The platform was oriented parallel with the lagoon, its long axis running N-S. The dimensions of the platform were difficult to accurately estimate but the total length N-S was a minimum of 60m while the E-W dimension varied with a maximum width of approximately 40m. The height of the platform at its eastern edge was approximately 1m sloping gently towards the west and the lagoon.

The two structures on top of the platform were oriented cardinally. The northernmost structure was the smaller of the two with a basal dimension of 12-x-14m. The pyramid rose to a height of approximately 2.5m in height with an upper platform that measured approximately 10-x-8m. This northern pyramid had an extensive looters trench that cut from the northwestern edge of the structure to the approximate center and ran 8.5m long and 2.5m wide at a depth of approximately 2m.

The southern pyramid was approximately 10m to the south of the northern pyramid and measured 18-x-16m at its base. It rose to a height of 3.5m with an upper platform of 10-x-10m. This pyramid also had an extensive looters trench cutting from the northwestern corner of the structure towards the center and was a similar dimension (approximately 8.5 m long, 2.5m wide and 2m deep). In addition, a single looters pit was also dug towards the southern edge of the upper platform that was 2-x-3m in dimension and dug to a depth of approximately 3m (**Figure 3.3**).

Some diagnostic ceramic material on the surface was collected from all three looters trenches. Although the context of these artifacts is lost, they may provide information on approximate timelines to bracket the construction phases for these two large structures.



Figure 3.3. Looters pit dug into the southern edge of the southern structure at Brown Water Lagoon. Survey assistant Jonathan Giron is shown for scale.

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Chapter 4

Re-Mapping the Saturday Creek Site Core

Satoru Murata, Brett Houk, and Joshua Beaucher

Introduction

A part of the Saturday Creek Site (hereinafter SC) including its core was originally mapped by Lisa Lucero and her team in 1999 and 2001, using GPS, tape, and compass (Lucero 1999, 2002). The Belize River East Archaeology (BREA) project complemented the above with GPS data of numerous mounds in the periphery of the SC core (Murata, Kaeding, and Harrison-Buck 2011) as well as with a total station-generated map of Hats Kaab (Murata 2011a), now considered a part of greater Saturday Creek. Having recognized the significance of the site over the course of our research, the BREA team decided to direct efforts to study the site core intensively, and in January 2014, commenced mapping and excavation. Mapping was continued in summer 2014, by the end of which the majority of the site core was covered; the resulting map is presented in this chapter.

The object of the current mapping project at SC is to provide a detailed topographic map of the site core using the total station, in order to aid in our excavations as well as to acquire a better understanding of the site core configuration. Mapping was directed by Murata and Houk during the January season, and by Murata assisted by Beaucher in the summer season. As in previous years, BREA field school students participated in the mapping process during both seasons. The January field school season specifically focused on mapping techniques; thus the students received intensive training and were tested on the mapping of one of the structures in the main plaza.

The generated map is complementary to the topographic map of the greater Saturday Creek area, created using drones and photogrammetry, as outlined by Willis and Walker in the following chapter. The combined results of these two mapping programs will provide us with one of the most expansive and detailed map of a Maya site that presently exists for the Belize River Valley, a testament to the utility and efficacy of drone mapping in open fields as well as the necessity of traditional total station mapping in still-forested areas.

Methods

As in the previous seasons, the main datum used to map SC has not been “tied in” with nearby survey markers and thus the map is fundamentally “floating” in three-dimensional space. We employed the same technique described previously in detail (Murata 2011a), using a Trimble

GeoXH GPS to establish two reference points on the landscape to orient our map. As previously explained, while the map is technically "floating," the technique we used ensures that its geographical placement is erroneous by at most several tens of centimeters—determined by the accuracy of the handheld Trimble GPS unit—and its orientation is accurate to within 0.1 degrees of true (UTM) north.

A steel rod (rebar) was placed on the top of the northern structure (Str. 20) of the main plaza as the "master" datum for the BREA mapping project of SC, which we call Station 1, and to which was assigned UTM coordinates (North American Datum 1927) taken from the GPS (**Table 4.1**). As usual, the elevation data from the GPS was assumed to be much less accurate than the horizontal coordinates, and thus we rounded the given figure to the nearest multiple of five, and assigned Station 1 the temporary elevation of 50 m above mean sea level (AMSL). A second rebar was placed just to the south of an unpaved road around 600 m to the north of Station 1; this "Station 2" functioned as the master back sight point for our SC map, using the technique mentioned above. Thus, the accuracy of the geographical placement and orientation of our map depends first on the accuracy of the assigned values for these two points. This means that accuracy can be improved in the future with better GPS or other geospatial technology.

With the total station occupying Station 1 and using Station 2 as the back sight, a third rebar (Station 3) was placed on the plaza floor of the North Plaza to the south of Station 1 to serve as the primary back sight point for the mapping of Str. 20. Thenceforth, a total of 40 stations (rebars) and 30 wooden "stakes" were placed throughout the site to create the map (see **Table 4.1**). It should be noted that all of these reference points are essentially "side shots" off of Stations 1 and 3, and we have not carried out the so-called "closing the loop" step with any of them to distribute the cumulative errors introduced each time we set up a new station/stake across all the reference points. What this means is that farther the points from Station 1, the greater the cumulative error. In practice, this amounts to at most few tens of centimeters at the farthest end—assumed to be accurate enough for our purpose. Nevertheless, these may all be further corrected in the future, if required, by adjusting the coordinates of the stations/stakes (along with their offshoot data points) with the kind of improved positional technology mentioned above.

While an optimal mapping environment demands a near total clearing of the vegetation, this was neither practical nor desirable considering time-constraints and site preservation. Therefore, although some structures (e.g., Str. 20) were almost completely cleared, other structures were mapped by strategically placing one or more reference points thereon, usually along the long axis of the structure, then having the hired local workers cut radial lines of sight from these points, along which we measured data points for the topographic map. Plaza floors and other relatively flat areas across the site were also left mostly intact, again using radial lines of sight to acquire the minimum required topographic data (**Figure 4.1**).

ID	NORTHING	EASTING	ELEVATION
STATION01	1916129.90	312295.65	50.00
STATION02	1916740.76	312218.63	45.49
STATION03	1916107.56	312302.57	46.12
STATION04	1916073.01	312298.94	46.63
STATION05	1916116.29	312317.40	46.68
STATION06	1916060.99	312272.51	45.44
STATION07	1916062.27	312319.82	46.70
STATION08	1916065.14	312269.93	45.44
STATION09	1916112.53	312330.08	47.56
STATION10	1915989.88	312326.14	45.30
STATION11	1915976.76	312314.25	47.90
STATION12	1915979.10	312339.21	49.18
STATION13	1915981.40	312358.65	52.13
STATION14	1915995.09	312280.30	44.72
STATION15	1916010.03	312246.55	54.45
STATION16	1915952.20	312313.28	45.36
STATION17	1915931.33	312311.83	55.53
STATION18	1915929.69	312311.78	55.68
STATION19	1915979.90	312361.97	52.20
STATION20	1915965.17	312386.95	46.10
STATION21	1915957.06	312390.94	48.76
STATION22	1915937.47	312384.59	47.54
STATION23	1915926.55	312382.79	47.52
STATION24	1915915.63	312372.69	45.54
STATION25	1915905.57	312354.13	45.57
STATION26	1915975.34	312314.85	47.85
STATION27	1915932.95	312274.42	44.93
STATION28	1915909.87	312294.56	45.75
STATION29	1915890.21	312296.30	48.61
STATION30	1915889.67	312319.36	48.38
STATION31	1915869.95	312300.51	45.09
STATION32	1915816.13	312257.76	45.13
STATION33	1915869.60	312269.33	44.49
STATION34	1915791.92	312241.92	46.50
STATION35	1915765.01	312218.74	45.63
STATION36	1915811.58	312243.67	44.80
STATION37	1915835.85	312255.63	45.02
STATION38	1915847.10	312246.92	45.86
STATION39	1915915.32	312245.03	45.35
STATION40	1915789.49	312181.77	47.91

Table 4.1 UTM coordinates and elevations of stations at Saturday Creek.

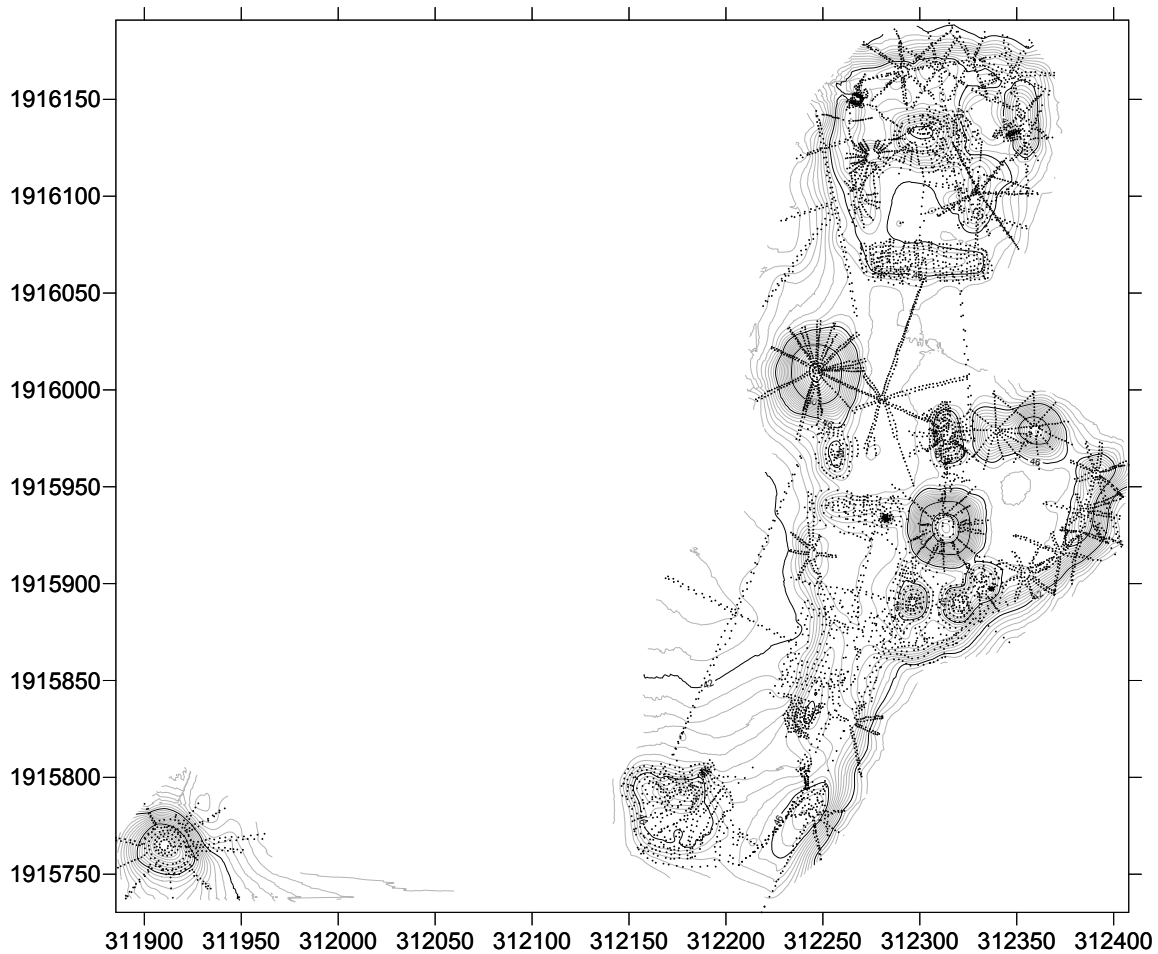


Figure 4.1 Contour map of Saturday Creek site core, overlain with points actually measured with the total station. While some structures were fully cleared and mapped, many structures as well as the flat areas in between were mapped using radiating lines from strategically placed nodal points.

Results and Discussion

Over the course of seven weeks, spanning the January and the summer 2014 seasons, we gathered a total of over 7,800 data points, recording at least 31 structures, two pyramidal structures, and one, but possibly two, ball courts (**Figure 4.2**). The topographic map was generated using Golden Software Surfer 12, with a contour interval of 0.4 m. The same data were used to also generate a 3D surface in Surfer (**Figure 4.3**).

We can see that the site core is flanked on the south and southeastern ends by a steep drop-off of around 5 m. The drop-off follows the ridge of a natural fluvial terrace, the bottom of which is the current floodplain. The ridge, however, does not seem to be entirely natural, as

there are portions along it with evidence of modification, including cardinally oriented sections with stone alignments along an otherwise generally northeast to southwest ridge. The stone alignments suggest the presence of a staircase (see **Figure 4.3**) down to the floodplain and facing the Belize River, which is roughly 200 m to the southeast. This is interesting, since immediately across the river on the south side of the river is the site of Ma'xan, which the BREA team surveyed, mapped, and excavated during the two 2011 seasons (Kaeding et al 2011; Runggaldier and Harrison-Buck 2011; Murata 2011b). Thus, it can be surmised that the south/southeast end of the site core functioned as a gateway to and from the site of Ma'xan, which, in turn, could be considered as part of greater Saturday Creek. In light of the above, also interesting is the section along this ridge where it appears the terrace was modified to have a more gradual slope facing southeast (see **Figure 4.4**). Such a slope is reminiscent of boat landings, which could mean that the floodplain was more frequently flooded in the past, and that boat access directly from the site core was a viable mode of transportation between what we now call Saturday Creek and Ma'xan.

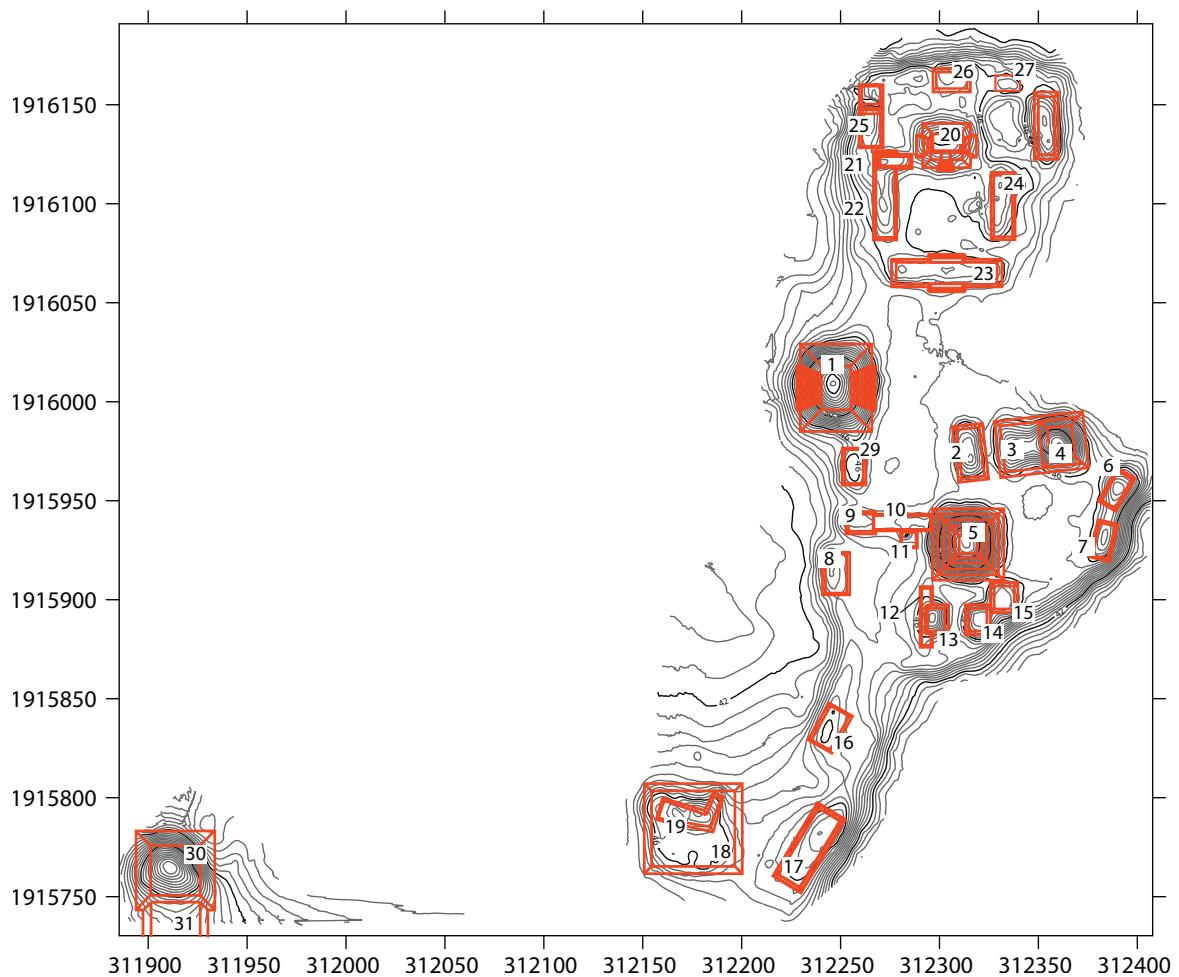


Figure 4.2 Contour map of SC site core, overlain with a rectified map and structure numbers (map prepared by S. Murata).



Figure 4.3 3D surface generated from the total station data using Surfer 12.

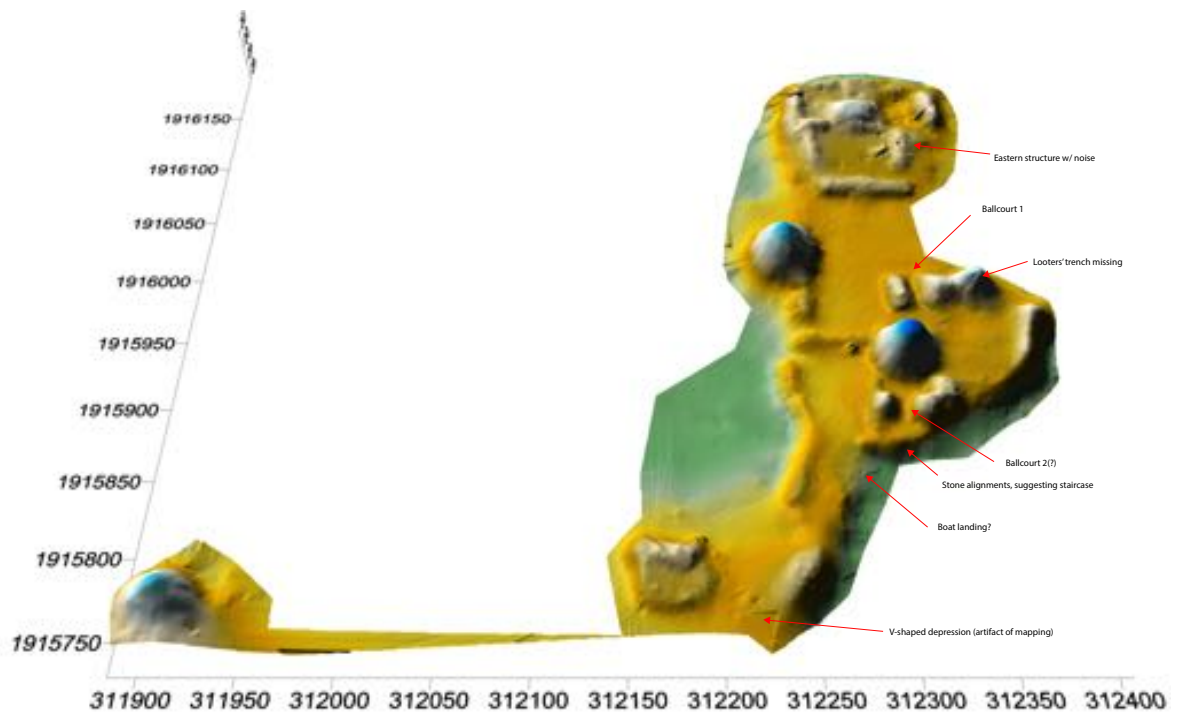


Figure 4.4 Points of interest.

While the terrace wall along the south/southwest end is primarily natural in origin, the entire site core was, in fact, raised to create an acropolis, as can be seen from the elevation difference with the surrounding terrace floor. This build-up is most prominent along the north and west edges of the Northern Plaza. The base level of the acropolis is around 45 m AMSL, and this level is sectioned into several "plazas" by the structures thereon. The main plaza is raised further by another c. 1 m, suggesting that the plaza functioned as an elite residence. The main plaza is also the only plaza that is formally configured with four surrounding structures in the cardinal directions. All of the other "plazas" are configured with one cardinal direction lacking a demarcating structure.

Two massive structures dominate the site core, each rising about 10 m above the surrounding plaza floors. Structure 5 to the south of the main ballcourt (Ballcourt 1) is truly pyramidal, with steep slopes on all four sides culminating to a narrow summit (see **Figures 4.3** and **4.4**). While not clearly shown in the map, there was some indication that staircases adorned at least the northern and southern sides, if not all four. Structure 1 to the west is nearly as tall, but has a relatively flat and rectangular top oriented N-S. A sizable outset staircase is evident on the eastern face, descending down onto the plaza floor.

We knew before the survey that Ballcourt 1 was interestingly configured, with the eastern structure having a large superstructure thereon. However, upon mapping, it was revealed that the orientation of the ballcourt complex is slightly (about 7°) offset to the west (see **Figures 4.2** and **4.4**). As the site core largely comprises structures that are well oriented cardinally, the offset of the ballcourt may suggest temporally different construction events. What was perhaps more surprising was another pair of structures (Strs. 13, 14) to the south of Str. 5 that are parallel along the N-S axis, and thus may be a second ballcourt. Whether or not this is the case, the two structures open to the south, where stone alignments suggest a staircase leading down onto the lower terrace, and face the site of Ma'xan, as described above. If one were to pass between these two structures heading north, the passage opens up to a small courtyard demarcated on the north by Str. 5 (**Figures 4.2** and **4.4**). Narrow passageways at the northwest and northeast corners of this courtyard lead one into two plaza-like areas to the west and east of the pyramid. Hence, Strs. 22 and 23 appear to have functioned as an entryway into the site core for those visiting the site from the south/river.

Perhaps the oddest structure was the last to be mapped. Structure 18 located in the southwestern corner of the site core, is a c. 50-x-50 m platform that rises about 1.5 m from the surrounding, more or less oriented cardinally (**Figure 4.5**). The southern half of the platform is quite flat; however, a large superstructure (Str. 19) is placed on the northern end of the platform that is roughly L-shaped and *not* oriented cardinally, but offset by about 30° east of north. Furthermore, the two ends of the "L" taper down to the ground surface, making the corner of the "L" the highest point (**Figure 4.5**). The 30° offset may be correlated to a similar offset seen in Str. 17 to the east, which, as can be seen from the contours, mirrors the natural topography of the terrace. The flat open space on the southern half of the platform along with the irregular shape of Str. 19 may indicate some type of production activities. As workers cleared the platform,

what appeared to be human bone was found on the surface at the southwestern corner of the platform. All of the above suggest Strs. 18/19 to be an interesting candidate for future excavation.

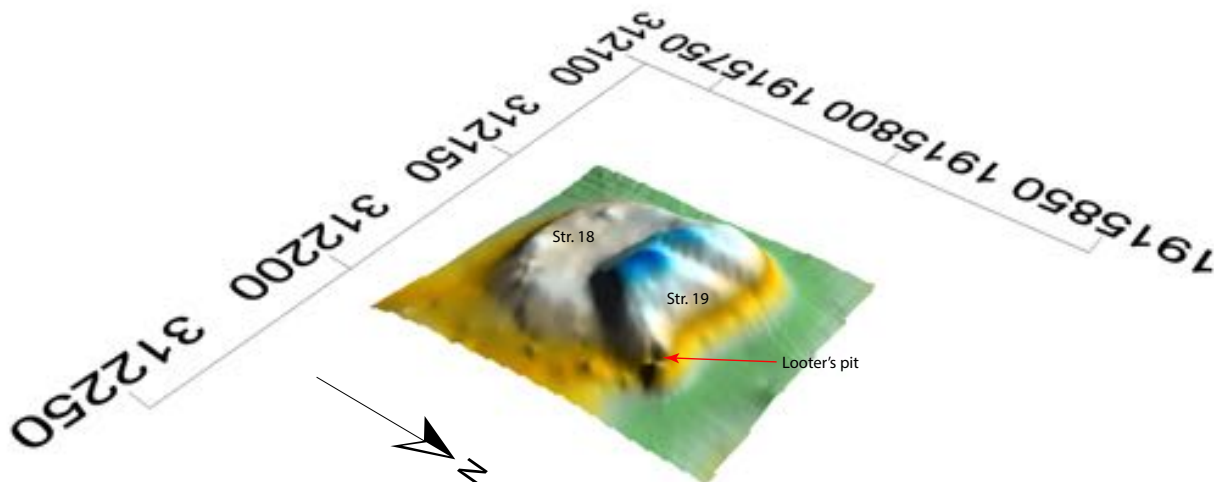


Figure 4.5 Structures 18 & 19 as seen from the northwest.

What must be kept in mind is that the site core mapped and presented herein is by no means isolated from its surrounding. The peripheral structures need to be viewed in relation to the surrounding structures in the open field, especially when trying to understand orientation and articulation. Fortunately for our project, drone mapping has been able to provide us with extremely useful complementary data, as is presented in the following chapter.

Future Work

With two seasons of mapping, we have been able to identify and map most, if not all, of the structures that comprise the site core of Saturday Creek. There are some forested areas to the west of the site core that lack total station data (**Figure 4.6**). While much of this area has been reconnoitered on foot, a safe bet is that a more intensive search will reveal at least a few smaller mounds. Indeed, there is at least one structure on Lucero's map that is situated on the western boundary of the forest and the open field, which we have visually confirmed, but not yet mapped.

The method we employed of cutting radial lines from select nodal points proved efficient and sufficiently accurate/precise for our needs. Total clearing, even if confined to the structures, would not have been possible in the timeframe at our disposal. The method is particularly effective for large areas having vegetation but lacking substantial architecture, as confirmed

visually through pedestrian survey. The technique, however, fails to capture subtle topography when employed to architecture, as can be seen (see **Figure 4.4**) when comparing the southern range structure (Str. 23) of the main plaza (total clearing) with the eastern range structure (Str. 24, radial lines only). The natural, and perhaps obvious, conclusion is that whenever possible, architectural features should be fully cleared for optimal mapping, and the radial-lines technique reserved for mapping flat areas therebetween.

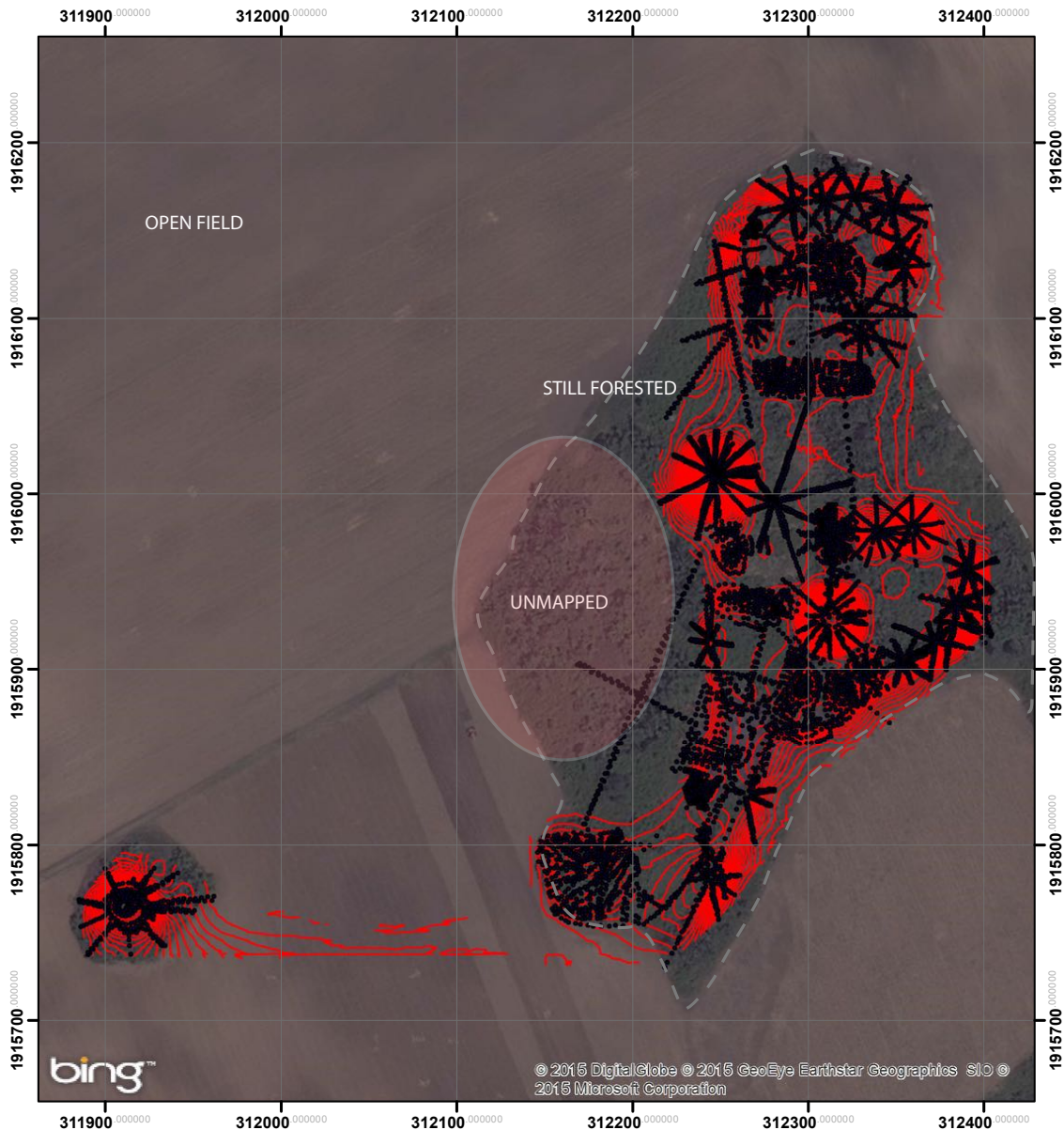


Figure 4.6 Map showing the relationship between the SC site core, the open field, and the still-forested area that includes the SC site core. Note the patch of forest on the western end that remains largely unmapped.

Partly due to the problem outlined in the previous paragraph and partly due to mapping being conducted by less skilled personnel (i.e., field school students), some of the structures have been mapped sloppily. The eastern structure of the main plaza indicate the presence of a certain degree of noise (irregularities in the topography not present in real-life). The superstructure atop the eastern structure of Ballcourt 1 (Str. 4) is lacking data for a large looters' trench that was visually observed at the summit extending south (see **Figure 4.4**). The southeastern most structure displays a V-shaped depression on the south side, which is likely an artifact of the radial-lines approach (see **Figure 4.4**). (Re)mapping these three structures, along with the unmapped western end of the forested area should be top priority if additional mapping is to take place at Saturday Creek.

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Chapter 5

UAV Mapping in the Saturday Creek Hinterlands

Mark Willis and Chet Walker

Introduction

In January of 2014, archaeologist Chet Walker and Mark Willis, of Archaeo-geophysical, Inc. were invited to Saturday Creek Extension (SCE) to conduct aerial mapping and 3D landscape modeling of the archaeological sites in the area. The main areas of interest were modern cornfields in and around the SCE project area. These fallow fields had been mechanically cleared of jungle vegetation and most large stones several years ago by local Mennonite farmers. Despite these impacts, some earthen mounds and other archaeological features are still easily identifiable with the naked eye in the fields. Additionally, pedestrian survey has located artifact scatters across much of the same areas and beyond. Our goal was to use Unmanned Aerial Vehicles (UAVs), commonly referred to as drones, to photogrammetrically map this archaeological landscape.

Equipment

Four UAVs were used during the course of the mapping at SCE. Two were fixed wing aircraft called Swinglet CAM (**Figure 5.1**). The Swinglet CAM is entirely autonomous UAV that looks airplane made of foam, weighing 500g, with a wing span of 80cm. This unit has an on-board system comprising a Canon IXUS 220HS 12-megapixel digital camera, a GPS, and a radio receiver, which is controlled by a ground-based computer via a 2.4GHz radio modem for data transfer. The UAV, all peripherals, and the ground-based computer can be stored in a single carrying case. Data are acquired rapidly (within one to two hours including set up and breakdown of equipment) under good weather conditions.



Figure 5.1. Swinglet CAM fixed wing UAV (photo by M. Willis).

All of the other aircraft were manufactured by DJI and were multi-rotor aircraft. These UAVs are capable of flying much closer ground and much slower than the fixed wing UAVs. The main advantages are that these drones can carry larger cameras, can fly close to the ground and collect close-up high resolution images. The main

disadvantage is this class of UAV covers a much smaller area during each flight. The largest of the multi-rotors used was a S900 hexakopter (**Figure 5.2**). The s900 is capable of lifting up to 3.2 kg (7 lbs.) and has a flight time of about 13 minutes. The s900 was equipped with a Sony NEX 7 digital camera and piloted remotely via a first person view (FPV). The remaining UAV was a custom modified Phantom 2. The modifications to the Phantom include the addition of a FPV camera and the attachment of a Canon point and shoot camera.



Figure 5.2 Prepping the S900 hexakopter for mapping (photo by M. Willis).

The FPV cameras allowed the ground pilots to view the project area from the drone via a video link to a pair of goggles. For the pilot, the view is the same as if he were onboard the aircraft. This real time feedback allowed for the UAV pilot to focus attention on areas of interest as well as maintain good transect spacing during flight.

Data Collection

Prior to collection aerial photography data, a series of Ground Control Points (GCPs) were placed on the ground at several locations in the project area. The GCPs were targets easily identifiable from the air. Each GCPs' location was recorded with a differentially-correctable GPS unit. The locational accuracy of the each GCP was post-processed to have an accuracy of greater than 10 cm.

A total of fourteen missions were flown with the Swinglet CAMs and another eight flights were flown with the multirotor UAVs. A total area of approximately 620 Hectares (1530

acres) were mapped in approximately eight hours of fieldwork and yielded about 2,500 high resolution photographic images. All of the flights were flown over the open cornfields.

Data Processing

For high-resolution mapping, the goal is to generate a very dense digital terrain model (DTM) and an aerial photo-mosaic. The first stage of data acquisition is accomplished through a digital process called photogrammetry. Photogrammetry extracts 3D data from a series of overlapping images and works similarly to our human eyes. One image is photographed from a "right-eye" perspective and another from the "left-eye" with approximately 70 percent overlap between the two. Computer software compares the overlapping area from the photographs and then recreates the topography of the region.

Traditional photogrammetry requires fairly rigid control over the way photographs are taken. The spatial relationship between the photographs also must be known. In order to achieve this, the camera-mounted UAV is programmed with a flight pattern that guarantees photographic overlap of 70 percent for the area of interest. Spatial controls are established by control points marked with aerial photo targets placed across each site prior to flight. After the flyovers are completed, RTK surveying equipment is used to establish the precise UTM locations of the targets. These coordinates serve to geo-rectify the digital images, establishing the precise location of the imagery to within +/- 10 centimeters under optimal conditions. The output includes a series of digital photographs that are processed using a technique called Structure from Motion (SfM) in the commercial software package PhotoScan. The software merges individual photographs by common points relative to the location of the camera. The software then uses the estimated camera positions with the tiled images to derive a 3D polygonal mesh of the ground surface. It ortho-rectifies the image series to establish a uniform scale, remove any distortion and produce digital ortho-photos (**Figures 5.3 and 5.4**) and Digital Elevation Models (DEMs) that can be used in any Geographic Information System (GIS).

The Saturday Creek data was exported as a Digital Terrain Model (DTM) as well as an orthographic mosaic image for review in ArcGIS. The DTM contained over 100 million individual elevation points and is comparable to the resolution collected by LiDAR systems but at a fraction of the cost and time. From the GIS, a hypographic map was created with 5 cm contours as well a slope model. Both of these processed datasets allowed for the surface shape of the project area to be examined in extraordinary detail and for the presence of a vast number of Maya structures to be revealed.

Results

After analyzing the 3D data, an unprecedented number of archaeological features were identified in the cornfields. Most of these appear to be small and low to the ground earthen mounds that

may have been the location of prehistoric structures. These features became more obvious in the GIS when a virtual light source was used to illuminate the model from highly oblique angles and from positions it would not naturally be lit from (Figures 5.5-5.8).



Figure 5.3 Comparison of publicly available data and that collected with the UAVs (maps prepared by M. Willis).

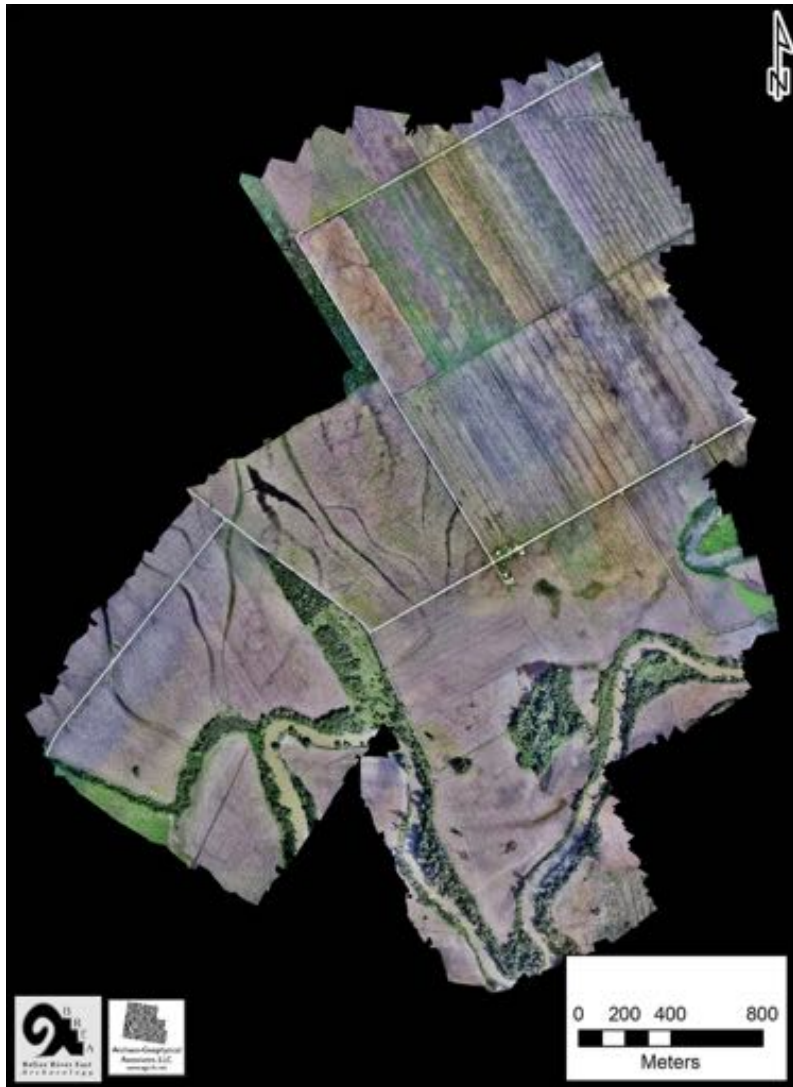


Figure 5.4. SfM generated ortho-photo mosaic of UAV data (map prepared by M. Willis).

Using the results of the drone imagery, the BREA team produced a rectified map of the drone survey based on a combination of the aerial imagery, elevation data from the DEM, and ground-truthing (**Figure 5.9**). This is a preliminary map that requires more systematic ground-truthing, which we plan to conduct during the summer of 2015. This rectified map is a conservative estimate of mounds. For instance, the tract of land between the site core of Saturday Creek and Hats Kaab/Xaman to the north shows in the drone imagery what appear to be a large number of subtle mounds that require further ground-truthing. The green dots on the map show some of the mounds that have been verified to be archaeological in nature via pedestrian survey. These locations not only contained evidence of mounded architecture, but surface inspection also revealed associated artifact and/or daub scatters on nearly every mound feature. A cursory inspection of the diagnostic ceramic material found on the surface indicates that many of these structures were continuously occupied from Preclassic to Postclassic times (ca. 500 BC-AD 1200).

Conclusions

A small portion of the Saturday Creek area was expediently and inexpensively mapped with UAVs. The modernly farmed areas of Belize often are considered by archaeologists to have little or no archaeological value because of the highly destructive nature of farming to the prehistoric landscape. Our project has shown that a large amount of archaeological features may be identified within these modern fields. Furthermore, our investigations at Gallon Jug yielded similar results in a different part of the country (Sandrock and Willis 2014 and Houk 2015). It is our opinion that as much of the farmed areas of Belize as possible should be documented with drones as soon as possible. The longer the fields are tilled the faster the presence of identifiable archaeological features will disappear.

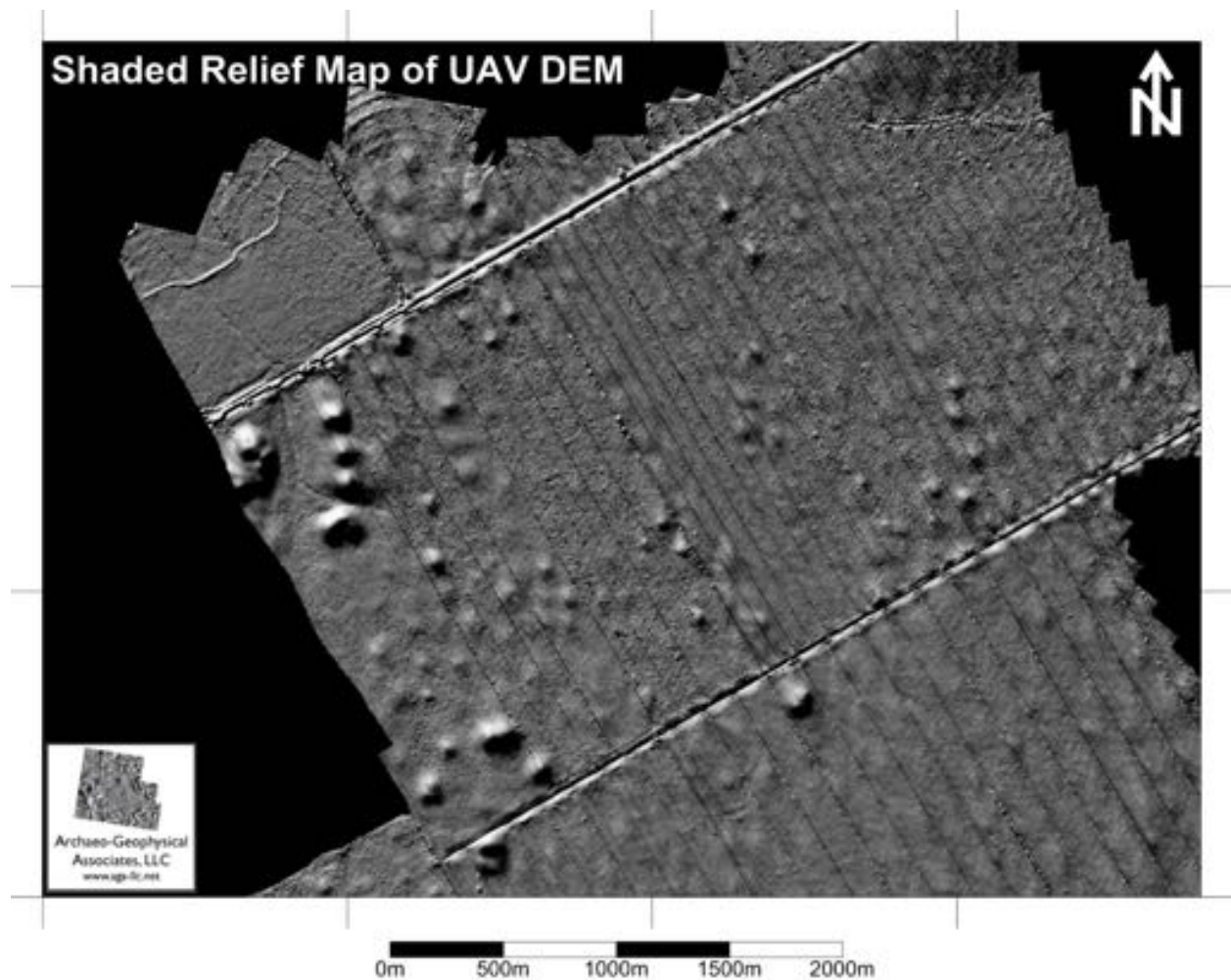


Figure 5.5. Detail of northern portion of DEM (map prepared by M. Willis).

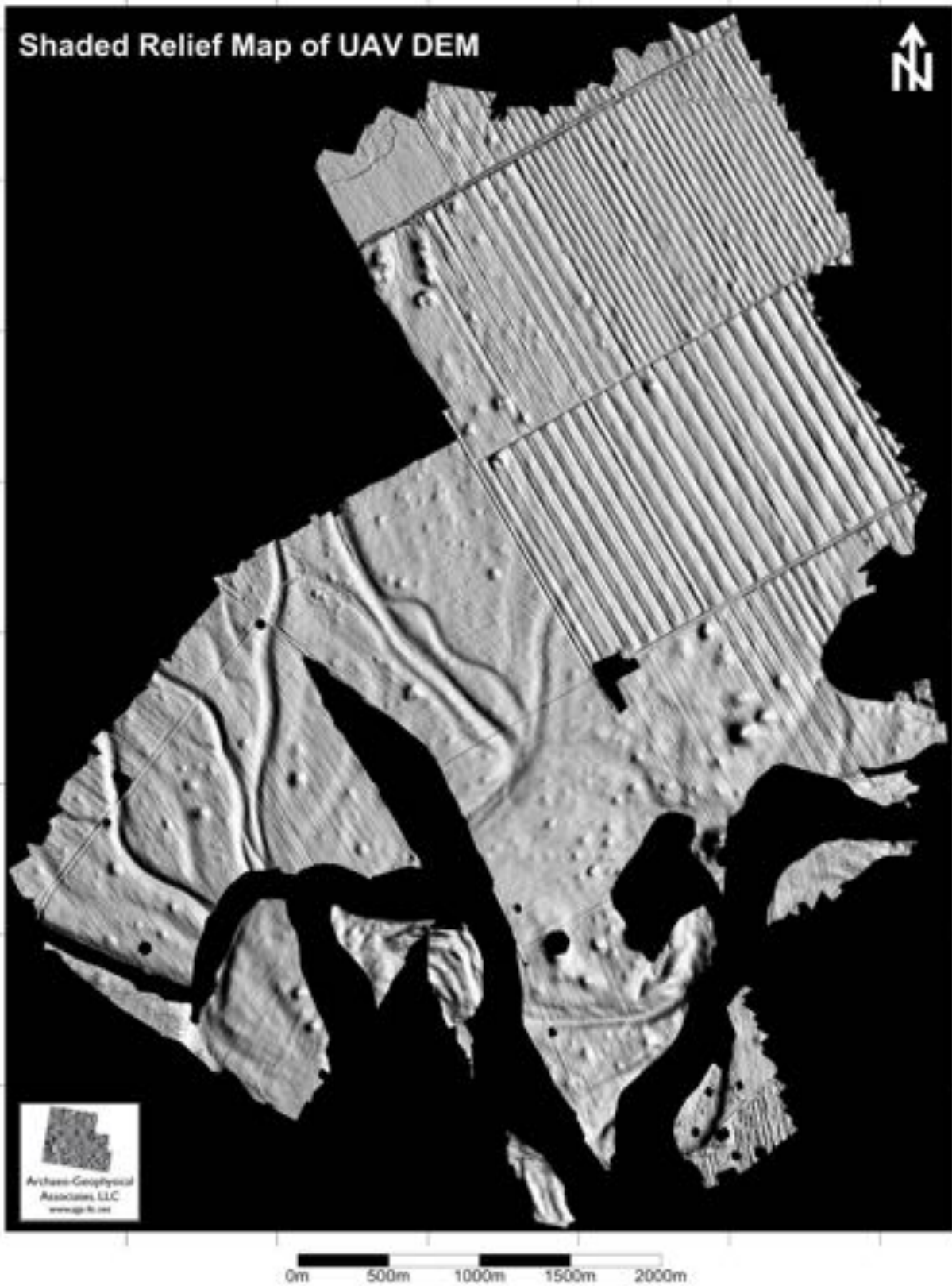


Figure 5.6. DEM with virtual illumination from various angles highlighting mound presence (map prepared by M. Willis).

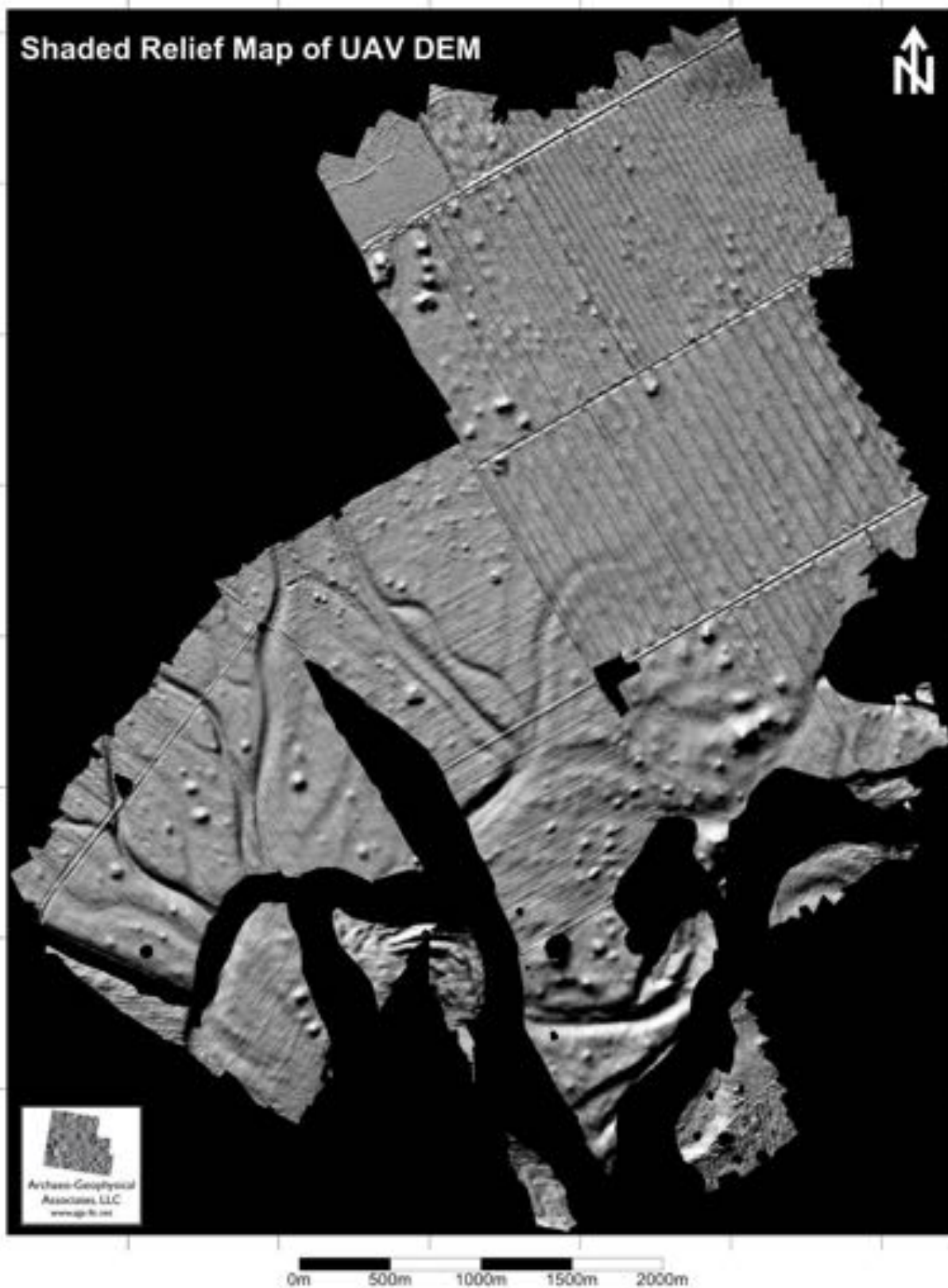


Figure 5.7. DEM with virtual illumination from various angles highlighting mound presence (map prepared by M. Willis).

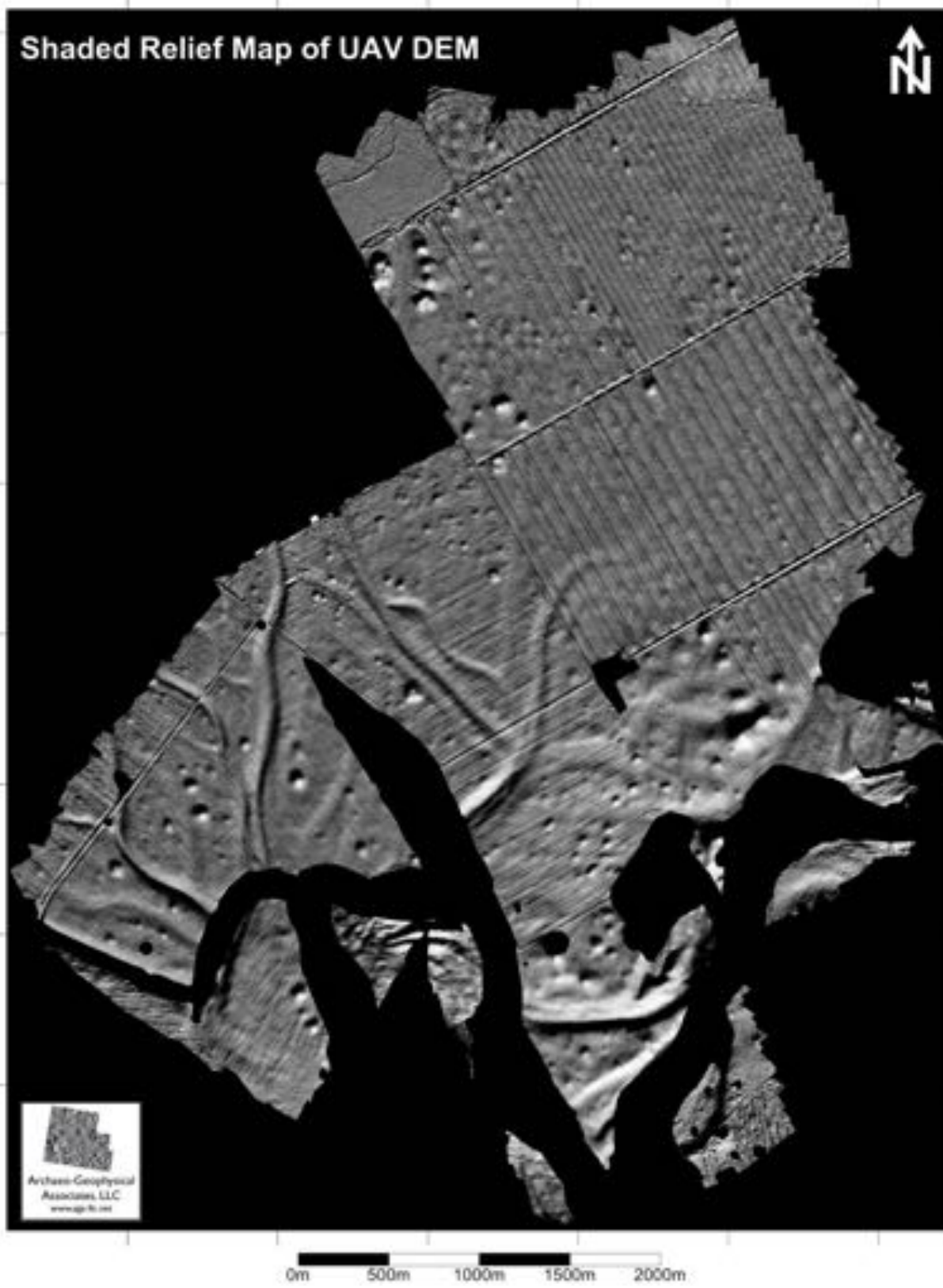


Figure 5.8. DEM with virtual illumination from various angles highlighting mound presences (map prepared by M. Willis).

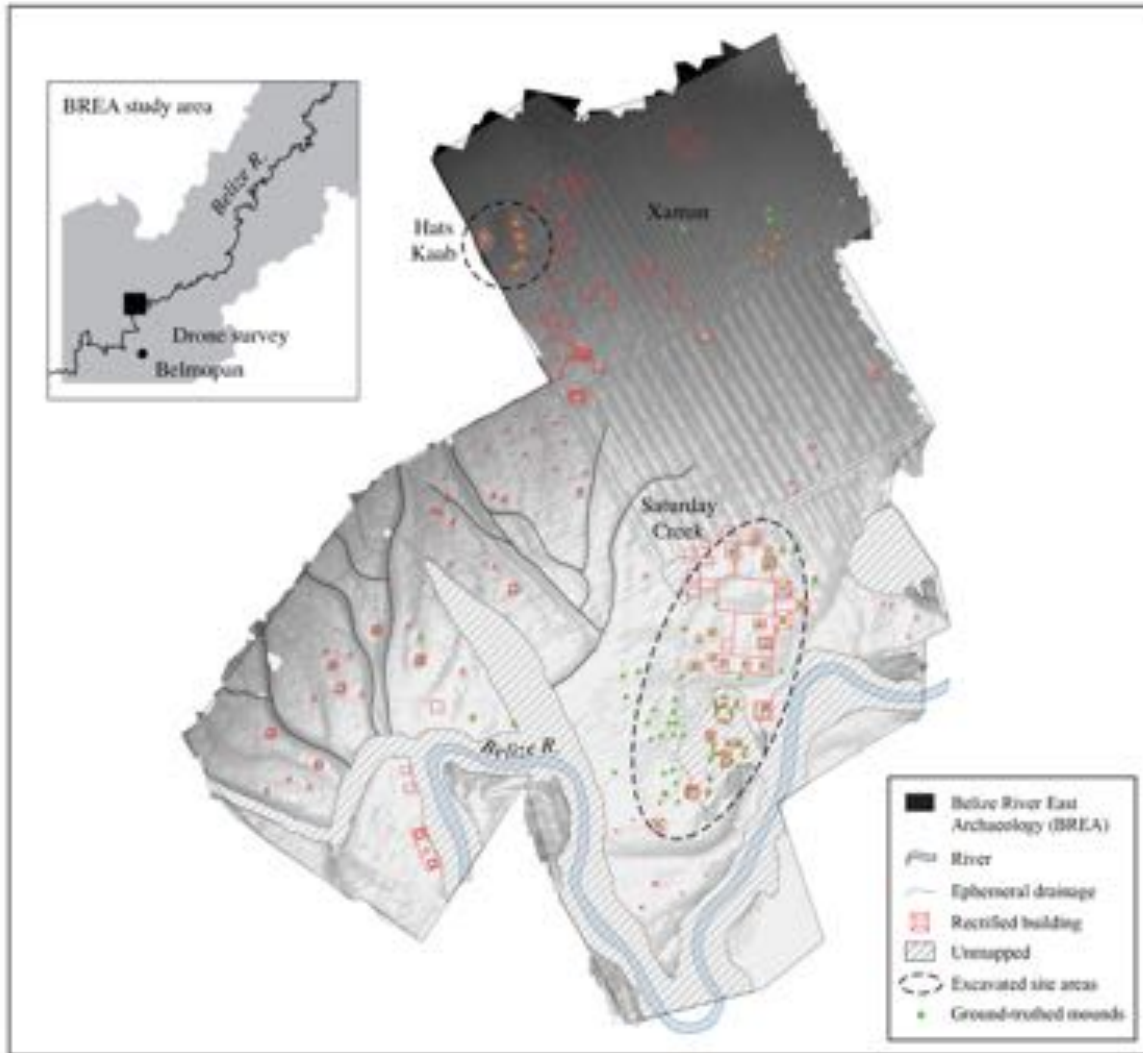


Figure 5.9 Rectified map of Saturday Creek site core and hinterland settlement (map created by M. Brouwer Burg).

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Chapter 6

Initial Survey and Reconnaissance of the Lower Belize Watershed

Brian Norris, Joseph Nigro, Satoru Murata, and Hugh Robinson

Survey and reconnaissance conducted in late January and early February of the 2015 season was focused on portions of the Lower Belize River Watershed in areas that include the cities and towns of Belize City, Biscayne, Boston Village, Burrell Boom, Crooked Tree, Davis Bank, Double Head Cabbage, Flowers Bank, Grace Bank, Isabella Bank, Lemonal, Rancho Delores, Sand Hill and Scotland Half Moon (see **Figure 6.1**). Portions of water bodies investigated beyond the Belize River include Black Creek, Burrell Creek, Jones Lagoon, Mexico Creek, Mexico Lagoon and Muscle Creek. The reconnaissance areas are shown on the overview map in **Figure 6.1**.

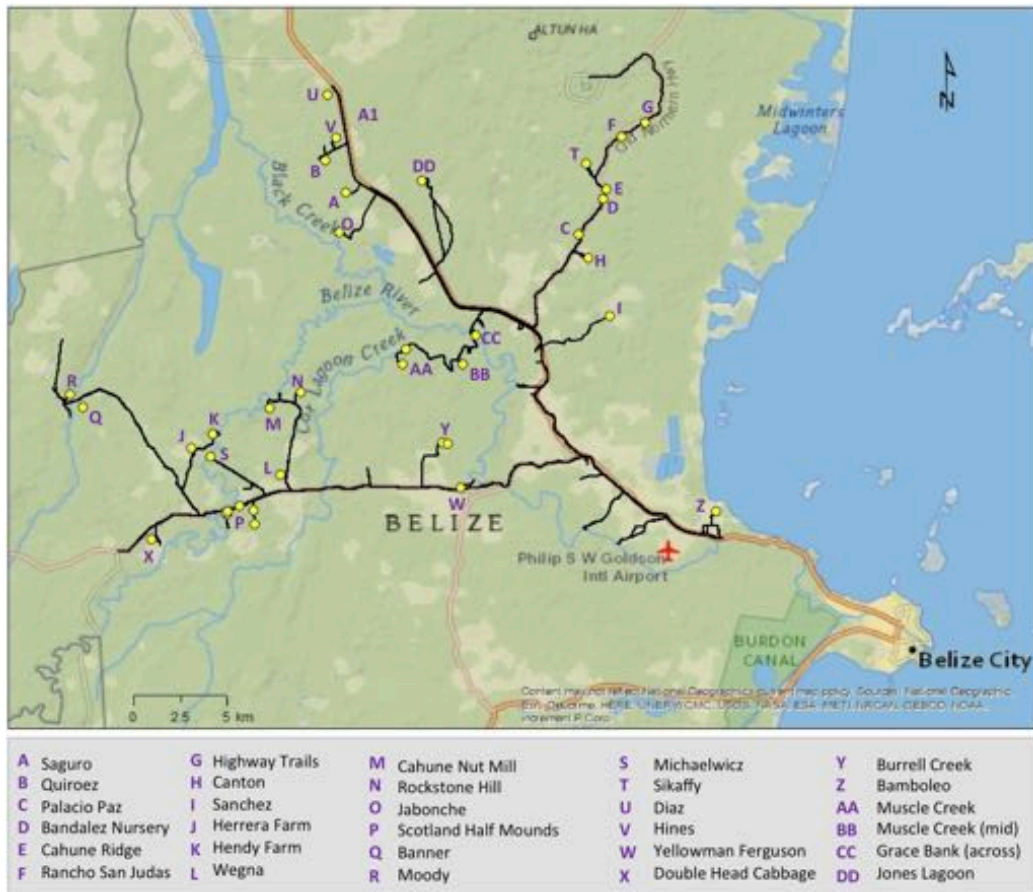


Figure 6.1 Map showing areas of reconnaissance in lower Belize Watershed.

Overview and Objectives

The primary objectives of the archaeological survey and reconnaissance included:

- Interviewing local people and others to locate known archaeological sites.
- Reconnaissance of probable archaeological sites based on local informants.
- Locating and documenting sites utilizing GPS, compass, field notes and sketch mapping.

Each of the areas denoted by letters on the overview map (**Figure 6.1**) are described below. A brief description of the archaeological sites located during reconnaissance is provided, including the number of mounds and their configuration, if discernable.

A1 – Flower’s Site: Minor Ceremonial Center

Although a brief site visit was made, no GPS data was collected at the Flower’s site, nor were any extensive sketches made. A rough sketch map was made of the large pyramidal structure, which was badly looted and had been damaged from past quarrying activities. The site was previously documented by the Institute of Archaeology (IA), who also has the site location recorded on their map (**Figure 6.2**). The site is characterized in the IA files as a minor ceremonial center and is considered one of the larger sites in this area of Belize. The BREA recon team was unable to return to fully document this site, and therefore, is relying on existing descriptions from IA and the map to show its location.



Figure 6.2 Location of Flower’s Site (map courtesy of the Institute of Archaeology, Belmopan, Belize).

A – Saguro Site: 28 mounds and remnants of a sacbe

Reconnaissance was conducted at the Saguro site (**Figure 6.3**), the grassland and bush to the west of Jim Saguro’s home on the Northern Highway in Biscayne. A total of 28 mounds and a sacbe were recorded at this site. Henry Dawson and Jim Saguro initially guided Brian Norris to a small mound, approximately 3-x-4 meters and 0.5 meter in height, along with remnants of stone that they suggested was the remnants of an ancient road or *sacbe*. These features were located with GPS. The sacbe appears to run in a northwesterly direction from Jabonche, which is a km or two away. The presence of a sacbe was confirmed by Murata and Robinson in their reconnaissance when they followed out a stone-lined feature that extended out to the northwest from Jabonche; the road connected to the points that Norris had taken of the sacbe at the Saguro site (see Murata and Robinson, this volume). Also located by Norris was a pair or 0.3m stones on the savannah that have been there since Dawson and Saguro can remember. These are some of the only stones around for miles. Later the same week, Jim Saguro also showed Norris and Nigro a series of 27 other mounds

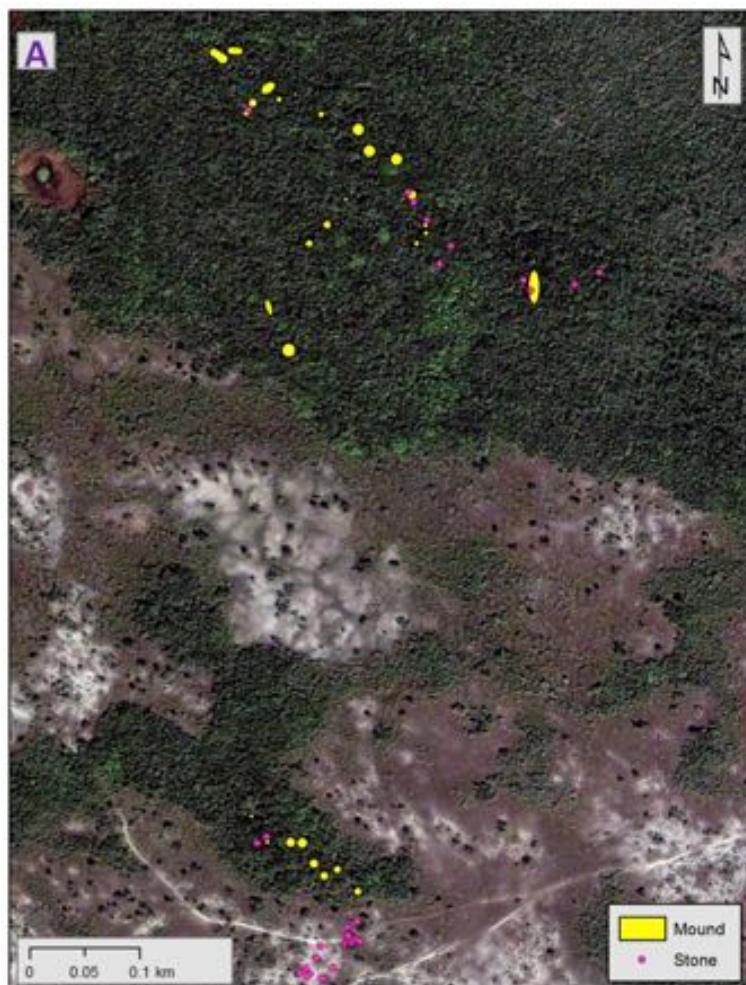


Figure 6.3 Saguro Site, Biscayne.

closer to his house, considered part of the Saguro site. Many of the mounds had one small white stone on them. No pottery sherds or other cultural evidence were found among the many gibbon holes.

B – Quiroez Site: 17 mounds

The Quiroez site (**Figure 6.4**) is owned by Enrique Quiroez, who lives on Stain Ridge Road in Biscayne, across from LaSalle Smith. He showed us a series of 27 mounds behind his house, to the southeast.



Figure 6.4 Quiroez Site, Biscayne.

C – Palacio Paz Site: 1 or 2 mounds

A stone mound was viewed from an iron gate with a sign labeled *Palacio Paz* on the Old Northern Highway. There were no trespassing signs posted and we could not find the owner. The GPS location was taken from the gate.

D – Bandalez Nursery: no mounds observed

David Bandalez, the son, told us that there were no mounds on the property. We did not meet the landowner and therefore did not access the property.

E – Cohune Ridge: no access, possible mounds

Some possibly destroyed mounds were visible from the road. We did not see a person or find out who the landowner was and did not enter the property

F – Rancho San Judas: no mounds observed

No mounds were observed between the road and pond. We did not walk the land any further east than the crocodile pond.

G – Highway Trails: no access, possible mounds

No mounds were observed from the road and no one was around to ask permission to access the land.

H – Canton Site, Boston Village: 385+ mounds

On the Canton Farm we located over 385 mounds, many of which we circumnavigated by all-terrain vehicles (ATV) mounted with GPS (**Figure 6.5**). The owner, Gillie Canton, his wife Pandora, and his cousin Matt each shared information with us about the Canton site. The larger structures were looted and destroyed, apparently when the Old Northern Highway was being built before Gillie Canton owned the land. Much of the structures at this time were used for road fill. Matt showed us at least 4 culvert drains that he believed were engineered by the ancient Maya. Gillie said that they flow into the lake on site (see **Figure 6.5**). Also,

we were told that the lake bottom is completely covered in flat white stone, which has become covered with mud over the years. Matt told us about a jade hatchet that was found on a mound in the northeastern section of what was located (see **Figure 6.5**). They showed us a variety of artifacts collected over the years.

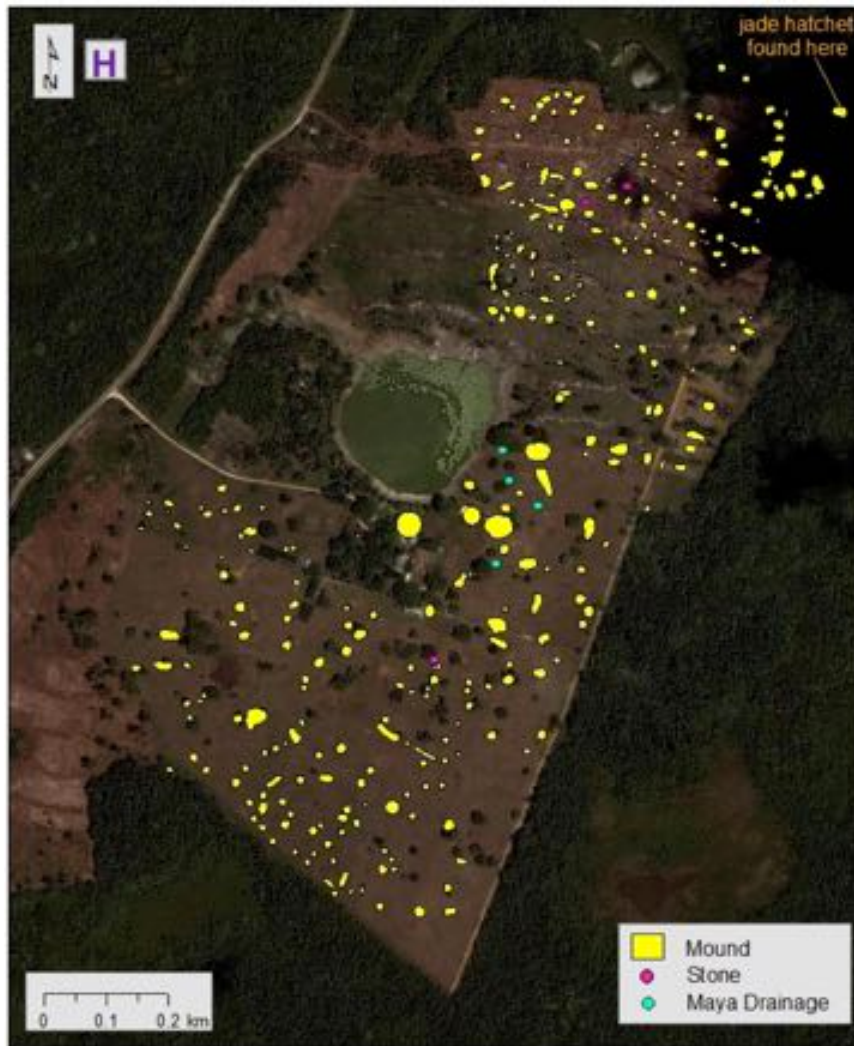


Figure 6.5 Canton Site, Boston Village.

I – Trevor Miles Property (Sanchez), Sand Hill to Salt Creek: Unsurveyed

Security guard Santanito Sanchez gave us the name of the landowner Trevor Miles who owned the property between Sand Hill to Salt Creek. The owner was not there so we did not travel beyond the gate. Therefore, we do not know if mounds exist on this property.

J – Herrera Farm

Celestia and Juan Herrera suggested that we visit the Hendy Farm (see below). They told us that the two mounds south of their home and on the west side of the road, were constructed by the neighbors.

K – Hendy Farm, Isabella Bank: 12 mounds

The Hendy Farm includes over 12 mounds (**Figure 6.6**). Dudley Hendy and his son Elden showed us around the property. Apparently, the center of the largest structure was dug out and used for material with the hope of creating a pool.

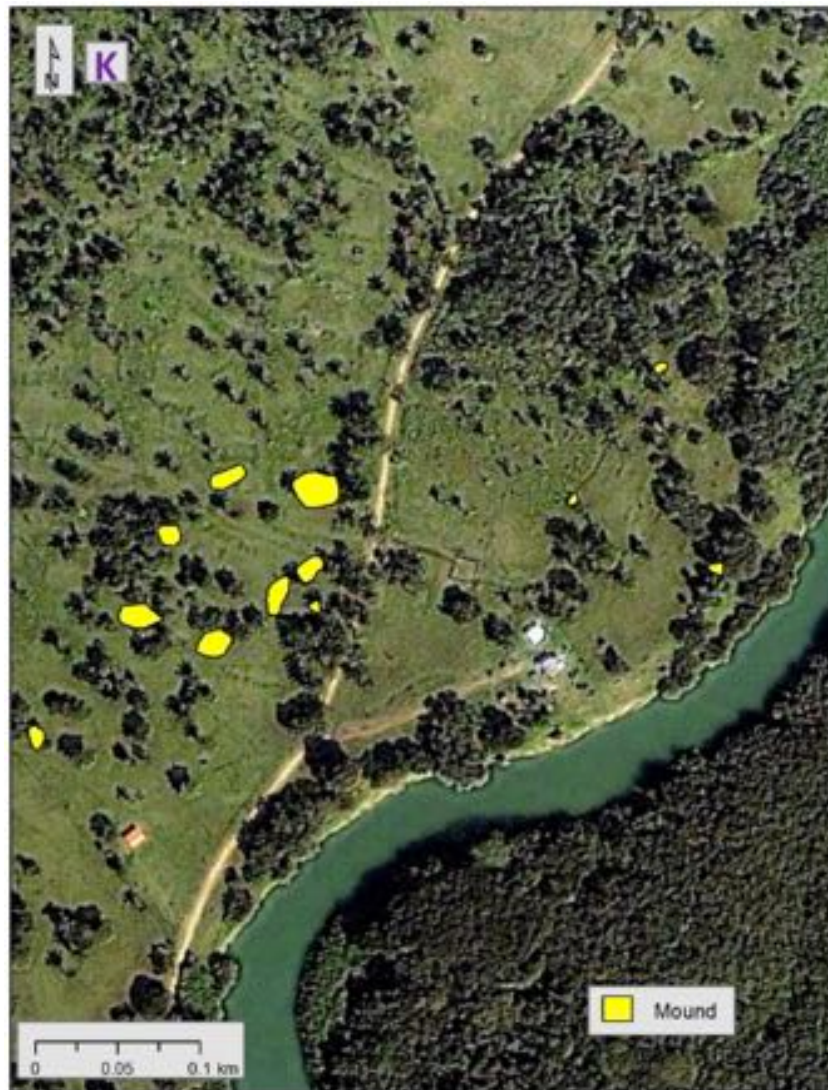


Figure 6.6 Hendy Site, Isabella Bank.

L – Wegna Site: One large Mound

Apparently there is a large mound along Flat Creek, according to Rubin Rayburn.

M – Cohune Nut Mill

Rubin Raburn runs the cooperative. His brother is Chairman of Flowers Bank. Rubin showed us Rockstone Hill site (below) and told us about the Wegna site (above).

N – Rockstone Hill Site, Flowers Bank: 2 mounds

Near Flowers Bank, we hiked through cohune and undergrowth under the guidance of Rubin Raburn. Two stone structures were located. One mound was approximately 6 meters above the creek and another was about 3 meters high.



Figure 6.7 Rockstone Hill Site, Flowers Bank.

O – Jabonche

The Jabonche site core consists of between 50-60 mounds and is one of the largest sites in the area. The site core was surveyed and mapped by BREA with a Total Station this season (see Murata and Robinson, this volume). Norris and Nigro tied in the Jabonche control to the network with 15-minute GPS observations on each of 5 primary traverse points 12, 13, 18, 20 and 22 (**Figure 6.8**).



Figure 6.8 Jabonche showing survey ground control.

P – Scotland Half Moon Site: 6 Mounds

Some mounds were visible from roads. Six structures were recorded all together (**Figure 6.9**). Landowners were not present so we did not enter the land and only were able to record structures that were along the roadside.



Figure 6.9 Scotland Half Moon Site.

Q – Cyril Banner, Lemonal

Cyril Banner told us that he knows of some possible sites along the Spanish Creek and that his cousin Ephrehiam Banner might be willing to take us to them by boat. We ran out of time and were not able to take them up on the offer. This is something to think about for next season.

R – Moody Site, Lemonal: 4 Mounds

Mark and Martha Moody showed us four mounds, some consisting of stone, located behind their house, all of which were located with GPS (**Figure 6.10**). Their home is probably on remnants of a mound as well.

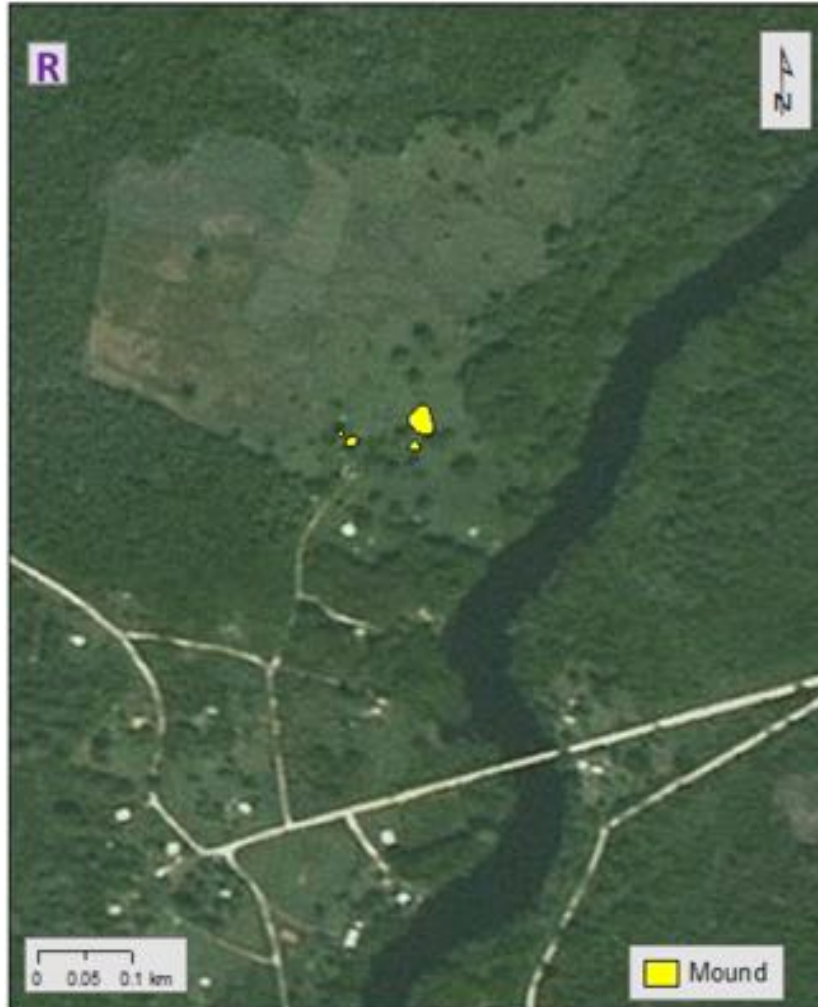


Figure 6.10 Moody Site, Lemonal.

S – Michaelwicz Site, Isabella Bank: 1 Mound

Dan Michaelwitz showed us a small 4m x 4m mound approximately 1 m high (**Figure 6.11**). No stone was observed on this mound. Dan also showed us stones and pottery artifacts that he uncovered during the construction of his house.



Figure 6.11 Michaelwicz Site, Isabella Bank.

T – Sikaffy Site, Boston Village: 28 Mounds

Mr. Sid Sikaffy showed us his back property, which had dozens of mounds, many of which were damaged. Eleanor Harrison-Buck sketch mapped the area while GPS locations were collected on 28 of the mounds at the Sikaffy site (**Figure 6.12**). There are more. We ran out of time during the field season and did not return to this site. We have permission from Mr. Sikaffy to return and will contact him during the next season. Both the Sikaffy site and the Canton site are located in Boston Village, likely hinterland settlement of the large nearby center of Altun Ha.

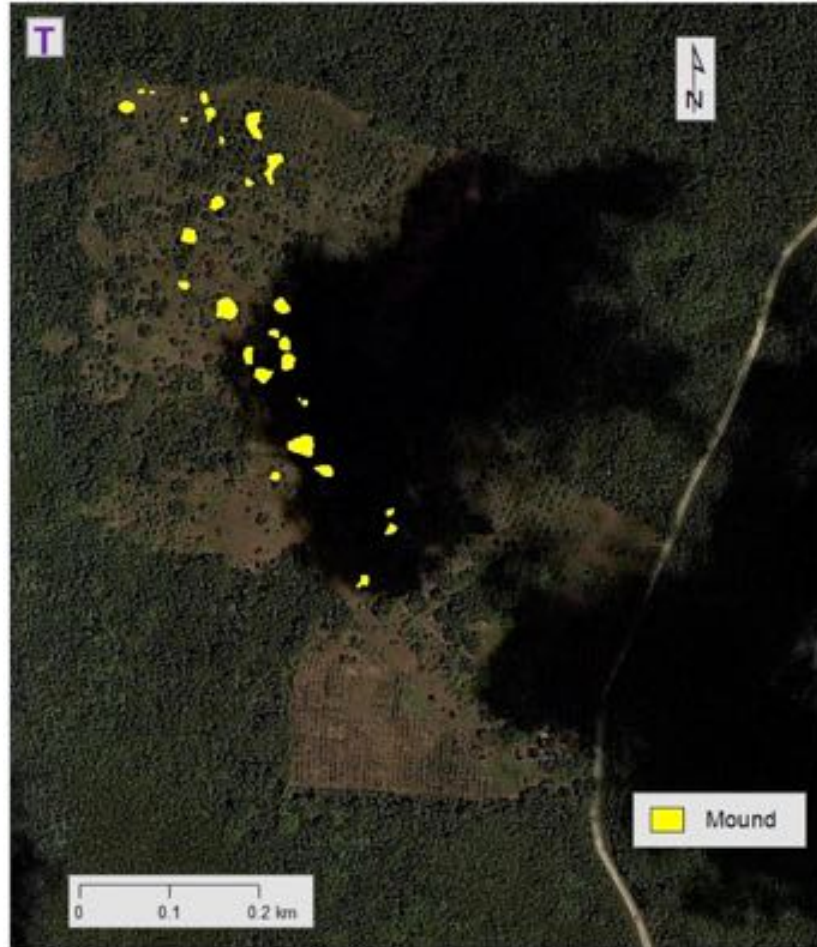


Figure 6.12 Sikaffy Site, Boston Village.

U – Diaz Site: 1 Mound

Ildefonso & Emma Jean Diaz showed us a single mound, 2m-x-4m, 1 m high. They told us that they observed other mounds to the south and southwest, which were now in heavy bush.

V – Hines Site, Biscayne: 34 Mounds

Brian and Therese Hines showed us a series of mounds on their property in Biscayne. We located 34 mounds, many of them are in bush (**Figure 6.13**). The largest mounds are surrounding their home. They also showed us buckets full of artifacts they had collected over the years from the property. Artifacts that were observed included a chert humanoid eccentric, unfinished tools, spherical ground stones, ceramic sherds, a conch shell trumpet,

crystals, a piece of tooth enamel, ear plug jewelry, a bead, fragments of groundstone manos and metates pieces and a burial.



Figure 6.13 Hines Site, Biscayne.

W – Yellowman Ferguson, Burrell Boom

Hector “Yellowman” Ferguson lives in Burrell Boom and told us about a possible site on Burrell Creek (See Y). Further reconnaissance is needed.

X – Mr. Lee’s Cool Spot, Double Head Cabbage

Reconnaissance at Mr. Lee’s Cool Spot and around the town of Double Head Cabbage did not yield any data.

Y – Burrell Creek Site: 4 Mounds

Hector “Yellowman” Ferguson showed us a total of four mounds on the south side of Burrell Creek, including three small structure and one massive flat platform measuring approximately 40-x-80 m that was reached by boat. No sherds or cultural evidence was found on any of the mounds.



Figure 6.14 Burrell Creek Site.

Z – Bamboleo Inn, Ladyville

Possible mound observed and located near the Bamboleo Inn. No cultural evidence was found.

AA through CC - Mussel Creek and Grace Bank Region

We travelled by boat along Mussel Creek after our local field assistants spent a day opening up Muscle Creek with machetes and chainsaws due to fallen trees and vegetation blocking the waterway. **Figure 6.15** shows the Muscle Creek and Grace Bank region and the three areas where mounds were found, labeled AA, BB & CC. More information regarding each of those is described and shown in the figures below.



Figure 6.15 Mussel Creek/Grace Bank overview map.

AA – Mussel Creek Site: 7 Mounds

From the creek, marked by “stone” in **Figure 6.16**, our local informant Mr. Leslie Moody brought us from his camp to two mounds by hiking through bush. One was approximately 5m high and the other about 3.5m high. Both showed evidence of looting. Mr. Leslie also showed us 3 other stone mounds closer to the camp on the way back.

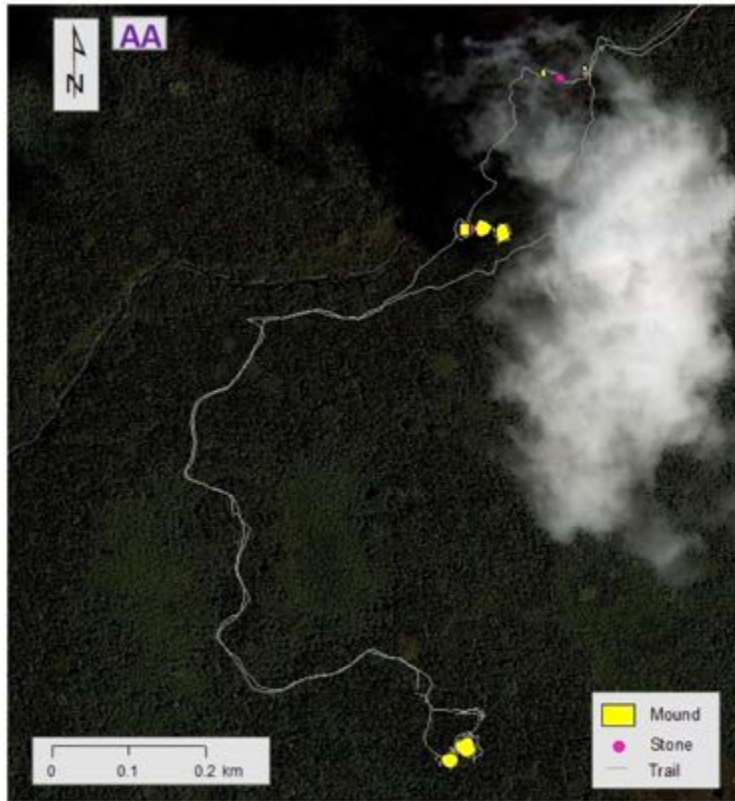


Figure 6.16 Mussel Creek Site.

BB – Mid-Mussel Creek Site: Unsurveyed

We were told that there are mounds on the south side of the Mussel Creek in the vicinity noted on the map in **Figure 6.15**. They are in thick bush and we did not have time to investigate this season.

CC –Grace Bank Site, Muscle Creek across from village: 26 Mounds

This site is on the eastern bank of Mussel Creek across from the Grace Bank village near the confluence with the Belize River (**Figure 6.17**). Approximately 26 low-lying mounds were recorded in pasture land and were located with GPS.

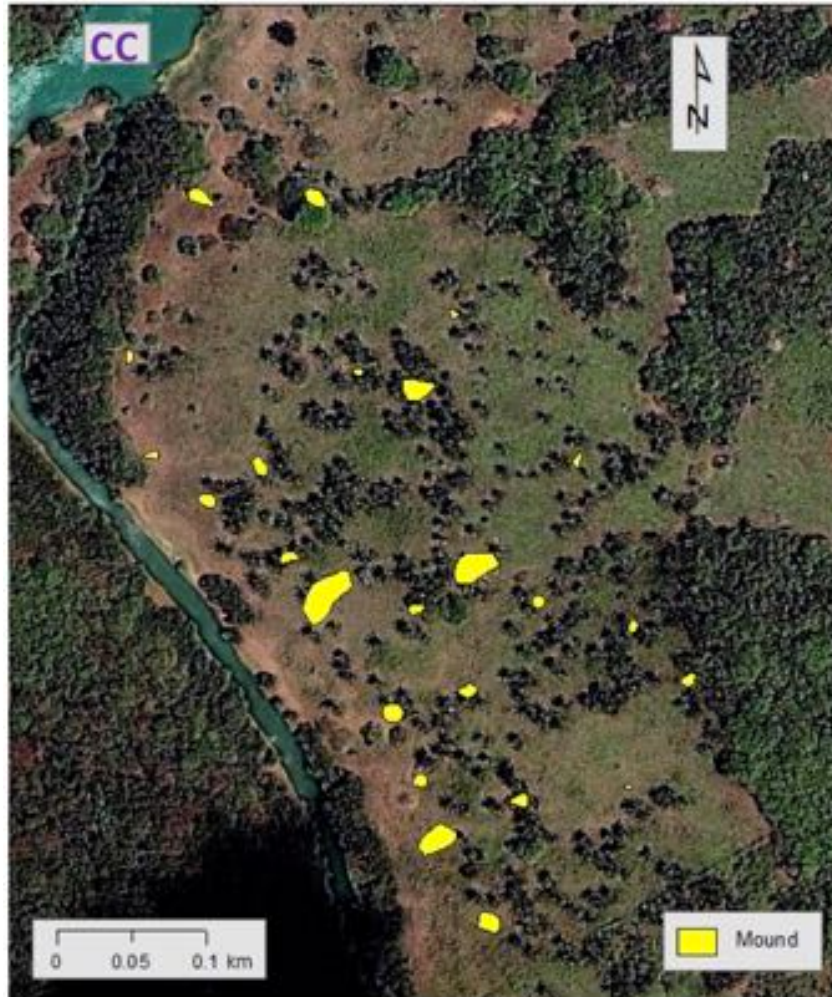


Figure 6.17 Grace Bank Site, Mussel Creek.

DD – Jones Lagoon Site 1: 14-16 Mounds

The Jones Lagoon Site 1 is located to the north of Jones Lagoon (also locally referred to as Mexico Lagoon). The site is accessible by boat via a channel that connects to the Jones Lagoon at the far northern end of the water body (see **Figure 6.18**). Norris and Nigro recorded a series of six mounds that are not right on the lagoon, but emerge from wet areas (**Figure 6.19**). According to our local informants, Jones Lagoon is brackish and gets very salty in the middle of the dry season. It is possible the lagoon was used by the Maya for salt-making. This has been found at the nearby site of Wits Cah Ak'al (WCA) at Mile 12 on the Western Highway, where salt-making and ceramic production were documented (Murata 2011). Murata and Robinson followed up with another recon investigation of Jones Lagoon and recorded an additional 8-10 mounds in the vicinity of Site 1. Murata who did his dissertation work at WCA observed that the mounds closely resemble those of the WCA site, consisting of a distinct fluffy soil with no stone. On the surface, Murata and Robinson noted evidence of pottery possibly dating to the Late or Terminal Classic period. Our local

informants tell us that more mounds that resemble these exist around Jones Lagoon and further exploration of this area is planned in future BREAs seasons.



Figure 6.18 Location of Jones Lagoon Site 1.

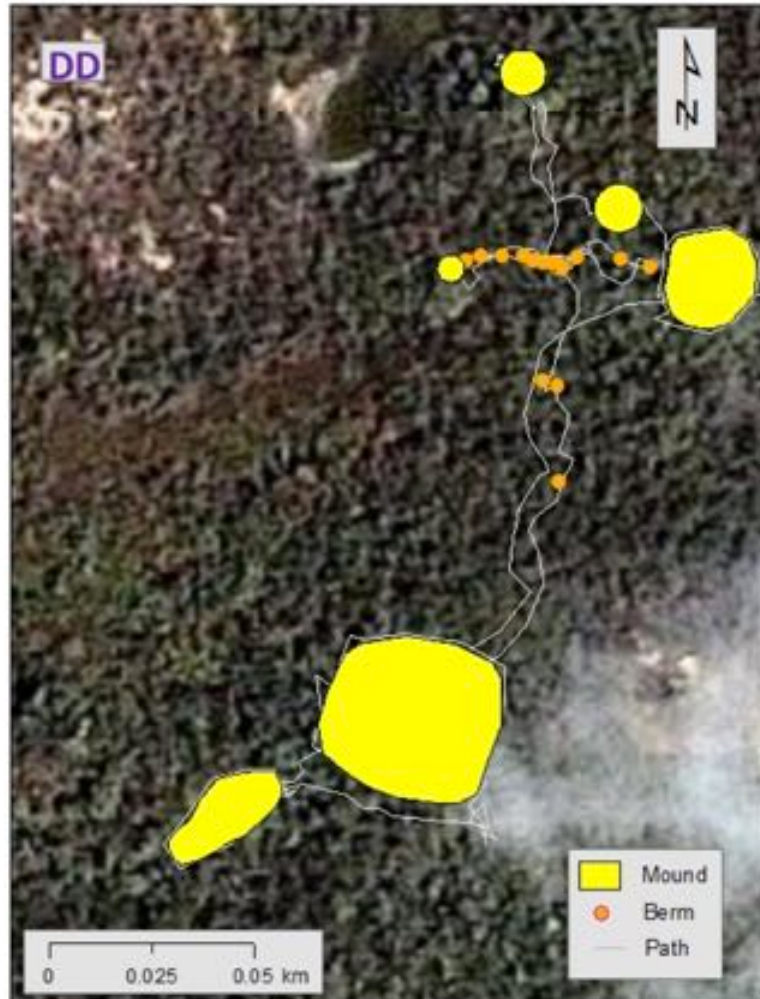


Figure 6.19 Close-up of the mounds at Jones Lagoon Site 1 (six mounds mapped by Norris and Nigro).

References Cited

Murata, Satoru

2011 Maya Salters, Maya Potters: The Archaeology of Multicrafting on Non-residential Mounds at Wits Cah Ak'al, Belize. Unpublished Doctoral dissertation. Department of Archaeology, Boston University, Boston, MA.

Sources/citations for imagery background: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community.

Chapter 7

Mapping the Sites of More Tomorrow, Ma'tunich, and Jabonche

Satoru Murata and Hugh Robinson

Introduction

The January-February 2015 season was a busy one for the BREA mapping team, during which we mapped three discrete sites.

The site of More Tomorrow was originally reconnoitered and surveyed with a GPS and compass during the 2011 season (Harrison-Buck and Murata 2011). A rough sketch of the architectural groups was generated at the point (Harrison-Buck and Murata 2011: Fig. 3.1). We returned to the site in January 2015 to create a formal map of the site as well as to place an excavation unit near one of the mounds where a fallen stela was observed during our previous visit (see Flanagan and Frederick, this volume). More Tomorrow became the training ground for the field school students, who learned how to set up and use the total station. As in previous years, two teams—one headed by Murata and the other by Robinson—employed a divide-and-conquer method to map the site. When we originally visited the site in 2011, we accessed it from the south side of the Belize River, crossing it with a canoe from the modern settlement of More Tomorrow village. Recognizing the importance of the site, and foreseeing a future excavation program, we sought access routes from the north side of the river, walking south from the Mennonite road that roughly parallels the river around 500 m to the north. Eventually, we came across a hunter's footpath that allowed passage through what was then a relatively dense forest. Today, the area between the site and the road has been entirely cleared into an agricultural field, utilized, according to local informants, for rice agriculture. The clearing had stopped in front of a large platform (Group A), attesting to the constant risk of destruction that these sites face. While we consider ourselves fortunate that the farmers did not go any further in their clearing, there is no telling how long the fortune will last.

The site of Ma'tunich was also first visited during the 2011 season (Harrison-Buck et al. 2011). Similar to the Saturday Creek site core and several other sites documented by BREA, Ma'tunich is in fact surrounded by an agricultural field. The only apparent reason it has been left more or less intact is because the stone architecture had inhibited easy bulldozing (although the periphery of the site does display some destruction). Unlike Saturday Creek or More Tomorrow, however, the architecture of Ma'tunich is much smaller in scale in both areal extent and the magnitude of the structures. Furthermore, the current landowner has overtly and covertly expressed intentions to raze the site in order to incorporate it for agricultural use. With the threat of destruction clear and possibly imminent, we decided to conduct a rapid mapping of the main plaza/platform as part of the final exam for the field school students during the last two

days of their work. The mapping was overseen (although, due to the nature of the exam, mostly on an hands-off basis) by Murata, while Robinson continued work at More Tomorrow.

After the departure of the students, the BREA team relocated downstream to work in an entirely new area. The site of Jabonche is located in the Washing Tree wetlands near Black Creek, a tributary to the Belize River. The site is recorded in the Belize Institute of Archaeology site records, and was reconnoitered by Harrison-Buck during Summer 2013, when she confirmed the presence of a ballcourt, a pyramid, and at least two plazas; she also received a tip from an informant on some tantalizing architecture to be found somewhere in the site (see Harrison-Buck, this volume). Murata and Robinson, assisted by workers from the nearby community of Biscayne, spent ten days mapping Jabonche.

More Tomorrow

Methods

The method used to establish the primary occupy point and back sight point for More Tomorrow is exactly the same as described in Ch. 4 of this volume, as well as in detail elsewhere, and thus will not be repeated here (Murata 2011). The primary occupy point (Station 1) was placed on the eastern slope of Str. 7, as the location provided a clear line of sight to the Mennonite road to the north. The elevation for Station 1 was approximated from the GPS data and arbitrarily set to 35 m AMSL. The primary back sight point (BS) was placed about 500 m north of Station 1, on the south side of the road. From these two points, Station 2 was placed between Str. 7 and Plaza Group A; all of the other points measured for the site are based on these initial points (**Table 7.1**). Because of the limited areal extent, most of the mounds were almost entirely cleared of vegetation, and the “radial lines” method described in Chapter 4 was utilized for areas between the platforms.

Results and Discussion

In the nine days spent mapping More Tomorrow, the students gathered a total of 3,644 points, and 23 structures, most of them comprising platforms and superstructures thereon (**Figure 7.1**). The topographic map was generated using Golden Software Surfer 12, with a contour interval of 0.4 m. The same data were used to also generate a 3D surface in Surfer (**Figure 7.2**).

The site is dominated by two large platforms, which have been named Plaza Group A and Plaza Group B. The site is not cardinally oriented, nor does it seem to have a strong, unifying orientation at all, besides most of the platforms being more or less oriented northwest-southeast.

Plaza Group A (Structure 1-3), rising around 4 m above the surrounding ground surface, is the only complex that on first sight appeared to have a formal plaza group arrangement;

however, with clearing and mapping, it was quickly revealed that the western and the southern edges lack stone superstructures. Since there were axial protrusions on both of these edges, non-permanent structures could have completed the plaza grouping; alternatively, the platform may represent an incomplete construction program. In either case, excavation should provide pertinent information. The north side of Structure 1/2 exhibits the only evidence for large scale looting activity, with an axial trench dug almost across the entire climb to the summit of Str. 2.

Table 7.1 Station numbers and elevations for More Tomorrow.

Station #	NORTHING	EASTING	ELEVATION
STATION01	1919421.25	319730.03	35
STATION02	1919471.1	319698.61	37.61
STATION03	1919483.88	319688	41.25
STATION04	1919470.72	319710.64	39.75
STATION05	1919433.72	319658.211	33.2741
STATION06	1919399.71	319789.615	33.2109
STATION07	1919393.71	319805.49	36.3068
STATION08	1919410.91	319847.549	39.95
STATION09	1919366.58	319818.039	35.997
STATION10	1919579.71	319772.963	33.9955
STATION11	1919501.7	319783.177	35.09
STATION12	1919360.48	319829.61	36.5987
STATION13	1919412.64	319875.773	38.7836
STATION14	1919380.55	319858.041	37.8001
STATION15	1919474.71	319800.201	32.5258

If not for the drainage ditch, which had been recently excavated to draw water from the nearby lagoon to the rice field according to local informants, Str. 7 would have been another example of an “appendage” type structure connected to the southeastern corner of Str. 1 to the north, similar to structures observed at Saturday Creek (See **Figure 4.2**, Structures 1 and 29, as well as Structures 5 and 15). If the monument placed in front of Str. 7 is from a later time period, the construction of these appendage structures may also postdate the structures to which they are attached; a line of thought that may be further pursued in the future through excavation.

The other major complex is Plaza Group B, constructed at the southern edge of the terrace on which all of the More Tomorrow structures are built. The platform’s southern edge follows the natural contour of the terrace; perhaps as a result, the platform is polygonal, and the superstructures thereon configure an almost triangular arrangement. Of these superstructures, Str. 12 is dominant, standing about 3 m above the plaza floor, and oriented about 45° off of the general orientation of the other structures. Mr. Rolland, who, in 2011, resided part-time at the site and had built several structures atop this plaza group and Str. 12 in particular, seems to have given up working the land; hence, several of his structures, including a shack and a pig-pen, have been left to decay atop this platform. Considering that Str. 12 would have been an excellent vantage point overlooking the bend in the Belize River (and possibly a boat landing, if dating to antiquity) to the south, there is good chance that the platform contains ample evidence of residential activity.

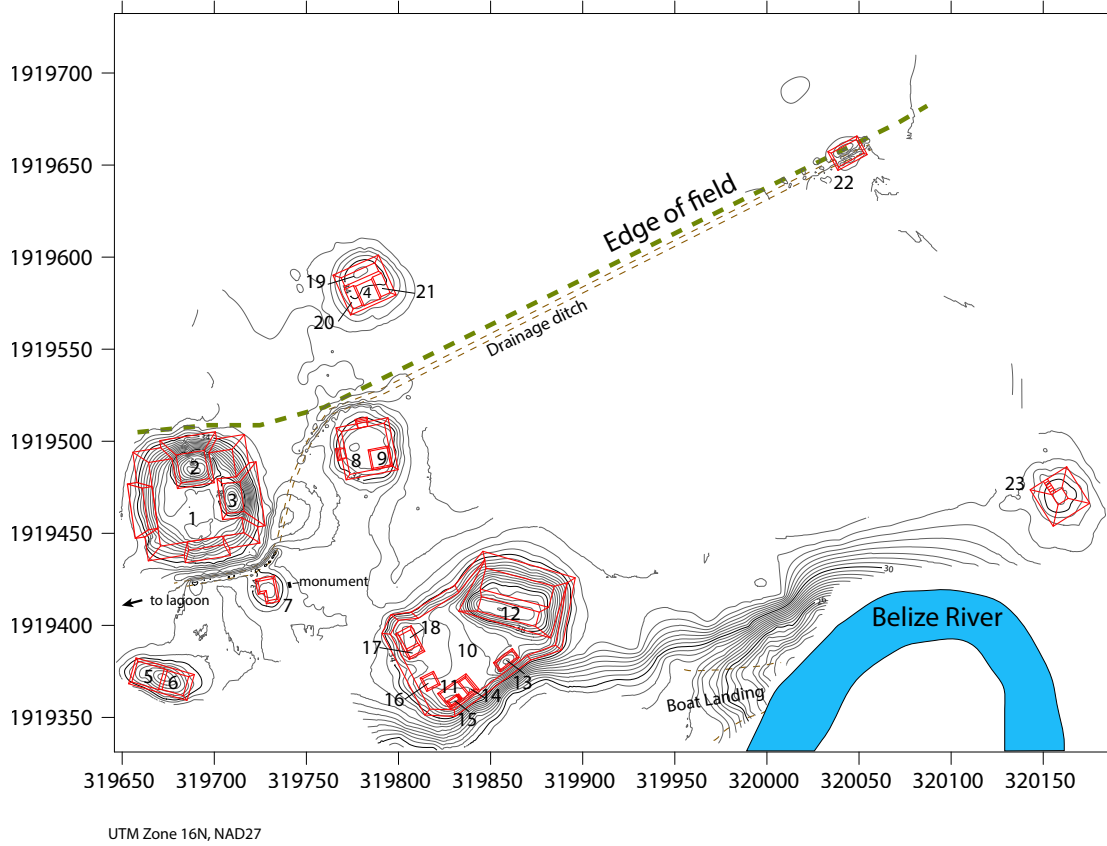


Figure 7.1 Contour map of More Tomorrow, with rectified structures and structure numbers overlain (map prepared by S. Murata and H. Robinson).

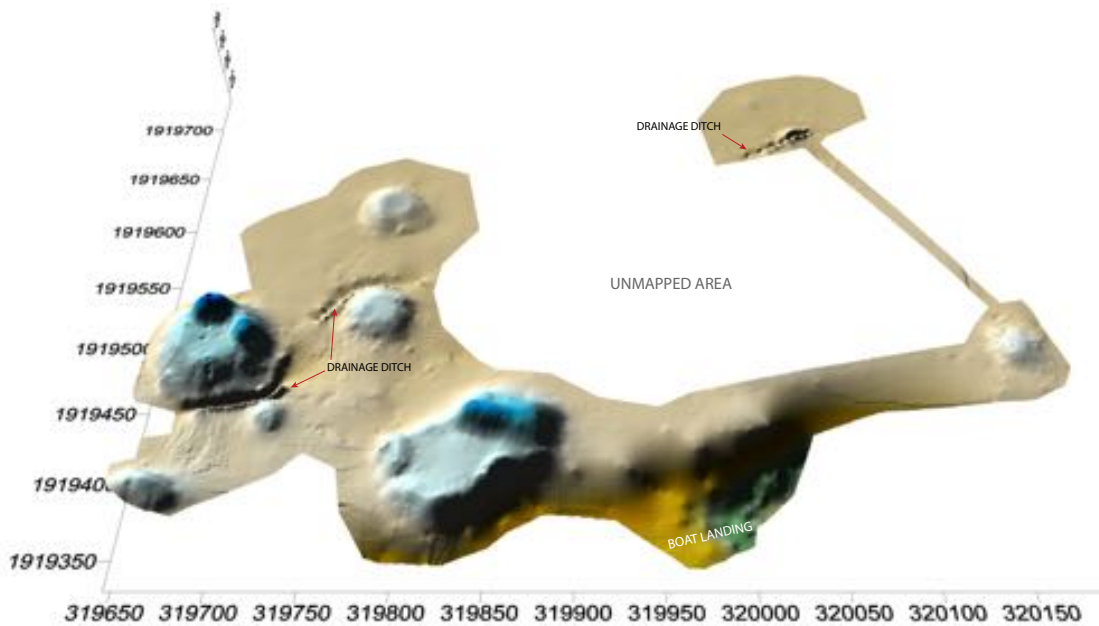


Figure 7.2 3D surface of More Tomorrow (map prepared by S. Murata).

Future Work

All of the More Tomorrow structures surveyed in 2011 have been fully mapped; however, the existence of Str. 22, confirmed only because it was partially exposed at the edge of the field, as well as visual confirmation by local informants of mounds several hundred meters west of Plaza Group A, suggest that there is more to the site. If future work is to be done, the area marked “unmapped” (also an area that is largely un-surveyed) as well as to the west of Str. 1 should be considered.

Ma'tunich

Methods

The method used to establish the primary occupy point and back sight point for Ma'tunich is exactly the same as described in Ch. 4 of this volume, as well as in detail elsewhere, and thus will not be repeated here (Murata 2011). The primary occupy point (Station 1) was placed on the top of Str. 2 and the primary back sight point (BS) was placed about 500 m north of Station 1, on the south side of the Mennonite road¹. From these two points, Station 2 was placed on the northeast corner of Str. 5; all of the other points measured for the site are based on these initial points. Because of the limited areal extent, the nature of the mapping program as constituting the final exam for the field school students, and the fact that most of the site was covered in low grass, rather than tall vegetation, most of the mounds were almost entirely cleared; the “radial lines” method described in Chapter 4 was utilized only for Str. 8, which was covered with thorny bush that was extremely difficult to chop.

The students were divided into four teams, each comprising two students except for the last, which consisted of the seventh student and Murata. Each team spent 2.5 hours mapping as much as they can in areas of the site designated beforehand. That is, team 1 was assigned the area including Strs. 4 and 5; team 2 was assigned the area including Strs. 6 and 7; team 3 was assigned the area including Strs. 2 and 3; and team 4 was assigned the area including Strs. 8 and 9. The students were instructed to setup the total station and collect data from two different occupy points (i.e., two setups were required, each by a different student as the primary operator), with the two students alternating their roles as the total station operator and the rod holder. Help from the supervisor (Murata) was provided only in dire circumstances.

Results and Discussion

In the one and a half days spent mapping Ma'tunich, the students gathered a total of 738 points and 8 structures, all on a large, raised platform of about 140 x 100 m (Str. 1, **Figure 7.3**).

The topographic map was generated using Golden Software Surfer 12, with a contour interval of 0.4 m. The same data were used to also generate a 3D surface in Surfer (**Figure 7.4**).

The main component of the site is the enclosed courtyard surrounded by Strs. 2, 3, 4, and 5. The northern structure (Str. 2) stands taller than the others constituting the plaza by about 1.6 m. The entire complex appears to be oriented slightly east of north by about four degrees.

As the agricultural field abuts the site in all four directions, the peripheries appear to have been heavily disturbed, making it difficult to assess whether the configurations seen are the result of the original construction. For example, the unusual constriction seen in the eastern half of Str. 4, and the inset corner to the east of Str. 3 and south of Strs. 8 and 9 may be the result of recent farming activities rather than the original intent of the ancient Maya. Nevertheless, there are some interesting things going on, such as the diagonal junction of Strs. 5 and 7 by Str. 6. While not mapped by the students, survey during the 2011 season suggested architectural remains of what may be later construction in the southwestern corner of the platform.

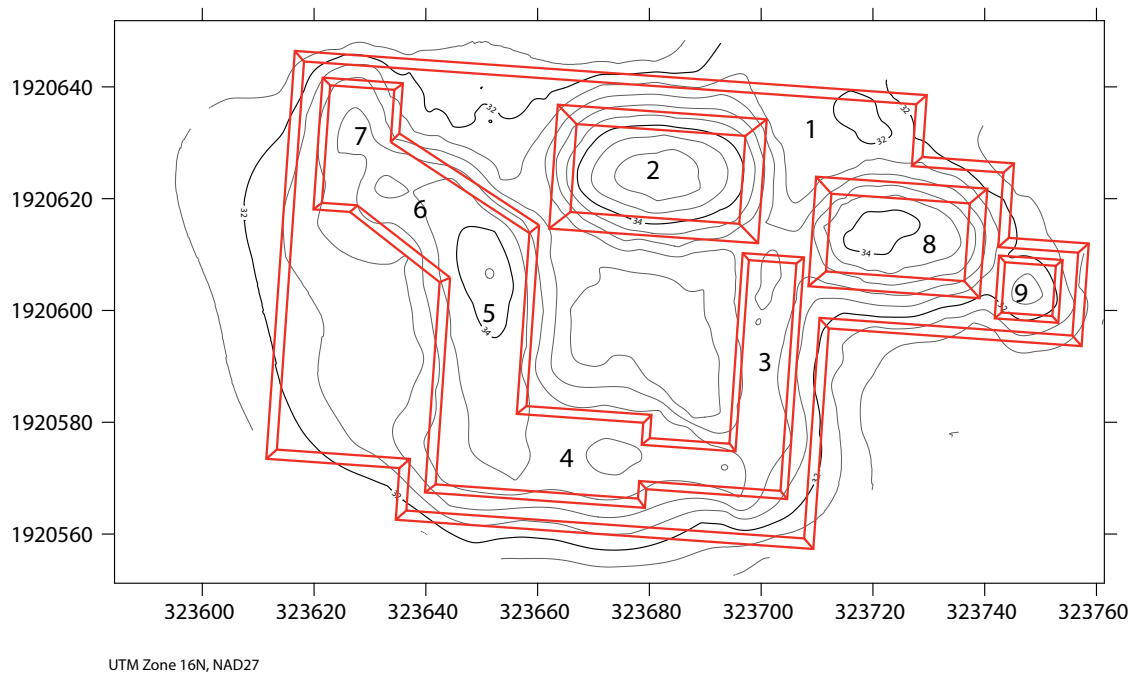


Figure 7.3 Contour map of Ma'tunich, with rectified structures and structure numbers overlain. It is difficult to determine whether the area circled as “corn field” truly represented an inset corner of the platform (Str. 1) in antiquity, or is the result of modern modification for agricultural use (map prepared by S. Murata).

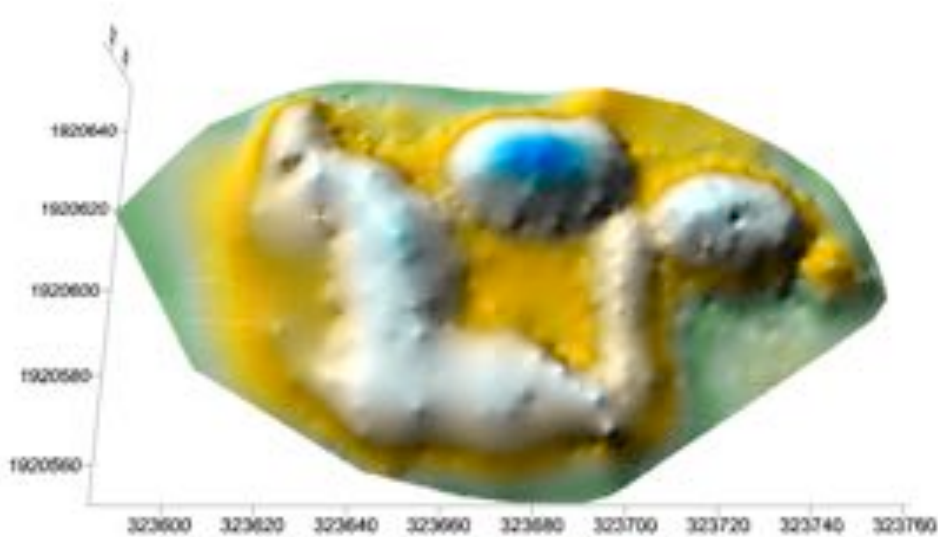


Figure 7.4 3D surface of Ma'tunich. Note: irregular “bumps” on surface due partially to the relatively low number of points collected (map prepared by S. Murata).

Future Work

The mapping program at Ma'tunich, in essence, killed two birds with one stone: (1) to provide a manageable area to be used to measure the skills acquired by the students, and (2) to undertake “salvage” mapping at a site that could be destroyed at any time. Because of both lack of time (1.5 days) spent, and the relative lack of skill of the students, the acquired data are not optimal, as can be seen in the 3D map (see **Figure 7.2**), in which the lack of data points has translated to irregularities on the 3D surface. At the same time, it has provided us with a map that probably would never have been produced if it could not be utilized as an examination grounds for the field school students. Since much of the tall grass, the corn in area marked “corn field” in the map, and some of the thorny bush mentioned above were left uncleared, a drone mapping session would not have been optimal here, either. In this sense, the map is the best thing that we could have hoped for. If future work remains a possibility (i.e., if not destroyed by the landowner), mapping of the lower structures in the southwest corner, as well an overall refinement of the data may be helpful. Another exam session at this site by future field school students may, in fact, be beneficial, as a means to kill two more birds. It should be noted, however, that per the request of the landowner, all of the “stations” have been removed; therefore, if future mapping is to take place, the process of establishing the primary occupy point and the primary backsight point must be repeated at that time.

Jabonche

Methods

Jabonche requires a drive in from the Northern highway into a currently, completely forested area. Moreover, unlike the Saturday Creek area, there are no wide-open fields allowing for a long (> 500 m) straight shot with the total station to utilize the method we have been using to place the BREA site maps geographically. Furthermore, due to technical issues, the Trimble GPS at our disposal was temporarily out of service. Therefore, the method used at Jabonche was different from usual.

First, a rebar (Station 1) was placed on the top of Str. 7 and given the arbitrary coordinates of (5000N, 5000E). Station 2 was placed near the center of Plaza A due (magnetic) north from Station 1, using a Suunto sighting compass. Then, Station 2 was used as the backsight to map the entire site.

Next, toward the end of the season, a Trimble GeoXH GPS, used primarily by the recon team (see Norris et al., this volume) was brought into the site to take readings on five stations with the best visibility of the sky (see **Table 7.2**). Due to the forest cover, the error ranges of the GPS unit were higher than usual. Of the five readings, two with the least amount of error (Stations 12 and 22) were chosen to correct the entire map. The procedure was as follows: first, the GPS coordinates for Station 22, with the smallest error range (1.2 m) was used to shift the entire total station map (i.e., parallel translation to match the total station readings for Station 22 to the GPS readings). Next, with Station 22 as the pivot point, the entire map was rotated so that the bearing from Station 22 to Station 12 in the shifted total station matched the bearing from Station 22 to Station 12 as recorded by the GPS. The calculation was conducted within Carlson Software's SurvCE, which is the survey software used with one of the total stations. In actuality, the parallel translation brought the total station readings for Station 12 (as well as the other three points) to within a meter or so of the GPS readings; this means that the original sighting with the compass was quite accurate, as well as that the GPS readings (and their corresponding error ranges) are reliable.

Table 7.2 Station numbers and elevations for Jabonche.

Station #	NORTHING	EASTING	ELEVATION
ST1	1920623.77	323676.29	35
ST2	1920606.76	323651.645	34.448
ST3	1920633.279	323629.18	33.28
ST4	1920574.166	323663.583	33.532
ST5	1920597.71	323699.232	33.22
ST6	1920614.66	323723.977	34.221

With the parallel translation, the shifted coordinates for Station 22 is the basis for the entire Jabonche map. In other words, in contrast to all of the other maps generated by the BREA team thus far, the horizontal error is likely to be in the 1 – 2 m range, as opposed to the 30

- 40 cm range. The possible angular error is also likely to be greater than BREAs other maps; however, assuming a combined error of 2.5 m between the GPS readings for Stations 12 and 22, which are 238 m apart, the maximum angular error is calculated to about 0.6° , which is at least as good as the best possible measurement we can expect from compass-based mapping. As usual, the accuracy of the map should be easy to improve in the future by re-measuring any two of the permanent stations with better GPS technology, then shifting all of the points in the same way as described above.

Results and Discussion

In the ten days spent mapping Jabonche, we gathered a total of 6,394 points, 60 structures including one ballcourt, one pyramidal structure, at least five architectural groups, and three *sacbeob* (**Figure 7.5**). The topographic map was generated using Golden Software Surfer 12, with a contour interval of 0.4 m. The same data were used to also generate a 3D surface in Surfer (**Figure 7.6**). In **Figure 7.7**, structure numbers are overlain on the contour / rectified map. This map should be referenced whenever a structure number is mentioned below.

The core of the site is atop a low rise of about 1 m. While this rise was likely modified by the Maya to prepare the flat surfaces for the plaza floors, it does not appear to be a formal platform, as evidenced by the irregular edges to the east (see **Figure 7.5**). These irregular “fingers” are oriented toward a low *bajo* area, which, according to local informants, becomes inundated and connects with Black Creek during the rainy season. Several possible structures lie on these fingers, without a formal alignment in a particular orientation (Strs. 30, 50, 52).

Because we placed our first Station 1 on Str. 7, which is oriented perfectly cardinally, our initial assumption was that a good portion of the site core would also be cardinally orientated. Hence, we were surprised later to find that the northern structure in Group A (Strs. 2-4) deviates greatly, at about 18° east of north. The pyramid (Str. 1) and the western structure of the ballcourt (Str. 5), which were thought to constitute the western and eastern structures of the plaza, respectively, are also slightly misoriented at about 4° east of north. Indeed, the only structure in the plaza that is cardinally oriented is Str. 7.

Structure 7 also doubles as the northern structure of Group B. The western and the southern structures of this plaza are much better oriented to the cardinal directions. However, Str. 10, first thought to be the eastern structure of the plaza, is again greatly misoriented at about $15-17^\circ$ east of north, and seemingly displaced as well.

When these variously oriented structures are examined in relation to structures outside of the plazas, certain patterns begin to emerge. For example, the pyramid (Str. 1), the two ballcourt structures (Strs. 5 and 6), and Str. 14, which is a large platform with a wide, flat top and staircases on each of its four sides (with the western staircase facing the ballcourt being the most substantial) seem to share an axial line, and the 4° east of north orientation. Similarly, Strs. 2-4, which appear to be greatly misoriented when seen in relation to the other structures in Group A, becomes much more coherent when seen in relation to structures to the north (Groups C and E),

all being oriented about 18° east of north.

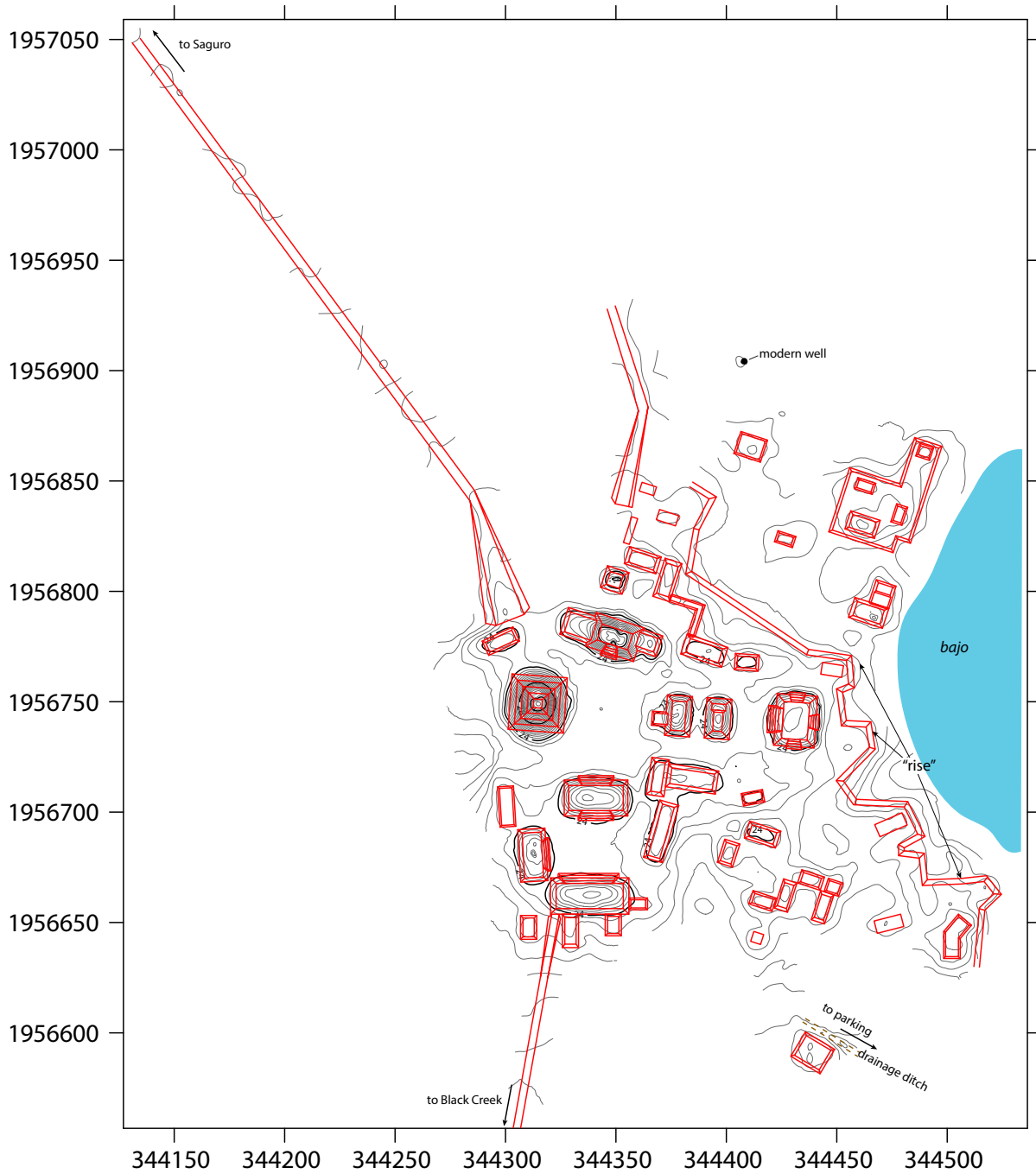


Figure 7.5 Contour map of Jabonche, with rectified structures overlain. While colored blue, the area indicated as *bajo* is not perennially inundated (map prepared by S. Murata and H. Robinson).

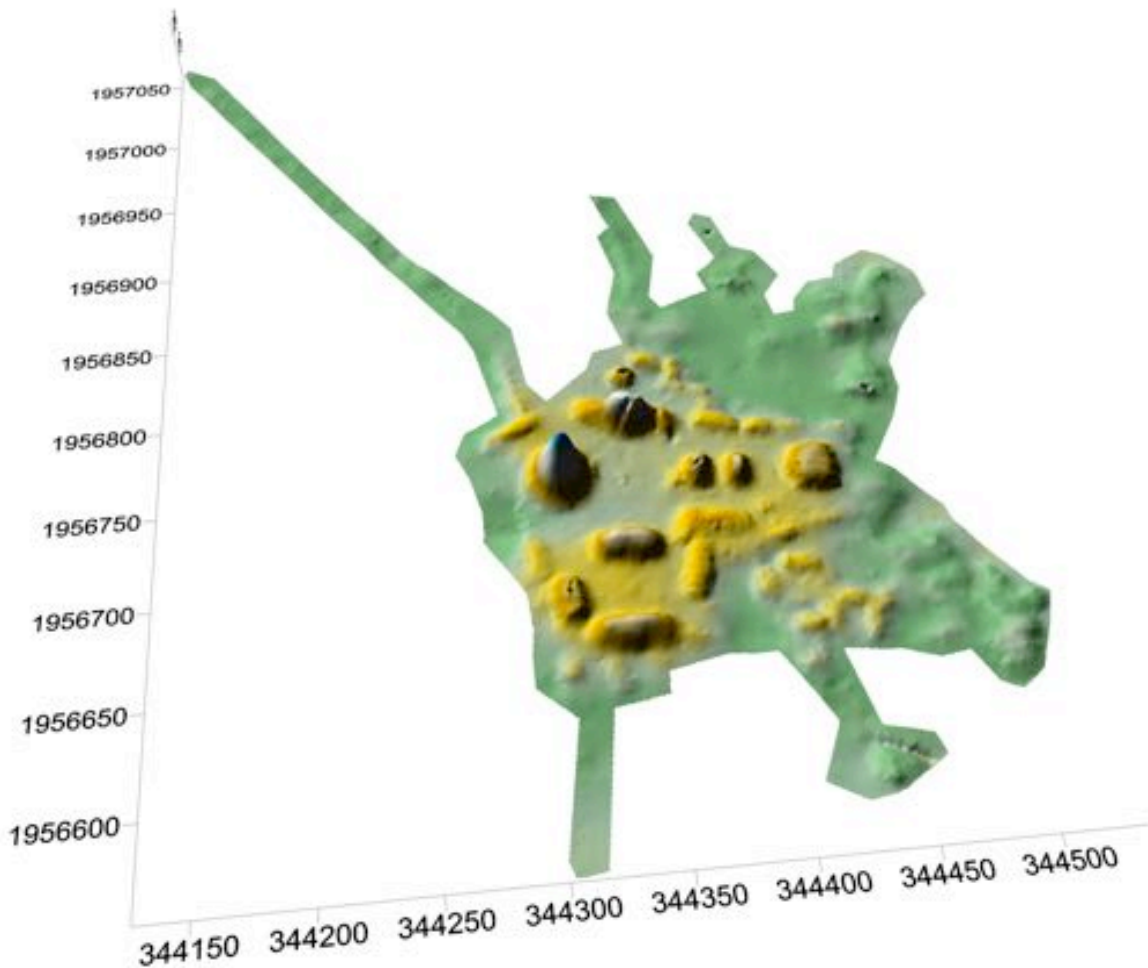


Figure 7.6 3D surface of Jabonche. Several large looters' pits are readily visible in the image, the most sizable being the trench excavate along the center axis of Str. 2 (map prepared by S. Murata).

Structures to the east of Str. 10 (Strs. 42-48) also appear to be about 18° east of north, mirroring the structures of the northern groups. Therefore, there seem to be at least three distinct orientation groups represented at the site: cardinal, 4° east of north, and 18° east of north (**Figure 7.8**). These groups likely represent different time periods of construction. For example, since Group B is, in a way, lacking a proper (cardinal) eastern structure, and similarly, Group A is lacking a proper northing structure, it could be hypothesized that the 18° east of north structures represent later time periods. Only excavation will fully shed light on this interesting mixture of architectural orientations.

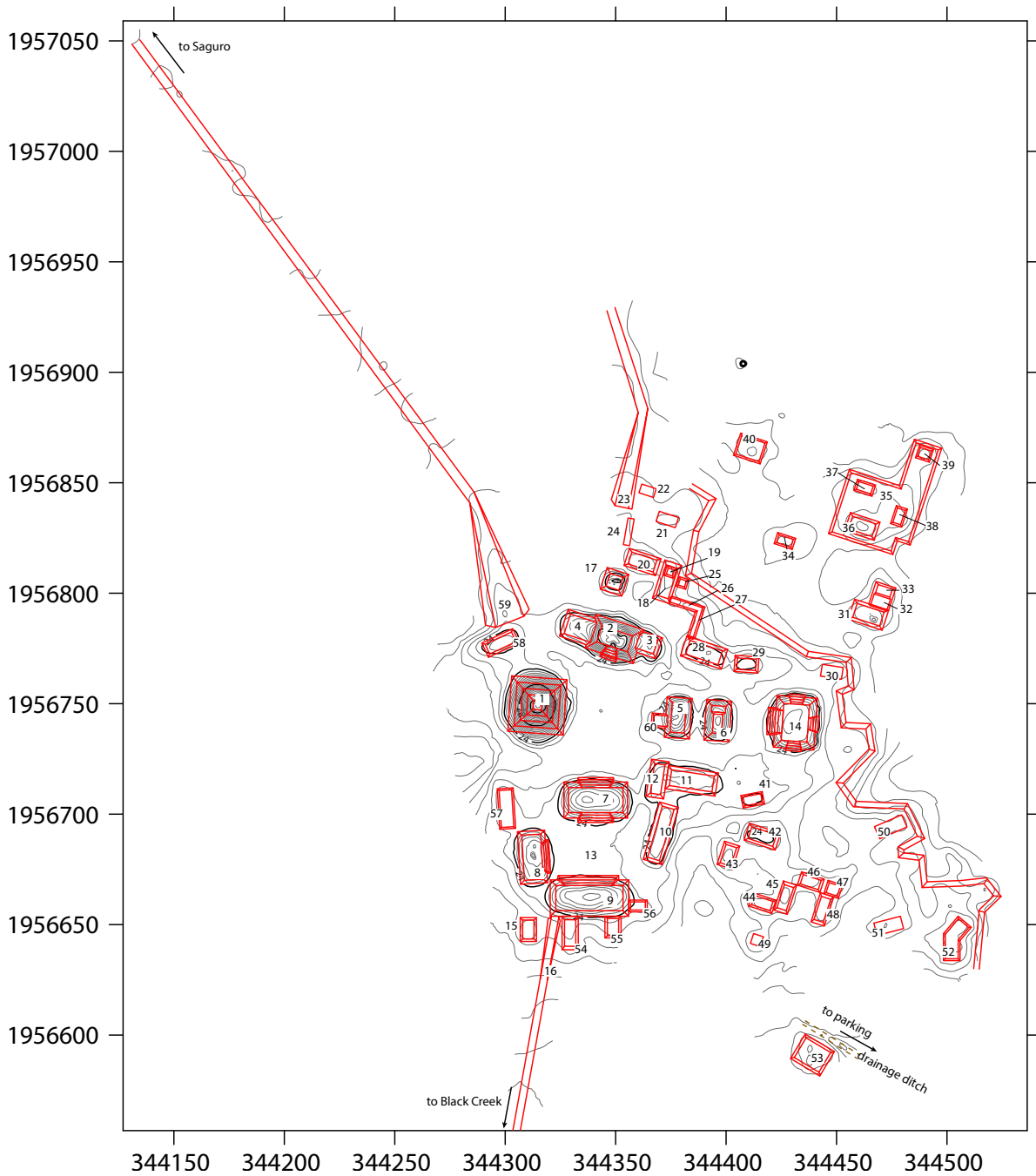


Figure 7.7 Contour map of Jabonche, with rectified structures and structure numbers overlain (map prepared by S. Murata and H. Robinson).

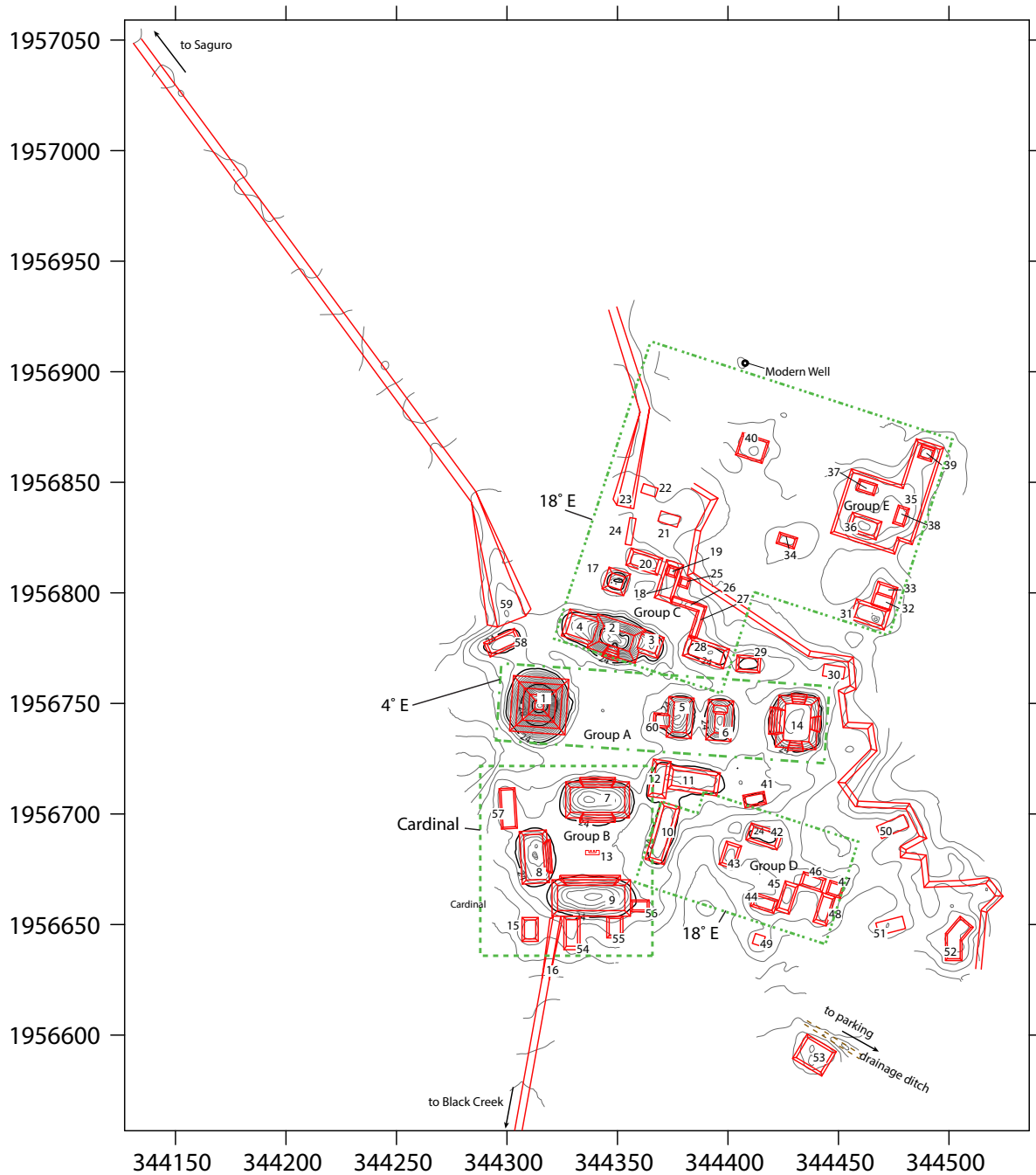


Figure 7.8 The orientations of the structures can be largely classified into three different groups, with orientations of about 0°, 4°, and 18° east of north, indicated here by the various dash/dotted lines (map prepared by S. Murata and H. Robinson).



Figure 7.9 Cross-section of the 3D surface illustrated in Fig. 7.4 viewed from the northwest. Note the *sacbe* extending to the northwest (left in this cross sectional view) and the flatness thereof (map prepared by S. Murata).

One of the most exciting finds at Jabonche was the identification of no less than three *sacbeob* radiating out from the site. The first to be identified was Str. 16, which extends SSW from the southwestern corner of Str. 9 (see **Figure 7.8**). The causeway is truly impressive in that, while not greatly raised in elevation from its surroundings, it seems to be entirely paved by large slabs of stone. While vegetation and time constraints allowed mapping only a portion (c. 120 m) of the *sacbe*, foot survey has confirmed that it continues in a straight line for at least another 100 m, into a low, swampy area that becomes part of Black Creek.

The most impressive *sacbe*, however, is the one labeled Str. 59, extending northwest from the northwest corner of the site (see **Figure 7.8**). After ramping down from Str. 58 by about 1.5 m to the NNW, the *sacbe*, paved with large stone slabs much like the southward *sacbe* described above, makes a slight bend and heads in a straight line, almost due northwest, more or less maintaining the elevation. While mapping with the total station could only be continued for about 300 m due to time constraints, Murata and Robinson followed the stones through the forest as far as possible, periodically marking out positions with a Garmin handheld GPS, before extremely thick secondary growth inhibited the way. The *sacbe* indeed continues straight northwest from where the total station data left off, and the farthest point we marked was within 65 m from a point recorded by Norris and Nigro as a possible *sacbe* at the Saguro site (see Norris et al., this volume), due northwest (**Figure 7.10**). Thus, there is no question that this *sacbe* links the sites of Jabonche and Saguro. Saguro, however, is a relatively minor site. Therefore, there is the possibility that the *sacbe* links Jabonche and yet another, larger site, and that Saguro is but a way point between the two—a hypothesis worth testing in the future.

The third and last *sacbe* extends north from the northern end of the site (north of Group C, Str. 23). This northward *sacbe* was less well paved, which made following its path a challenge. Furthermore, after taking a bend at about 50 m from the proximal end, the *sacbe* seems to take another bend to the east, but it could not be followed any distance from this second bend, at which point we reached the end of the last day of mapping.

The site of Jabonche was inhabited until relatively recently; therefore, there are remains of modern occupation throughout the site. There is a special concentration of modern remains in the northeast corner of the site around the area of Strs. 31-40 (see **Figure 7.8**). Nearby, there

is also a remnant of a modern well about 50 m north of Str. 40, which still holds fresh water.

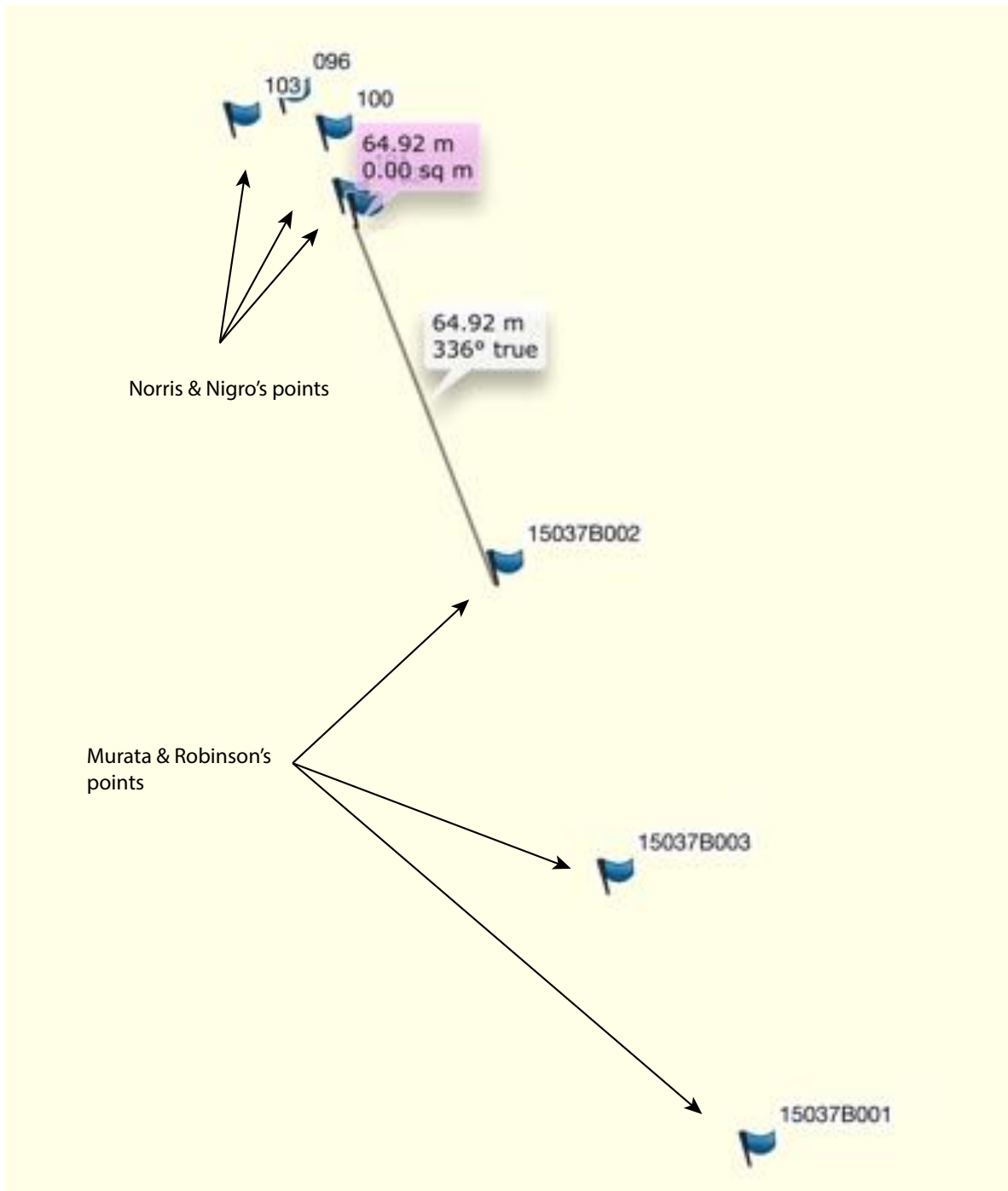


Figure 7.10 The three points at the bottom are GPS points taken along the extension of the Saguro *sacbe* by Murata and Robinson. Note that if the trajectory is followed with the same bearing, it meets with points recorded by Norris and Nigro as a *sacbe* extending southeast from the site of Saguro.

Future Work

We were able to accomplish a great deal in the limited amount of time at our disposal at in the latter half of the Jan/Feb 2015 season. While we feel that the most substantial structures have all been identified and mapped, the map is certainly not complete. Provided below are areas worthy of further survey, and possibly clearing and mapping, at Jabonche.

1. West of the site core: very little was inspected toward the west from the western end of the site core (Strs., 1, 8, 57, 58, 59). As there is a decline in elevation immediately to the west into a low, wet area, the possibility of large architectural groups in that direction seems slim; however, it may be worth cutting a transect due west from Str. 57 for a few hundred meters to be certain.

2. South of the site core: Str. 53 was visible as it is adjacent to a recently excavated drainage ditch (which is immediately adjacent to the foot path that took us into the site). The fact of its presence there (although heavily disturbed by a large anthill) suggests that there may be more architecture between Str. 53 and the site core. Hence, a survey of the blank space between Strs. 9, 16, 49, and 53 is recommended, perhaps by cutting several transects.

3. North of the site core: the area between the two northern *sacbeob* (Strs. 59 and 23) remain yet to be surveyed; while elevation drops in that direction as well, there is a good chance that some smaller structures are present therein. Therefore, the fan-shaped area between Strs. 58, 59 and Strs. 4, 17, 24, 23 should be examined.

4. East of the site core: as described above, directly east of the site is a *bajo* area with no architecture. However, this low area seems to be relatively confined, and it can be seen that the eastern structures follow a gentle curve around the *bajo*. Therefore, there is a good chance that peripheral structures continue to the northeast. Thus, the area along the northern edge of the *bajo* (i.e., to the northeast and east of Strs. 38, 39) should be checked.

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¹ Incidentally, we quickly learned that the particular segment of the Mennonite road to the north of Ma'tunich is used as a take off/landing strip for crop dusters; we were notified by the Mennonites that any protrusions in the road, such a rebar, is not welcomed. Therefore, the back sight rebar was immediately removed and we were instructed by the landowner to remove any rebar or temporary stakes thereafter.

Section II

Site Investigations

Chapter 8

Excavations on and around Structure 20 at Saturday Creek (Operations 17 and 18)

Kelin Flanagan and Eleanor Harrison-Buck

Introduction

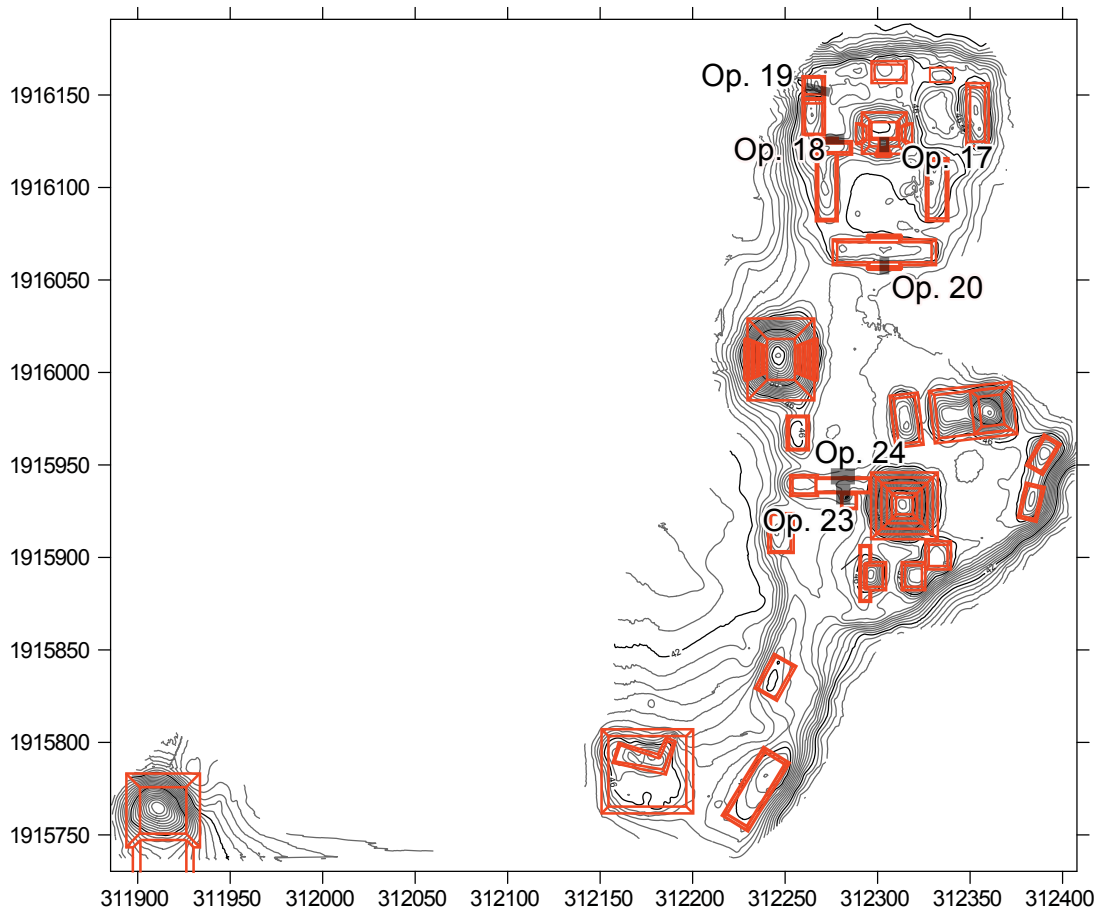
Saturday Creek was the focus of mapping as well as several excavations during the January and summer 2014 field seasons. The site core of Saturday Creek presented in **Figure 8.1** is largely preserved due to the fact that it has been left in bush; only Structure 25 appears damaged due to bulldozing, which likely occurred in the last 10 years (see Runggaldier and Isa, this volume). The southern part of the site core has been cleared for some cultivation of plaintain and other crops, but unlike the Saturday Creek hinterland settlement (see Willis and Walker, this volume), the site core has not been subjected to clearing with mechanical equipment in the form of bulldozing and agricultural planting has been with pole and stick, rather than mechanical plowing so architecture remains relatively intact.

Operations (Ops.) 17-20 were located in and around the northernmost plaza group in the Saturday Creek site core (**Figure 8.1**). Ops. 17 and 18 are presented here. Op. 17 was located on the top of Structure 20 close to the structure's central axis. Op. 18 was located off mound in the saddle that functioned as an alleyway between Structures 20 and 21 in the Northern Plaza Group.

Objectives and Description of the Research

We had a number of specific objectives in mind with the excavation of Ops. 17 and 18 at Saturday Creek:

1. Test for the presence of termination deposits on and around Structure 20.
2. Define the architectural features and any earlier phases of Structure 20, the primary elite residence at Saturday Creek.
3. Recover diagnostic pottery from the different phases of architecture to determine the chronology of the Northern Plaza Group.



**Figure 8.1 Location of Ops. 17-24 at Saturday Creek
(map prepared by S. Murata and adapted by M. Brouwer Burg).**

Elsewhere in the Maya Lowlands, termination deposits are typically located on the centerline of buildings and block the stairways or passageways leading into the main elite residential plaza groups (Harrison-Buck 2012). The placement of Ops. 17 and 18, as well as Op. 20 (see Runggaldier and Isa, this volume) were guided by this pattern of termination ritual found elsewhere in the Maya Lowlands. However, our excavations ultimately did not yield any conclusive evidence of termination deposits in these locations. Very little material culture was found in Op. 17, namely on the surface of Structure 20, and no clear indication of earlier construction phases were detected when excavations penetrated ca. 70 cm deep into the Structure 20 platform. A uniform cobble fill with few artifacts suggested that the platform was built in a single construction phase. Likewise, only scattered bits of terminal debris were recovered from the final floor surface between Structures 20 and 21 in Operation 18 with no evidence of termination deposits. However, excavation of Op. 18 revealed several earlier plaster floors that suggested the North Plaza underwent multiple phases of construction.

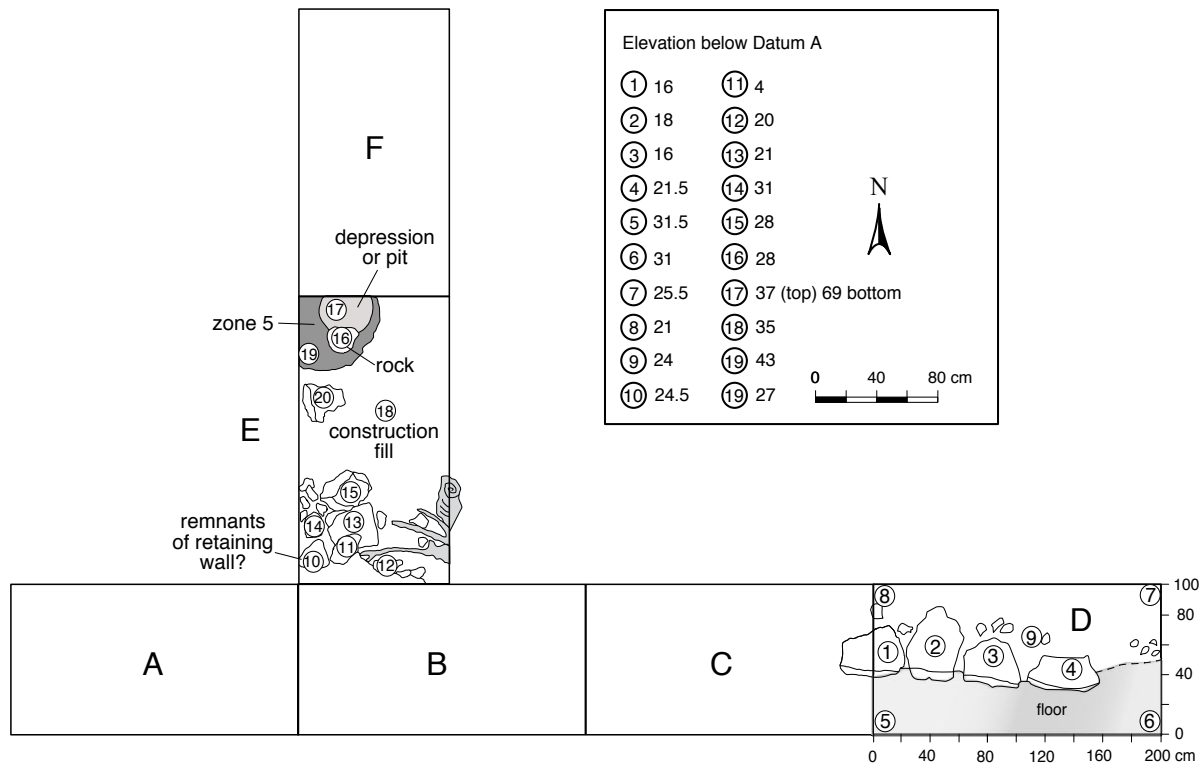
Excavation of Operation 17 occurred during the January 2014 season and excavation of Operation 18 was carried out over two field seasons in January and the summer 2014. Excavations in January were directed by Eleanor Harrison-Buck and the summer excavations were directed by Kelin Flanagan. Below we describe the results of our findings from excavation.

Operation 17

Op. 17 is a shallow test unit that was placed on the top of Structure 20, the main elite residence at Saturday Creek in the North Plaza (**Figure 8.1**). The unit is cardinaly oriented and was divided up into five squares (**Figure 8.2**). Squares A-D are 1m (north-south) by 2m (east-west). Squares E and F are located north of Square B. Unlike Squares A-D, Squares E and F are oriented 2m (north-south) by 1m (east-west). Ultimately, Squares C and F were not excavated and only a portion of Square B was excavated because of a large tree in the middle of the square. Of the squares that were excavated, only a thin layer of overburden and collapse debris was removed to define an east-west retaining wall of Structure 20 in Squares A, B and D (Zones 1 and 2). The most excavation occurred in Square E where Zones 3-7 were excavated, comprising the remains of a floor, ballast, and construction fill within Structure 20. All zones yielded very few artifacts and the uniform fill of the structure was almost completely devoid of artifacts. Therefore, excavation of Square E ceased after excavating only about 70 cm in depth. All measurements for Op. 17 were taken from Datum A, which was located on a tree nearby the unit and the point was shot in with the Total Station, along with corners of the excavation unit. The details of each zone are described below.

Zone 1

Zone 1 is a thin topsoil (~5-7cm in depth) that was excavated in Squares A, B, D, and E. There are a number of trees growing on top of Structure 20, adding to the root disturbance in Op. 17. Because of the presence of a large tree in the middle of Square B it was decided that only a small portion along the west side of the square would be excavated, measuring .50 (east-west) x 1m (north). At the base of Zone 1 the humic layer transitioned to a lighter silty-clay matrix and a mix of collapse debris and floor ballast was encountered (Zone 2). This Zone 2 surface is not uniform, but uneven and poorly preserved. Portions of an intact east-west retaining wall of Structure 20 was visible in parts of the excavation unit. For instance, a line of 4 large cut blocks running east-west was partially visible in Square D prior to excavation and was further defined in Zone 1. Only a light density of artifacts was recovered from the topsoil.



**Figure 8.2 Planview of Op. 17 at Saturday Creek
(drawn by E. Harrison-Buck and digitized by M. Brouwer Burg).**

Zone 2

Zone 2 appears to be a mix of collapse debris and eroded plaster floor that was excavated in Squares A and D on the south (or exterior) side of the east-west retaining wall. The matrix of Zone 2 consists of boulder and cobble-size tumble debris with very few artifacts. In Square D, the retaining wall of Structure 20 was further exposed at the bottom of Zone 2. The highest density of the collapse debris in Square D was in the southeastern corner of the square, which may mark the southeastern corner of the east-west wall of Structure 20. However, the corner of the structure was never definitively identified due to poor preservation.

Toward the base of Zone 2 there was a noticeable color change as the soil became lighter, going from a dark brown to an ashy gray. At the bottom of Zone 2 in Square D a relatively flat and fairly level ballast fill was defined, which comprised small limestone cobbles. Little to no plaster was preserved, but the floor had a number of sherds lying flat and the east-west retaining wall was found resting directly on the surface. In Square A we encountered at the base of Zone 2 patches of possible ballast, but a lot of old and new tree disturbance had disturbed the surface and made it difficult to define as a uniform level. Despite digging a bit deeper in Square A, we did not encounter an east-west retaining wall and we believe it is slightly to the north of Square

A, which would mean the structure is oriented a couple of degrees north of west (running ~275 degrees).

Zone 3

Zone 3 is the remains of ballast fill of the final floor surface of the Structure 20 platform. This was excavated in Square E only. The matrix yielded a very light density of artifacts and only 50% of the soil was screened. The matrix of Zone 3 consists of loose fill with small cobbles and pebbles. The zone was ended arbitrarily.

Zone 4

Zone 4 is the construction fill directly below Zone 3 ballast fill. This was excavated in Square E only. The fill is virtually devoid of artifacts and only 50% of the soil was screened. The matrix of Zone 4 is similar to Zone 3 with slightly more cobbles whereas the ballast consisted of smaller pebble size inclusions. Zone 4 consists of loose fill with a mix of small cobbles and pebbles. The fill is quite uniform and sterile and the zone was ended arbitrarily.

Zone 5

Zone 5 is a pit feature encountered during the excavation of Square E. The dark soil inside the pit is loose and less dense than the surrounding soil. The dark soil inside the pit is much looser and less dense than the surrounding lighter tan matrix of the Zone 4 construction fill. We believe the pit feature is a result of natural tree disturbance. Upon sifting we came across a lot of smaller pebbles rather than medium to larger sized rocks characteristic of the surrounding construction fill material, which is a lighter color with larger to medium sized limestone rocks.

Zone 6

Zone 6 is the same construction fill that continues below zone 4 that Zone 5 (round pit from tree disturbance) intruded into. The fill consists of loose soil with cobble and small pebbles. Very few artifacts were found in the fill. Of the few ceramics, there was one with striations and one containing a flange. The overall size of Zone 6 was smaller than the zones above it in Square E due to the rocks and tree roots on the south side of the square. At the base of Zone 6 the size of the cobble fill increased.

Zone 7

Zone 7 is a continuation of the construction fill from above, but the size and density of the cobbles in the fill increases in Zone 7 and the fill is a somewhat lighter in color. The size of the rocks continues to increase toward the bottom of the zone. Very light artifact density with only a few backed clay material pieces. Increase in the amount of cobble and rock size in this zone. The fill is quite sterile so although more fill continues below, the excavation ceased at this point during the January 2014 season.

Operation 18

Op. 18 was a 2-x-7-m unit laid out in a cardinal orientation in the saddle between Structures 20 and 21 of the Northern Plaza Group (**Figure 8.3**). The excavation unit consists of three 2-x-2-m squares (A-C) and one 1-x-2-m square (D). The excavation of Operation 18 was begun in the January 2014 season, working primarily in Squares A and B (**Figure 8.4**). The northeast corner of Structure 21 was exposed in Sq. A. During the summer 2014 season, excavations continued to the east and the western edge of Structure 20 was defined in Squares C and D. The plaster floor of a narrow alleyway, formed by Structures 20 and 21, was exposed in Squares A-C, along with several earlier floors (see **Figure 8.5**).

Buckets measuring 5 gallons in volume were used to remove all soil and a count was used to estimate the total volume of excavated material removed from each zone. Zones were separated when changes in the matrices or, in some cases (like deep deposits of collapse debris) was separated into arbitrary 20cm zones to maintain some vertical control. Excavated materials were screened through ¼ inch mesh at either 50% or 25% frequency depending on the overall quantity of artifacts recovered, which in this location was very light. Only a few zones were an exception to this rule; for instance, 100% of buckets were screened for Zones 9 and 10 (see below).

Datum A located near the southeast corner of Square A served as an arbitrary datum for measurements during the January 2014 season. During the summer 2014 season, Datum B was used. Placed near the northeast corner of Square A it was tall enough to account for the eastward rising slope of Structure 20 that could be used for measurements in squares C and D. Below we describe the findings from each zone of excavation.

Zone 1

Zone 1 was the topsoil defined across the unit in Squares A, B, C, and D. This zone (approximately 25 cm thick) is composed of a thick, organic-rich humic layer with few artifacts present across the unit. The zone was consistently a relatively dark colored matrix consisting of wet, silty-clay soil with a high density of roots and a light density of collapsed stone. In the

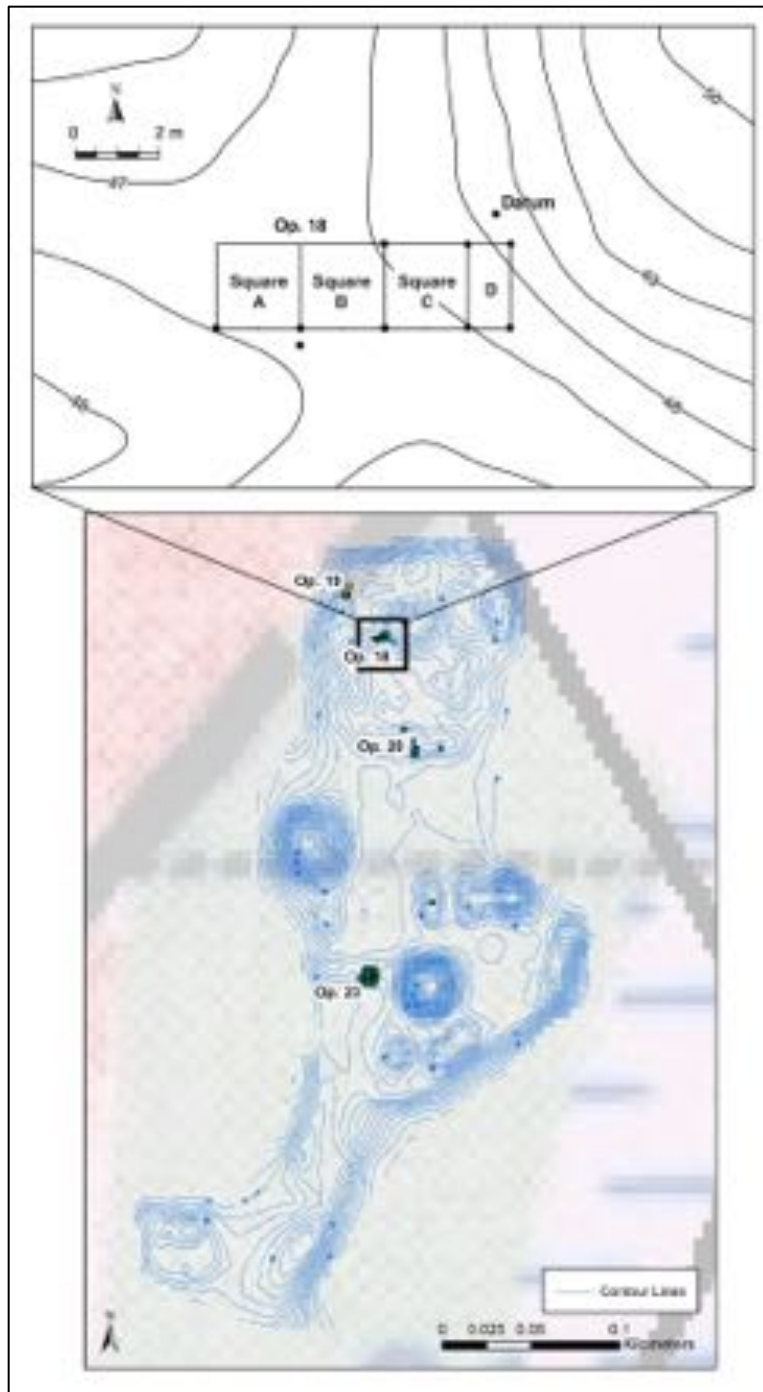
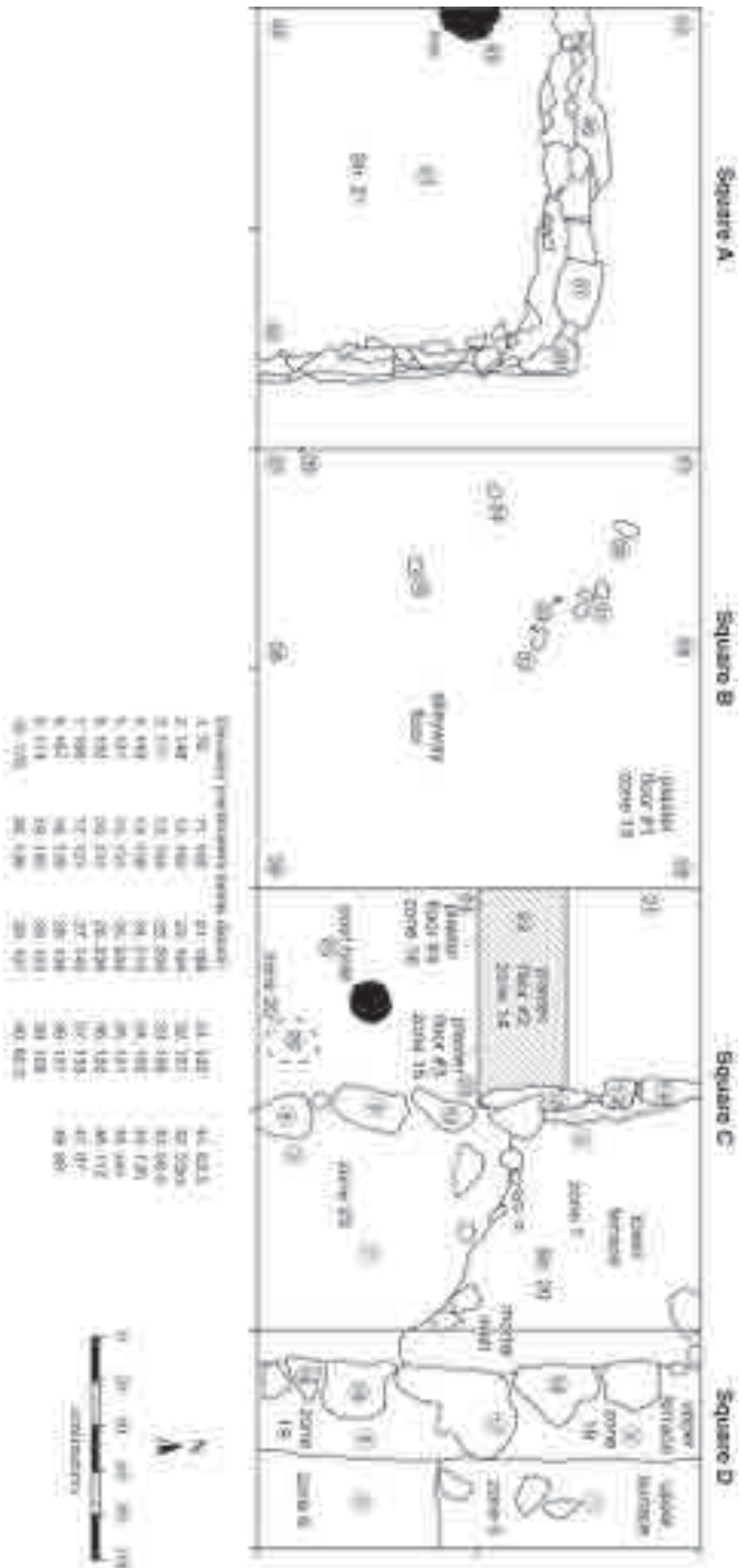


Figure 8.3 Op. 18, Squares A- D
 (map prepared by S. Murata and adapted by M. Brouwer Burg).



southeast corner of Square B, the zone includes a lighter colored matrix from an extinct leaf cutter mound that continues into the eastern half of Square A, proximate to Structure 21. In this zone, 50% of buckets were screened from all squares. Topsoil becomes increasingly darker down slope (off mound) into Square B located in the middle of the alleyway. Matrix is composed of a light density of limestone cobbles, likely collapse debris falling from Structures 20 and 21 into the saddle between the two structures. Slightly larger boulder-size collapse was seen in Zone 1 Square C. The excavation of Zone 1 in Square C went a little deeper than the humic layer by as much as 5 cm in the east and 2 cm in the west. Overall, very few artifacts were recovered across the unit, including ceramic sherds and lithic debitage. Soil became increasingly lighter as depth increased.

Zone 2

Zone 2 is characterized as collapse debris falling from Structures 20 and 21. The zone is composed of a lighter colored matrix directly below the topsoil, although it is obscured somewhat in Squares A and B due to the extinct leaf cutter mound located there. This zone is found in squares A and B only and was removed as Zones 5 and 6 in Squares C and D. 50% of buckets were screened for both squares.

At the start of the zone in Square A, some limestone cobbles were visible in the lower (western) half of the unit. A low number of ceramic artifacts were recovered from a total of 63 buckets of soil. At the bottom of Zone 2 the top of the northeast corner of Structure 21 was partially exposed (**Figures 8.4** and **8.5**). The matrix was composed of collapse debris containing a high density of small stones mixed with larger limestone cobbles and boulders. The color of Zone 2 in this square was 10YR 4/2.

In Square B, the majority of ceramic sherds recovered came from the western-most edge of the square. It is likely they collapse from Structure 21. The primary Munsell reading of Square B (10YR 4/3) represents the color of the collapse debris falling from Structure 20 whereas the collapse debris from Structure 21 had a Munsell value of 10YR 2/3. As the collapse slopes downward off Structure 21 into Square B the number of cut limestone boulders in the collapse increased. There were only a few large cut limestone blocks seen slumping off the Structure 21 retaining wall. Artifacts recovered include fire-cracked rock, freshwater snail shells, baked clay material, ceramic sherds, possible speleothems, and a ground stone tool.

Zone 3

Zone 3 consisted of a continuation of the Zone 2 collapse debris in Squares A and B. We removed the collapse in arbitrary intervals of 20 cm zones. At the bottom of Zone 2 and top of Zone 3, the top course of the cardinaly-oriented eastern retaining wall of Structure 21 was exposed in the southeastern corner of Square A. This eastern retaining wall runs north about 1.5 meters in Square A before cornering to the west for another 1.5 meters where it runs into the

western excavation wall of Square A (see **Figure 8.4**). Zone 3 was aimed at further exposing this northeast corner of Structure 21 in Square A and continuing to remove the collapse debris from the 2-x-2 m area in Square B that represents the alleyway. At the bottom of Zone 3 in Square B there was a higher density of large cut limestone boulders that were found right up against the wall and are clearly the remains of tumble that fell off of Structure 21, indicating that it had at least one additional course on top that had since collapsed. In both Squares A and B, 50% of buckets were screened. A light density of ceramic sherds and baked clay material were recovered. In the northeast corner of Square B the remains of a cohune palm made the soil significantly darker in this area. Zone 3 was terminated after an arbitrary 20 cm, however the collapse continued below this into Zone 4 (see below).

Zone 4

Zone 4 is a continuation of the Zone 3 collapse debris in Squares A and B. The Zone 4 collapse debris lay directly overtop of a plaster floor surface. Zone 4 in Square A consists of an L-shaped area with a narrow strip around the perimeter of the northeast corner of Structure 21. There is about a 50 cm corridor between the northern side of Structure 21 and the north excavation wall of Square A. The northeastern corner of the structure contains two nicely preserved courses of stone, but there was at least one more (maybe two) course of stone that have since collapsed. Only one stone of this top course remains intact on the western wall of the exposed portion Structure 21. In Squares A and B, 50% of buckets were screened until the last 5 cm above the plaster floor. Artifact density increased as we neared the floor surface and at that point 100% of buckets were screened. Some sherds were found lying flat, hovering about 5 cm above the floor surface with a medium density of charcoal flecks mixed in to the last 5 cm of the matrix above the floor. These artifacts were bagged separately and point plotted in the planview (see **Figure 8.4**). Two C-14 samples of charcoal chunks found in to the last 5 cm of the matrix above the floor were collected as part of Zone 4. Photos were taken of the artifacts *in situ* on the floor. Notably, few artifacts were recovered adjacent to the building, particularly along its northern side. The artifact deposits resembled defacto terminal debris, as opposed to purposeful termination deposits on the floor.

At the base of Zone 4 the plaster floor (Zone 13) was defined. The Zone 13 floor had some well-preserved patches but most of it consisted of compact ballast with little plaster remaining. The best-preserved patches appear gray, as if burned. Surprisingly, the patch of floor closest to the NE corner of Structure 21 is poorly preserved. The collapse debris was filled with cobble and pebble size limestone inclusions and the soil color was 10YR 4/2.

Zone 5

Zone 5 is collapse debris in Squares C and D that is similar to Zone 2 in Squares A and B of Operation 18. Like Zone 2, it is the matrix directly below the topsoil but was given a different

zone number because they were excavated during separate seasons, but also because the collapse in Squares C and D was likely associated with Structure 20, rather than Structure 20 (in Squares A and B). The matrix was composed of a lighter colored, densely packed clayey soil with limestone inclusions. 50% of the soil buckets were screened.

Zone 5 in Square D was characterized by an abundance of limestone cobbles in the northern half of the square. Soil color (10YR 3/3) was lighter than the soil in Zone 1. The northern half of the square also contained tumble collapse similar to Zone 6 (see below). The soil color was slightly lighter with a higher volume of large limestone cobbles and stones in Square C than Zone 5 in Square D. Also, the eastern 15-20 cm of Square D consists of a darker, softer clay matrix (possibly earthen structure fill) with few limestone cobble collapse stones. The differential matrices may reflect the tumble following the slope of the mound. In the southern half of Square D, the soil matrix was similar to that of Zone 5 in Square C. It was a more compact, dark clay matrix with fewer limestone inclusions. Square D terminated at a clear color change.

Square C was a lighter colored (10YR 3/2) dense clay below topsoil. The top of Zone 2 had some collapse visible in the northeast corner of the square, thinning out as the zone moved west in the square. The matrix is compact with crushed limestone and limestone cobbles. In both Squares C and D 50% of buckets were screened. A light density of ceramic sherds and lithic debitage were recovered. At the bottom of Zone 5, the collapse debris continued (as Zone 6), but was denser and the soil color was lighter, which prompted the zone change.

Zone 6

Zone 6 is directly below Zone 5 and is a continuation of the tumble debris falling from Structure 20. The soil matrix in Zone 6 was lighter (10YR 4/3) than Zone 5 matrix but all of it is considered to be tumble from Structure 20. Zone 6 terminates at a soil color change. The soil became much lighter at the bottom of the zone. At the base of the zone, an intact limestone cobble construction fill of a lower terrace of Structure 20 was partially defined in the southeast part of Square C. The zone terminated at an arbitrary 20 cm depth, and it is marked by a soil change in the northwest corner of Square C, which contained very soft clay (10YR 3/4) and crushed limestone (beginning at 137 cm below Datum C). It appears to be construction fill spilling down to the lower terrace wall (defined as Zone 8 below). Some artifacts from a tree disturbance (defined as Zone 9 below) are possibly mixed in this zone as well. In both Squares C and D, 50% of buckets were screened and a light density of artifacts were recovered. Artifacts were from both the tumble of the top tier of architecture on this structure as well as a zone of clay to the east (including nice striated sherd from the clay zone). Striated ceramic sherds were found at the interface of Zones 6 and 7 in Square D.

Zone 7

Zone 7 was a continuation of the tumble present in Zone 6, but displayed a lighter colored clay matrix (10YR 7/4). A line of stones running north-south was further uncovered in this zone, which represents a terrace wall of Structure 20. It is possible we removed some of the construction fill of the upper terrace in the eastern portion of Square D, however no cut- or seated-stones were found to retain this matrix. It is possible some stones were robbed from this structure at some point, which might explain the paucity of cut facing stones. A small balk of fill was left unexcavated to be included in a new zone (Zone 10) in order to test the association of the possible construction fill to the first construction tier.

For Square C, a north-south oriented wall was located in the central and northern portions of Square C, representing a lower terrace. An pit feature that ended up being the remains of a natural tree disturbance was defined in the northeast corner of this square. The soil in that pit was darker and was excavated as a different zone (see Zone 9 below). In Squares C and D, 50% of buckets were screened. This zone may have dug partially into the inner construction fill of the terrace wall in the southeast portion of the square. Therefore, a mix of artifacts from tumble and construction fill might be expected in this zone. Some artifacts from Zone 9 may also be mixed in with this as well. The soil matrix was mostly very pale (10YR 7/4) with crumbly limestone and mortar inclusions. A light density of sherds and debitage, as well as a carbon sample were collected from this zone.

Excavation of Zone 7 in Square D occurred only in southern half of square at first, and a 40 cm balk of a different soil context was left unexcavated in the east. The tumble fall trended diagonally across the whole unit, so larger cobbles appeared more frequently in the western portion. The matrix was soft clay mostly of a slightly different color (10YR 4/4) than in Square C, and the zone terminated right at the interface of the lower terrace fill. The matrix was composed of collapse from Structure 20. It was filled with limestone rocks and cobbles as well as chert and a light density of ceramics sherds.

A bark beater was recovered from Square C but was not identified right away by the excavators so the exact provenience was lost. However, it seems likely that it was recovered from below Zone 7. This artifact was labeled as surface collection FCB: 5047.

Zone 8

Zone 8 began west of the lower (north-south) terrace wall exposed in Zone 7. This zone is only found in Square C. The material was mostly tumble from the structure. The soil color immediately became slightly darker (10YR 4/2) than zone 7. Fifty percent of buckets were screened. At the base of Zone 8, the bottom of the lower terrace wall was exposed with a plaster floor (Zone 13) abutting their exterior face (see **Figure 8.5**). A light density of ceramic sherds was also recovered from Zone 8, including fish bone (possible parrotfish) that was found at

bottom of the zone. Zone 8 terminated 5-10 cm above the Zone 13 plaster floor and was excavated separately as Zone 11 (see below). The matrix of Zone 8 was composed of collapse debris with one large fallen limestone boulder that was likely originally a part of the terrace wall. The soil was a compact clay and fewer large cobbles are found in this matrix when compared with Zone 7.

Zone 9

Zone 9 was an intrusive pit located in the northeast corner of Square C and the northwest corner of Square D. It was at first uncertain whether the feature was cultural or natural from tree roots. All buckets were screened. A carbon sample was collected at 130 cm below Datum C. The soil matrix was a dark compact silty clay (10YR 4/4) with small limestone inclusions. A light density of sherds and some daub were collected as well as the carbon sample. Upon completion of excavation, we determined that it was likely an old tree's root-ball due to the shape of the pit. Rather than being conical in shape, the pit undercut a portion of Zones 5 and 6 collapse debris, suggestive of a modern, natural disturbance.

Zone 10

Zone 10 removed the wall fill from east of the first tier stone wall in Square C. All buckets were screened. Once the north-south lower terrace wall was identified, we realized the eastern portion of Zone 7 was likely construction fill. A small balk of this fill was therefore left unexcavated and excavated separately as Zone 10. However, no artifacts were found. The matrix was composed of high density of medium and large limestone cobbles with a soft clay colored 10YR 4/3.

Zone 11

Zone 11 is in Square C and was the last 5-10 cm of tumble, mortart, and plaster "melt" right above a plaster floor (Zone 13) surface west of the lower terrace stone wall. The floor was well preserved throughout much of Square C, but in the center showed signs of being capped with a repair to the floor (Zone 12). Animal bone and obsidian were recovered as well as lithic debitage and ceramics. The matrix was composed of compact clay (10YR 3/4) with a light scattering of small bits of limestone.

Zone 12

Zone 12 is below the plaster cap, or the plaster floor patch. This zone consists of the fill of the repair to the floor in Square C. The cut to the floor runs east-west, roughly perpendicular to the western lower terrace wall of Structure 20. It is only 10 cm thick and the eastern portion

ends when we encountered a second plaster floor (Zone 14). In the west, the second (Zone 14) floor does not appear to continue, however. After further excavation and a peeling back of the trampled soil in Square B 1 m towards the west, it appeared that the “cut” was likely caused by water erosion spilling from the top of the structure. The matrix was described as a very compact light colored clay (10YR 5/3) with small ballast stones and a light scatter of small sherds and debitage.

Zone 13

Zone 13 is the final plaster floor that was built and appears to post-date the lower terrace wall of Structure 20, abutting it rather than running underneath it (see **Figure 8.5**). It was cross-sectioned 60 cm south of the northern excavation limits and began at the wall defined in Square C. We removed the plaster floor and a thin ballast layer until the second plaster floor (Zone 14) was reached. This secondary floor was the same floor found at the bottom of the Zone 12 cut (described above). The interface between floors is difficult to determine in many places. The Munsell of the Zone 13 plaster floor was 10yr 8/1. The matrix also included a sandy clay ballast (10YR 5/3) of limestone inclusions with crushed mortar. Fifty percent of buckets were screened. Only tiny ceramics and cortical lithic flakes were found.

Zone 14

Zone 14 comprised the second plaster floor exposed in Square C. Only a small portion of the Zone 14 floor was excavated, a 1-x-1 m square abutting the west side of the lower terrace wall of Structure 20 (see **Figure 8.5**). The floor was of poor quality with inconsistent elevations and it did not appear smooth and continuous. Fifty percent of buckets were screened and only a few artifacts were found. The matrix consisted of plaster and grey ballast (10YR 6/3). When we excavated the Zone 14 plaster floor, a third plaster floor (Zone 15) was discovered underneath.

Zone 15

Zone 15 is the third plaster floor in Square C. The excavation continued in the 1-x-1 m zone created for Zone 14, however a narrow (20 cm) balk was left unexcavated (similar to the 60 cm balk of Zone 13) to view the surface and cross-section of different floors (the plaster thickness and ballast of each floor; see **Figure 8.5**). Therefore, the aerial dimensions of this zone were 70-x-100 cm. Fifty percent of buckets were screened. Very few artifacts were recovered from the floor matrix (10YR 8/1).

Zone 16

Zone 16 is a fourth plaster fourth discovered directly below the Zone 15 floor in Square C (see **Figure 8.5**). The excavation halted when the soil color changed to a light brown (7.5YR 4/4). This is unlike the gray of the ballast matrix or white plaster. Fifty percent of buckets were screened and very few artifacts were recovered.

Zone 17

Zone 17 is a zone of collapse (similar to Zone 6) over top of the Structure 20 terrace construction in Square D. It was removed separately because it was initially thought to represent a possible surface. This zone was only located in the northern side of the 1-x-2 m unit that is Square D. The matrix was characterized by a soil color of 10YR 5/4 and a high density of limestone rocks and inclusions. All buckets were screened. Remains of mortar and plaster were found about 3 cm down from top of this zone, but only in the northwest corner. It was originally thought that Zone 5 ended at a surface as a result of the presence of the plaster. However, it was later determined to be plaster melt from the upper terrace construction of Structure 20.

Zone 18

Zone 18 is below Zone 17 in the western half of Square D and all of it should be considered collapse debris and as part of the same context as Zones 6 and 7. It was characterized by a decrease in the density of limestone stones and the inclusions. The semi-compact, light brown clay (10YR 5/4) had a somewhat smoother texture. This zone terminated at the same depth as the bottom of Zone 7, at the interface of the lower terrace. A short, single course of stones was seated at this interface as well – a second (upper) terrace wall was defined at this point. Due to the tumbled nature of a large faced stone that we removed from this zone, at least one more course of stones is believed to have existed on this short wall comprising the upper terrace of Structure 20 (see **Figures 8.4** and **8.5**). A light density of ceramic sherds was recovered.

Zone 19

Zone 19 is a 100-x-50 cm quadrant of collapse debris in the southwest corner of Square D (1 m north x 50 cm east). It was removed separately as the collapse above and to the west of the upper terrace wall. We were uncertain if this was construction fill or collapse in the southwest quadrant of Square D, but it is likely part of the same collapse defined above in Zones 6, 7, 17 and 18 contexts. The goal was to find intersect construction of the upper terrace wall and better understand its configuration. The wall extends north-south across the length of Square D

(**Figure 8.4**). The matrix was composed of a light brown soil (10YR 4/4) with flecks of marl and yielded a light density of ceramic sherds.

Zone 20

Zone 20 was construction fill below Zone 16 in the 1-x-1 m unit in Square C. The matrix was a very smooth, semi-compact light yellow-red soil with very few inclusions and it had a Munsell of 7.5YR 4/4. The goal was to find artifacts of an earlier occupation. None were found after 20 cm, however, so we changed zones and a post-hole was dug (Zone 21).

Zone 21

Zone 21 was a posthole excavation, dug into the fill below Zone 20 in Square C, located in the center of a 70-x-100 cm area (visible in **Figure 8.4**). The goal of the posthole excavation was to punch down and look for any evidence of earlier occupation. Fifty percent of buckets were screened. The posthole went to a depth of 100 cm with no artifacts or color change. Therefore, the matrix may be a natural fill; it was a smooth light yellow-red (7.5YR 4/4) clay with little to no inclusions or artifacts. As this point of sterile soil, excavation ceased.

Zone 22

Zone 22 was the removal of a mortar collapse consisting of a mound of plaster and cobbles in front of the upper terrace wall. This zone is restricted to the central portion of the western half of Square D (56 cm N-S x 45 cm E-W). We now believe this matrix to be mortar melt above the second terrace of Structure 20. All buckets were screened and no artifacts were found.

Zone 23

The goal for Zone 23 was to dig down into the lower terrace, west of the upper terrace wall in Square C. We created a 1-x-1 m square in the southeast quadrant of the square and we were looking for a lower course of the upper terrace wall stones and possibly a corner in the lower terrace. No further architecture was found. The matrix did not appear to be construction fill. It was a very compact tan colored (10YR 5/4) clay with some burnt stone and a high density of rocks, cobbles and decaying limestone. A light artifact density was recovered.

Interpretations and Conclusions

Op. 18 defined a narrow alleyway between the western edge of Structure 20 and the northeastern corner of Structure 21. Square A exposed two terraces on the northeast corner of Structure 21. Likewise, Squares C and D also exposed two terrace constructions – an upper and a lower terrace – of Structure 20. Some of the facing stones from this platform may have been removed, but this is uncertain. The same might be said for Structure 23 (see Runggaldier and Isa, this volume). As seasonal storms blew through this area, this would serve to undermine the structure and could explain “slip out” of fill and the “melt” of plaster and mortar found in the collapse debris in Squares C and D, sloping off the structure mound. The effects of the collapse would have been further exacerbated if the facing stones had been removed. This combined with rain may have contributed not only to the destruction of the upper terrace of Structure 20, but also created the linear “cut” of Zone 12 creating a channel for draining water and eroded mortar deposition. The general lack of artifacts in the collapse debris of Structure 20 is similar to the lack of material associated with the uniform fill in Op. 17. Together, it suggests that the platform may have been built in a single construction episode with freshly quarried fill, as is frequently the case at other Classic Maya centers, like Xunantunich for instance. Diagnostic sherds suggest a Late to Terminal Classic occupation, but further lab analysis is planned for the future.

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Chapter 9

Investigations of Structure 25 at Saturday Creek (Operation 19)

Astrid Runggaldier, Eleanor Harrison-Buck, and Mari Isa

Introduction

Operation 19 was located in the section of Saturday Creek that is still largely in bush, where mounds have not been flattened and cleared for cultivation, as is the case for the majority of the area surrounding the site core. However, Operation 19 focused on Structure 25 – a mound at the northwest edge of the portion of the site still under bush and adjacent to a plowed field farmed with large machinery. At some point in recent years the field provided direct access for a bulldozer to intrude on Str. 25, roughly perpendicular to the long axis of the structure, destroying several phases of architecture. Vestiges of these are visible in the vertical profiles left on either side of the bulldozed cut, and constitute the main evidence recorded with Operation 19.

Because of the nature and context of the evidence at Str. 25, Operation 19 is essentially a salvage operation, aimed at recording the exposed architectural phases, recovering as much as can be gleaned from the recently destroyed construction of Str. 25, and probing further below the base of the bulldozer cut for *in situ* ceramics to correlate with stratigraphy and to place the visible architecture in chronological sequence. Operation 19 was started in the January 2014 field season with a cleaning of the vertical sections, and a collection of ceramics from the surface of the cut. In the summer 2014 season, a probe under 1 x 1 m was placed into the west section of the bulldozer cut, excavated westward to obtain a record of undisturbed material, and extended downward beyond the base of the cut as a small pit to expose and record a sequence of plaster floors. In this manner, despite the destruction suffered by Str. 25, Operation 19 documented a structural sequence encompassing at least two major phases: one with several plaster floors abutting small platforms probably supporting perishable structures, and a later enlargement phase of platform building with two substantial remodeling episodes. From preliminary field observation the entire sequence of this construction appears to belong to the Classic period, and produced a large sample of polychrome ceramics. The limit of excavation at the base of Operation 19 is still on a significant rise compared with the surrounding fields, and it is likely that deeper excavations would expose an occupation sequence that predates the Classic evidence we recovered this year.

Objectives

1. Clean and rectify the vertical sections of the bulldozer cut to remove moldy surfaces and make the stratigraphic record visible for recording
2. Document the construction sequence of Str. 25 to be included in the record of Saturday Creek occupation history before it weathers or is further destroyed
3. Probe an undisturbed section to recover diagnostic pottery that can be correlated with the construction sequence and with surface collections of mixed materials in the bulldozer cut
4. Test for the presence and depth of Preclassic material in the exposed cut or the extension downward
5. Recover specimens for radiocarbon dating

Description of Operation 19 at Saturday Creek

The research area encompassed a roughly N-S cut, and focused primarily on the west section, where the stratigraphy seemed better preserved. The space of the investigation was oriented NW-SE and spanned approximately 8 meters, with a vertical section 2.20 meters high for the bulldozer cut, and a total of 3.95 m high measured from the datum (Fig. 10.1). The datum was a nail driven into the closest tree to the section and placed at the level of the highest elevation of the mound; all measurements for profile documentation and depth in the probe excavation were taken from this datum (Datum A). The following description of the research gives an overview description of the zones, starting from the top of the mound, or the most recent phases, and follows construction sequence rather than the assignation of the zone numbers. Specific zone descriptions follow the numerical sequence of zones.

Structure 25 is a mound roughly 2 m high from the plaza floor in which Str. 20 is the largest structure. Zone 1 (see **Figure 9.1**) is the current top zone and what remains, on the surface of a platform, of the structure or structures built here, presumably all or partly of perishable materials. Zone 1 is therefore the weathered layer of collapsed architecture. The most recent platform face is Zone 5, and its surface is Zone 2, which was reused as the surface in two subsequent platform enlargement remodeling episodes. These have platform faces designated as Zone 6 (more recent) and Zone 7 (earliest). The latter is the earliest episode of platform building in this spot, and constitutes the retaining front (facing south towards Str. 20) of a large-scale construction effort that brought in the bulk of the platform fill designated as Zone 3.

This large building episode seems to have reused midden materials mined nearby as construction fill for the core of the platform, which includes only a few limestone rocks larger than 20 cm, and is otherwise composed of clay, burnt soil, baked clay material in large chunks, and ash. In this midden is also a high density of large and fairly well-preserved polychrome

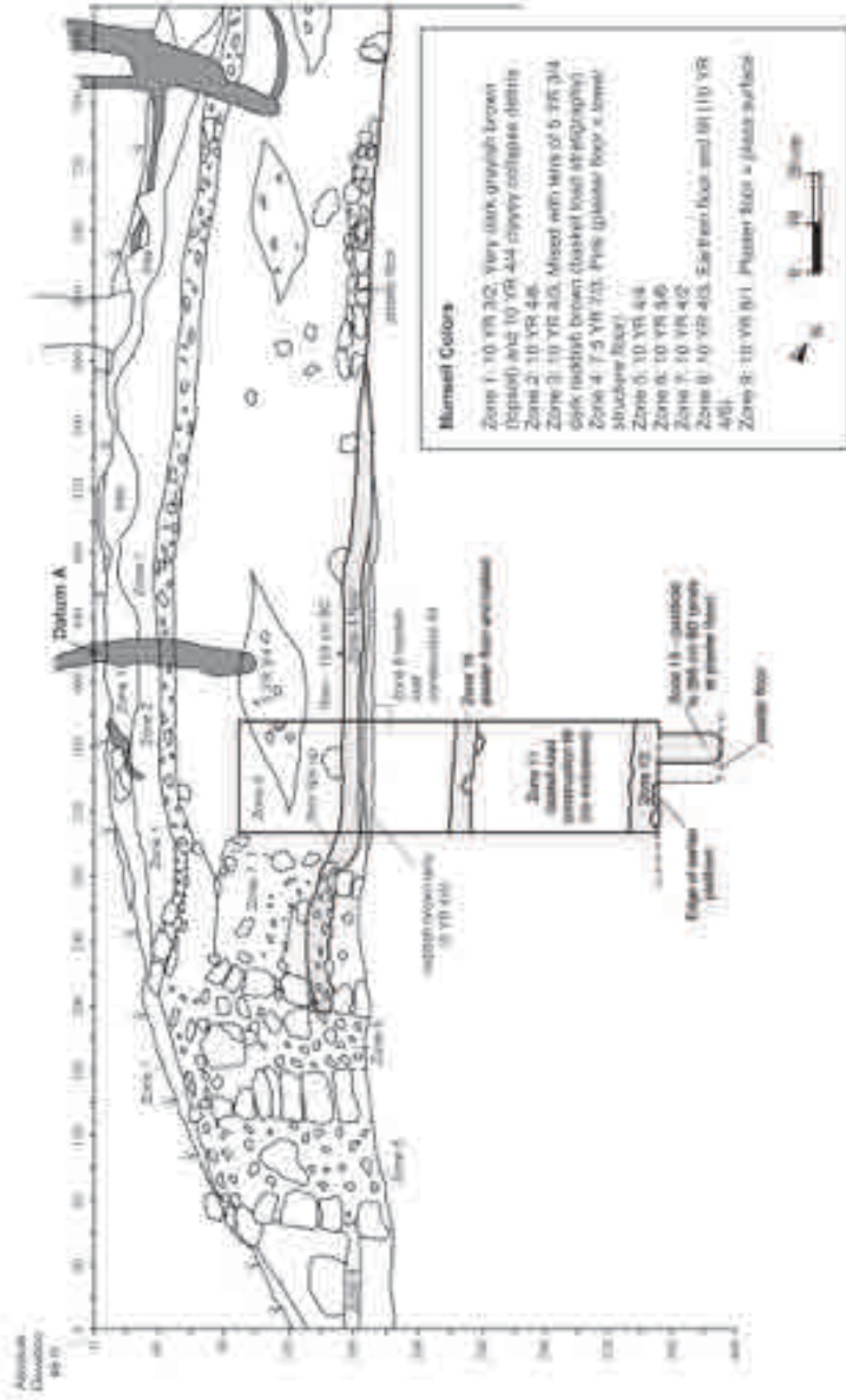


Figure 9.1.1. Profile of the west section of Structure 25.

sherds, suggesting that the deposit is not a domestic trash heap but perhaps the spoils of a large burning event that included the breaking of vessels, a selection of which ended up in this secondary re-deposition. The lack of food refuse (bones) and other broken tools expected of domestic middens also supports the idea that this platform was built with the spoils of Classic-period events that involved large amounts of pottery and extensive burning. While the composition of the platform core may not be uniformly consistent across the exposed 5 meters of its section, the probe excavated into Zone 3 indicates by the Munsell color readings that other lenses of this midden deposit are present throughout the Zone 3 platform core.

The platform that began with Zone 3 and its facing Zone 7, was enlarged with a new facing (Zone 6), and then again with Zone 5 probably at the time of construction of the most recent plaza floor, in this profile drawing designated as Zone 9. Accordingly, the Zone 6 remodeling probably correlates with an earlier plaza floor surfacing that lies deeper than 2.3 m BD in front or south of the Str. 25 platform. Deeper still should be the plaza floor that was in use when the platform and Zone 7 were built, although that floor also abutted a much shallower platform beneath Zone 7, and may be one of the floors recorded in the deep probe (perhaps Zone 10 or Zone 12).

Zones 4 through 14 record a group of earlier building episodes of perhaps smaller proportions than the platform of Zone 3, and seem to have culminated with a small raised platform with surfacing uniform and continuous with Zone 4, which was probably an exterior plaster floor. On it an accumulation of stones approximately 1.60 m wide NW-SE (see **Figure 9.1** between markers for meters 6.00 and 7.20 on the horizontal axis) suggests that this space might have had small perishable structures or work areas in a patio surfaced by Zone 4. The southern edge of the patio probably corresponds with the rise in Zone 4 and the underlying Zone 8, where a more permanent surface was constructed with retaining stones compared with the above-mentioned accumulation of stones further north. Nevertheless these surfaces were all in use at the same time, and appear to constitute simpler architecture consistent with a humbler patio group in this area predating the construction of the Zone 3 platform.

Zone 8 marks the beginning of the probe into deeper materials below the limits of the bulldozer disturbance, and comprises a relatively thick (60 cm) fill of basket-load construction underlying the well-constructed and well-preserved plaster floor of Zone 4. It is unclear how the Zone 8 fill correlated with the small rise covered by Zone 4, and future excavation would test whether the stacked stones are indeed a small platform or the vestiges of a 0.80 m-wide structure wall south of the Op. 19 probe, and buried deeper with the fill of Zone 8 piled up against it.

Below Zone 8 is another plaster floor (Zone 10) with its fill, also basket-load construction, designated as Zone 11, but piled on a coarser base of stone fill (Zone 12), which covered the stones of a possible earlier wall. Zone 13 was an arbitrarily designated post-hole dug sample of Zone 12 fill at the edge of the possible wall, until it reached the base of fill at an earlier plaster floor (Zone 14). This last zone marks the limit of excavation given the difficulty of the restricted space, and provides a stratigraphic base for a roughly 4 m deep section of the mound of Str. 25 (the floor at Zone 14 is 3.95 m BD). There is no reason to believe that cultural layers end

here, and a larger exposure would surely allow for excavation of Zone 14 and its earlier construction episodes. Analysis of the materials recovered from the stratified sequence encompassing Zones 3, 4, 8, 10, 11, 12, and 13 will indicate the earliest materials present, although from rough estimates based on field observations it would appear that all layers belong to Classic period events. While plenty of burned materials and charcoal were recovered from Zone 3, given the nature of the fill as a re-deposited midden, the radiocarbon assessments would give a *terminus post quem* for the construction of the main platform of Str. 25, but not date the construction itself, which might be considerably later. The radiocarbon samples from Zones 8, 11, and 12 will provide estimates for the chronology of the earlier episodes of construction at Str. 25, pre-dating the large construction event of the Zone 3 platform and its Zones 6 and 7 remodeling events.

Operation 19 Zone Details

Zone 1

Zone 1 is the top zone in the west section of the bulldozed cut. It measures 40 cm at its thickest, includes several roots, and was cleaned in the January season for the purpose of drawing a profile section but no materials were recovered from it and no Munsell readings were taken.

Zone 2

Zone 2 is a roughly 10 cm thick layer of gravel size and slightly larger limestone (ca. 5 cm) that constitutes a surface. This is the upper part of a platform with no preserved plaster surfacing, so the zone likely represents the ballast layer underneath. It was cleaned and drawn in the January season and no materials nor Munsell readings were taken from it.

Zone 3

Zone 3, cleaned in January and excavated further in summer 2014, is the core fill of a platform, much of it comprising midden used as fill. An excavation unit, 70cm wide NW-SE by 60cm high, follows the orientation of the bulldozed cut, which is 30 degrees west of north. The probe begins with the upper edge at 85 cm BD and ends at the floor surface of Zone 4, 153 cm BD. The unit goal was to expose a surface area of the plaster floor (70 cm x 70 cm under which artifacts would be sealed and undisturbed). Zone 3 is mostly small limestone (the three largest stones, ca. 20 cm in size, were laying directly on top of the Zone 4 floor), a large quantity of reddish burnt clay material (bcm) roughly fist-size and smaller (perhaps from cleaning out hearths or from a burning event), lenses of yellowish and dark brown burnt soil, and lumps of gray ash with charcoal chunks. Overall the Munsell reading for the silty clay deposits is 10YR 4/3, while the red lenses of interlayered material have Munsell readings of 5YR 3/4 and 5YR 4/6. The most remarkable recovered materials from this layer are a large quantity of fairly large

sherds, many of which polychrome or with well-preserved slips, in addition to a few fragments of what is likely animal bone, and a C14 sample.

Zone 4

Zone 4 is a plaster floor with a relatively thin surface (1-2 cm) over a ballast of fairly uniform limestone cobbles that are generally 6-7 cm wide. The floor plus ballast constitute zone 4 and together are about 10-12 cm thick and clearly end at a level of brown sticky clay fill (zone 8) with a very different color from Zone 4. The Munsell reading is from the silty soil between ballast stones - 10 YR 3/5. No sherds or other materials were included in this zone.

Zone 5

Zone 5 is a platform facing wall that was cleaned and drawn in January and from which no materials were recovered. It represents the most recent enlargement of the platform for which Zone 3 constitutes the core fill.

Zone 6

Zone 6 is a platform facing wall that was cleaned and drawn in January and from which no materials were recovered. It comprises an enlargement phase of the platform for which Zone 3 is the core fill, and predates the Zone 5 enlargement.

Zone 7

Zone 7 is a platform facing wall that was cleaned and drawn in January and from which no materials were recovered. It is the original facing wall of the platform for which Zone 3 is the core fill. All three platform facing walls (Zones 7, 6, and 5) underlie the surfacing represented by Zone 2.

Zone 8

Zone 8 is directly below the plaster floor and ballast of Zone 4 and is different in texture and color: darker brown sticky clay with a few limestone inclusions. While the overlying zone had no artifacts, from this zone sherds were uncovered right away in the clay. Zone 8 comprises construction fill and appears to also be made up from midden material. Polychrome sherds suggests that below the floor it is still Classic period, or perhaps Early Classic. The matrix of Zone 8 was laid down in basket load construction with three different colors and textures of soil interlayered throughout with no clearly separable delineations: dark, sticky clay (10YR 4/3 = most abundant, described above), yellowish brown sandy clay (10YR 5/6), and dry, brownish gray silty clay (10YR 7/2). A small extension to the east allowed the excavation to become larger and more manageable, creating a rectangular surface 70 cm NW-SE x 150 cm, excavated below the bulldozer cut into undisturbed layers. A very light artifact density includes a few small body sherds, some chert lithic material, and C14 samples (from 160 cm BD and 190 cm BD). This fill zone is approximately 60 cm thick, from 159 cm BD to 222 cm BD, and encompasses materials

that were *in situ* below the destruction of the bulldozing activities. The zone ended with the uncovering of an earlier plaster floor surface designated as Zone 10.

Zone 9

Zone 9 is the surface of a plaster floor abutting the face of the Zone 5 platform facing wall and built in conjunction with it. It represents the plaza floor in which Str. 20 is the largest structure just a few meters south of Str. 25. It was identified, cleaned and drawn in January and was not further excavated; therefore, no materials were recovered from it.

Zone 10

Zone 10 consists of a plaster floor and the ballast directly below it. This floor and its ballast underlie the Zone 4 floor and ballast and the fill of Zone 8, and therefore are the preceding construction episode. The surface of the plaster is polished and the plaster itself is thin (1-2 cm). Overall the layer is approximately 13 cm thick, from 222 cm BD to 235 cm BD. The ballast is primarily limestone pieces of uniform size (most 6 to 10 cm in length, with a maximum length of 15 cm), and little soil, with a Munsell reading of 7.5YR 2/8. Artifacts were few and included small lithic and ceramic pieces. The fact that the plaster floor was intact across the entire excavation, including the small above-mentioned extension, indicates clearly that the bulldozer damage did not reach this zone and that the materials beneath are in a sealed context, although most of the Zone 8 fill also appeared undisturbed.

Zone 11

Zone 11 is a thick layer of construction fill directly underlying the plaster floor and ballast described above (Zone 10). The fill is heavy, sticky clay with no limestone or other rock inclusions. As with Zone 8, Zone 11 may represent basket load fill with two distinct colors and textures of soil interspersed throughout: dark brown, sticky clay (10YR 4/3) and yellowish brown, silty clay (10 YR 5/6). Occasionally, small chunks of gray, silty soil (2.5 YR 5/2) were also noted. The artifact density was very light, but included the recovery of a C14 sample at 292 cm BD. This zone was a slightly thicker layer than Zone 8, comprising about 90 cm of fill deposits, from 235 cm BD to 324 cm BD. The zone was ended at 324 cm BD when the fill appeared to change both texture and color. The underlying zone may still be part of the same construction episode but comprise a layer of different material, and hence was separated.

Zone 12

Zone 12 constitutes construction fill of loose grayish clay with many limestone inclusions (most small, under 5 cm). This zone contains a higher concentration of artifacts and charcoal than the overlying Zone 11, but, while deposit materials are different from Zone 11, it is likely part of the same construction episode. Zone 12 was started when the matrix changed from dark brown, sticky clay with no inclusions (Zone 11) to looser, grayish clay with many limestone inclusions; the matrix was recorded as Munsell reading 10YR 3/7. Additionally, zone 12

exhibited a higher density of artifacts and charcoal (one C14 sample was recovered) than had been in Zone 11, especially along the east section of the excavation and to a lesser degree along the west section, representing the distribution of fill on either side of what resulted in a buried limestone wall. A row of large limestone rocks (the largest measuring 32 cm in length) was encountered running N-S across the unit, and at this depth in a small excavation it was impractical to continue further down without damaging earlier architecture. These stones are likely part of the wall of an earlier structure that predates construction of all layers visible in the stratigraphic section obtained by cleaning the vertical cut caused by the bulldozer. The Zone 12 fill occurs on both sides of the wall as well as above it (covering the wall by approximately 12 cm in thickness), and therefore this zone is the earliest enlargement episode recorded by Operation 19.

Zone 13

A post-hole test was conducted on the NW side of the unit to recover sample materials at arbitrarily designated intervals of 25 cm, starting at 337 cm BD. The post-hole excavation was stopped at 395 cm BD when it reached an earlier floor. The color, inclusion density, and texture of the matrix was consistent with that of Zone 12 all the way down to the floor but was separately numbered to identify the sample obtained from a post-hole digger, and therefore lower in artifact density than the sample obtained from the entire unit above. A post-hole test was first attempted on the east side of the wall stones, but was abandoned when it hit large limestone rocks within the first 10 cm, indicating that the wall and its core fill extend to the east, so that in future excavations more of this early structure could be recovered in the open space between the two sides of the bulldozer cut.

Zone 14

Zone 14 includes a portion of a wall from an earlier structure running N-S through the unit, and the floor possibly associated with it that was identified at the limit of excavation (at the base of the post-hole test). The wall was given a zone number designation but was not further excavated; no separate designation was given to the floor at the base of the post-hole test as more details will need to be recovered in future work. Nevertheless the wall and floor constitute the earliest architecture identified with Operation 19, and could be the focus on future work aimed at identifying early levels, possibly dating to the Preclassic period. Zones 13, 12, and 11 taken together represent the fill of a single building episode approximately 160 cm thick, capped by the floor of Zone 10. This is the first recorded enlargement phase above the wall and floor of Zone 14, which culminated with the most recent enlargement phase identified in Zones 5 and 9 (platform facing wall and plaza floor).

Interpretations and Conclusions

Despite the destruction caused by modern agricultural and bulldozing activities at Saturday Creek, the salvage-like section cleaning and the probe into undisturbed material undertaken with Operation 19 achieved a great deal of information that would have otherwise been unable to be refitted with the stratigraphic history of the site. All objectives proposed by this operation were met, although the testing for presence and depth of Preclassic layers (Objective #4) concluded that the early phases of this part of the site lie at the levels at the bottom of the excavation (Zones 13 and 14) or even deeper.

In general, we can summarize that the area of Str. 25, which lies in the ceremonial core of the site, began with construction of what was likely a small-scale patio group (up to and including Zone 4), and was subsequently expanded in the Classic period to a relatively large platform (Zone 3) with several remodeling phases. The presence of fill materials for Zone 3 encompassing the reuse of a midden rich in polychrome vessels and devoid of food refuse (especially bone) and other domestic debris, suggests that ceremonial or communal activities involving large quantities of pottery and extensive burning took place in a location not far from Str. 20.

The reused midden materials also provided an extensive sample of well-preserved ceramics for the diagnostic type collection of Saturday Creek. Additionally, the substantial presence of Classic period construction episodes spanning nearly 4 m of accumulated layers confirms the parallel evidence from other operations at Saturday Creek that point to Late Classic and Terminal Classic as the primary occupation periods for Saturday Creek.

For what concerns testing the presence of Preclassic layers, which are known from excavations at the edges of the core of Saturday Creek (Lucero 1999; 2002; 2008), in the entire depth of excavation Operation 19 did not identify any sealed layers of uniformly Preclassic material. Some Preclassic material may be mixed in with later layers; however, at the base of excavation, nearly 4 m below Datum, the excavation uncovered additional architecture (a wall and a floor) that may well be Preclassic or may overlay Preclassic layers further below, given that the architecture uncovered at the base is deeply buried, yet still above the level of the surrounding natural soil surface in the fields around Saturday Creek.

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Chapter 10

Excavations of Structure 23 at Saturday Creek (Operation 20)

Astrid Runggaldier and Mari Isa

Introduction

Operation 20 was excavated on Structure 23, an E-W running range structure closing the southern end of a multi-structure compound at the northern area of the ceremonial core that is still covered by bush (see **Figure 8.1**). The mound does not have any evidence of looting, and several stones are preserved in rough alignment along the southern face of the structure. The excavation proposed to test the architectural vestiges of the construction sequence at this mound to determine chronology and number of construction episodes. Given that the unit was not very large, and the construction episodes had employed dry fill, the excavation was terminated at approximately 2.5 m at the deepest point, where the fill stones became too large to remove without considerable collapse occurring from the sides of the excavation. With this operation, three building episodes were uncovered, all dating to the Classic period on preliminary inspection of the associated materials.

Objectives

1. Uncover architecture of the latest phase and preceding phases.
2. Document building chronology based on construction sequence and associated artifacts.
3. Determine the type of architecture, orientation, and possible function of the building.

Description of Operation 20 at Saturday Creek

The operation was aligned N-S, perpendicular with the long axis of the southern range structure, near the center of the mound or center-west side of the structure. The placement of the unit sought to uncover either a staircase, or the edges of a staircase balustrade or platform. The presence of a staircase would confirm that the structure had a southern access, and probably a symmetrical opening and staircase on its northern side, which would give the building the function of gateway structure for an enclosed patio presided over by the main elite residence, Structure 20.

The excavation unit measured 1.5 m in width E-W and 3 m in length N-S. The operation was divided into two squares: A on the north and B on the south side. The datum (Datum A) was

a nail placed 50 cm above the current mound surface on the stake of the unit's NW corner. A total of 9 zones were identified, as well as unexcavated architecture, to which no zone number was assigned. Therefore, zones 1-6 were identified in square A, where the limit of excavation was determined by the presence of a masonry platform; in square B, all zones 1-9 were visible in the profile of the unit, most clearly displayed by the west section of the excavation (**Figure 10.1**). The following description summarizes the three identified construction phases, and the next section describes each zone detail.

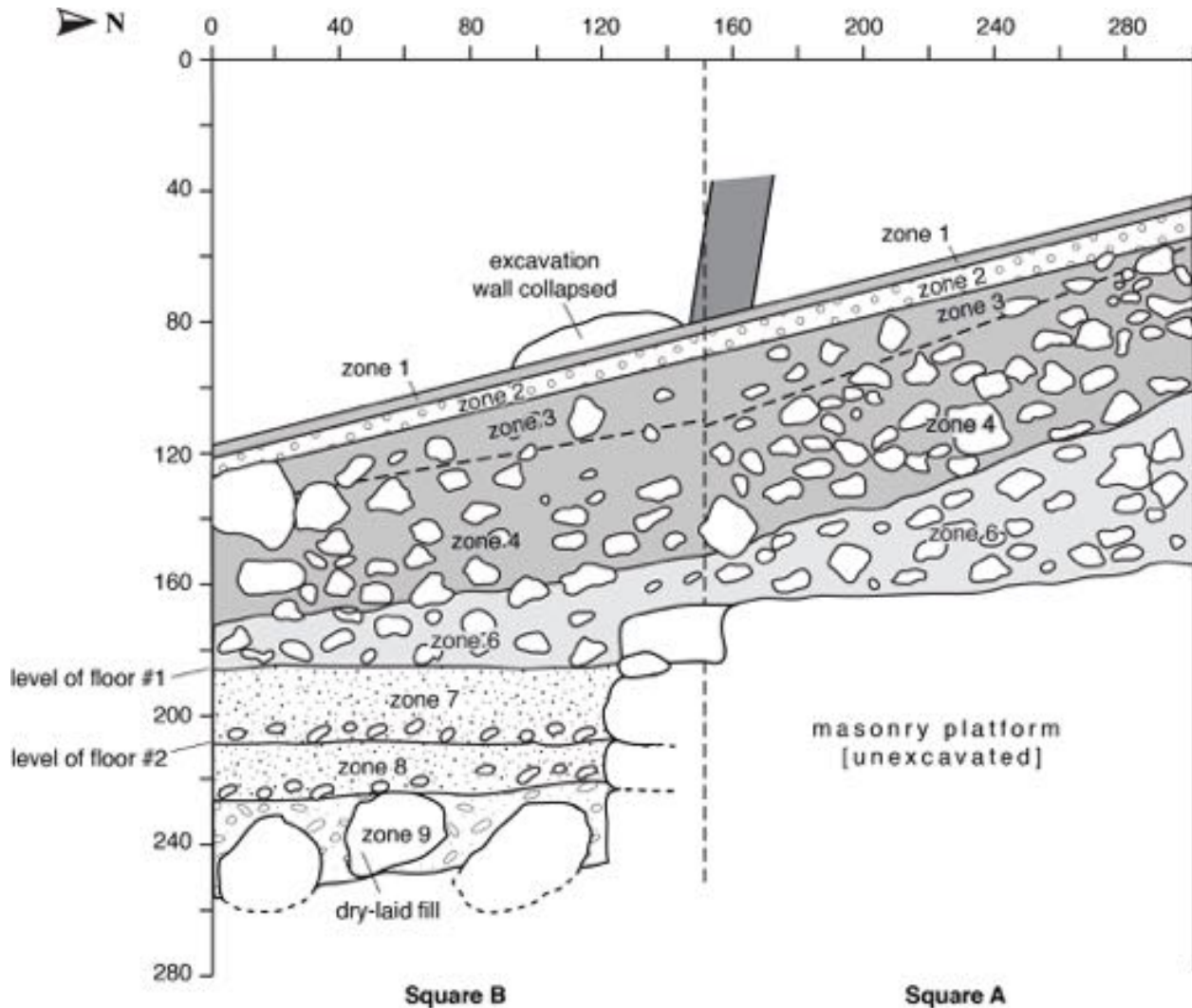


Figure 10.1. Profile of the stratigraphy in the west section of Operation 20.

The most recent episode of construction is a building phase that achieved the current size of the mound, with its full E-W extent. The surface stones of this architectural phase appear to be entirely gone, probably collapsed at the south base of the structure, exposing the core fill of

the most recent phase. Therefore the uppermost part of the stratigraphic sequence is a mix of tumble and construction fill.

The second identified phase is a construction episode that remodeled an existing platform by adding 4 courses of stone visible in the east section of the excavation. These are of a different kind and quality of masonry work, which makes them distinguishable from the underlying platform wall, visible across the entire unit, including the west section of the excavation (see **Figure 10.1**). The second phase of construction is associated with a floor (Zone 7) abutting the architecture and built up to cover two courses of stone of the earlier platform. Given that the platform wall of the second construction episode appears to be a rough corner, it appears that this phase added a structure at the top center of the mound, and that the most recent episode that followed enlarged the structure considerably to an elongated E-W shape. The coarse wall is the SW of a platform/staircase or small structure at the top of the mound.

The earliest identified phase is a platform wall with an associated floor (Zone 8) that underlies the remodeling floor. As the facing stones of this platform cross the excavation unit E-W, it appears that the buried structure is longer than the second remodeling phase, but it is unknown if it is as long as the most recent one visible from the shape of the mound. The masonry of this platform uses more lime mortar, causing the surrounding materials to have a lighter and more yellow color than any of the overlying layers. Because the courses of stone of the second construction episode were not removed from the top of this platform, it is unknown whether they are built on top of a platform or on top of a staircase.

Below the floor associated with the earliest identified phase is a construction fill of dry laid large limestone rocks that were difficult to remove, and determined the limit of excavation of this operation. The construction fill implies a large building episode underlies all the exposed architecture, and it is likely that this constitutes the main construction efforts for this part of the site. In the future, efforts to recover more data from these earlier phases will require an excavation much larger in scale to allow for the safe removal of the large stones.

Operation 20 Zone Details

Zone 1

Zone 1 is a thin humic layer (Munsell 5YR 2.5/1) lying over the top of the tumble that slopes off the southern side of the range structure. It is only about 5 cm thick, includes several roots, and has a light density of artifacts, mostly of eroded pottery sherds. Some baked clay material (bcm) appears in the recovered artifacts, and given that this part of the site is still in bush, it is likely to have been daub from perishable buildings.

Zone 2

Zone 2 is a thin layer of broken down limestone and chert cobble tumble from architecture collapsing downslope along the front staircase or platform projecting south from the range structure. The stones are scattered throughout with no concentrations or patterned layout, mixed with a matrix of dark clayey soil (Munsell 7.5Y 3/1).

Zone 3

Zone 3 is mostly collapse, with the largest stones about 20 cm in size, in a matrix of loose soil (Munsell 10YR 3/3). Some concentration in square A and along a N-S alignment in the middle of the trench suggest that these are broken down stones from the uppermost part of architecture visible in the layers below, where tumble mixes with the fill with no clear demarcation separating the two. While Zone 3, approximately 20 cm in thickness, is mostly collapse the lower part of the layer looks distinctively like fill although with no clear interface between the two; therefore Zone 3 can be characterized as a mix of collapse and fill, while zone 4 separates out a construction fill layer not mixed with tumble. The top of Zone 4 was somewhat arbitrarily defined to keep the materials from construction fill separated from those mixed with collapse. The uppermost part of a wall appears from clearing Zone 3 and is present in the east half of Square A, with a corner in the northeast part of Square B. The architecture seems to be the SW corner of a platform or base of a structure atop the mound. The construction fill part of Zone 3 clearly belongs to the enlargement phase for the most recent building episode, the facing stones of which have now weathered and fallen off.

Zone 4

Zone 4 comprises a construction fill layer abutting the SW corner of the platform wall. The fill is only in the western half of square A and most of square B, and is visible in the section profile (see **Figure 10.1**). This layer is mostly rocks of both limestone and chert cobbles without much soil matrix, placed as dry fill and very unstable. The soil matrix is dark in most of Zone 4 and then changes to yellowish brown and silty texture (Munsell 10YR 3/4), especially in square A. The color change warranted separation as Zone 6, with less chert and more limestone. It is likely that the erosion of limestone and lime mortar accounts for the color change in the matrix, but the composition of Zone 6 is still very similar to the fill in Zone 4. With the removal of the stones of Zone 4, the architecture comprising a series of uncut stacked stones running N-S along the middle of the square is visible in most of Square A. Almost no artifacts were recovered from this area. In Square B, the removal of Zone 4 uncovered the facing wall of the platform, three stones wide running E-W along the north edge of the square.

Zone 5

Zone 5 was separated as a circular pit feature about 35-40 cm in diameter with dark soil (Munsell 10YR 2/2), uniform texture with no inclusions except for a couple of limestone rocks and several flecks of charcoal. No other finds were recovered from the pit, located within the Zone 4 fill, up against the western side of the N-S running line of stones in square A. The pit is cut into the existing layer of zone 4 and completely overlying Zone 6.

Zone 6

Zone 6 is construction fill underlying Zone 4, identified first in the western half of Square A and then in front of the wall in the northern edge of Square B. It comprises yellowish brown soil (Munsell 2.5 YR 5/3), siltier texture, fewer inclusions of chert cobbles and mostly limestone, the weathering of which might account for the color change in the matrix, which is mostly visible directly in front of and around the architecture.

Zone 7

Zone 7 is a plaster floor (Floor #1 in **Figure 10.1**) with an eroded surface and therefore only limited polished sections are preserved in the western half of the excavation. Despite the poor preservation, the surface is flat, lying directly below Zone 6 in Square B, and abutting the wall that runs E-W in the northern edge of Square B. Closest to the corner and face of the wall the color is lighter than in the rest of the square, with few small limestone inclusions and a light artifact concentration, with one charcoal sample recovered from this layer. This floor layer is considerably thick (approximately 25 cm) and comprises an upper stratum of mostly plaster with few limestone inclusions (Munsell 2.5Y 8/1), and a lower stratum of more concentrated and larger limestone inclusions that serves as the ballast for the floor surface. The floor slopes up slightly in the north of Square B and abuts the E-W wall of the previously uncovered platform. This floor likely corresponds with the several courses of stones that appeared with the removal of Zone 3 and then Zone 4, and is part of a construction phase preceding the most recent one in which an earlier platform was enlarged. The distinction between earlier and later masonry is visible in the stone shapes and sizes, the careful alignment of the earlier stones versus the rough stacking of the remodeling phase, and the lighter color of the deeply buried phase versus the darker matrix and stones of the addition (**Figure 10.2**).

Zone 8

Zone 8 includes a floor (Floor #2) directly below the one identified as Zone 7, and comprises an uneven and eroded plaster surface with several broken fragments of red-painted plaster and a higher concentration of ceramics scattered roughly in the center of Square B close

to the face of the platform. This earlier floor is associated with a course of limestone facing stones in the north portion of Square B, and represents the earliest of the three construction episodes identified with this operation (see **Figure 10.2**). The zone ends when the ballast (Munsell 10YR 6/3) beneath Floor #2 changes to large construction fill stones.

Zone 9

Zone 9 is dry-laid construction fill with large stones and very loose soil between them. The fill is mostly large unshaped blocks of limestone, a few interspersed river cobbles, and light colored soil (10 YR 6/3 and 10YR 7/2) distributed across the unit. The material indicates the type of large-scale fill that may have served as the main construction effort for the basal platform or initial structure for this part of the site. Given the small size of the excavation, a few of the large stones were removed, but further excavation would have caused the overlying unstable fill in Zones 4 and 6 to collapse, and therefore the operation was terminated upon determining that the fill continues further below. Bottom elevations, at just over 2.5 m below datum, represent an arbitrary stopping point. Future exploration of this phase will require a larger excavation space, and more extensive uncovering of the E-W face of the masonry architecture to determine the relationship between this construction fill and the platform wall identified in the eastern half of Square A and northeastern part of Square B.



Figure 10.2. View north from Square B to Square A with Floor #2 (Zone 8) abutting a wall.

Interpretations and Conclusions

The Operation 20 excavation was very limited in size to be able to recover extensive information on the architectural history of Structure 23. Nevertheless, the excavation proved able to meet the objectives of documenting the construction sequence of at least three episodes related to the buildings underlying the current mound. The most recent one, amounting to the current size of the mound, seems to be extensively weathered and most facing stones are no longer present. Therefore, excavation of this phase exposed essentially the construction fill of this episode directly beneath the humus layer. Even so, it appears that this construction episode was a significant enlargement of the previous structure and associated platform, for which a SW corner was exposed, and showed a relatively crude masonry style with stones that had no carefully shaped faces and mortars with very little lime content. In contrast to this phase, which had been constructed atop an existing platform, the earliest identified phase shows dressed limestone block masonry and lime mortar. Based on preliminary assessment of the artifacts associated with all three of these phases, construction episodes date to the Classic period. Certainly, additional architectural phases are buried deeper beneath the ones uncovered by Operation 20, and may date as early as the Preclassic; however, this operation shows that Saturday Creek underwent large building programs in the Classic period, and especially the Terminal Classic, which may have been the time of largest expansion of this site.

Chapter 11

Basket Loads and Bundle Burials: Investigating the Western Structure (Structure 1) and Plaza of the Hats Kaab E-Group (Operations 21 and 22)

Marieka Brouwer Burg and Astrid Runggaldier

Introduction

In 2012, BREA project reconnaissance discovered an alignment of ancient Maya mounds reminiscent of the architectural alignment referred to as an “E-Group.” This type of alignment takes its name from the archetypal group originally defined at Uaxactun (Blom 1924; Ricketson and Ricketson 1937; Ruppert 1977 [1940]). Characteristics of such an architectural arrangement include a western radial pyramid connected to a linear eastern range platform by a plaza. Three small structures of varying permanence and construction material capped the eastern platform; the nature of their variation is one feature that differentiates types of E-Group arrangements (e.g., Cenote-style, etc.; Chase and Chase 1995). While E-Groups may have begun as structures for observing solar equinoxes and solstices in the Preclassic, this function appears to have become quickly obsolete. By the late Preclassic, the architectural arrangements were repurposed by the ancient Maya for other ritual and community events, some involving the planting and harvesting of maize. This shifting usage pattern continued throughout the Classic and Terminal Classic periods and consequently, the rigid structure carefully marking solar movements seen in early E-Groups (dating to the middle Preclassic) becomes more relaxed in later periods. For example, the western radial structures were often elaborated and enlarged; the structures on the eastern platform often experienced similar renovations. To distinguish these E-Group descendants from their earlier predecessors, Aimers 1998 proposes using the term “inline triadic eastern shrines” to describe what is often the only defining characteristic still visible in Classic period sites (see Aimers 1998; Awe 2008; Runggaldier and Brouwer Burg 2012; Runggaldier et al. 2013).

The E-Group-like site found by the BREA team in 2012 was named Hats Kaab. The site consists of a large western mound with an amorphous shape; an expansive plaza; a long, north-south trending eastern platform with three superstructures; and a low southern structure (a characteristic shared by the Uaxactun E-Group; see **Figure 11.1**). Two previous excavations were undertaken at the site to elucidate its depositional, occupational, and chronological history (Runggaldier and Brouwer Burg 2012; Runggaldier et al. 2013). It was determined that this architectural arrangement experienced multiple construction episodes and use phases during the Late Preclassic and early Classic. In addition, extensive surface collection yielded substantial

artifacts from the Terminal Classic. Although the terminus post quem has not yet been established for the site, it was used intermittently over a period of 500-1000 years.

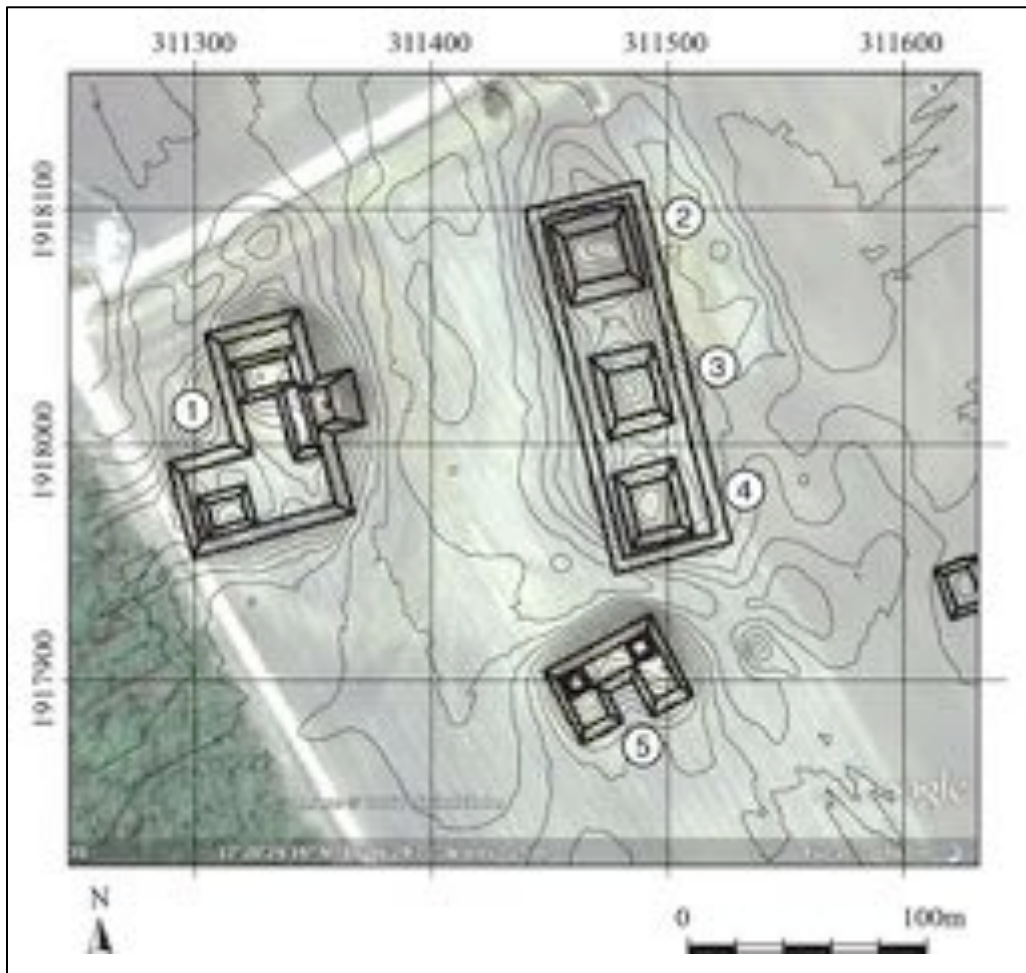


Figure 11.1 Overview of the site of Hats Kaab with structure numbers noted (digitized by M. Brouwer Burg).

Description of the Research and Main Objectives

The primary goal of the Operations 21 and 22 excavations was to answer lingering questions about the temporal occupation, use and reuse of the Hats Kaab E-Group (**Figure 11.2**). The excavation of two previous operations (Op. 7 and Op. 9) in January and Summer 2012 indicated that a substantial period of use occurred during the late Preclassic (see Runggaldier and Brouwer Burg 2012; Runggaldier et al. 2013). This conjecture was based on diagnostic ceramic artifacts, radiocarbon dating, and agreement with known phases of E-Group architectural construction. Both Operations 7 and 9 were located on the eastern range platform of the E-Group

and thus, we felt it necessary to investigate the other main architectural components of the E-Group: the western structure and the plaza.

In previous excavations at the site of Hats Kaab, signs of multiple phases of basket-load construction were uncovered along the central axis of the middle building on the eastern platform (Runggaldier and Brouwer Burg 2012; Runggaldier et al. 2013). Remnants of a refurbished stairway were found in Operation 7. Operation 9 revealed a series of aligned postholes (n=4), perhaps indicative of perishable structures, as well as an intact burial positioned near the base of the platform. No excavations were undertaken on the western structure prior to this year.

Operation 21 was placed atop the western 'viewing' structure, usually configured as a radial pyramid in late Preclassic E-Groups (Aimers and Rice 2003; Chase and Chase 2006; etc.). A DEM of the Hats Kaab site revealed that the western structure is much more complicated than a simple radial structure (see Runggaldier and Brouwer Burg 2012:Fig. 7.2), appearing to have undergone various additions and renovations, leading most notably to two large platform projections extending to the west and south. The main goal of Operation 21 was thus to determine if we could shed light on the phases of construction, renovation, and expansion of the western structure.

Both of the previous excavations at Hats Kaab (Operations 7 and 9) revealed a layer with a sherd rich surface and a comparatively large assemblage of ceramics. We hypothesized that if the eastern platform and western structure were constructed as part of the same architectural complex and used concurrently, then a similar stratigraphic sequence should be found on the western structure. Thus, a secondary goal of Operation 21 was to elucidate whether the western structure was used contemporaneously with the structures on the eastern range platform. To establish chronology, diagnostic artifacts of the late Preclassic were sought, along with charcoal samples for future radiocarbon analysis.

Operation 22 was placed in the center of the plaza, equidistant from the estimated edge of the lowest terraces of the western and eastern structures. The main goal of this operation was to determine the depth of the anthropogenic plaza fill, and thus the depth of construction and occupation of this locale. At other late Preclassic E-Groups such as Cival and Seibal, very large estimates of time, labor, and raw material have been evoked to explain the presence of level plaza floors in otherwise heterogeneous terrain (Estrada-Belli 2011; Innomata 2012). While the Hats Kaab E-Group is located in a relatively even floodplain, we suspected that at least some additional raw material (in the form of basket-mounded clay) was brought in to elevate and level the plaza floor. How much raw material was brought in, and the attendant time and effort involved, was thus a pertinent question.

A secondary goal of Operation 22 was to find diagnostic artifacts or charcoal samples that could be dated in order to determine any temporal characteristics of the plaza construction and use.

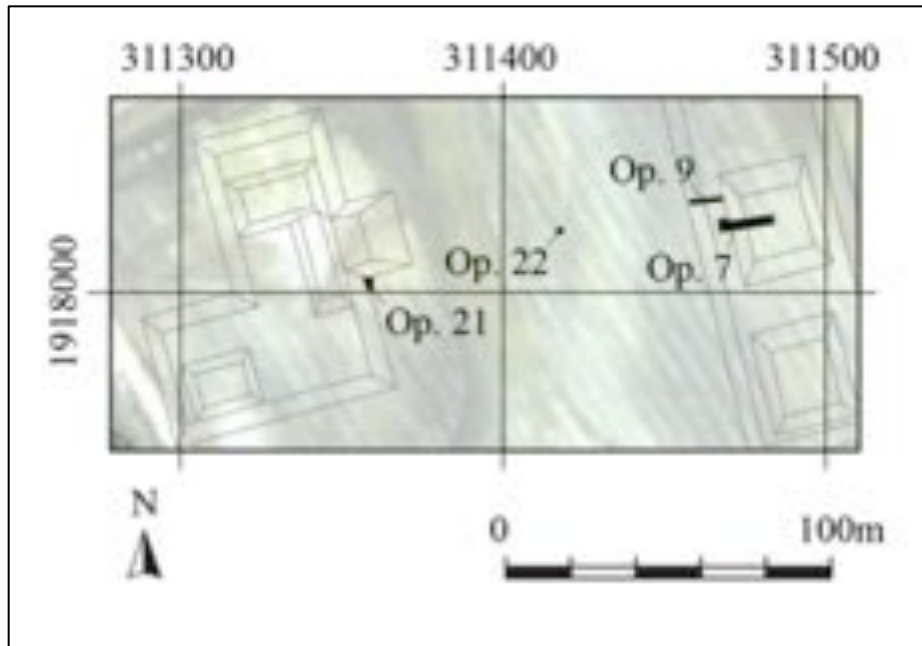


Figure 11.2 Operations from 2012 (7 and 9) and 2014 (21 and 22).

Operation 21 at Hats Kaab

This operation was placed on the southern side of the main pyramidal component of the Structure 1, purportedly constructed before additions to the west and south (**Figure 11.2**). At the time of excavation, corn had been planted in the field. Operation 21 was oriented N-S on the southern edge of Structure 1, measuring 1x3 m in size (**Figure 11.3**). Midway through the excavations, a 1x1 m extension was added to the west of the main trench. The entire trench was dug as a single unit (Square A), the smaller 1x1 m unit to the west designated as Square B. While the same zones were identified in each square, they will be discussed separately below as different features were uncovered in each.

An arbitrary datum (Datum A) was set to the northwest of the unit and served as the primary elevation from which all other measurements were taken. Five-gallon buckets were used to remove soil and rock from the excavation and buckets were counted for each excavated zone. In general, soil was screened at 25% for Square A and 10% for Square B through a ¼ mesh, with exceptions noted below. Artifact density overall was light to moderate.

Square A

Zone 1

This zone consisted of plowzone that overlaid all other zones. Few artifacts were recovered. A color difference and greater limestone presence is readily apparent between this part of the mound and surrounding mounds and plaza indicating that masonry architecture was at one time present. This zone likely represents the most recent phase of architectural construction, although any large stones that may have been present have been removed. Any smaller fill or ballast stones have been broken into bits by the plow. The zone extends roughly 25-30cm in depth and ends with a color change to a lighter yellowish soil (**Figure 11.4**). The zone was approximately 31cm in thickness at the north end of the trench, and 28cm in thickness at the south end of the trench. In the center of the trench, it measured roughly 31cm in thickness. The soil density was loose with a uniform silty-clay texture, and a Munsell reading of 10YR 3/3. Of the 79.5 buckets excavated, only one bucket of limestone rock was removed, ranging in size from 4-20 cm. This zone was closed when the soil became more clayey and compact, with slight color change occurring. Artifacts included rim (N=4), special¹ (N=3), and body sherds (N=33); animal bone (N=1); debitage (15); freshwater shell (N=3); and obsidian (N=1).



Figure 11.3 Opening shot of Operation 21 (photo by A. Runggaldier).

¹ Special sherds are designated as those with morphology diagnostic of form (necks, bases, handles, etc.) and that are neither rims nor plain body sherds. Body sherds with distinctive surface treatments diagnostic of particular types are also considered special sherds.

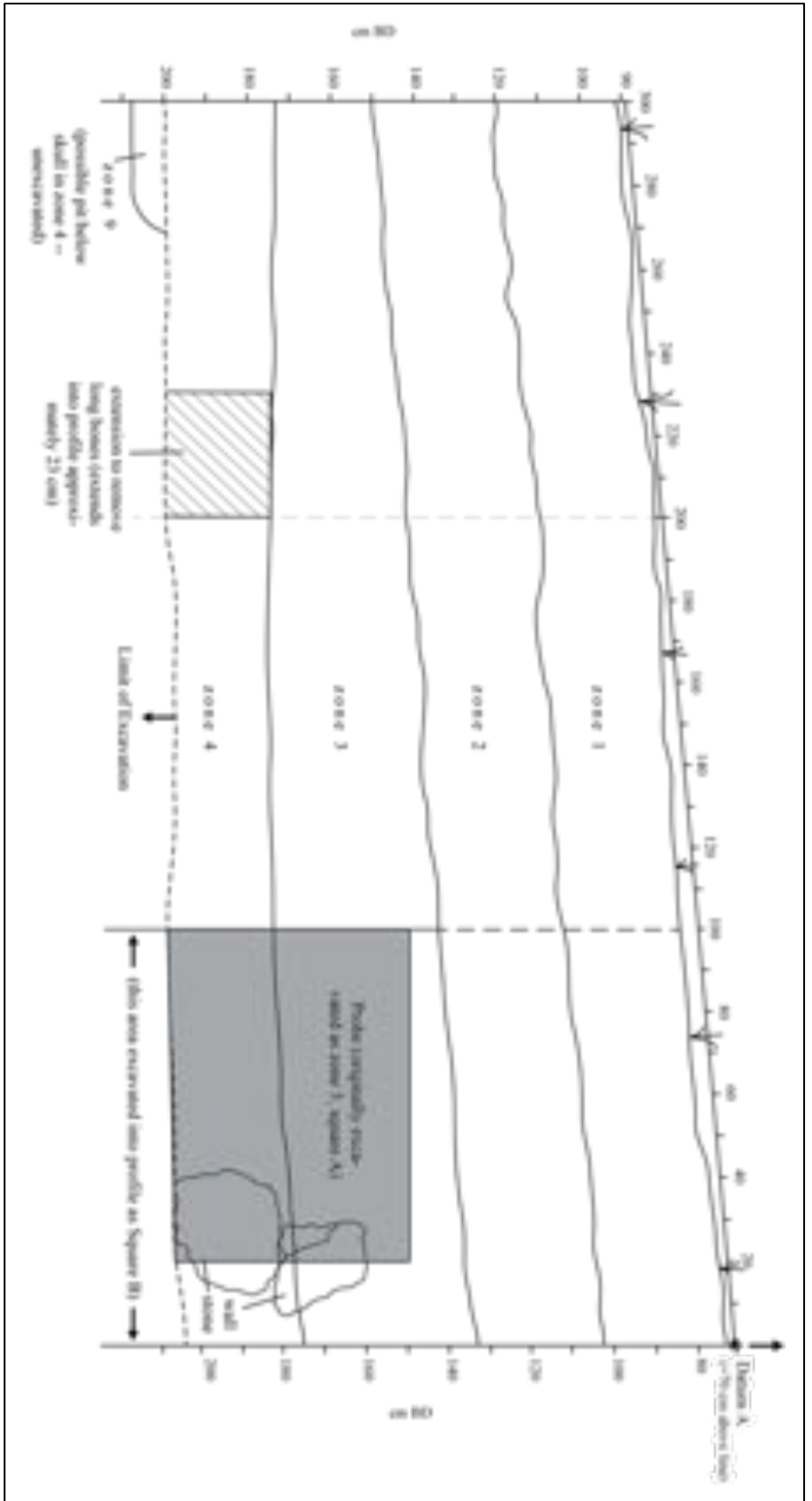


Figure 11.4 Profile drawing of Operation 21, west section (drawing and digitization by M. Brouwer Burg).

Zone 2

This zone seems to represent an expansion phase of basket load construction on Structure 1, on top of masonry architecture (see underlying zones; **Figure 11.5**). The zone is fairly uniform and was switched to Zone 3 at the arbitrary determined depth of 30 cm. The soil density of this high clay content soil was compact. A yellowish Munsell reading of 2.5Y 4/2 was taken. The zone is nearly devoid of artifacts, weathered and powdery orange sherds do appear; however, they are so poorly preserved that they smear under the trowel and cannot be extracted for collection. Of those artifacts recoverable, there were some rim (N=4), special (N=3), and body sherds (N=26); and two pieces of debitage. As such, only 10% of the soil was screened. A total of 79 buckets of soil were extracted and only one stone that measured 15cm in diameter. This stone was found lodged in the eastern section of the unit in the SE corner.



Figure 11.5 Plan view of Zone 3 with Zones 1 and 2 visible in the section (photo by A. Runggaldier).

A dark lens (7.5 YR 2.5-1) was found in the northwest corner of the trench containing charcoal flecks. This lens measured roughly 30x40cm in diameter, with a center elevation of 128 cm BD.

Inside the lens, the soil is softer than the more compact yellow basket-load soil (10YR 4-4). The lens peters out in subsequent levels.

A small 12-cm possible posthole was also uncovered on the eastern section at about 120cm north of the southern section (**Figure 11.6**). Some baked clay material (BCM) was found around the posthole, but not inside it.



Figure 11.6 Possible posthole in Zone 3 (photo by A. Runggaldier).

Zone 3

This zone was begun arbitrarily after Zone 2 was taken down approximately 30cm. Otherwise, there was very little visible difference between Zone 2 and 3, apart from a few more artifacts (sherds and debitage) in Zone 3. Both zones consist of basket load construction fill. The zone was roughly 40cm thick in the north of the unit, 30cm thick in the center, and 20cm thick in the south and overlay a level surface (top of Zone 4). This uniform, compact, clayey soil had a Munsell reading of 2.5YR 4/2 with medium artifact density. Artifacts included rim (N=13), special (N=11), and body sherds (N=131); baked clay material (N=20); debitage (N=20); bone

(N=1); and a chipped tool (N=1). One of the rims is a late Preclassic form of the Sierra group (Altamira Fluted) (**Figure 11.7** bottom); fragments of a Sierra Red jar were recovered from the middle of the square, near the bottom of Zone 3 (**Figure 11.7** top). One charcoal sample was collected for AMS dating.



Figure 11.7 Preclassic sherds from Zone 3. Top: just excavated Sierra Red body sherds. Bottom: Altamira Fluted rim sherd (photo by M. Brouwer Burg).

A total of 83.5 buckets were removed, screening at 10% until bucket 56 and at 25% thereafter, when more sherds became visible. Eight (8) limestone rocks were recovered,

measuring between 5-12cm in size. Plaster flecks were also visible toward the bottom of the zone.

The posthole first recovered in Zone 2 continued into Zone 3 for about 30cm total. It is very straight, and is located roughly 120 cm from the southeast corner of the trench. The soil within the posthole has a Munsell reading of 2.5Y 2.5/1. The posthole began around 149cm BD and has a diameter of about 12 cm. Another posthole was discovered along roughly the same N-S axis in Zone 3, although this posthole pinched out quickly (within 5cm) and is thus far less convincing. This posthole was roughly 5cm in diameter. Neither of the two possible postholes contained any artifacts, and thus were not given separate zone distinctions. However, they may indicate the presence of some kind of surface, perhaps representing the remains of a perishable structure.

Zone 3 was closed when a comparatively sherd-rich and level surface was found roughly 175cm BD (see Zone 4 description below; **Figure 11.8**). We interpret Zones 2 and 3 together as representing a later phase of construction that overlay earlier phase(s) seen in Zone 4.



Figure 11.8 Sherd-rich and plaster-flecked surface found at the bottom of Zone 3. Photo depicts southernmost 80cm of Square A (photo by A. Runggaldier).

Zone 4

This zone began with a sherd-rich and plaster-flecked surface found at a level depth below Zone 3, indicating that this surface was likely a floor. The surface is characterized by evenly distributed small eroded and burned sherds, as well as flecks of limestone and plaster of varying sizes up to gravel size. The zone represents a use surface and construction phase pre-dating the basket-load fill of Zones 2 and 3, although the plaster floor has since leached into the surrounding soil matrix (**Figure 11.9**). The posthole along the eastern wall, originally identified in Zone 2, is still visible in this zone. North of this posthole, plaster flecks are lacking. In the north of the unit, the zone measures roughly 28cm in thickness; in the center it measures 32 cm; and in the south it measures 33cm in thickness. The clayey, compact soil had a Munsell reading of 2.5Y 4/3. The Zone 4 surface appears to be a floor of compacted earth and plaster, with most of the underlying construction matrix consisting of midden fill from elsewhere.



Figure 11.9 Intersection of Zone 3 and Zone 4 along the western wall of Square A (photo by A. Runggaldier; digitizing by M. Brouwer Burg).

A large number of artifacts were recovered, including rim (N=49), special (N=16), and body sherds (N=455); baked clay material (N=33); a chipped tool (N=1); debitage (N=50); animal bone (N=2); human bone (N=36 foil-wrapped packets); freshwater shell/snail (N=24);

radiocarbon samples (N=2); four beads (two jade, one soapstone, and one bone; **Figure 11.10**); one archaeobotanical sample; and one *in situ metate* fragment (**Figure 11.11**; see also **Figure 11.12**). The largest collection of groundstone artifacts in the BREA project area derives from Hats Kaab; however, this particular metate fragment is the first to be found in situ in a closed context at the site. As such, it has the potential to reveal information about raw material sourcing during the late Preclassic, and may also yield food residues that can be analyzed. Of the 99.5 buckets, only ¼ bucket of small limestone rocks were recovered, most between 5-10cm in diameter.



Figure 11.10 Two jade and one soapstone (center) bead found in Zone 4 (photo by M. Brouwer Burg).



Figure 11.11 Metate fragment found in situ in Zone 4 (photos by A. Runggaldier and M. Brouwer Burg).

In the northwest corner of the unit, three large stones were uncovered suggesting an architectural feature, such as a wall (**Figure 11.12**). The sherd-rich surface of Zone 4 lips up to these stones at an elevation of 173cm BD, suggesting that wall and surface may belong to the same construction phase, although we cannot say definitively if this was the case. To the east of

the stones—where the wall would have continued—a clay lens cuts into Zone 4, extending southward by 130cm and with an elevation of 191cm BD. This lens appears to taper like a funnel, and consists of uniform clay with no sign of plaster flecks or limestone. A minimal number of sherds were found, and they were very eroded.



Figure 11.12 Wall stones, clay lens, and metate fragment in north of unit, Zone 4. Bones of disarticulated burial visible in southern portion of unit (photo by A. Runggaldier; digitizing by M. Brouwer Burg).

A disarticulated human burial was found throughout Zone 4, the result of a secondary deposit in the midden construction fill, perhaps in the form of a bundle burial (visible in **Figures 11.13-11.14**). While most of the bone appears to derive from one or two adult individuals (sex

indeterminate; Wrobel pers. comm.), a single sub-adult deciduous tooth was also found. The majority of the bone was very poorly preserved and extremely difficult to extract from the surrounding matrix. Therefore, much of the bone was removed along with the surrounding matrix to hold the material together. At least 19 long bone fragments were recovered, most of which were extracted with their matrix and wrapped in tinfoil. A number of teeth (N=15) were found scattered along the west section and throughout the southern end of the unit, in addition to those found still articulated with the maxilla and mandible of the skull. A tooth was found at the north end of the trench, not far from one of the jade beads, suggesting that the latter may have also been part of the burial prior to its re-deposition in disarticulated form in Zone 4. The skull itself, at the south end of the trench, was crushed and difficult to excavate; it too was removed with much of the surrounding matrix to keep it intact. All of the bone was drawn, mapped, and photographed prior to removal. A total of 36 bone packets were extracted, containing varying amounts of bone. Unidentifiable bone fragments were collected from general areas and packaged together. Identifiable bones were wrapped in packets that were keyed to specific locations of the overall plan map. Elevations were taken on each identifiable bone cluster and on some areas of general bone scatter. The bone from this part of the unit was exported to the bioarchaeology lab of Dr. Gabriel Wrobel (Michigan State University), where the material will be analyzed for minimum number of individuals, articulation, age, sex, and health status. The burial is assumed to be mostly disarticulated as no discernable pattern was apparent in the placement of the bone and in some cases long bones appeared to have been bundled together. Additionally, some of the long bone fragments (N=4) exhibited straight and clean breaks perpendicular to the bone shaft, not a typical breakage pattern for fleshed bone. Rather, clean breaks like these are more likely post-mortem and take place after the bone has been skeletonized (Wrobel pers. comm. 2015).

These human remains were originally deposited in a different location or locations, and were subsequently removed and placed in this secondary context (Zone 4). The movement from primary to secondary contexts likely involved a change in mortuary practice, from inhumation to bundle burial(s), as evidenced by the presence of closely spaced parallel long bones from different parts of the human body (see **Figure 11.13** and **11.14**, especially the bones in the Extension). We cannot rule out that only one individual was present for three reasons: 1) more long bone fragments were found than is contained by a single human individual; 2) more molars and incisors were recovered than is contained by a single individual; and 3) more than one skull may be present (many skull fragments, and maxilla and mandibles with attached teeth were found in addition to the intact skull). Bioarchaeological analysis will help to clarify the taphonomic processes of this assemblage (see Wrobel, Volume 2).

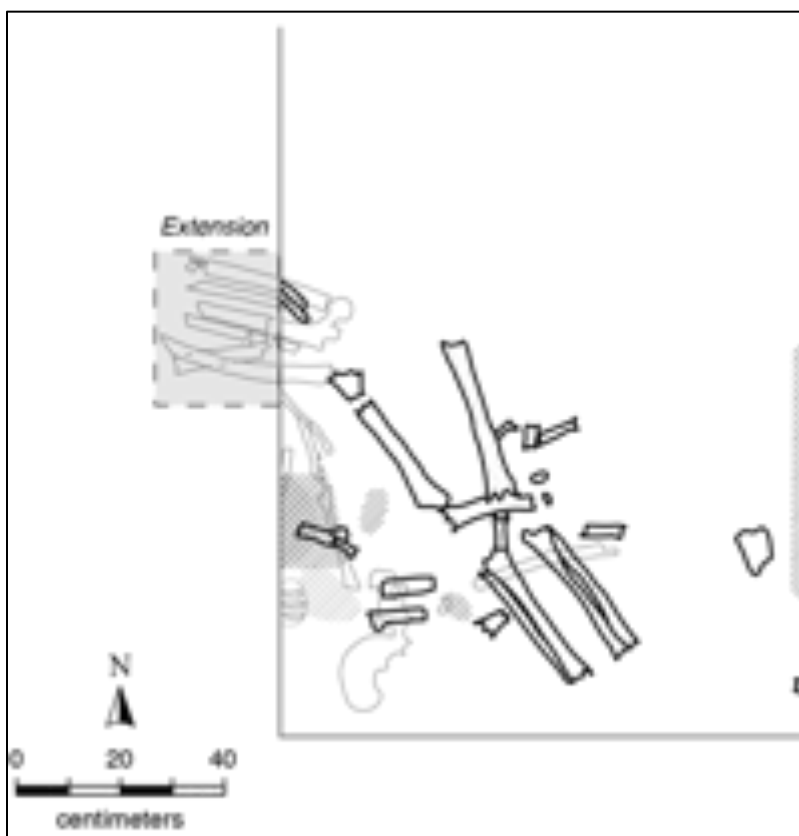


Figure 11.14 Disarticulated burial. Darker lines indicate bones in an upper layer; lighter lines indicate bones further below. For relative elevations, see Figure 11.13 (drawn and digitized by M. Brouwer Burg).

Given that 100% of identifiable sherds found in Zones 3 and 4 were late Preclassic, we feel fairly confident that Zone 4 represents a single construction event that borrowed fill material from a separate late Preclassic midden. However, the construction of Zones 3 and 4 could conceivably have taken place during a later period that borrowed fill material from an earlier midden feature (even though no identifiable late Classic or Terminal Classic sherds were recovered from these zones). Cortical bone from the secondary burial may prove useful in this sense, as it was placed in the fill of Zone 4 during construction and should date to the time period during which it was re-deposited. Thus, if the bone yields late Classic dates, then we can be fairly certain that Zones 3 and 4 consisted of fill that was mined from an earlier Preclassic midden; if the bone yields late Preclassic dates, then we can assume that Zone 4 was constructed during the same time period.

Although Zone 4 contained midden fill it was itself not a midden, as it revealed no internal stratigraphy generally characteristic of such a feature. Instead, the layer exhibits consistency in the type of fill utilized, as well as a level surface that may have been plastered. Furthermore, it is unclear whether Zone 4 represents a phase of construction separate from the

construction of the southern wall of Structure 1. Thus, we can say that either two or three phases of construction are present in Operation 21.

Zone 5

This zone is a lateral probe extending roughly 30cm into the west section of Square A (see gray area in **Figure 11.4**; **Figure 11.15**; see also **Figure 11.22** below). The extension measured 50 cm up from the center of Zone 4, and was eventually dug down to meet the bottom of Zone 4. The cut extended to 1 m south from the NW corner of Square A. The two courses of stone are thought to be the risers on a step or the retaining wall of a terrace. Aligned with these two courses of stone (to the west), two additional aligned and stacked stones were found, creating an E-W line. The wall does not continue to the east, because a cut truncated and removed part of the wall, replacing it with the uniform clay lens described in Zone 4.

Within Zone 5, 19 rims sherds were recovered, one of which was relatively large in size (about 16 cm long), an unusual characteristic for Hats Kaab ceramics. In addition, seven special sherds were found, 101 body sherds, one piece of baked clay material, six debitage fragments, and two pieces of human bone, including a tooth. This tooth was found about 2 m north of the human remains found in the southern end of Square A, Zone 4. In total, 24 buckets were excavated and screened at 10%. The zone was closed at an average elevation of 204 cm BD across the unit, as probing in the north and south indicated soil color change directly below this level.

Zone 9

This zone represents a small pit in the far southern corner of Square A (**Figure 11.16**). The pit was distinguished from the surrounding Zone 4 sherd-rich matrix in that it was darker in color and had fewer artifact or marly inclusions. The skull associated with the human bones described in Zone 4 was found to sit directly atop this zone, in addition to a broken long bone. The depth of the pit is not known as time restricted its full excavation. However, it began at 207cm below datum, at the bottom of Zone 4. In addition to the bones found at the interface between Zone 4 and this zone, only three body sherds were found, weighing a mere 9 grams. These sherds were found in association with the skull at the southern end of the excavation, so they should be considered part of the assemblage from Zone 4.



Figure 11.15 Zone 5 westward extension with double-course wall stones visible (photo by A. Runggaldier).

In sum, while we had hoped to gain a better understanding of the phases of construction and overall architectural configuration of Structure 1 through the excavation of Square A, only a few poorly preserved wall stones were recovered (see **Figure 11.12 and 11.15**). These stones represented a portion of the south facing wall of Structure 1 and appear to be part of the original structure, that is, before the construction of the southern and western extensions (see **Figure 11.1**). Perishable structures may have been constructed on the platform of this building from which solstices and equinoxes could be viewed over the eastern platform Structures 2, 3, and 4. It is also possible that no structures were present on top of Structure 1. Regarding renovations to Structure 1, we found that the southern wall was cut at some point by a clay pit (as seen in the northeast corner of the excavation; see **Figure 11.12**).



Figure 11.16 Zone 9 pit shown prior to extraction of the skull found in Zone 4. Note the pit's darker color and lack of marl (photo by M. Brouwer Burg).

Zone 4 is intriguing, in that it appears to represent a southward projecting terrace that was filled with material borrowed from a late Preclassic midden, as well as skeletal remains in secondary context. It may be that the individual(s?) found here was uprooted accidentally during renovations of other parts of the structure and was re-deposited in this zone, the remaining long bones bundled together before interment and some bones broken before the secondary deposit but after being skeletonized in another context. The bones were all found directly in the construction fill of Zone 4 rather than in a distinct pit feature, implying that they were deposited directly into the fill, perhaps encased in a perishable container (such as a basket or cloth bag). Further, it seems likely that the Zone 4 construction fill was consolidated quickly, as the bones were found throughout the ~30cm of the layer (the skull had the lowest elevation). Many of the bones appear to be smashed or snapped, although it is unclear if this was due to intentional human activity or a by-product of being deposited in the Zone 4 fill.

The late Preclassic midden fill was leveled to create the surface of Zone 4 and was possibly plastered. This zone may have been built concurrently with the construction of the south wall of Structure 1 (phase 1), or it may have been built during a subsequent phase of construction (phase 2). What is certain is that Zone 4 was covered by basket-load clay soil in yet another phase of construction (phase 3, consisting of Zones 2 and 3), as was the southern face of the original building of Structure 1. We believe these zones represent fill from either a southward projecting terrace or the body of Structure 1 itself. In both cases, stone masonry likely faced these layers, although this masonry has since been removed through modern-day plowing and bulldozing.

Square B

Zones 1-3

As noted above, the same zones were identified in Squares A and B; however, due to the very different features found in each, these squares are treated separately here. Whereas Square A was dominated by the Zone 4 disarticulated burial, Square B revealed architectural features that had the potential to contribute to our overall goals for the operation: to understand chronology and phases of construction on the western structure.

Square B began as a 50-x-50 cm probe extending into the northwestern wall of Square A, called Zone 5 (see above). Two additional stones were found directly behind the two-course wall exposed in Square A, which warranted further expansion of the Zone 5 cut into a full-fledged 1-x-1 m unit adjacent to Square A and excavated from the surface. Zones 1 and 2 in Square B were very similar in nature to those found in Square A: Zone 1 consisted of a plowzone layer roughly 30 cm in thickness, corresponding to the thickness of Zone 1 in Square A. A total of 23.5 buckets were removed, and screened at 10%. Artifacts found included rim (N=5), special (N=2), and body sherds (N=23); bake clay material (N=1); and debitage (N=1).

Zone 2 was taken down from the bottom on Zone 1 to an arbitrary thickness of about 30 cm (about 131 cm BD). As in Square A, zone 2 consisted of semi-compact, silty-clay with moderate artifact density. A total of 30.5 buckets were screened at 10%. Artifacts included rim (N=8), special (N=2), and body sherds (N=72); baked clay material (N=3); freshwater shell (pomacea, N=6); debitage (N=1); and one chipped tool. Unique to this zone was a lens of marly fill and many pomacea shell fragments (**Figure 11.17**). This lens was not designated a separate zone, but the elevated pomacea levels suggest it may mark the top of a midden deposit.



Figure 11.17 Marly, pomacea-filled lens at bottom of Zone 2, Square B (photo by M. Brouwer Burg).

Zone 3 in Square B was taken down from the bottom of Zone 2 to meet the top of Zone 5 in Square A, making this zone also roughly 30 cm in thickness. The pomacea lens was still visible in this zone, although it appeared to pinch towards the south. In addition, some burned and smashed sherds were uncovered along the southern wall. A moderate number of artifacts were recovered: rim (N=8), special (N=3); and body sherds (N=66); bake clay material (N=4); debitage (N=8); and animal bone (N=3). This zone was closed arbitrarily when the known top of Zone 4 in Square A was reached. A total of 23 buckets were removed and screened at 10%.

Zone 4

This zone was extracted as the southern portion of Zone 5 in the Square A probe (**Figure 11.18**). Please see Zone 5 above for description.

Zone 5

We did not designate any Zone 5 in Square B to avoid confusion with the Zone 5, Square A probe (see also **Figure 11.22** below).

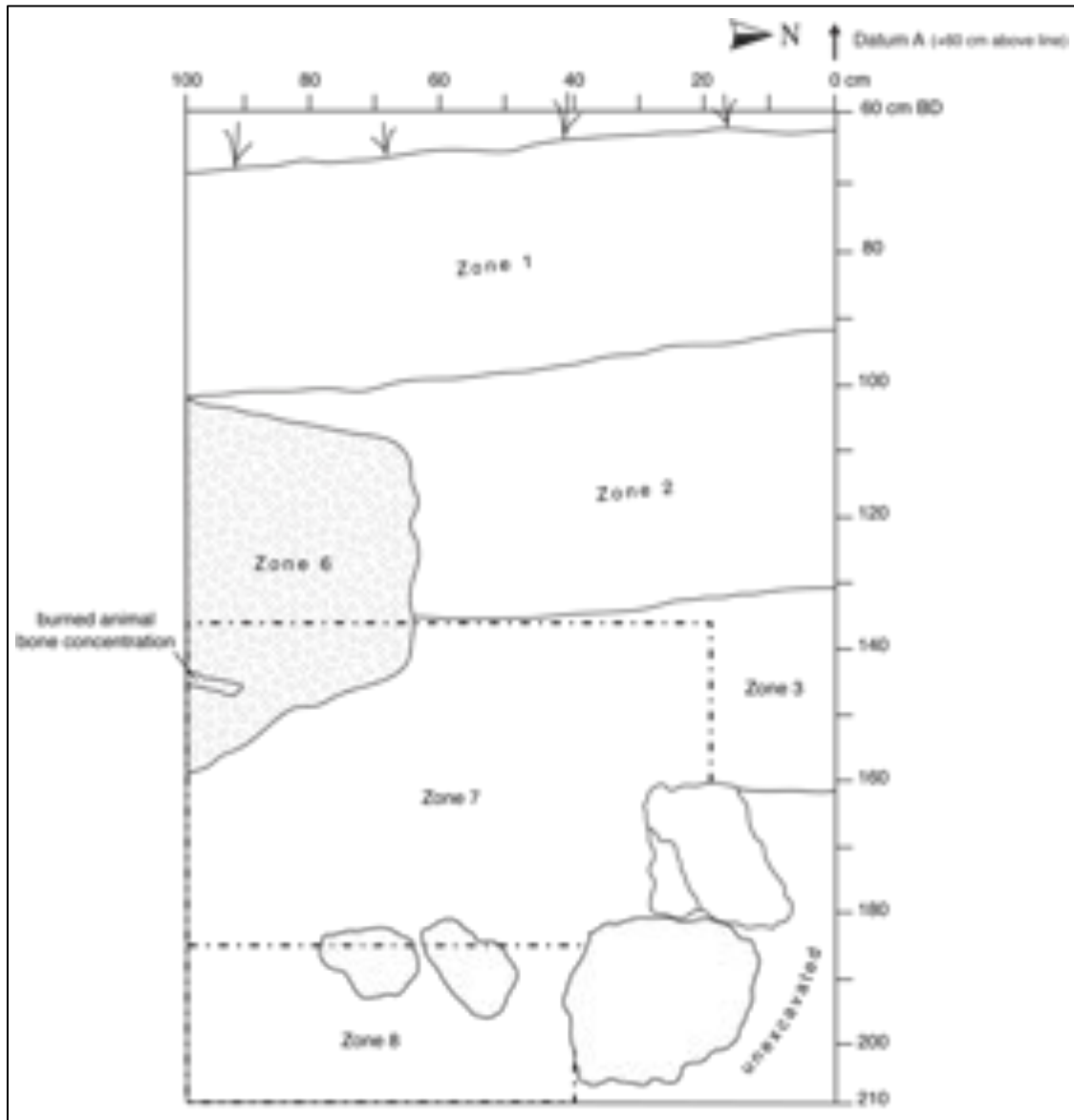


Figure 11.18 Profile of Square B (drawn and digitized by M. Brouwer Burg).

Zone 6

This zone represents the extension of the pomacea lens seen in Zones 2 and 3. It was created to remove the many burned and smashed sherds lying in the southwest corner of Square B, and is thought to represent a pit or heap of trash (see **Figures 11.18-11.19**). Including the pomacea lens, this midden pit/heap extended from 103 cm BD to 160 cm BD. Throughout, the pit/heap consisted of marly, pomacea-strewn fill. Many artifacts were recovered from this small zone, including rim (N=12), special (N=6), and body sherds (N=87); bake clay material (N=1); debitage (N=4); freshwater shell (pomacea, N=4); animal bone (N=6); and one radiocarbon

sample. Of the special sherds, one mammaform foot was recovered, a form characteristic of the late Preclassic. Some of the animal bone appears to be of the genus *Pecari* (peccary).



Figure 11.19 Photo of Zone 6, Square B pit/heap filled with smashed sherds, animal bone, marl, and pomacea (photo by M. Brouwer Burg).

Zone 7

This zone represents yet another extension into the western wall of Square B (see **Figures 11.18** and **11.20**). The probe was 80 cm wide and 50 cm high, beginning 20 cm from the northern edge of Square B in the horizontal plane and extending to the southern edge of the square. This extension was cut in order to find the projected corner between the east-west wall exposed along the northern edge of Squares A and B, and a possible later north-south wall constructed to the west. No such corner was recovered, although an intriguing stone

configuration was revealed in the southwest corner of the unit, which was removed in Zone 8 (see below). This probe extended from 136 cm BD to a depth of 196 cm BD. A total of 16 buckets were screened at 10%. A moderate number of artifacts were recovered, including rim (N=10), special (N=6), and body sherds (N=42); debitage (N=1); animal bone (N=3); and a radiocarbon sample (N=1).

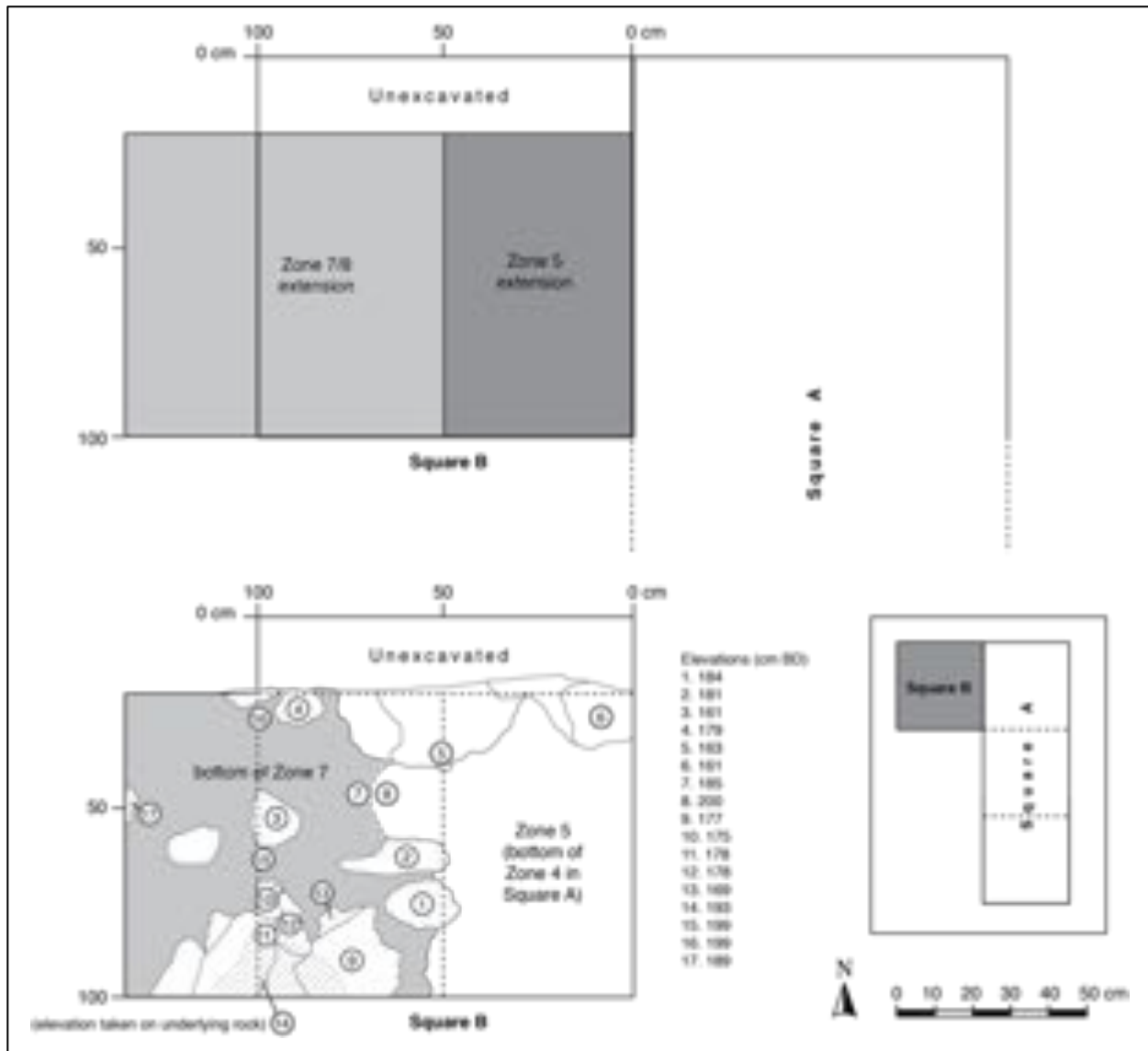


Figure 11.20 Zone 7, Square B extension (drawn and digitized by M. Brouwer Burg).

Zone 8

Zone 8 involved taking down the extension begun in Zone 7 to the bottom of Zone 4 in Square A (see **Figures 11.18 and 11.20**). The possible wall stones identified in the southwest corner of Zone 7 were pulled to reveal further courses; however, no underlying stones were

recovered. Thus, these stones likely represent collapse from a northern or western wall. A total of 16 buckets were screened at 10%. A medium number of artifacts were recovered, including rim (N=4), special (N=6), and body sherds (N=52); debitage (N=2), and a radiocarbon sample.

The extension of Square B did little to enhance our understanding of the construction sequence or architecture of the Structure 1. We did not find a continuation of the south-facing wall of Structure 1 in the Zone 7/8 extension of Square A, although it could be the wall is present just to the north of our excavations. We did uncover significant limestone collapse, although no discernable pattern was recognized to indicate from which direction the stone had fallen. It could feasibly have collapsed down from the south-facing wall, or it could have collapsed from an unknown western wall. As mentioned earlier, significant renovation of Structure 1 occurred, including the addition of a large southern platform, although we know little about the timing of this event. The presence of the pomacea-filled lens and the number of burned animal bones in Zones 2 and 3 suggest a small midden heap or pit was deposited in Square B.

Operation 22

This operation was placed in the middle of the plaza, roughly equidistant from the basal edge of Structure 1 and the eastern platform (see **Figure 11.2**). The goal of this excavation was to determine the approximate depth of anthropogenic material. At other middle and late Preclassic sites with E-Groups, significant amounts of construction material were brought in to create the level plaza surface (e.g., Cival and Seibal; Estrada-Belli 2011; Inomata et al. 2013). It appears that much material was brought in to level the plaza at Hats Kaab, as anthropogenic layers were still being recovered at the limit of excavation, roughly 2 m below ground surface. At that point, this 1-x-1 m unit (designated Square A) was so deep that only one person could fit inside to dig, and a ladder was used for access. All zones were screened at 10% due to low artifact density.

Zone 1

This zone consisted of clayey, semi-compact plowzone soil. Similar to Zone 1 in Operation 21, Zone 1 in Operation 22 measured about 25 cm in thickness and was closed when a color change was distinguished. This silty-clay soil had a Munsell reading of 2.5Y 3/2 and contained only one artifact; a small and very eroded sherd. One rock was found at the top of the surface, measuring 7 cm in diameter. A total of 28 buckets were excavated.

Zone 2

This zone began at the bottom of Zone 1, where a color change was distinguished. This zone was greyer in color (Munsell reading of 10YR 3/2). The soil was very dense and moist,

perhaps wetter than the soil on the surrounding mounds given the depressed location of this excavation. Flecks of orange were present in the soil, some of which were highly eroded sherds; others were decayed roots. The layer was 58cm in thickness and had no rock inclusions. While no recoverable artifacts were found, the layer is still considered to be anthropogenic given the presence of the extremely eroded orange sherds. Zone 2 was closed when a layer with slightly more sherds was reached (Zone 3; see below). A total of 62.5 buckets were removed in Zone 2.

Zone 3

Zone 3 is nearly identical to Zone 2 in its soil matrix features: it consists of semi-compact, clayey soil (Munsell reading of 10YR 3/2), with no stone inclusions. A slightly higher concentration of sherds were found in this layer and the clay itself was stained red in places from sherd erosion. Two sherds were found intact and collected; the rest were left as they measured less than 0.25 cm in size. This zone measured about 15 cm in thickness and 16 buckets were collected.

Zone 4

Similar to Zone 3, Zone 4 was begun when two small sherds were found, measuring 1-x-1 cm, in addition to a few sherds too small for collection. A piece of chert was recovered that has dubious flake scars. It measured 6 cm in length and was noted but not collected. The soil was very compact and clayey, and of the same color (e.g., Munsell 10YR 3/2). The layer measured roughly 35 cm in thickness and was closed after the chert was found. A total of 27 buckets were excavated.

Zone 5

This zone began after a piece of possibly worked chert was found at the bottom of Zone 4. It mirrored the above-lying zones in consistency: the soil was very compact and clayey. The Munsell reading was 10YR 4/2. Artifact density was light (one rim, 17 body sherds), with several burned sherd fragments visible but too eroded to be collected. A small piece of BCM was recovered along with small body sherds about 10cm above the limit of excavation. Two additional pieces of chert were found, both likely natural. However, their presence suggests human activity as chert does not occur naturally in this part of Belize. A sherd with more integrity was found at 212 cm BD. A total of 23.5 buckets of soil were removed from this zone, which was closed upon reaching the natural water table.

Energetics Assessment

Operation 22 revealed that much clayey soil was brought to and used at the site of Hats Kaab to build up and level out the plaza surface, using the basket-load construction technique. The Belize River is not far distant (c. 2 km), however, given the size of the plaza this distance may have posed a significant amount of time and labor. This process may have occurred over a period of time, as small numbers of broken and eroded sherds, bcm, and chert were found in situ. The very weathered nature of the artifacts is likely due to the low elevation of this part of the site: this depression is where water would have pooled after running off the higher buildings and platforms during the rainy season. Intermittent waterlogging of the soil must have served to slowly leach out minerals in the ceramic paste.

The overall goal of the operation was to find sterile soil; even at a depth of 212 cm BD (where the water table was encountered), we had not yet found sterile soil, suggesting the plaza foundations may have extended even deeper in some places. In a previous paper, we estimated that the plaza at Hats Kaab covered roughly 171-x-95 m, with an average surface area of 16,245 m² (Brouwer Burg et al. 2014). If we assume that on average, about 1 m of fill was required to level out the Hats Kaab plaza, then the plaza would have required 16,245 m³ of fill material. Given that Estrada-Belli (2011:75) estimated that the entire Middle Preclassic plaza required 1,304,026 m³, this number is not so incredible. However, Estrada-Belli's estimate also includes the material necessary to build up the western pyramid and the eastern platform. At Hats Kaab Structures 1, 2, 3, and 4 would have required about 13,624 m³. If the southern Structure 5 is also included, that number reaches 15,124 m³. These numbers are telling and underscore the importance of plazas in site planning and construction: at Hats Kaab, plaza leveling required slightly more material than the all of the other structures combined. In total, we estimate that at least 31,369 m³ were brought into the site.

Overall, 157 5-gallon buckets were required to excavate Operation 22. If we assume the plaza thickness is on average about 1 m throughout the site, then 1,275,232 buckets would be needed to excavate the entire area (78.5 buckets * 16,245 m³). If each bucket weighs roughly 30 pounds, this equates to 38,256,975 pounds of soil (or 19128 tons). We can also estimate how much effort was required to construct the Hats Kaab plaza. A human walking at a moderate pace (or one carrying 30 pounds) can cover about 5 km in an hour (or a trip from the river to Hats Kaab and back). Assuming that the workers transporting soil walked this fast, then they could make 8-9 trips back and forth in a day (assuming a 10 hour day with some breaks). If each trip brought 30 pounds worth of soil, and 10 workmen were busy each day of the week, it would take 15,940 days to complete this project (43 years)! If 50 workmen were busy each day of the week, it would take 3188 days, or ~9 years. This enormous time estimate strongly indicates that the plaza was built up over a long period of time, with small and increment additions made with each subsequent generation.

Interpretations and Conclusions

The excavation of Operations 21 and 22 at Hats Kaab, in addition to the previous excavations of Operation 7 and 9, reveal an intriguing occupation history for the site. We now have evidence from Operation 21 that the construction efforts to build the western and eastern mounds all appear to be part of a single construction plan. These structures all belonged together and reflect a cohesive construction and occupation history, further supporting our hypothesis that the site was initially intended to function as an E-Group type arrangement. We know from previous radiocarbon and ceramic analysis that the site was used predominantly in the Late Preclassic period (see Runggaldier and Brouwer Burg 2013).

Similar to the excavations of Operations 7 and 9, Operation 21 yielded only minimal masonry architecture, encasing basket-loaded earthen fill. In this operation, we can distinguish at least two, if not three phases of construction, which we consider to date to the late Preclassic. Future radiocarbon assessments will confirm this chronological assessment, but similarities in construction techniques and fill material between Operations 7, 9, and 21 suggest that all areas date to a similar time period. In Operation 7, three construction phases and two remodeling events were documented (see Runggaldier and Brouwer Burg 2013: Fig. 7.32), involving the construction and remodeling of what we interpret as a central stone stairway. Both Operations 7 and 9 contained traces of a terrace or platform edge toward their western extents. The presence of four postholes in Operation 9 indicates that perishable structures may once have stood on this part of the eastern platform. Further, an articulated burial and upturned vessel in Operation 9 suggests ritual behavior (inhumation and caching). Although we recorded but did not excavate the burial in Operation 9, it appears to have been articulated and in a primary depositional context. By contrast, the human remains in Operation 21 do not suggest a primary depositional context indicative of ritual behavior, but rather point to an accidental uprooting of the skeleton(s) elsewhere, and subsequent re-deposition of these remains in the zone 4 fill. This corresponds to ritual behavior and burial practices observed at other E-Groups, which typically occur on or near the eastern complex rather than the western radial pyramid (see Estrada-Belli 2011).

Operation 22 confirmed that there is evidence of human activity buried deeply in the center of the plaza, although no evidence of construction was found. We suppose that given the low-lying nature of this area, all plaster and artifacts were leached into the surrounding matrix. Nonetheless, cultural material was found at depths of +2 m from found surface, thereby proving the cultural rather than natural deposition of this fill. This finding indicates that the plaza was consciously planned as part of the larger E-Group architectural arrangement, serving to link together the other five structures into a coherent whole.

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Chapter 12

Investigating a Postclassic Shrine at Saturday Creek: Excavations of Structures 10 and 11 (Operation 23)

Eleanor Harrison-Buck and Kelin Flanagan

Introduction

Saturday Creek was the focus of several excavations during the January and summer 2014 field seasons, as well as the January 2015 season. Two of the excavations (Operations 23 and 24) were focused around Structures 10 and 11 in the Southwest Plaza (see **Figure 8.1**). Operation (Op.) 23, presented here, was primarily focused around Structure (Str.) 11, an all-stone, square platform. A high density of stone material was visible on the surface prior to excavation and resembled several other all-stone buildings found at Hum Chaak and Ik'nal, two nearby sites in the BREA study area (Harrison-Buck 2011 and 2013). These buildings were circular in shape with a single interior room and dated to the Terminal Classic period (ca. AD 780-950). In contrast, excavations of Str. 11 revealed a square platform made entirely of stone that appears to date to the Postclassic.

A large looter's pit dug into the top of Str. 11 created a gaping hole on the top of the platform and obscured the architectural features in the southern half of the structure (**Figure 12.1**), but it appears to be a square platform; no masonry superstructure walls could be readily identified when the top of the structure was cleared down. Unlike the structures at Hum Chaak and Ik'nal, the final phase of the square platform at Saturday Creek contained a series of radial steps that likely existed on all four sides (the east side was not excavated). Excavations exposed the western half of Str. 11 and revealed a large area of the plaza to the west of the structure. Stairs on the west and north sides of the platform were also defined, as well as a small portion of the southern staircase. In addition, adjacent to Str. 11 just to the north is Str. 10. We exposed the southern edge of this raised platform that runs east-west and abuts Str. 11 around its southeast corner (see **Figure 8.1**).

While most of the excavations conducted in the North Plaza group (Ops. 17-20) at Saturday Creek suggested a primarily a Classic period occupation (ca. AD 200-800), excavation of Ops. 23 and 24 in the Southwest Plaza area revealed a later occupation. Excavation of Op. 23 showed signs of a dense Late-to-Terminal Classic occupation in earlier layers beneath Str. 11 and in the final phase, we recovered an abundance of Late Postclassic censers, found smashed and scattered along the western facing side of Str. 11, suggesting a ritual function (see Linseman and Harrison-Buck, Volume 2). A final cache deposit exposed in Op. 23 was associated with the southwest corner of Str. 10 and contained an historic crystal bottle stopper, suggestive of a

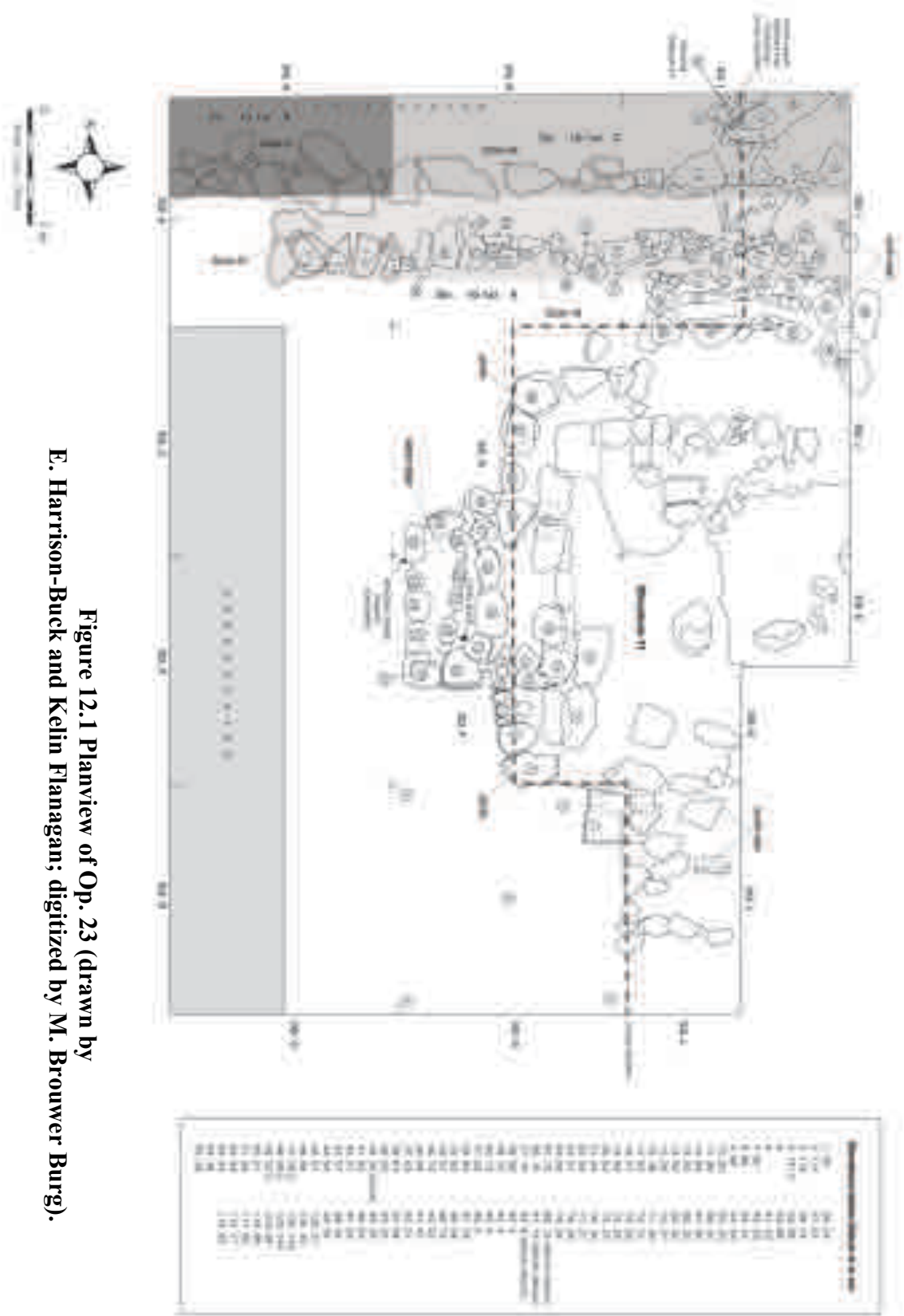


Figure 12.1 Planview of Op. 23 (drawn by E. Harrison-Buck and Kélin Flanagan; digitized by M. Brouwer Burg).

Contact period occupation or visitation to the site following its abandonment. The finds from the southeast corner of Str. 10, discussed herein, led us to expand the excavations during January 2015 to include Op. 24, which exposed more of this east-west platform (see Kaeding and Harrison-Buck, this volume). Here, we provide a review of our objectives for Op. 23, a description of the layout of the unit, and a detailed description of the finds by zone and square.

Objectives

1. To determine the architectural layout of Strs. 10 and 11.
2. To identify the final form of these structures and any earlier phases of construction.
3. To obtain ceramic and/or carbon samples from each construction phase for use in chronological analysis of the buildings' development.
4. To identify through architectural and artifactual evidence the relationship of Str. 11 with the adjacent Str. 10 east-west platform.
5. To salvage architectural and artifactual evidence from looter damage to Str. 11.

Description of Operation 23

Op. 23 is a large, cardinally-oriented unit that measures a little under 6 m east-west by 8 m north-south. The operation was divided up into 12 squares (Sqs. A-L). Sqs. A-I were laid out as 2-x-2 m units, although in the case of Sqs. A, B, C, E, and G only half the squares (1-x-2 m) were excavated (see **Figure 12.1**). Sq. K was an L-shaped unit due to the presence of Datum A in the southeast corner. Sqs. C, E, G, and nearly all of Square H were located off-mound within the plaza area; only a small part of Sq. H exposed the southwestern corner of Str. 11 and the western edge of the southern radial staircase. Sq. L is a 1-x-2 m unit with the long axis oriented north-south. This square further exposed the western half of the southern radial staircase. Sqs. D and F exposed the western radial staircase, a low plinth, and portions of the surrounding plaza area and Sq. I exposed the northern radial staircase of Str. 11, as well as the southern side of Str. 10. Sqs. I, A, and B exposed the southern edge of the Str. 10, a long, east-west platform. In Sq. I, the southeast corner of a cobble platform (Zone 2) that comprises the final phase of Structure 10 was exposed. This Zone 2 platform was the focus of excavation in Op. 24 (see Kaeding and Harrison-Buck, this volume). Sq. I revealed a cache deposit (Zone 13), discussed further below, intruding into the southeast corner of the Zone 2 platform of Str. 10, which contained Late Postclassic material as well as the Contact period crystal artifact.

Overview of the Construction Phases of Structures 10 and 11

Excavations of Structures 10 and 11 revealed multiple phases of construction. The all-stone structure began as a simple square stone platform (Str. 11-1st C). At some point, radial staircases (Zones 12 and 29) were constructed around the exterior of the square platform (Str. 11-1st B). In a final phase of construction, a low, one-course high plinth (Zone 12) was added to the exterior of the platform (Str. 11-1st A) in between the radial stairs. These last two phases may be coeval, but this is difficult to determine with certainty and are therefore separated. While the same plaza floor may have been used throughout all three phases of Str. 11, there is a thick dark matrix that surrounds the exterior of Str. 11-1st A (Zones 3/6) and this dark lens also underlies the plinth and radial stair construction (Zones 15 and 31), suggesting that the dark matrix may represent another occupational surface added during the final phase of construction.

Str. 10 began with an east-west oriented platform (10-1st C), which appears to pre-date the existence of Str. 11. A pebble floor surface (Zone 36) is associated with this initial phase of construction, which also pre-dates Str. 11. Following this, a thick fill layer comprising a re-deposited midden capped with a limestone pebble surface (Zones 21/24 and Zones 16/10) was built over top of the Zone 36 pebble floor. This thick floor construction covered the first two courses of Str. 10-1st C. During this intermediate phase of construction, Str. 10-1st B was constructed, which involved the expansion of its east-west retaining wall (Zone 34) to include the Zone 35 wall. In the final phase of construction (Str. 10-1st A), another east-west retaining wall (Zone 18) was added to the southern side of the platform and covered the earlier Str. 10-1st B platform (see **Figures 12.1** and **12.2**). The retaining wall (Zone 18) of this latest phase of construction physically abuts the northern radial staircase of Str. 11-1st A. Although it is possible that in this final phase the same floor surface (Zones 21/24 and Zones 16/10) continued to be used, the same dark matrix noted above running under the final phase of Str. 11-1st A also appears to run underneath Str. 10-1st A, suggesting that the dark matrix is a final occupational surface used at this time.

Several small test excavations that probed deeper into Op. 23 in Squares F and I showed a series of fill layers and at least two discrete cobble floor surfaces that pre-date the construction of Structures 10 and 11. For instance, the thick cobble surface that comprises Zone 20 in Sq. F and Zone 38 in Sq. I appear to represent the same surface and runs underneath both Strs. 10 and 11 (see **Figure 12.2**). This floor appears to be associated with some earlier phase of occupation in this part of the site, but any architectural affiliation is unknown and requires further testing.

Excavation Methods

The site core of Saturday is primarily in bush. However, the southern section of the site had been partially cleared for planting in recent years, which made our initial clearing of the all-stone structure (Structure 11) fairly easy. Fortunately, the cultivation activity has involved non-

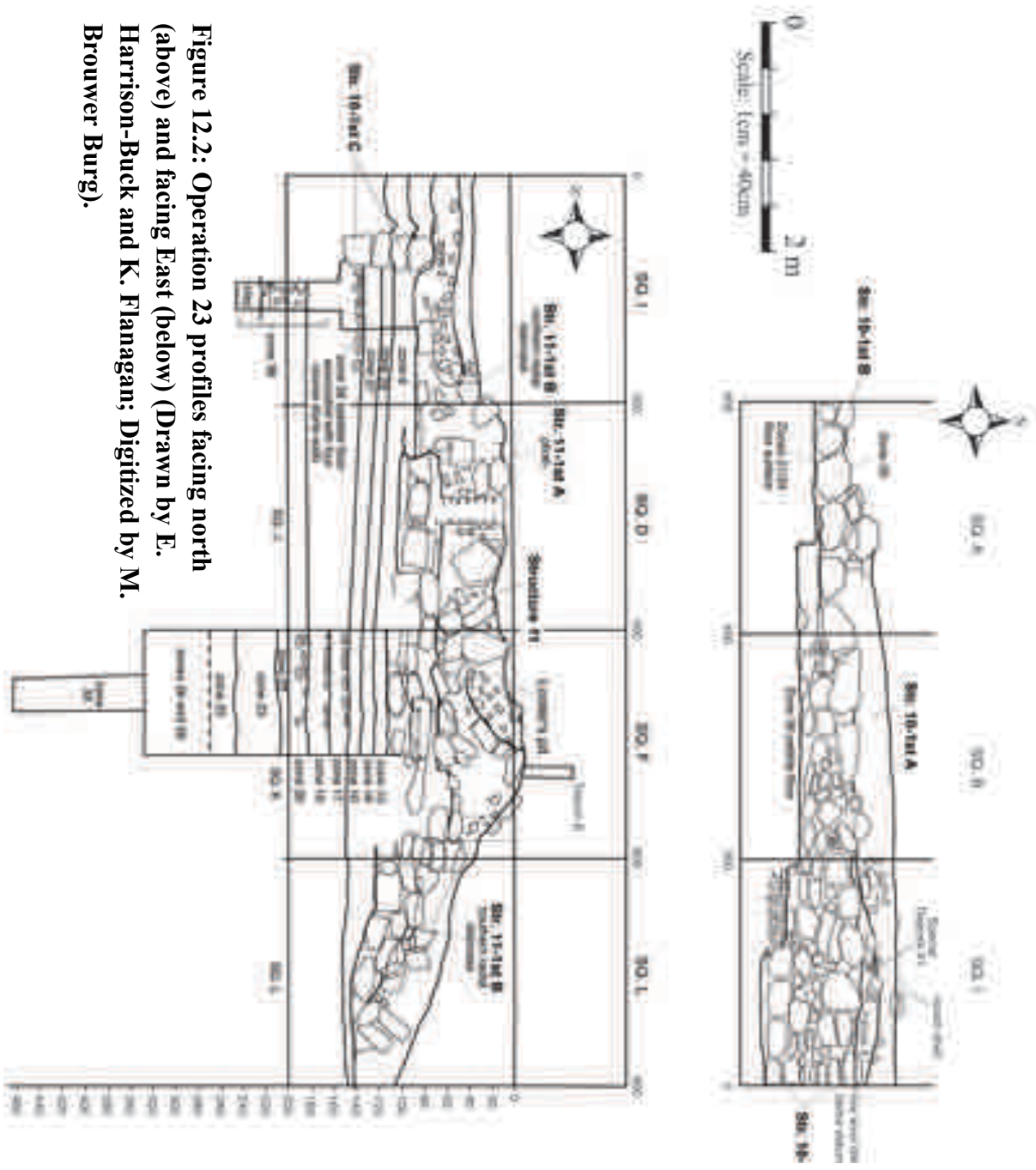


Figure 12.2: Operation 23 profiles facing north (above) and facing East (below) (Drawn by E. Harrison-Buck and K. Flanagan; Digitized by M. Brouwer Burg).

mechanized clearing, planting and harvesting and, unlike other sites in the BREA study area, has not been heavily disturbed by repeated plowing and other destructive activities. However, Structure 11 showed signs of recent (within the last few years) damage by looters, who had dug a large pit into the top of the structure not quite on center, with another smaller pit dug into the eastern side of the structure. A high density of loose cobbles were seen on the summit of the mound with construction fill tossed down the sides of the mound. Surface collections from the looter's back-dirt and around the structure revealed several notable artifacts, including a marine shell and Postclassic incense burner fragments. These types of artifacts indicate that the structure likely functioned as a ritual shrine building, rather than a residence.

Two temporary datum points (Datum A and B) were placed around the stony mound. Datum A was located at the northwest corner of Sq. A and was used to measure the vertical depths for Sqs. A, B, C, D, E, F, G and H. To account for the height of the structure, Datum B was placed on the southeast corner of Square K, and used for measurements in Squares I, J, K, and L. All vertical measurements throughout our excavations were taken from these two datum points, which ultimately were logged with the Total Station. We also used the Total Station to map the final plan view of the structure (**Figure 12.1**). Buckets measuring 5 gallons in volume were used to remove all soil, rocks, and other material from the unit. Zones were separated either arbitrarily at ~20cm depths or when a color or texture change was noted. In most cases, 100% of all dirt was screened through a ¼" mesh screen, but in some cases where artifact density was exceedingly low only 50% of the dirt was screened. The densest areas of artifacts were right around the exterior walls of the all-stone structure, associated with the plaza surface areas and fill layers (Zones 3, 6, 10, 16, and 24) and between the earlier and later phases of the E-W platform retaining wall of Str. 10 (see below). Picks and shovels were used to remove the overburden and trowels were used to define architecture and *in situ* artifacts. Below I review the details of this excavation by zone, our smallest unit of excavation.

Description of the Excavation

Zone 1 - Topsoil

Zone 1 is a loose, dark topsoil (10YR 2/1) that covers most of Op. 23. The one exception is in parts of Sq. K, where the looters' back-dirt (with a color of 10YR 4/2) was piled up on the surface and above the topsoil, making it difficult to separate these zones in some instances. The goal of Zone 1 in Sqs. J, K, and L was the removal of the loose tumble from the very top of the all-stone structure that are disturbed due to the looting activities. The looter's back dirt in Sqs. J, K, and L is significantly lighter (10YR 2/2) than the dark topsoil found in Zone 1 throughout the unit.

Squares A-H were located to the west of Str. 11 and the topzone consisted of a loose, dark humic layer. Only half of Squares C, E, and G were excavated (1 m [E-W] x 2m [N-S]). In

Sqs. A and B, the entire square was excavated except for a thin .50 x 2 m strip along the northern edge of the unit (see **Figure 12.1**). These areas were left unexcavated due to time constraints. At the base of Zone 1 in Squares A, B, and I, the top portion of an east-west retaining wall (Zone 18) with a southern faced edge was exposed, which represents the final phase of Str. 10-1st A—the platform that lies to the north of Str. 11. The Zone 18 retaining wall runs east-west through Squares A and B and into Sq. I where it intersects with the northern stairside of Str. 11. The interior fill of the Str. 10-1st A platform was removed as Zone 2 in Squares A, B, and I (see below). On the western side of the all-stone structure, a low plinth was partially exposed at the bottom of Zone 1 in Sqs. D and F, and a large quantity of tumble was exposed here and at the base of Zone 1 in Sq. H. We removed the tumble, including many large collapsed boulders directly below Zone 1 as Zone 4 (see below).

For the squares that were over top of Structures 10 (Sq. I) and 11 (Sqs. J, K, and L), the artifact density increased with depth. Within the squares that were just west of Str. 11 (Sqs. A-H), artifact density was generally light but rose significantly toward the base of Zone 1 where a large quantity of ceramic figurine and incense burner fragments were found. Other artifacts found in Zone 1 included animal bone, pottery sherds and debitage. The artifact density in Zone 1 was higher in Square I, which was located on mound, where Strs. 10 and 11 intersect. The medium density of artifacts increased at the base of the zone where the surface of a fill layer was encountered, which comprised a dense matrix with small to medium pebbles and cobbles. This is fill of Str. 10-1st A, which was removed as Zone 2 (see below).

There were a few notable objects found on the surface outside of Op. 23 that were collected as surface finds, including a conch shell that was found on the surface on the northern edge of Sq. I. A photo was taken *in situ*. It is possible this was originally associated with Special Deposit 1, a cache deposit found almost directly below the shell in the southeast corner of Str. 10-1st A, the latest phase of the east-west platform (see Zone 13 further below).

Zone 4 - tumble

Zone 4 is a combination of tumble and looter's back dirt, which is found covering the all-stone structure in Sqs. J, K, and L, and also falling off the structure to the west in Sqs. D, F, and H. Zone 4 lies below Zone 1. On-mound, Zone 4 directly overlies Zone 8, which is the remainder of the loose, looter's back dirt found in Sqs. J and K (see below). Off-mound, Zone 4 overlies the Zone 3 dark, midden-rich material containing the censer material surrounding the exterior of Str. 11 and overlying the plaza surface (see below). At the base of Zone 4, portions of the western steps of Str. 11 were visible.

The looter's back dirt is concentrated in the SE quadrant of Square D, while the other squares consist primarily of tumble. The looter's back dirt is a considerably looser silty-clay and lighter in color, and yielded a much higher artifact density than the collapse debris. The artifacts from the interior of Str. 11 included some Terminal Classic and earlier pottery types, suggesting that the initial phase, Str. 11-1st C, may date to earlier than Postclassic times. The Zone 4 tumble

debris was present primarily in Squares F and H. Given the relatively light density of artifacts found in the Zone 4 collapse debris, 50% of all buckets were screened. The one exception was Square J, where 100% of soil buckets were screened due to the high density of artifacts recovered from the looter's back dirt. Artifacts recovered include a Gibnut jaw and other faunal remains, a chipped tool, baked clay material, ceramic sherds and rim sherds. A prismatic obsidian blade fragment was found in Square L along with faunal remains, lithic debitage, a mano fragment and ceramic sherds. The soil color in Square L was slightly different from the colors in the rest of the squares of this zone (2.5Y 4/2).

Zone 3

Zone 3 is a dark clayey matrix (10YR 3/2) that is below the Zone 4 tumble, which was excavated in squares A, B, C, D, E, F, G and H. This 10-20 cm thick midden-rich lens (Zones 3 and 6) is heaped over a plaza surface (Zones 10/16/21/24 below) that surrounds the outside of (and may run underneath) Str. 11, the all-stone structure of Operation 23. Only half of Sqs. C, G, and E were excavated (see **Figure 12.1**). The Zone 3 material appears to be terminal debris, but may have functioned as some kind plaza surface during the final phase of occupation as there was at least one pit feature (Zone 7) with a marine shell deposit found intruding into Zone 3. Toward the bottom of Zone 3 in Square C, we encountered a nicely preserved north-south line of stones that ran south into Sq. E. These were the facing stones of a central, western-facing staircase (Zone 12) that abuts the west side of the all-stone, square structure.

In some parts of the unit, there was a slightly lighter matrix with a high density of pebbles that was encountered at the base of Zone 3. This appears to be the eroded remains of a floor surface (Zones 21/24 in Sqs. A, B, and I and Zones 16/10 in Sqs. F, G, and H). For the most part, we tried to maintain a 5cm layer of the dark matrix (Zone 6 which is the same as Zone 3) right above this floor surface to collect the terminal debris above the floor (see further below). The top of this floor surface (below the dark matrix) was difficult to define because it slopes significantly downward to the south (about a 20 cm difference across the unit).

In Sqs. C, D, and E the dark, midden-rich material of Zone 3 is roughly 10-20 cm thick mixed with small amounts of tumble on the western side of the all-stone structure. Most of the larger collapsed stone material was recovered in Squares D and F, which are partially on mound. Here, there is a mix of the darker, midden-rich material of Zone 3 containing censer material and a lighter matrix that is the remains of collapse debris, which was removed as both Zones 3 and 4 (as noted above, Zone 3 lies directly below the Zone 4 tumble). The Zone 3 matrix is significantly darker than the Zone 4 stone-filled tumble. Half of zone has a 10YR 3/1 Munsell, the same soil color as Zone 3 in Square B. Three soil colors were identified in Sqs. D and F – 10YR 6/4 (the spill from the interior of the structure), 10YR 4/3 (the Munsell recorded as the main soil color with a mixture of 1 and 3) and 10YR 3/2 (clayey, the darkest Munsell, wall spill from Square B).

In Squares A and B, a light density of artifacts were found in Zone 3, including ceramic sherds and obsidian. In Zone 3 in Squares C-H there was a higher density of artifacts, but the most artifacts were found immediately west of Str. 11, along with the majority of the collapsed stone material (removed as Zone 4). Artifacts recovered include animal bone, human bone, debitage, and pottery sherds consisting primarily of broken Postclassic ceramic material with a high density of smashed censer wares, both effigy and non-effigy types (see Linesman and Harrison-Buck, Volume 2). One notable artifact from Zone 3 includes a Late Postclassic effigy censer found in the southwest corner of Sq. H (elevation of 122cm below Datum A). This is a Chen Mul Modeled figurine of an old man, likely wise creator god Itzamnaaj (see Linesman and Harrison-Buck, Volume 2). Defined at the base of Zone 3, the effigy censer was removed as part of Zone 6 (see below). While the Zone 3 matrix is suggestive of terminal debris, it is possible it represents a final occupational surface associated with the later phases of Str. 11 (and Str. 10). A similar dark lens (Zones 15 and 31) was found underlying the radial staircases that were added on to Str. 11-1st B and the surface on which the plinth (Str. 11-1st C) rests appears to be a similar elevation as Zones 3/6.

While most of Zone 3 is a dark matrix filled with Postclassic smashed censer material, a small portion in the northeastern part of Square A consists of the Zone 2 cobble fill of Str. 10-1st A (see Zone 2 below). The upper portion of the Zone 2 cobble fill was removed as part of Zone 3 in Square A. The matrix here is the same as Zone 2—a compact gray clayey soil with large cobbles and limestone rocks. At the bottom of the zone in Sqs. A and B we encountered an east-west wall (Zone 18) that was originally at least two courses high and retains the Zone 2 cobble fill. Together, Zones 2 and 18 comprise the latest phase of Str. 10-1st A, discussed further below. South of this structure, the Zone 3 soil was a darker and significantly less compact silty clay soil with very few cobbles or limestone. Several of the larger stones found in this area likely represent collapse from the Str. 10-1st A retaining wall (probably the wall's 2nd course of stones found only preserved in Sq. I [see Zone 18 below]). Further to the north running along the northern edge of Square A another east-west wall (Zone 34) was encountered at the base of Zone 3 that represents an earlier phase of Str. 10 (Strs. 10-1st C). The interior fill of this earlier platform was not excavated during the 2014 season (see Zones 14 and 34 below).

Zone 5

Zone 5 lies directly below Zone 4 in Squares D and F and is a continuation of the tumble debris. The densest amount of tumble was found in Sqs. D and F, fallen off mound onto the western staircase of Str. 11 that exists in this area of the unit. The tumble is easily distinguished from the darker, midden-rich matrix of Zone 3. Zone 4 tumble is lighter in color, contains a higher density of stone tumble, and overlies the steps associated with the all-stone structure. The collapse was drawn and removed as zone 5. At the base of Zone 5, there were several lines of *in situ* cut stones that were also drawn and appear to represent a series of steps visible in the southern half of Sq. D and in Sq. F. To the north of this possible stair side was more collapse

debris that resembles Zone 3 in Squares A, B, C, and E, but it was removed as Zone 3. Zone 5 was the tumble primarily restricted to over the western staircase. Here, several in situ artifacts were found at different levels suggesting they were terminal debris left on the steps, which are poorly preserved.

Zone 6

Zone 6 is a continuation of Zone 3 in Squares C, D, E, G and H—a dark, midden-rich silty clay matrix with a small amount of tumble. This material appears to be terminal debris, but there was at least one pit feature with a marine shell deposit found intruding into Zones 3 and 6 (see Zone 7 below). Zone 6 matrix comprises roughly 5 cm above what appears to be the original plaza floor surface associated with Str. 11—a lighter, pebbly surface (see Zones 21/24 and Zones 16/10 below). As noted above, this surface slopes downward to the south and was not well preserved, making it difficult to define at the base of Zone 6. While our excavations at the bottom of Zone 6 attempted to define this surface, portions of the floor may have been removed as part of Zone 6. Other portions of the floor were removed as part of Zone 10 in Sqs. F, G and H, a sherd-filled construction fill layer associated with the floor (see below).

Throughout Op. 23 among the different squares, the soil colors of Zone 6 vary slightly. In Square D, Zone 6 involved the removal of 5 cm of matrix above the occupation surface west of the northern plinth and the northern side of the stairs. Soil color in Square D was 10YR 3/2. Square E soil color was 10YR 4/3 and in Square G, the soil color was recorded as 10YR 4/2. In Square H, the soil color was 10YR 4/2 and consisted of a soft, semi-compact silty-clay matrix with a high density of tiny limestone inclusions, which probably represents the remains of the plaza floor surface, some of which was removed as part of Zone 6.

Predominantly, the artifacts in Zone 6 were a continuation of the Zone 3 Postclassic censer wares. Zone 6 in Sq. H yielded one noteworthy artifact—a Chenmul Modeled censer head, which was exposed in Zone 3 but was ultimately removed as part of Zone 6 in Sq. H. A high density of charcoal and a high density of ceramic sherds were also found in the SW portion of Sq. H, which may represent a portion of the subsequent Zone 10 midden-rich fill that appears to contain predominantly Terminal Classic ceramic material (see below). The soil in this area was also much darker than the rest of the bottom of this zone and may represent another intrusive pit feature. Photos were taken, but the “pit feature” was so ephemeral that we did not attempt to define and remove this as a separate zone. Rather, we removed all of this level in Sq. H as Zone 10 (see further below).

Zone 7 – Special Deposit 2

In addition to the ephemeral pit feature in Sq. H, a smaller, more well-defined pit feature was exposed in Zone 6 in Sq. C. The Zone 7 pit feature is located in the southwest corner of Square C and referred to as Special Deposit 2. The pit had been cut into the dark, midden-rich

matrix of Zone 3. The fill of the pit consists of a dark, loose soil (10YR 2/1). Due to the similarity of soil color (10YR 3/3) between the pit fill and the surrounding Zones 3 and 6, we did not catch the pit feature until Zone 6 (about 5cm above the plaza floor) when a conch shell was defined within the intrusive pit feature. Field and lab photos were taken of the shell and the feature was drawn in planview. In addition to the conch shell, artifacts recovered from this soft silty clay pit fill include ceramic sherds, fresh water snail remains, and carbon samples. FCB 5560 is a sediment/botanical sample taken of the pit fill.

Zone 10 – Surface/Fill Layer with re-deposited midden (equivalent to Zone 16 in Sq. F and Zone 21/24/27/30 in Sqs. A, B, and I)

Zone 10 was defined in Sqs. F, G, and H and consists of a densely packed sherd layer that appears to be a re-deposited midden that was used as a construction fill/floor surface associated with the earliest phase of Str. 11 (Str. 11-1st C). Excavations in Sq. I also exposed a similar-looking sherd fill layer, defined as Zones 21/24/27/30 (see below), which appears to be equivalent to Zone 10. Like Zone 10, the sherd layer in Sq. I underlies Zone 6 and appears to function as the fill/floor surface associated with the earliest phase of the original square all-stone platform, Str. 11-1st C (see **Figure 12.2**).

Excavations underneath the western radial steps in Sq. F also exposed a sherd layer that appears to be equivalent to Zones 10 and 24. Here, the stratigraphy is fairly well-defined and Zone 16 functions as a fill layer that runs underneath the bottom course of the original all-stone square structure (Str. 11-1st C). Zone 15 directly overlies Zone 16 in Sq. F (see below) and is a dark lens that may be equivalent to the Zone 6 matrix that overlies Zones 10 and 24. If so, Zone 15 would not represent a plaza floor surface, but appears to serve as a fill layer added over top of Zone 16 when the western radial steps were added during a later phase of construction (Str. 11-1st B), similar to Zone 31 in Sqs. I and J that underlies the Zone 29 northern radial steps (see below). Thus, Zones 16/10 and Zones 21/24/27/30 appear to have functioned as the plaza surface and fill associated with the original square structure, but pre-dates Str. 11-1st C as this floor surface appears to run underneath the structure (see **Figure 12.1**). This floor also pre-dates the construction of Str. 10-1st A, but post-dates the construction of Str. 10-1st C. The floor may be coeval with Str. 10-1st B, but possibly continued to have been used during the platform's final phase (see Zones 21/24/27/30 below).

The thick layer of sherds in Squares F, G, H, and I sits directly on top of a pebble floor surface, excavated only in Sq. F as Zone 17 and in Sq. I as Zone 36 (see below and **Figure 12.2**). This pebbly floor surface slopes upward toward the north. A heavy density of artifacts and a botanical sample were recovered from the Zone 10 matrix. The artifacts primarily consisted of ceramic sherds associated with the Terminal Classic, but some may also date to earlier and later time periods. Further analysis will be conducted during a future lab season. The thick bed of artifacts was found resting right on the pebble floor surface at the bottom of Zone 10. In Squares

G and H, the matrix included the sherds (Zone 10) and the associated limestone pebble floor surface above (Zone 16 in Sq. F and Zone 21 in Sqs. A and B).

Structure 10

Zone 2 – Construction fill of Str. 10-1st A

Zone 2 is a compact construction fill for Str. 10-1st A, the latest phase of the east-west platform structure. Retaining the Zone 2 fill is a retaining wall (see Zone 18 below). Zone 2 fill directly underlies Zone 1 and is restricted to Squares A, B, and I, where the fill of this later phase platform was removed in the area between the earlier and later E-W retaining walls of Str. 10 (**Figure 12.1**). The gray clayey fill of Zone 2 contains cobble and pebble inclusions and contains a medium to high density of artifacts that appear to be Postclassic in date. There was a high frequency of smashed, unslipped censer material as well as pottery sherds, debitage, bake clay material, animal bone, human bone, and historic glass.

Within Square I, Zone 2 was a mix of tumble and fill along the northern edge of Str. 11. The northern edge of the all-stone structure abuts and appears to partially overlie the southern edge of the east-west oriented platform structure. In Sq. I, this east-west platform is built up on the north side of Str. 11 and partially covers the northern radial staircase, suggesting it post-dates the latter. The compact, clayey cobble fill overlies a softer orange clay fill (Zone 13) that was deposited into the Zone 2 fill. The Zone 2 fill covers an earlier phase of the east-west platform (Str. 10-1st C), which was designated as Zone 14 (see below). As Zone 2 was being excavated, Special Deposit 1 (Zone 13) was exposed in the fill layer of Zone 2.

In Square A, Zone 2 was the soil between the two east-west platform retaining walls, below Zone 1. A stone bead fragment was found in the screen. This bead may have been originally located on the surface of Str. 10-1st A. The soil matrix was very compact with few limestone inclusions, but the majority of the zone was composed of very large limestone boulders. Only a small sliver of the Zone 2 cobble construction fill was removed from Square B.

Zone 18 – East-West Retaining wall of Str. 10-1st A

Zone 18 comprises the retaining wall of Str. 10-1st A, the final phase of this east-west platform, which retains the Zone 2 construction fill (see **Figure 12.1**). This retaining wall was originally at least two courses high, although most of the wall exposed in Sqs. A and B was only preserved to one course in height and the second course had collapsed to the south of the wall (found in Zone 3 of Sqs. A and B – see above). The east-west wall was defined at the base of Zone 3 and a portion of it was removed as Zone 18 in Sqs. B and I where the top course of stones was removed just north of Str. 11, where the northern radial stairs (Zone 29) were located. The matrix of Zone 18 is very dark (10YR 3/1) semi-compact soil with few artifacts or inclusions.

When the top course of stone was removed, the bottom riser of the northern steps was exposed. The bottom riser physically abuts the top course of the Zone 18 southern-facing retaining wall. Both constructions appear to sit on the same floor surface and may be coeval. However, It seems more likely that the steps (Zone 29) pre-date the Str. 10-1st A (Zone 18) retaining wall as the latter seems to partially overlie the former. Removal of the top course of stones and the Zone 2 fill behind it (to the north) exposed the top portion of the earlier retaining wall (Zone 34) and fill (Zone 14) of Str. 10-1st C in Sqs. B and I.

Zone 37 – North-South Retaining wall of Str. 10-1st A

Zone 37 is a north-south wall that is found at the terminus of the Zone 18 east-west wall of Str. 10-1st A where this one-course high wall corners to the north. Only a small portion of the Zone 37 north-south wall was exposed in Sq. A (see **Figure 12.1**). It would appear that the Zone 37 wall was built at the same time as the Zone 18 retaining wall as part of the latest phase of construction (Str. 10-1st A). These walls less well constructed than the earliest Zone 34 retaining wall of Str. 10-1st C.

Zone 13 – Special Deposit 1 associated with Str. 10-1st A

As the Zone 2 fill of Str. 10-1st A was being excavated in Sq. I, Special Deposit 1 was exposed (Zone 13) placed within an ephemeral pit feature interred within the southeast corner of Str. 10-1st A. The pit feature was found along the northern edge of Square I and intruded into the Zone 2 clayey, compact fill of Str. 10-1st A (**Figure 12.1**). The sandy orange matrix (10YR 4/4) is significantly softer and easier to trowel than the surrounding Zone 2 compact clay and cobble fill covering Special Deposit 1. The pit fill was also quite different from the Zone 14 packed clay construction fill below the deposit that was associated with the earliest east-west platform (Str. 10-1st C).

Inside the pit feature Special Deposit 1 was defined that consisted of a concentration of highly fragmented animal bone and shell, which were heavily burned (**Figure 12.3**). The bones were removed in layers (Layers 1-8) and excavated and wet sieved in the lab. Due to their highly fragmentary nature, defining the bones *in situ* was not possible. A total of three (very different) jade beads were recovered in the different layers, as well as a worked bone object (shown in **Figure 12.3**). In addition, directly underlying Layer 1 that was sealed by several fragments of unslipped pottery was an historic crystal bottle stopper whose base was broken. All other objects appear to date to the Late Postclassic period, but this historic object is presumed to date to the Spanish Contact period (see **Figure 12.3**; for further discussion see Harrison-Buck et al. 2015; Kaeding and Harrison-Buck, this volume). Both the bones and the fill were removed as Zone 13. The deposit held virtually no sediment, just burned animal bone and one or two possible human bones. Directly underlying and supporting the bones in Layer 8 was a large, thick walled sherd broken into three pieces. It is an intricate Postclassic incised vessel (shown in

Figure 12.3). The evidence suggests that the final phase of Str. 10-1st A, while perhaps built in the Late Postclassic, witnessed some degree of use during the Contact period.



Figure 12.3 Special Deposit 1 in Operation 23, including (bottom right) historic quartz bottle stopper (photos by E. Harrison-Buck and M. Brouwer Burg).

Zone 35 – East-West Retaining wall Addition (Str. 10-1st B)

Zone 35 is a later building phase (Str. 10-1st B) that comprises a retaining wall that was grafted on to the original construction of Str. 10-1st C (discussed further below), right at the interface of Sqs. A and B (**Figure 12.1**). The Zone 35 east-west wall is a one course high

retaining wall that was a later addition to the Zone 34 wall, visible in the profile drawing (**Figure 12.2**). The Zone 35 wall is notably different in construction from the Zone 34 wall and it juts out slightly to the south, but is basically in line with the Zone 34 wall. The Zone 35 wall continues to run west through and beyond Square A (shown in **Figure 12.1**).

Zone 14 – Construction fill of Str. 10-1st C

At the base of Zones 2 and 13, the surface of the earliest east-west platform (Str. 10-1st C) was exposed in the northern half of Square I and along the northern edge of Sqs. A and B. Zone 14 is the fill of Str. 10-1st C. The matrix of Zone 14 is a clay with a Munsell color of 10YR 3/2. This fill was not excavated during the 2014 season, only the surface was defined at the base of Zone 2. The Zone 14 platform fill is retained by a four-course high retaining wall (see Zone 34 below). This earlier platform to the north of the all stone structure was expanded to the west with Str. 10-1st B and later covered over by Str. 10-1st A (the Zone 18 retaining wall and Zone 2 fill of Str. 10-1st A discussed above). The Zone 13 pit and Special Deposit 1 is associated with the final phase of Str. 10-1st A, but the bottom of the pit (if it can be called that) intrudes slightly into the Zone 14 construction fill.

Zone 34 – Retaining wall of Str. 10-1st C

Zone 34 is a four-course high east-west retaining wall of Str. 10-1st C. We defined but did not excavate Str. 10-1st C. However, Str. 10-1st C appears to predate all other architecture exposed in Op. 23, based on the depth of the Zone 34 four-course retaining wall. The plaza floor (Zones 10/16/21/24) that is associated with the original all-stone square structure (Str. 11-1st C) runs underneath Str. 10-1st A and is associated with the top of the 2nd course of stones on the Zone 34 wall, clearly post-dating the construction of Str. 10-1st C. The Zone 34 wall was exposed in Sq. I and runs west where it was also exposed in the northern edge of Sqs. A and B. The Zone 34 wall terminates roughly at the interface of Squares A and B (see **Figure 12.1** and **12.2**). As noted above, right at this junction another one-course high east-west wall (Zone 35) was grafted on to the end of the Zone 34 wall (Str. 10-1st B) and is basically in line with the Zone 34 wall. Str. 10-1st B continues to run west through and beyond Square A, effectively expanding the platform to the west by more than four meters. Str. 10-1st B sits at the level of the Zone 21/24 floor surface, suggesting that it was built possibly around the same time as the Zone 21/24 plaza floor, which covers the first two courses of the Zone 34 wall. Some time later, Str. 10-1st C was partially covered over by Str. 10-1st A (the Zone 18 wall and Zone 2 cobble fill), but in this final phase the western extension of Str. 10-1st B may have continued to be used. It is conceivable that Str. 10-1st B is coeval with the construction of Str. 10-1st A (the Zone 18 retaining wall and Zone 2 cobble fill). Limited horizontal exposure inhibits a fuller reconstruction.

Zones 21/24/27/30 – Floor Surface and Fill Layer with re-deposited midden (equivalent to Zones 10 and 16 in Sqs. F, G, and H)

Zone 21 is below Zone 2 in Sqs. A and B and is a speckled limestone matrix that the one-to-two course high Zone 18 retaining wall (Str. 10-1st A) sits on. The zone was ended arbitrarily in Sqs. A and B but is part of Zone 24, which directly underlies Zone 21 in Sqs. A and B, but in Sq. I there is no Zone 21—this was entirely excavated as Zone 24. Zone 24 contains more of the limestone speckled surface as well as a sherd-packed fill layer that was excavated in Sqs. A, B, and I. Zones 27 and 30 (below Zone 24, excavated only in Sqs. I and B) are extremely soft light brown sandy clay with few inclusions, but appear to be part of the same Zone 24 fill construction material. There was no color change but a high density of small cobbles was observed in the matrix at the bottom of Zone 30, which represents an earlier pebble floor surface (Zone 36).

The limestone speckled floor surface and sherd-packed fill of Zones 21/24/27/30 also was found in Sq. F (Zones 16 and 10), as well as Sqs. G and H (excavated as Zone 10 only). This floor and associated fill material runs underneath the final phase of Str. 10-1st A and interfaces with the bottom of the second course of stone on the retaining wall (Zone 34) of Str. 10-1st B (see **Figure 12.2**), suggesting that this second plaza floor surface may have been built around the same time as the Str. 10-1st B (Zone 35) addition. In Sqs. A and B, the Zones 21/24/27 floor surface and fill was removed between the two east-west platform walls of Str. 10 and removal of this material exposed the lowest two courses of the Str. 10-1st C retaining wall (Zone 34) and the initial pebble floor surface (Zone 36). The matrix of Zones 21/24/27/30 is similar to the Zone 2 fill, however the clay is a lighter color (10YR 4/2) and much denser. At the bottom of this zone, Square A maintained a slightly lower elevation than square B. There is a general slope down in the unit from north to the south. Therefore, the top of this floor surface in Sqs. A, B, and I is about 15-20 cm higher than the top of the Zone 16 surface (107 cm below Datum A) in Square F (see **Figure 12.2**).

In Square B, lithic debitage and ceramic sherds were recovered in the fill layer of the floor (Zone 24). A high density of sherds found in SE corner, close in proximity to corner of northern radial steps of Str. 11 (~ 100 cmbd - 112 cmbd). Within Square I, ceramic body sherds and a chipped stone tool were found.

Zone 36 – Pebble Floor Surface Associated with Str. 10-1st C (equivalent to Zone 17 in Sq. F)

Zone 36 is a pebble-filled surface. This pebble-filled surface consists of the same sandy orange-brown (10YR 3/6) matrix of Zone 30 but it contained a much higher density of river pebbles. Only a small section of the Zone 36 floor was exposed in Sq. I in the southern half of the square. The northern half of the square comprises the southern edge of the earlier east-west platform of Str. 10-1st C. The Zone 36 floor is associated with the bottom course of the Zone 34 east-west wall of Str. 10-1st C. It is the first of two floors associated with Str. 10-1st C. Lying directly over top of Zone 36 is the second floor and fill construction (Zones 21/24/27/30). The

Zone 36 pebble surface may be the equivalent of Zone 17 in Sq. F (at 134cm below Datum A). There is a significant slope from north to south and the elevation of these two sections of the pebble floor differs by about 15-20 cm.

The Zone 36 floor surface runs throughout the southern half of Sq. I, but in the center of the square was an area devoid of pebbles, but with the same sandy orange-brown (10YR 3/6) matrix. We defined this pebble-free area as a cut in the Zone 36 floor and excavated it separately as Zone 32 (see below). At the base of Zone 36 we encountered another surface that may be the equivalent of the Zone 19 floor in Square F (at 152cm below Datum A).

Zone 32 – cut into Zone 36 floor

Zone 32 appeared to be a cut into the pebble-filled floor of Zone 36 and was removed separately. It was composed of a soft sandy, light brown (10YR 4/6) clay with very few small inclusions. The cut was a small area that measures 60 cm at its widest point east-west and was positioned adjacent to the earlier east-west platform wall (Zone 34). The pit contained one large ceramic jar fragment.

Zone 38

Zone 38 is a posthole, which was started at the bottom of Zone 32/36 at around 143 cm below Datum A. The first 20 cm consist of a compact sandy clay (10YR 4/3) matrix with flecks of limestone. This portion of the zone is probably the equivalent of Zone 19 in Square F. Roughly 20 cm down we hit a compact limestone-filled surface with stones sizes ranging from 5-10 cm, which appears to be the equivalent of Zone 20 in Sq. F.

Structure 11

Zone 8

Zone 8 is the looter's back dirt mixed with some intact construction fill from the earliest construction phase of the all-stone structure. This zone is found in Squares J and K. Zone 8 removed the loose back dirt from the deep looters pit that cut into the center. The looter's pit gutted the fill of the platform and damaged the front (western side) facing stones of the all stone square platform structure. A high density of loose cobble and boulder inclusions were found in the loose matrix that comprises the looter's back dirt. Square K was an L-shaped unit with only a 1m x 1m section of the 2x2 unit in the SE corner left unexcavated. Square K was located east of Square F and south of Square J. The goal of Square K was to further define the southern extent of the looter's pit and the south and west walls of the square platform of Str. 11. Although artifacts from this zone were retained it should be noted that the context is not secure. It is a mix

of fill and top zone. Munsell colors recorded were 10YR 4/2 for the looter's dirt and 2.5YR 6/3, which is a silty clay associated with intact construction fill.

Zone 11 – Construction fill of Str. 11-1st C

Zone 11 is the intact construction fill of Str. 11-1st C platform. The looter's pit had significantly disturbed the fill of the platform, particularly in Sq. K where intact fill was only located in the southwest corner of the square. This densely packed soil was removed to the same level as the bottom of Zone 8 looter's pit. Two large well-seated stones were located in the southern end of Sq. K. They are likely the remains of the southern retaining wall of the initial square platform of Str. 11-1st C. Zone 11 was also excavated in Sqs. F and J. This matrix consists of a silty clay with a mixture of two Munsell colors (10YR 3/2 and 10YR 5/3). Like Sq. K, the densely packed soil in Sqs. F and J was removed to the same level as the bottom of Zone 8 (looter's pit).

Zone 9 – Special Deposit 3

Zone 9 is a pit feature in Sq. K that cuts into the top of Str. 11 and was dubbed Special Deposit 3. The fill of the pit is a loose, dark organic rich matrix (10YR 2/2) mixed with a medium density of cobbles 2-5 cm in size. The fill is significantly darker than the surrounding Zone 11 construction fill of Str. 11. The Zone 9 pit was located roughly on the centerline of Str. 11, identified along the western edge of Sq. K inside the fill of the all-stone square structure, which has been heavily disturbed by a large looter's pit (Zone 8). Near the pit feature we found a nearly complete obsidian blade and a small, thin perforated jade bead. It is possible the pit is the result of a natural tree disturbance but it was located roughly on the centerline of the structure on its far west side near where the stairs join the west side of the square structure. It is also possible that the pit feature and artifacts represent the remains of a cache but looters disturbed the pit.

Zone 12 – Western Radial Staircase (Str. 11-1st B)

Zone 12 is the remains of a western staircase leading to the top of the all-stone square platform. The stairs appear to have been added later to the building and are therefore designated Str. 11-1st B. The goal of removing the staircase was to locate earlier construction phases beneath Str. 11. The Zone 12 western steps are located in Squares D and F. The matrix is a silty clay (10YR 4/3) with light artifact density. The stairs occupies the majority of Square F. There were four clear steps, however it is likely that there were originally at least five steps on the west side of the all stone structure that led up to the top of the square platform. This zone terminated at the bottom of the last facing stone of the square structure. The Zone 12 stairs sit on a surface consisting of a compact dark matrix (Zone 15), which may also run underneath Str. 11.

Zone 29 – Northern Radial Staircase (Str. 11-1st B)

Zone 29 represents a portion of the radial steps on the north side of Str. 11. The stairs appear to have been added later to the building and are therefore designated Str. 11-1st B. Only the western half (1 m) of the steps was removed in Sq. I, as well as a small portion in Sq. J (**Figure 12.1**). Our goal with removing Zone 29 was to further define the sequence of this later construction event. The radial stairs consist of roughly three steps retaining a loose cobble fill. The construction fill of the northern steps is a light colored clay loam. In Square I, the matrix was mottled with two Munsell colors, including 10YR 4/3 and 10YR 4/1. In Square J, the matrix was a sandy clay with a Munsell color of 10YR 5/4. The north wall of the original square structure was exposed at the base of Zone 29, revealing a nicely faced wall. The northern stairs were a later addition to Str. 11 that caps Zone 31 (see below)—a dark fill that may be associated with the Zones 3/6 dark matrix containing Postclassic censerwares that was found around exterior plaza floor surface.

Plinth (Str. 11-1st A)

Built at the same time or just slightly later is a one-course high plinth. This phase of construction is designated Str. 11-1st A and was added on to the exterior of the structure in between the radial staircases.

Earlier Construction Below Str. 11 (Square F)

Zone 31

Zone 31 is a dark (2.5Y 3/2), wet clay fill directly beneath the Zone 29 northern staircase in Sq. I. This 20 cm thick lens of material contains many limestone inclusions and is wedged between the Zone 18 east-west wall and the northern side of all-stone structure. It terminated arbitrarily after 20 cm. It was wedged between Zone 18 (the later E-W platform wall) and the northern side of all-stone structure. The dark soil beneath the Zone 29 is distinct from the lighter construction fill of the northern steps (Zone 29). The construction sequence suggests that Zone 31 was part of the northern radial stairs (Str. 11-1st B) and Str. 10-1st A construction.

Zone 15

Zone 15 is a dark matrix that underlies the western radial staircase (Zone 12) that was excavated in Sq. F. The matrix consists of a silty clay soil (10YR 3/2) and is similar to the dark lens (Zone 31) found underneath the northern radial staircase (Zone 29). Zone 16 is a speckled

limestone floor surface with an associated sherd fill (Zone 10) that lies directly below Zone 15. While Zone 16 appears to run underneath Str. 11, Zone 15 may lie just underneath the western radial staircase, although this was difficult to ascertain. It is possible that Zone 15 represents a floor surface underneath the western radial steps, but the the dark matrix is more similar to the Zones 3/6 found at roughly the same elevation in the plaza areas outside of Str. 11 (see **Figure 12.2**). Therefore, it is possible that the Zones 3/6 and 15 represent an occupational surface that dates to the later phase of Str. 11-1st B.

Zones 16/10 – Surface/Fill Layer with re-deposited midden Associated with Str. 11-1st C (equivalent to Zone 10 in Sqs. G, F, and H, and Zones 21/24 in Sqs. A, B, and I)

Zone 16 lies directly below Zone 15 within Square F and is a speckled limestone surface that represents the plaza floor that is associated with Str. 11-1st C. If Zones 3/6 and 15 represent a later occupational surface, then it is possible that the Zone 16 floor was no longer used when Strs. 11-1st B and A were constructed. At the base of Zone 16, a 10-15 cm thick bed of sherds (Soil color was 10YR 3/4) that resembles Zone 10 in Sqs. G and H was encountered. This bed of sherds overlies the Zone 17 pebble floor surface exposed in Sq. F, as well as at the base of Zone 10 in Sqs. G and H. In Sqs. G and H some of the matrix from Zone 10 may have removed some of the Zone 17 floor that the sherd layer rests on. The Zone 10 context in Sqs. F, G and H is also in Zones 21/24/27/30 in Sqs. A, B, and I. In all cases, the sherd fill layer is roughly 10-15 cm thick and directly below this bed of broken sherds is another earlier pebble floor surface (Zone 17 in Sqs. F, G, and H and Zone 36 in Sq. I).

Zone 17 – Pebble Floor Surface Underneath Str. 11-1st C (equivalent to Zone 36 in Sq. I)

Zone 17 is an early floor surface that is composed of dense pebbles with a sandy-clay matrix (10YR 3/4) below it. This sandy-clay, pebble-filled surface is at the same depth as the pebbled floor surface exposed at the base of Zone 10 in Sqs. G and H. This also appears to be equivalent to the pebble surface defined as Zone 36 in Sq. I (see **Figure 12.2**). Artifacts recovered from this zone were marine shell fragments, animal bones, pottery sherds, ceramic rims and lithic debitage.

Zone 19

Zone 19 is another pebble-filled surface found below Zone 17 in Sq. F with an earthen layer below it. The matrix was a semi-compact sandy clay with a color of 10YR 4/2. Lithic debitage, animal bone and ceramic sherds were recovered. Zone 19 ended when another floor surface was encountered (Zone 20).

Zone 20

Zone 20 is a third floor surface identified in Square F that runs underneath Str. 11. This zone contains a high density of medium sized cobbles and the floor and/or ballast is much thicker than the two previous floors. This appears to correspond with the thick pebble surface recorded in the Zone 38 posthole in Sq. I (see **Figure 12.2**). Carbon samples were collected at the interface between Zone 20 and Zone 19. The dense clay was colored 10YR 3/2.

Zone 22

Zone 22 is an earthen fill layer below the Zone 20 floor in Square F. A few faunal remains were found. The zone matrix is a lighter brown (10YR 4/4) with very few inclusions.

Zone 23

Zone 23 is a darker soil (10YR 3/2) directly below Zone 22 in Square F. This zone was filled with many small limestone inclusions and a fourth occupation surface was identified in this layer. A light density of artifacts was recovered from Zone 23.

Zone 25

Zone 25 is an earthen layer directly below Zone 23 in Sq. F. The matrix was a smooth clay (soil color 10YR 3/2) with few inclusions. A light density of artifacts was found.

Zone 26

Zone 26 is an earthen layer directly below Zone 25 in Sq. F. Zone 26 was a lighter color (10YR 3/4) and a sandier matrix than that of Zone 25. Artifacts were less dense in this zone than the previous zone. Some charcoal was found and a carbon sample was taken. Lithic debitage and obsidian also were found in this zone.

Zone 28

Zone 28 is located below Zone 26 in Square F. This was the final zone in Square F before a post hole was dug (Zone 33). This zone yielded baked clay material, but that was all of the artifacts recovered. It is otherwise virtually devoid of artifacts. The matrix was a very compact dense dark (10YR 4/4) clay with very few tiny limestone inclusions.

Zone 33

Zone 33 was a 1 m deep posthole dug below Zone 28 in Square F. No artifacts were recovered. Therefore, sterile soil was encountered. The matrix was very compact (10YR 4/4) with very tiny inclusions and no soil or texture change from Zone 28. Sterile soil was encountered between 140 cm and 180 cm below Datum A in the deep probes that were excavated in both Squares F and I (see **Figure 12.2**).

Interpretations and Conclusions

Both structures 10 and 11 revealed multiple phases of construction. The all-stone structure (Structure 11) had possibly as many as three phases of construction. Str. 11-1st C was the initial phase comprising a simple square stone platform. This phase may date as early as the Late-to-Terminal Classic period as very little Postclassic censer material was found associated with the disturbed fill of this platform and the Zone 16/10 floor associated with this building contained a high density of sherds that look to be Classic (rather than Postclassic) in date. The second phase of construction, Str. 11-1st B, appears to correspond to the Postclassic period and comprises the addition of radial staircases, presumably added to all four sides of the platform (the eastern side was not excavated in 2014 but stairs were identified on the other three sides). At this time or at some point later on, the plinths were added in between the staircases (Str. 11-1st A). A dark matrix (Zones 15 and 31) similar to Zones 3/6 underlies the radial stairs of Str. 11-1st B and also appears to underlie the plinth (Str. 11-1st A). This dark matrix was filled with censer material, but may not simply be terminal debris, but rather, an occupational surface associated with the final two phases of construction.

Like Str. 11, Str. 10 also seems to have at least three discrete construction phases, beginning with Str. 10-1st C, a simple east-west oriented platform. This construction pre-dates Str. 11-1st C, described above. The earliest floor associated with the initial phase of Str. 10-1st C is a pebble surface (Zone 36). This floor is equivalent to Zone 17 in Sq. F, seen in profile running beneath Str. 11 (see **Figure 12.2**). Although analysis is forthcoming and a date for this early phase of Str. 10-1st C has not been secured, it must logically pre-date Str. 11-1st C, possibly corresponding to the Early or Late Classic period. As noted above, limited horizontal exposure of Str. 10 inhibits a fuller view of the construction phases for Str. 10, but there appears to be at least two other later phases to Str. 10. Following Str. 10-1st C, an intermediate phase, Str. 10-1st B, involved the addition of the Zone 35 retaining wall that extended the Zone 34 retaining wall to the west by more than 4 m. The bottom course of the Zone 35 wall is much higher than the bottom course of the Zone 34 wall and appears to be at the same elevation as the Zone 21/24 floor. This floor construction abuts the southern facing of Str. 10-1st C and covers the first two courses of the Zone 34 retaining wall. This floor comprises a thick fill of re-deposited midden with material that dates to the Late-to-Terminal Classic period, which may provide a date for Str. 10-1st B, if they were constructed at the same time. Alternatively, Str. 10-1st B may have been

built around the same time as Str. 10-1st A, which dates to the Late Postclassic-early Contact period.

During the final phase of construction, Str. 10-1st A covered over a portion of Str. 10-1st C and during this final phase there appears to have been continued use of Str. 10-1st B addition to the west. Str. 10-1st A comprises a two-course high retaining wall (Zone 18) with a cobble fill (Zone 2). A cache (Special Deposit 1) found in the southeast corner of Str. 10-1st A contained an historic crystal glass artifact, indicating that the final component of Str. 10 dates to the Contact period. The bottom course of stones of the Str. 10-1st A retaining wall (Zone 18) rest upon the same prepared surface as the bottom course of stones from the northern radial staircase (Zone 29) of Str. 11-1st B, as well as the plinth (Str. 11-1st C), suggesting that these three building phases, if not constructed at the same time, may have been contemporaneous in use during the final occupation of the site.

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Chapter 13

Further Investigations of Structure 10: Testing for Evidence of Spanish Contact at Saturday Creek (Operation 24)

Adam Kaeding and Eleanor Harrison-Buck

During the course of the January 2014 season, BREA team members excavated Operation (Op.) 23 in order to investigate Structure 11 in the Southwest Plaza of Saturday Creek (see **Figure 8.1**). This small platform structure appears to have functioned as a Late Postclassic shrine (Linseman and Harrison-Buck, Volume 2; Harrison-Buck and Flanagan, this volume). While the results of Op. 23 are widely informative, only the archaeological signature of the northeast corner of the unit is particularly relevant to the placement and objectives of Op. 24 (Sq. I in **Figure 12.1**). In Sq. I of Op. 23, the southern edge of Structure 10 was exposed, including the southeast corner of a superstructure platform (Str. 10-1st A). While excavating in a matrix of cobble fill, Harrison-Buck encountered and excavated a unique cache deposit (Special Deposit 1) consisting of a high density of burned faunal remains (primarily marine shell) resting on an elaborately decorated Postclassic ceramic sherd. Sealed inside the concentration of burned bone and shell were three jade beads, a bone pendant, and, perhaps most significantly, a modified quartz crystal object (see **Figure 12.3**). Though the nature of this cache context was clearly and undeniably Pre-Columbian, the quartz crystal object itself most closely resembles a broken bottle stopper, which is almost certainly a post-Contact Spanish artifact.

The primary objective of Op. 24 was to expand the excavation of Structure 10 in an effort to better understand the context of Special Deposit 1 and the nature of an early Spanish Colonial period at Saturday Creek. Excavations of Op. 24 yielded equally exciting results, including another cache deposit positioned in the northeast corner of the Structure 10-1st A (referred to herein as the “superstructure platform”). The cache consisted of a small incised Postclassic-style bowl containing four jade beads and another large fragment of worked crystal. Together, these two cache deposits suggest a very early Colonial period Maya occupation in this portion of the Saturday Creek site core involving Maya who by this time had encountered Europeans, likely Spanish missionaries.

Early Colonial Presence in the BREA Project Area

One of the main research objectives of the first phases of BREA survey is to attempt to locate and identify sites related to early Spanish colonial activity in Belize in order to more fully understand those periods of time immediately before, during, and following the arrival of Europeans. As has been presented elsewhere (Buck et al. 2013; Harrison-Buck et al. 2012, 2013,

2014; Jones 1989; Scholes and Thompson 1977), historical records document that locations within the BREA survey area hosted the earliest Spanish missionaries and their envoys in Belize as they attempted to establish contact with and, ultimately, control over populations living far beyond the frontiers of the more tightly controlled provinces in what is now Mexican territory. These early *entradas* departed from the southern extent of Spanish control and set out along a route that led over rivers, lagoons, pine ridges, savannah, swamp, and finally reached the banks of the Belize River. The Spaniards observed abandoned settlements and were hosted in active villages while native emissaries spread word of their arrival and intentions. The Franciscans established churches in the region, including the Contact period towns of Tipu, Zaczuz, and Lamanai, where they could administer the spiritual needs of the recently or soon-to-be converted residents of these remote areas.

According to ethnohistoric accounts, a concentration of Contact period Maya settlements clustered in the vicinity of Saturday Creek, including Chunukum, Lucu, Chantome, Zaczuz, and Petenzub (Jones 1989). These settlements were strongly integrated with the Contact period town of Tipu to the west in the upper Belize Valley. In addition, a north-south overland route connected these middle Belize River settlements with the larger Contact period town of Lamanai to the north (Jones 1989:Map 2). Colonial documents record the names of these villages and settlements and their general arrangement along the Belize River, but only the larger settlements of Tipu and Lamanai have yet to be identified archaeologically. One of the primary goals of the BREA project has been to identify the Contact period Maya settlements along the middle Belize River and to isolate the location of the north-south overland route. To do this, BREA research has incorporated a component of survey along the projected overland route, high potential settlement areas, and landforms that resemble the colonial descriptions (Brouwer Burg et al. 2014; Buck et al. 2013; Gantos, this volume). Our aim is to establish an anchor connecting the modern landscape with its distribution of identified archaeological resources to historically document sites and landscape features, which would offer avenues of further research tracing the colonial and deeper historical overland connections back north toward Mexico and west upriver toward the Peten.

To date, the BREA project's investment of time and resources towards examining the more recent archaeological record of the project area has yielded significant and intriguing results. In a departure from the Pre-Columbian-centric perspectives that sometimes dominate project research interests in the Maya region, the BREA approach has shed greater light on the Colonial period occupation in the valley. The histories documented range from the years of slavery in the eighteenth and early nineteenth centuries that underpin today's majority population to the culture of logging camps that defined the country of Belize for a large part of its colonial history during the nineteenth and early twentieth centuries, to the diaspora of high profile ex-Confederates following the culmination of the United States Civil War. The earliest Spanish colonial component, however, dating to the sixteenth and seventeenth centuries has remained challenging to detect. This situation comes as no surprise; historical documents describe the particularly transient character of Spanish presence in Belize, which no doubt explain the often

ephemeral nature of early Spanish Colonial signatures (Oland 2014:650). The crystal object recovered from Saturday Creek, in a monumental Maya site with no apparent European surface features, associated with a cache feature undeniably characteristic of Pre-Columbian cultural traditions, provides the first definitive evidence for this elusive period of early interaction in the BREA study area.

Operation 24: Unit Placement and Excavation Strategy

While Op. 23 was excavated to investigate Structure 11, the location of Special Deposit 1 in the northeast corner of the unit placed it in more direct association with Structure 10 – a long low range structure extending west from the site's main pyramid to establish the northern boundary of the western plaza (**Figure 13.1**). As mentioned above, the primary objective of Op. 24 was to explore Structure 10 for further evidence of early colonial period interaction and presence at Saturday Creek and, by extension, in the region. The placement of the unit and the strategy employed during excavation are reflective of this goal.

Beyond the discovery of Special Deposit 1, the excavation of Op. 23 also provided an idea of the construction sequence for the western plaza in general and some of that portion of the site's architectural features in particular. In terms of the Op. 24 excavation strategy, the most important discoveries include the identification of the latest plaza floor and the construction of Structure 10's southern wall. **Figure 13.2** shows a section of the southern facing profile of the southern wall of Structure 10 as exposed during the excavation of Op. 24. This will be described in greater detail below, but what is salient at this point in the discussion is that this exposure does not reach the bottom of the wall itself. Instead this is the level at which the wall intersects with the most recent plaza surface exposed prior to the general abandonment of the site. Though it lacks convincing plaster, this surface level was identified during the excavation of Op. 23, defined by a dense concentration of Postclassic ceramic sherds resting on this surface around Structure 11. In addition, this surface is associated with a one course high wall that partially covered the earlier south wall of Structure 10 (for more detail see Harrison-Buck and Flanagan, this volume).

Among the first steps in the Op. 24 excavation strategy was to re-expose this short wall and re-identify the surface upon which it sits. This allowed us to follow that surface north from the short wall in order to find the intersection between the surface and the southern wall of Structure 10. The corners created by such features are often found to have a higher density of artifacts than might be expected on the flat central areas of plazas where artifacts are likely to have been more exposed to erosion and washout as well as sweeping and maintenance. In fact, similar contexts have proven crucial in the identification and investigation of other Spanish Colonial period sites in Belize (Morandi 2010).

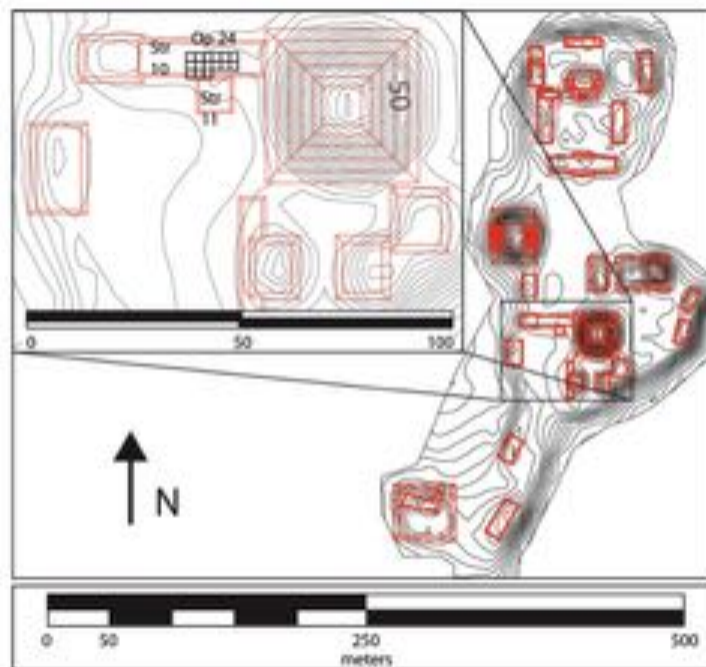


Figure 13.1 Location of Op. 24 in Southwest Plaza Group at Saturday Creek.

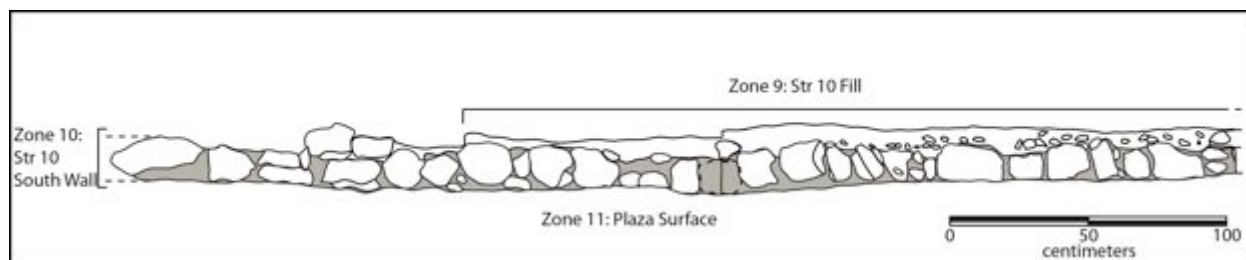


Figure 13.2 Profile of south wall of Str. 10
(drawn by E. Harrison-Buck, digitized by M. Brouwer Burg).

A second strategy employed in the investigation into contact period materials associated with Structure 11 at Saturday Creek was more directly reflective of the artifacts already recovered. Special Deposit 1 was identified at the northern edge of Op. 23, along the southern edge of Structure 10. Because the cache was located at the edge of the excavation unit and in the course of investigating a different structure, its wider context in relation to Structure 10 was not entirely understood. What was clear, however, was that the cache deposit and its associated post-contact artifact were relatively near the surface and within the boundaries of the structure itself. Accordingly, the second phase in our excavation strategy was to pursue an extensive broad but shallow exposure of the top of Structure 10 in an effort to identify any contexts similar to Special Deposit 1.

In order to proceed with the excavation strategies outlined above, a grid of fifteen 2-x-2 m squares was superimposed over Structure 10. The southeast corner of this grid was located slightly overlapping, but not precisely in the same location as the northeast corner of the previous

season's Op. 23. The intentional overlap between these units allowed us the easiest and most accurate means of tying directly into the previous excavation data. Given the time constraints of the season, the grid was not extended to cover the furthest northern wall of Structure 10 and was also extended only far enough to the west to investigate what appeared to be a potential stair along the southern wall of Structure 10. Even with this targeted investigation, the grid ultimately covered more than 60 square meters—an area that would not have been feasible to excavate in the allotted time, but an arrangement that would allow excavation to follow any promising archaeological features or characteristics. This grid was laid over the unit using a total station, which was tied directly into the control grid established during the detailed mapping of the site in a previous survey season. This allowed the precise measurements of the units, a cardinal orientation for unit lines, and the ability to accurately tie all excavation data into the larger site and region maps.

Operation 24: Excavation Results

The following section presents a brief introduction to the raw context data recovered during the course of excavation. A more thorough discussion of some of the interpretations and conclusions of the investigations follows. **Figure 13.3** introduces a stylized matrix illustrating the relationship between contexts recorded in Op. 24. The remainder of this section works its way up from the bottom to the top of that diagram with a brief description of each of the contexts represented in the figure. Zone 1, the modern leaf litter and topsoil, is excluded from this discussion.

Zones 10 and 11

Zones 10 and 11 are relative outliers to the sequence investigated in Op. 24. The role of these two zones is generally clear, but the chronological sequence cannot be directly tied into the rest of the zones without further research either through excavation or potentially via artifact analysis. The southern wall of Structure 10 was identified as Zone 10 for the purposes of data recording. The latest surface of the plaza was designated Zone 11 for the same reason. It is worth noting that the southern wall of Structure 10 (Zone 10) extended deeper for several courses as it was exposed in Op. 23 (See Harrison-Buck and Flanagan, this volume). Furthermore, the latest plaza surface (Zone 11) abuts directly against the Zone 10 wall – in fact it seems to be particularly well preserved at that junction – with no evidence of anything like a construction trench. To that end, it can be conclusively stated that Zone 10 predates Zone 11; hence the relationship demonstrated in **Figure 13.3**. Zone 10 may be the oldest architectural feature represented in Op. 24, though that cannot be as securely established barring further investigation. Neither zone was excavated so these will continue to function as administrative units. Zones 15 and 17 are almost certainly associated with Zone 10. Our current understanding

of the site suggests that Zone 10 may provide the southern wall of the structure comprised of Zones 15 and 17 (see below). Unfortunately, we have not had the opportunity to more intensively investigate the relationship of these features, which is why Figure 13.3 illustrates the link between these zones with a dotted line. Zones 9 and 2, on the other hand, are features that were clearly later deposits whose relationships are, therefore, illustrated with solid lines.

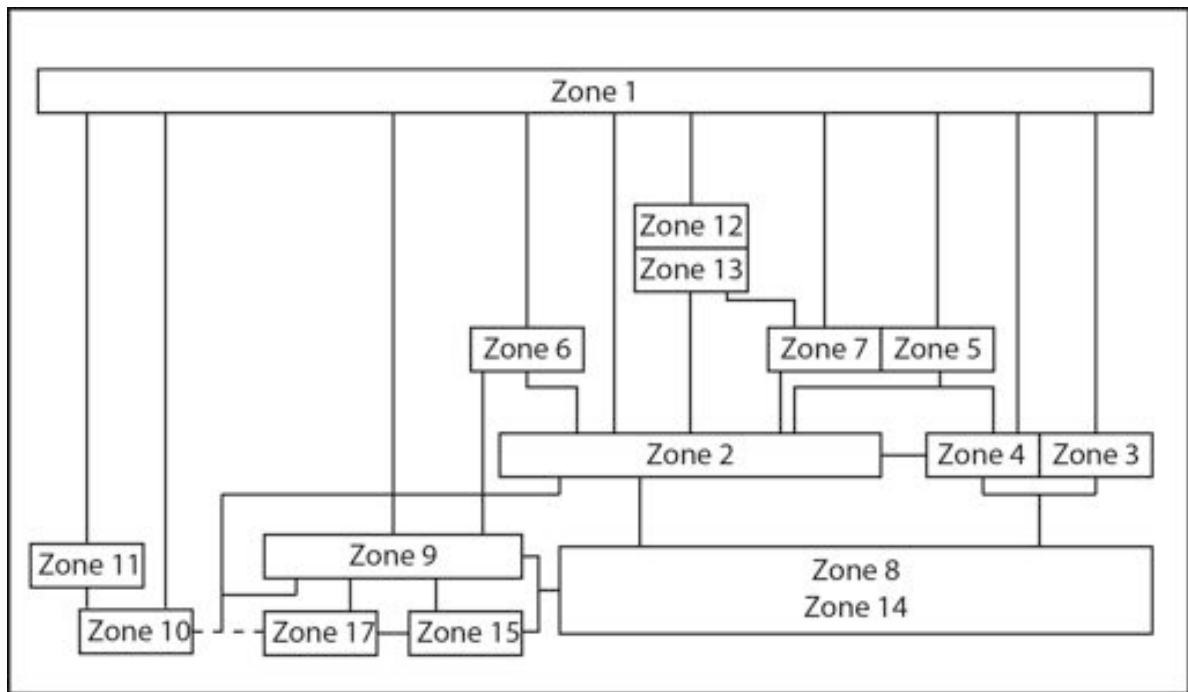


Figure 13.3 Op. 24 Harris Matrix.

Zones 15 and 17

A substructure underlying Structure 10 was signaled by the tops of three stones comprising a small portion of a north-south running wall that was revealed in a small approximately 25-x-25 cm investigative probe (see section below on *Architectural Construction Sequence*). Given the very limited exposure to this substructural feature, the possibility that the current interpretation is inaccurate remains. Nevertheless, the alignment of the stones is convincing evidence of a wall and the matrix to the west of this wall is distinct from the matrix to the east. The wall itself has been designated Zone 15, and the surface of the substructure that it retains is Zone 17.

Excavation did no more than expose the surface of Zones 15 and 17 and, accordingly, the chronological relationship between these two features and the Zone 10 wall or the Zone 11 plaza surface is unclear. In fact, there may be a relationship between the short, one course wall resting upon the Zone 11 surface exposed in Op. 23 (**Figure 13.4**) as the corner of that wall seems to align with the trajectory of Zone 15, but confirmation to this effect will require further

investigation. There was a marked distinction between the matrix of soil above and west of the Zone 15 wall and that to the east. As will be discussed below, this difference was noted when the eastern fill was exposed and stood in direct contrast to the matrix to the west. The western context was excavated as Zone 9, and so the eastern fill was designated Zone 14.

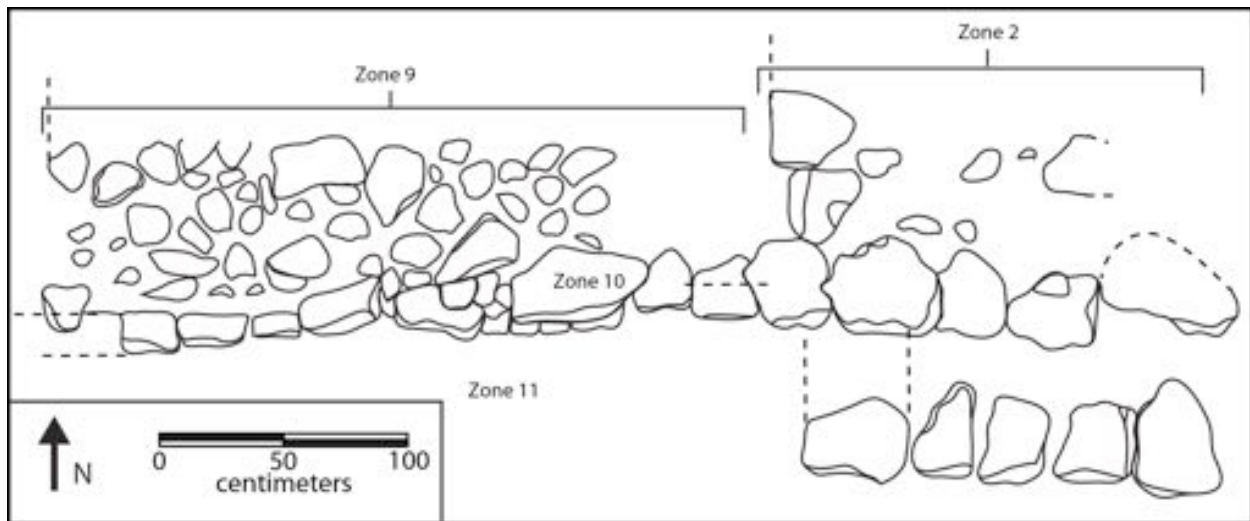


Figure 13.4 Planview of Op. 24 showing intact portion of superstructure platform wall (drawn by E. Harrison-Buck, digitized by M. Brouwer Burg).

Zone 9

The surface of structure 10, once fully exposed, was a compact earthen fill with a few small cobbles characterized most distinctly by a white speckled matrix perhaps indicative of degraded plaster. This structure fill was designated Zone 9 and was most easily distinguished from adjacent zones ultimately by the white speckling. Because that contrast was not as clear until deeper levels were reached, and because the cobble feature itself was not initially recognizable as a separate element from Structure 10, there was likely some intermixing of Zone 9 and Zone 2 contexts and artifact recovery at the earlier stages of excavation.

The white speckled matrix of Zone 9 runs into a yellowish brown fill extending to the east with the intersection aligning generally with the western edge of the cobble platform. That yellowish brown fill was collected separately in the investigative probe and this distinction from Zone 9 was maintained all the way down to the depth at which the Zone 15 wall was identified. There is no indication that the yellowish brown fill ended at that point, which is why both Zones 15 and 9 are illustrated as contemporary with Zones 14 and 8. Zone 9 was directly covered with Zone 1 overburden, but also with some of the Zone 6 artifact scatter at the edge of the cobble feature. The interaction of these zones is illustrated in profile in **Figure 13.5**.

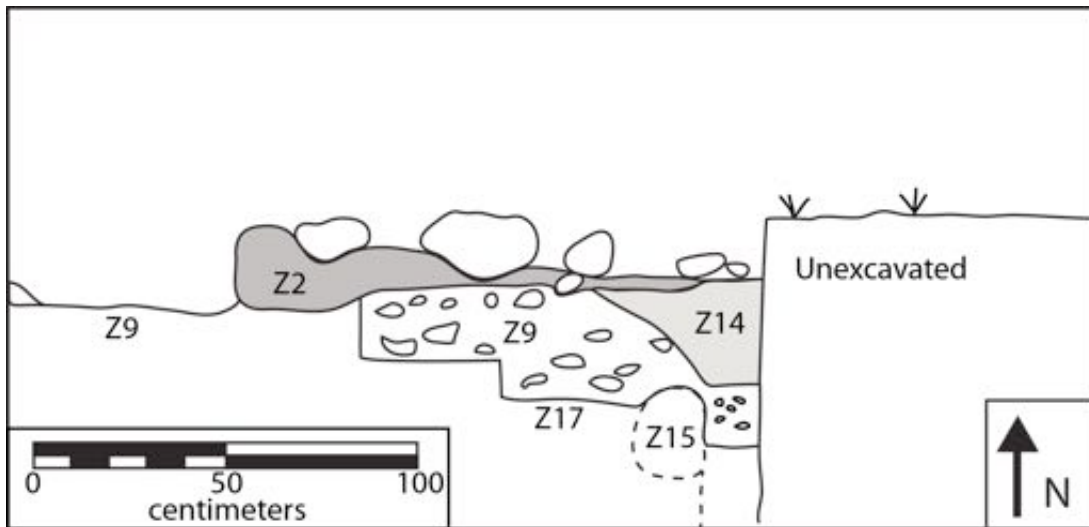


Figure 13.5 Northern profile showing sequences of construction for Str. 10
(drawn by E. Harrison-Buck, digitized by M. Brouwer Burg).

Zones 8 and 14

The yellowish brown fill located to the east of Zone 9 was excavated to the depth of the Zone 15 and 17 structure and was identified as Zone 14. This was originally noted as a contrast within the matrix as the Zone 2 cobble platform was removed. The Zone 14/Zone 9 contrast aligned closely but not exactly with the edge of the cobble platform. Upon further exposure and greater understanding, it became clear that the yellowish brown Zone 14 matrix that stood in distinction to the Zone 9 white-speckled fill on the west side of the cobble platform was the same stratum that had been identified as Zone 8 beneath the Zone 2 cobble platform on the east. Accordingly, these two zones have been combined in **Figure 13.3**.

To a large extent, the middle-right section of excavation zones depicted in **Figure 13.3** (Zones 2, 3, 4, 5, 6, 7, 13, and 14) can be considered a related block of contexts. These are the various features most directly related to the Zone 2 cobble platform. This entire block is underlain by the Zone 14/Zone 8 yellowish brown fill with very little physical overlap extending above the Zone 9 fill and Zone 10 wall of Structure 10, though the chronological sequence is clear.

Zone 2

The central feature of Op. 24 was discovered to be a small (less than 4-x-4 m) loosely square cobble platform constructed on top of and at the eastern end of Structure 10. That this was a construction feature separate from the underlying structure was not immediately apparent and, as a result, some of the earliest material recovered as Zone 2 may, in fact, be mixed with content more appropriately assigned to Zone 9 (any such cross-Zone contamination would be

confined to Squares D and J). As the majority of the results of excavation pertain to the Zone 2 cobble feature, it is discussed in much greater detail below in the “Interpretations and Conclusions” section.

Zone 2 was constructed mainly above Zone 8/14 fill – still arguably on top of Structure 10 as it is all bounded to south by the Zone 10 wall – with a slight overlap above and adjacent to the Zone 9 fill that extends to the west. The remainder of this discussion pertains to excavation zones that were identified by their position in relation to Zone 2. All of these relationships are demonstrated in **Figure 13.3**.

Zones 3 and 4

Having identified the edges of Zone 2, Zones 3 and 4 were identified as separate contexts in order to control the collection of materials from outside of the cobble platform. Zone 3 was isolated first as the area south of the feature's southern wall (Zone 10). Zone 4 isolated the outer areas to the north and east of Zone 2. The difference between Zones 3 and 4 is strictly spatial and indicates no apparent chronological, sequential, architectural, or cultural distinction. The materials collected from each will be analyzed separately and any statistically significant difference might distinguish the importance of the plaza-facing side of Structure 10, but, likely, no such significant difference will be detected. It is for that reason that the two zones have been combined in **Figure 13.3**. These zones were directly beneath the Zone 1 overburden.

Zones 5, 6, and 7

Like Zones 3 and 4 above, the distinction among Zones 5, 6, and 7 may be more of a reflection of collection methods than cultural significance. All three of these zones are fairly dense artifact scatters distributed on top or directly in front of the Zone 2 cobble structure. This artifact scatter is densest in the northeast corner of Zone 2, where it is dominated by Postclassic ceramic sherds and was designated Zone 5 and Zone 7 representing respectively those artifacts outside of the platform and those inside (or on top) of the cobble platform. The other area of high artifact concentration on top of the Zone 2 platform was along the western wall. These artifacts were collected as Zone 6. Because all of these artifacts are scattered about the surface of a unifying cobble platform, it seems likely that their deposit in this context was the result of similar and likely contemporaneous events. However, as discussed below (see section on *Postclassic Scatter and Associated Near-Surface Artifacts*) there are apparent differences between the artifact assemblage on the west edge (Zone 6) and that from the northeast corner (Zones 5 and 7).

As it straddled the western edge of the Zone 2 cobble platform, Zone 6 is over and chronologically later than both Zone 2 and Zone 9. Zone 5 (the portion of the artifact concentration located outside of the Zone 2 cobble platform) has a similar relationship with Zone 3/4 (most directly Zone 4, given the location). However, because the edge of Zone 2 was not

well preserved or defined in this area, some of Zone 5 was likely collected from either side of that ambiguous line. The same is true of Zone 7 – theoretically, these artifacts overlaid only Zone 2, but, in practice, there was likely intermixing. In all cases, as these artifacts were almost certainly deposited at the same time as a result of the same behaviors, the separation of certainly Zone 5 from Zone 7, and less so the separation of either of those two from Zone 6, is likely the creation of distinctions without differences.

Zones 12 and 13

The most important context in Op. 24 with regards to our research objectives was excavated as Zones 12 and 13. Following shortly after the identification and characterization of the Zone 2 cobble feature, photographs documenting the excavation of Special Deposit 1 in Op. 23 were reviewed. In the course of this review, it became apparent that Special Deposit 1 and its post-contact crystal object were potentially associated with the Zone 2 cobble feature of Structure 10 (as opposed to Structure 11). In this scenario then, the highest hypothetical potential for additional features of a similar nature was interpreted to be in the corners of the cobble feature rather than at random across the top of Structure 10. With this in mind, the excavation strategy was refined to target the corners of the Zone 2 cobble platform.

The original Special Deposit 1, according to this approach, would have been cached in the southeast corner of the Zone 2 platform. Considering that the west wall of Zone 2 was by far the best defined and that the intact wall of Zone 10 defined the southern wall of the feature, initial efforts targeted the southwest corner. The controlled removal of Zone 2 in that area ultimately exposed the interface between Zones 9 and 14, but yielded no indication of any special deposit or post-contact artifact. The sherd scatter of Zone 5 and 7 was being piece plotted and removed at roughly the same time, which opened up Zone 2 for excavation in the northeast corner. After removing all of the Zone 2 cobble fill from the southeast quadrant in order to best understand the context (thereby exposing Zone 8 across the square), excavation began to do the same in the northeast quadrant. Shortly after the initiation of this process, an area relatively void of stone appeared among the fill that was otherwise fairly dense with small cobbles. Because of the prevailing theory concerning Special Deposit 1, this void was assigned a separate number, Zone 12, and immediately designated Special Deposit 4. After some additional removal of Zone 12, a smaller concentration of sherds was revealed near the center of the generally amorphous feature (**Figure 13.6**).

Continued excavation within Zone 12 ultimately proved that the interpretation of the context of Special Deposit 1 as a cache within the Zone 2 cobble fill was likely correct. Beneath the sherds shown in Figure 13.6, the rim of a small vessel appeared. Careful excavation revealed that the rim continued around to constitute the majority of the vessel. Once the vessel itself was exposed, broken but with more than 80 percent of the vessel form articulated *in situ*, it was designated Zone 13 (**Figure 13.7**).



Figure 13.6 Photo of northeast corner of superstructure platform (Str. 10-1st A) showing location of Special Deposit 4 (photo by A. Kaeding).

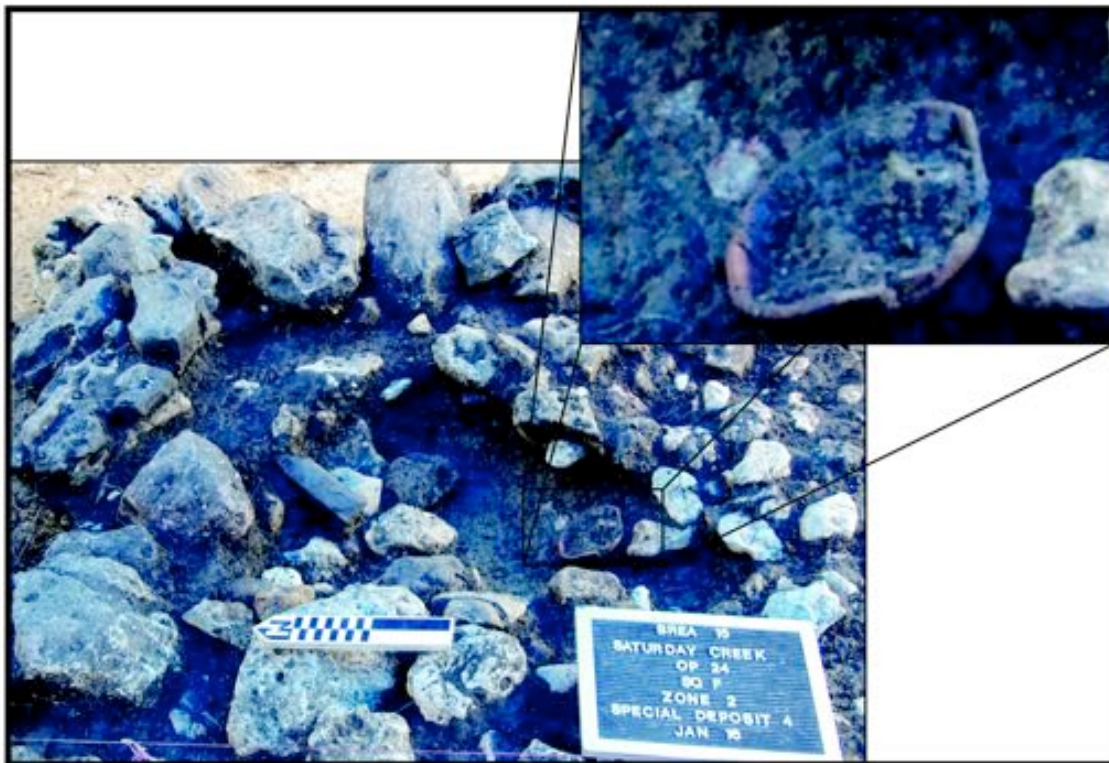


Figure 13.7 Special Deposit 4 in northeast corner of Str. 10-1st A (photos by A. Kaeding).

The soil matrix of Zone 13 (the contents of the dish) was excavated using wooden skewers without having moved the vessel from its original location. Excavation of Zone 13 revealed that Special Deposit 4 was, in fact, a complementary cache to Special Deposit 1, featuring not only jade and precolumbian ceramics, but also another modified crystal object (Figure 13.8).



Figure 13.8 Close-up shot of Special Deposit 4 (photo by E. Harrison-Buck).

Interpretations and Conclusions

The archaeological signature presented above lends itself to different levels of interpretation based on the various categories of artifacts in their specific contexts. Some of these potential interpretations and lines of inquiry are presented here and may be referenced as artifact analysis continues, and further archaeological excavation is considered. The recovered architectural data speaks to a sequence of construction that helps illustrate the development of the site. The uppermost deposit contains a sample of ceramic materials diverse and substantial enough that it could provide considerable insight into the latest occupation, abandonment, or reuse of the site. Finally, the presence and context of the special deposits continues to inform our primary research goal of better understanding the early colonial interactions in the area.

Architectural Construction Sequence

The excavation of Op. 23 provided an understanding of the construction sequence for this plaza area. A very rudimentary breakdown of this sequence as it applies to Structure 10 is that

there were several construction and re-paving events within the plaza itself. At some point during this architectural development, Structures 10 and 11 were built. Later, upon the most recent surface of the plaza, Structure 11 was modified with outset radial staircases and an associated plinth (see Harrison-Buck and Flanagan, this volume). At around the same stage of construction, considerably postdating the initial phases of Structure 11, the short one-course wall that served as one of the crucial guides during excavation of Op. 24 was added to the southern side of Structure 11, physically connecting the two buildings. This is a brief summary of the sequence that we understood as we began excavations of Op. 24.

The excavation of Op. 24 helped to clarify several enigmatic characteristics of the building's most recent architectural alterations and, ultimately, added an element of information to one of its earlier manifestations. One of the first characteristics that struck BREA team members when clearing off and examining the surface of Structure 10 was the distribution of several very large stones mainly concentrated on the eastern and western ends of the structure. The distribution of these stones was unclear; they are not formally cut blocks and are much larger than standard construction stones. Following the excavation of Op. 24, the function and source of these stones remains unclear; however, their placement as elements of the most recent, least formal construction phase seems compelling. In fact, one of these stones located at the northeast corner of Op. 24 was broken in half and, though it requires a degree of speculation, its outline prior to that breakage is traced nearly exactly in pottery sherds distributed during arguably one of the last large scale events at the site. When the pieces of that large stone were removed, no such concentration of sherds was found beneath it. A second large stone located directly west of the one introduced above demonstrated a similar pattern with the densest distribution of sherds found in the pockets of construction fill within the wall and fill and surrounding the stone. This stone was not removed so it cannot be conclusively demonstrated that the sherd feature was not continuous beneath. Moving further east in Op. 24, a similar pattern can be noted but, strangely, with a distribution of different artifact types. Concentrations of sherds were still present, but here on the western end of the Zone 2 small cobble superstructure, they were far less dominant in an artifact scatter and included mainly bone and several stone tools. Nevertheless, there appears to be a persistent association between the artifact scatters and the locations of the large stones. Thus, we would argue that these stones predate, even if briefly, the distribution of artifact scatters that lay nearest the surface and the stones were elements of the final construction phase, involving what appears to be a hastily constructed superstructure on top of Structure 10.

Up to about this point in the investigation of the artifact scatters and the large stones discussed above, it had not been conclusively obvious that Structure 10 had a later construction built on top of it. However, from our excavations we have been able to define the boundaries of the Zone 2 cobble platform, including semi-intact eastern and western retaining walls. We believe the Zone 2 platform connects with the final phase of the Structure 10 east-west wall, which was exposed in Op. 23 (Harrison-Buck and Flanagan, this volume). This low, one course high wall (drawn in yellow in **Figure 13.9** reconstruction) runs parallel to an earlier east-west

southern wall (drawn in blue) and jogs in to meet this earlier wall. Unlike the earlier wall, the later wall rests on the final (most recent) plaza surface and post-dates all construction, including all phases of Structure 11.

The reason that the configuration of the latest phase of Structure 10 was difficult to identify was because it was so poorly constructed. Even the best identifiable wall was not much more than a roughly linear arrangement of several similarly sized stones that ended abruptly as it reached the large stones of the structure's northwest corner. On the eastern side of the Zone 2 cobble platform, the complementary feature was even less compelling. Here the difference that identified the inside/top of the superstructure from the outside/off structure matrix was identified more by a lower concentration of cobbles in a roughly linear pattern. Ultimately, this difference in concentration was borne out as excavation continued and an even more ephemeral wall of poorly aligned stones presented the superstructural element's east wall. Just like the other side, this stone alignment became less clear as the wall reached the large stone. Essentially, what this feature represents is a roughly squared, relatively level pile of cobbles defined on the east and west by a poorly constructed "retaining wall" of larger cobbles, to the south by the existing wall of Structure 10, and to the north by the petering out of that same cobble fill roughly coinciding with a somewhat haphazard distribution of large stones. It is conceivable that this poorly constructed, poorly defined feature might have been disregarded in the course of a more aggressive excavation strategy. However, as we will see below, it becomes a crucial element in the interpretation of the site as this feature is the direct context for the special deposits that provide the most insight into Early Colonial interaction at Saturday Creek.

In continuing to investigate the nature of this enigmatic superstructure, the upper cobbles of Zone 2 in certain areas were removed. This approach would allow comparison of the signatures associated with the walls versus those of the inner construction fill, the fill of the feature itself with that of its surroundings, and, presumably, the fill of the upper feature and the surface upon which it was constructed. However, as removal of the fill continued, the underlying surface provided further questions. Excavation had reached greater depths in both the eastern and western sides of the upper feature, but none had targeted the center. As a result, when the inner fill was removed from these areas and the underlying surface on the east and west sides were considerably different, no obvious means to rectify the incongruity had been exposed. Furthermore, even within the western side squares there was not a uniform surface underneath the cobble wall and feature construction fill. Instead there seemed to be a persistence of a white speckled matrix (potentially a remnant of degrading plaster or mortar) meeting a poorly-defined, yellowish-brown, compacted soil fill. The interface between these two was not clearly defined, nor did it align particularly well with the architectural elements that had been removed above. In an effort to better understand this aspect of the construction sequence, excavation proceeded in a small quarter section of one of the squares overlapping the white surface and the yellow-brown surface. The prediction that one or the other of these fill matrices would extend into and underneath the other was revealed not to be the case. Instead, at the bottom of this small

exposure the interface between the fill types aligned with a line of stones that possessed all of the characteristics of a retaining wall facing east (shown as Zone 15 in **Figure 13.5**).

Due to project constraints and research objectives further exposure of this wall beyond the tops of the stones and a few centimeters of their facing sides was not pursued, so it is impossible at this point to fully characterize the wall's function or its vertical or horizontal extent. The existence of this wall itself does, however, suggest that Structure 10 developed as an extension of a previous structure that did not initially extend as far to the east as it does in its current configuration. That provides a different rough outline of construction for Structure 10 that begins with an earlier structure which was extended at a later date at least to the east, but potentially also to the south when the Structure 10 earlier southern wall (in blue on **Figure 13.9**) was built and identified in Op. 23 (see Harrison-Buck and Flanagan, this volume). Later, following whatever alterations resulted in the current plaza-length manifestation of Structure 10, a final episode of modification took place on at least the eastern end of the building. This likely involved the rather hasty arrangement of several larger cobbles into two north-south alignments, the placement of several much larger stones connecting those two alignments on their northern ends, and the filling of the space between with soil and smaller cobbles (the Zone 2 platform). The filling process seems likely to have resulted in many of the smaller cobbles rolling down from the slightly mounded center and concentrating along the eastern and western alignments as well as the southern wall, which was created by and potentially extended from the existing southern wall of Structure 10. This latest feature was in place when at least Special Deposit 4 and likely Special Deposit 1 were interred, though further analysis is required to better determine potentially how much time passed between those events. Later – and, again, how much later awaits further analysis – a substantial final event took place that resulted in the dense scatter of ceramic sherds and other artifacts.

Postclassic Artifact Scatter and Associated Near-Surface Artifacts

Among the remarkable features uncovered during the course of the brief period of excavation for Op. 24 was the dense artifact scatter that overlaid all of the construction on the eastern end of the structure – associated most directly with the east side of the cobble feature described above (**Figure 13.10**). Predominantly, this was a layer of thick, decorated, Late Postclassic ceramic sherds. Revealed just below overburden, the sherds were distributed in a fairly even pattern over the northeast corner of the unit. A great deal of information awaits the in-depth analysis of this collection; however, the circumstances of excavation also compel interpretation. Specifically, this section will briefly address the artifact scatter as it was manifested differently on the west side and the northeast corner of the cobble feature in terms of what the artifact distribution might indicate.

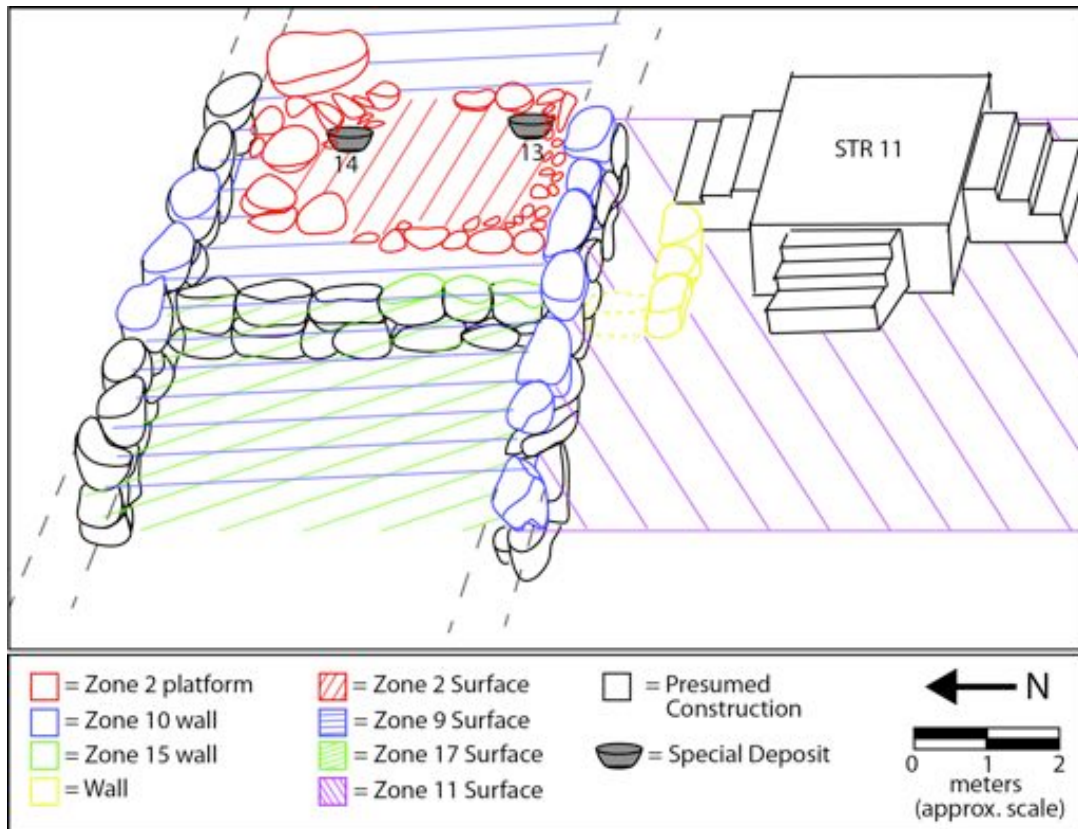


Figure 13.9 Idealized reconstruction of Structures 10 and 11 (drawing by A. Kaeding).

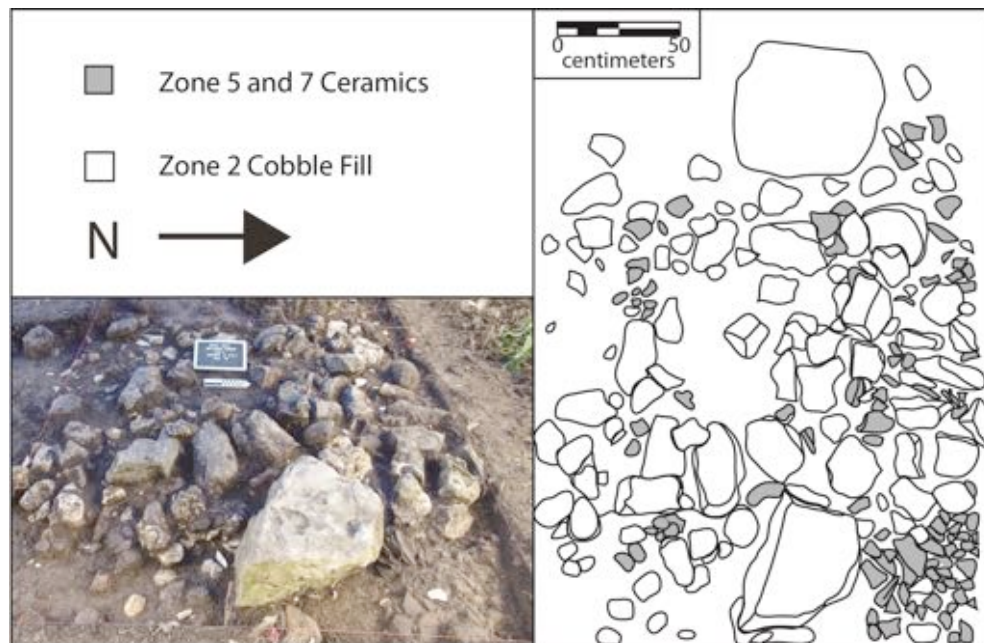


Figure 13.10 Northeast corner of Str. 10-1st A showing Zones 2, 5, and 7 (drawing by E. Harrison-Buck, photo by A. Kaeding).

On the west side of the cobble feature, the near-surface artifact scatter was originally recognized by the identification of bone; initially interpreted as potential midden refuse. Ceramic sherds were present among this scatter as was lithic material including obsidian and chert bifaces. In the course of excavation, the collection of fragmented long bones that originally characterized the feature grew to include teeth, skull fragments, and egg shells.

At least three possible and competing scenarios come to mind that could help explain the bone scatter on this side of the cobble feature. These artifacts may be evidence of the process by which the eastern cobble feature was constructed. In the construction scenario discussed above, the cobble feature was outlined in what seems to have been a rather expedient fashion with medium sized cobbles and then filled in with earth and cobbles. If it truly was a rapidly executed project, then it is possible that the fill/construction material for the low feature was collected from nearby. The mixture of lithic, ceramic, and bone materials may have been included in this fill in which case this is at least a secondary deposit that reflects the eroding surface of the platform than of any particular activity in that specific location. On the other end of the interpretative spectrum, it is possible that this bone-dominated feature is indicative of very specific behaviors at that particular location. As is discussed below, the northeastern corner of the cobble feature was characterized by a dense scatter of ceramic sherds. It is possible that the event that led to the distribution of those materials included other elements signified by a concentration of bone and lithics rather than ceramics. For example, it is possible that there was a feast component to the behaviors that created this signature and that both the bones and the stone tools (as well as potentially some of the ceramics) were deposited on top of this feature as a result of that behavior. Alternately, a completely different interpretation might discount the archaeological significance of the faunal material altogether. The eggshells are of particular interest in the context of this interpretation. A variety of vultures are nearly ubiquitous in the region. Many species of vultures are known to lay their eggs almost exclusively on the ground surface, apparently with a particular preference for rocky crevices. The parent vultures will then stand guard near the laying site (they do not tend to construct a nest) for up to several weeks. If the eggshells recovered from a pocket of topsoils between two of the larger stones turn out to be identifiable as vulture eggs, then it seems rather likely that the scatter of bones in the immediate area may have been deposited by the parent birds while the eggs were incubating. Further analysis of the eggshells might suggest such an interpretation. Likewise, ongoing faunal analysis may indicate that the species represented in the scatter of bones correspond with the diet of local vultures. Of course, should this prove to be the case, the lithic and ceramic material mixed among the bone scatter are likely associated more directly with the artifacts from the northeast corner of the cobble feature rather than indicative of a separate suite of behaviors or events.

As the topsoil and upper levels of overburden were removed from the northeast corner of the cobble feature, a great abundance of ceramic sherds was revealed. In-field observation of the thickness, type of manufacture, and nature of decoration strongly suggest that the great majority, if not all, of the sherds in this dense scatter date to the Late Postclassic period. Initial observation suggests that there may be a considerable range of types and vessel forms. All of

these preliminary indications must be investigated more thoroughly during an upcoming season dedicated to laboratory analysis. Following that analysis, this deposit may prove to contribute a great deal of information concerning the Late Postclassic ceramic assemblage for the area. The relationship between this deposit and the sherd scatter identified in Op. 23 associated with Structure 11 also possesses the potential to be very informative with regards to some of the later activities in this plaza.

For now, as above, the most valuable information currently available is derived from the distribution of the artifacts rather than their identification. Two aspects from the distribution of these sherds inform the nature of the cobble platform. First, while the sherds were generally dense on the northeast corner of the cobble platform, they seem to have been concentrated most specifically in pockets between the cobbles that make up the platform and occasionally extending underneath some of the higher seated cobbles themselves. There was rarely significant soil accumulation between the sherds and the stones upon which they rested. These might seem like, and may ultimately prove to be, insignificant observations; however it is possible that this pattern of distribution is indicative of the manifestation of the cobble platform at the time that these sherds were deposited. Specifically, the relationship between the upper cobbles and the sherds may indicate both that the cobble platform was neither leveled nor plastered and that the cobbles themselves had continued to settle after the time at which the sherds were scattered. As mentioned above, the slightly mounded topography of the cobble platform and the higher concentrations of stones delineating the outer edges of the platform might be indicative of the construction process. The relationship between cobbles and sherds on the northeast corner might be further suggestion that the entire cobble feature was constructed relatively quickly, covered on the northeast corner with the scatter of sherds, eroded rather gradually, and then sat in that state for the duration of time that was required for the overburden to accumulate.

The second observation regarding this sherd scatter concerns the large stones distributed along the top of Structure 10, notably forming the northern edge of the cobble platform. These enigmatic stones are much larger than any of the construction materials encountered at any level of the site so far investigated. Their presence on top of Structure 10 has yet to be explained. They have no obvious pattern of distribution, no decoration, and no clear function. Some of them appear to be broken with their constituent parts slightly separated. One of these is the long somewhat flat stone located in the northeast corner of the cobble platform. Given the general shape of the stone, somewhat flattened on either side, thinner than it is wide or tall, and wider at one end of its long axis than the other, it could be imagined as a small version of a once standing monument. In that imaginary scenario, it would have broken roughly in half across, perhaps upon falling or being knocked down. The two halves then stayed where they landed separated by a gap indicative of the force of impact. Again, this is all speculation derived only from the very generalized shape of the stone and the fact that the breakage on the east side of the western half generally appeared as if it would align with the breakage on the west side of the eastern half.

The distribution of the Postclassic sherds bears relevance to this question as well. As can be seen in **Figure 13.6**, the densest single concentration of sherds is in the very northeast corner of the unit. In this area, sherds were piled up several layers thick, most notably in the area directly abutting the western half of the large potentially broken stone. As can be seen in the image, however, that density of artifacts stops abruptly as it continues west along the edge of the large stone. Instead, east of the west side of the large broken stone and up to the edge of the unit where the west side of the east half of the stone lay, there is a striking lack of sherds. The most tempting interpretation of this specific aspect of the artifact distribution is that a) the two pieces of stone were in fact halves of one original large stone, b) that stone was laying flat in the same location prior to being broken, and c) this was the scenario when the Postclassic sherd scatter was deposited. Unfortunately, the finer understanding of this micro-scaled chronology has not lent any immediate insight concerning the nature of the large stones, what possible event or behavior may have caused the fracture of this large stone and the relocation of the eastern half, or the circumstances of, or purposes for, the sherd scatter or the cobble platform itself. Hopefully, the observations described above concerning the distribution of these artifacts can help inform future artifact analysis and/or excavation.

Post Contact Artifact Presence

The primary objective of Op. 24 was to investigate for further evidence of early Spanish colonial presence. With the excavation of the modified crystal securely recovered from Zone 13 in Special Deposit 4, that objective was met. The specific contextual details of Special Deposit 4 help guide the interpretation in advance of further artifact analysis.

Analysis of excavation records indicates that Special Deposit 4 was intrusive into the Zone 2 cobble platform. The unconsolidated nature of the cobble platform obscured this fact until the Op. 24 excavation reached a level that provided greater clarity – the point at which Zone 12 was distinguished as an amorphous feature and pre-designated Special Deposit 4. However, given the benefit of hindsight, a review of unit photographs and plan view drawings indicates that no substantial features had ever capped the area under which the cache was located (**Figure 13.11**).

The photos and plan view drawing in **Figure 13.11** show rather clearly that, not only was the area over the cache absent of the dense cobble fill prior to the excavation of Zone 12, but also that the layer of Postclassic sherds (Zones 5 and 7) were also largely been absent from this specific location, suggestive of a later disturbance that removed the sherds from this area. This can be seen in the upper photograph of **Figure 13.11**, where a continuation of the sherd scatter is mainly identified at the northern end of the Zone 2 cobble platform and clearly extended south of the Special Deposit 4, suggesting the Zone 12 cache was an intrusive feature that post-date the sherd scatter event. This evidence leaves little doubt that the interment of the Special Deposit 4 cache was the latest event to take place in the sequence that has formed this portion of the site.

As an intrusive feature convincingly capped only by the most recent accumulation of topsoil, the interment of Special Deposit 4 could hypothetically date to any period following the latest dates associated with any of the other contexts excavated in Op. 24. Further analysis of the artifacts from Zones 12 and 13 may help provide more refined dates for this deposit itself; however, some preliminary observations also serve to help postulate the chronology and imagine potential circumstances of this deposit.

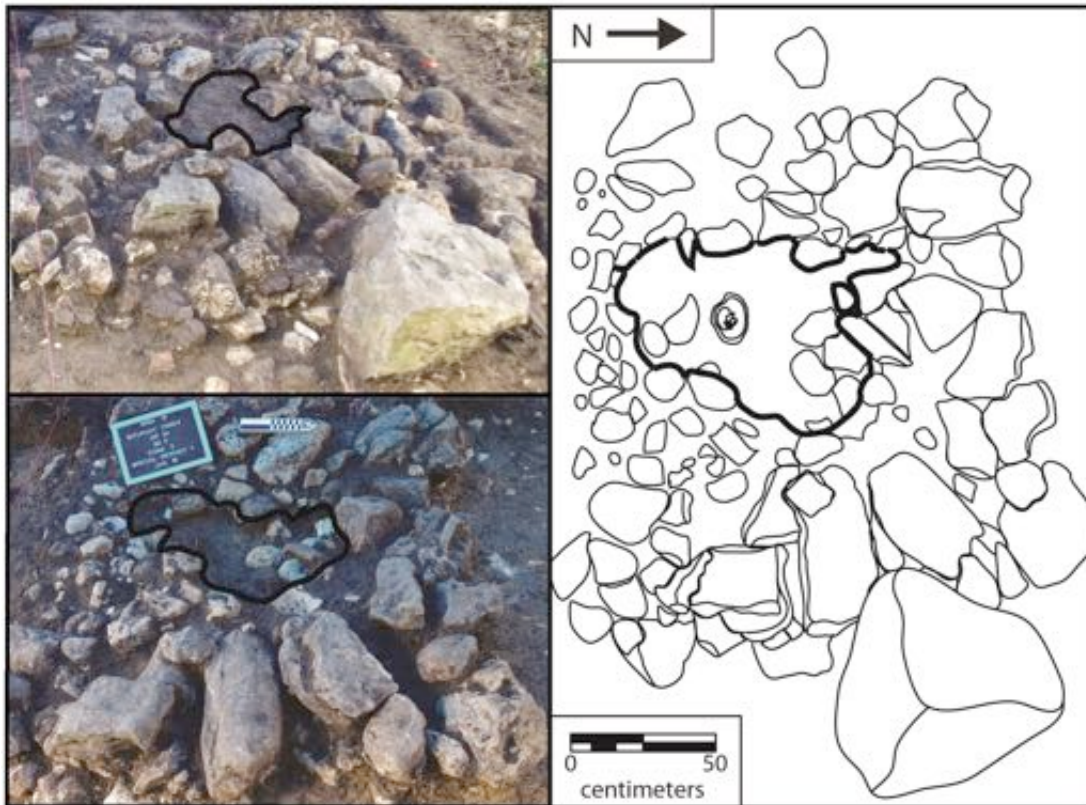


Figure 13.11 location of Special Deposit 4 (drawing and photos by A. Kaeding).

Ultimately, we offer that Op. 24 fulfilled its objective of providing further evidence for early Spanish colonial presence in the region. The crystal cube from Special Deposit 4 sits at the crux of this speculation, the logic for which is outlined as follows: a) though the pit represented by Zone 12 is intrusive, the context of Special Deposit 4 is undeniably Maya in character, and b) the larger context for all of Op. 24 is also undeniably Maya with no identified architectural elements indicating Spanish occupation or presence, but c) the crystal object is of European origin, so d) the presence Special Deposit 4 speaks directly to an interface between cultures that occurred only during the earliest stages of Belizean colonial history.

The first two tenets of the argument outlined above require little further explanation or elaboration. Corner caches are well known in Pre-columbian Maya contexts, often characterized

by shallow dishes and generally featuring jade beads just like Special Deposit 4. Likewise, several seasons of archaeological investigation have been dedicated to the investigation of Saturday Creek. This has included extensive and intensive mapping and targeted excavation at the site's extent and its core. Nothing in the course of this research has yet identified any post-Contact architectural or archaeological features. The third claim in the argument outlined above – that the crystal object is of European origin – does require further support in lieu of material analysis. From a certain perspective, it is unfortunate that the idiosyncratic material from this cache is crystal rather than metal, glass, or glazed ceramic. While the latter material types from among that list would provide irrefutable proof of a post-Contact date, crystal objects were not unknown to the Pre-columbian Maya.

Crystals have been documented and studied in a number of Pre-columbian archaeological and contemporary ethnographic and ethnohistoric Maya contexts. Ethnohistorically and ethnographically, the prominence of crystals in the shamanic toolkit and among personal shrines reflects their function in healing and divining rituals potentially deriving their significance from their reflective luster – a quality of potentially pan-American value (Saunders 2003; Scott 2009). In Pre-columbian contexts, the role and prominence of crystals in the archaeological record has been somewhat problematic (Brady and Prufer 1999). Because the majority of crystal objects in archaeological settings are unlikely to have been modified they "fall into no preexisting artifact category" (Brady and Prufer 1999:139). As a result, these objects might not be recognized, collected, or recorded and are, therefore, underrepresented in the archaeological literature. Nevertheless, some modified crystals have been identified from the Maya area and, in particular contexts, unmodified objects have been recognized as artifacts. The contexts that tend to be associated with these small unmodified pieces of crystal are generally areas of particular ritual importance including caves, burials, burials within caves, altars, caches, ritual structures, cenotes, and ballcourts (Brady 2012; Brady and Prufer 1999:137; Lucero and Gibbs 2007; Healy 2007).

Early Spanish material culture has been recorded from the Spanish southern frontier areas of Belize and Guatemala in a manner that reflects the spectrum of colonial interaction ranging from infrequent, indirect contact at places like Zacpeten to a relatively constant hegemonic presence at places like Tipu (Oland 2014; Pugh 2009). Depending on the respective positions of the sites along that spectrum, Spanish artifact assemblages display a range of diversities and densities and potentially a patterned difference in the nature of depositional contexts (Oland 2014). For example, Oland (2014:661) notes that sites like Cedar Bank and Tipu, where Spanish presence was more sustained, are characterized by densities of Spanish ceramics in association with elite residences. Alternately, at Zacpeten, where interaction with the colonial world was likely restricted to indirect contact, European artifacts were restricted to seemingly ritual contexts including caches deposited along the central lines and termination deposits capping the upper levels of Pre-columbian architectural features (Pugh 2009). In this sense, Special Deposit 4 is most like the indirect Contact context of Zacpeten – which, in fact, also included a post-

Contact cache containing a crystal object (Pugh 2009:381) – though the mid-spectrum site of Progress Lagoon also produced a cache containing a Spanish artifact (Oland 2014:659).

As mentioned above, modified crystal objects are exceedingly rare in Pre-columbian contexts; so much so that the material type itself may be misleadingly underrepresented in the archaeological literature (Brady 2012; Brady and Prufer 1999). To date BREA team researchers have not identified reports of objects modified in the style of that discovered in Special Deposit 1 (see Harrison-Buck and Flanagan, this volume). Post-Contact modified crystal is less rare. One particularly interesting example has been recovered from Mission San Luis, an early post-Contact site in Florida (McEwan 1997). Investigations of San Luis have produced a quartz crystal cross reflecting Christian tradition but with identifiable markings of Pre-columbian manufacture techniques (McEwan 1997). This level of analysis has yet to be applied to the Saturday Creek artifacts, but our field observations indicate that a variety of manufacture techniques could potentially be identified.

All of the points laid out above lend to a claim of probability. While the alternatives are not impossible, it is more likely that the bottle-stopper shaped crystal from Special Deposit 1 is of European origin similar to known artifacts from at least one similar context, and less likely that it is a completely novel Pre-columbian artifact previously unknown from corner cache contexts (McEwan et. al. 1997). Furthermore, it is more likely that the crystal cube from Special Deposit 4 is associated with the crystal object from Special Deposit 1, and less likely that the cube is an example of a rare modified crystal artifact in a cache deposit unique within Belize, but coincidentally meters away from the European crystal of Special Deposit 1. Following that logic, the crystal cube from Special Deposit 4, undeniably recovered from a secure culturally Pre-columbian Maya context is indicative of early Spanish colonial Contact.

In a very rudimentary sketch of historical demographic trends in Belize following the arrival of Europeans on the continent, the Maya that had occupied the lower banks of the Belize River were active in the area when the Spanish traversed the region, but were gradually pushed further and further west as British colonial logging interests established more permanent presence throughout the territory (Jones 1977). The profound implication of this extremely simplified scenario is that the duration of interaction between Maya groups performing traditional practices (such as the interment of ritual corner caches) would likely have been limited to a period of time between the arrival of the first transient Spaniards and the dislocating pressures of British colonial activities. To extend this speculation even further, the location of the post-Contact cache among the ruins of what seems to have likely been an abandoned monumental Pre-columbian site (in fact, in the shadows of the site's tallest pyramid) may be suggestive of behavior akin to revitalization efforts which often incorporated foreign objects in culturally significant locations (Harrison-Buck 2014; Pugh 2009). Traditional and abandoned places and practices might be revisited or incorporated into the creation of new structures during times of cultural contact and social upheaval or ambiguity (Oland 2014: 662; Pugh 2014:375). The arrival of Spanish missionaries dedicated to massive scale religious conversion and the

political reorganization of the region can certainly be imagined as a source of such cultural tumult and apprehension.

The scenario by which the crystal objects themselves were acquired by those who deposited them at Saturday Creek – potentially involving gift giving, conflict, down-the-line-trade, theft, etc. – is pure speculation (Harrison-Buck 2014; Oland 2014; Pugh 2009). The significance of the deposition of these objects in this particular location may also prove elusive. Nevertheless, the data recovered during this brief, targeted excavation have added to our understanding of the later historical events and processes that defined this portion of Saturday Creek. For the first time, those events and processes securely include early Spanish colonial interaction. To that end, further research at and around Saturday Creek possesses the potential to inform that pivotal period in the history of the BREA project area and, by extension, the history of the Spanish Colonial frontier.

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Chapter 14

Excavations at More Tomorrow: Investigating a Stone Monument (Operation 25)

Kelin Flanagan and Kathryn Frederick

Introduction

Operation 25 was excavated within the site of More Tomorrow in January 2015. A large, broken, stone monument was found associated with a line of stones just east of Structure 7 at More Tomorrow. Units were placed to examine the nature of the architecture. This Operation began as a 6 m (N-S) by 3 m (E-W) unit. It ran parallel to Structure 7. This unit was then bisected into two, 3m-x-3m squares. Square A was in the north and Square B in the south. Squares A and B were placed so that they would include all of the stones associated with the large, broken, stone monument (likely a monument) and the lines of stone running south from this monument (possibly steps or walls). The Operation then expanded to the west in the form of two, 2 m (E-W) by 1 m (N-S) squares. Squares C, D and E were placed consecutively headed from the east to the west and abut the western edges of Squares A and B. The goal for the expansion of this operation was to uncover the architecture of the center of the eastern side of Structure 7. The center of the structure was estimated by leveling a 100-m tape across the top of the structure mound, recording the length of the structure N-S, then halving this number. This operation included 14 zones total. Below we describe each zone in detail. Following the zone descriptions is a short discussion and conclusion for this excavation. Two arbitrary datum points were used for all elevation measurements. In Squares A and B, elevations were taken from Datum A, while measurements for Squares C, D, and E were taken from Datum B.

Description of the Excavation

Zone 1

Zone 1 was the top zone. A wet and muddy matrix with many leaves and roots. Informants reported that this area was periodically inundated. This was further evidenced by the rice growing in the plowed fields just west of the site. This zone measured 1-3 cm thick.

In Square A, due to muddy conditions and lack of artifacts we only screened 50% of the soil. We shovel-scraped the eastern half. Charcoal found was evidence of relatively recent fires or burning at this site. The monument stone and other large stones surrounding it may have been

cracked due to heat from a fire. Soil color was 10YR 3/2. Matrix exhibited tiny limestone and charcoal inclusions.

In Square B, a semi-linear arrangement of stones was exposed before removal of Zone 1 matrix (**Figure 14.1**). We started excavating from the east and headed toward the stones in order to define the exterior of the potential architecture. We found zero artifacts and screened 50% of the dirt. No clear cardinal linear alignment of the stones was defined after removal of Zone 1. We determined that the eastern-most portion of the stone accumulation was likely collapse and these stones and their associated matrix were removed as Zone 6. The Munsell for Zone 1 was 10YR 3/2.

In Square C, we removed the muddy topsoil across the unit. zone thickness ranged from 1 cm to 10 cm thick. Soil color was different in this Square (7.5YR 4/4) than in Squares A and B. Due to a lack of artifacts and muddy conditions we only screened 25% of the dirt.

Square D was located due west of Square C. The goal was to look for architecture of Structure 7. The muddy topsoil of Zone 1 in this Square ranged in thickness from 3 cm to 10 cm thick. We did not find any artifacts. An obvious change in soil color was observed in this square compared to squares A and B.

Square E was located due west of Square D. After not locating Structure 7's architectural stones in Square D, the Operation was expanded with this square. Zone 1 gradually lightened in color (7.5YR 4/4) as we excavated toward the west. Architectural stone for Structure 7 was not found in this zone.

Zone 2

Zone 2 was the alluvium overburden composed of a silty clay found in all squares of this Operation (Sqs. A, B, C, D and E) below Zone 1 (**Figure 14.1**). The matrix we removed had covered the semi-linear arrangement of stones in Squares A and B. This Zone also included some tumble from Structure 7 in Square E. Munsell values differed between the Squares around the broken monument (Sqs. A and B had value and chroma 10YR 3/2) and the squares placed in the center of the eastern side of Structure 7 (Sqs. C, D, and E had a value and chroma of 10YR 4/4). Zone thickness varied across squares. In general, Zone 2 was thicker in Squares C, D, and E, gradually thinning as it sloped downward toward the west.

In Square A, Zone 2 was a dense silty clay matrix with very few inclusions but riddled with roots and grubs. Modern plastic was found at the top of this zone. Also found at the top of the zone was burnt wood/charcoal and some baked clay, likely from whatever burning occurred at this location. More plastic was located at the same surface that the top half of the broken monument is sitting upon. A prismatic obsidian blade fragment was also located at this level just north of the top half of the monument. Two more prismatic obsidian blade fragments were found, one to the northwest corner of the top half of the monument and one to the south-east of the bottom half of the monument, along the southern excavation wall. A cluster of ceramics (possibly an intentionally smashed vessel) was found at the base of the bottom half of the monument.



Figure 14.1 Bottom of Zone 2 of Squares A and B, facing North. Accumulation of semi-linear stones in the foreground are from Square B and the broken stone monument can be seen in the background (Square A).

In Square B, there was a lot of root disturbance. A second, lower tier of the line of stones was found after the removal of Zone 6 (stone wall collapse). This was called Wall 1 until further deconstruction of the stones did not reveal, cardinaly placed, orderly or anchored architecture. This zone ended just shy of a surface (matrix resting just below this zone and just above the surface (Zone 7) was designated Zone 4). A context change, which included a more tightly packed matrix as well as the presence of charcoal and tiny ceramic flecks, suggested we were nearing a surface and this encouraged the decision to change zones. This zone also included the matrix west of the accumulation of stones. We found zero artifacts to the west of these stones.

In Square C, at the bottom of Zone 2, the soil became a mottled mixture of 10YR 4/4 and 10YR 3/2. An obsidian blade fragment was found 8 cm north x 27 cm east, laying flat at the bottom of Zone 2.

In Square D, Zone 2 soil color was a mottled 10YR 3/3 and 10YR 4/4 and there was no clear break between the two soil colors. Zone 2 was terminated when 10YR 4/4 became the dominant soil color. The location of Square D coincided with the upslope of the mound (Structure 7), so the lighter soil could be the beginning of construction fill. However, no architecture or large, cut stones were found in this zone. Fragmented ceramics were found, but not collected due to their extremely small size and friable condition. 50% of buckets were screened due to lack of artifacts.

In Square E, some large cut stones were found. However, they appear to have tumbled from Structure 7 above.

Zone 3

Zone 3 was assigned to the broken stone monument (monument) in Square A. At one time the monument was a large tall flat stone. Through taphonomic processes, and perhaps modern human disturbance as well, the monument split in half. The cause could be from falling towards a large cut stone. There is also a possibility that the stone cracked in half due to fire. The break was not smooth, but instead raw, jagged and pock-marked. Though the edges of the stone monument flaked off in many places, the cracks could not be seen running throughout the monument.

Zone 4

Zone 4 was the removal of the alluvium overburden (Munsell of 10YR 3/2) in Squares A and B until roughly 5 cm above an ephemeral use surface. Zone 2, Zone 6 (collapse) and Zone 10 (eastern and western lines of stone that compose a short freestanding wall) all sat upon the surface (Zone 7) found below Zone 4. A 50 cm baulk was left in the east for both squares. The termination of Zone 7 was not arbitrary, the zone exhibited a context change after approximately 6 cm to 10 cm - the soil was littered with flakes of charcoal, baked clay, and broken ceramics. In Square B especially, a slight spike in artifact density as we approached the ephemeral use surface was noted. The surface (Zone 7) is slightly more gray in color than Zone 4.

Zone 5

Zone 5 included the two roughly parallel lines of stones running N-S (one to the west and one to the east) in Square B only. The matrix excavated between these two lines of stone was designated as Zone 10. Fourteen total stones were counted. After excavation, we realized this line of stones was not attached to anything else. It was a free-standing line of stones extending from Square B into Square A. It ended in a pile of stones that included the broken stone monument. It did not connect to Structure 7, nor were there any corners or cardinal straight alignments.

Zone 6

Zone 6 was the stone collapse east of the “freestanding N-S wall” in Square B and the matrix they were set in. These stones were sitting on the top of Zone 4. A minimal amount of non-diagnostic artifacts were found.

Zone 7

Zone 7 was the packed earthen (ephemeral) surface that Zone 4, Zone 6 and Zone 10 sit upon. This zone was only identified in Square B. The soil of the surface reached is a slightly lighter gray than previous zones and more compact. There was also a context change where the soil was littered with flakes of charcoal, baked clay, and broken ceramics. The surface was left unexcavated.

Zone 8

Zone 8 is the light yellow soil below Zone 2 in squares D and E. It is associated with Structure 7. This zone slopes upward toward the west in relation to the structure.

In Square E, this zone began as the light yellow soil context change below Zone 2. Zone ends at a context change—medium sized limestone cobbles were reached. They appear to have a linear E-W alignment despite their scattered nature. A darker more compact soil is found to the south of these stones but the soft light yellow silt that characterizes Zone 8 is still found to the north of this line of stones.

Zone 9

Zone 9 was the alluvium overburden excavated from beneath the top half of the stone monument in Square A (which was removed as Zone 3). It includes a soil matrix similar to Zone 2 as well as some large, unshaped stones. Minimal artifacts were recovered. This zone should be considered as an extension of Zone 2. A thick ceramic rim, a Mano fragment, and a modern

plastic button were found in this location. Clearly, there was some taphonomic mixing in this zone. Elevations were taken on the highest point under the monument, not actually taken from the corners.

Zone 10

Zone 10 included only the matrix between the free-standing N-S line of stones. Artifacts recovered from this zone were found in the soil matrix between the two roughly N-S aligned lines of stone.

In Square A, shotgun shell found below rocks to the west of a large square-cut stone that may be interpreted as an altar. This “altar” stone was sitting just south of the bottom half of the broken stone monument.

In Square B, a mano was found at 72 cm north x 84 cm east, 86cm below Datum A. An obsidian blade fragment was also found in this zone in this Square. Some of the stones at the bottom of this zone continued below the ephemeral use surface we defined (top of Zone 7). There was no consistency to their depth so it is difficult to say they were all sitting on a single surface. Their lowest depths ranged from 106 cm below Datum A to 114 cm below Datum A.



Figure 14.2 View of the broken stone monument facing West. After removal of Zone 3 (top half of broken monument) and Zone 13 (1 m x 1 m square below altar stone, East of bottom half of broken stone monument). This image also includes a progress of Squares C, D, and E as excavations searched for in-tact architecture (photo by K. Flanagan).

Zone 11

Zone 11 was the ephemeral use surface in the trench of Squares C, D, and E. Smashed, friable ceramics rested within this zone's matrix. This zone was left unexcavated.

Zone 12

Zone 12 was the construction fill of Structure 7. This zone was the area immediately under the large square-cut stone ("altar").

Zone 13

Zone 13 was a 1 m x 1 m unit directly below the "altar" stone and just to the south of the monument that resembles a stela (see **Figure 14.2**). We were looking for a cache deposit, which often are found associated with stelae and altar monuments, but none were found. There was an unusual deposit of very compact clay, possibly burned. The soil was light pink in color. This zone was located in Square A only. Munsell color was 5YR 5/4. The bottom of the monument sat at 120 cm below Datum A.

Zone 14

Zone 14 was a retaining wall that was found at the bottom of Zone 8 in Square E in a 1 m x 1 m square on the eastern end of Square E (**Figure 14.3**). The goal was to chase the profile of this possible wall. The stones were cobble sized and there were three courses of purposefully placed stones running north to south. The southern excavation wall had stratigraphy indicating basket-loaded construction fill with differently shaped clumps of mottled soils. Mostly, it was deep red in color, likely due to soil chemistry, perhaps an abundance of iron, or perhaps burning.

Discussion and Conclusion

The goal of this Operation was to define the broken stone monument and any architecture related to the monument. Unfortunately, this Operation did not reveal any intact architecture. The monument had clearly shifted from some taphonomic process. Candidates for identification as to the cause of the site's destruction include periodic inundation and erosion, fire burning (intentional or unintentional) and/or physical movement by a modern human or machine. Evidence for burning, periodic flooding and modern human manipulation were apparent in the artifacts and ecofacts recovered. It is likely that a combination of these processes caused this level of site destruction. Very few artifacts were recovered from a comparatively high volumetric of soil in this excavation and of those artifacts, very few diagnostics were recovered. A fair amount of obsidian was recovered and some residue analysis may be possible with these

artifacts. If there is an intact, undisturbed site component, it will not be found at this shallow depth. Artifacts collected revealed a mixing of modern and prehistoric contexts within the first 10 - 20 cm of the surface. This is a thick “plow-zone” with disturbed archaeological contexts. It is possible, as is evidenced by context changes found in deeper elevations (Zone 14) and the knowledge of this site receiving a high volume of alluvial deposition, that a portion of the site remains undisturbed below our excavation limits for 2015.

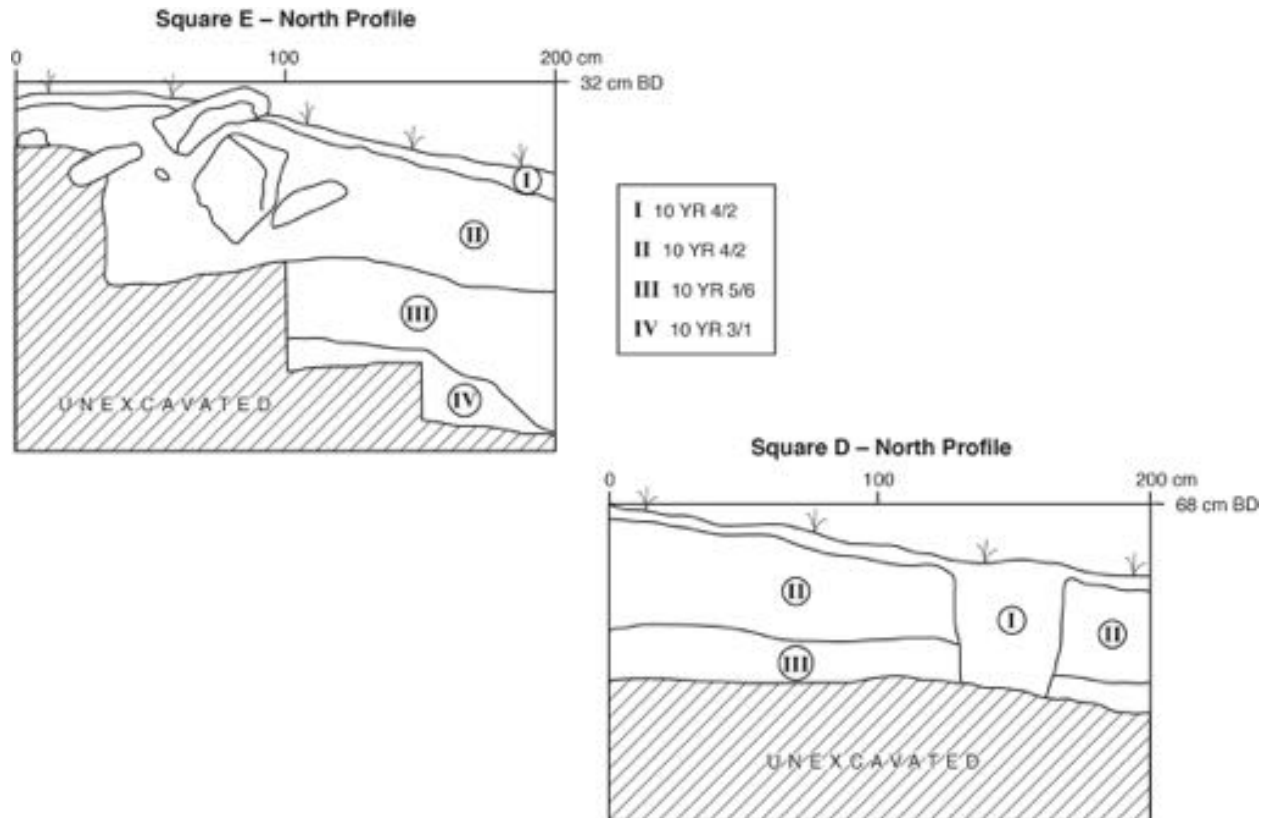


Figure 14.3 Profile of the northern walls for Squares D and E. Zone I in Sq. D was determined to be old tree root bioturbation.

Chapter 15

Investigations of a Columned Structure at Jabonche (Operation 26)

Eleanor Harrison-Buck

Introduction

Operation 26 at Jabonche (**Figure 15.1**) is an 8m (east-west) x 6 m (north-south) unit positioned over an all stone rectilinear structure (Structure 13) and is divided into twelve 2x2m squares (A-L). The low, all stone structure has a series of unusual stone columns along the front (northern) side of the structure, but few if any are in situ. They appear broken and strewn about (**Figure 15.2**). Given the evidence of destruction, it is possible the building was purposefully terminated. Although a full analysis is forthcoming, the building appears to date no earlier than the Terminal Classic period and there is some cursory evidence of Postclassic material on the surface, suggesting that the building may have been built and used during these time periods. Unlike the Classic period architecture that surrounds Structure 13, the columned building does not contain any obvious mound or platform elevating it above the plaza surface. As such, an excavation strategy comprising a shallow, but broad horizontal exposure was carried out. Below is a description of the three zones (1-3) that were defined in the excavation of Operation 25.

Description of the Excavation

Zone 1

Zone 1 in Sq. A is a thick layer of dark topsoil with a few large cobbles and mostly small pebbles and cobbles in the dark topsoil. Very few large stones were observed in Sq. A. with the exception of one large column fragment in the SW corner of Sq. A. This column stands relatively upright, tilted slightly to the south-southwest (see **Figure 15.3**). Another mini column was exposed in Zone 1 in the SE corner of the square. This small column is unusual from the others found in Op. 26. It sits on the surface of Zone 2. Zone 1 comes down to a white marl (Zone 2), which we interpret as collapse debris as a number of large fragments of fallen stone columns were found in the Zone 2 debris to the east in Sq. B. The large column in the SW corner of Sq. A continues below into Zones 2 and 3. This column appears to be *in situ*. However, the base of the

column was not exposed in 2015. The artifact density in Zone 1 of Sq. A is light and includes pottery sherds, debitage, human bone, and chipped tool.

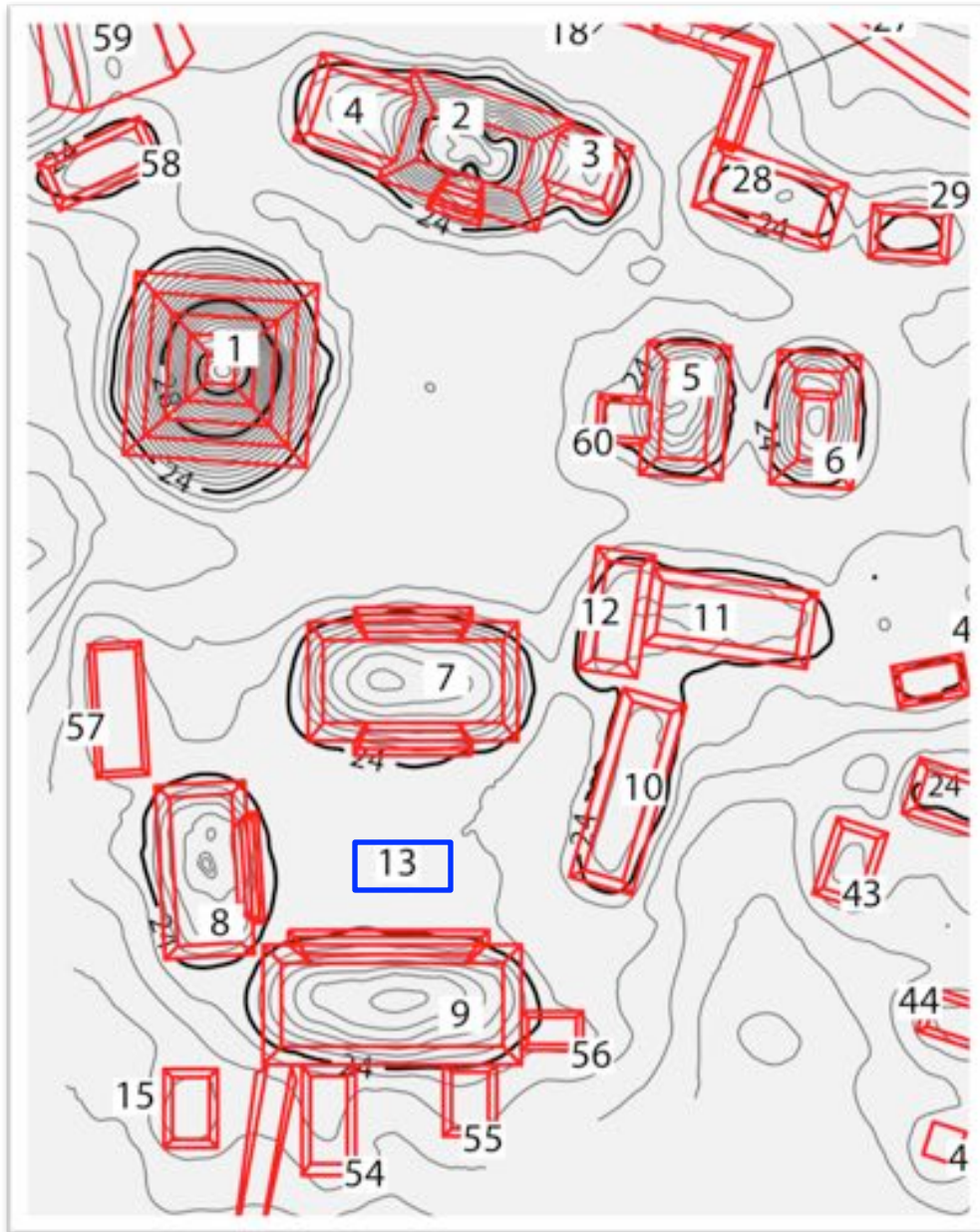


Figure 15.1 Location of Structure 13 and Operation 25 (in blue) at Jabonche.



Figure 15.2 Remains of Structure 13 and column fragments during excavation (photos by E. Harrison-Buck).

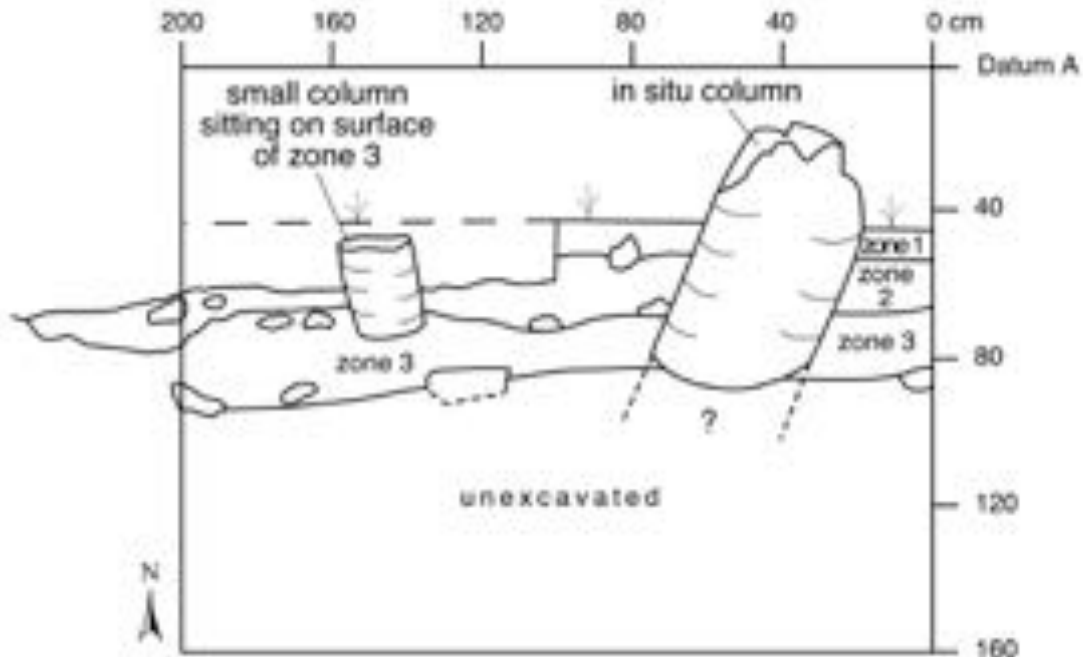


Figure 15.3 Profile of two columns in Square A looking south (drawn by E. Harrison-Buck, digitized by M. Brouwer Burg).

Zone 1 in Sq. B is a thick dark, organic rich layer of topsoil that surrounds large fragments of carved stone fragments. At the base of Zone 1 we encountered a pebble filled collapse debris with some larger cobbles. All sizable stones were defined and removed as part of Zone 2 collapse debris. Here, at least seven sizable fragments of carved stone columns were exposed at the base of Zone 1 (see **Figure 15.4**). Artifact density increases in Square B, as well as Square C, which are positioned along the northern (front) side of Str. 13. Here, the bulk of the column fragments were found. Our aim with excavating Squares B and C is to be able to understand the original positioning of the columns along the front of the building. Most of the artifacts recovered thus far appear (on a cursory inspection) to date to the Terminal Classic, but several sherds from Square B may be Postclassic. Further analysis is needed. A medium density of artifacts was recovered, including obsidian, pottery sherds, debitage, animal bone, human bone, and fresh water/snail shell.

Zone 1 in Square C is an organic rich topsoil with light density of loose tumble on surface. The Zone 1 topzone in Sq. C covers the northern edge of Str. 13, near the structure's NE corner. This square has significantly less large stone tumble on the surface, suggesting that the northern edge of Str. 13 is probably further to the south in Sq. G. One of the largest fragments of a column is just to the east in a Sq. B. The artifact

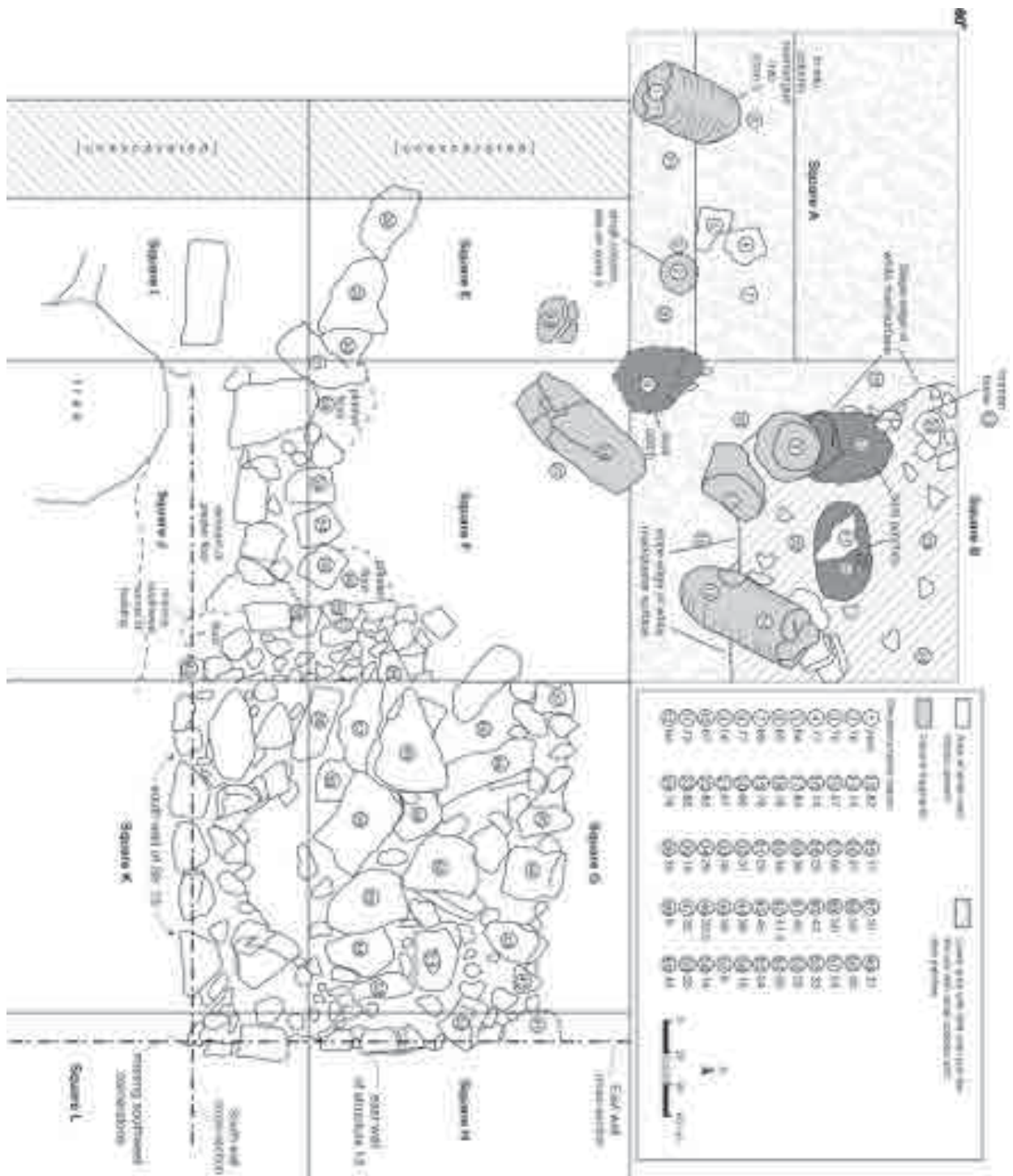


Figure 15.4 Planview of Operation 25 (drawn by E. Harrison-Buck, digitized by M. Brouwer Burg).

density in Zone 1 of Sq. C is light and includes pottery sherds and some obsidian blade fragments.

Zone 1 in Square D is similar to Square L with a thicker layer of dark, organic rich topsoil with less lighter matrix than was found in Squares K and H (see below). This may be because the SE and NE corners of Structure 13 were found in Squares L and D, respectively. There are two trees in Square D. One is in the NW corner and the other is on the eastern side and is half in Sq. D and half in Sq. H. Due to this tree, like Sq. H only the western side of Square D was excavated. The area excavated measures 2m (north-south) x 1m (east-west). Zone 1 consists of an organic rich soil with lots of roots. At the base of Zone 1 the soil was slightly lighter gray color with specks of limestone and larger pieces of tumble. No intact architecture was visible at the base of Zone 1. The artifact density in Zone 1 of Sq. D is light and includes pottery sherds.

Only the eastern half of Square E was excavated in 2015 (a 2m N-S x 1m E-W area). A size able tree exists in the western half of Sq. E. Very few large stones were encountered in Square E as it is off mound. Several fragments of stone were seen at the base of Zone 1 that appear to be part of the column found in the SW corner of Sq. F (see **Figure 15.4**). The only large stones in Zone 1 of Sq. E were fragments of a column and a rough line of larger stones running along the southern edge of Sq. E visible on the surface prior to excavation. Based on their orientation, this rough line of stones does not appear to be an intact wall, but is more likely collapse from Structure 13. The artifact density in Zone 1 of Sq. E is light and includes pottery sherds.

Sq. F is on mound and a high density of stone was defined in Zone 1. Only a thin layer of topsoil was removed from between the stones. The artifact density in Zone 1 of Sq. D is light and includes pottery sherds and debitage. Only a light density of small, loose stones was removed in Zone 1. The bulk of stone collapse in Sq. F was removed as Zone 2 (see below).

Zone 1 of Sq. G includes the topsoil over the top of Str. 13. Excavations in Sq. G were aimed at finding the northern edge of Str. 13. A high density of lithics was recovered from the surface of Str. 13 in Zone 1. A good amount of debitage was observed and some large flakes and nodules with cortex. Only a light density of small, loose stones was removed in Zone 1. The bulk of stone collapse in Sq. F was removed as Zone 2 (see below).

Zone 1 in Sq. H is the topsoil and encompasses the east side of Str. 13. Due to two large trees in the eastern side of the square only the western side of Sq. H was excavated in 2015. The area excavated measures 2m (north-south) x 1m (east-west). Zone 1 was a thin layer of organic rich soil with lots of roots and very few artifacts (only two pieces of lithic debitage). At the base of Zone 1 portions of a north-south wall were visible. This is the eastern wall of Str. 13. Only some of the very loose stones from the surface were removed as part of Zone 1.

Only a 1m (east-west) x 2 m (north-south) was excavated in Sq. I with the aim of defining the southern wall of Str. 13. Zone 1 topzone contains a high density of roots from a large tree in Square J, which extends into the southern half of Square I. A large, finely cut rectangular block exists on the surface of Square I, which measures 67cm long x 21 cm wide and 21cm high. There were no other large stones found in Zone 1, except for this large cut rectangular block visible on the surface.

A sizable tree with intrusive roots occupies the SW corner (approx. 1x1m) of Square J and therefore this part of the square was not excavated. At the base of Zone 1 a portion of the southern wall of Structure 13 was exposed that appears to jog north about 40cm. The artifact density in Zone 1 of Square J is light and includes pottery sherds and debitage.

Zone 1 in Square K consists of a thin topsoil and encompasses the south side of Structure 13, near its SE corner. At the base of Zone 1 portions of an east-west wall were visible. This is the southern wall of Str. 13. The artifact density in Zone 1 of Square K is light and includes pottery sherds.

There is a thicker layer of dark, organic topsoil in Zone 1 of Square L compared to the thin, light brown layer found in Squares K and H with tumble directly below. The first 5-10cm of this layer was removed as Zone 1, but it continued somewhat deeper in the eastern half of the square. Only a light density of stone was encountered in Zone 1 of Square L. We ended the zone in this area as we encountered signs of white limestone pebbles and a few larger stones representing tumble. The artifact density in Zone 1 of Square L is light and includes pottery sherds.

Zone 2

Zone 2 consists of what appears to be collapse debris mixed with a mottled marl. The highest density of collapse, broken columns, and marl debris appears in the area of Square B. In other squares, we find a lighter density of smaller cobble inclusions. The marl white surface in Square B is not level and patches of dark black sticky soil found underneath and localized around the columns may be cuts into the marl surface. On the surface of the dark patches there is some evidence of burning (charcoal chunks and gray burned limestone pebbles). Fragments of what appears to be human bone were found associated with some of the dark patches. For instance, some human teeth were recovered in the dark patch in the NW corner of Square B.

In Square G, Zone 2 removed what appeared to be collapse on-mound, but we believe that some of this stone material may represent poorly preserved construction fill for Structure 13. Excavations ultimately revealed only a small portion of an intact platform structure measuring roughly 2.50 m x 2.50 m (see **Figure 15.4**). Only the southern, eastern and western sides of this small platform structure were found intact. When no intact northern wall was found, we probed into the platform structure to test

whether the small construction represented a free-standing wall, similar to other columned buildings found elsewhere in the Maya Lowlands, such as the Terminal Classic example at Xunantunich (**Figure 15.5**). We determined that the construction was not a free-standing walled building, but rather, consisted of a solid square platform, which in some ways resembles the size and shape of the solid platform wall in Structure A20 (compare **Figures 15.4** and **15.5**). An eccentric was found in at the interface of collapse and fill in Zone 2 of Square G, along the northern edge of Structure 13 (**Figure 15.4**). It is difficult to say with certainty whether this simple, three-pointed eccentric represents terminal debris or a building cache, but the latter seems likely given the potential fill context.



Figure 15.5 Structure A20 at Xunantunich (photo courtesy of J. Awe).

Artifact density increases slightly with depth, especially toward the front (north) side of Structure 13. There was a concentration of large sherds in the SW corner of Sq. D at 66cm below Datum A that were pedestaled and photographed. Most of the ceramics appear to be part of the base of a high pedestal-based vessel. Here in Square D, there is a slightly lighter density of large and small tumble compared to Squares K and H. Where tumble was encountered, it consisted of a medium to high density of limestone rocks in a dark, loose dirt. At the base of Zone 2 in Squares K, L, and H, a poorly preserved plaster floor was found, which does not appear to continue north into Square D. Ultimately, two consecutive floors were identified, with the lower floor running underneath Structure 13 (exposed in Square G when the fill was removed to test whether the structure was a solid platform or free-standing walled building).

Zone 3

Zone 3 represents the white, soft marl that was found below the Zone 2 collapse debris along the front (north) side of Structure 13. This high density of white soft marl (Munsell 10YR 8/1) was distinguishable from the large stones and loose, dark matrix of Zone 2 to warrant its own zone designation. Only a small area of Zone 3 was excavated in Square A. At the base of Zone 3, the base of the column continued (see **Figure 15.3**). Due to time constraints, excavations were halted at this point. Square A may be the most promising location for further excavation in the future as the one possibly *in situ* column was found here. That the column appears to continue below the Zone 3 marl suggests that this layer may cover more intact portions of the columned building that are more deeply buried. The plaster floor surfaces found underneath and just outside (to the south) of the small square platform construction found in Squares F, G, J, K, L, and H (see **Figure 15.4**) may correspond to the elevated floor (or rear bench?) area seen in Structure A20. It may be that the columns of Structure 13, which appear offset to the north-northwest of the little square platform were configured similarly to Structure A20 and are seated in a lower floor that forms an open front room. If so, we could anticipate finding this floor surface further down in Square A. If Structure A20 can be used as a template, this step down might explain why we did not find a north facing wall to the small square platform in Square G, nor a floor to the north of the platform; both may be further down, underneath the marl fill of Zone 3 that was defined at the base of Zone 2 in Square G.

Interpretations and Conclusions

Further excavation of Structure 13, specifically into the Zone 3 marl along the front (north side) of the building may help clarify the building layout and configuration of the columns. The collapse debris found throughout Operation 26 may have accumulated through natural post-depositional processes, but it is possible that the building may have been purposefully destroyed and the columns knocked down and broken up. The smashed stone and layer of marl may have been purposefully laid down as part of a termination event. It is difficult to imagine that bioturbation alone could be responsible for the damage to the columns, which are made from a very hard limestone material. They are broken, smashed, and scattered in such a way that suggests a purposeful act of destruction in antiquity.

Chapter 16

Testing for Midden Deposits at Jabonche (Operations 27 & 28)

Kelin Flanagan, Kathryn Frederick, and Eleanor Harrison-Buck

Introduction

Operations 27 and 28 at Jabonche were two 1 x 2m test pits that were excavated during the January 2015 BREA field season. The units were located within a series of residential plazuela groups found at the northern end of the Jabonche site center (**Figure 16.1**). These test units were located on the edges of platform exteriors in the hopes of locating midden (or trash) contexts. The goals of our investigations of midden contexts were aimed at:

- 1) recovering faunal remains for dietary and environmental analyses;
- 2) collecting diagnostic ceramic and lithic materials to date the site contexts;
- 3) and recording architectural information to shed light on ancient structure planning and spatial arrangements.

In order to locate a midden with a high probability of answering our research questions, we conducted a series of targeted shovel test pits around the outside of structures that we felt confident were residential in nature. The series of shovel test pits helped us to identify spikes in material culture thought to represent middens and helped us to select the locations for Operations 27 and 28, as discussed further below.

Methods for Shovel Test Pitting

Shovel Test Pit (STP) placement was based on the general observation within Maya archaeology that waste (midden material) often collects along the sides and backs of structure platforms and at the corners of structures. Two Shovel Test Units were excavated, referred to as Shovel Test Unit 2 and Shovel Test Unit 3. Shovel Test Unit 2 included a series of STPs associated with the eastern side of Structure 24, just north of Structure 20; here, ultimately Operation 28 was laid out. The other group of STPs, Shovel Test Unit 3, was placed along the north side of Structure 26 and east of Structure 18; here Operation 27 ultimately was laid out. Shovel Test Unit 2 laid out a total of 20 flagged locations demarcating STPs, of which ten were ultimately tested in January 2015 (STP2-2, STP2-3, STP2-4, STP2-5, STP2-12, STP2-13, STP2-14, STP2-17, STP2-18, STP2-20). Shovel Test Unit 3 laid out a total of 25 flagged locations, eleven of which were excavated (STP3-1, STP3-2, STP3-3,

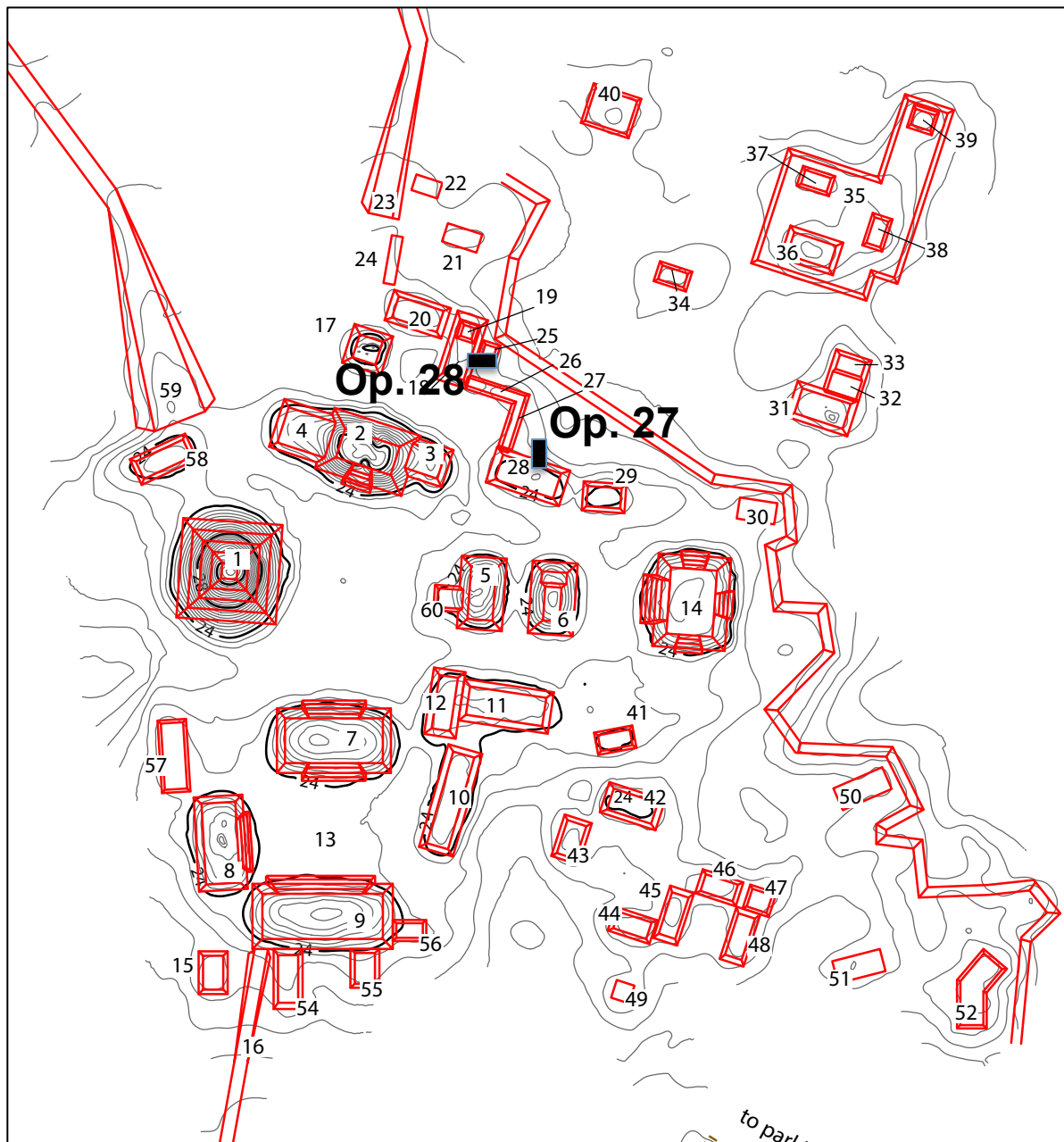


Figure 16.1 Location of Operations 27 and 28 at Jabonche.

STP3-6, STP3-7, STP3-8, STP3-9, STP3-10, STP3-12, STP3-13, and STP3-23). Two arbitrary datum points (A and B) were used for all measurements with the STPs and the two operations. Datum A was used for Shovel Test Unit 2 (STP2) and Operation 28 whereas Datum B was used for Shovel Test Unit 3 (STP3) and Operation 27.

Shovel Test Pit Unit 3

Shovel Test Unit 3 was arranged in a grid of staggered postholes, positioned along the north side of Structure 26 and the east side of Structure 18, located just to the north of the site's ballcourt and main ceremonial center (**Figure 16.1**). The grid location of Shovel Test Unit 3 was aimed at exposing any midden deposits located on what appears to be the backside of a main residential plaza formed by Structures 17, 18, and 20. The STPs were labeled in ascending order in rows from south to north, beginning in the southwest corner; where Structures 26 and 18 corner. A total of 25 STPs were laid out with the Total Station, but as noted above only 11 of these were excavated. Once midden material was discovered it was unnecessary to continue testing. The 11 STPs that were excavated (STP3-1, STP3-2, STP3-3, STP3-6, STP3-7, STP3-8, STP3-9, STP3-10, STP3-12, STP3-13, and STP3-23) were targeted due to their close proximity to Structures 26, 18, and 25. A spike in midden-rich material was found in STP3-7 and the subsequent STPs were excavated to confirm the midden and define its extent. STP3-7 contained a large amount of bone and ceramic in a loose soil matrix and Op. 27 was positioned over top of this STP to further expose the midden material. The findings of the 11 STPs are discussed below, followed by a description of the excavation of Op. 27.

STP3-1

Encountered very dark (10yr 1/2) soil that extended much deeper (all the way to the bottom) on the north side. A few ceramics were recovered. The majority of ceramics came from lower half of STP.

STP3-2

Soil in level 1 is very dark with few inclusions. Chert found in level 2 (76 cm below Datum B). There is a high density of small and brittle ceramics suggesting this is a midden. This context appears to continue deeper than our test pit. Large faced stone found on south side (E-W orientation) at 103 cm below datum B and continues down to bottom of test pit. likely part of southern E-W Structure 26.

STP3-3

STP halted due to large white construction stone with plaster on it. Lithics and ceramics found.

STP3-6

This STP was halted soon after breaking ground due to the presence of stone collapse from adjacent structures 18 and 26.

STP3-7

At 30cm depth a gray, silty clay material with decaying limestone heavily intermixed. This depth also revealed a large amount of cultural debris; ceramics, lithics, bone. This continued down to the maximum depth of our STP (90cm). This soil matrix was considered midden debris.

STP3-8

This STP was halted soon after breaking ground due to the presence of stone collapse from adjacent structures 18 and 26.

STP3-9

Fire-cracked rock found. The matrix almost immediately is made of a gray colored soil that is thought to represent midden debris mixed with limestone inclusions. This layer continued deeper than in STP's 3-2, 3-7, and 3-13. Only 1 very tiny ceramic was found (not collected).

STP3-10

Like STP3-9, the matrix immediately displays a gray color with many limestone inclusions. Few artifacts were found and the test pit was terminated when a larger number of medium sized limestone pieces and a more dense clay were encountered..

STP3-12

This STP was located north of Structure 26 in the vicinity of Structure 25 but far enough away from the structure to avoid collapse. Midden debris was identified; chert, ceramics and faunal remains were all recovered from the gray matrix. *STP3-23*

Immediately encountered stone collapse, could not excavate further. *STP3-13*

Good midden-like material, gray matrix with many inclusions; bone, lithics, ceramics represented.

Operation 27

As noted above, the results of the shovel tests, namely the finds in STP3-7, directed the placement of Op. 27. STP3-7 contained the densest layer of midden debris of the 11 STPSs excavated, and was nearest to Structure 26. The placement of Op. 27 was done with the hope that

its southern end would clip the northern exterior retaining wall of Structure 26, which it did. The excavation was oriented cardinally, 2m (north-south) x 1m (east-west) and consists of one square designated Square A. The unit was laid out using a transect and all elevation information was measured from Datum B. A thick, midden-rich layer was located below 20-25 cm zone of overburden that contained very few artifacts.

The midden-rich layer is 20-40 cm thick, but it is unclear whether it represents a trash heap. There are several indications that suggest this a secondary deposit of midden material used as construction fill. This midden layer was capped with a 5-10 cm thick discrete layer that consisted of marl, pebbles and more midden-rich material. This surface was level and resembled an exterior floor that appears to be associated with the final phase of Structure 26 (see east wall cross-section in **Figure 16.2**). The fill layer abuts a later building phase of the exterior wall of Structure 26 and suggests that it is either coeval or postdates this final addition to the southern wall of Structure 26. This midden-rich fill layer sits directly on top of an earlier floor associated with Phase 1 and possibly also Phase 2 of Structure 26. Although the midden may be in a secondary context, the material was rich in faunal remains, meeting one of our overall goals for testing in this location. Below we describe the details of this excavation. The exterior southern-facing retaining wall of Str. 26 shows that the structure is not perfectly cardinal, but rather, is oriented about 10 degrees (or more) east of north (**Figures 16.3**)

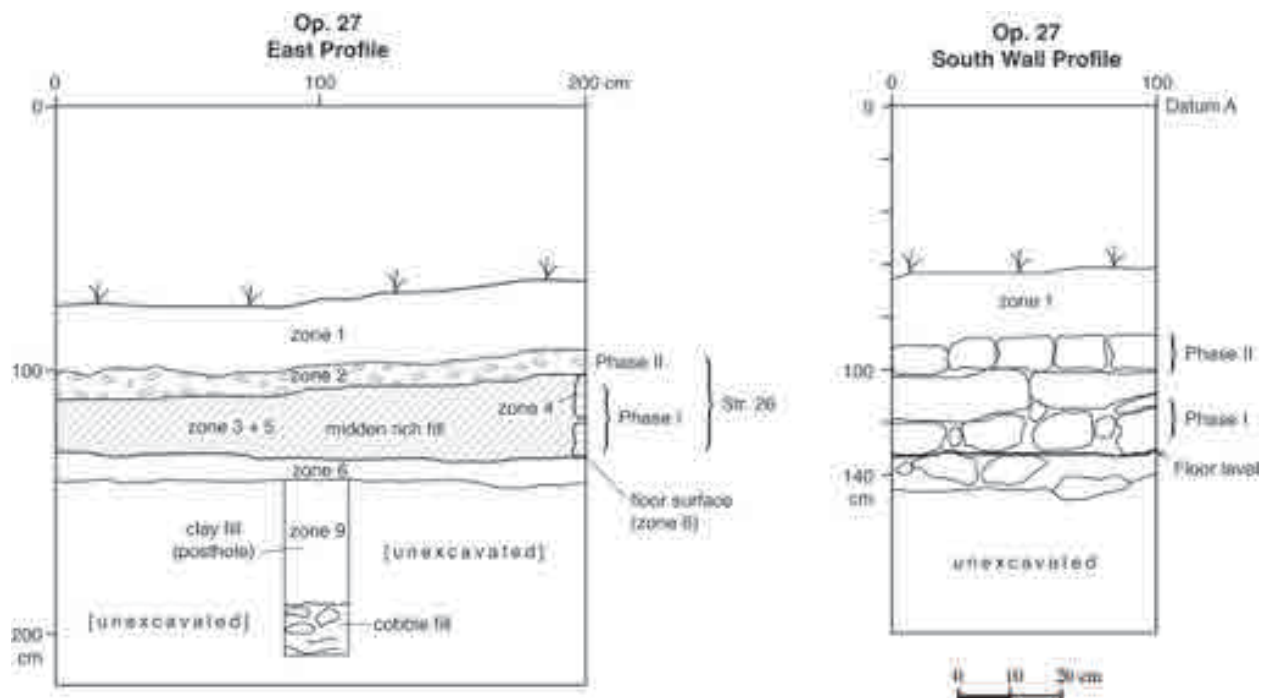


Figure 16.2 Cross-section drawings of the south and east walls of Op. 27 (drawn by E. Harrison-Buck, digitized by M. Brouwer Burg).

Zone 1

The first zone (0-20cm) in Operation 27 consisted of a dark topsoil layer (10yr 2/1) of silt loam, with minimal archaeological material. Only 35 artifacts were recovered; these included ceramic sherds, animal bone, and lithic debitage. Due to the proximity to Structure 20, SQ A slopes downwards to the north. Zone 1 was excavated mostly with shovels.



Figure 16.3 Closing shot of Op. 27 (photo by S. Murata).

Zone 2

Zone 2 was an arbitrary level within a stratigraphic level. When the artifact count became dense, a new zone was introduced, realizing later that there was a slight change in soil color that began several centimeters above our arbitrary zone 2. Therefore, the south end of SQ A more accurately represents Zone 2 (20-30cm); whereas the north end of SQ A (28-30cm) had only a couple centimeters of Zone 2. Zone 2 consisted of dark gray (2.5yr 3/1) silty clay with limestone inclusions. There is a pebble-filled matrix and then the midden deposit begins around 110cm bd.,. Zone 2 also exposed the top portion of the north wall of Structure 26, located on the south end of SQ A (see Zone 4 below). Zone 2 was excavated with shovels. Dense archaeological material was recovered from Zone 2, including ceramics sherds, animal bones, and lithic debitage, indicating the surface of the midden-rich fill layer.

Zone 3

Zone 3 (30-45cm) is a midden-rich fill layer that was defined by a change in soil color and an increase in artifact density. This zone consisted of a silty clay loam in a gray soil matrix (2.5yr 2.5/1) with limestone inclusions; defined as midden. Archaeological material included ceramic sherds, lithic debitage, and an extremely dense amount of animal bone. Collected a 2 liter soil sample from the top of Zone 3. Zone 3 was excavated with 80 percent shovel and 10 percent trowel.

Zone 4

Zone 4 is defined as the limestone blocks exposed in the southern end of Op. 27, which represent the northern edge of the Structure 26 retaining wall. The retaining wall consists of three courses of cut stone. However, the top course differs in size and block type, suggesting a discrete phase of architecture. The two phases are visible in the south and east wall cross-sections (see **Figure 16.2**). The earlier Phase 1 wall consists of larger more roughly cut blocks and sits on a layer of core cobble fill visible in the south wall cross-section drawing (**Figure 16.3**). A packed earthen floor surface abuts the Phase 1 wall and likely represents an exterior plaza surface. The later Phase 2 wall consists of a single layer of smaller cut limestone blocks that sits directly on top of the earlier Phase 1 wall, but is set back just slightly. The Phase 2 wall appears to be associated with the top of the midden-rich fill layer and may be coeval or pre-date the fill in which case it may have been constructed when the earlier floor was still in use prior to the midden fill layer.

Zone 5

Zone 5 (45-55cm) was an arbitrary 10 cm level implemented to insure vertical control for artifact type and density. Zone 5 consisted of a silty clay loam in a gray soil matrix (2.5yr 2.5/1)

with limestone inclusions. Archaeological material included ceramic sherds, lithic debitage, and dense animal bone. A 2 liter soil sample was collected from this zone. Initially SQ A was subdivided for this zone (only excavating the south end), but later the entirety of SQ A zone 5 was excavated. Excavation was accomplished with shovels.

Zone 6

Zone 6 (55-75cm) represents the earlier floor surface associated with the bottom course of the Phase 1 wall of Structure 26 (see **Figure 16.2**). Excavation revealed that the floor was likely built at the same time as the Structure 26 platform. Rather than running underneath the platform, excavation of the floor revealed a cobble fill layer lying directly underneath the lowest course of cut wall stone visible in the south wall cross-section drawing (**Figure 16.3**). Zone 6 consists of a dark (10yr 4/1) sandy clay matrix. Two centimeters into zone 6 on the north end of SQ A, an oblong shaped feature of differing soil was defined and removed separately as Zone 7 (see below). In addition, a postmold feature also appears to be cutting into the Zone 6 floor surface and was defined and excavated separately as Zone 8 (see below). Archaeological material from the Zone 6 floor included ceramic sherds, lithic debitage, and animal bone, and it continued to be dense. This zone was primarily excavated with shovels.

Zone 7

Zone 7 was defined as an enigmatic feature consisting of a large, oblong shaped area of burned soil and debris cutting into the earlier floor surface. An elevation taken just below the surface of this feature was 132 cm below Datum B. Some of this feature was removed as part of Zone 6 before it was recognized as a discrete feature. Excavation of this feature revealed a fairly shallow (only 7cm) and ephemeral pit feature. Charcoal samples were taken from this feature.

Zone 8

Zone 8 was defined as a postmold cutting into the earlier floor surface. The surface of the postmold is 131 cm below Datum B and was located 80cm from the south wall of Op. 27 and 60cm from the west excavation wall. The postmold was 13cm in diameter and was excavated to a depth of 20cm. No archaeological material was found within the postmold.

Zone 9

Zone 9 (75-85cm) consists of a posthole that we dug into the floor surface. This was the final zone for SQ A. This zone consisted of dark (10yr 3/2) sandy loam that bottomed out on a cobble fill layer at around 190 cm below Datum B. The density of archaeological material from Zone 9 was very low (only 7 artifacts), a drastic decrease compared to the zones above it.

Shovel Test Pit Unit 2

Shovel Test Unit 2 was located in an adjacent plazuela group in the northern part of the site (see **Figure 16.1**). Structures 20, 24, and 29 line the south, west, and north sides (respectively) of this small plaza area. Structures 20 and 24 appear to be the “back side” of a larger plaza group to the south that consists of Structures 17, 18, 19, and 20 (see **Figure 16.1**). It was surmised that trash deposits might have accumulated in this “rear” area. Therefore, we laid out a 5 m (north-south) x 4 m (east-west) grid within the corner created by Structures 20 and 24. Shovel Test Unit 2 was arranged in a grid of staggered postholes spaced one meter apart. The grid was positioned along the east side of Structure 24 and along the north side of Structure 20. The grid location of Shovel Test Unit 2 was aimed at exposing any midden deposits located within this partially enclosed plaza area. A total of 20 STPs were laid out in STP Unit 2, of which only ten were actually dug (STP2-2, STP2-3, STP2-4, STP2-5, STP2-12, STP2-13, STP2-14, STP2-17, STP2-18, STP2-20). The selected STP’s were dug with a post-hole digger as far as physically possible (roughly between 80-100 cm in depth from the surface) or until sterile soil was reached. STPs were labeled in ascending order in rows from south to north, beginning in the southwest corner near where Structures 20 and 24 corner (see **Figure 16.2**). A spike in midden-rich material was found in STP2-20, which is where Operation 28 was ultimately located. The nine other STPs allowed us to roughly define the aerial extent of the midden and determine the best location of Op. 28. The findings of the ten STPs are discussed below, followed by a description of the excavation of Op. 28.

STP2-2

A few small stones that appear to be collapse from the Northern side of Structure 20, were found about 10-15 cm below the surface. The matrix was a dense clay. The artifacts were friable and fragile, they were also not as numerous within the sascab (possible midden or fill) as the artifact count in STP3 post holes. No animal bone located. The presence of stones prevented further excavation with the posthole digger.

STP2-3

A large stone prevented further excavation of this shovel test pit past 20 centimeters.

STP2-4

Dark soil only composed the matrix. The excavation halted due to a large quantity of stone, including the presence of a single faced stone only 5 cm below the surface. The cut, faced side was turned toward Structure 20 and not cardinally oriented. This suggested that it was collapse. Also, no other stones like it in close proximity add to this idea.

STP2-5

Consisted of a dark soil matrix absent of artifacts in the first level. The second level was a gray-colored clay matrix with sascab. Artifacts were present in this second zone but only represented by a medium density of friable ceramics and a bit of chert debitage.

STP2-12

This post hole ended when stones prevented further digging. A light yellow or tan clay is present at the lower half of this hole as well. It was very compact and void of artifacts. It is possible this was structure fill. There were a number of medium sized stones above this yellow/tan clay and red stains from decaying ceramics were found below and mixed in with the stones.

STP2-13

This shovel test had 3 levels. The first was top-zone overburden, the 2nd was a possible midden context composed of a dark gray matrix with limestone inclusions and a medium artifact density. Artifacts recovered included ceramics, debitage, and faunal remains. The third zone was characterized by a light gray sascab with a minimal presence of artifacts and no animal bone. It is likely this 3rd level was fill.

STP2-14

This shovel test pit yielded a lower artifact count and no bone. Obsidian was found in the 1st zone of the post hole. The second zone yielded few artifacts. The light gray matrix of the second zone was denser also (further suggesting that it was fill).

STP2-17

Zone 1 was composed of extremely black soil. Only 1 artifact was found in level 1. Marl was found in the last 2 cm.

STP2-18

The artifacts were present starting in level 2. Artifact density then thinned out in level 3. Marl was hit in level 4.

STP2-20

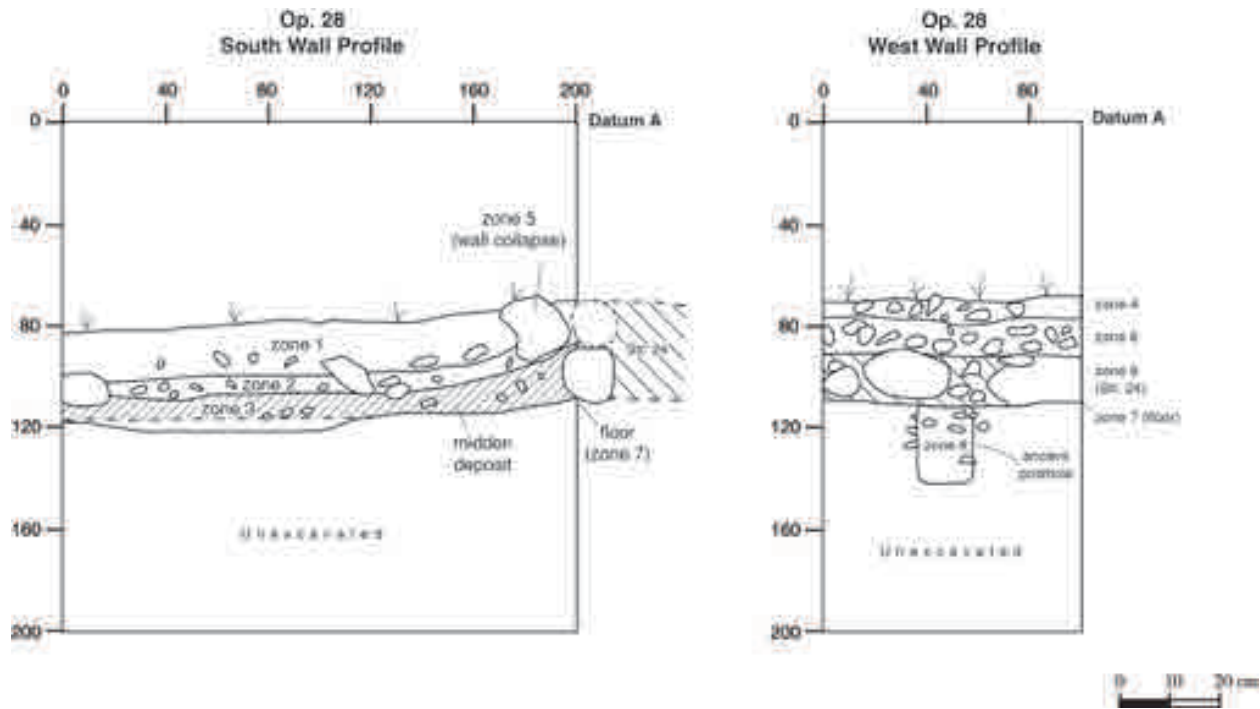
A Midden-like gray sascab matrix was reached in level 2. Animal bone was present (light density) in zone 2 along with a medium density of friable artifacts. Gray, limestone speckled matrix continued below the stopping point of the post hole. A ceramic ball was also found.

Operation 28

The results of the shovel tests that were dug directed our placement of Operation 28. Operation 28 was a cardinaly oriented excavation unit, measuring 1 m (north-south) x 2 m (east-west). The unit was placed over STP2-20 to expand on a midden context identified in the shovel testing pitting operation, described above. The unit was laid out using a transect and all elevation information was measured from Datum A. Our goal was to uncover a portion of an intact midden as well as the eastern wall of Structure 24 as a reference to anchor the midden to a structural context. In order to learn more about what the inhabitants of this site ate and the types of faunal resources available, soil samples were collected from the top of each zone described below. Excavations revealed a dense midden deposit heaped up against the eastern exterior retaining wall of Structure 24 (**Figure 16.4**). The midden debris was removed as Zones 2 and 3 and included ceramic debris, faunal bone, lithic debitage, shell, and a small amount of human remains. The dense midden deposit was found overlying a packed earthen plaza floor surface (Zone 7), which was defined but not excavated at the base of the unit. An ancient pit or posthole feature was found associated with the plaza surface and was excavated separately as Zone 8. Below, we provide the descriptions of each of the eight zones defined in the excavation of Operation 28.

Zone 1

Zone 1 was a 15-20 cm thick topzone consisting of an organic-rich humic layer. The soil was a dark brown loam filled with leaves in all stages of decomposition, twigs and roots (10YR 3/1). Larger stones in the western portion of the unit were left in place to test whether they were part of the structure wall or not. The topzone soil sloped down toward the east off the mound and was removed with a flat shovel. Lithic debitage, ceramic sherds and faunal remains were collected in this zone. The zone was halted when the soil changed color and artifact density increased. The stones in the western portion of the unit are oriented roughly north-south and were defined at the base of Zone 1. They represent the wall stones that have slumped forward slightly, falling from the east side of Structure 24. These were ultimately removed as part of Zone 5 collapse debris (see below).



**Figure 16.4 Cross-section drawings of Op. 28
(drawn by E. Harrison-Buck, digitized by M. Brouwer Burg).**

Zone 2

Zone 2 appears to be a mix of overburden and the beginning of the midden deposit, an intermediary zone caused by taphonomic mixing of the midden (Zone 3) and the layering of organic/collapse material above it (Zone 1). The soil changed to a clay-silt with a Munsell value of 10YR 2/1. A higher density of artifacts and a more densely packed clay matrix characterized this zone. Its thickness ranged from 9 cm to 19 cm. The top of an intact midden (Zone 3) and some human remains were found in the western quarter of the unit. The midden and more human remains were found in a related soil context further east in the unit at a deeper elevation. This context change marked the end of Zone 2 and demonstrated a noticeable slope in the unit profile. Artifacts recovered from this zone include ceramic sherds and lithic debitage.

Zone 3

At the top of Zone 3 we had defined an intact midden heap (**Figure 16.6**). This matrix was filled with ceramic body sherds, rim sherds, debitage, faunal material and some human bone. The matrix was a silty-clay with a Munsell value of 10YR 3/1. It was speckled with crushed ceramic, bone, shell and lithics. As previously noted, human remains were scattered across the top of this zone. A mandible was recovered from the northwestern corner, a long bone from the

southwestern corner and another possible human bone was recovered in the center of the western half of the unit (see **Figure 16.5**). Human remains were excavated carefully, wrapped in foil, labeled with provenience and a north arrow based on the *in situ* position of the bone. The Zone 3 midden sloped dramatically, demonstrating the “heaped” nature of a midden piled against the retaining wall of a platform (Structure 24). Elevation was higher in the west, and the midden used to be heaped against the eastern side of Structure 24 (visible in south wall profile in **Figure 16.4**). A sample from the top of the midden was collected. This sample was recovered with a thin trowel scrape across the entire square. Everything in the scrape, including soil matrix, was bagged in three, 8 oz. cloth field collection bags to be flotted and analyzed for faunal remains by our BREA specialist. The sample may be able to reveal what species of fauna the Maya of this region and time were exploiting. These data may also help environmental reconstruction efforts for this region as well.

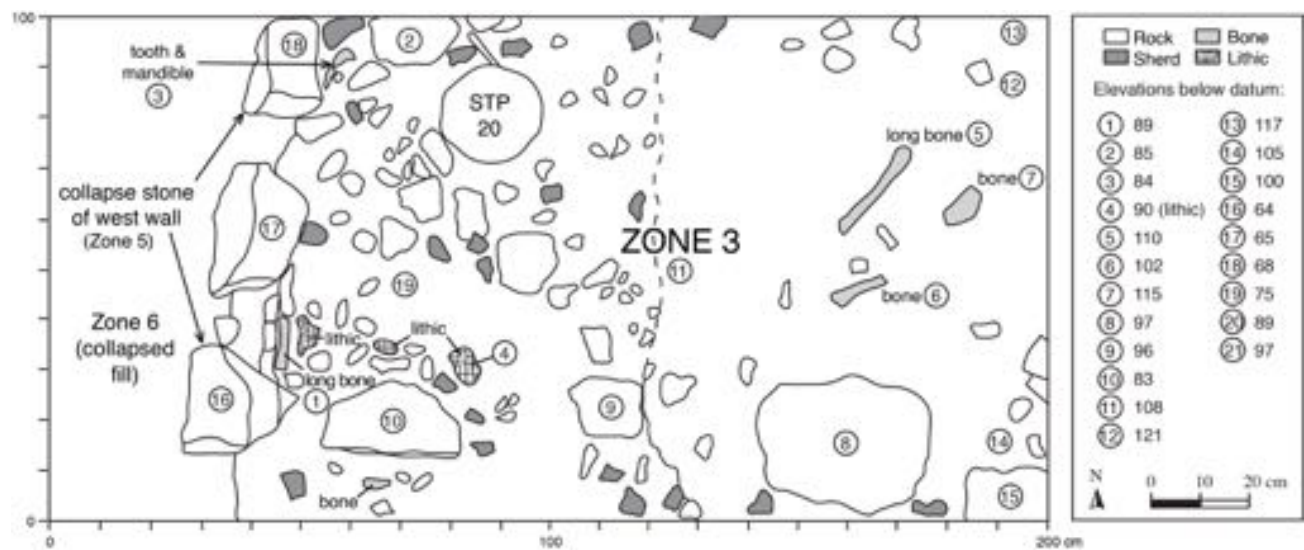


Figure 16.5 Planview of Op. 28 showing Zone 3 midden deposit (drawn by E. Harrison-Buck, digitized by M. Brouwer Burg).

Zone 4

Zone 4 consists of the topzone over the small portion of the platform structure exposed along the western edge of Op. 28. Excavating this area separately allows us to isolate any potential terminal debris on the surface of the platform and to distinguish it from the context to the east of the line of stones, outside of the retaining wall. The line of stones turned out to be collapsed stones of the retaining wall for the platform of Structure 24. The intact wall is barely visible in the western wall of the excavation unit (**Figure 16.4**). Few artifacts were found in this zone, including lithic debitage and seemingly non-diagnostic ceramic sherds. The Munsell value and soil type were the same as Zone 1, discussed above.

Zone 5

Zone 5 was the line of large stones in the western portion of the square (**Figures 16.4 and 16.6**). These stones were oriented roughly north-south and initially thought to be an intact retaining wall for Structure 24. Ultimately, it was determined to be the collapsed top course of stones of the eastern retaining wall of Structure 24 that had retained a north-south line when it slumped forward. The midden may have helped to retain its linear arrangement as the stones were in direct contact with the midden.

Zone 6

Zone 6 was collapse debris sitting on top of the intact eastern retaining wall of Str. 24. The zone is a small area below Zone 4 to the west of the north-south oriented line of stones (Zone 5) that was removed as collapse (**Figure 16.5**). This material is likely the fill of Structure 24 that spilled out when the front stones (Zone 5) fell forward onto the midden (see **Figure 16.4**). The Zone was composed mostly of medium-sized cobbles, likely the remains of the Str. 24 construction fill that spilled out on and right in front (to the east of) the intact wall. No artifacts were recovered from Zone 6. The collapsed cobble lay on the surface of the intact wall and some of the midden context closest to the structure.

Zone 7

Zone 7 consists of a packed earthen floor that was a lighter gray color than the dark matrix of the midden deposit, which lay directly over top of the floor (**Figures 16.6 and 16.7**). Remains of the midden deposit (Zone 3) were defined resting on the floor, including large fragments of ceramics and a nearly complete turtle carapace located near the surface of the floor, situated up against the exterior of the eastern wall of Str. 24 (see **Figures 16.6 and 16.6**). The Zone 7 packed earthen floor surface was not excavated, but its surface was defined at the base of Zone 3, distinguished by its lighter gray color with flecks of limestone sascab. The floor appears level and artifacts were found lying flat on its surface. Additionally, an ancient postmold feature (Zone 8) was found associated with the surface, cutting into Zone 7 (see below).

Zone 8

Zone 8 is a posthole or small pit feature (~30cm in dia) found cutting into the Zone 7 floor surface (**Figures 16.6-16.8**). The pit was distinguished by a significantly darker matrix consisting of a black soil with a Munsell color of 7.5YR 2.5/1. The posthole is positioned about 40 cm east of the Str. 24 retaining wall. Excavation of the postmold revealed a light density of artifacts and few inclusions, but exposed in its sidewalls a fill of small-sized cobbles with a clayey matrix that makes up the fill of the Zone 7 surface.

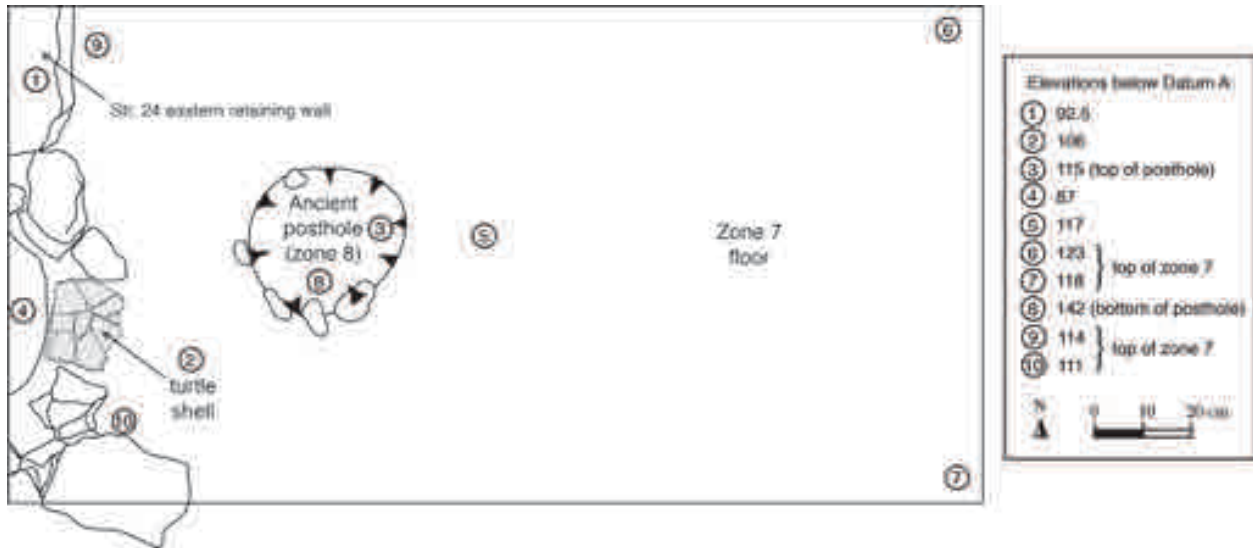


Figure 16.6 Planview of Op. 28 showing the eastern edge of Structure 24 retaining wall, Zone 7 floor and an associated ancient posthole (Zone 8) intruding into the floor. Note turtle carapace (part of Zone 3) resting on the Zone 7 floor (drawn by E. Harrison-Buck, digitized by M. Brouwer Burg).

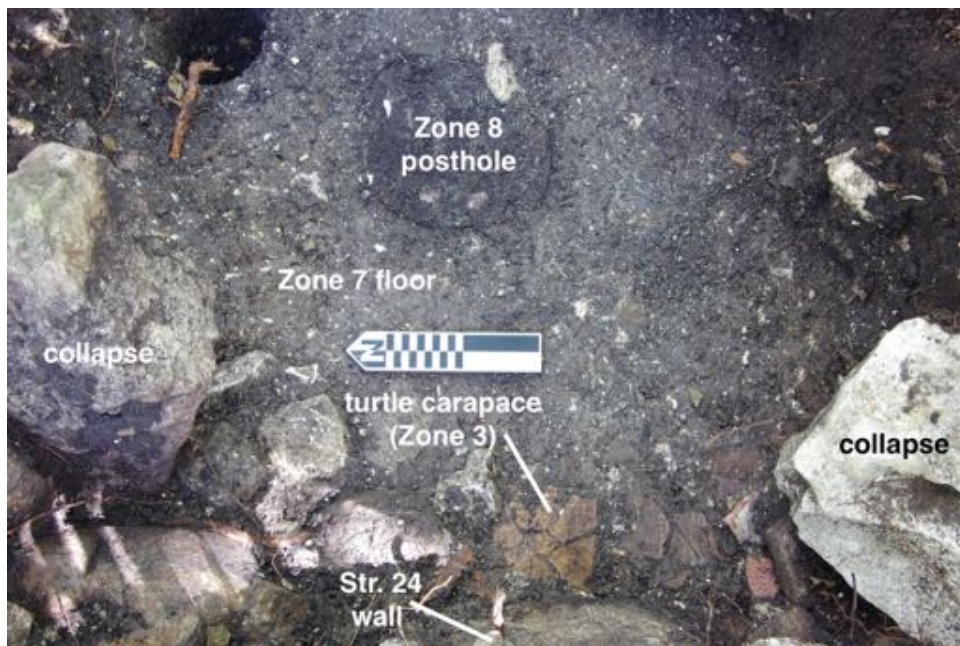


Figure 16.7 Close-up photo of Op. 28 showing turtle carapace (part of Zone 3) up against the eastern edge of Structure 24 retaining wall and resting on the Zone 7 floor. Visible is STP3-20 and an associated ancient posthole (Zone 8) intruding into the Zone 7 floor in the background (Photo by E. Harrison-Buck).



Figure 16.8 Closing shot of Op. 28 (photo by S. Murata).

Discussion

While Op. 28 revealed a rich intact midden along the “back-side” of Structure 24, the midden found in Op. 27 likely represents a fill layer of re-deposited trash. In the case of Op. j27, the midden debris appears to have been re-used for fill in a later phase of construction as fill associated with the building of another plaza surface (Phase II). The midden material (Zone 3) in Op. 27 was not sloping, but deposited in a level manner and capped with a surface (Zone 2) consisting of midden material mixed with a concentration of tiny limestone pebbles and sascab

flecks indicative of a plaza floor. The construction of this later fill and floor surface in the plaza area may coincide with a later phase of construction added to the exterior retaining wall of Str. 26. In contrast, the Op. 28 midden appears to be in a primary context. The midden deposit slopes downward off the eastern side of Str. 24 and appears to be heaped against the building. No surface caps this deposit.

The midden material from both Operations 27 and 28 yielded exceedingly high densities of faunal material as well as other fragmentary remains of trash material, primarily broken pieces of pottery and lithic debris. There are many diagnostic ceramic sherds and these contexts should be datable and future analysis is planned. The high density of faunal remains found within the two excavations was fortuitous given the goals of the excavations. Soil samples that were collected throughout the excavations will undergo flotation in a future lab season as part of a study by our faunal specialist, Lori Phillips (see Phillips, this volume). The heavy fraction of the flotation samples will be sorted to identify smaller faunal remains that typically fall through the ¼ inch mesh screen. These faunal analyses will shed light on what faunal resources were available and what particularly resources were exploited over time by the ancient Maya of Jabonche.

Chapter 17

Future Directions for BRE A

Eleanor Harrison-Buck

The 2014-2015 field seasons yielded tremendously productive results, as these chapters attest. By the end of the 2015 season, the BRE A project had identified a total of 2000 mounds representing over 80 different sites in the middle Belize Valley alone, which had never been mapped before (**Figures 1.1** and **1.2** [Harrison-Buck 2011, 2013]). In 2015, we plan to spend the summer doing a lab season and will return in 2016 to build on our prior research, carrying out further survey, mapping, and excavation of select sites in the BRE A study.

During the January-February 2015 season as we wrapped up our work in the middle reaches of the Belize River valley, we began to turn our attention to the lower half of the Belize Watershed where we find several large tracts of perennial wetlands (Harrison-Buck 2014). Another major goal of our fieldwork accomplished during 2015 was to lay the groundwork for a long-term, interdisciplinary study, aimed at investigating ancient Maya settlement distribution in relation to wetland use.

Through this long-term, interdisciplinary study, we aim to explore how environment, wetland agriculture, and ancient Maya society operated together in the eastern Belize Watershed through time. Research has shown that wetland environments provide important proxies for gauging climate change, such as drought, and for understanding human-environment interactions and adaptive responses to stress in the Maya area (Beach et al. 2009; Dunning et al. 2012; Emery and Thornton 2012, 2013; Luzzadder-Beach et al. 2012). Numerous paleoenvironmental studies point to pan-regional drought conditions during different periods of Maya prehistory, the most famous being the one around the time of the political collapse of many large Peten-affiliated Maya centers at the end of the Late Classic period (see Turner and Sabloff 2012 for a recent review).

Future Research Objectives

Our main research objectives for future seasons will continue to build on the 2014-2015 fieldwork presented herein. During the summer of 2015 we will hold a lab season and conduct artifact analysis. In January of 2016, we will continue to focus our efforts primarily in the middle parts of the Belize River valley in the area between the confluences of Saturday Creek and Labouring Creek. During the summer of 2016, we plan to expand on our reconnaissance in the eastern, lower part of the watershed in and around the vast wetlands that occupy many of the tributaries and water bodies, such as Western Lagoon, ones Lagoon, Black Creek, and Labouring

Creek (**Figure 1.1**) where we plan to carry out additional survey, mapping, and test excavation in future seasons. Below we outline a number of specific goals we have in mind for future field seasons:

1. Continue to investigate the north-south overland route and document evidence of Spanish Contact at Saturday Creek in the middle reaches of the Belize Valley.
2. Expand our initial reconnaissance of the ancient sites and modified wetlands in the lower Belize Watershed and map with the Total Station the sites in the hinterlands of Altun Ha (e.g., Canton and Sikaffy Site).
3. Conduct additional test excavations at Jabonche and other sites in this area.
4. Investigate a series of possible salt- and pottery-making sites in the Jones Lagoon area in the easternmost part of the Belize watershed, closest to the coast, along with soil sampling here and elsewhere in the valley.

Proposed Future Activities

One of our overall research objectives for the BREA project is to develop a more comprehensive settlement history and a more specific understanding of changes that occurred among the Belize Valley settlements of the eastern half of the watershed. Through our archaeological investigations, we seek to understand how these settlements were impacted during periods of significant cultural transformation in Maya history—first during the Preclassic-Classic transition, then later during the so-called Classic Maya “collapse” period, and finally during the Spanish Conquest in the sixteenth and seventeenth centuries. Our future research objectives, outlined below, will continue to build on these overarching goals.

Objective 1

The Spanish ethnohistoric accounts mention a north-south overland route that the colonial period friars used in their attempts to pacify the Maya living at sites, such as Tipu, along the Belize River, and the Itza living farther to the west in the Peten region of Guatemala (Jones 1989; Scholes and Roys 1977). This overland route was said to stem from the headwaters of the New River and run south, crossing Labouring Creek to where it intersected the mid-section of the Belize River. Our survey suggests that the densely settled site of Saturday Creek and the nearby site of Chikin Chi’Haal and its neighboring ceremonial group Hats Kaab mark an important crossroads where we suggest the north-south overland route may have entered the mid-section of the Belize River. Our investigations of the Southwest Plaza at Saturday Creek have revealed our first solid evidence of Spanish Contact with the Maya living at the “crossroads” and we will continue to investigate this site in 2016 for additional evidence of occupation during this period of profound transformation in the Maya area. Additionally, we plan to map and test the site of Chikin Chi’Haal in 2016.

Elsewhere, I argue that the overland route pre-dates the Spanish Conquest and was used by the Maya as early as the Terminal Classic period (Harrison-Buck 2010). In our expanded survey of this north-south route, I anticipate finding additional clusters of ancient Maya settlement lining the length of this north-south overland route. In 2016, we will continue to conduct intensive pedestrian survey along the north-south transect where we have not yet carried out any reconnaissance, beginning at a pine ridge forest located between the East Gate of the Yalbac property and the Program for Belize (PfB) gate. Survey teams will walk south along this pine ridge to Jaegar wetlands where a large site with a 13 m high pyramid has been identified just north of Whitewater Lagoon proximate to the Jaegar wetlands where an extensive stretch of ditched and drained fields exist.

Objective 2

In just two short weeks of preliminary reconnaissance in the lower eastern part of the study area, our recon team documented an overwhelming number of mounds (>1000). More no doubt exist and we plan to expand on the reconnaissance in this area, which includes the area around Altun Ha, along the main trunk of the Belize River, as well as the Spanish Creek tributary where we have been told by local informants a number of sizeable sites exist. We also aim to conduct additional reconnaissance of the wetlands along the tributaries of the Belize River, including Washing Tree and Western Lagoon wetlands where evidence of modified fields can be seen in publically available satellite imagery.

Within the 6000 km² BREA study area, there are over 122 km² of perennial wetlands, which is significant given there is only a total of 436km² of wetlands in the entire country of Belize (Meerman and Sabido 2010:Table 2). In satellite imagery that is freely available to the public (e.g., Google Earth), ditched and drained fields as well as other hydrological features are visible in many of the perennial wetlands of the BREA study area, including Jaegar and Washing Tree wetlands, Labouring Creek, Western Lagoon, and the Spanish and Black Creeks. We believe there are preserved ditched and drained fields in virtually all of the perennial wetlands in the BREA study area (**Figure 17.1**). The wetland features that I have observed in the imagery from the BREA study area are strikingly similar to the hydrological features identified and excavated in the perennial wetlands of northern Belize (Baker 2003; Beach et al. 2009; Guderjan and Krause 2011; Luzzadder-Beach et al. 2012).

Our preliminary reconnaissance of wetland features and their associated sites will lay the groundwork for more extensive investigations planned for future field seasons. We will begin our investigations by doing an aerial flight in a small, low-flying plane over the BREA wetlands at the onset of the rainy season and also plan to use drones to survey these hard-to-reach areas. According to Siemens and Puleston (1972:229), the ridges and canals of wetland fields tend to be particularly well defined by color differences in the vegetation at the onset of the rainy season. Guderjan and Krause (2011) note that air reconnaissance in a small, low-flying aircraft offers the best vantage point for discerning wetland fields and capturing them in oblique photographs and we also believe that drones offer another potentially useful method for accurately and efficiently

mapping these features. Our next step will be to pinpoint locations of the modified fields on our master GIS map. We will do some preliminary ground-truthing along the Spanish and Black Creeks, including Washing Tree Wetlands in the vicinity of the site of Jabonche on Black Creek, accessible via the Northern Highway. Following the aerial mapping, our aim is to sample a number of areas with test excavations in the future.



Figure 17.1. Map of BREA study area showing locations of wetland fields (drafted by M. Brouwer Burg).

Objective 3

A third goal of future field seasons will involve further test excavation at the site of Jabonche (**Figure 1.1**). In January-February 2015, we mapped the site center of Jabonche with a Total Station (Murata and Robinson, this volume). During this time we also performed test excavations in a northern residential group (Flanagan and Frederick, this volume) and also performed a broad horizontal exposure of an unusual columned structure in the southern plaza (Harrison-Buck, this volume). Further investigation of this area planned for future field seasons is aimed at clarifying the layout and configuration of the columned building and its chronological placement. We also plan to test other areas of the site to determine the overall site chronology,

including the three sacbes and a stone monument in the main plaza that were identified by our survey team in 2015 (see Murata and Robinson, this volume).

Objective 4

We aim to further investigate the site of Jones Lagoon as a possible location of ancient Maya salt and pottery production. This site, located at the northern end of Jones Lagoon, consists of roughly 10-15 mounds (but possibly more), which were identified during the 2015 season (see Norris et al., this volume). The configuration of the mounds is reminiscent of the salt- and pottery-making site of Wits Cah Ak'al (WCA), located at the boundary of the Sibun and Belize Watersheds, just east of Belize City near the modern town of Hattieville on the Western Highway. Excavations at WCA have revealed a series of sizeable earthen mounds filled with debris from saltmaking, as well as pottery production (Murata 2011). The site shows little to no evidence of habitation and appears to be strictly a large-scale production locale. The local clays are ideal for pottery production and salt can be extracted from the brackish lagoon waters. The mounds contain no standing architecture and in some cases debris, such as vessel fragments, spacers and clay supports associated with salt production, are visible on the surface. WCA is situated at the interface of pine savannah and wetland environments and is adjacent to Hector Lagoon, which is brackish. Jones Lagoon has a similar environment and is an ideal location where such activities may have been taking place. We aim to test this hypothesis in future seasons.

Additionally, we would like to conduct systematic soil sampling in order to test soils for their clay and saline properties, which will be directed by soil specialist Dr. Serita Frey. She will conduct soil biogeochemical analyses to trace the local source(s) of clay for ceramic production and saline properties ideal for salt production in the areas where such production locales are thought to exist.

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