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Surviving Collapse: Collective Memory and Political Reorganization at Actuncan, Belize

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by

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Abstract of the Dissertation

Surviving Collapse:
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This dissertation focuses on a study of political reorganization at the ancient Maya site of Actuncan, Belize following the 9th century collapse of Classic Maya society. During the Terminal Classic period (A.D. 780–1000), Maya divine kingship was gradually abandoned, leading to increased warfare, regional food scarcity, and mass migration. In contrast to broader trends, the residents of Actuncan did not leave. In this dissertation, I draw on the theoretical frameworks of resilience theory and collective memory to explain why Actuncan was not abandoned and how the local community reorganized its political and ritual institutions after the failure of divine kingship. I base my arguments on excavation, artefactual, and chemical data from Group 4, a civic center, and low platforms in Plaza A, all of which were built entirely during the Terminal Classic period. These data allow me to explore how the people of Actuncan reorganized their political and ritual institutions in the aftermath of the Maya collapse.

To consider the specific circumstances that led to Actuncan's Terminal Classic renaissance, I frame the site's reorganization in the terms of resilience theory and collective

memory. Resilience theory provides a useful way to organize the complex processes concerning the collapse of Maya society. I draw on the resilience theory to develop four alternate hypotheses for Actuncan's Terminal Classic organization. Evidence for the form and function of Group 4 was matched to testable correlates associated with possible hierarchical, corporate, mercantile, or ritual underpinnings of Actuncan's new political organization.

While resilience theory provides an outline of options that communities might have taken as they reorganized their societies, I draw on collective memory as a tool to understand why they made the choices they did. To do this, I trace Actuncan's social and political history through a reconstruction of the site's urban development to understand how the local community remembered their past. My excavations in Plaza A targeted evidence for Terminal Classic activity in a space originally constructed a millennium earlier by the site's Late Preclassic rulers.

My methods focused on collecting three scales of data that contributed to understanding how and why Actuncan's community was reorganized. At the middle scale, Group 4's architectural form was uncovered through over 400 m^2 of horizontal excavations. Based on a comparison to other examples of Maya civic architecture, these data indicate that Group 4 was built to support a corporate ideology. At the small scale, I collected samples for soil chemistry and microartifact analysis from across the surface of Group 4. Based on these data, I identified evidence for food preparation and consumption. I argue that Group 4 was a council, or *popol nah*, and the center of a corporate form of authority.

At the largest scale, I aimed to reconstruct changes in the organization and function of Actuncan's public spaces during the Terminal Classic period. First, my excavations in Plaza A targeted low platforms to test whether they were constructed during the Terminal Classic period. In combination with other data collected by James McGovern in the 1990s and my colleague on the Actuncan Archaeological Project, I reconstructed Actuncan's political and household histories. Together, these data indicate that the Terminal Classic community at Actuncan transformed Actuncan's site core to focus ritual attention on the site's most distant past. In the part of the site around Group 4, old buildings were dismantled or desecrated.

My results indicate that Group 4 was constructed as a council house that was the seat of new inclusive political institutions. I suggest that the strategies enacted by the community and the council were a direct repudiation of the failed autocratic power of Classic period kings. I conclude that the community separated the ritual and political aspects of life. Not only were leaders no longer divine, but religious practice was physically separated from the political infrastructure. I argue the community's inclusive reorganization drew on the memory of the site's own Preclassic shared leadership structure and the latent power of commoner lineage heads.

Chapter 1. INTRODUCTION

1.1 Introduction

The jungle-covered cities of the ancient Maya have long captured the imaginations of explorers, archaeologists, and the otherwise curious. Visions of giant trees sprouting from towering pyramids and vine covered carved monuments have been popularized since the early adventures of John Lloyd Stephens and Fredrick Catherwood (Stephens 1841). These images have framed research on the ancient Maya and explain to some extent the long-term focus of research on the collapse of their Classic period (A.D. 250–780) society. Indeed, the 9th century A.D. failure of Classic Maya society is often cited as one of the primary exemplars for societal collapse (Culbert 1988, 1973; Diamond 2005:157-177; Tainter 1988:152-177; Thompson 1954; Webster 2002).

What we know is that the ancient lowland Maya faced the widespread failure of a hierarchical system of governance headed by divine kings during the Late (A.D. 600-780) and Terminal Classic periods (A.D. 780-1000) (Demarest et al. 2004b). Commonly referred to as the Maya collapse, the failure of this political system compelled local Maya communities to reshape their society. In some regions, especially in the southern Lowlands, this period of political strife was accompanied by population decline, endemic warfare, and drought (Culbert 1973; Demarest et al. 1997; Gill 2000; Turner 1990; Yaeger and Hodell 2008). Furthermore, rather than universal catastrophic collapse, the Terminal Classic period is now understood to be marked by regional variation in the pace and consequences of this political failure (Aimers 2007; Demarest et al.

2004a). In other words, the collapse did not take place instantaneously across the breadth of the Maya Lowlands. Rather, populations declined gradually and kings fell one-by-one, periodically leaving kingdoms leaderless.

Research into the Maya collapse often focuses on its causes and catastrophic effects, with little consideration for the social organization of remnant communities. Explanations for the collapse frequently map onto modern anxieties about the future failure of our own civilization (Tainter 2008; Wilk 1985) and focus on elite-centric data related to the trajectory of political entities. Recently, however, archaeologists have pushed back against sensationalized depictions of past civilization failures. These researchers have shifted focus to exploring the inevitability of societal reorganization by those who survive the events of collapse (Costanza et al. 2007b; Eisenstadt 1988; McAnany and Yoffee 2010b; Schwartz and Nichols 2006). McAnany and Yoffee (2010a) go so far as to explicitly argue that sensationalizing collapse presents ethical challenges, while studying past instances of resilience, sustainability, and reorganization provides insight into humanity's adaptive potential and successful strategies adopted in the past.

In Maya archaeology, this shift has led to a new focus on the communities that survived the collapse. Some researchers have advocated for viewing the Late and Terminal Classic periods as a time of transformations and transitions rather than collapse (Aimers 2007; Demarest et al. 2004a). Indeed, Mayanists have long debated the merits of approaching the collapse strictly as an endpoint brought on by fundamental weaknesses in Classic Maya society (Erasmus 1968; Sabloff and Willey 1967). Similarly, others argue against using the term "collapse" because it deemphasizes the Postclassic, historic, and modern Maya who lived after the failure of the Classic Maya states (D. Z. Chase and A. F. Chase 2004; McAnany and Gallareta Negrón 2010). Certainly research on the Postclassic period (A.D. 1000–1567) shows it is no longer fair nor accurate to characterize the Postclassic Maya as inferior to their Classic period predecessors (Chase and Rice 1985; D. Z. Chase and A. F. Chase 2004; Pendergast 1990:169).

That said, research on the Terminal Classic to Postclassic transition has generally focused on continuity and disjuncture over the long-term. This focus is important for understanding the changes that took place in Maya society; however, it does little to explain the processes behind sociopolitical reorganization after the Maya collapse. Furthermore, as populations declined in the Terminal Classic period (Turner 1990) the decision to remain in the southern Lowlands was exceptional and must have reflected the choices made by specific individuals, households, and communities. Only recently have researchers begun to research the strategies these remnant communities adopted in the immediate aftermath of the political collapse (see Lamoureux-St-Hilaire et al. 2015; Schwarz 2009). Following this thread, my approach looks beyond elite markers of the collapse to consider the agency of households, factions, and communities in determining the trajectories of their post-collapse lives (Schwarz 2013b). In contrast to areas that were completely depopulated or experienced royal revivals (Tourtellot and González 2004), the salience of self-determination and local innovation is particularly important in areas where regal power appears to have rapidly disappeared, leaving commoners to reorganize themselves (Eberl 2014; Iannone et al. 2014; Scherer and Golden 2014).

The site of Actuncan, Belize provides a particularly rich setting to research the events of the collapse. Neighboring sites in the upper Belize River valley have been the subject of archaeological investigation for over a century, leading to a particularly robust regional data set. Furthermore, research in the 1990s by the Xunantunich Archaeological Project provided a detailed understanding of the political entanglements and strategies of the region’s final kings

(LeCount and Yaeger 2010b). In 2010, the Actuncan Archaeological Project (AAP) discovered that Actuncan experienced a renaissance in construction and occupation during the period of Xunantunich's decline and the depopulation of the hinterlands (LeCount et al. 2011). This discovery was striking because previous research at Actuncan indicated that the site was primarily occupied during the Late Preclassic and Early Classic periods (400 B.C.–A.D. 600). Most importantly, preliminary excavations indicated that a large architectural complex (Group 4) was likely built as a new public center within the site (Mendelsohn and Keller 2011).

Actuncan's Terminal Classic renaissance serves as the primary topic of this dissertation. Drawing on data from across the site, I investigate the political strategies adopted by the Actuncan community in the aftermath of the Maya collapse. In this pursuit, I draw inspiration from resilience theory and collective memory studies to consider the local contingencies that structured the community's post-collapse innovation. To me, the process of political collapse and community reorganization are interesting because it provides an opportunity for novel invention and is structured by the knowledge and experiences of negotiating stakeholders. Innovation is ultimately incremental and anchored in reconfigurations of what came before.

1.2 Collapse and a Framework for Research

While archaeological research has a long history of addressing societal collapse (Culbert 1973; Dalfes et al. 1997; Tainter 1988; Webster 2002; Yoffee and Cowgill 1988), recently, research has focused more directly on the regeneration of complex societies rather than just the events leading up to collapse (Eisenstadt 1988; McAnany and Yoffee 2010b; Schwartz and Nichols 2006). This new focus has redirected the discussion from the frailty of human societies to their resilience (Adams 1978; Butzer 2012; Gunderson and Holling 2002; Redman 2005;

Redman and Kinzig 2003; Walker and Salt 2006).

Following Tainter (1988:4), I define collapse as a fundamentally a political process. Collapse does not result from shifts in the relative power between peer polities. During the Maya Classic period, rulers of individual polities were frequently replaced, and the extent of their hegemony was highly variable (Martin and Grube 2008). This variability existed within a dynamic system of competing polities in which strong polities expanded by subordinating others, only to see their power subsequently wane as subordinates gained independence (Marcus 1993). Rather, collapse happens when an entire political system fails, resulting in wide-ranging side effects that reach well beyond the political sphere. In the case of the ancient Maya, the collapse ended the reigns of hereditary divine kings and resulted in a broad social crisis because Maya kingship was deeply entangled in religious and economic structures (Demarest 1992; Freidel and Reilly 2010; Freidel and Schele 1988; Freidel et al. 1993; Freidel and Shaw 2000). Once the political system collapsed, hierarchies and structures of centralized control fragmented, and previously integrated cities, towns, and villages became isolated (Freter 1994; Yaeger 2003).

While collapse is devastating to existing political elites, models of resilience point out that it provides an opening for experimentation, innovation, and adaptation for other members of society (Holling and Gunderson 2002:45-47), often resulting in substantial societal change (Nelson 1999; Nelson et al. 2006). Resilience theory (Faulseit 2016b; Gunderson and Holling 2002; Walker and Salt 2006) argues that following cycles of collapse, resilient aspects of society form the basis for reorganization. Because of the fragmentation caused by collapse, post-collapse reorganization occurs initially at the community level where local groups are forced to reevaluate the underpinnings of their society and implement innovative solutions to solve their social crisis. For these communities, survival must have derived from resilient strategies anchored in local experiences.

Though the Maya collapse was a slow process that impacted different lowland polities over a period of 300 years, collapse and regeneration can be seen at any individual site through dramatic disjunctions in the archaeological record (Beck et al. 2007). These transformations are often visible through changes in markers such as material culture, settlement patterns, the built environment, and ritual behavior. Therefore, archaeologists should look to localized changes in archaeological patterns to study how post-collapse societies remake themselves in the immediate aftermath of collapse.

My research focuses on how the Actuncan community drew on local histories and collective memory to remodel their social institutions in response to collapse (McIntosh et al. 2000). Here, I define collective memory as a group's collective understanding of the way things were in the past (Van Dyke and Alcock 2003:2). Within models of resilience, recent memory from the collapse period is attributed two roles in the redevelopment of political institutions. First, local memory of pre-collapse institutions serves as a blueprint for the construction of new institutions (Holling et al. 2002:72-76; Walker and Salt 2006:91). Societies are inherently conservative and use preexisting ideas as a starting point in the processes of developing a new political framework (Bronson 2006; Schwartz 2006:10-11). For example, in the transition from Old to Middle Kingdoms in Egypt, the new political institutions appeared remarkably similar to the old, with only ideational weakening of pharaonic authority (Morris 2006). This is understandable because in the chaos that usually follows political collapse, past institutions serve as the most fully formed template local populations can draw on to facilitate rebuilding. Second, collective memory serves as the greatest source of motivation for change. Change is driven by local memory of the trauma of collapse and the failures of pre-collapse institutions. For example, between A.D. 800 and 1100 in the Río Verde valley in Oaxaca, Mexico, local populations actively rejected the preexisting local political ideologies of divine kingship following a period of strife through monument destruction and transformation of sacred space into mundane domestic space (Joyce et al. 2001). The result is a locally situated process of negotiation in which preexisting institutions are selectively modified, rejected, or maintained in order to create a new, coherent society (Chase and Chase 2006; Sims 2006:116-119). Archaeologically, the results of this process can be seen through changes in the form and use of the built environment (Beck et al. 2007; Cobb and King 2005).

Additionally, the moral legitimacy of new forms of authority is built within older frameworks of memory. In long occupied settings like the Terminal Classic Maya lowlands, rebuilding societies had to contend with the inscribed reminders of the past in the form of the built environment (Bradley 1998). Used strategically, the built environment may be manipulated to root new structures of authority in the past (Alcock 2002), as seen in the Roman emperor Augustus's construction of a temple in glorification of himself on the ancient Athenian Acropolis (Thakur 2007). Through collective ceremony and spectacle, old monuments, including monumental architecture, can be resignified to meet the needs of the present. The manipulation of monuments in the process of legitimization can be seen archaeologically through the material remains of social practices that create and modify memories (Mills and Walker 2008a). However, monuments can only be manipulated effectively if the present day perception of their past is accounted for (Ashmore 2002).

One approach to understanding the collective memory surrounding monuments is to track how they might have been collectively remembered through time. Collective remembering is a social process through which a collective understanding of the past results from the convergence of individually held memories. A collective remembering approach considers how the past is remembered through interactions between people, places, and materials. Importantly, groups with divergent understandings of the past, called mnemonic communities by Zerubavel (1996), may emerge from the process of collective remembering. I argue that considering the process of collective remembering may provide archaeologists access to alternative narratives of the past that exist alongside the official narrative propagated by those in power. By treating Actuncan as a mnemonic community, I use a collective remembering framework to trace how its past may have been understood in the Terminal Classic period. I use this framework to explain Terminal Classic ritual activity and changes in the urban plan at Actuncan.

1.3 Research Questions

The chapters that follow address two primary research questions:

1) *What is the political organization formed at Actuncan during the Terminal Classic period?*

Because this research looks explicitly at political transition, understanding the structure of Actuncan's community before and after the site's reorganization is critical to pinpointing the way the local community changed in the wake of political collapse. The pre-collapse community is relatively well understood based on the AAP's recent excavations and a long history of community research in the Belize River valley (Garber 2004; LeCount and Yaeger 2010c; Mixter et al. 2012a; Robin 2012; Yaeger 2000a, b). During the Late Classic period, several similarly sized centers ruled by divine kings appear to have competed for control over the valley, aided and abetted by the rulers of larger, more powerful polities outside the region. At this time, Actuncan was a secondary center occupied by a small urban population within the Xunantunich polity.

In contrast to demographic trends seen elsewhere in the Belize River valley, recent excavations of households at Actuncan indicate that populations remained steady during the Terminal Classic period (Mixter et al. 2012b). Further, test excavations indicate a resumption of public architecture erection at the site centered around the construction of Group 4 (LeCount et al. 2011; Mendelsohn and Keller 2011). Following Maya practices of design, Group 4's architectural form would have reflected the institutional ideologies it was intended to house (Kowalski 2003; Schele and Freidel 1990; Webster 2001). Because Group 4 is the largest Terminal Classic construction at Actuncan, these ideologies reflect institutions of authority able to mobilize community labor. The activities that took place in this group point to the enactment of these political ideologies and the realities of public life under the Terminal Classic regime (Houston and Stuart 2001).

Research into the first question draws on two primary data sets. First, excavations at Group 4 targeted that complex's architecture. The form of this space is compared to known architectural features to evaluate its intended function. Second, these architectural data are supplemented by direct evidence of the activities that took place within Group 4. If the architecture points to the intended political ideology embodied by Group 4, then the activities point to the actualization of that reality.

2) How did members of the Actuncan community draw on their memory of the past in the process of societal reorganization?

Actuncan's Terminal Classic center was built within the remains of a larger, Classic period (A.D. 250-780) civic and ceremonial center that featured several imposing temples. This architecture would have served as a constant reminder of the site's history during negotiations that led to Actuncan's political reorganization in the Terminal Classic period. Community members likely had strong memories of their past, especially concerning the defunct political institutions these buildings represented (Joyce et al. 2001). Nonetheless, these same buildings also maintained deep ritual significance from their association with cosmological constructs (Ashmore and Sabloff 2002; Benavides C. 2008; Freidel et al. 1993:231-256; McAnany 1998; Schele and Mathews 1998). The community's remembrance of these structures played a critical and complex role during political negotiations to establish new forms of governance. Based on their views of the past and their visions of the future, aspiring power brokers would have manipulated the collective memory of civic buildings to legitimize their authority through ceremonies and rituals. The kinds (or absence) of ritual activities associated with civic structures built prior to the collapse will point to the community's relationship with this past and the aspects of that past that influenced and legitimized the Terminal Classic political organization (Ashmore 2002; Canuto and Andrews 2008).

Research into this second question focuses on the Terminal Classic use of Actuncan's urban landscape. The Terminal Classic residents of Actuncan occupied the remains of a Terminal Preclassic (150 B.C.–A.D. 250) royal capital. As such, their new civic center was surrounded by at least a millennium of monumental construction. The treatment of Actuncan's old buildings and the rearrangement of its architectural plan point to which of these old spaces the Terminal Classic occupants viewed as important and taboo.

1.4 Organization of this Dissertation

In this dissertation, I present the results of research carried out during field and laboratory seasons that took place from 2010 to 2014. My excavations of Group 4 revealed that it was very different from the elite palaces that functionally preceded it. Rather than exclusive, secretive events, Group 4 was clearly constructed to host a more public political process dependent on inclusive rather than exclusionary events. My activity area study of Group 4's surface supports this inclusive public function. The resulting data indicate that Group 4 functioned as a venue for public and inclusive food preparation and consumption. I argue that this space was likely used as a council house, or *popol nah*. My investigations of Terminal Classic ritual deposits and changes to Actuncan's urban layout indicate that the community selectively revered, desecrated, dismantled, and ignored buildings constructed during the site's Preclassic and Classic period past.

Based on these findings, I propose that the Actuncan community built a new political system built on an inclusive political strategy that contrasted substantially with the exclusive strategies of the Classic period. Furthermore, the Actuncan community actively manipulated the site's layout to allow for political and religious institutions amenable to the post-royal structure of the community. Importantly, political and religious spaces were physically separated in a repudiation of their intertwined relationship under the Classic period rule of divine kings. Similarly, buildings associated with Actuncan's Classic period rulers were destroyed and ritually desecrated. Together, these actions indicate that the community possessed a nuanced understanding of its past, even if that understanding occasionally appears to have misinterpreted or forgotten the original importance of some old locations. Rather, what is important is understanding the remembrances of individuals living in the Terminal Classic and how these remembrances impacted the process of political reorganization.

The eight chapters that follow substantiate these arguments. In Chapter 2, I present background information on the ancient Maya and the site of Actuncan. After describing the geographic setting of Actuncan, I provide an introduction to the culture history of the ancient Maya. These descriptions of each time period provide context for the data I present about Actuncan. Next, I present both Actuncan's political history and its household occupational history. Over 2000 years of occupation, Actuncan experienced a dynamic political history. The site was an independent polity in the Late and Terminal Preclassic periods. In the Early and Late Classic periods, Actuncan's rulers lost their authority and power passed to neighboring cities before the site experienced a resurgence of household building and civic authority in the Terminal Classic period.

Establishing the household history is critical to my arguments about collective remembering at Actuncan. I argue in chapter 3 that mnemonic communities can be identified by identifying long-lived circumscribed groups of households that would have interacted intensively over long periods of time. Here, I show that Actuncan's commoner households were occupied from at least the Terminal Preclassic to Terminal Classic periods. Together, the households living in Actuncan shared over 800 years of collective experiences and daily interactions. These interactions form the foundation for Actuncan's mnemonic community.

In Chapter 3, I detail the theoretical underpinnings of my research into the Terminal Classic community at Actuncan. This chapter has three goals. First, I detail resilience theory and its application to the Maya collapse. To me, resilience theory provides a framework for modeling how aspects of Classic Maya society formed the underpinnings of the Terminal Classic reorganization. Because a society's political, social, economic, and religious organizations do not transform at the same rate, a political collapse may result in solutions drawn from other segments of society. In accordance with this framework, I present four hypotheses for underpinnings of Actuncan's Terminal Classic political organization. In each of these hypothesized solutions, Group 4 would have served a different function. I present archaeological correlates for each suggested function based on Group 4's architecture and activity areas.

Resilience theory describes the role of memory in structuring reorganization. However, resilience theory is a descriptive model originated by ecologists and therefore does not adequately account for the complex processes by which human societies remember. In the second half of Chapter 3, I draw on the concept of collective remembering to build a methodology for identifying the impacts of collective memory in the archaeological record. This model emphasizes the role of every day interactions and community formation in the consummation and perpetuation of a common understanding of the past. The narratives perpetuated by elites, though easily visible in the archaeological record, are not necessarily subscribed to by everyone. Rather, alternative narratives may be perpetuated within geographically circumscribed communities on the basis of conversations that take place in the course of daily life. This framework is important because I argue in this dissertation that the community of Actuncan retained a local understanding of the past that helps to explain the political organization they adopted and its legitimizing principles.

In Chapter 4, I detail the methods I used in excavation, laboratory analysis, and interpretation. These methods were used to collect and analyze the data presented in Chapters 5, 6, 7, and 8.

Chapter 5 details the excavations I undertook in and around the Actuncan's Terminal Classic civic center of Group 4. The first part of the chapter provides a detailed description of the excavations and my findings. The second part of the chapter provides of summary of my findings and a comparative analysis of the architectural form of Group 4. Ultimately, I conclude that the architectural form of Group 4 follows a series of formal characteristics typical of Terminal

Classic civic complexes. Additionally, evidence of multiple construction phases in combination with ceramic sherds diagnostic to the Postclassic period indicate that the Terminal Classic occupation of Actuncan likely lasted for several generations – indicating relative success. Finally, the openness of Group 4's form indicate that Group 4 was constructed to allow ease of access and to embody an inclusive political organization.

In Chapter 6, I draw on activity area data from Group 4 to address the actual use of this complex. The first portion of the chapter details my analysis of soil chemistry and microartifact data collected from across the surface of Group 4. I conclude that the distributional signatures of these materials point to a primary activity area within Group 4's patio that was likely associated with public food preparation and consumption. In contrast, the spaces inside Group 4's buildings have very quiet activity signatures. These data corroborate the findings in Chapter 5. It appears that Group 4 was used as location for public gatherings and performance. The architectural and activity signatures point to inclusive political strategies.

Chapter 7 focuses on excavations I undertook within Plaza A. There, I excavated three low platforms that I hypothesized were constructed during the Terminal Classic period. I hypothesized that Plaza A was significant to the Terminal Classic Maya as a source of legitimacy. Additionally, these structures presented an opportunity to test how the Terminal Classic community remembered the spaces of their Preclassic past. These excavations did indicate that Plaza A was used for ritual activities during the Terminal Classic period.

In Chapter 8, I analyze Terminal Classic modifications to Actuncan's layout in the context of ancient Maya conceptions of urban design. I look at the original and reinterpreted significance of buildings and spaces within the Actuncan center to consider what changes to the layout tell us about the legitimization of the Terminal Classic community. In particular, I look at how the Terminal Classic arrangement of the site divides Actuncan into discrete ritual and civic segments. In contrast, under the rule of divine kings, ritual and civic life were interdigitated. This shift reflects a conscious effort to separate politics and ritual in daily life.

I conclude the document with a discussion of the role of memory in the political reorganization and legitimization of authority at Actuncan. I argue that the reorganization of Actuncan's landscape reflects the community's memory of specific locations within the city. These memories do not necessarily match the original importance of specific buildings or the official narratives propagated during the Classic period. Instead, the community possesses a local understanding of the past that it draws on strategically during the political reorganization to create an urban landscape amenable to a new more inclusive set of political strategies.

Chapter 2. PHYSICAL CONTEXT AND CULTURE HISTORY

2.1 Introduction

Variability in the trajectory and impacts of the Maya collapse indicates that it was a contingent process, heavily dependent on continued local access to resources and networks as well as on local historical peculiarities. This chapter introduces Actuncan's upper Belize River valley context and provides a brief summary of the culture history of the ancient Maya world. I then situate Actuncan's dual political and household histories within this regional context.

Actuncan was located on a ridge above the Mopan River's western bank in western Belize near the modern border with Guatemala (Figure 2.1). In this dissertation, I make a distinction between the upper Belize River valley and the lower Mopan River valley in order to alleviate confusion. The upper Belize River valley traditionally refers to a geographic area bounded by the edge of the Vaca Plateau to the south and the modern Belizean border to the west (Chase 2004). To the northeast, the edge of the upper Belize River valley is delimited by the confluence of the Mopan and Macal River valleys. The alluvial flatland and neighboring hills that flank the stretch of the Belize River east from the confluence to modern Belizean capital of Belmopan is traditionally referred to as the central Belize River valley (Chase 2004). As such, the upper Belize River valley encompasses just the valley bottoms and bordering uplands of the Mopan and Macal Rivers between their confluence and the modern border of Belize. In contrast,

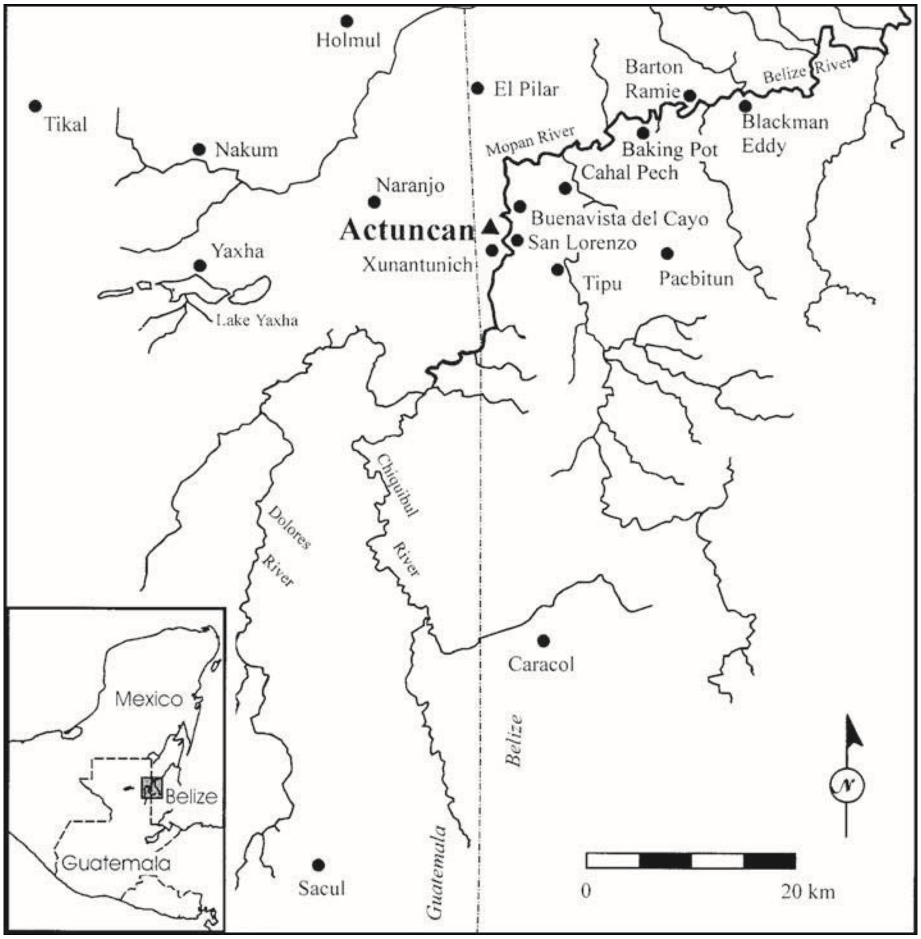

Figure 2.1. Map showing the location of Actuncan within the Maya Lowlands and the Belize River valley. (LeCount et al. 2001:Figure 1)

the lower Mopan River valley refers specifically to the valley bottom and margins of the Mopan River between the modern Belizean border and the confluence of the Mopan and Macal Rivers so that the lower Mopan River valley is considered a subsection of the upper Belize River valley. This distinction is important because the lower Mopan River valley is the venue for the local political dynamics that impact Actuncan most directly. The impact of Macal River valley polities on the Mopan River valley is less well understood.

Throughout prehistory, the upper Belize River valley has been an economically advantaged geographic location due to locally available natural resources, fertile alluvial soils, and access to riverine trade. Additionally, Actuncan is situated within a zone of particularly high settlement density. Populations were relatively dense in the upper Belize River valley, and it supported numerous major centers located within close proximity (Driver and Garber 2004; Garber 2004). As result, at various times multiple rulers competed over control of the region and for position within the complex hierarchy of lord and vassal states present in the Maya Lowlands of the Classic period (Helmke and Awe 2012; Martin and Grube 2008). Long term research within the Belize River valley indicates that these capitals were not necessarily contemporaneous. Rather, the dynamic ebb and flow of power between these centers provides the primary political context for understanding life in the Belize River valley. To place upper Belize River valley settlement in perspective, I review what is known about these sites and the relationships between them.

Although preliminary findings indicate that Actuncan experienced a series of rises and falls, the dating of this site's dynamic history has not been previously established. To contextualize this site and understand the past that the Actuncan community remembered in the Terminal Classic period, I establish a chronology of the site based on both monumental construction and trends in household occupation. This work draws on McGovern's (2004) research on the timing of Actuncan's monumental construction and excavations within households and monumental architecture by the AAP since 2001 (LeCount 2013, 2014b, 2015b; LeCount and Blitz 2001, 2012; LeCount et al. 2005; LeCount and Keller 2011; LeCount and Mixter 2016). These data are complemented by the region's high resolution ceramic seriation (Awe 1992; Brady et al. 1998; Gifford 1976; Hoggarth et al. 2014; LeCount 1996, 2015a; LeCount et al. 2002; Sullivan and Awe 2013; Sullivan et al. 2009), which can be used to understand occupation chronologies to contexts not dated using absolute methods. The Late and Terminal Classic portions of the ceramic sequence are anchored by a series of radiocarbon assays run by the Xunantunich Archaeological project (LeCount et al. 2002). Additionally, analysis of radiocarbon dates from Actuncan is ongoing (LeCount 2015a; Mixter and LeCount 2013a, b). Preliminary results from this analysis underpins the absolute boundaries between the Preclassic and Early Classic ceramic phases presented in this dissertation. Final results are forthcoming at a later date.

The Belize River valley and adjoining upland regions have been the target of investigation by a large number of researchers since at least the beginning of the 20th century (e.g. Gann 1894-1895, 1925; Garber 2004; LeCount and Yaeger 2010c; Robin 2012; Willey et al. 1965). Despite the relative paucity of hieroglyphic inscriptions, researchers have been able to develop detailed understandings of the historical trajectories of a number of sites along the valley including Xunantunich (Brown et al. 2011; LeCount and Yaeger 2010c; LeCount et al. 2002; MacKie 1985; Thompson 1942), Buenavista del Cayo (Ball and Taschek 2004; Peuramaki-Brown 2012; Yaeger et al. 2015), Chan (Robin 2012), Baking Pot (Hoggarth 2012), Cahal Pech (Awe 1992, 2013; Ebert et al. 2016), and Barton Ramie (Willey et al. 1965). By establishing a firmer understanding of Actuncan's occupation history, it can be understood in a Belize River valley context. In particular, Actuncan's trajectory can be compared to its nearest neighbors, Buenavista del Cayo and Xunantunich[1], which, along with Actuncan seem, to have rotated as the

[1] Archaeologists have been undertaking research at Xunantunich since the 1980s, including excavations by Gann (1894-1895, 1925), Thompson (1942), Anderson (1966), Satterthwaite (1950a, b), MacKie (1961, 1985), Schmidt (1974; Graham 1979), Pendergast and Graham

local center of authority from the initial occupation of the valley around 1000 B.C. to the abandonment of Actuncan, around A.D. 1000 (Ashmore 2010; LeCount and Yaeger 2010a;

(1981), the Xunantunich Archaeological Project (Leventhal et al. 2010), Belize's Tourism Development Project (Audet 2006), the Xunantunich Palace Excavations (Yaeger 2005, 2010b), the Mopan Valley Preclassic Project (Brown 2010, Brown et al. 2011, 2013, 2016; McCurdy 2016; McCurdy et al. 2014), and the Belize Valley Archaeological Reconnaissance Project (Helmke and Awe 2016; Santasilia and Tilden 2016; Zanotto et al. 2016). Most of these excavation projects targeted Xunantunich's Late Classic period hilltop ceremonial center. However, test excavations directed by Robin (Robin et al. 1994) identified a separate Preclassic ceremonial center, known as Group E, located on the hillslope to the east of the site's primary center. Research directed by Brown has determined that Group E's footprint equals the area of Xunantunich' Late Classic core (Brown et al. 2016). Evidence currently indicates that construction at Group E halted by the end of the Late Preclassic period (Brown 2013), well before the Early Classic period initiation of monumental construction on the hilltop (Leventhal 2010). As a result, the two centers are best thought of as separate political entities. To avoid confusion, Brown (Brown et al. 2016:51) refers to these as Early Xunantunich and Classic Xunantunich. Early Xunantunich likely dominated the lower Mopan River valley during the Middle Preclassic period prior to the rise of Actuncan, while Classic Xunantunich dominated the region during the Late Classic period, before diminishing in the 9th century A.D. Because Early Xunantunich plays a comparatively minor role in the topic of this dissertation, I refer to Classic Xunantunich simply as Xunantunich and Early Xunantunich as Xunantunich Group E.

Leventhal and Ashmore 2004). Establishing Actuncan's position within local shifts in power and population makes it possible to understand the local histories that the Terminal Classic occupants of Actuncan and the surrounding valley were reacting to as they developed strategies in response to the political failure of the Maya collapse.

2.2 Settlement and Geographic Setting of the Upper Belize River Valley

Located on a ridge overlooking the western bank of the Mopan River in western Belize, the ancient Maya site of Actuncan was occupied for about 2000 years, from the initial settlement of the hilltop by 1000 B.C. to its final abandonment around A.D. 1000 (Figure 2.2). The site is situated on a T-3 alluvial terrace overlooking the river below (Smith 1998; Willey et al. 1965). The rejuvenating flows of the Mopan River's periodic flooding and the seasonal rains would have maintained the productivity of the fertile soils located in the valley bottom (Fedick 1995). Agricultural production in the alluvial plain was augmented by terrace agriculture in the uplands along the valley margin (Neff 2010; Wyatt 2012). In contrast to much of the Maya Lowlands, which suffer from unpredictable rainfall and limited permanent water sources, in the Mopan River valley food production was likely a source of local stability and an export commodity during years of abundance.

In addition to sustaining local fertility, the Mopan River served as a critical conduit of communication and trade. From prehistoric to colonial times, the greater Belize River system served as a major canoe-based route between the resource-poor Maya heartland in the northern part of modern Petén, Guatemala and critical trade resources located along the Caribbean Coast and in the Maya Mountains (Chase 2004; Helmke and Awe 2012; Jones 1989; Laporte 2004; Laporte et al. 2008). Major trade resources produced or traded along this route included salt, Caribbean marine resources, granitic stones used for grinding corn, cacao, obsidian, and greenstone (Laporte 2004; McKillop 2002, 2004; Muhs et al. 1985).

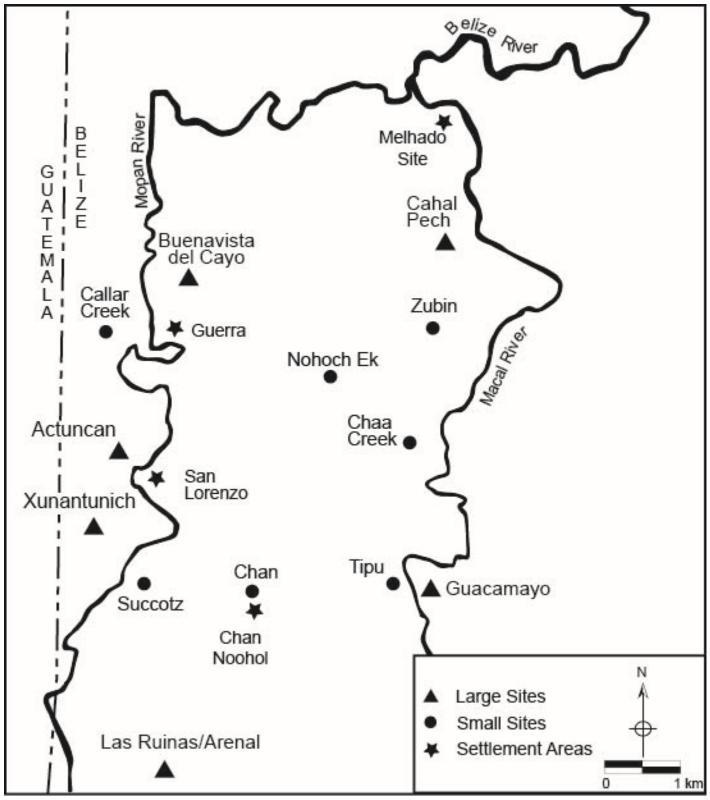

Figure 2.2. Map of the upper Belize River valley (adapted from Yaeger 2000a:Figure 3.9)

Perhaps owing to the availability of water and good farm land, settlement in the Belize River valley is widely dispersed, following pockets of the best soil along the valley margins. Research by the Xunantunich Settlement Survey indicates that households cluster into settlement zones that center on a number of villages and minor centers strung across the valley (Yaeger 2010b). Some of these minor centers, villages, and settlement clusters, which include Chan, Callar Creek, Chaa Creek, Rancho San Lorenzo, Dos Chombitos, and Nohoch Ek, were occupied from the Middle Preclassic period until the Postclassic period, indicating the deep antiquity of these outlying settlement zones (Brown et al. 2009; Connell 2000; Ehret 1995; Kosakowsky

2012; Robin 1999; Yaeger 2000b). Patterns of household growth indicate that the earliest established households controlled critical resources leading to the greatest stability. At Chan and San Lorenzo, the most intensively investigated of these settlements, the oldest households tended to be the last households abandoned (Ashmore et al. 2004; Robin et al. 2012c).

Importantly, the settlement clusters spread across the valley are not homogenous in their arrangement or composition. Some, like Chan, Chaa Creek, and Callar Creek, consist of a variety of household clusters that radiate from a formal minor center (Connell 2000, 2003; Kurnick 2013; Robin 2013, 2012; Yaeger et al. 2012). Others, like Nohoch Ek, likely served as the estates of rural elites (Taschek and Ball 2003). Yet even modest villages, like San Lorenzo, and suburban neighborhoods, such as Buenavista del Cayo's south settlement zone, were organized around modest non-residential structures that served as gathering points and community centers (Peuramaki-Brown 2013; Yaeger 2000a).

2.3 Culture History of the Maya with Particular Reference to the Belize River Valley

Starting with the next section, I briefly describe the culture historical trajectory of the Maya Lowlands with particular reference to the Belize River valley (Table 2.1). This description provides context for the outline of Actuncan's trajectory that follows.

2.3.1 Terminal Early Preclassic Period (1100–900 B.C)

The earliest evidence of village life in the southern Maya Lowlands is typically identified by the earliest known construction of permanent structures and the contemporaneous adoption of early ceramic traditions (Clark and Cheetham 2003; Iceland 2005; Inomata et al. 2013; Lohse 2010). Research at Ceibal, Guatemala has revealed that the earliest securely-dated monumental

Table 2.1. Summary of lower Mopan River valley chronology.

Time Period	**Dates**	**Local Ceramic Phase***	**Barton Ramie Ceramic Phase****	**Summary of Lower Mopan River Valley Politics**
Terminal Early Preclassic	1100–900 B.C.	Muyal	Cunil***	Initial occupation
Middle Preclassic	900–400 B.C.	Nohol	Jenny Creek	Valley dominated by Xunantunich Group E
Late Preclassic	400–150 B.C.	Ok'inal	Barton Creek	Early village at Actuncan superseded by a formal urban plan
Terminal Preclassic	150 B.C.–A.D. 250	Pek'kat	Mount Hope and Floral Park	Actuncan's apogee under divine leadership
Early Classic	A.D. 250–600	Ak'ab	Hermitage	Actuncan is no longer the regional capital, power shifts to Buenavista del Cayo
Late Classic I	A.D. 600–670	Samal	Tiger Run	Rapid construction of Xunantunich in competition with Buenavista del Cayo
Late Classic II	A.D. 670–780	Hats' Chaak	Early Facet Spanish Lookout	Valley dominated by kings located at Xunantunich
Terminal Classic	A.D. 780–1000	Tsak'	Late Facet Spanish Lookout	The authority of Xunantunich's kings fails, and Actuncan replaces it as the local capital.
Postclassic	A.D. 1000 - 1567	No complex defined	New Town	Limited evidence of occupation

Preclassic timespans are defined based on ^{14}C and stratigraphy from Actuncan. Late Classic timespans are based on research by the Xunantunich Archaeological Project (LeCount et al. 2002). These timespans reflect local observations rather than the traditional regional definitions.
*Based on LeCount et al. 2002
**Based on Gifford 1976
***Based on findings at Cahal Pech reported in Awe et al. 1992. Cunil ceramics were not identified at Barton Ramie.

construction in the Maya world was built around 1000 B.C. (Inomata et al. 2013). These early construction efforts may have been undertaken by partially mobile populations (Inomata et al. 2015b). This hypothesis accounts for the absence of clear evidence for domestic structures dating to this early time period. Alternatively, the depth of terminal Early Preclassic deposits may simply limit our ability to access the full range of contexts from this time period.

In the Belize River valley, the Cunil ceramic complex was first defined at Cahal Pech and has been dated to between 1100 and 900 B.C. (Awe 1992; Cheetham 2005; Healy et al. 2004a; Sullivan and Awe 2013; Sullivan et al. 2009). There, Cunil deposits are associated with low tamped marl platforms with postholes and the remains of burned clay briquettes with pole impressions (Awe 1992). Similar ceramic types have been identified in unmixed deposits at other sites in the region, including Blackman Eddy and Xunantunich (Brown 2003; Garber et al. 2004a; LeCount et al. 2002). At Blackman Eddy, the terminal Early Preclassic occupation consists of a series of post-holes cut into bedrock (Garber et al. 2004a:33-36). Bedrock was levelled by the Maya to provide an open plaza space and foundation for structures. The post-holes appear to have formed circular or apsidal structures. Additionally, low tamped-earth mounds formed the foundations for apsidal pole and thatch structures. Several overlapping phases of construction were evident, indicating a pattern of repeated renovation and long-term terminal Early Preclassic occupation of Blackman Eddy.

In the lower Mopan River valley evidence of the terminal Early Preclassic period is scarce. Locally known as the Muyal ceramic complex, ceramics similar to those uncovered at Cahal Pech and Blackman Eddy have been identified at Xunantunich and Chan, though at Chan the sherds are only found mixed in later deposits (Kosakowsky 2012:44; LeCount et al. 2002). At Xunantunich, the Muyal ceramic phase was defined based on sherds pressed into a dark paleosol beneath that site's tallest building, known as El Castillo (LeCount et al. 2002). These ceramics may have been related to the construction of two low platforms encountered in tunnel excavations, though the associations are somewhat uncertain (Leventhal 2010:82).

2.3.2 Middle Preclassic period (900–400 B.C.)

During the Middle Preclassic period, the earliest identified constructions were simple perishable buildings anchored into levelled sections of bedrock (Garber et al. 2004a; Gerhardt and Hammond 1991). These structures are evident based on the remains of post impressions cut into bedrock. Soon after, low apsidal, round, and, later, rectangular platforms that would have supported perishable superstructures became widespread (Aimers 2000; Cliff 1988; Hammond 1991; Hansen 1998; Healy et al. 2004b:223-225; Horn 2015; Peniche May 2014; Powis et al. 2009). These platforms were constructed with stacked limestone retaining walls and either stone or earthen fill. These early structures were either topped by a layer of tamped marl or a thin layer of plaster.

Monumental construction and formal site plans also became widespread during this time period (Doyle 2012; Estrada-Belli 2011; Hansen 1998; Inomata et al. 2013; Joyce 2004). In particular, E-Group complexes are frequently identified as the earliest manifestation of public architecture (Clark and Hansen 2001; Doyle 2012; Estrada-Belli 2011; Inomata et al. 2013; Laporte and Fialko 1995). Named after Group E at Uaxactún (Ricketson and Ricketson 1937), E-Group complexes are composed of a single western pyramid paired with a long linear eastern mound. E-Groups may have been used to track the solar year and celebrate agricultural cycles (Aimers and Rice 2006; Aveni and Hartung 1989; Chase and Chase 1995). At the least, they were likely early gathering places, centers of public ritual, and possibly early centers of exchange (Doyle 2012; Inomata et al. 2015a; Stanton and Freidel 2003). Generally, the Middle Preclassic period is considered the first time period in which you see clear cultural unity across the Maya Lowlands. This unity is marked by in part by the spread of architectural styles, such as E-Groups. Additionally, much of the Maya Lowlands replaced the diverse ceramic spheres of the terminal Early Preclassic with a converging set of ceramic styles that define the Mamom ceramic complex (Willey et al. 1967).

The central and upper Belize River valleys were the venue for a substantial occupation during the Middle Preclassic period. Low circular and rectangular platforms are evident at Cahal Pech and Pacbitun (Aimers et al. 2000; Healy et al. 2004a; Healy et al. 2004b; Horn 2015; Peniche May 2014; Powis et al. 2009). Additionally, Middle Preclassic monumental architecture has been identified (Garber et al. 2004a), including E-Groups at Xunantunich Group E, Chan, Pacbitun, and Blackman Eddy (Brown 2013; Brown et al. 2011; Brown et al. 2013; Healy et al. 2004a; Robin et al. 2012a).

2.3.3 Late Preclassic (400 –150 B.C) and Terminal Preclassic (150 B.C.–A.D. 250) Periods

During the Late and Terminal Preclassic periods divine kingship was adopted as the underpinning for hierarchical leadership as clearly articulated in the iconography of artistic programs (Estrada-Belli 2011; Estrada Belli 2006; Freidel and Schele 1988; Saturno 2009; Saturno et al. 2005; Taube et al. 2010) and the construction of increasingly exclusive residential spaces (Clark and Hansen 2001; Inomata et al. 2015a). During this time period, ancient Maya cities and villages grew and stratified. At sites such El Mirador, Late Preclassic domiciles were arranged into groups of structures organized around patios (Demarest et al. 1984; Ringle 1999), a pattern that becomes nearly ubiquitous in the Classic period. At other sites, Middle Preclassic villages were covered by large platforms that supported multiple buildings (Gerhardt and Hammond 1991; Hendon 1999; Ringle 1999).

Within city centers, monumental architecture grew in size and was elaborated by monumental art programs. E-Groups at major centers were renovated and continued to grow

(Doyle 2012; Estrada-Belli 2011; Laporte and Fialko 1995; Ricketson and Ricketson 1937). Additionally, new truly-massive pyramid complexes were constructed, including the largest Maya pyramids ever constructed, the Danta and Tigre pyramids of El Mirador (Hansen 1990; Matheny 1987). Similar pyramid complexes at sites including Cival (Estrada-Belli 2011), Lamanai (Pendergast 1981), Tikal (Coe 1990), and Uaxactun (Valdés 1992) have been categorized as triadic temple groups. Triadic temple groups consist of three pyramids arranged around three sides of a square central plaza (Hansen 1998). Typically, the middle of these three pyramids was taller than its flanking partners and, in some cases, could actually be a tall platform that supported three smaller pyramids on its summit. This new monumental architecture was often elaborately decorated with large modeled stucco sculpture (Coe 1990; Estrada-Belli 2011; Freidel 1986; Hansen 1992; Schele and Freidel 1990). Tenants of Late Preclassic site planning are discussed in greater detail in Chapter 8.

In the central and upper Belize River valley, evidence points to continuity of occupation from many sites originally settled in the Middle Preclassic period, including Blackman Eddy, Chan, Barton Ramie, and Cahal Pech (Awe 2012; Ebert et al. 2016; Garber et al. 2004b; Robin et al. 2012c; Willey et al. 1965). At Xunantunich in the lower Mopan River valley, evidence indicates that Group D and Group E were both occupied in the Late Preclassic period (Brown 2013; Brown et al. 2013; Brown et al. 2016; McCurdy et al. 2014). At Cahal Pech, Chan, and Xunantunich, burials began to be placed in positions of privilege—under the floors of public temples—during the Late and Terminal Preclassic periods (Awe 2013; Brown 2013; Novotny 2012). At Xunantunich, a formal tomb chamber was constructed into Structure E-2-1st, the eastern structure of that site's E-Group (Brown 2013). The presence of these burials points to clear special treatment of community leaders, if not the marking of early royal rulers (Awe 2013;

Brown 2013).

Importantly, the burial placed at the summit of Xunantunich's Structure E-2 may have marked the end of monumental construction at Group E. Although evidence points to the continuation of ritual activity in the group into the Terminal Preclassic period (and reoccurring centuries later in the Postclassic period [Brown 2011]), construction appears to have ended in the Late Preclassic period (Brown et al. 2011). This moment may correspond with the Late Preclassic strengthening of nearby Actuncan. Because the two centers are only 2 km apart, it is unlikely that both sites would have had contemporaneous apogees. Rather, this transition from Xunantunich Group E to Actuncan may mark the first of several shifts in the location of political authority in the lower Mopan River valley. Previous researchers have noted that the upper Belize River valley was a particularly dynamic political environment (Ashmore 2010; Leventhal and Ashmore 2004); however Brown's work at Xunantunich Group E and the AAP's work at Actuncan suggests these dynamics stretch well back in the Preclassic period.

2.3.4 Classic Period (A.D. 250–780)

The onset of the Classic period is traditionally marked by the introduction of carved stone monuments marked with hieroglyphic texts in second half of the third century A.D. These texts tell the histories of the royal dynasties that ruled Maya centers during the Classic period (Martin and Grube 2008; Proskouriakoff 1960; Schele and Freidel 1990) and provide evidence that Maya divine kings (*k'uhul ajawob*[2]) ruled semi-autonomous kingdoms scattered across the Maya

[2] The plural of *ajaw* is *ajawob*. In this text, I limit the use of *k'uhul ajaw* to instances where hieroglyphic texts call an individual a *k'uhul ajaw*. I use the term divine king more liberally to

Lowlands. These kings became embroiled in wars and complex alliance networks that resulted in certain divine kings serving as "overkings" (Martin and Grube 2008:20-21) who were owed allegiance by a network of client kings. The rivalry between the sites of Tikal and Calakmul, in particular, dominated the politics of the Maya Lowlands during the Classic Period.

The Classic period was marked by a consistent increase in population density throughout the southern Maya Lowlands (Turner 1990). As populations increased, so did the social disparity between ruling elites and commoners. The rise of the Classic period royal court (Inomata and Houston 2001) included the clear demarcation of titled rulers and elites, many of whom retained an ancestral right to their position (Houston and Stuart 2001; Jackson 2013; Martin and Grube 2008). Rulers and elites began to inhabit increasingly exclusive palace complexes constructed with corbelled vault masonry architecture (Christie 2003). Additionally, rulers were buried in elaborately appointed tombs in large public mortuary pyramids (Coe 1990). In part, divine kings traded on their charisma and cult of personality to maintain the loyalty of local inhabitants and to ensure tribute. However, courtly life was likely also maintained through the administration of markets and by ensuring continued access to trade goods (Freidel 1981b; Masson and Freidel 2012).

The Classic period is traditionally split into Early Classic (A.D. 250–600) and Late

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refer to instances where evidence indicates a polity was ruled by a divine king even if no text explicitly backs this claim. This distinction is important because of the small number of texts encountered in the Belize River Valley. Generally, archaeologists working in this area are required to draw on alternative lines of evidence to understand the nature of local political hierarchies.

Classic (A.D. 600–780) periods based on the shift from the Tzakol to the Tepeu ceramic complexes (Smith 1955). During the Early Classic period, texts are concentrated in a few large political centers. In contrast, during the Late Classic period sites with texts proliferate, and the southern Maya Lowlands reach their peak of population. In the Belize River valley, few texts are encountered at any time; however the few known texts do provide insight into the position of Belize River valley political centers within the broader political network of the southern Maya Lowlands (Helmke and Awe 2012). Evidence for Classic period royal lineages has been identified at Baking Pot, Buenavista del Cayo (Yaeger et al. 2015), Cahal Pech (Awe 2013), Pacbitun (Healy et al. 2004b), and Xunantunich (Helmke et al. 2010). Furthermore, settlement surveys indicate that local populations reach their apex in the Late Classic period (Robin et al. 2012c; Yaeger 2010b).

Although densely populated during the Classic period, the Belize River valley was politically peripheral – a zone of vassal polities located between the competing regional powers of Naranjo and Caracol (Driver and Garber 2004; Helmke and Awe 2012, 2016). The secondary nature of the Belize River polities is evident in the moderate size of local political capitals and the general paucity of historic texts inscribed on monuments and ceramic vessels (LeCount and Yaeger 2010b). Despite its political marginality, the Belize River was a key strategic resource important to larger polities in the ecologically marginal central Petén because of its fertile alluvial soils and riverine trade route. As such, Petén polities would have been interested in controlling and exploiting both locally produced foodstuffs and access to more distant trade items.

Because of the river's economic importance, control over the Mopan River valley was contested. Within this territory, power shifted between several ceremonial centers during different periods of time (Ashmore 2010; Leventhal and Ashmore 2004). Even though Actuncan served as the first local seat of divine kings, authority was diverted to the nearby centers of Buenavista del Cayo and Xunantunich by the end of the Early Classic and Late Classic periods, respectively. This shift was likely due to the interference of regional power brokers hoping to harness local Mopan River valley resources though the creation of vassal relationships (Ball and Taschek 2004; LeCount and Yaeger 2010c; Peuramaki-Brown 2012).

Excavations have revealed only limited evidence of Late Classic period monumental construction or ritual activity within Actuncan's public spaces. However, Actuncan was not abandoned in the Early Classic period. Recent excavations on households within the Actuncan core show that most households continued to be occupied throughout the Classic period (Mixter et al. 2014). Instead of a capital, during the Late Classic period the site likely functioned as a secondary center within the Buenavista del Cayo and, later, Xunantunich polities (Mixter et al. 2013).

2.3.5 Terminal Classic Period (A.D. 780–1000)

In the 9th century A.D., ancient Maya civilization was transformed by the collapse of the Classic Maya political system (Demarest et al. 2004a; Freidel and Shaw 2000). This political failure impacted all segments of society as warfare proliferated, trade routes were disrupted, and people migrated away from existing centers.

By the beginning of the Terminal Classic period, the authority of divine rulers at Xunantunich had begun to wane (Ashmore et al. 2004; LeCount et al. 2002). That site's royal residence was sacked and ritually buried in the Late Classic period (Yaeger 2010a), and later three carved stelae were erected between A.D. 820 and 849 indicating a transition from the preeminence of foreign overlords to local rule (Helmke et al. 2010). Nonetheless, Xunantunich's new local rulers began to lose control over their own polity (LeCount and Yaeger 2010a:363-365; Yaeger 2008). This trend is marked by changes in both the Xunantunich center and in its hinterlands. Much of the site's civic complex was abandoned and public activities were restricted to one small plaza in front of the site's largest ceremonial structure (Jamison 2010). At the same time, other local centers, such as Buenavista del Cayo and Cahal Pech, began to bury individuals in the manner of kings, possibly contesting Xunantunich's claim to wide-reaching regional authority (Awe 2013; Helmke et al. 2008). Similarly, at Actuncan, the razing and ritual termination of a household interpreted as the Late Classic residence of a noble vassal from Xunantunich would have served as a dramatic declaration of independence (Mixter et al. 2013). Finally, populations in the upper Belize River valley began to emigrate even before the Terminal Classic period began, indicating a diminution in Xunantunich's ability to call on the labor necessary to support the royal court and maintain that site's infrastructure (Ashmore et al. 2004; Robin et al. 2012c). Sometime after the erection of the final carved monument in A.D. 849, the divine kings at Xunantunich were removed from power, and the civic core was abandoned (LeCount et al. 2002).

As in other areas of the southern Maya Lowlands, the political collapse of centers in the Mopan River valley happened during a period of gradual demographic decline, but did not inspire a rapid and absolute demographic collapse (Ashmore et al. 2004). Instead, territorial control over the landscape fragmented as individual communities took responsibility for developing their own localized systems of governance. Data from the Mopan River valley and nearby Vaca Plateau also indicate that the hardships of the Terminal Classic period resulted in societal compression, whereby non-royal households with the oldest claims to local land and resources formed the core of the remaining population (Ashmore et al. 2004; Iannone et al. 2014:293-294; Robin 2013:168-173). Ruling families likely fled (or died) and poorest populations chose to leave (Ashmore et al. 2004; Chase et al. 2014; Iannone 2005). This societal compression is evident in settlement data and the increasingly even distribution of pottery types in the lower Mopan River valley (LeCount 2005). Households at Actuncan were deeply rooted, and their members chose to remain at the site through the Terminal Classic period (Mixter et al. 2014; Yaeger 2008). As Xunantunich's power contracted, Actuncan initiated a renewed program of civic construction and ritual activity, and these long-lived households formed the core of a new sociopolitical order without the material trappings of divine kingship (LeCount et al. 2011).

2.3.6 Terminal and Postclassic Sociopolitical Transformations

To better contextualize the Terminal Classic political transformations observed in this dissertation, here I briefly outline societal transformations that took place in the transition from the Classic to the Postclassic period. Importantly, during the Terminal Classic period, these societal transformations were not yet *fait accompli*. Reorganizing communities likely had substantial latitude in the moments immediately following the collapse.

With the failure of divine kingship, political systems began shifting towards more inclusionary political practices. Evidence from the Late Classic period indicates that the power of secondary nobles had increased in some polities. At this time, secondary nobles are mentioned more often on monuments (Culbert 1991:326; Houston 1993:127-134; Jackson 2013:82-83) and are increasingly involved in the political process (Fash et al. 1992; Jackson 2013:107-110; McAnany 1993).

During the Postclassic period, authority was evidently held by a shifting hierarchy of lineage heads and local officials (Braswell 2001; Carmack 1981; Marcus 1993; Okoshi-Harada 2012; Peraza Lope and Masson 2014:41-59; Ringle and Bey 2001; Roys 1957). In the Mayapán polity, council rule, known as *multepal*, provided regional officials and top lineage heads a voice in governance, even if lords from the Cocom, Xiu, and Chel families ultimately dominated the decision making (Landa 1941; Ringle and Bey 2001). Similarly, at Utatlán in the Guatemalan highlands, a confederacy composed of noble lineages was dominated by a supreme ruler (Carmack 1977:13). Additionally, during the Terminal Classic period Chichen Itza was likely ruled by a similar council-based government (Kowalski 2011; Ringle 2004; Schele and Freidel 1990), and, during the Postclassic period, the Itza of the Petén Lakes shared power between a civic leader, a priestly leader, and a governing council (Jones 1998:60-107).

Importantly, Okoshi-Harada's (2012) model for Postclassic political organization suggests that individual leaders at all levels of the hierarchy had substantial agency. Based on his reconstruction, the leaders of households, lineages, and villages were not tightly bound to a centralized authority. Rather, they could withdraw from alliances and either remain independent or align with other powers (see also Marcus 1993). While there were surely incentives to maintain an allegiance with a powerful center like Mayapan, the ties between leaders and their constituents were comparatively weak when compared to the centralized authority held by Classic period kings. McAnany (1995) has argued that this lineage-based authority was not new during the Terminal Classic period, but rather was simply repressed under the rule of divine kings.

Additionally, the decline of divine kings was marked by the separation of kings from their divine powers. For Freidel and Shaw (2000) divine kings failed in part because stress on the food supply strained the credibility of the king's cosmic obligation to ensure sufficient sustenance. The collapse of divine kingship forced Maya communities to rework the relationship between their leaders and cosmology. During the Classic period, Maya kings served as both the primary ruler and the primary religious practitioner (Freidel 2008; Freidel et al. 1993). During the Terminal Classic and Postclassic periods, many basic cosmological precepts remained similar. Indeed, there is great continuity between the Quiche' *popol vuh* recorded after the Spanish conquest (Tedlock 1985) and stories told in iconography that reaches back to the Preclassic period (for example Taube et al. 2010). However, the Terminal Classic period did see the introduction of a widespread cult of Kukulcan, the feathered serpent, in association with Chichén Itzá's rise to power in the northern lowlands (Ringle et al. 1998). It is important to note that no evidence for the adoption of this cult has been identified in the upper Belize River valley (Hoggarth 2012; Hoggarth and Awe 2014).

Even if many of the cosmological principles remained in place, the end of divine kingship did result in the creation of a fulltime priesthood. In the Colonial era, priestly positions were often hereditary or filled by the secondary sons of nobles (Landa 1941:27). Additionally, iconography and ethnohistories indicate that priests composed complex hierarchies (Jones 1998; Masson 2000:234-247; Masson et al. 2006:194-197; Rice 2009:44; Ringle 2004; Ringle et al. 1998). Priests provided the vestments of power to leaders and often served a role on advisory councils (Peraza Lope and Masson 2014:54). Additionally, the political and ritual spheres were not consistently divided, as ruling nobles looked for religious sanction and likely had to deal with priests meddling in civic affairs. In the Petén Lakes, authority was explicitly split between a priest and a lord (Jones 1998).

Perhaps most significantly, researchers have long posited that the Classic to Postclassic period transition was accompanied by a transformation in the economy. During the latter period, the Maya world became inextricably tied to the Mesoamerican world system, leading to a massive increase in mercantilism (Masson 2000; Sabloff and Rathje 1975; Smith and Berdan 2003). During the Classic period, markets did exist (King 2015; Masson and Freidel 2012). In fact, evidence from the Early Classic city of Chunchucmil indicates that it may have been ruled by a federation of merchant families rather than a divine king (Dahlin and Ardren 2002). However, during the Postclassic period, trade and the position of merchants became amplified.

During the Terminal Classic period, these sociopolitical transformations took place at variable paces across the Maya Lowlands (Aimers 2007). This variability is particularly true in the southern Maya Lowlands where the turmoil of the collapse era slowed trade and the transference of information. Importantly, many of the trends discussed in this section are based on data from the northern Lowlands, where Postclassic data is most robust. Sites such as Actuncan may or may not have followed the same trajectory.

2.3.7 Postclassic Period (A.D. 1000–1567)

The Belize River valley has long been considered one of the few regions of the southern lowlands that was continuously occupied from the Classic period to the Postclassic period. Evidence of Postclassic domestic occupation has been recorded at Baking Pot, Barton Ramie, and Tipu (Aimers 2004; Graham et al. 1985; Hoggarth and Awe 2014, 2016; Willey et al. 1965), though recent research has brought into question whether this occupation was truly continuous (Hoggarth et al. 2014). Tipu, in particular, is known from ethnohistoric records to have been an important trading settlement at the time of the Spanish conquest (Jones 1989). Additionally, the presence of Postclassic ceramic deposits at sites such as Chan and Xunantunich Group E provide evidence that these sites continued to be visited, even if they were not occupied full time (Brown

2011; Robin et al. 2012a). A small quantity of Postclassic ceramics have been collected from across Actuncan, which indicate that Actuncan was occupied for a time, at least until the adoption of these ceramic styles. However, the overall paucity of Postclassic ceramics does not point to a robust occupation at this time.

2.4 Actuncan's History from Households and Monumental Architecture

Since the beginning of the epigraphic revolution in Maya archaeology, a major focus of research in the Maya Lowlands has shifted towards understanding the role specific historical events play in framing and influencing broader social processes (Martin and Grube 2008; Proskouriakoff 1960; Schele and Freidel 1990). Within the central Maya zone, the presence of detailed royal histories carved on stone monuments and painted on ceramic vessels provides the opportunity for researchers to anchor their dirt archaeology within the framework of these historical contexts. However, not all time periods or regions of the Maya Lowlands have the benefit of histories. Research in areas of the Maya world with few or no texts, including the Belize River valley (but see Helmke and Awe 2012, 2016; Helmke et al. 2010; Helmke et al. 2008; Houston et al. 1992; Santasilia 2012; Yaeger et al. 2015), continues to rely on traditional chronology building resulting from grounding relative ceramic sequences and absolute chronological markers. Through the use of detailed excavations combined with increasingly accurate radiocarbon dating techniques, research at ahistorical centers can be historicized and therefore contextualized within regional socio-political trends (Aquino et al. 2013; Bachand 2008; Culleton et al. 2012; Ebert et al. 2016; Hoggarth et al. 2014; Inomata et al. 2014; Inomata et al. 2013; Kennett et al. 2013).

Research over the past 25 years has drawn on a combination of radiocarbon dating, extensive excavations in settlements, and ceramic chronologies to develop a detailed understanding of population and construction trends in the Mopan River valley (LeCount et al. 2002; Peuramaki-Brown 2012; Robin et al. 2012c; Yaeger 2000b, 2010b). This effort has been continued at Actuncan, where no hieroglyphic texts have been encountered to date. Research at Actuncan has focused on both civic architecture (Donohue 2014; Heindel 2016; Jamison 2013; McGovern 2004; Mixter and Langlie 2014; Mixter and Nick 2014; Simova and Mixter 2016) and households (Fulton 2015b; LeCount 2004; LeCount and Blitz 2005; LeCount et al. 2011; Mixter et al. 2014; Mixter et al. 2013) in an effort to understand the site's parallel social and political histories. While moments of architectural construction and pause are evident in the monumental architecture, tracing trends in the domestic architecture is more difficult. To that end, the AAP has focused our radiocarbon dating program on domestic architecture to take advantage of the complex stratigraphy to clarify the periods of construction using Bayesian modelling. The results of this radiocarbon program have been reported elsewhere (LeCount 2015a; Mixter and LeCount 2013a, b) and are only summarized here because they are ongoing.

As noted above, the Mopan and Belize River valleys featured a high frequency of political centers strung along their length (Driver and Garber 2004; Helmke and Awe 2012). Because of the continuous nature of domestic settlement between these major centers, evaluating the extent of territorial control of each major center becomes difficult. This situation is partly explained by considering the chronology of these centers discussed above. Evidence from the Mopan River valley indicates that authority shifted between Actuncan, Buenavista del Cayo, and Xunantunich due to changes in local political fortunes and interference from regional hegemons located outside the valley (Ashmore 2010; Ball and Taschek 2004; Chase 2004; Helmke and Awe 2012; Helmke et al. 2010; Kurnick 2013; LeCount and Yaeger 2010a; Leventhal and

Ashmore 2004; Peuramaki-Brown 2012). Actuncan, Buenavista del Cayo and Xunantunich were likely only simultaneous seats of authority for short, contentious periods of time marked by violence, as attested to by evidence for palisades and dramatic desecratory events (Kurnick 2013, 2016; Luzmoor 2013; Nick 2013; Yaeger 2010a). While it is clear that members of hinterland communities were strategically affiliating with these larger polity capitals (Connell 2010; Kurnick 2016; LeCount 2010a; Yaeger 2000a, 2003), they also maintained their own local community identities—visible both in settlement patterns and subtle variability in material culture (Preziosi 2003) that were rooted in relations often older than the political capitals that ruled them.

In the remainder of this section, I construct a model of Actuncan's major political transitions and assess their effects on urban household trajectories over Actuncan's history. In particular, I look at how the fortunes of individual households align with the political history of the Actuncan polity. First, I draw on data from monumental architecture recorded by McGovern (2004) and AAP members to describe Actuncan's cycle of political power. Establishing the site's political trajectory is critical to providing context for understanding the original importance of the monumental buildings at Actuncan, the site's hiatus as a center of authority, and the site's Terminal Classic reorganization. Then I draw on evidence from household excavations to show how Actuncan was home to a continuous residential community from the Late Preclassic to the Terminal Classic periods. Although surely impacted by the political shifts within the Mopan River valley, the variable trajectories of different households within Actuncan's center indicate that several of these households' fortunes were not entirely tied to Actuncan's political role. Actuncan's residential continuity is important because these long-lived households would have formed the basis for the site's Terminal Classic community and its understanding of Actuncan's past.

2.4.1 Actuncan's Political History

Although initially occupied in the terminal Early Preclassic period, Actuncan was first constructed as a capital sometime during the Late Preclassic period when an earlier village was completely covered by a new, formalized site plan. At this time, Actuncan's public architecture was organized into two formal civic-ceremonial groups located on adjoining hilltops (Figure 2.3). Actuncan South was the site's ritual center. It housed a large, visually dominant, triadic pyramid group focused on Structure 1, a 28 m tall pyramid located on the south side of Plaza A. Several stone monuments were also found in this plaza, one of which (Stela 1) was carved in a style diagnostic to the Late Preclassic period (Fahsen and Grube 2005:79). Actuncan South is isolated from the much larger Actuncan North by a deep ravine. The site's only known *sacbe* (a formal plastered causeway) stretches across the ravine connecting the two parts of the site. In contrast to Actuncan South's single plaza, Actuncan North is organized into five plazas bounded by monumental structures that likely served a variety of ceremonial, administrative, economic, and residential purposes. Plaza C is the largest public gathering place at Actuncan and contains administrative structures (Structures 19a and 12), a ball court (Structures 13 and 14), and likely a funerary pyramid (Structure 15). Plaza D has more restricted access and is the subject of excavations described in Chapters 5 and 6. This plaza may have shifted functions over time. Its original function is poorly understood, though it may have been used by Late and Terminal Preclassic elites living in Structures 29 and 41 (McGovern 2004:57). As I elucidate in Chapter 5, Plaza D was repurposed during the Terminal Classic period as the primary civic zone. The structures surrounding Plaza F form a typical Cenote-style Preclassic E-Group complex

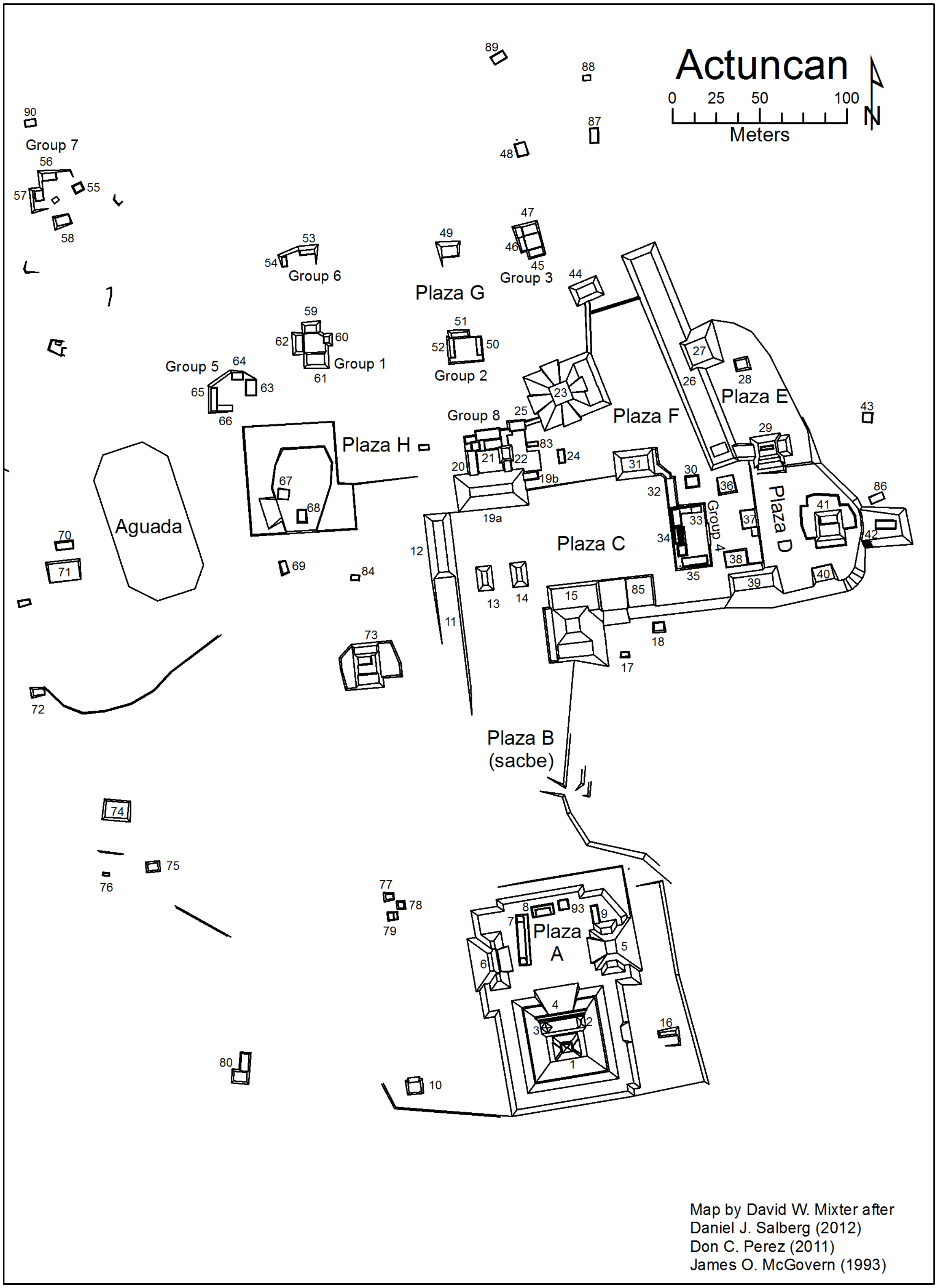

Figure 2.3. Map of Actuncan's site core.

(see Chase and Chase 1995 for comparison). Plaza E is an unusual plaza located east the eastern range of the E-Group. Based on its restricted access, it may relate to the E-Group. Plaza H is a large, poorly understood plaza bounded by Structure 12 and Group 8 to the east; Structure 73, a large elite house, to the south; a poorly understood civic group that may be associated with the aguada to the west; and Group 1's household plot to the north. Excavations indicate that this space contained a number of discrete activities areas and several buried buildings (Chambers-Koenig 2013; Craiker 2013; Keller and Craiker 2012). The multiple functions of these urban spaces reflect the multifarious roles urban centers played in early Maya society.

AAP's preliminary chronology indicates that Actuncan was subject to a series of boom and bust cycles that reflect the tumultuous rise and decline of a local seat of power over a 2000-year period. This reconstruction is based on a synthesis of McGovern (2004) and AAP's ceramic dating of monumental construction episodes (Table 2.2) as well as the contextual evidence recorded from AAP excavations. We roughly divide Actuncan's history into six periods of occupation: 1) A terminal Early Preclassic village; 2) a period of spatially restricted use during the Middle Preclassic period; 3) a Late Preclassic village; 4) a royal ceremonial center founded near the beginning of the Terminal Preclassic and reaching its apogee during Early Classic period; 5) a Late Classic period of political subordination (Mixter et al. 2013), and, finally; 6) a Terminal Classic period of revitalization that lasts to the Postclassic period (LeCount et al. 2011; Mixter et al. 2014).

During the 2011 field season, deep penetrating excavations into Structure 41 identified the remains of a terminal Early Preclassic structure and the burned remains of two smashed Cunil phase vessels associated with the termination of this early platform (Mixter 2012). The initial occupation of Actuncan appears to be as a terminal Early Preclassic village. A single

Table 2.2. Number of construction episodes by structure/architectural feature and temporal period. Adapted from McGovern 2004:Table 5-1.

	Terminal Early Preclassic 1100-900 B.C.	Middle Preclassic 900-400 B.C.	Late Preclassic 400-150 B.C.	Terminal Preclassic* 150 B.C.-A.D. 250	Early Classic A.D. 250-600	Late Classic I A.D. 600-670	Late Classic II A.D. 670-780	Terminal Classic A.D. 780-1000	Source
Actuncan South									
Platform-Plaza A			3		1	1			McGovern 2004:114-117
Structure 1		**	2			1			McGovern 2004:123-124
Structure 4		**	2		1	1			McGovern 2004:117-122
Structure 5			2		1		1		McGovern 2004:125-129
Structure 6			4						McGovern 2004:129-131
Actuncan North									
Plaza C south of 19a			3		1		1		Jamison 2013
Plaza C Ball Court Alley		**	2		1	1	2		McGovern 2004:137-138, 178-180
Structure 12							1		McGovern 2004:133-134
Structure 13					2	1			McGovern 2004:137-138, 178-180
Structure 15		**	1	1	1?		1?		McGovern 2004:131-133, 174
Structure 19a				3	1	1			Jamison 2013; McGovern 2004:134-136; Mixter et al. 2013
Plaza E		1							McGovern 2004:139
Plaza F		3	2	2	1	1?			Mixter and Craiker 2013
Structure 23				3					Heindel 2016; LeCount, personal communication 2016
Structure 26	1		4	4					Donohue 2014; LeCount 2015; Simova and Mixter 2016
Structure 26a					4				McGovern 2004:139-142
Structure 27				2					Donohue 2014; LeCount 2015
Structure 31					1	1			McGovern 2004:142-145
Group 4					1			2	Chapter 5

This chart is adapted from McGovern 2004:Table 5-1 based on AAP data and my reinterpretation of McGovern's data. See Appendix A for a short discussion of my reworking of McGovern's data.
*McGovern (2004:107-110) chose not to distinguish the Terminal Preclassic as a distinct phase. I have used his primary data (McGovern 2004:166-181) to reintroduce it where I was able.
** McGovern (2004:Table 5-1) listed five Middle Preclassic construction phases. Of these, his data only supports one, in Plaza E. See Appendix A for my reasoning.
? Some evidence points to construction in periods marked by a question mark, however either we did not reach a distinct construction phase or the ceramic dates on the constructions are not secure due to limited sample sizes.

radiocarbon sample from this deposit indicates that this Cunil phase platform was terminated around 1000 B.C. (LeCount 2015a). This early date is consistent with radiocarbon dates from terminal Early Preclassic deposits at Cahal Pech (Awe 1992). Additionally, recent work on Structure 26, the eastern range of Actuncan's E-Group, encountered a similar burnt feature of Cunil ceramics on the earliest version of that structure (Structure 26-sub-2), verifying that Actuncan was likely a center of aggregation during the terminal Early Preclassic Period (Simova and Mixter 2016). Our findings parallel those by Inomata and colleagues (Inomata et al. 2015b; Inomata et al. 2013) at Ceibal, where they interpret contemporaneous E-Group construction as a gathering point for mobile populations.

The Middle Preclassic use of Actuncan appears to have been spatially and functionally limited. Middle Preclassic ceramics are only found in primary deposits in the site's E-group at Plaza F, perhaps indicating the site's use as a ritual zone with limited residential space (Mixter and Craiker 2013)[3]. This time period corresponds to the initial occupation at Xunantunich documented by Brown (2010, 2013; Brown et al. 2011; Brown et al. 2013). Based on current evidence, it is likely that Xunantunich Group E dominated local politics during this time period.

Perhaps Actuncan's most distinctive trait is its clear early affiliation with architectural

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[3] Although McGovern (2004) posits that the earliest versions of Structures 1 and 4 were Middle Preclassic, his conclusion is based on their stratigraphic position beneath a Late Preclassic construction phase rather than direct ceramic evidence. No unequivocal evidence of Middle Preclassic construction has been identified in Plaza A by him or me. Although future research may unveil earlier construction phases, current evidence indicates that construction in Plaza A began in the Late Preclassic period.

and artistic programs connected to the Preclassic dissemination of the Maya cult of divine kingship. The presence of early divine kingship at the site is attested to by markers such as the large triadic temple group, the E-Group, an early ball court (Hansen 1998), and the site's early carved stela (Fahsen and Grube 2005:79) that dates stylistically to the 1st or 2nd century B.C. based on its stylistic similarity to the portraiture seen on the murals from the West Wall of Pinturas Building at San Bartolo (Taube et al. 2010).

The introduction of hierarchical rule at Actuncan in the Late Preclassic period marked by the burial of a poorly understood Late Prelassic village and its replacement with a new planned site center built on a monumental scale. Evidence of this buried village has been found in several areas of Actuncan North. Under Group 1, Rothenberg (2012) identified two buried Late Preclassic structures that were not direct antecedents to the later patio-focused domestic group. Similarly, a massive plaza fill deposit was uncovered under Structure 41 that buried the Cunil structure and resulted in the construction of the first plaster plaza surface (Mixter 2012). Finally, excavations under Group 8 and in Plaza C identified a Late Preclassic layer of leveled clay that appears to have been brought in as fill (Mixter and Craiker 2013; Mixter and Freiwald 2013). Similar wholesale reorganizations of site plans have been identified at the sites of Pacbitun, Cahal Pech, and Cerros, where early nucleated villages were buried under reassembled centers during the adoption of divine kingship (Cliff 1982, 1988; Healy et al. 2004a; Peniche May 2014; Powis et al. 2009). Radiocarbon dates from one buried Late Preclassic structure and redeposited Late Preclassic midden place the occupation of Actuncan's Late Preclassic village between 450 and 200 B.C. (LeCount 2015a; Mixter and LeCount 2013b).

This broad remodeling of Actuncan's site core likely corresponds to the establishment of divine leadership and sparked the construction of much of the site's ceremonial core. Table 2.2

shows that the Late and Terminal Preclassic periods were the most active timespans of monumental construction. Indeed, nearly all civic structures that have been investigated at the site were originally laid out at this time, the exceptions being Structures 12, 31, and 34-sub-1 (the Early Classic building under Group 4), which are comparatively small additions dating to the Early Classic period. It is important to note that many of the buildings listed in Table 2.2 have not been excavated to the core, so earlier versions may exist. Only Plaza F, the site's E-Group, shows evidence of continuity of construction from prior to the construction of the planned center. Deep under Plaza F, our excavations encountered the only known Middle Preclassic deposits at the site. Additionally, the discovery of two sub-structures under Structure 26 (Simova and Mixter 2016) indicate that this location was an important ritual prior to the construction of the planned center. Furthermore, as you can see on the site map (

Figure 2.3), the buildings around Plaza F maintained a different orientation than the rest of the site, perhaps indicating that the E-Group had an earlier ceremonial importance that was worth preserving.

This site-wide overhaul would have required a tremendous amount of labor. Based on volumetric calculations, McGovern (2004:147) estimates that 52% of the volume of the site's monumental architecture was constructed during the Late and Terminal Preclassic periods. This estimate generally follows the patterns we have observed in our excavations in monumental structures. Our radiocarbon dates place these site-wide transformations to around 200 B.C., near the end of the Late Preclassic period. The proposed date of 200 B.C fits this suggestion and aligns with a stylistically appropriate date for Actuncan's Stela 1.

The Late and Terminal Preclassic periods appear to have formed the apogee of Actuncan's power. Construction stopped at Xunantunich Group E during the Late Preclassic period, when the placement of a tomb in the summit of Structure E-2 may have marked the end of Early Xunantunich's period of primacy (Brown 2013). Although several other sites in the region constructed E-Group complexes by the end of the Late Preclassic period (Brown et al. 2016; Robin et al. 2012a), Actuncan is distinguished by the comparatively large areal extent of its Preclassic civic center, by its triadic temple group decorated with polychrome plaster masks, and by its carved stela. At this time, the rulers located at Actuncan likely held sway over the lower Mopan River valley.

Dating the end of local rule at Actuncan has proven to be a more challenging task. While McGovern (2004:154-156) viewed the Early Classic period as Actuncan's apogee, AAP research has found that construction slowed at this time (Table 2.2). Our research indicates that construction on the E-Group, Structures 23 and 26, ended in the Terminal Preclassic period. Additionally, the Early Classic period construction on 19a is only the renovation of that building's staircase, not a full rebuilding. Currently, the latest radiocarbon dates from Structures 26 and 41 place the final construction events from the site's apogee to between A.D. 225 and 325.

Furthermore, three radiocarbon dates—two from Structure 41 and one from below Group 4—may date destruction events associated with those two buildings. The date from Group 4 (detailed in Chapter 5) is a primary deposit of burned materials located along the face of an Early Classic platform (Structure 34-sub-1). The two dates from Structure 41 were recovered from a deposit of tumbled fill stones along the edge of the structure. The deposit contained a large quantity of broken sculpted stucco that were likely the remains of a frieze that once decorated the building. This deposit may be the result of the intentional destruction of this building. All three dates fall in similar ranges, between A.D. 425 and 530 (LeCount 2015a). Because these dates mark the collapse and/or desecration of buildings within Actuncan's ceremonial center, they mark the latest possible date for the collapse of royal leadership at Actuncan. As such, I suggest that Actuncan's period as a royal seat ended around A.D. 400. Importantly, this timing likely corresponds to the rise of Buenavista del Cayo as the primary locus of authority in the valley. A recently discovered tomb at that site likely dates to the 5th century A.D. (Yaeger et al. 2015), by which time Buenavista was likely the capital of the lower Mopan River valley polity. Continuing research at both sites should help to clarify the relationship between the waning of royal power at Actuncan and the ascendance of Buenavista. Broadly speaking, the small quantities of Early Classic ceramics recovered from most civic contexts at Actuncan speaks to the limited use of these spaces after Actuncan's rulers were eclipsed.

The final two phases in the site's history can be dated based on the well-defined regional ceramic chronology for the Late Classic period. After the fall of royal power, the remaining population was subordinated by other local political centers. Locally, this trajectory fits the model of regional political succession proposed by members of the Xunantunich Archaeological Project (Ashmore 2010; LeCount and Yaeger 2010a; Leventhal and Ashmore 2004). Under this model, power along the Mopan River valley moved from Actuncan to Buenavista del Cayo by the end of the Early Classic period, then to Xunantunich during the second half of the Late Classic period.

During Actuncan's period under subordinate rule, there is limited evidence for construction efforts within the site's monumental architecture. McGovern (2004:123-124) identified Late Classic construction efforts in Plaza A and especially on Structure 1. Such a large scale construction effort would be far larger than anything the AAP has encountered from this time period. McGovern's (2004:169-170) dating of this construction was based on a very small number of diagnostic sherds collected from a looter's tunnel. Further research is needed to verify the timing of this construction phase.

Even if some construction was undertaken to renovate structures during the Late Classic period, it is unlikely that these actions were locally derived. Indeed, any construction at Actuncan pales in comparison to the construction boom on-going at Xunantunich (LeCount et al. 2002). At this time, Actuncan was likely integrated into the Xunantunich polity. Any monumental construction at Actuncan must have been approved and sponsored by Xunantunich. Xunantunich may have been explicitly interested in laying claim to Actuncan and marking that the later center was part of the former's territory (Ashmore 1998). The construction of a ruler's residence, Group 8, off the north side of Structure 19, Actuncan's largest administrative structure, may have marked the shift in regional power from Buenavista to Xunantunich (Mixter et al. 2013). This multi-patio residence was likely the home a vassal noble of Xunantunich who served as an administrator at Actuncan. Although Group 8 is small in comparison to typical Classic period royal palaces, evidence indicates that it hosted the full suite of residential, administrative, and ritual functions that usually took place in royal palaces (LeCount et al. 2016). Its construction at Actuncan indicates that the kings of Xunantunich viewed Actuncan as important to the administration and legitimacy of their polity (Mixter et al. 2013).

During the Terminal Classic period, Actuncan enjoyed a brief renaissance as a center of authority. During this time period, Group 4 is constructed as a new civic complex and Plaza A came back into use as ritual space. Importantly, the reemergence of Actuncan is paired with the destruction and abandonment of Structure 19 and Group 8 (Mixter et al. 2013; Simova et al. 2015). During the Terminal Classic period, the members of the Actuncan community explicitly disassociated themselves from the residence of their Late Classic ruler. Actuncan's Terminal

Classic period use is a major topic of this dissertation. I will argue in Chapter 5 and 6 that Group 4 was a new integrative structure and was specifically used as a council house. In Chapter 7, I will look more carefully at the Terminal Classic deposits in Plaza A to comment on the ritual underpinnings of the site's Terminal Classic revitalization.

While the final abandonment of Actuncan remains imprecise, the presence of Postclassic ceramics on Group 4, Structure 41 and elsewhere in the site core suggests a lengthy occupation until Postclassic ceramic types begin to appear in the local assemblage (Figure 2.4). The exact date for the introduction of Postclassic period ceramic types is poorly defined; however, Group 4 underwent at least one major renovation, indicating that the Terminal Classic community was constituted at least until that ceramic transition.

Figure 2.4. Postclassic ceramics from the vicinity of Group 4. The jar rims on the left are stylistically similar to Pozo Cream (LeCount et al. 2011:Figure 5). The support on the right is an Augustine Red scroll foot.

2.4.2 Actuncan's Household History

Comparing the trajectory of Actuncan's households to the site's political history is important for considering how the site's dynamic history impacted the trajectory of residential life. In particular this study provides insight into the continuity of Actuncan's households over time and into the similarities and differences in how members of Actuncan's community experienced their common history. Actuncan's site core was host to three different forms of household that likely represented three different social strata. Our excavations at Actuncan have targeted ten households that represent each of these strata: six commoner patio-focused groups, three large elite single house mounds, and the site's Late Classic ruler's residence. These excavations have established preliminary trajectories for each of these households.

To evaluate how households are affected by Actuncan's political history, I will compare in detail the trajectories of these urban households with the political fortunes of the Actuncan polity during three political transitions: the establishment of divine kingship, the initial failure of political authority and subsequent subordination during the Late Classic period, and the site's revitalization during the Terminal Classic period. A summary of the occupation histories of all excavated households is presented in Figure 2.5.

Three of the patio-focused groups investigated, Groups 1, 5, and 7, are each composed of four structures oriented around a central patio. Groups 1 and 5 are located directly adjacent to the site's urban center north of Plaza H. Group 7 is the more distant, but is still located less than 200 meters from the site core. Based on ceramic dating, Group 1 was founded in its current arrangement during the Late Preclassic period contemporaneously with the establishment of the site's coherent site plan (Antonelli and Rothenberg 2011; Rothenberg 2012). Groups 5 and 7 were founded during the Terminal Preclassic period, sometime after the establishment of divine kingship (Hahn 2012; Simova 2012). Although also patio-focused groups, Groups 2 and 3 are considered in less detail because of the limited nature of the excavations into these household groups (LeCount et al. 2005). Current data indicates that each of these was founded in the Late Classic period as populations in the region swelled or other local lineages grew and fissioned. However, more complete excavations following the trenching methodology adopted for Groups

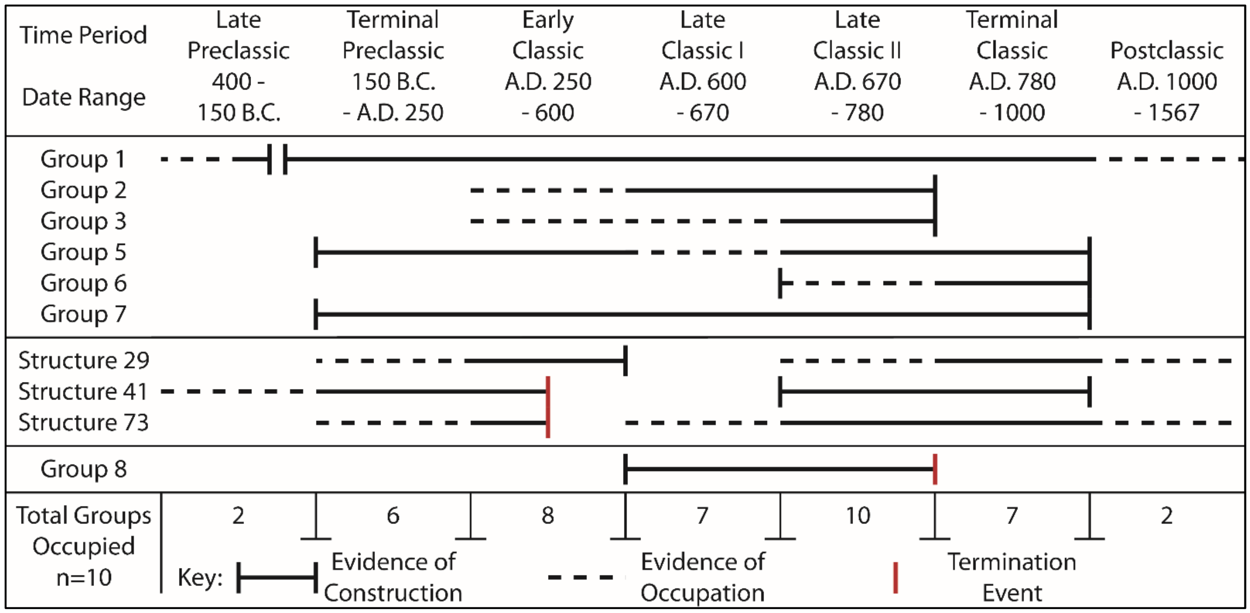

Figure 2.5. Figure indicating the periods of occupation of Actuncan's ten investigated households. Groups 1-3 and 5-7 are commoner households, Structures 29, 41, and 73 are elite houses, and Group 8 is a Late Classic noble residence.[4]

1 and 5 will prove a more secure picture of these two groups construction sequence. Similarly, Group 6 was only excavated to a limited extent (Simova 2012), and Fulton (2015b) considers Group 6 to be within the Group 1 house lot and correspondingly part of that household.

Actuncan's Preclassic elite appear to have lived in markedly different domiciles from the polity's commoners. Three large single house mounds, Structures 29, 41, and 73 housed the heads of Actuncan's most eminent households. Prior to the clear establishment of hereditary rule

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[4] It is important to note that Groups 2 and 3 were subject to the comparatively limited excavations, so the absence of materials from before the Early Classic and after the Late Classic may instead be the result of the sample size rather than a true reflection of occupation length.

in the Maya Lowlands in the first century A.D. (Martin and Grube 2008), Maya kingship was shamanic in nature and legitimacy derived from the supernatural (Freidel and Schele 1988; Freidel et al. 1993). While Actuncan's Late Preclassic monumental architecture and carved monuments point clearly to Preclassic divine kingship at the site, the details of who became king may have been negotiated by local elite lineages. Indeed, the AAP has been unable to identify a royal household of the kind you might expect to find if a single house dominated the local political hierarchy. Instead, these three elite households likely collaborated (or competed) to rule the Actuncan polity. Although the process of selecting Preclassic divine rulers is not clear, they could have come from different lineages at different times.

Structures 29 and 41 are in the eastern section of the site core, while Structure 73 is located just west of the site's *sacbe* that connects Actuncan's northern and southern groups. These house mounds are large terraced structures with the foundations of a single dwelling remaining on top. Dating the initial construction of these large structures is difficult. Because of their large size we have not reached the earliest versions of Structures 41 and 73. However all three likely date to the Terminal Preclassic based on ceramics below associated plaza floors (LeCount 2015a; Mixter 2012; Nordine 2014; Simova et al. 2014).

During Actuncan's Preclassic and Early Classic apogee these elite households appear to have benefited from several centuries of stability. Although major architectural overhauls are rare, at least three construction phases from these time periods have been uncovered in Structures 29 and 41 and two phases in Structure 73. Additionally, within Structure 41 and 73, a multitude of smaller architectural modifications reflect the ongoing tinkering that often takes place within domestic space.

Importantly, all three structures were abandoned in the Early Classic period. On both

Structures 41 and 73, deposits of smashed Early Classic ceramics were left on the surface of the structures' terraces (Mixter 2012; Simova 2012). The heavily weathered quality of the ceramics from Structure 73 indicates that this deposit was left uncovered (Simova 2013). These materials were not disturbed or covered later, indicating an Early Classic end to the structure's use as a domicile by their original occupants. Our understanding of Structure 29 is more limited because we did not encounter broad scale evidence of a termination deposit and because much of the building's Early Classic southern staircase was destroyed before being renovated in the Late or Terminal Classic period (LeCount 2015a; Nordine 2014).

After a period of abandonment, all three structures come back into use. Structure 29 was reoccupied and renovated as some point. AAP excavations identified one major construction phase and one minor renovation dating to the Late and Terminal Classic periods (Nordine 2014). The major construction event increased the size of Structure 29's substructure substantially. Unfortunately, excavations did not encounter sealed contexts within this construction phase, leaving its timing broadly defined as Late to Terminal Classic. A small expansion at the foot of the staircase, known as Choki's Terrace, dates definitively to the Terminal Classic period. Additionally, I would note that Structure 29-1st's terminal staircase was very poorly preserved and few cut stone steps were encountered. In one scenario, these stones were taken after the building's Terminal Classic abandonment for the construction of Group 4.

Structure 41 has a complex series of modifications after the Early Classic period. As noted in the previous section, radiocarbon evidence from tumbled stones south of Structure 41 points to a desecratory event at the transition from the Early Classic to the Late Classic I periods (A.D. 425 to 530). This deposit is accompanied by a ceramic assemblage that LeCount (2015) has defined as transitional between the Early Classic and Late Classic I. Structure 41 was then recommissioned during the Late Classic II period when a seated burial was deposited on the summit of Structure 41, marking the renewal of renovation to the building's existing architecture (Freiwald et al. 2014). A direct date from this burial places this renovation between cal A.D. 695 and 862 (LeCount 2015a). The Late Classic II renovations to Structure 41 were quite dramatic (Mixter et al. 2014). A masonry superstructure was removed and the substructure was partially excavated by the Maya to produce a two-level summit platform that likely supported a perishable superstructure. The upper-most platform was clearly oriented facing south and likely supported three low benches. Small renovations continued on the summit of Structure 41 into the Terminal Classic period. Unfortunately, the function of Structure 41 and its longevity are not clear. Activity area data indicate that Structure 41 was a multi-functional space during the Terminal Classic period (Heindel 2015; Mixter 2011a). The evidence for low level crafting may indicate that the structure was reoccupied as a residence; however, I do not think there is sufficient evidence to rule out the possibility that Structure 41 was a special function structure, especially given Structure 41's position across Plaza D from Group 4.

To me, Structure 73 seems less likely to have been used as a domicile. While the Early Classic termination deposit on Structure 41 was covered over, the one on Structure 73 remained open to the elements for centuries despite substantial Late Classic period construction on other parts of Structure 73. During the Late Classic period, Structure 73 became a venue for many commingled burials placed within the newly constructed platform (Simova et al. 2014; Simova et al. 2015). While research into this reuse is ongoing, these burials may follow the pattern identified by Freiwald (2012; Freiwald and Micklin 2013) in the Late Classic period at Group 1. In both locations, multiple burials are placed within a constrained area. When previous burials are encountered during grave preparation, they are pushed aside or rearranged to make space for the new individual (Freiwald et al. 2015). At this time, Structure 73 may have been reoccupied as a domicile; however, I am skeptical that the Maya would live cheek-to-jowl with an uncovered termination deposit. In the absence of clear evidence for domestic debris, I find it more likely that Structure 73 was utilized as a special purpose ritual structure. In the Terminal Classic period, the summit of Structure 73 was definitely used as a location for ceremonial activities (Simova et al. 2015). Evidence for this ritual activity includes a large wide variety of artifacts. Especially notable are over 5,500 jute discovered among layers of collapse from the building, comal rims, *manos*, and *metate* fragments.

Together, these lines of evidence point to great similarity in the early developmental trajectories of Structures 29, 41, and 73. These massive single houses were established in association with the rise of divine rule at the site and remained stable until the Early Classic end of Actuncan's political apogee. Structures 41 and 73 were terminated in similar ways during a similar period of time. While no evidence of termination was encountered on Structure 29, it falls out of use in the Early Classic period before being renovated in the Late Classic period. These lines of evidence indicate that the fortunes of Actuncan's Preclassic elite families were strongly tied to the political fortunes of the polity. When the polity fell, the elites left.

When Structures 29, 41, and 73 are reoccupied, the functions of these spaces are much less clear. While I prefer to interpret them as ritual or special function structures, LeCount (personal communication, 2016) suggests that they were reoccupied as houses during the Late Classic period when Xunantunich was expanding its power and the valley reached its apex of population. These existing buildings could have easily formed the houses of elites loyal to Xunantunich. Structure 73 then clearly is transformed into a ritual locale in the Terminal Classic period, whereas Structure 29 was likely abandoned just in time to make its stones available for use in new masonry work. Structure 41 is the hardest to evaluate; however current evidence may point to either a domestic or special function for this structure during the Late Classic II and Terminal Classic periods. Given the distribution of Terminal Classic deposits across these three structures, Structure 41 is the only structure that could have been a residence during the Terminal Classic revitalization at the site. Even if it was, it is unlikely that the residents were descendants of the lineage that constructed the house in the Terminal Preclassic period.

One other elite household was established at Actuncan, but during the Late Classic period. As mentioned in the previous section, during the Late Classic I period Group 8 was constructed, converting Structure 19 into a multi-patio residence (Mixter et al. 2013). Our research indicates that Group 8's three patios and their associated low platforms were primarily used as domestic space, while Structure 19's rooms were used for public ritual and administration (LeCount et al. 2016). Based on the timing of Group 8's construction, my colleagues and I (Mixter et al. 2013) have hypothesized that Group 8 housed a noble vassal of Xunantunich as part of that site's efforts to exert control over Actuncan. By the Terminal Classic period, Structure 19 and Group 8 were both abandoned, and they were terminated in the Terminal Classic period. A termination deposit was placed in the main courtyard of Group 8. Structure 19's masonry superstructure was dismantled, and its rooms were filled with vault stones and plaster. Furthermore, cut stones from Structure 19's staircase and superstructure were removed and likely used in the construction of Group 4. The residents of this elite compound likely were not descended from the site's Preclassic elites and ultimately did not participate in the site's revitalization.

In contrast, the site's patio-focused groups follow a diversity of trajectories that don't follow any specific pattern. Groups 1 and 5 apparently prospered during Actuncan's period as a polity capital (Mixter et al. 2014). Both underwent renovation, but at markedly different paces. In Group 1, only three patio floors were encountered for a household occupied over at least a 1000 years (Antonelli and Rothenberg 2011; Rothenberg 2012). In contrast, the smaller Group 5 had at least 13 patio floor surfaces, many of which had been constructed by the end of the Early Classic period (Hahn 2012).

Unlike the elite houses, the three commoner households had divergent outcomes following the failure of the Actuncan polity (Mixter et al. 2014). Group 5 appears to remain the most stable. The residents continue to renovate at a rate similar to that during the site's apogee. At Group 1, there is evidence that points to a slowing of renovation during the first half of the Late Classic period. It is likely that the residents of this group lost wealth and status during Actuncan's period of subordination, but it is unlikely that the group was abandoned entirely based on continued evidence of occupation. This pattern contrasts with Group 7 (Simova 2012). Of the four structures tested in Group 7, only one dates to the site's Terminal Preclassic apogee. The other two structures date exclusively to the Late and Terminal Classic periods, suggesting prosperity during these later periods. Renovation resumes at all three domestic groups by the Terminal Classic period, indicating that Actuncan's return to prominence led to prosperity for the remaining community.

In contrast to elite members of the Actuncan community, Maya commoners experienced a diversity of outcomes during periods of political transition. Group 1, the largest patio-focused group in the urban core, suffered the most from the failure of the polity. I suggest that its large size resulted from the household's early attachment to polity rulers. However, when the Actuncan king was overthrown, this household suffered the greatest, falling into poverty. In contrast, the members of Group 5 remained stable, and Group 7 increased its prosperity after the fall of the Actuncan polity. This variability indicates that commoner household fortunes were not intrinsically dependent on polity success. Instead, the variable strategies that households adopted to create relations with polity rulers led to a diversity of outcomes when the polity failed.

2.5 Conclusions

Actuncan's political fortunes and household trajectories form parallel but interrelated site histories. The political history provides a general timeline for the power of Actuncan's leaders based on their ability to muster labor for monumental construction. By comparing Actuncan's construction chronology with the histories of nearby Xunantunich and Buenavista del Cayo, a clear picture emerges of which polity ruled the region during different time periods. The household history, on the other hand, allows us to evaluate the variability in household trajectories and correlate those shifts to Actuncan's political history. Rather than being universally towed along by Actuncan's political fortunes, household trajectories are driven by social status and individual strategies adopted by specific households. Elite households are abandoned when the polity failed, while the three commoner households follow divergent trajectories at that point in time, likely the result of varying sociopolitical strategies and affiliations adopted during the transition period from Actuncan as a polity capital to a subordinate secondary center. Thus, household resilience is largely self-determined

For this study, what is most interesting is that most patio-focused household groups remained continuously occupied from the Early Classic period to the Terminal Classic period. Similar to other settlement clusters located in the Mopan River valley, Actuncan's long-lived households formed a community simply by living within a circumscribed area for centuries. In their review of the principles that underlie community formation, Yaeger and Canuto (2000) focus on interaction as critical to the construction of communities. Although they caution that communities need not be spatially discrete, the kind of clustered settlements recorded in the Belize River valley point to the frequent interactions and shared practices that often underpin communities. For the San Lorenzo community, Yaeger (2000a) argues that shared *habitus* and practices of affiliation associated with resource procurement and village-wide gatherings, such as feasts, emphasized the sameness of the village's residents. The construction of community centers, such as the Chan ceremonial core and SL-13 at San Lorenzo would have reified community connections as both centers of interaction, community gathering, and materializations of a common community past (Cap 2012; Kosakowsky et al. 2012; Yaeger 2000a). At Chan's central group, the repeated deposition of ritual offerings and burial of important ancestors point to the kind of events that would have structured the community identity around a common past (Kosakowsky et al. 2012). The discovery of caches and other deposits at Chan is a particularly striking example of local community construction because these deposits were not likely placed by a ruler or ruling family. Instead, Robin and colleagues (2014; 2012b) have argued that power in Chan was shared by community members rather than centralized in the hands of a single individual. Community-initiated acts like these indicate that these communities were imaged to exist by their members based on a set of common experiences (sensu Anderson 1991). In rural settlements, these kinds of public displays are only possible if the local residents self-identify as part of a community fixed in a common past.

Kara Fulton (2015; see also LeCount and Blitz 2012) has argued that Actuncan's community was held together in part by affiliative practices of feasting and ancestor veneration focused on Group 1, the largest and oldest household at the site. This pattern is similar to the kind of feasting hosted by the oldest and wealthiest households in nearby San Lorenzo (Yaeger

2000b). However, in contrast to the other communities in the Mopan River valley, the residents of Actuncan's northern neighborhood were not centered around a modest village center or gathering place. Instead, the Actuncan community was located immediately adjacent to a monumental architectural complex. As the members of the Actuncan community met on the way to and from the field or market, the site's massive pyramids and broad public plazas would have shadowed them. These massive mnemonics would have structured their interactions and remembrances. Whether or not the Actuncan community continued to understand the historical context of these structures' original construction and use, the continued occupancy of the site would have ensured that the monuments were not forgotten. Indeed, over time this monumental architecture would have been linked to the actions of various external agents who attempted to assert authority over community during different periods of time. Further, the continuous occupation of the Actuncan settlement would likely have tied the local community identity to the remembrance of this landscape and to the stories, legends, or ancestors attached to these abandoned pyramids (see also Halperin 2014; Stanton and Magnoni 2008). Despite Actuncan's tumultuous political history, the occupation of the site's patio-focused groups formed the critical line of continuity that bound Actuncan's households into a community.

As I note in Chapter 3, establishing the continuity of Actuncan's community is critical to understanding how the local past was remembered by the Terminal Classic residents of the site. The residential continuity of commoner households points to the long-term resilience of these households, even in the face of political challenges. The residential disjunction of elite households, on the other hand, points to their dependence on the durability of the leaders they were tied to. Ultimately, the local commoner community formed the foundation of Actuncan's Terminal Classic political revival.

Chapter 3. COLLAPSE, RESILIENCE, AND COLLECTIVE REMEMBERING

3.1 Introduction

Research into societal regeneration has long been overshadowed by investigations into collapse, with a few early exceptions (Adams 1978; Eisenstadt 1988; Hastorf 1993; Marcus 1989, 1993, 1998). This inequity is problematic because the very concept of collapse is predicated on the observed "deterioration" of a culture from a more complex state to a reorganized, though less complex, state (Tainter 1988). Except in the rare circumstance when everyone in a society dies, collapse can only be identified and measured with reference to the society's regeneration. Despite this framework, researchers have often approached collapse with the assumption that it resulted in disastrous change that qualitatively diminished a society. This approach has often led to a primary focus on identifying the causes of collapse so that those in the present may not repeat the mistakes of the past. Climate determinism has played an especially prominent role in the development of theories regarding societal collapse (Dalfes et al. 1997; Liu and Feng 2012; Ortloff and Kolata 1993; Weiss et al. 1993). The Maya case has been no exception, as several authors have argued ardently that cycles of drought caused the Maya collapse (Gill 2000; Hodell et al. 1995; Hoggarth et al. 2016; Kennett et al. 2012; Lucero 2002).

In contrast, many archaeologists have recently rejected the strong rhetoric and fear mongering used by both popular writers (Diamond 2005; Fagan 1999) and academics to describe societal collapse (McAnany and Yoffee 2010b; Schwartz and Nichols 2006). Instead, these researchers encourage a renewed focus on describing resilience and understanding the process of societal regeneration. In particular, one important critique of climate determinism posits that climate impacts are mediated by society (Butzer and Endfield 2012; Davis 2002). Climate can only cause collapse if a society is unable or unwilling to make appropriate structural adjustments. Researchers driven by concern about modern societal collapse have focused on developing models that couple social and environmental systems in order to use studies of the past to inform policy and social action in the present (Costanza et al. 2007b; Tainter 2000).

My approach to understanding societal collapse at Actuncan draws on two outgrowths of this movement: 1) the adoption of resilience theory from the field of ecology as a way of describing coupled human-environmental systems and 2) the recognition of the importance of collective memory in the process of resilience and reorganization. In this chapter, I explore the contribution of each of these theoretical branches to my interpretive methodology. I will begin by briefly explaining the basic tenets of resilience theory and how it provides a framework to describe cycles of societal collapse, reorganization, apparent stability, and subsequent collapse. I will then explain the Maya collapse in resilience theory terms. Based on this discussion, I will present several hypotheses for the form of Actuncan's societal reorganization. The data in the following chapters will address these hypotheses.

Resilience theory also emphasizes the role of memory as a source of structure and inspiration during the process of reorganization. The second half of this chapter will build a methodology for understanding the impacts of collective remembering on sociopolitical reorganization. I will explain the theoretical underpinnings that I use to understand how the process of sociopolitical reorganization was both structured and inspired by the past. Local memory served as inspiration for both the organization and legitimization of post-collapse life at Actuncan.

3.2 Resilience Theory and Collapse

The adaptation of resilience theory as a framework for social change was originated by ecologists who were using the theory to understand the complex interactions of human and ecological systems (Gunderson and Holling 2002; Walker and Salt 2006). Resilience theory is based on two basic concepts. First adaptive cycles are used to describe the cyclical progression of all ecological and human systems through phases of exploitation (*r* for short), conservation (*K*), release (Ω), and reorganization (α) that follow in sequence (Holling and Gunderson 2002). The cyclical sequence is typically represented as a loop drawn as a figure-eight to represent the relative interconnectedness and developmental potential of the system at any particular time in the cycle (Figure 3.1). Although originally intended to model the cycles of ecosystems, the adaptive cycle concept can be used to describe human systems. The *r*-phase represents the establishment and growth of new social or ecological system. At this time, people and resources are not committed to a particular organization and have great capacity for resilience and adaptation. Rules and norms are still forming and systems are able to take on more adaptive forms. In political systems, the *r*-phase might be represented by the formation of a new state.

During the *K*-phase, systems are locked into particular arrangements. Systems become more efficient, but they also become interconnected and adapted to a particular set of situations. Because of their interconnectedness, these systems become susceptible to outside stimuli and internal strife. In political systems, the *K*-phase might be represented by increasing bureaucratization or dependency on scarce resources. These processes make political systems more rigid and therefore less able to adapt when external conditions change. This process has been described as the diminishing returns of increasing complexity (Tainter 1988, 2006). While

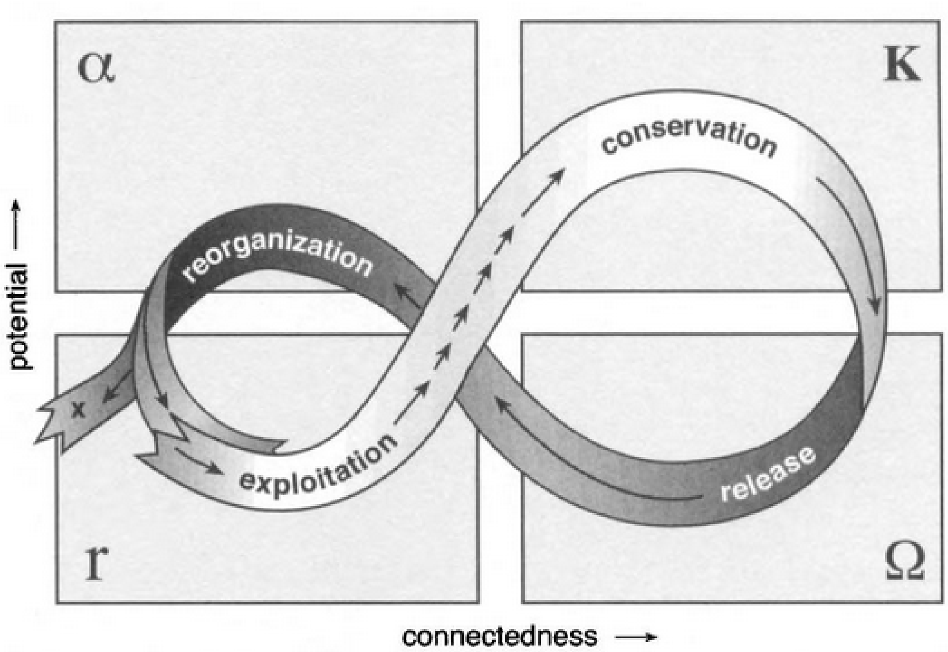

Figure 3.1. Stylized diagram of the adaptive cycle (Holling and Gunderson 2002: Figure 2.1)

life in the *K*-phase may seem more stable, the system is actually more fragile and susceptible to abrupt events (Costanza et al. 2007a; Dearing 2007). Human systems are different from ecological systems because human agency provides the opportunity to develop innovative solutions to challenges that arise. However, complex interconnected systems are often heavily invested in a particular way of doing things. This leads to a high level of rigidity that resists innovation and defies resilience (Hegmon et al. 2008).

The **Ω**-phase is typically caused when a disturbance causes the unravelling of a *K*-phase system. The rigidity developed during the *K*-phase makes the system less able to adapt to disturbances, eventually leading to system collapse. During this phase, existing interconnections dissolve and resources are freed for reallocation. The **Ω**-phase is followed rapidly by the α-phase, during which systems begin to reform. The α-phase provides substantial latitude for innovation and the rearrangement of institutions. In the case of the Maya collapse, the Terminal Classic period can be viewed as a Ω-phase followed rapidly by an α-phase. In the lower Mopan River valley, the two may have taken place nearly simultaneously. Even as Xunantunich was still collapsing, construction had begun at Actuncan, marking the α-phase political reorganization.

The second important aspect of resilience theory is panarchy theory (Figure 3.2). Panarchy theory points out that adaptive cycles work at multiple scales (Holling et al. 2002). Different scales of adaptive cycles turn at varying speeds and can influence each other. For example, Maya politics can be viewed at either the scale of the individual polity or the scale of the Maya Lowlands political system. At the smaller scale, cycles of release, reorganization, exploitation, and consolidation may take place at the time scale of a single king's life or the span of a hereditary ruling lineage. At the larger scale, on the other hand, cycles of consolidation, release, reorganization, and exploitation may match the major periods of political coherence and fragmentation identified by Marcus (1993) in her dynamic model. In this case, the entire Classic period would be a period of consolidation, as Maya divine kings participated in ever-more-complex networks of alliances and rivalries. The collapse of this political system would then represent a release followed by the reorganization that took place in the Terminal Classic period. Cycles can also track different aspects of a society. For example, even though they are related, political organization may change at a different pace than social organization. The collapse of a Maya polity's centralized authority may not impact village level social dynamics, for example. Similarly, economic and religious systems need not change at the same pace as social and political systems.

Interconnections between adaptive cycles take place in two ways that are critical to my discussion of the Maya collapse and Actuncan's political reorganization. First, collapse in one cycle can impact adjacent cycles causing a cascading process of collapse (Butzer 2012). In

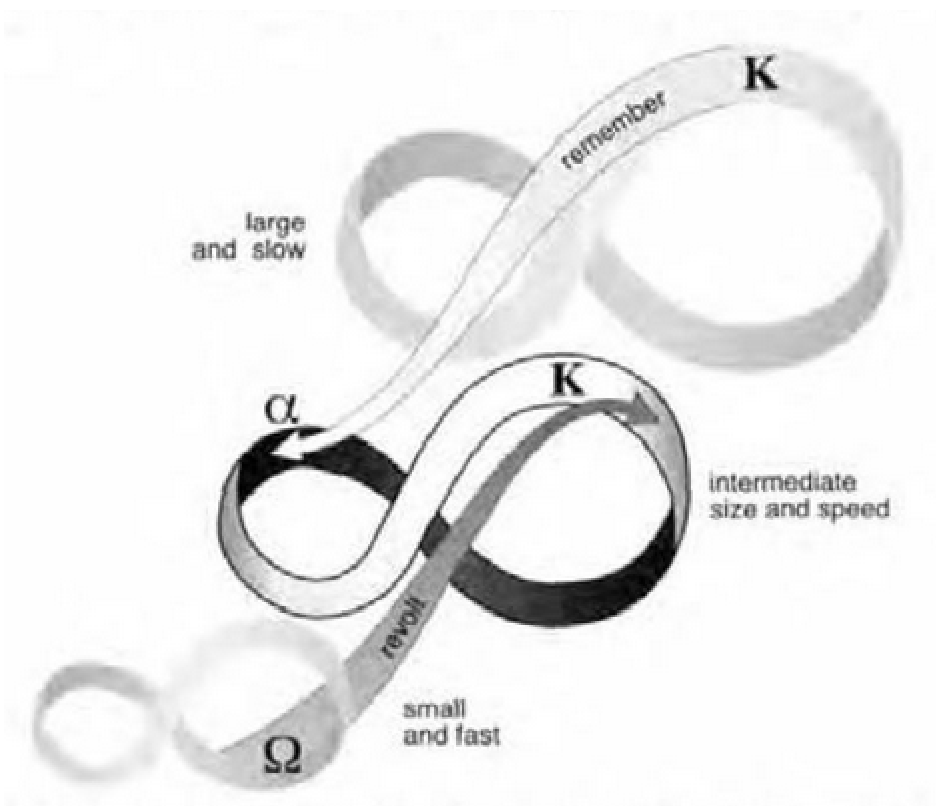

Figure 3.2. A panarchy composed of nested adaptive cycles. Note how the "remember" function connects the reorganization phase to the conservation phase of another, larger cycle. (Holling et al. 2002: Figure 3.10)

resilience theory this kind of feedback loop is known as "revolt." A pertinent example of revolt relates to the collapse. The collapse of the Maya political system would have caused simultaneous failure of Classic Maya religious precepts because of the centrality of kings to religion in their role as divine lord (Freidel et al. 1993; Houston and Stuart 1996). The failure of the political system led to the simultaneous failure and rethinking of religious precepts (Freidel and Shaw 2000).

Second, panarchy theory emphasizes the role memory plays in reorganization (Holling et al. 2002). The "remember"[5] process points out that systems draw on larger-scale, slower-moving adaptive cycles to jump start reorganization. For example, when the ruler of an individual Classic Maya polity died, the regional political system provided a pattern for understanding how to replace that king. For ecologists the reference to memory is metaphorical. After a forest burns, the environment is exploited by seeds that remain from the plant species that in that forest. These seeds represent a memory of the original forest with the potential to eventually replicate its form. However, within human societies, the "remember" process can be understood literally. The memory of past institutions and events form the foundation for the reorganization of societies after collapse.

Although many archaeologists have adopted resilience theory as a model for understanding the cyclicality of culture change (Aimers and Iannone 2014; Delcourt and Delcourt 2004; Faulseit 2016b; Nelson et al. 2006; Redman 2005; Rosen and Rivera-Collazo 2012), two important critiques have been leveled at the use of resilience theory as an archaeological framework. The first challenge is that resilience theorists continue to exaggerate the role of climate, and other external processes, as forcing mechanisms. In contrast, Butzer (2012) notes that external and environmental forces are secondary to internal cultural factors in determining the course of culture change. While external forces may push against human systems, change only takes place when human societies are ill prepared to manage the external force and unable to innovate new strategies. Perhaps unsurprisingly given resilience theory's

[5] When referring to resilience theory's concept of "remember", I will place the term in quotes. This distinction aims to reduce confusion between this term and remembering as related to human memory.

basis in ecology, the independence of human agents is poorly accounted for. However, human agency provides a bulwark against external stimuli. What resilience theory provides is a useful model for describing the cultural structures that limit the social change.

The second challenge is that resilience theory is inherently descriptive rather than explanatory or prescriptive (Cote and Nightingale 2012; Faulseit 2016a:12-16; Kidder et al. 2016:73). Indeed adaptive cycles are best used as a heuristic for considering the interrelationships between different aspects and scales of culture change (Aimers and Iannone 2014:27). Organizing human systems into adaptive cycles provides a way to control complex processes and to perhaps identify new connections. Furthermore, specific aspects of the adaptive cycle model may point to explanatory value, if adequately adapted to account for the complexity of human processes. For example, archaeologists have critically applied the concepts of rigidity and path dependency to explain how increasing interconnectedness and bureaucratization can limit agency and lead to collapse (Hegmon et al. 2008; Kidder et al. 2016; Storey and Storey 2016).

I propose that the "remember" process provides a similar opportunity to explain the transition from collapse to reorganization. Resilience theory ecologists talk about the release of resources that accompanies collapse (Holling and Gunderson 2002:45-47). In the case of human societies, reorganizing groups have the opportunity to reinvest those resources in innovative ways. Yet, innovation is limited by existing knowledge and innovators' abilities to form social coalitions. As a result, agents advocating for change are bound by historically contingent structures.

In one path to political reorganization, groups may draw inspiration from other cultural institutions. For example, Maya political, economic, religious, and social organization could be considered separate adaptive cycles. In fact Chase and Chase (2006) trace how different organizational "frames" transformed differentially from the Classic to Postclassic periods. Although all were necessarily disrupted by the political collapse, Maya economic, religious, and social organizations did not collapse in the dramatic way the political system did. Therefore, Terminal Classic Actuncan may have "remembered" organizational principles from one of these other cultural segments to inspire their reorganization. Indeed, the memory of past institutions typically provide the basis for the construction of new institutions during reorganization (Bronson 2006; Masson et al. 2006; Pugh 2002; Schwartz 2006). In the next section, I will provide a series of hypotheses that might explain the organizational principles that underlie Actuncan's post-collapse political reformulation.

While resilience theory provides a model for understanding the organizational options available to the Terminal Classic Maya, studies of collective memory aid in understanding why different political strategies were adopted. Indeed, a community's positive and negative memories of events that took place during the collapse would have informed their reorganization (Hassan 2000; McIntosh et al. 2000). Appropriately, the impact of collective memory on reorganization can be modeled as a "remember" process. Unfortunately, in most archaeological applications of memory to societal regeneration, collective memory is treated as a static shared concept rather than a contested frame. In the Actuncan case, the community's memory of its past must have been negotiated. The understanding of that past can been seen archaeologically in their treatment of Preclassic and Classic period buildings within the urban center. In the second half of this chapter, I outline collective remembering as a methodology for interpreting the impact of collective memory in the archaeological record. While adaptive cycles help elucidate the breadth of organizational options available to reorganizing communities, a collective memory approach helps elucidate the historically particular reasons why a certain trajectory was chosen (see also Hutson et al. 2016).

3.3 Hypotheses for Political Reorganization

Ethnohistoric, ethnographic, and archaeological evidence suggest that the Maya of different places and eras adhered to a variety of different political forms. These varied greatly both in who held power and in the level of inclusiveness within the political process (Marcus 1993; Martin and Grube 2008). I propose four possible hypotheses for political strategies adopted following the Maya collapse. In each hypothesis, the Terminal Classic community would have drawn on continuity in an aspect of Classic Maya society, as outlined in the discussion of resilience theory above.

Each of these hypotheses can be tested based on the architectural form and function of Group 4, the primary civic complex I excavated in my research. The archaeological correlates for each were formed based on multiple lines of evidence and multiple sources of analogy (Wylie 2002:136-167). It is important to note that these hypotheses are not necessarily mutually exclusive. Hypothesis 1 and 2 propose alternative structures of authority, while hypotheses 3 and 4 suggest that Terminal Classic Actuncan was largely focused on the ritual and mercantilism, respectively.

Hypothesis 1: Continued hierarchical authority by an apical elite ruler: Following the disappearance of divine kingship, the Actuncan community may have reformed under a hierarchical system similar to the Classic period. This process of regeneration whereby the new political organization follows a previous well-known organization is called template regeneration (Bronson 2006; Morris 2006). In resilience theory terms, the Actuncan community would be "remembering" the Classic period political structure. Elsewhere, post-collapse attempts to revive divine rule is well known from Ceibal and Nakum (Hermes and Źrałka 2012; Tourtellot and González 2004). Remaining Mopan River valley elites may have established a new power center at Actuncan, or new leaders may have swiftly constructed a new hierarchy on the basis of charismatic leadership. Notably, new leaders do not need to be descendants of earlier elites and would not need to have made use of the preexisting elite infrastructure. Rather, given the evidence for Terminal Classic transformations in the uses of Actuncan's elite houses, only Structure 41 may have been an elite house at this time; however, evidence for Structure 41's Terminal Classic function is inconclusive. As a result, I rely on evidence for the form and function of Group 4 to test this hypothesis.

In this scenario, Group 4 would have been constructed as a new center of authority for a primary local ruler. I would expect architecture and activities to point to exclusionary political strategies (Blanton et al. 1996). Group 4's architectural layout should emphasize the power of a specific individual through the construction of a single primary seat. During the Classic period, ruling individuals sat on thrones when they held audiences in an official capacity. The presence of a constructed throne with masonry armrests or an elevated platform designed to support a throne made of perishable materials would strongly support a single leader (Demarest et al. 2003; Harrison 2001; Valdés 2001). Aside from a central seat, the structures located around the edges should have functions similar to those in Classic period palaces (Inomata 2001a), as loci of administration and elite craft work. The latter would be identifiable through material remains and activity area proxies (LeCount et al. 2016; Terry et al. 2004; Wells et al. 2000; Widmer 2009). Importantly, individual rooms should show specialized use, either as elite activity space, as indicated by activity signatures for elite crafts (Inomata 2001b), or administrative space, showing little evidence of activities (Robin et al. 2012b). The central patio of Group 4 would be expected to remain clean. The remains of ceramic serving vessels from associated midden deposits should provide evidence of exclusive elite feasting rather than more inclusive practices (Dietler 1996; LeCount 2001).

Hypothesis 2: Council-based authority built around collaboration between kin groups: Some Maya groups within both ancient and ethnographic settings follow more inclusive forms of authority located at council houses, or *popol nah*. In this scenario, hierarchical authority was rejected following the failure of divine kings, and leaders of community kin groups collectively held power. The inspiration for council-based authority may have come from two possible sources. First, the presence of council houses has been identified at some sites contemporaneous with the proliferation of titled nobles at the end of the Classic period (Ambrosino 2003; Culbert 1991:326; Fash et al. 1992; Jackson 2013). These points of evidence likely indicate that leaders at the end of the Late Classic period were more beholden to the input of their advisors and subordinates, than their predecessors. Second, the idea of kin-based rule may have been embedded in Maya social systems. McAnany (1995) has argued that divine kings existed in tension with a very old Maya social organization focused on kin-based rule. With the formal hierarchy of kings removed, the local community may have drawn on this social organization as a template to formulate the new political organization. In resilience theory terminology, the institution of council-based rule can be conceived of as a "remember" process, where by kin-based leadership was reasserted following its suppression during the Early and Late Classic periods.

If the Actuncan community adopted council-based rule, I would expect the Group 4's architecture and activities to follow patterns expected in instances of corporate rule (Blanton et al. 1996). One possibility is that Group 4 was a council house. The presence of council houses has been documented from both Classic and Postclassic period contexts bracketing the Terminal Classic period (Ambrosino 2003; Fash et al. 1992; Pugh et al. 2009; Schele and Freidel 1990:364-370). Ethnohistoric, ethnographic and iconographic descriptions of council houses provide a distinct set of criteria for identifying council houses through their associations with dancing, meeting in council, and public feasting (Landa 1941; Schele 1998; Vogt 1969). Dancing cannot easily be identified in the archaeological record; however, council houses should be accompanied by a wide open space that could be used for dance performance. Group 4's broad patio could serve this purpose. If it were used for dancing, we would expect clean activity area signatures, similar to those seen in administrative buildings (Robin et al. 2012b:144). The same patio could be used as a space for gathering during council meetings. Perimeter structures should be primarily benches used both for meetings of the council and holding audience with community members (Freidel and Sabloff 1984; Pugh et al. 2009; Rice 1986).

Excavations of Group 4 indicate that each structure was built with a different design and masonry technique. One hypothesis is that each of these structures was associated with a local kin group participating in the council, in a manner similar to the toponyms located on the exterior of the council house at Copán (Canuto and Fash 2004; Fash et al. 1992). If one of the structures has a coherent layout as a C-shaped structure, it likely functioned as a council house (Freidel and Sabloff 1984; Rice 1986). In this case, the benches along the walls of the structure would have served as seating for the arrangement of councilors (Vogt 1969:272-281). Although unlikely to be present, iconographic programs associated with council houses should relate to either mat or flower motifs (Ambrosino 2003; Fash et al. 1992; Schele 1998). Expected activities would consist primarily of meeting, eating, and dancing. Public food preparation and consumption in particular may be evident from soil chemistry and microartifact data. Furthermore, the remains of ceramic serving vessels and faunal assemblages from middens should provide evidence of inclusionary alliance feasts, rather than elite-only exclusionary practices (Hayden 2001:55-57; Keller 2012; LeCount 2001).

Hypothesis 3: Theocratic authority based on ritual importance of Actuncan: The previous two possibilities downplay the emigration of local Maya during the Terminal Classic period. While the population in Actuncan's center remained relatively steady during the Terminal Classic period, the Mopan River valley as a whole experienced a decrease in population. Given the freedom to relocate, Maya who remained must have had reason to do so. Hypotheses 1 and 2 assume that Actuncan remained a fully-functional community with entangled, though transformed, social, political, ritual, and economic institutions and aspirations. The local resilience of political institutions dissuaded members of the community from moving to more stable areas. Alternatively, people may have stayed to create a special purpose site based on a specific quality of Actuncan's location. In this case, the ritual importance of "old" Actuncan served as the main driver for locating Terminal Classic power in this location. For the Maya, locations maintain ritual power, even after the site is abandoned (Stanton and Magnoni 2008). In certain areas, constructed landscapes, especially those associated with important natural features or particular age, can serve as pilgrimage sites (Brown 2011; Freidel and Sabloff 1984; Halperin 2014; Hansen et al. 2008; Landa 1941; Robin et al. 2012a). I suggest Actuncan's ancient power may have incentivized the transformation of Actuncan into such a pilgrimage site. In this case, authority would rest with members of the priesthood, while other members of the community provided services to pilgrims. The community might resemble in many ways the settlements that grew up near Olympia and Delphi in ancient Greece, where the local population provided services, including food, lodging, and even banking services, to pilgrims and tourists visiting those towns' athletic facilities and temples (Morgan 1990). While those towns' continued occupation was driven by their historical and ritual importance, community members who were not affiliated with the priesthood thrived by creating a service economy.

In terms of resilience theory, this model would indicate the "remembering" of religious precepts from the Classic period. Although the collapse resulted in the end of kings' association with cosmological cycles (Freidel and Shaw 2000), evidence indicates large amounts of continuity in Maya religion from the Preclassic period until the arrival of the Spanish. The role of ritual specialists during the Classic period is still poorly understood (Freidel and Guenter in prep), but some evidence indicates that there would have been a Classic period precedent (Rossi et al. 2015; Zender 2004) for a Terminal Classic priesthood.

At Actuncan, this possibility would mean that Group 4 primarily served a ritual function. The structures lining the edges of the Group 4 platform should be individual buildings with altars and shrines as opposed to benches. The group would then resemble the Terminal Classic "shrine groups" identified along the Caribbean coast of the Yucatan Peninsula (Andrews and Andrews 1975; Freidel and Sabloff 1984). Chemical residue studies should suggest strong evidence of ritual offerings, including burning and use of pigments (Middleton and Price 1996; Wells et al. 2000). Additionally, associated macroartifact assemblages should feature a preponderance of ritual objects, especially censers, bloodletting implements and objects of particular value concentrated in deposits of spent ritual items on altars or swept immediately to the side as ritual refuse (Pugh 2001).

Hypothesis 4: Authority rests in a merchant oligarchy based on economic importance of Actuncan: This possibility suggests that Actuncan survived as a special purpose economic center controlled by local merchants. Many communities survived the Maya collapse because of their location near important resources or along significant trade routes (Andrews 1990; Berdan et al. 2003; Masson 1997, 2000; Masson and Mock 2004; McAnany et al. 2002). In this case, the Actuncan community would have been "remembering" and amplifying the importance of the Mopan River valley as a critical trade route, evident in the presence of Classic period markets at Xunantunich and Buenavista del Cayo (Cap 2015a, b; Keller 2006). While no evidence currently indicates that Actuncan was a market city during earlier time periods, the tradition of trade existed in the Mopan River valley and continued to Colonial times (Jones 1989) and even to the 20th century (Landon 1935). During the Terminal Classic period, some areas of eastern Maya Lowlands including the higher reaches of the Mopán River valley and the neighboring Sibun River valley appear to have benefited from the expansion of exchange networks at this time (Harrison-Buck 2007; Kepecs et al. 1994; Laporte 2004). Actuncan rests at a major natural crossroad of trade. From Actuncan, merchants can continue south by canoe or can head west across land towards the settlements of the Petén Lakes district (Laporte 2004; Rice and Rice 2004; Schwarz 2009). At the time of the Spanish conflict, nearby Tipu on the Macal River served as the end of the river route inland from the Caribbean (Jones 1989), a role that easily could have been served by Actuncan. If Terminal Classic Actuncan was primarily mercantile in nature, then Group 4 may have served an economic function. Architectural evidence might include evidence of market stalls and storage space, rather than shrines or buildings with benches. In contrast to the alternative hypotheses, activity area research should show signatures most similar to a marketplace, such as the sale, storage, and production divided into discrete areas for different types of goods (Cap 2011, 2015b). Activities should not be restricted to elite crafting, and evidence from microartifacts might include chipped stone tool production. Artifact assemblages should provide evidence of a variety of goods, including utilitarian ceramics otherwise not typically associated with public spaces.

3.4 Collective Memory

The summit of Structure 1 at Actuncan rises above the modern forest canopy, a stone reminder of a once great city standing watch like a sentinel over the landscape. The summit's 28 m height looms above the Mopan River, which snakes just to the east. Now covered in tropical forest and corn furrows, this river valley once was home to ancient Maya farmers, who, from its construction in the first millennium B.C., could look up and see this monument—first as a brightly-colored Preclassic temple pyramid, then as a Classic period ruin slowly crumbling due to neglect. Despite its advancing decrepitude, the residents of Actuncan's center continued to walk past its abandoned monuments including Structure 1's tree-covered mass, which formed a striking silhouette on the horizon. The site continued to be remembered as an old place—a place inhabited by ancestors.

Among the ancient Maya, the importance of the past has long been recognized through explicit statements of descent made by rulers and ordinary households' practice of repeatedly burying important ancestors in the same locations under house floors (McAnany 1995; Proskouriakoff 1960). In the 16th century, Spanish priests recorded the oral traditions of Maya lineages who remembered their descent as a means to legitimize their control over people and territory. For the ancient Maya, the collective memory of descent served as the primary source of legitimacy for control over people or land (McAnany 1995). In the archaeological record, the importance of memory is also evident in the palimpsest use of architectural space by the ancient Maya. Ruins were built over or repurposed by later people as a way to create genealogical ties to the past (Halperin 2014; Kristan-Graham and Amrhein 2015; McAnany 1998; Navarro-Farr and Rich 2014; Simova et al. 2015; Stanton and Magnoni 2008). Additionally, old sites and buildings were frequently the destinations of pilgrimage, as evidenced by altars and the remains of ritual practices encountered atop collapsed structures (Brown 2011; Hansen et al. 2008; Robin et al. 2012a). Drawing on these and other examples, Canuto and Andrews (2008:269-271) have commented that Maya historical awareness existed at various levels of abstraction depending in a large part on temporal distance and occupational history (see also Gosden and Lock 1998). Generational oral histories, social continuity, and hieroglyphic inscriptions encourage accurate remembering. Over longer time periods, memories and material markers of the past blend into the Maya wilderness and take on meaning as metaphorical natural features and supernatural homes to the ancestors (Brown 2008; Halperin 2014; Taube 2003:467-468).

Following Connerton's (1989) influential exposition on *How Societies Remember*, much archaeological work on collective memory has focused on the inscribed and embodied qualities of memory production. Although Connerton (1989:73-79) was more directly interested in text and modern media, archaeologists have rightly expanded the inscribed category to include the placement of tangible markers on the landscape—the materialization of past actions by people of all levels of society (Bradley 1998). This theoretical anchoring has led to two approaches to collective memory. One approach focuses on how societies intentionally reworked their pasts through performance and modifications to the lived landscape to legitimize authority or influence the future of a society, state, or collective (Alcock 2002; Schortman and Urban 2011; Schwartz 2013). A second approach focuses on the memory created through everyday practices and how this kind of quotidian memory creation leads to the production of identity, land tenure, and meaningful places (Hendon 2010; Joyce 2003; LeCount 2010b; Lillios 2008; McAnany 1995).

These two perspectives are important because they underpin claims to authority by groups and individuals at the state and household scales (Hobsbawn and Ranger 1983; McAnany 1995, 1998). However, neither the state nor the household view of memory adequately considers how claims about the past gain salience. The execution of a brilliant performance by a ruler does not guarantee that this event will be remembered as evidence of their greatness and magnanimity. Rather, memories are perpetually digested and interpreted within social, political, and historical contexts. This mental processing provides difficulties for archaeologists who can easily see the materialization of official narratives, but have difficulty seeing the re-interpretation of formal events and official propaganda by everyday people (Overholtzer 2013; Trouillot 1995). Yet, minority and marginalized understandings of the past are critical to understanding the stability (or instability) of formal institutions and trajectories of reorganization during political transitions (Schwartz 2006; Yoffee 2015).

To bridge the divide between elite and household approaches to collective memory, I draw on the concept of collective remembering to develop a relational approach to the archaeological study of collective memory that considers the impact of both official messaging and informal community-level interactions on the process of memory production and perpetuation (Bartlett 1932; Middleton and Edwards 1990b; Wertsch 2002, 2009). Public monuments, ceremonies, and events are not accepted whole cloth but rather are interpreted by subordinate groups and individuals within a cultural and historical context. Importantly, collective remembering results from repeated interactions and conversations that happen through the practice of daily life (Middleton and Edwards 1990a). Rather than seeing the production of official memory and the everyday creation of memory as discrete processes, collective memory is synthesized relationally through a web of interactions structured by periodic events, individual's daily schedules, and the physical setting that structures the rhythm of people's daily lives. Thus, collective remembering becomes a process that results from daily practice and is constrained by the spatial dimensions of interaction (de Certeau 1984). Furthermore, routinized local interactions and the materiality of city and village facilitate the development of communities of remembering (Yaeger and Canuto 2000; Zerubavel 1996). The collective remembering within these communities reflects a local interpretation of the past and may reify alternatives to official narratives as a kind of "hidden transcript" in resistance to official narratives propagated by hegemons (Scott 1990). Rather than viewing collective memory as monolithic or a tool of domination, approaching memory from the perspective of interactions draws attention to the potential for locally diverse understandings of the past and their implications for power relations.

As both a center of political authority and a community center, Actuncan formed a nexus of interactions—both between people, and between people and the material landscape—that facilitated the collective remembering of the past. Importantly, these memories were not retained by repeated, elite-centered performances, but rather through the quotidian interactions of daily practice that form an under-considered component of collective remembering. At Actuncan, the quotidian nature of remembering was particularly relevant during the Late Classic period when Actuncan was not a center of political authority, but rather ruled from afar. However, memories passed through conversations and oral traditions drift and fade, moving from the realm of direct experience to myth and legend that vaguely resemble the facts of the past (Gosden and Lock 1998). By focusing on how networks of interaction facilitate the production and perpetuation of collective memory, a collective remembering approach accounts for this shift and the changing cultural context that memories reside within. Terminal Classic expressions of memory at

Actuncan indicate that the local community did not accurately remember the site's Preclassic apogee and the cultural traditions originally associated with its buildings. Rather than reference buildings in a way that follows Preclassic norms, acts of remembrance reflect a Classic period understanding of ritual and architectural construction. These details indicate that the Actuncan's community had reimagined the urban landscape through discussion, speculation, and the lens of changing norms. In this way, the past was constructed in service to the Terminal Classic context: remembered imperfectly, interpreted through the lens of current agendas, and expressed in contemporary cultural terms. This remembrance formed the basis for legitimizing the community's Terminal Classic revival.

3.4.1 Collective Remembering: A Relational Approach to Collective Memory

Classic Maya rulers were masters of producing elaborate spectacle. The murals from Bonampak, Mexico portray the pageantry of Maya kings in elaborate full color (Miller and Brittenham 2013). Magnificent processional parades are accompanied by musicians, entertainers, and warriors in full regalia (see also Morton 2012; Reese-Taylor 2002). Captives stretch sprawled across the stairs of a great pyramid, suffering from the removal of their fingernails or distal phalanges while Bonampak's elite stand triumphant. This kind of performance was intended to reify charismatic royal authority by providing a venue for kings to display their wealth, martial power, and cosmological associations (Demarest 1992; Freidel et al. 1993; Inomata 2006b). Spectacles were motivated by specific events—whether a royal accession, a martial triumph, or an important calendrical date—and were intended to establish particular memories in the minds of local polity members. The first-hand experience of these kinds of commemorative ceremonies are discussed by Connerton (1989), who suggests that their power resides in incorporation—the memory formed through bodily participation either as a performer or spectator. For the Maya, this kind of public event both constructed the polity by gathering the local populous in one place and reified sociopolitical inequality through the physical separation of performing elites and spectating commoners (Inomata 2006a:807-809).

Just producing a great spectacle does not guarantee that it was processed and remembered as intended. After an event takes place remembering and interpretation begin, providing space for disagreements over the facts and differences in opinion about what transpired. In his foundational study *Remembering*, psychologist Frederic Bartlett (1932) argued two critical points. First, memory is not a set of information possessed by collectives for individuals to draw on—as previously argued by Maurice Halbwachs (1992 [1925])—but rather a constructive process in which individual memories are influenced by social associations and cultural context. Thus, memory is produced in part through individual cognition but also through the social interaction. Second, memory does not stand as an accurate representation of the past, but is instead an “effort after meaning” (Bartlett 1932:44). By this, Bartlett meant that individuals reconstruct memories in the moment of recall and, in the effort, actively reshape them in the context of the present (Schacter 1996). Numerous psychological studies have pointed to the inaccuracy and memory distortions that result from the constructive nature of recall (Roediger and McDermott 2000; Schacter 1995). To emphasize that recalling the past is a collective and constructive process, Bartlett preferred the term “remembering” to “memory,” the latter of which evokes the static connotation of Halbwachs’ initial formulation of memory.

As a psychologist, Bartlett’s writing on remembering ultimately focused on the impacts of the social on individual cognition (Douglas 1986:81). From this perspective, individuality and the constructive nature of remembering insert instability into the process of memory production.

In contrast, social interaction, public commemoration, and cultural norms provide structure to the collective production of memory. Psychological studies of "collaborative remembering" show how memory is produced through social interactions—the memory of individuals placed together tend to converge on a common narrative (Weldon 2001; Weldon and Bellinger 1997). Put another way, individual memory largely derives from internalizing social discourse over time (Wertsch 2002:37). If commemorative ceremonies, such as those put on by Maya rulers and elites, provide events intended to be fixed in memory, their internalization is ultimately conditioned by the discourse that develops around that event, its associated actors, and the historical moment.

Collective remembering refers to the processes by which a common understanding of the past is resolved from individual versions of events (Wertsch 2002, 2009). Rather than a static view of collective memory, collective remembering acknowledges both the fallibility of individual memory and the role of social interactions in the process of remembering. The collective memory does not necessarily represent the facts of the past—a reality long acknowledged in archaeology—and is also mutable, unstable, and may not be uniform across a population. Rather, as an aggregation of individual memories, collective memory is influenced by the limits and biases of individual observations, interests, and agendas. Although individual memories are never fully reconciled, a collective memory emerges from public discourse wherein common understandings of the past are reified and the memories of some individuals adjust to accepted and popularized versions of the past.

3.5 Collective Remembering, Landscapes, and Narratives

Wertsch (2002:37-40) identifies social interaction as a critical locus of collective remembering, where people both remember together and internalize collective memories beyond their autobiographical experience. I specifically focus on three kinds of interactions that are critical to collective remembering: public events, including the kinds of spectacles typically discussed in archaeology (Coben and Inomata 2006); informal interactions based around the conversations that take place in the course of everyday life (Middleton and Edwards 1990a); and the role of monuments and important points on the landscape as mnemonics that focus and perpetuate memory (Basso 1996; Bradley 1998), even if collective remembering may cause their original intended meanings or associations to drift. These categories of interaction are not intended to be understood as exclusive to each other. Rather, all are part of the practice of everyday life, wherein individuals—and their memories—are constituted by their interactions and relationships (de Certeau 1984). If public events form the seed of what is to be remembered, it is conversations—both at the event and in the days that follow—that cement how events are remembered.

Monuments and the constructed landscape play different roles in framing collective remembering. Public space serves as the setting for the public events and informal interactions that facilitate collective remembering. Recent attention by archaeologists to public space and events has emphasized the way periodic gatherings provide the opportunity for individuals to consolidate collective identities through common experience (Freidel 1981b; Inomata and Coben 2006; Tsukamoto and Inomata 2014). Among the ancient Maya, the recent identification of public plazas that were used as marketplaces indicates that ancient Maya public gatherings were not just for formal performance and spectacle, but also provided ample opportunity for trade and socialization, as is common in market settings (King 2015). Additionally, city and village centers likely served as loci for interactions and collective remembering outside of periodic events. In the modern cities of Central America, plazas and public spaces would have been the center of public life where farmers, craftspeople, and traders exchange wares and gather to chat and gossip. Ethnographers have pointed out that these kinds of informal interactions have important political implications (Low 2000), and they provide the venue for collective remembering to take place. Similarly, archaeologists interested in how identity is created relationally have pointed to the role fields, pathways, and neighborhoods played in facilitating inter-household interactions that form the foundation for communities (Ardren 2015; Hutson 2010). Space limits who remembers together and facilitates the creation of communities based on a common understanding of the past. Just as proximity and frequency of interaction facilitate the convergence toward a collective memory, residents of distant locales interact less frequently, and their interactions may clarify divisions between communities based on differences in understandings of the past. Space plays a role in structuring how similarities and differences in collective memory develop and are acknowledged as part of the process of community and identity formation.

Monuments and urban space are durable reminders of the past that structure and influence collective remembering in addition to providing a venue for the person-to-person interactions that facilitate the production of collective memory. Recent work by archaeologists and social theorists interested in "post-humanism" or the "ontological turn" aim, in part, to credit materials, including the constructed landscape, with their ability to shape and influence people, places, agendas, ideas, and practices (Alberti et al. 2011; Appadurai 1988; Gell 1998; Hodder 2012; Ingold 2011; Knappett and Malafouris 2008; Latour 2005; Miller 2005; Watts 2013). Similarly, the ancient Maya built environment influenced the local process of collective remembering. I have already laid out how public space provided the venue for conversation.

However, buildings, roads, and monuments also were markers dedicated to past kings, venues for past ceremonies and spectacles, and places where the official business of the polity or village took place. They inscribed the past—sometimes literally with texts—onto the landscape for all to remember (Alcock 2002). The durability of urban space, stone monuments, and monumental architecture perpetuated knowledge of the past because their existence frames the kinds and content of interactions that take place. Indeed, the continuous presence of people within these spaces perpetuates their importance as markers of the past.

Yet, contra Latour (2005), humans and the constructed landscape are not equivalent actants, entities that modify the action of others. Rather, monuments and monumental architecture were power-laden emblems of the asymmetrical relations between elites—who commissioned and lived among them—and commoners—who constructed and dwelt at their margins (Van Dyke 2015). The temples, palaces, and monuments reflect the motives and intentions of those in power. However, the interpretations and memory of durable monuments are not guaranteed. Rather these kinds of monuments become entangled with meanings, associations, and remembrances that may not match the meanings intended by those who constructed them. In this way, collective remembering empowers non-elites who are less visible in the archaeological record to reinterpret monuments based on their own relationships, socioeconomic situation, and historical context.

3.6 Variability in Memory: Communities and Alternative Narratives

Variability in collective memory can also be understood in terms of narratives across social class. Wertsch (2002:55-56; also 1998) identifies "narratives as one of a few different instruments we have for representing settings, actors, and events of the past." In part because memory is constructive, narratives are dialogic, delivered and conceived within the context of a particular teller or occasion of telling (Wertsch 2002:59-60). The delivery of a narrative is cast in the agenda and perspective of a particular teller. As such, narratives propagated by dominant powers in public venues may be different than those told by common folk spoken in alleys or kitchens. Wertsch (2002:117-148) traces how narratives of the past in the Soviet Union persisted on parallel tracks—an official, propagandist narrative was propagated by the government, while a set of folk narratives was passed on illicitly in kitchen and dining rooms. The latter was valued precisely because government authorities suppressed it. Similarly, Maya rulers clearly aimed to propagate a specific narrative of their lives and their polities' history through inscriptions on stone and monumental construction in stone (Marcus 1992). What we don't know is how tightly commoner Maya narratives adhered to these official narratives. Were alternative narratives of the past maintained in households and rural communities? How tightly did official narratives hold the allegiance of commoners? If alternative narratives were maintained in hinterland communities, these can be considered a kind of resistance—hidden transcripts obscured to the archaeologist by the public transcripts of official narratives, to use the terms of James C. Scott (1990).

I argue that alternative narratives are not just a possibility, but an inevitable product of the relational and constructive nature of collective remembering. Just as spectacle, public space, and collective remembering may result in different memories of the past between socioeconomic classes, settlement patterns facilitate differential intensity of interactions, whereby proximity may play a critical role in the development of mnemonic communities (Zerubavel 1996, 1997). I follow Wertsch (2002:67) in arguing that "collective remembering typically provides an essential basis for the creation and maintenance of groups – specifically, imagined communities." In preindustrial societies, like the ancient Maya, collective remembering is dependent on face-to-face interactions and is inherently framed by the spatial and material parameters that constrain interactions. In other words, individuals have greater opportunity to discuss the past—and agree or disagree—with those they interact with frequently. The social geographies that structure individuals' daily lives—such as neighborhoods, villages, rural estates, minor centers—may serve as natural fault lines for the construction of mnemonic communities, just as they do other kinds of communities explored in archaeology (Ardren 2015; Hutson 2010; Yaeger and Canuto 2000).

At the community level, the perception of a collective past may be materialized through the construction of village centers or community gathering points associated with village life. Importantly, as long-lived units of social identity and interaction, a community's collectively remembered past might not concur with official narratives or the alternative narratives maintained by nearby communities. At rural centers away from the polity capital, inhabitants would have been more able to express opinions contrary to the official narrative. Thus, diverging interpretations of the past arise in villages and secondary centers where geography allows for the maintenance of alternative narratives.

From spectacle, to conversation, to monument, a collective remembering approach views memory as resulting from a constructive and relational process. This process results in ever-evolving versions of the past that often diverge between social groups—especially communities constructed based on practice. Of course archaeological evidence for memory typically does not clearly articulate multiple understandings about the past. Instead, public evidence of memory work (Mills and Walker 2008b) is often laden with the power relations that existed in the remembering societies. Fortunately, the dynamic nature of Maya politics (Marcus 1993; Martin and Grube 2008) included multiple transitions in regimes and political systems evident in both the epigraphic and archaeological record. Indeed, monuments and public architecture are durable, material remnants of past regimes. During transitional periods, these old spaces provide a venue for communities and leaders to perform their collective memory, which may not match the dominant narratives propagated by past leaders.

3.7 Collapse and Memory: Identifying Collective Remembering among the ancient Maya

The 9th century Maya collapse provides a particularly fertile time period for the investigation of collective remembering. In the context of this sociopolitical transition, the power void provided an opening for non-royals to express their views about the past in a public forum. For example, at the site of El Perú-Waka', the non-royal residents of the site converted a pyramid previously dedicated to that site's dynastic line into a public shrine representing the remembered importance of this place to the site's remaining occupants (Navarro-Farr and Arroyave Prera 2014; Navarro-Farr et al. 2008). The repeated ritual visitation by community members reflects the alternative interpretation of this space developed through collective remembering by mnemonic communities previously invisible in the archaeological record.

Similarly, my case study from Actuncan points to how collective remembering can be utilized as a framework to interpret the local contingencies that directed the path of social reorganization. In particular, I draw on collective remembering to explain why the Terminal Classic community reorganized the way it did and how their political system gained legitimacy in the absence of divine rule. Methodologically, collective remembering relies on identifying two things in the archaeological record: 1) communities established through frequent interaction or commonality in media consumption; and 2) material evidence of memory that points to its constructive and relational nature. In the previous chapter, I demonstrated that Actuncan was a settlement continuously occupied for at least 1000 years. During this time local residents formed a community based on their proximity to each other and association with Actuncan's monumental Preclassic core. The site's pyramids and plazas provided space for social interaction and mnemonics of the community's powerful roots. After the site's demise as a capital, evidence from across the Belize River valley points to the propagation of new official narratives from the nearby site of Xunantunich. Actuncan and its residents were subsumed into this new polity, but, like many nearby settlements, I argue that they remained a discrete mnemonic community. The results of collective remembering by Actuncan's residents are evident in the interactions between the community and the city's constructed landscape after the 9th century failure of Xunantunich's divine kings. In Chapters 7 and 8, I will draw on excavation data from across the Actuncan core to show how Actuncan's Terminal Classic community reoriented their built environment to reflect their understanding of the past. Then, in Chapter 9, I show how they remembered their past in a way that is divergent from both Xunantunich's Late Classic official narratives and Actuncan's Preclassic apogee. Instead, the Terminal Classic renovations to Actuncan's built environment reflect the remembering of Actuncan's Preclassic past through the dual lens of the community's specific history and Late Classic cultural norms.

3.8 Summary

In this dissertation the collective remembering approach provides an interpretive framework to explain which aspects of the past the community remembered and which it chose to reify during the process of sociopolitical reorganization. If resilience theory provides a heuristic mechanism through which to model the processes of the collapse, collective remembering provides insight into the human processes that directed the community's decision-making. In resilience theory, "remembering" is an abstraction that expresses how systems draw on knowledge and organizations from their past to reorganize, whereas collective remembering attempts to provide a framework to explain what is remembered and how it is remembered. To me, using the two in tandem provides the utility of bridging between the comparative potential of system-level description and the explanatory power of historical contingency. In the case of Actuncan, resilience theory provides the inspiration for a series of hypotheses about how Actuncan reorganized, while collective memory explores why the community chose a particular path to reorganization.

Chapter 4. METHODS

4.1 Introduction

In this chapter, I describe the methods that I used to conduct my current research in the field and laboratory. I used a variety of methods, including a landscape analysis, excavation, the analysis and quantification of recovered cultural materials, microartifact analysis, and soil chemistry analysis to evaluate the organization and activities of Actuncan's Terminal Classic community. Accordingly, these methods focus on the three different scales of data and interpretation – urban landscape, architectural layout, and activity areas – discussed in Chapters 5, 6, and 7. My excavations and laboratory analysis primarily took place from 2012 to 2014 during two excavation seasons and two laboratory seasons. Landscape analysis was based on my personal observations of the site over six field seasons and ongoing survey at the site, initiated by James O. McGovern (2004) and continued by Don Perez (2011), Daniel Salberg (2012), and myself (Mixter 2014). Excavations took place in two primary locations, Group 4 and Plaza A, during 2012 and 2013 with the aid of operation supervisors BrieAnna Langlie and Allison Nick (Mixter and Craiker 2013; Mixter and Langlie 2014; Mixter and Nick 2014). Macroartifact and microartifact analysis took place during 2013 and 2014 with the assistance of Kelvin Requena and Maria Yacab during 2013 (Mixter 2015). Finally, laboratory analysis of the soil chemistry was contracted to Dr. E. Christian Wells and his Cultural Soilscapes group at the University of South Florida.

I adopted a variety of methods to produce multiple scales of data designed to address my two primary research questions. This chapter begins with a review of the research methodology designed to answer each question. Here, I focus on how each research method was designed to address the primary research questions.

I begin by outlining the project's recording system and my excavation methods, which are critical to understanding the recording of architectural specifics and the provenience of artifacts and samples that were later analyzed in the laboratory. I continue by explaining the laboratory analyses of artifacts and other materials collected in the field. First, methods of analysis of several categories of macroartifacts collected in the field, including ceramics, chipped chert, chipped obsidian, ground stone, and other stone artifacts, are described. Then, the methods used to quantify microartifacts within soil samples are described. Additionally, methods for analyzing plaster and soil chemistry samples are described. Together, the microartifacts and soil chemistry analyses aim to define the location of activity areas on the Group 4 platform. Finally, the analytical methods used to describe the spatial distribution of activity areas are defined. I conclude with a discussion of the analytical methods used to analyze the changing organization of Actuncan's urban layout. This analysis depended heavily on data collected since 2001 by my colleagues and by McGovern (2004) during the 1990s to reveal the site's appearance before and after the fall of divine kingship.

The methods of analysis included in this dissertation were adopted in order to provide multiple lines of evidence aimed at considering the use of the Actuncan center and architecture that was newly constructed during the Terminal Classic period. Together, the data produced at multiple scales provides a window into social and political life during the Terminal Classic period – a view that hints at the renewed sociopolitical organization and the role of collective memory in producing and maintaining that organization. The purpose of this dissertation is to bring together these separate datasets to better understand the contingent variables at play in local processes of reorganization following the Maya collapse.

4.2 Excavation Methods and Recording System

As part of my dissertation research, I directed both horizontal and vertical excavations targeting three different kinds of contexts. First, to gain a high resolution information about the surface architecture and activities on top of the Group 4 platform, Allison Nick and I directed the horizontal exposure of 354 m^2 across the surface of the platform (Mixter and Nick 2014). These excavations built on Mendelsohn and Keller's (2011) excavation of 53 m^2 during the 2010 field season. Second, Nick and I also directed vertical excavations off the south and east perimeters of the Group 4 platform focused on identifying the construction of the larger platform and locating midden deposits containing materials from activities taking place on the platform (Mixter and Nick 2014). Finally, BrieAnna Langlie and I directed a trenching operation in Plaza A to understand the construction sequence and nature of ritual activities associated with three low linear platforms (Mixter and Langlie 2014).

Since 2010, the Actuncan Archaeological Project has utilized a uniform excavation and recording system to ensure standardization and comparability across excavations (LeCount 2011). This methodology called for all excavations to be executed in adjoining 1 m by 1 m grids oriented to the cardinal directions to maximize the horizontal tracking of artifact distributions. Excavations during 2012 exposed the limitations of this methodology when we targeted large architecture. Small excavation units become increasingly unwieldy when faced with large construction fill, and excavations targeting ritual deposits located on the center line require units oriented to the architecture rather than arbitrary cardinal directions. Therefore, during the 2013 field season, these requirements were relaxed to account for the requirements of each excavation.

Excavations were conducted by teams of two local workmen, one excavator and one screener, overseen by an archaeologist supervisor. Each supervisor was responsible for two to three teams of workmen. I kept tabs on all ongoing excavations as well as those I supervised directly. All excavations were undertaken following natural stratigraphy when possible. If strata appeared to be deeper than 10 cm, arbitrary levels were established at a depth appropriate to the size of the fill, usually 10 or 20 cm.

Excavations proceeded in the following steps, modified as noted for particular locations:

1. Square or rectangular excavation units were laid out in accordance with the goals and requirements of each location. On and around Group 4, excavations were laid out along cardinal directions to match the excavations undertaken in 2010 (Mendelsohn and Keller 2011). Units located on the platform surface followed the 1 m by 1 m grid laid out at that time. Units to the south and east of the platform that targeted middens and the platform architecture were either 2 m by 2 m or 1 m by 2 m depending on the particular situation. Excavations in Plaza A were laid out as 1 by 2 m units connected lengthwise to form 1 m wide trenches perpendicular to the three investigated platforms. The coordinates of these units were then recorded digitally using a Total Station.
2. Excavations cleared zones of modern soil development and architectural collapse to define the terminal architecture.
3. Terminal phase occupation surfaces were exposed and sampled for microartifacts and soil chemistry analysis if necessary (see collection methods in corresponding sections below).
4. Where research questions dictated, excavations continued vertically to expose evidence of earlier construction phases or to reach culturally sterile deposits.

Excavations were undertaken primarily with trowels and small geological picks. All recovered matrix was passed through 6.35 mm (1/4 inch) mesh screen and all cultural remains larger than this size were collected. Collected material was segregated based on the unit and lot from which it was recovered (see below). All excavated matrix was collected in five gallon buckets to determine the volume of each excavated context for standardization purposes.

4.2.1 Recording System

Excavations were recorded using a hierarchical lot system that established alphanumeric provenience designations and served as the basis for all note taking. All notes were recorded on lot forms (Appendix B) with additional lists established to keep track of sampling, special items, and other occasional phenomena. In this section, I will briefly describe the lot system used by the project and the information recorded on forms and lists. First, I will begin by describing the hierarchical system of recording:

1. *Operation number*: Operation numbers were established to signify a set of excavation units attached to a particular research question. Operation numbers have been assigned sequentially since the beginning of the AAP in 2001. The size and nature of the excavations contained in a single operation are intentionally flexible to account for the variety of investigations that have taken place at the site, though often excavations associated with a single building or location are contained in a single operation. The research presented in this dissertation primarily focuses on Operations 8, 35, 36, 37, 40, 41, 42, 43, 44, and 45. Operation 8 was originally assigned in 2010 and during the initial test excavations of the Group 4 platform (Mendelsohn and Keller 2011) and continued during the 2013 excavations (Mixter and Nick 2014:99-100). This operation focused on

excavations located along the central east-west axis of the Group 4 as established in 2010. Operation 40 extended these broad horizontal excavations north and south across the surface of the platform's patio. Operation 40 only excavated to the terminal patio surface in order to collected data for activity area studies (Mixter and Nick 2014:99-102). Operations 36, 42, and 44 adjoined Operation 40 and investigated the terminal architecture of Structures 35, 34a, and 33a respectively (Mixter and Nick 2014:102-115). Operations 35 and 37 investigated the location of possible midden deposits found immediately off the edge of the Group 4 platform and further south off Actuncan's main platform respectively (Mixter and Nick 2014:115-123). Finally, Operations 41, 43, and 45 investigated the construction sequences of Structures 7, 8, and 9 respectively, located in Plaza A (Mixter and Langlie 2014).

2. *Unit number*: Within each operation, each rectangular excavation unit was assigned a letter designation. These units provide the maximum horizontal boundaries for artifact collection. Most excavations were undertaken in 1 m by 1 m units, though 1 m by 2 m and 2 m by 2 m units were also utilized. Excavation units were named sequentially based on when the location of the unit was placed. From 2010 to 2012, when more than 26 units were assigned in an operation, the subsequent units were designated AA, BB, CC, etc. However, beginning in 2013, the 27th and subsequent units were designated AA, AB, AC, etc. Operation 8 follows the old nomenclature, while most others discussed in this dissertation followed the new naming procedure. The exception was Operation 40, which was laid out on a large predesignated grid. The first letter of these units represents its east-west position on the grid, while the second letter represents the north-south position. The original unit AA would have been located in northwest corner of Operation 40 if that

grid square had been excavated. Therefore, the unit designations in Operation 40 are not sequential.

3. *Lot*: The final number in the provenience reflected the smallest space of excavation. Because excavations proceeded according to natural and arbitrary strata, each stratum within a unit was designated a separate lot number. A lot need not extend the entire horizontal width of a unit, but rather reflects the stratigraphic realities observed in the field. In this report, each lot is expressed as an alphanumeric as such (Operation)(Unit)(Lot). For example: 42AE2.

Additional provenience information includes a running list of features (listed in numerical order within an operation) and burials (listed in numerical order across all operations in the AAP). A feature may contain multiple lots, but a lot must be entirely part of a feature. Additionally, burials are also assigned a feature number.

A number of logistical and descriptive items are recorded on each lot form:

- *Date Started*: Records the date excavations in the lot began.
- *Number of artifact bags*: The number of bags of artifacts recovered from the lot and returned to the laboratory.
- *Number of gallons*: The volume of matrix excavated in this lot.
- *Materials*: The categories of artifacts observed during recovery from screening.
- *Soil texture*: A field assessment of the particle size composition of the soil matrix based on a hand identification chart.
- *Munsell color*: Records the color of the soil in comparison to a Munsell soil color chart.
- *Wet or dry?*: Records whether the soil was wet or dry when the Munsell color was evaluated.

- *Rock inclusions*: Records the nature of the stone inclusions found in the lot's matrix.
- *Inclusion size*: Records the size of the stone inclusions encountered in the lot.
- *Cultural context*: A code is recorded signifying the cultural and archaeological context of the lot based on the consultation of a cultural code list used by AAP. These codes aid later analysis by enabling easy identification of all middens, architectural fill, and architectural collapse, for example.
- *Unit depths*: The top and bottom depths of the lot's corners and center are all recorded.
- *Samples*: If any sample were collected from the lot, the sample numbers are recorded. Samples recorded in this section include soil and plaster for chemical analysis, bulk soil for flotation or microartifact recovery, carbon for C14 dating, and any other materials collected separately for special laboratory analysis.
- *Photos*: The camera name and photo numbers of all photographs taken of the lot are recorded.
- *Excavators* and *Recorded by*: The names of the excavators and recording supervisor are recorded.

These bits of information provide standardization in the recording of all proveniences. Additionally, the lot's goals and a comprehensive recording of all findings are recorded in a description. Included is a detailed description of all architectural features found, which are named using nonsense codes, following the practice of the Tikal Project (Coe and Haviland 1982:47). This serves to avoid labeling something numerically when the order of construction or deposition is still unclear. In the case of some buried architecture, the appropriate order of construction may never be discernible. In each excavation location, separate categories of objects were chosen to designate walls and floors encountered in excavation.

All excavations were documented through photography and drawing. All excavation lots were photographed on completion and many photographs were taken of architectural features encountered in the excavations. The lot forms are printed with graph paper on the reverse, where a plan of each lot's base is recorded. Elevation drawings of all walls and other architectural features were completed. Additionally, profile, section, and other drawings were completed as needed. Plan drawings were generally executed at a 1:10 scale, while profiles, elevations, and other drawings were generally executed at a 1:20 scale.

4.2.2 Analytical Units – Aggregating Lots for Analysis

Excavating large architecture in small excavation units requires careful correlation between neighboring units. Cultural strata and features rarely fit within the boundaries of a single 1 by 1 m space. As a result, neighboring lots of the same cultural strata were combined into groups of lots termed analytical units. This recording system is similar to the "lot groups" used by other projects (Haviland 1985:161; Yaeger 2000b:382-384). After excavation, lots are retrospectively grouped into analytical units based on the lots' common cultural context. To be considered part of the same analytical unit, lots must be spatially adjoining and part of the same deposit. Each analytical unit is then named and provided a numerical identifier identical to the Operation number. These numbers do not indicate stratigraphic priority, but rather are shorthand to be used within excavation descriptions. Subsequently, a Harris Matrix (Harris 1989) is constructed relating the analytical units to each other in order of deposition. Analytical unit numbers are noted using AU as a prefix – for example AU3 or AU54. Lists of analytical units and Harris Matrices are presented with the description of each set of excavations.

4.3 Laboratory Analysis

During the fall of 2013 and summer of 2014, I directed laboratory analysis of materials recovered from my excavations of Terminal Classic contexts. These analyses were primarily aimed at using multiple material proxies to evaluate the nature of Terminal Classic activities taking place in two locations at Actuncan: Group 4 and Plaza A. Within Group 4, macroartifacts, microartifacts, and soil chemistry samples were collected from broad horizontal excavations across the occupation surface of a large platform. The analysis and mapping of these materials aim to evaluate the location of discrete activity spaces on top of this platform. Additionally, excavations off the sides of this platform targeted locations where refuse middens are often found in the Maya world. Materials recovered from these off mound locations provide additional evidence for activities on the platform by looking at what kinds of materials were discarded from events taking place on that space. Finally, the analysis of materials and samples from limited vertical excavations into the platform surface provide evidence for activities across multiple time periods and chronological information to date the construction and renovation of the platform.

At Plaza A, materials from the surfaces of Structures 7, 8, and 9 were collected to evaluate the nature of ritual activities that may have taken place within these spaces. Secondarily, analysis of ceramics from sealed deposits below structure surfaces provided construction and renovation dates accurate to ceramic phases. I will not dedicate space here detailing the excavations of the relevant contexts. Descriptions of these excavations can be found in Chapters 5 and 7 of this dissertation (Mendelsohn and Keller 2011; Mixter and Craiker 2013; Mixter and Langlie 2014; Mixter and Nick 2014; Nick and Mixter 2013).

In this section, I describe the methods used to analyze three categories of materials: microartifacts, macroartifacts, and soil chemistry samples. The analysis of materials from Group

4 forms part of a strategy aimed at using multiple scales of artifact analysis to better understand the nature of activities that took place on this broad platform. In cases of rapid abandonment, traditional analyses of macroartifact classes using materials above 0.635 cm (0.25 inch) in size can yield detailed information about activity spaces (Inomata 2003; Inomata and Triadan 2000; Sheets 1998, 2002). However, during more typical planned abandonments, the Maya usually take their possessions with them and clean their spaces. Large materials found on occupation surfaces are likely to be the products of ritual abandonment rituals or post-abandonment visitations (Mock 1998; Schiffer 1987; Stanton and Magnoni 2008). In contrast, microartifacts, materials smaller than 0.635 cm (0.25 inch), are not efficiently swept away and, as a result, are trampled into occupation surfaces (Gifford-Gonzalez et al. 1985; McKellar 1983; Nielsen 1991a, b). As such, these objects would have been used close to where they were recovered and, therefore, are more direct proxies of activities than their larger counterparts. By mapping variations in the presence of different microartifact classes across space, researchers can identify high density areas where particular materials may have been worked, stored, or used. Furthermore, by comparing the density of microartifacts with larger macroartifacts, researchers can infer information about the formation processes that took place within specific contexts (Sherwood et al. 1995; Stein and Teltser 1989). The collection and analysis of soil chemistry samples from across the entire Group 4 surface provides a third scale of analysis (Middleton and Price 1996).

Macroartifact analysis focused on ceramic and stone artifacts. Bone and shell macroartifacts were not analyzed beyond counts and weights per lot. Bone was exceptionally uncommon in my excavations and most examples likely are the result of modern intrusions. Shell artifacts were largely jute river snails (*Pachychilus sp.*). My ceramic analysis focused on assessing the nature of activities in certain spaces and the relative dates of building construction phases. First, to investigate activity areas, ceramics were evaluated for paste ware, form, size, and decoration. These attributes relate to the vessel function, which in turn contributes to understanding activities taking place within associated spaces. Within Group 4, few ceramics were found *in situ* on occupation surfaces and no middens were identified despite my efforts to locate one. In Plaza A, ceramics were found in terminal deposits on the plaza and structure surfaces and may represent *in situ* remains of activities that took place in this space. Second, ceramics were evaluated for temporally sensitive modes and surface treatments to provide *terminus post quem* dates for deposits and associated construction phases. I referred to Gifford (1976) and LeCount's (1996; LeCount et al. 2002) works for temporally sensitive attributes. Type varieties were noted when possible, however, many sherds were small and highly eroded making them difficult to classify. The results of this analysis are reported in the tables listing each analytical unit as a *terminus post quem* designation.

Broadly, stone artifacts were analyzed following three different methodologies based on appropriate technological and material concerns. For each, the goal was to contribute to our larger inventory of materials from occupation contexts in order to better understand the activities taking place in each space. Flaked stone artifacts were analyzed using two different methods that focused on collecting a combination of quantitative and qualitative data. Chert artifacts were analyzed in less detail to account for their relative abundance and the limitations of my expertise in lithic analysis. My relatively simple analysis aimed to address if lithic reduction took place in the areas of interest and what kinds of stone tools might have been used in those spaces. In contrast, because there are not local obsidian sources, this stone must have been imported in antiquity and was encountered in limited quantities. In addition to understanding activities, analysis of obsidian has the potential to address Terminal Classic Actuncan's access to long distance trade routes. To address this second question, the obsidian analysis was designed to be comparable with Sara Shults's (2012; Shults and LeCount 2013) analysis of all obsidian collected from Actuncan prior to 2013.

All other stone objects were analyzed using a third methodology that prioritized detailed description over quantitative analysis. The purpose of this analysis was to formally record all other stone materials that might relate to the activities taking place in the investigated locations. Most prominently, these materials include ground stone objects that may point to cooking or pigment preparation, slate objects that may be ornamental or ritual, and ornamental greenstone objects. This catch-all analysis was necessary due to the limited quantity of materials from many of these material and technological categories. As such, slightly different kinds of descriptive and morphometric data were collected for artifacts categorized according to material, source, and identifiable production technology.

Microartifact and soil chemistry analysis focused on materials recovered from the terminal occupation surface of the Group 4 platform. These materials were quantified and form the underpinning of the activity area study presented in Chapter 7. These materials were collected on a grid to provide a high resolution understanding of the distribution of activity residue across this space.

In the subsections that follow, I will describe the analytical methods undertaken and provide a summary of preliminary results. A brief section describing the contexts and research program will be followed by a description of field and preliminary lab procedures. Then, the methods of analysis of each material type will be detailed.

4.3.1 Analysis of Ceramic Macroartifacts

The analysis of ceramic materials was designed to advance two research goals. First, ceramics were analyzed with an eye to our understanding of what kinds of activities were taking place in public contexts during the Terminal Classic period. To this end, I focused on analyses of vessel attributes that might reveal the uses of spaces where materials were found. The analysis of vessel form is particularly useful for assessing the uses of vessels found in midden deposits resulting from food production or consumption events and from ritual deposits where the remains of the event were smashed in place. In these cases, vessel form can point to the kinds of food stuffs being produced and consumed as well as whether food was consumed individually or communally (Houston et al. 1989; LeCount 2001). Further, spatial analyses of ceramic material can add to broader multi-proxy studies of activities areas that also include the microartifact analysis just discussed. Second, careful analysis of ceramic materials can be used to place deposits and construction events within chronological ceramic phases. These phases are based on the fine-grained sequence of diagnostic modes developed by LeCount (1996, 2015a; LeCount et al. 2002) for the region around Actuncan. The outline of this chronology is presented in Chapter 2 above. To keep my data comparable to other work in the area, I based many of the attributes I collected on characteristics from LeCount's (1996) *Basic and Detailed Sorts* and their subsequent adaptation by other researchers working in the area (Peuramaki-Brown 2012; Yaeger 2000b).

In total, 29,950 sherds were analyzed from 645 excavation lots. Because many of the analyzed ceramics come from contexts near the modern surface, the assemblage as a whole contained a high proportion of heavily fragmented materials with limited diagnostic attributes. With this in mind, I chose to collect data in a variety of quantitative and qualitative categories to maximize my understanding of the spatial distribution of the ceramics without diluting a detailed recording of the more well-preserved sherds that might provide chronological or functional information. To this end, sherds from each excavation lot were sorted into groups with similar characteristics and then entered together as a common entry into a Microsoft Access database developed for this project. Instead of entering each sherd individually, this method lumps materials within the same provenience that exhibit similar characteristics so as to better deal with large quantities of broken material with limited distinguishing materials.

In the remainder of this section, I will discuss each of the characteristics recorded in the database. The flexibility of using modern database software means that each possible characteristic does not need to be coded as a numeric value, but instead can be represented by a descriptive response chosen from a defined list. Here, I will describe some of the most common selections for each variable; however, the system was designed to provide flexibility when other options were identified.

First, basic information about the excavation lot was recorded at the top of the entry. Relevant information focused on provenience information for the bag of ceramics, including operation, unit, lot, feature number, special find number, bag number, and the total number of bags from that lot. Additionally, a count of all sherds from the bag and a total weight of those sherds were recorded. The date of analysis and the initials of the analyst (mine in all instances) were recorded. After all the sherds were recorded and entered, a list of all chronological periods represented in the lot was recorded along with a *terminus post quem* date. A final field provided an opportunity to record any written notes or observations about the bag of ceramics as a whole.

After separating materials into piles of similar sherds, each pile was recorded separately for the following criteria:

Count. In this category, I recorded how many sherds with a similar set of characteristics were encountered in the bag. Because of the broken nature of the assemblage, the quantity of sherds without many distinguishing characteristics tended to be large, while well-preserved sherds often displayed characteristics that were unique within the bag, leading to counts of one.

Weight. The weight in grams of all sherds with a similar set of characteristics was recorded.

Sherd Type. Sherds were separated to distinguish what portion of the vessel they represent. This category was most important as it separated body sherds from rims, bases, and appendages that are more likely to display diagnostic modal characteristics.

Paste-ware. Because of the poorly preserved nature of the assemblage, the paste-ware category was used in two distinct ways. First, it was used most heavily to describe four basic paste categories that formed the only descriptive distinctions possible between the numerous fragmentary body sherds encountered. These four categories were calcite ware, micaceous ware, ash ware, and orange ware. In contrast to the wares defined by their temper, the orange ware category was used to describe a nearly temper-less orange paste that matches the description of Mars Orange Ware, which typically dates to the Middle Preclassic period. Even these basic categories provide chronological information because Mars Orange Ware is limited to the Middle Preclassic period, and ash ware is predominately associated with the Late Classic period. Second, in cases where sherds were well enough preserved to be designated a type-variety classification, I instead listed the paste-ware following Gifford's classifications, each of which corresponds to one of the aforementioned paste-based classifications.

Type-variety. When possible, I recorded type-variety designation of a sherd, including group, type, or variety. I primarily drew on the descriptions of ceramics from Barton Ramie by Gifford (1976) and the detailed local descriptions by LeCount (1996, 2015a; LeCount et al.

2002). I also consulted a variety of other resources when necessary. Because most sherds did not have clearly diagnostic attributes, a type-variety designation was not specified for most sherds.

Form. I defined form when enough of the vessel survived to make this designation. This category was limited to rims. I followed Sabloff's (1975:23-27) formal distinctions as closely as possible. Additionally, I placed many rims into broad "open form" and "closed form" categories due to the lack of preservation and small size of many rims. These categories allowed me to avoid making fine distinctions between forms such as bowls, dishes, and plates when only a small portion of the rim remained.

Rim radius. For rim fragments with at least 5 percent of the rim preserved, I used a rim chart to measure to the size of the vessel. The vessel size helps distinguish between pots used for serving, storage, and personal use.

Temporally diagnostic modes. A number of formal modes and surface treatments are chronological sensitivity. This category recorded specific temporally sensitive modes that have been previously identified. In particular, I focused here on rim and lip treatments, for example pie-crust rims on Cayo group jars and the chronologically sensitive lip-angles of Mount Maloney Black incurving bowls (LeCount 1996; LeCount et al. 2002).

Curvature. I recorded the curvature of the vessel following definitions by Sabloff (1975).

Flange. Here I recorded any flange, ridge, or diagnostic angle evident on a vessel wall. These attributes are particularly important for identifying ceramics dating from the Terminal Preclassic, Early Classic, and Samal phase of the Late Classic.

Spout. If a sherd included a spout, I recorded the type.

Handle. If a sherd included a handle, I recorded the type.

Foot and base. If a sherd included a base or foot, I recorded the type. This is another category that may be chronologically sensitive.

Interior slip color and exterior slip color. I recorded the color of the interior and exterior surface treatments separately. Many vessels were only slipped on either the interior or the exterior and a few had different slip colors. Polychrome painted ceramics were noted as polychrome, with the specific coloration noted in the comments.

Surface treatment. Changes in slip technology over time led to temporally diagnostic shifts in the texture and luster of surface treatments. In particular, the transition from waxy to glossy slips is indicative of the transition from the Preclassic to Classic periods.

Decorative technique. In this category, I recorded decorative techniques that subtract or add clay from the surface of the sherds. This category includes alterations to the ceramic surface, including striations and impressions, as well as modeling and appliqued decorations.

Chronology. If a group of sherds has characteristics that provide a chronological *terminus post quem*, I note that here. In aggregate, the entries in this category were used to determine the date of the entire bag of ceramics.

Finally, any other comments were recorded describing unusual sherds and the decorative motifs on polychrome sherds. Any sherds that were pulled for the type collection or further documentation were also noted. A note about any sherds removed from the bag for inclusion in type collections was recorded on the tag of the bag. All sherds were then returned to storage.

4.3.2 Analysis of Flaked Chert Macroartifacts

The analysis of chert artifacts focused on identifying useful products and debris resulting from intentional reduction. This analysis focused on recording a small number of attributes in order to provide basic insights into reduction activities that may have taken place at the excavated locations. To this end, chert artifacts were sorted by size and then categorized into types of tools and production debris. Importantly, the results are comparable to the chert recovered from the microartifact fractions described above. Chert artifacts from a lot were first processed through a series of nested screens to separate the materials into three size classes: greater than 2.54 cm (1 inch), between 1.27 cm (0.5 inch) and 2.54 cm, and between 0.635 cm (0.25 inch) and 1.27 cm. Only materials larger than 0.635 cm were collected in the field as macroartifacts, resulting in the lower boundary of our size categories. Each of these size classes was then sorted and quantified separately.

Materials in each size class were then sorted into morphological types based on the core reduction process. Flakes were identified based on the identification of platforms and bulbs of percussion. Flakes were then separated into three stages of reduction based on the presence of cortex and the number of dorsal scars. Primary Flakes generally had at most two dorsal flake scars and cortex covering between 50 and 100% of the dorsal side. Secondary flakes had between 0 and 75% cortex covering the dorsal side and more dorsal scars. Importantly, they typically did not show platform preparation and were thicker relative to their width when compared to tertiary flakes. Tertiary flakes include all flakes with prepared platforms. These represent end-stage reduction and rarely had any remaining cortex. Most tertiary flakes were very thin relative to their width. Blades were defined as flakes that were at least twice as long as their width. Additionally, flakes with evidence of used or retouched edges were cataloged separately and considered expedient tools.

Chunks were defined as angular debris that did not have the characteristics of flakes or clear evidence of flake scars. This material is probably mostly shatter from intentional reduction and natural, post-depositional breakage. Especially when small, chunks may also reflect evidence of breakage from tool use. Chunks contrast with nodules, which are defined as any piece of chert without evidence of human use. This includes any small bits of rounded chert or pieces with evidence of patination. Since much of the construction fill material was made of large, unmodified chert cobbles from the nearby riverside, large cortical flakes that appear to have been removed by stones naturally hitting together were included in this category.

Cores were defined based on the presence of defined flake scars. The kind of core was then described in the notes. Similarly, tools were defined based on either the nature of retouching or their placement into recognized formal types, such as bifaces, scrappers, and projectile points. Tools and cores were assigned to categories defined for the region by Jon VandenBosch (1999) through comparison to the type collection he built during his work on the Xunantunich Archaeological Project in the 1990s. These identifications were noted in the comments for that entry. Finally, hammer stones were defined based on the telltale signs of battering.

After sorting was complete, each class of materials was counted, weighed to the nearest 0.1 g, and recorded along with the provenience in a Microsoft Excel spreadsheet.

Chert materials have been analyzed under these protocols from Operations 8, 35, 36, 40, 41, 42, and 44. In total, 5808 chert objects weighing 98935.2 g were examined. Eighty-seven percent of these objects were reduction bi-products, in comparison to approximately 1%, which were finished products in the form of formal or informal (in the form of retouched flakes) tools (Table 4.1). Additionally, four chert hammer stones were identified. The balance consisted of naturally occurring chert nodules, which made up 12% of the objects analyzed. These nodules were likely materials transported from the river to Actuncan to be used as construction fill.

Flakes make up the largest proportion of reduction by-products, represented most strongly by secondary flakes, but primary flakes and tertiary flakes are also present in large

Table 4.1. Summary of chipped stone artifacts.

Category of Material	Count	Frequency	Weight	Proportion of Total Weight
Reduction By-Products	**5078**	**87.4%**	**78184.95**	**79.03%**
Blades	19	0.3%	55.9	0.06%
Chunks	1527	26.3%	22294.3	22.53%
Cores	10	0.2%	1734.8	1.75%
Flakes	3516	60.5%	53131.15	53.70%
Tools	**51**	**0.9%**	**5050.3**	**5.10%**
Retouched Blades	3	0.1%	41.8	0.04%
Retouched Flakes	23	0.4%	1408.3	1.42%
Tool	31	0.5%	3600.2	3.64%
Other	**679**	**11.7%**	**15699.9**	**15.87%**
Hammer Stone	4	0.1%	1355.7	1.37%
Nodule	674	11.6%	14332.9	14.49%
Unknown	1	0.0%	11.3	0.01%
Total	**5808**	**100.00%**	**98935.15**	**100.00%**

quantities (Table 4.2). This indicates that all stages of lithic production were taking place around Actuncan, though not necessarily within the analyzed contexts. Rather, the ratio of flakes to chunks is 3516 to 1527, a proportion that does not indicate intensive production or disposal of production debris within the analyzed contexts. Rather, the high frequency of flakes is typical away from production zones because it reflects the curation of flakes for later use.

Table 4.2. Summary of Reduction of Stage of Chert Flakes

Flake Reduction Stage	Count	Frequency
Primary	**1089**	**30.77%**
Retouched	4	0.11%
Secondary	**1565**	**44.22%**
Retouched	11	0.31%
Tertiary	**846**	**23.91%**
Retouched	7	0.20%
Not Recorded	**39**	**1.10%**
Retouched	1	0.03%
Total	**3539**	**100.00%**

Only 10 cores and 31 formal tools were identified in the analyzed sample of chert artifacts, pointing to the very limited presence of these materials within the relevant contexts. Seven of the cores were flake cores, three of which seem to have been cores used to make chert prismatic blades. Overall, tools and cores made up less than 1% of the assemblage, an incredibly low frequency that points to few activities involving chert stone tools taking place within the excavated spaces.

4.3.3 Analysis of Flaked Obsidian Macroartifacts

Additionally detailed descriptive data was collected on all obsidian artifacts to produce a database comparable to previous work by Shults (2012; Shults and LeCount 2013) on the distribution of obsidian at Actuncan. The small quantity of obsidian from the contexts addressed in this chapter made this level of detail possible. In total, 74 obsidian objects were analyzed, three of which were refits analyzed as a single object. Full results can be found in Appendix C.

First, each object was categorized based on the core reduction process using the same categories as for flaked chert. The vast majority of objects were prismatic blades, though six flakes and two chunks (likely shatter) were identified. Blades were differentiated from flakes based on formal evidence of the technology used in their production. Blades are a kind of flake produced using prismatic blade technology and are represented as long, slender fragments that maintain a roughly even width until near their distal end. The preservation of blades and flakes was then assessed. I noted if the blade or flake was whole. For fragments, I noted which portion of the flake or blade was represented. Proximal fragments were recognized based on the presence of a platform, while distal fragments were identified based on their characteristic taper. All other fragments were assumed to be medial. To a similar end, a count of the number of fragments was recorded. Each entry represented one fragment, except in the three cases of refits.

Next, a number of descriptive metrics were recorded. First, the fragment's maximum length, width, and thickness were recorded using a digital caliper. The percent of cortex was recorded, though no cortex was observed on any analyzed specimens. For blades, the number of dorsal ridges was recorded as a proxy for the use-life of the source core when the blade was removed. I then noted how much use-wear was apparent and whether retouching was evident.

I also recorded the color of the specimen following Shults's (2012) categories. The visual description of obsidian based on distinctive colors and inclusions allows for the sourcing of individual obsidian artifacts to specific sources (Braswell et al. 2000). Finally, a space was provided for any comments about the specimen.

This analysis showed that most of the obsidian artifacts analyzed were prismatic blades, composing 90% of the assemblage (Table 4.3). Other flakes and shatter represent the other 10% of the sample, a larger proportion of the sample than Shults (Shults 2012:70) encountered within Actuncan's households. Because of the relatively small sample size of obsidian analyzed, only 6 flakes and 2 bits of shatter were identified. Similar to the entire Actuncan assemblage (Shults 2012:71), distal blades are underrepresented in the sample, perhaps indicating that blades were arriving at Actuncan already processed, not produced on site. I noted in the analysis of microartifacts that micro-sized obsidian was rare in the assemblage. In contrast, 27 obsidian fragments were encountered from the surface of Group 4 during analysis of the macroartifacts. This indicates that obsidian was present within this space, even if reduction likely was not. The artifacts could have been used for a variety of purposes that would not leave microartifact sized fragments.

Table 4.3. Summary obsidian artifacts.

	Count	Frequency
Blade	**69**	**89.61%**
Distal	5	6.49%
Medial	36	46.75%
Proximal	28	36.36%
Flake	**6**	**7.79%**
Shatter	**2**	**2.60%**
Total	**77**	**100.00%**

4.3.4 Analysis of Ground Stone Macroartifacts and Other Stone Objects

A great variety of stone objects were analyzed on the spreadsheet for ground and other stone artifacts. These encompassed material classes inventoried as ground stone, slate, greenstone, and other stone. Most of the objects in this class were worked by grinding or pecking as opposed to flaking. However, unworked stones were also analyzed. I collected a combination of metric and descriptive data from these materials to best represent the functional details I was interested in for ground stone tools, but also to describe any unusual stone objects recovered from the relevant contexts. In total, 53 objects were described.

Each object was first weighed and measured. My heaviest scale only measured to 4000 g, so objects over this weight were recorded as weighing 4000 g. The object's length, width, and thickness were recorded, following the logical orientation when one was evident. If the object was of human manufacture, I indicated if the object was whole or broken.

I then indicated the material of the object. For ground-stone objects, the material was mostly granitic stone, limestone, and greenstone. The most numerous kind of object analyzed was worked slate. Other materials included quartz, possible petrified wood and unidentified natural stones.

For worked objects, the form was also recorded when identifiable. Ground-stone objects included manos, metates, hammer stones, and pestles. A fragment of a celt and plaque were identified among the slate objects, though most were debitage or fragments of unidentifiable objects. The two greenstone objects were a celt fragment and a bead. The shape of ground-stone objects was then described in greater detail. Also, if an object showed signs of wear or use, its location on the object was recorded. A final field provided the opportunity to describe the object in detail.

This analysis encompassed a wide variety of materials, some of which were difficult to categorize. Ground stone tools included 3 limestone manos and 5 granitic metates. Additionally, a single ground chert tool appears to be a pestle based on the patina on one of the object's ends. Two greenstone objects were recorded. One was the corner of a polished greenstone celt found buried within the fill of Group 4. The other was a portion of a globular bead found associated with a deposit of ritual ceramic vessels on the step of Structure 8 on the north side of Plaza A (Mixter and Langlie 2014:37).

Twenty-five slate objects were also identified and recorded. Seventeen of these objects were either unworked objects or debitage, categories which are difficult to differentiate. Five were fragments of unknown worked slate objects identified based on their polished surfaces and worked edges. One was a large slab of slate, which may or may not have been shaped. The last two objects were clearly fragments of ornamental objects, one the pointed end of a thin celt and the other a broken slate plaque.

4.3.5 Analysis of Microartifacts

Microartifact analysis is the collection and quantification of artifacts below the size of artifacts typically collected by archaeologists during field screening (Sherwood 2001). In this research, microartifacts are defined as artifacts between 6.35 mm (1/4 inch) and 1.59 mm (1/16 inch) in size. Microartifact analysis originated in an interest in using artifact size as a way to examine site formation processes and the locations of activity areas during the 1980s (Dunnell and Stein 1989; Fladmark 1982; Hayden and Cannon 1983; Rosen 1986; Schiffer 1987; Sherwood et al. 1995; Stein and Teltser 1989). This research was based in the hypothesis that particles of varying sizes are preserved differentially in different kinds of contexts (Stein and Teltser 1989). With the exception of certain exceptionally preserved contexts, large artifacts are typically removed from activity areas and are subject to cultural refuse sorting (Hayden and Cannon 1983). Following cleaning efforts, only small particles are expected to remain in place as residual primary refuse (Schiffer 1987). Ethnoarchaeological and experimental studies show that the repetition of an activity within a specific space leads to the integration of small materials into the archaeological record (Clark 1986, 1991; Gifford-Gonzalez et al. 1985; McKellar 1983; Nielsen 1991a, b; O'Connell 1987). Based on a comparison between the presence of macroartifacts and microartifacts, hypotheses about the location of activities and refuse can be made (Hull 1987; Sherwood 1991; Sherwood et al. 1995).

Initially, the collection of microartifacts was limited to artifacts below the size of 2 mm, based on the sedimentological division between sand and gravel and the lower limit of unaided visual artifact identification (Dunnell and Stein 1989). These methodological pioneers placed the lower limit of microartifact analysis at 0.50 mm, at which point the temper and matrix of fired clay materials begins to separate (Dunnell and Stein 1989; Rosen 1989; Sherwood 1991, 2001). However, as Sherwood (2001) notes, these size limits exclude from analysis materials between those collected in the 6.35 mm (1/4 inch) mesh screens typically used in the field and the 2.00

mm upper limit. Importantly, continued experimental and archaeological studies have found that materials within this gap are often more useful and are most likely to resist sweeping and be integrated into the archaeological record (Cap 2012; Nielsen 1991a). Drawing on these experimental studies and the experience of past archaeological studies in the region, my research focuses on materials within this intermediate range, though the exact range of 6.35 mm (1/4 inch) to 1.59 mm (1/16 inch) was determined based on the mesh sizes of the nested screens owned by our project.

4.3.5.1 The Taphonomy of Microartifacts: Issues and Caveats

Microartifacts enter the archaeological record as objects break, activities produce small material residues, and friable materials are trampled into smaller bits. The integration of microartifacts into the archaeological record is impacted by multiple factors, including the material of the artifact, the way a space was used, the substrate of the occupation surface, the location of the surface, and natural forces that may serve to dislocate materials post-deposition. Because microartifact analysis is based on the differential incorporation of various size artifacts into the archaeological record, it is important to understand the cultural and natural forces that may affect the way materials are deposited.

Broadly, cultural materials become microartifact-sized residues through two processes. Either they are the direct by-products of activities, or they result from objects breaking and being subsequently broken down by trampling or natural forces. The pathway of different microartifacts into the archaeological record depends on the artifacts' material and attached physical properties (Dunnell and Stein 1989; Sherwood et al. 1995). Generally, durable material, such as flaked chert and obsidian, are not fragmented further following deposition. Thus, they are typically the direct result of knapping practices associated with the creation of stone tools (Fladmark 1982). Many of the other materials in the archaeological record are much more friable. In particular, fired clay material can be affected by mechanical weathering processes, such as trampling (Gifford-Gonzalez et al. 1985; Nielsen 1991b). Since ceramics typically enter the archaeological record as large sherds or vessels, microceramics are typically produced as objects are trampled before they are swept away. Additionally, delicate materials of organic origin such as bone, shell, and botanical remains are vulnerable to both mechanical and chemical weathering. In the Maya Lowlands, the monsoonal wet and dry seasons lead to poor preservation conditions for these materials. In my discussion of specific material types below, I speak to preservation issues that may bias or influence the distribution of particular microartifact classes.

The recovery of microartifacts is also dependent on determining how they are integrated into the archaeological record in relation to the occupation surfaces that are readily evident in excavation. Experimental research has focused on analyzing the taphonomic processes of dirt surfaces. These indicate that microartifacts typically remain in place even when larger artifacts have been fragmented, removed, or swept away and that trampling from repeated movement across a space tends to push small remains vertically into occupation surfaces, trapping them in primary refuse contexts. (Gifford-Gonzalez et al. 1985; McKellar 1983; Nielsen 1991a, b). However, it is important to note that these studies have been primarily performed on packed earth surfaces, not the hard plaster surfaces common in the Maya world.

The ancient Maya constructed floor surfaces out of lime plaster created by processing locally mined soft limestone bedrock. These floors formed a hard living surface. Generally, the use of plaster floors should impede the vertical incorporation of microartifacts into the archaeological record more than the dirt floors evaluated in experimental studies. In contrast to these dirt surfaces, trampling should more readily incorporate hard or sharp objects, such as lithic debitage, into the hard plaster. Friable materials, such as ceramics, are much more likely to be heavily fragmented and pushed horizontally to the margins of the plaster surface (Gifford-Gonzalez et al. 1985; Nielsen 1991b). Additionally, the hard plaster surface may affect the efficiency of sweeping activities. While sweeping on dirt surfaces is not particularly efficient in removing microartifacts between 1 mm and 8 mm (Nielsen 1991a) (Nielsen 1991b), no similar experimental studies of sweeping on plaster surfaces exist. I hypothesize that sweeping was more effective on plaster surfaces, resulting in higher concentrations of microartifact residues in corners, along walls, and outside door jambs. This hypothesis is supported by Randolph Widmer's (2009) finding that microartifact debris was concentrated in these areas in his study of a residential compound at Copán, Honduras.

The use of lime plaster as an occupation surface also impacts taphonomy of microartifacts after abandonment. Maya plaster primarily is composed of calcium carbonate and is therefore susceptible to degradation from long-term exposure to the intense sunshine and seasonal monsoons of the southern Maya Lowlands. Over time, the alternating exposure to sun and rain dissolves the limestone surface. Small chunks of calcium carbonate from the plaster floor are permanently incorporated into the archaeological record and often are all that remains of unburied plaster surfaces. As the plaster deteriorates, natural weathering processes lead to soil formation on top of the structure. Microartifact materials left on top of the terminal floor are incorporated into the newly formed soil layers and the fine strata at the location of the previous occupation surface. These natural processes disperse remaining microartifacts vertically and complicate the process of sample collection.

Additional dislocation of microartifacts would have resulted from bioturbation after abandonment. While root growth and burrowing fauna are critical to soil development, they have the potential to displace artifacts, moving them either laterally or vertically (Johnson 2002). Research suggests that burrowing fauna such as earthworms, gophers and ants can substantially move archaeological material (Wood and Johnson 1978). Artifacts are buried through the slow undercutting of material by rodent burrow holes and subsequent deposition of removed material on the surface (Balek 2002). While the results of larger rodents such as gophers often leave holes visible to the archaeologist, smaller burrowing animals, such as earth worms and ants, move soil at a slower, less detectable, scale (Stein 1983; Van Nest 2002). In the Maya lowlands, the primary agents of bioturbation are earthworms, ants, termites, and tree roots (Johnston 2002:8-10). While all of these organisms have the ability to dramatically displace artifacts, they only operate within the biomantle, the soil zone consisting of the O horizon, A horizon, and top of the underlying horizon (Johnson 2002). Within the tropics, the A horizon is typically only 20-40 cm deep with the biomantle reaching 30-50 cm (Johnston 2002:10). In my excavations, I observed that the A horizon typically only reached 5-10 cm deep, and rests upon the zone of eroding plaster floor and underlying stone ballast. Given the superficial nature of terminal floor surfaces and the broken nature of these layers, they are likely heavily worked over by both flora and fauna.

This consideration of the natural and cultural processes informed the design of my microartifact collection strategy and the subsequent interpretation of the results. Most importantly, no individual microartifact has particular cultural significance. Rather, interpretation of cultural significance must come from identifying patterns in the spatial distribution of different kinds of microartifacts collected in a methodologically consistent way. In discussing my methods in the section that follows, I will reference how taphonomic considerations impacted the research design.

4.3.5.2 Microartifact Field Collection and Sampling Procedures

All microartifact samples analyzed for this study derived from bulk soil samples collected across the surface of the Group 4 platform during the 2010 and 2013 excavations (See excavation protocols above and detailed excavation descriptions in Chapter 5). The sampling scheme was developed to maximize the spatial resolution in order to facilitate distributional analyses and to maximize the efficiency of laboratory analysis. During the 2010 excavations, samples were collected from every 1 m by 1 m unit in association with the terminal occupation surface. In 2013, samples were collected from every other 1 m by 1 m unit following a high density staggered lattice pattern (Wells 2010). In deference to the time consuming nature of microartifact analysis, this sampling strategy allowed for high resolution data collection while cutting the number of samples that required analysis in half. Units in which standing architectural elements or clear disturbances interrupted the occupation surface were not sampled.

Samples were collected at the depth of the platform's terminal occupation surface as identified by a preserved plaster surface or the signature white limestone speckled remnants of an eroded floor. At this depth, bulk soil samples measuring approximately 4 L were collected by scrapping the entire area of the 1 m by 1 m unit (Lennstrom and Hastorf 1992) until a single Tyvek collection bag was filled.

In the field laboratory, microartifacts were extracted from the bulk soil samples through a wet screening procedure (LeCount 2011:4). Because soil sample volume was not precisely measured in the field, the volume of soil in each sample was recorded in the lab to the nearest 0.25 L. Since the local soils often contain a high quantity of clay, the samples were soaked overnight in water to allow them to pass through screens more efficiently. After the samples were deemed appropriately separated, they were water screened through a 1/16-inch mesh and laid out to dry on flour sacks. When drying was complete, samples were divided into three size fractions using a set of three nested screens: 6.35 mm (1/4 inch), 3.18 mm (1/8 inch), and 1.59 mm (1/16 inch) mesh. Materials smaller than 1.59 mm were not collected. The project labeled each fraction with a 1-3 designation, indicating a range from larger to smaller material. Fraction 1 materials are equivalent to macroartifacts collected in the field, while fractions 2 and 3 are both microartifacts. Each fraction was packaged separately for storage. Analysis of microartifacts from Group 4 began immediately after the end of the 2013 field season. This procedure will be described in the next section.

4.3.5.3 Laboratory Analysis of Microartifact Samples

Analysis of microartifact samples consists primarily of separating each size-sorted fraction into different classes of artifacts. From July to October of 2013, 139 samples were sorted by Kelvin Requena, Maria Yacab, and me in the Actuncan Archaeological Project field laboratory. Sorting methods were based on protocols I developed during analysis of samples from Structure 41 in 2010 and 2011 (Mixter 2011a). These in turn were developed in consultation with Bernadette Cap (2012, 2015b) and based on her work at nearby Chan and Buenavista del Cayo.

After being removed from storage, each fraction was hand sorted separately in a tray, starting with the largest materials and moving to the medium, then the smallest size classes. Although full hand sorting is discouraged by Sherwood and Ousley (1995), they worked primarily with materials below 2 mm in size (following definition in Dunnell and Stein 1989), smaller than those analyzed in this study. As noted previously, Sherwood (2001) states that traditional analysis excludes materials between 6.35 mm and 2 mm, the size of materials known to be most resistant to sweeping (Nielsen 1991a). The full sort method has been used successfully in the past (Metcalfe and Heath 1990; Simms and Heath 1990) and is the standard method within the region (Cap 2012, 2015b) and at Actuncan (Craiker 2013; Fulton 2015a; Mixter 2011a). Additionally, sorting the entire sample provides the greatest level of accuracy in quantification and accounts for rare artifact types. Even though the > 6.35 mm fraction is equivalent in size to the macroartifacts collected from screens in the field, materials of this size recovered from the bulk soil samples were sorted to provide volumetrically controlled quantification. From previous experience, we determined that all materials above 1.59 mm in size (in other words all microartifacts included in this study) can be sorted using the naked eye with fairly high confidence. A Dino-Lite Pro II AD4113T digital microscope with 10x to 220x magnification was used to confirm identifications. After the sorting was completed, all classes of material were weighed, and cultural artifacts are counted. Weights were recorded to the 0.01 g unless the total weight of an artifact class was over 400 g. In this case, a less precise scale was used that only measured to the nearest 1 g. Counts and weights of each material class were recorded on a sorting form (Appendix D) modeled after the one used during my work on Structure 41 (Mixter 2011a).

Before sorting began, the sample's provenience, the analyst's identity, and the date were recorded on the sorting form. The volume of collected soil was found in the laboratory log used during the wet sieving process. Finally, the portion of the sample sorted was recorded. In the samples discussed here, 100% of all samples was sorted. In previous work at the site, samples have been sub-sampled to save time. Before each size fraction was sorted, the weight of all materials in that fraction was recorded.

The greatest challenge of microartifact analysis is the large amount of time it takes to sort a single sample (Sherwood 1991, 2001). Because these samples derive from heavily eroded plaster floors laid on top of limestone rubble fill, the samples are primarily composed of thousands of broken bits of limestone. Separating other material classes from the limestone is a difficult and arduous task. Experiments sorting 4 L samples indicate that processing a full 4-liter sample took approximately 6 hours for an experienced sorter. To shorten the sorting time of each sample, several categories of materials were only weighed, not counted. Most importantly, we only weighed the recovered limestone, which overwhelmed all other material types in each sample, counting as many as 10,000 particles per 4 L. These bits of limestone are likely eroded bits of construction material – either plaster floors or construction fill. Additionally, small bits of friable shell, which are likely the broken down remains of intrusive modern ground snails, were only weighed. Small balls of clay aggregate that were not disaggregated in the water sieving process were also weighed. Finally, bits of modern organic material, mostly rootlets, were not weighed. We also did not count the numerous and friable bits of organic material found in the smallest fraction 3. To reduce the space required for curation, the limestone, clay aggregate, and organic material classes were discarded after analysis of a sample was complete. After sorting was completed, each material class was stored in a separate plastic bag and the sample's tag was marked to indicate the date of analysis and identity of the analyst. Completed sorting forms were filed in a 3-ring binder and later entered into a Microsoft Access database.

Results of this initial quantification are presented in the form of three tables. The first table in Appendix E provides a list of all microartifact samples, their provenience, the volume of sediment collected, and the weight of each size fraction after washing and sieving removed all particles smaller than 1.59 mm in size. This table points out several potential issues for analysis and interpretation. First, the differences in volume, although small, necessitate that the raw quantities of microartifacts from each sample be normalized by volume before they can be analyzed in any meaningful way. Second, the lists of weights indicate that there is some difference in the yields after processing. This variability, especially within fraction 1, could point to the presence of more collapsed construction material within any excavation unit. However, it could also point to small inconsistencies in collection depth from sample to sample. Absent collapse debris, a larger yield could point to collection of materials from a slightly deeper depth that captured more structure fill. Alternatively, particularly low density samples may have been collected above the level of the eroding plaster occupation surface.

Table 4.4 provides a breakdown of the total count and weight of each microartifact class categorized by fraction. This chart points to the dominance of limestone in the assemblage, making up between 88% and 93% of the weight of analyzed materials in fraction. Other abundant materials classes include quartz, other stone, other shell (mostly land snails), and carbon, all of which are likely largely naturally occurring either from the breakdown of limestone used as fill or bioturbation. Other shell and carbon in particular may be most useful for mapping the relative intensity of bioturbation across the surface of the platform rather than any ancient cultural inputs. Among counted categories with particular cultural significance, ceramics stand out as the most frequent in fraction 1, while the sum of culturally derived chert flakes and chunks are more frequent in fractions 2 and 3. Other clear cultural products, such as daub, obsidian, and economic shell, are not ubiquitous across samples, but occur frequently enough for densities to be mapped across the surface of the platform. Other cultural materials, including obsidian, slate, crystal, and mica occur so rarely that they may not indicate particular cultural

Table 4.4. Total quantity of each microartifact class in sorted samples from Group 4. These quantities do not include samples from Operations 29 and 33 or samples with missing volumes. All weights are expressed in grams.

Microartifact Class	Presence (of 132)	Fraction 1		Fraction 2		Fraction 3	
		Cnt	Wght (g)	Cnt	Wght (g)	Cnt	Wght (g)
chert flakes	131	448	1442.15	541	35.72	1604	16.68
chert chunks	132	242	993.81	529	49.66	1706	25.44
chert tools	1	1	0.38	0	0	0	0
chert other	121	118	1574.73	250	27.39	558	12.74
obsidian chunks	2	0	0	0	0	2	0.00
obsidian flakes	3	0	0	2	0.05	1	0.00
slate	7	1	0.21	4	0.41	6	0.07
quartz	132	427	475.36	2251	436.39	15511	476.08
limestone	132	0	130775.69	0	22615.64	0	21405.50
other stone	129	637	8342.73	1267	300.32	2501	48.29
economic shell	74	23	20.38	40	2.48	191	2.46
other shell	132	4180	713.33	0	454.75	0	745.76
ceramic	132	1370	3620.65	760	69.09	1336	22.01
daub	53	31	67.96	91	5.23	75	0.64
carbon	131	113	12.96	655	13.65	7490	25.04
bone	83	1	0.20	31	1.11	300	1.64
clay aggregate	131	0	53.74	0	155.42	0	175.99
organic remains	132	0	329.64	0	154.31	0	0
modern	3	18	6.96	53	4.35	323	4.72
plaster	2	2	10.14	0	0	0	0
speleothem	2	1	0.70	1	0.11	0	0
burned shell	6	0	0	0	0	15	0.19
crystal	4	0	0	1	0.06	13	0.10
mica	1	0	0	0	0	3	0.05
unknown 1	71	3	0.05	17	0.66	537	1.81
unknown 2	5	1	0.20	0	0	7	0.04
unknown 3	20	0	0	2	0.23	25	0.43
unknown 4	34	0	0	6	0.20	100	0.47
unknown 5	33	2	0.29	3	0.42	48	0.66
unknown 6	6	0	0	4	0.14	32	0.20
unknown 7	15	0	0	3	0.39	19	0.27
unknown 8	3	6	16.32	7	0.89	5	0.08
unknown 9	5	0	0	5	0.10	4	0.04
unknown 10	1	0	0	1	0.31	0	0
unknown 11	5	6	17.99	2	0.12	0	0
unknown 12	19	1	0.45	3	0.59	20	0.35
unknown 13	6	1	0.34	3	0.32	5	0.00
special	1	0	0	0	0	1	0.05
Totals		7633	148477.36	6532	24330.51	32438	22967.80

inputs.

Appendix F provides a breakdown of the density in count/L and g/L of six culturally derived microartifact types within all Group 4 samples. Additionally, the mean and standard deviation of these densities are calculated as well as the ubiquity of each artifact type presented as a percent frequency. This table includes the sum of fractions 2 and 3 to provide data for all microartifacts. Additionally, chert flakes and chunks were combined to provide the densities of all microchert. This table points out the ubiquitous presence of chert and ceramic microartifacts and the variable presence of daub and economic shell across the analyzed samples. Additionally, obsidian and slate occur only infrequently within the assemblage.

In the section that follows, I will discuss the various material classes identified in our microartifact analysis. For each, I describe the criteria used to identify that material class and provide a discussion of its ubiquity and density within the assemblage. The summary analysis in this chapter will provide a baseline for the distributional analysis aimed at identifying activity areas presented in Chapter 7.

4.3.5.4 Microartifact Material Classes

Material classes recorded during microartifact sorting focused on cultural materials. Since these materials come from the surface of a mounded structure, all materials, with the exception of modern organic remains, can be considered artifacts. Classes were determined primarily on the basis of observed macroartifact classes. Additional classes were added throughout the sorting process as new materials were discovered. The following section contains a brief description of each artifact class identified. The identities of some materials are unknown and are appropriately labeled "Unknown" by number in the order they were found. These are described based on identifiable physical features. Continued research may lead to the identification of these materials.

Chert. Chert artifacts were sorted first by material type and then into technologically defined subcategories. Because chert is the primary material used to produce stone tools at Actuncan, this category is critical to understanding the possible production and use of these tools on the Group 4 platform. Chert debris resulting from human action is easily identified based on its angularity and concoidal fracture patterning. Because of the small size of the materials analyzed, chert microartifacts were placed in five broad categories. "Chert flakes" were identified based on the presence of a bulb of percussion or platform. "Chert chunks" are bits of debitage that result from either tool use or lithic reduction. These were identified based on their angularity and lack of flake characteristics. "Chert blades" are portions of flakes produced using prismatic blade technology. No chert blades were identified during our analysis. "Chert tools" are chert objects that were shaped into a formal tool or showed evidence of retouching. Only one possible tool was identified in our analysis – a possible engraver found in the macroartifact sized fraction 1. "Chert other" is a catch-all category for all other bits of chert found in the samples. This category consists mostly of rounded chert fragments that appear to be unworked and naturally derived.

Chert microartifacts were encountered in all samples. Within fractions 2 and 3, an average of 7.62 chert flakes or chunks per liter were recorded with a standard deviation of 4.04, indicating a fair amount of variability between samples (Appendix F). While the ubiquity of these materials across the samples indicates that they likely are present within the background of the structure fill and collapse, the variability in quantity between samples indicates that areas of particularly high frequencies exist that may point to activity areas. Interestingly, a similar quantity of microartifact chert chunks and flakes were encountered across the surface of the Group 4 platform, while substantially more flakes than chunks were encountered among the macroartifacts. This likely points to the curation of chert flakes for later use.

Obsidian. Because obsidian is also used to produce stone tools, this material was split into the same technological subcategories as chert. Obsidian is easily identifiable because of its limited range of coloration, from black to green, and its high translucence. In contrast to chert, only a small number of obsidian fragments were identified (n=5), of which three were categorized as flakes and two as chunks. No blades, tools, or other bits were identified within the microartifact fractions. This contrasts with the abundance of obsidian identified in households at Actuncan. As discussed in the analysis of chipped stone macroartifacts below, 27 fragments of obsidian were also recovered from the surface of the Group 4 surface during our excavations. While obsidian was present, it was in much lower densities than was typical in domestic contexts at Actuncan (Shults 2012). Additionally, the absence of microartifacts indicates that spaces were either being carefully cleaned or that obsidian knapping and elite activities requiring the use of obsidian (see Aoyama 2007) were not taking place within Group 4.

Slate. Another commonly worked stone at Actuncan is slate. This material is identified based on its distinctive dark gray color and grainy texture. Slate microartifacts were initially identified with the aid of Kelvin Requena who was familiar with the material because of the modern tradition of slate working in the nearby town of San José Soccotz. Only 11 slate fragments were identified from the microartifact samples, indicating that this material was not worked within this space. Within the macroartifact assemblage, 14 slate artifacts were recovered, indicating that the material was present at Group 4 even if we do not have evidence of its manufacture or use.

Quartz. This material is made up primarily of angular crystalline particles with traits similar to quartzite. These granules may have been inclusions in the limestone used to fill the Group 4 platform. As the limestone underwent the weathering process, these inclusions may have been released from within that limestone. Alternatively, others have suggested that quartz can be used as an abrasive to aid in the carving or grinding of hard, ornamental stones including jade (Kovacevich 2006), though no evidence of microartifact debris from ornamental stones was encountered in the microartifact samples. Most likely, the majority of this material class is naturally occurring.

Limestone. This class of material is the primary construction material used by the Maya and is the primary stone material underpinning the geology of western Belize. This material is quarried locally and used both as rubble for structure and as precisely cut blocks for architectural façades. Additionally, limestone is burnt, pulverized, and hydrated to make lime plaster surfaces. The limestone in this area is generally quite soft and friable. Both the limestone rubble and the plaster easily break down into smaller particles. The limestone particles have an opaque cream to white color that occasionally strays to a light yellow or pink. The weathered limestone particles are irregularly shaped but all edges are rounded. Particles that derive from eroded plaster have a powdery texture. Due to the large quantity of limestone and obvious association with construction material, limestone particles have been weighed but not counted. Its distribution of limestone could correlate to the presence of collapsed architecture. Since the plaster surface of the Group 4 platform was badly eroded in most places, and likely originally quite thin, identifying the precise depth to collect artifacts from proved to be difficult. More limestone in microartifact samples may be a function of collapse material resting on the surface, or it may have derived from a sample taken slightly too low into the limestone fill of the platform.

Other Stone. This class is a catchall for stones and minerals that have not been culturally modified and don't fit into other identifiable categories. While most of this material was likely brought to Group 4 during construction, some portion of this material may have been altered by people; however, these modifications are not identifiable at the micro-scale. For example, I suspect this fraction contains granitic inclusions that may be a byproduct of the use of ground stone tools. Because of the material's small size, making fine mineralogical distinctions becomes difficult. Several classes of unknown materials likely belong in this "other stone" category.

Shell fragments. Small fragments of shell are quite abundant in the samples. Most of these shells appear to derive from land snails that died in the matrix following its ancient abandonment. Since shell and limestone are both made of calcium carbonate, some confusion can arise when comparing these two material classes. Shell is identifiable by its smooth surface and the remnants of the shell's spiral structure. Land snails generally have a very thin shell that can clearly be identified based primarily on the material's thinness. Thin shells were placed in the "other shell" category to account for the likely lack of cultural importance. River and marine shells, collectively "economic shell," are identifiable based on the greater thickness of the shell. These kinds of shell must have been transported to Group 4 by humans and therefore are likely of cultural importance. However, at the microartifact level, it is difficult to distinguish between different kinds of shell, including marine shells and freshwater jute snails (*Pachychilus* sp.). This distinction is not made despite the different function of marine shell and freshwater snails. Jute snails were likely used as a dietary supplement by the ancient Maya and are fairly ubiquitous in the archaeological record (Healy et al. 1990). Their presence in caves and civic deposits, however, point to their role in ritual feasting (Halperin et al. 2003; Keller 2012). Marine shells, on the other hand, were likely traded for their use in ornamental regalia.

In contrast to many culturally derived artifact classes that are ubiquitous, economic shell was only present in 50.8% of the microartifact samples from the surface of the Group 4 platform. Further, because economic shells are not naturally occurring, their presence in certain locations should be culturally derived. That said, a maximum density of 3.00/L is quite low and may indicate incidental deposition rather than evidence of concerted use.

Fired clay: daub and ceramic. Particles of fired clay were placed in two separate classes on the basis of their functional origin. AAP macroartifact collections indicate that daub and ceramics are both present in the local archaeological record. Daub consists of construction material used in *bajareque* construction. Clay is placed over walls made of wooden poles and allowed to dry. If this clay burns, it preserves in the archaeological record. However, daub is difficult to distinguish from pottery. Evidence of *bajareque* house construction is fairly common at the sites of Barton Ramie and San Lorenzo in the Belize River valley (Willey et al. 1965; Yaeger 2000b); however, this construction type is not ubiquitous in the region. At the Chan site, structures were constructed primarily out of pole and thatch with only a very limited use of *bajareque* (Robin 1999).

Ceramic microartifacts result from the breakdown of ceramic vessels. This can happen through breakage related to use and natural decomposition, especially in surface contexts. Both ceramic material and daub are quite friable and break down into larger constituent parts through weathering. Ceramics and daub are differentiated primarily based on shape and inclusions. Daub tends to contain voids from organics and limited amounts of sand inclusions. Ceramics, on the other hand, contain a much higher density of temper. Ceramics tend to break into somewhat angular particles, while daub tends to maintain a rounded shape as it breaks down. Also, I found color to be a useful tiebreaker for separating ceramic from daub. While ceramic material may take on a variety of colors (red, brown, gray, tan) daub tends to range between yellow and reddish-yellow. While clay for ceramics found at Actuncan likely comes from any number of sources across the Maya Lowlands, daub probably comes from the most convenient local clay source located on the side of the hill between Actuncan North and the Mopan River. This material consists of an almost mustard yellow clay (personal observation, 2010), which may have produced this range of colors. Fired clay objects are identified based on a combination of inclusions, shape, and color. Daub has a more uniform appearance, which allows for consistent identification.

On Group 4, ceramics are one of the most numerous and ubiquitous microartifact classes, appearing in 100% of the sorted samples with a mean density of 3.65/L. The ubiquity of ceramics indicates that it is present in background quantities across the entirety of Group 4. However, several individual samples contained densities well above the mean, up to 13.05/L, indicating that zones of particularly high density likely were present on the surface of Group 4. Research into the spatial distribution of these materials is presented in Chapter 6. Importantly, previous research has found that high densities of microceramics in association with high phosphate levels provide evidence of food storage (Cap 2015b) and that sweeping practices cause high densities of microceramics to aggregate along the interior of structure walls and outside doorways (Widmer 2009).

In contrast, daub is only present in 35.6% of samples, while exhibiting strong variability between samples exhibited by a mean density of only 0.30/L with a standard deviation of 0.64. Individual samples can contain a density up to 4.51/L, and the spatial arrangement of daub may point to the presence of ephemeral features or architectural constructions including lined pits, hearths, or walls (Cap 2011, 2015b).

Carbon. This class consists primarily of carbonized plant material. In many archaeological contexts, carbon is valued as a source of information about plant life in ancient times and radiocarbon dates. However, in this case the carbon has limited usefulness. The fields surrounding Group 4 have been burned repeatedly in recent times, including the weeks before our excavations began in 2013. As a result, most carbon is likely the result of recent events. That said, carbon is nearly ubiquitous and occurs in especially large quantities in Fraction 3 (Table 4.4). Higher densities of carbon may point to the areas of particularly high bioturbation from the roots of plants.

Bone. Bone fragments may or may not be the result of cultural processes. Because these data come from contexts near the modern surface, this material is likely the result of more recent natural processes of animal mortality and burrowing. Bone was identified based on its shape, color, and texture. Bone occurs in 63% of samples on Group 4, and, like carbon, high densities may point to areas of bioturbation.

Clay aggregate. This material class consists of aggregated clay that has not broken down sufficiently to pass through the screens during processing. This material is easily identifiable and generally consists of spherical balls of dark brown soil with tiny white flecks (limestone inclusions) on the surface. This material was produced during soil formation on top of the structure since its abandonment. Like limestone, soil aggregates were weighed but not counted. This material is recorded on the sorting form as "dirt".

Organic remains. This material generally consists of uncharred grass, bits of wood, seeds and rootlets from plant material that has grown on top of Structure 41. As recently as the 1990s, the site was covered by tropical forest. Currently, it is covered in grass planted for cow grazing. This material does not have ancient origins and is only weighed only for Fractions 1 and 2. We did not weigh organic remains from Fraction 3 and no organic remains were counted.

Unknown. Objects were sorted into various categories of unknown materials. Ultimately, 13 unknown artifact types were identified. Future research may allow for identification of these materials, though I generally do not believe that they are indicative of anthropogenic behavior. These unknowns and other materials types not initially included on the sorting form will be described here.

Modern. These are bits of material that clearly derive from the modern industrial age. In our analysis, all modern materials were bits of stray metal that likely entered the record through disturbances.

Plaster. Plaster was only differentiated from limestone in fraction 1. It was identified by the flat, finished surface distinctive of Maya plaster surfaces. In the microartifact size classes, plaster is largely indistinguishable from unprocessed forms of limestone.

Speleothem. This category includes limestone formations that likely originated from cave contexts. This material was identified based on its shape. Clear speleothems are rare: only two were identified in our analysis. This category may be underrepresented because these $CaCO_3$ formations look like limestone.

Burned shell. Shell bits turned gray from burning. A category for burned shell was only added part way through analysis and few examples (n=21) were identified.

Crystal. Crystals were identified as clear, translucent stones with a crystalline structure. Likely these are clear, translucent quartz. These materials were separated because of their ethnographically documented use as important objects in ritual activities, especially divination.

Mica. Mica was identified based on both the coloration and morphology. This material flakes into sheets and maintains an iridescent sheen on its surface. Mica was likely used on objects of personal ornamentation. This material was rarely identified (n=4).

Unknown 1. This abundant and distinctive material has a similar consistency and white color to shell. Unknown 1 has a uniform convex form with smooth interior and exterior of interconnected roughly geometrically shaped linear protrusions. When found whole, Unknown 1 appears to form full, hollow spheres. Unknown 1 is likely made up of broken pieces of the seed of *Celtis* sp., a genus often found as a modern contaminant within flotation samples examined by paleoethnobotanists working in the Maya world (Clarissa Cagnato, personal communication 2015). Interestingly, Unknown 1 appears in 54% of the samples, perhaps indicating the presence of *Celtis* sp. plants on the surface of Group 4 in the recent past.

Unknown 2. This material is a gray-black stone with a coarse texture. The material is distinctive because of the numerous reflective inclusions that give the material sparkly appearance. Unknown 2 breaks in a roughly angular form. Unknown 2 occurs only rarely in analyzed samples (n=8).

Unknown 3. This material has a smooth and hard black exterior with exposed white inclusions, which grades into a dark reddish core. The exterior is generally curved, but does not form a consistent shape. When cracked open, the broken surface is irregular in texture. The material appears to be stone and may be the same as Unknown 7 and Unknown 9. This material occurs in only 20 of 132 samples and only in small quantities (n = 47).

Unknown 4. This flat, thin material is light gray to white in color with a slightly undulating textured surface. Under magnification, the material is slightly translucent, perhaps indicating a crystalline internal structure. Unknown 4 is likely $CaCO_3$. It has some characteristics of shell; however, it may also be a naturally occurring limestone formation. This material is the second most ubiquitous unknown, occurring in 26% of samples.

Unknown 5. This material is reddish-orange in color and may develop a black cortex. The material has a coarse texture and may be a siltstone of some kind. The red likely indicates high iron content. Because of this stone's chalky texture, it may be usable as a pigment. This material occurs in 25% of the analyzed samples, but generally in very low quantities. The exception is a single sample with 7 fragments.

Unknown 6. This material is course, dark in color, and irregularly shaped. A finer black material appears to bind together many small stone inclusions. It may be burnt remains of some kind of material. Only 36 fragments were encountered across six samples, though 32 of these fragments were clustered together around 40IC on the northeast corner of Group 4.

Unknown 7. This material has a hard dark gray to black exterior with reddish hints. The exterior is smooth but irregular with a dull sheen. This material is incredibly hard and may have a reddish interior. Unknown 7 appears similar to Unknown 3 and Unknown 9. This material was not encountered frequently (n=22) and in low frequencies across 15 samples.

Unknown 8. Unknown 8 is an abundant light tan-colored material with a distinctive friable nature. The material is lightweight and irregularly shaped with many internal voids. It is easily broken even with light handling. The material is a porous stone of some kind. This material was only encountered in three samples and mostly in 40KI, which contained 16 of 18 examples.

Unknown 9. This material is a black, somewhat shiny, and very hard stone. The exterior of this material is angular. This stone has features similar to Unknown 3 and Unknown 7. Nine examples of this material were encountered across five samples.

Unknown 10. Unknown 10 is a single very hard black, shiny stone. Only one example of this category was defined in 40CG.

Unknown 11. This material class is a translucent white stone material. Most examples are flat with a translucent crystalline material located between parallel opaque cortexes. Sometimes the material takes on a bubbly appearance or texture. Only eight examples were encountered across five samples.

Unknown 12. Unknown 12 is another example of a reddish black stone. In this case, the material appears to be relatively course and follow a planar fracture pattern. These stones are often well rounded as though they have been river washed. Only 24 examples were encountered across 19 samples.

Unknown 13. Light yellow to pink in color, this material is slightly translucent and has a fibrous appearance. Unknown 13 appears to be a brittle stone of some kind. Only nine examples of this material was encountered across six samples.

Special 1. A single example was labeled as a special microartifact find. This object appears to be either worked shell or limestone.

4.3.6 Analysis of Soil and Plaster Chemistry Samples

In recent years, soil chemistry has been used with great success to identify activity spaces within Mesoamerican archaeological sites (Anderson et al. 2012; Barba and Manzanilla 1987; Canuto et al. 2010; Cook et al. 2006; Coronel et al. 2015; Eberl et al. 2012; Fernández et al. 2002; Fulton et al. 2013; Hutson et al. 2007; Hutson and Terry 2006; Inomata et al. 2001; Manzanilla and Barba 1990; Middleton 1998; Middleton and Price 1996; Parnell et al. 2002; Robin et al. 2012b; Rothenberg 2010; Terry et al. 2004; Terry et al. 2000; Wells 2004; Wells et al. 2007; Wells et al. 2000). Like microartifact analysis, the analysis of anthropogenic residues in soils allows archaeologists to identify activity areas that would otherwise have been obscured by natural and cultural processes (LaMotta and Schiffer 1999). The Maya in particular tend to remove waste to secondary locations away from primary occupation areas and sweep occupation spaces clean to removed smaller debris (Deal 1985; Fernández et al. 2002; Hayden and Cannon 1983). Soil chemistry analysis is based on the idea that repeated human activities produce chemical residues that leach chemical compounds into occupation surfaces. After these residues are deposited in the soil, cations (positively charged ions) of individual elements fix to anions (negatively charged ions) that naturally occur in the soils, particularly clays (Wells 2006; Wells et al. 2007). Calcareous plaster surfaces like the surfaces sampled on Group 4 are particularly efficient at trapping chemical residues and preserving them in place over very long periods of time (Barba 2007; Hutson and Terry 2006; Wells 2004). The elemental signatures recovered can then be interpreted based on a comparison to patterns observed in ethnoarchaeological studies (Barba and Ortiz 1992; Fernández et al. 2002; Middleton and Price 1996; Terry et al. 2004; Wells 2004; Wells et al. 2007). However, because of variability in natural underlying geology the spatial patterning of relative elemental concentrations is more useful than absolute elemental concentrations for interpreting anthropologic activities (Entwhistle and Abrahams 1997; Linderholm and Lundberg 1994; Wells et al. 2007).

At Actuncan, soil samples for elemental analysis were collected from across the surface of Group 4 in a similar manner to the microartifacts. At the level of the terminal occupation surface, point samples of at least .25 g of soil were collected from the center of each 1 m by 1 m excavation unit in a high density square lattice (Wells 2010:213-214). Samples were not collected if the center of the excavation unit had a clear modern disturbance or if the unit was interrupted by an architectural element.

Two hundred seventy-nine samples were then sent to the Cultural Soilscapes research group directed by E. Christian Wells at the University of South Florida. There, approximately 2.00 g of soil from each sample was aired dried, pulverized in a Coors porcelain mortar, and sieved through 1 mm mesh. Following the Foss mild acid-extraction technique, the soils were then mixed with 10 mL of .60 M HCL mixed with .16 M HNO_3 (both trace metal grade) in a phosphate-free polyethylene scintillation vial. This mixture was then shaken at 220 rpm for 30 minutes. Each sample was then filtered through Whatman ashless filter paper and decanted into a clean polyethylene vial. The remaining solution was then diluted using ultra-purified water to bring to bring concentrations into the optimal measuring range for the instrument. The samples were then analyzed using a Perkin Elmer Elan II DRC quadrupole inductively coupled plasma-mass spectrometer (ICP-MS) at the Center for Geochemical Analysis at the University of South Florida. Known solution standards containing the elements of interest were used for calibration during analysis. The calibrated concentrations of 20 elements were determined: barium (Ba), calcium (Ca), cobalt (Co), chromium (Cr), copper (Cu), iron (Fe), mercury (Hg), potassium (K), magnesium (Mg), manganese (Mn), sodium (Na), nickel (Ni), phosphorus (P), lead (Pb), strontium (Sr), titanium (Ti), uranium (U), vanadium (V), yttrium (Y), and zinc (Zn). The results are reported in parts per million (ppm) of the element. The raw data are presented in Appendix G. In Chapter 6, I provide further details regarding the analysis and interpretation of these data.

4.4 Methods for Landscape Analysis

Chapter 8 of this dissertation focuses on investigating Actuncan's Terminal Classic sociopolitical reorganization through an analysis of the changing layout and use of the site's urban landscape. This analysis builds on the long-standing understanding that Maya civic plans are laid out by leaders intending to evoke specific ideological and political messages and to provide dedicated spaces for the performance of authority and community solidarity (Ashmore 1989, 1991; Ashmore and Sabloff 2002; Inomata 2006a; Reese-Taylor and Koontz 2001; Ringle 1999). By looking at the site's changing layout through time, I evaluate how the nature of authority at Actuncan changed over time and how later occupants of the site remembered, evoked, and manipulated the site's monumentally inscribed past.

This landscape analysis draws on three primary sources of data in order to reconstruct the organization, renovation, and changing uses of the site core's plan from its Terminal Preclassic apogee of royal authority to its reconstitution as the valley's capital in the Terminal Classic period. The first major data addressed in Chapter 5 is the map of Actuncan's site center. Originally mapped from 1992 to 1993 by McGovern as part of his dissertation research, the site map has been modified by Don Perez, Daniel Salberg, and me since 2010 (McGovern 2004; Mixter 2014; Mixter and Freiwald 2013:35-36; Perez 2011; Salberg 2012). This research mapped the two major architectural groups as well as household groups near the site core. These data provide a baseline for understanding the size, organization, and layout of Actuncan's major architectural efforts.

Second, I draw on McGovern's investigations of the site's looter's trenches and AAP research of public architecture and plazas to understand the changing nature of the site's layout (Donohue 2014; Jamison 2013; McGovern 2004; Mendelsohn and Keller 2011; Mixter and Craiker 2013; Mixter and Freiwald 2013; Mixter and Langlie 2014; Mixter and Nick 2014; Nick and Mixter 2013). This research looks at the construction sequences of numerous public structures within the site core and provides a basic delineation of the sequence of construction at Actuncan's site core.

Finally, I draw on these same excavations to reexamine the nature of ongoing activity associated with several major zones of the site during the Terminal Classic period. In certain areas, the continuation or resumption of ritual activity speaks to the ongoing importance of these spaces (McGovern 2004; Mixter and Langlie 2014). In others, abandonment is marked by intentional ceremonies or by the apparent degradation and dismantling of the buildings themselves (Donohue 2014; Mixter et al. 2013). These data direct my interpretations of collective memory and how Actuncan's history impacted the meanings, associations, and connections of the local community to specific places.

Based on this multi-evidential reconstruction of Actuncan's urban plan, Chapter 8 looks at its changing use and manipulation. This will be done by looking at specific architectural forms – the triadic temple group, the main range structure, the Terminal Classic civic complex – and how plazas and causeways integrated them into a united whole. Based on comparison to other site plans and concepts of Maya ideology and cosmology, I evaluate the importance of these specific places over time and consider how the site layout was modified in the Terminal Classic period to facilitate the site's renewed political activity.

Chapter 5. EXCAVATIONS IN GROUP 4 AND AROUND PLAZA D

5.1 Introduction

The investigations reported here were spurred by my interest in understanding the substantial and unexpected evidence of Terminal Classic period occupation of Actuncan revealed during AAP excavations in 2010 and 2011 (LeCount et al. 2011; Mixter et al. 2014). These findings were surprising because McGovern (1994:112-113; 2004:159) reported no evidence of Terminal Classic construction and only a single deposit related to Terminal Classic occupation. In contrast, the AAP's systematic excavations of the site's household groups revealed evidence of Terminal Classic occupation on nearly every patio-focused household group (Antonelli and Rothenberg 2011; Hahn 2012; LeCount et al. 2011; Mixter et al. 2014; Rothenberg 2012; Simova 2012). Additionally, each of the three large Preclassic elite houses was reoccupied during the Terminal Classic period, though probably not as domiciles (Mixter et al. 2014; Nordine 2014; Simova et al. 2014; Simova et al. 2015). Furthermore, excavations have recovered small quantities of ceramics diagnostic to the Postclassic period from surface deposits across the site (LeCount et al. 2011). Although these deposits are ephemeral and further analysis of these materials is necessary, these data may indicate that Actuncan was occupied until the initial adoption of ceramics associated with the Postclassic New Town ceramic phase (Gifford 1976), beyond the well-documented abandonment of Xunantunich in the mid-9th century (LeCount et al. 2002).

However, the AAP's test excavations in Group 4 provided clear evidence that Actuncan

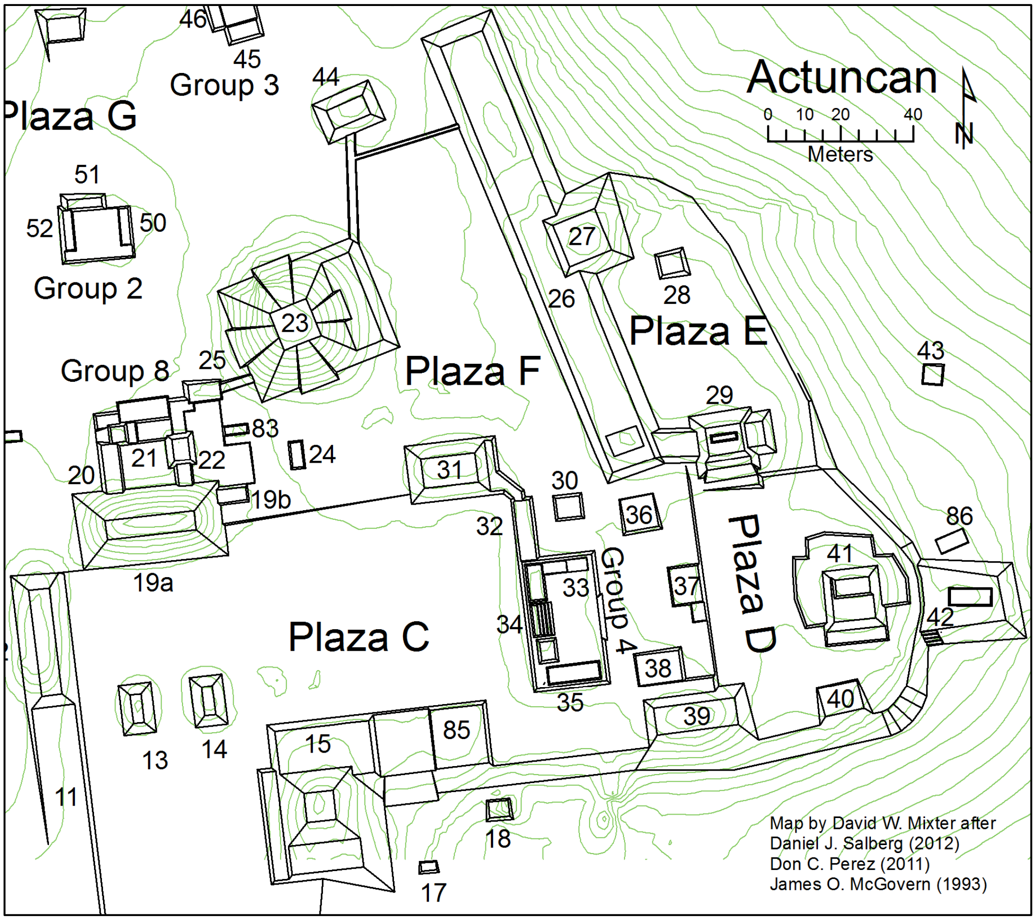

Figure 5.1. Map of Actuncan North showing Group 4 in relation to the site's other monumental architecture and Plazas C and D.

was a civic center in the Terminal Classic period (LeCount et al. 2011). LeCount (2009; 2011:6) originally hypothesized that Group 4 was either a domestic patio-focused group like those excavated in the northern neighborhood or part of an elite palace complex focused around Plaza D (following the hypothesis of McGovern 2004:57). Excavations led by Rebecca Mendelsohn and Angela Keller (2011) encountered very few artifacts on the group's surface. This pattern did not match the domestic groups excavated elsewhere at the site and suggested that Group 4 served a civic function (LeCount et al. 2011). This interpretation was further supported by Group 4's central location between Plaza C and Plaza D within Actuncan North (Figure 5.1). Ceramics recovered from a deep penetrating test excavation, described below, indicate that Group 4 was constructed during the Terminal Classic period at the same time Xunantunich was shrinking in influence and populations in the rest of the Mopan River valley were declining. Based on the group's C-shaped form, as originally drawn by McGovern (Figure 5.2), Keller (LeCount et al. 2011) hypothesized that Group 4 might have been a *popol nah*, or council house (following Bey et al. 1997; Fash et al. 1992; Freidel and Sabloff 1984; Proskouriakoff 1962; Rice 1986). Keller (LeCount et al. 2011; Mendelsohn and Keller 2011) also proposed an alternative arrangement of Group 4, in which Structures 33-35 were actually a series of small buildings rather than long adjoining platforms (Figure 5.2). At the least, this preliminary research showed that Group 4 was a civic structure and suggested that Actuncan was a center of public life during the Terminal Classic period (LeCount et al. 2011).

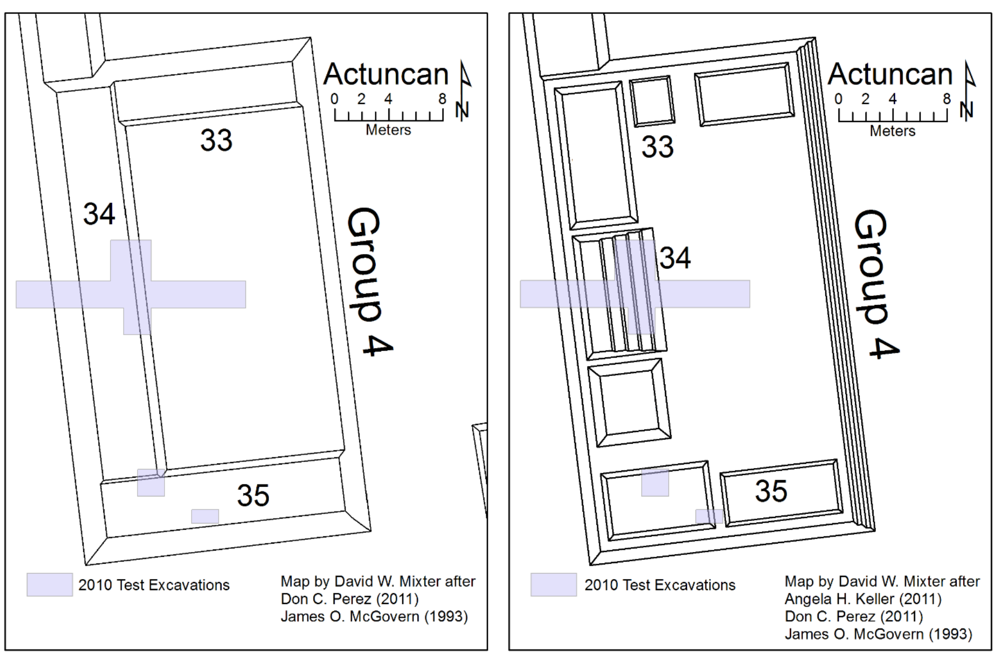

Figure 5.2. Map showing the alternative reconstructions of Group 4 by McGovern (1993), on the left, and by Keller (LeCount et al. 2011:Figure 6), on the right. This map also shows the extent of Mendelsohn and Keller's (2011) 2010 test excavations.

In designing my excavations, I targeted two major parts of the site. First, I wanted to understand the form and function of Group 4. Because Group 4 was the apparent center of civic life at Actuncan during the Terminal Classic period, the form and function of this space provides a comparative reference for understanding the transformations in political ideology that underpinned the site's renewal. Second, I targeted several structures in Plaza A looking for evidence of Terminal Classic ritual deposits associated with Actuncan's major Preclassic architecture. The thick Terminal Classic ritual deposit recorded on Structure 5 by McGovern (2004) suggested that Plaza A was a space for Terminal Classic ritual activity. I hypothesized that a series of low platforms located in Plaza A was Terminal Classic in date based on their low height and incongruity with the large pyramids that surrounded the plaza.

In this chapter, I present the results of the excavations on and around Group 4. The Plaza A excavations will be presented in Chapter 7. I will begin with a description the mounds that form Group 4 and the associated Plaza D. Plaza D forms the major venue for public life during the Terminal Classic, and excavations have identified limited evidence of Terminal Classic occupation on other structures flanking the plaza. I will then detail three seasons of excavations that directly targeted Group 4 during the 2010, 2012, and 2013 field seasons. The 2010 excavations were directed by Mendelsohn and Keller (2011). I directed additional excavations over the following two seasons. In 2012, preliminary testing off the edge of the Group 4 patio was undertaken by Crystal Craiker and me (Mixter and Craiker 2013). Additionally, Allison Nick (Nick 2013; Nick and Mixter 2013) directed excavations in the center of Plaza D that targeted a low rise that I hypothesized might be a Terminal Classic wall running north-south across the center of the plaza. Finally, in 2013, Nick and I (Mixter and Nick 2014) directed broad horizontal exposures of Group 4 to fully understand the group's architectural form and to collect artifacts from across that space.

The major goals of this research were to define the form of this Terminal Classic architectural complex, evaluate its history of construction, and map the locations of ancient activities associated with the space. The final goal will be discussed in the next chapter. After describing the excavations, I will discuss the evidence for the date of Group 4's construction and its duration of occupation. Finally, a comparative and contextual analysis of Group 4's architectural form will be compared to the hypotheses laid out in Chapter 3 to provide insights into the political ideology encoded in Group 4's construction.

5.2 Description of Group 4

As described in Chapter 3, Actuncan was constructed on a high alluvial terrace along the western bank of the Mopan River. The site's two major architectural complexes, Actuncan North and Actuncan South, were originally mapped by McGovern (2004) during 1992 and 1993. Within Actuncan North, Group 4 was mapped as three structures—33, 34, and 35—built around an elevated patio. This arrangement of structures was first labeled Group 4 by LeCount (2009) who hypothesized that it was a patio-focused domestic group similar to Groups 1-3, 5, and 7. In this dissertation, Group 4 refers to Structures 33-35 and the elevated patio they delineate (Figure 5.3).

Group 4 plays a critical role in defining the layout of Actuncan North by defining the boundary between Plaza C, Actuncan's primary civic plaza, and Plaza D, a semi-private space associated in the Preclassic with the two large single residences (Structures 29 and 41) and a range structure (Structure 39). Evidence of a tall platform (Structure 34-sub-1) under Group 4—possibly the base of a Preclassic range structure—indicates that the division of these plazas dates

Figure 5.3: Photo showing Group 4 at the maximum extent of excavation in 2013.

back at least to the Early Classic period (Mendelsohn and Keller 2011; described in more detail below). During the Terminal Classic period, Group 4 was constructed facing east towards Plaza D. The absence of structures on Group 4's eastern edge indicates that activities taking place in the Group 4 patio would have been visible by people in Plaza D. Additionally, modern burning at the site in 2013 revealed a previously unidentified central staircase on the eastern edge of Group 4's platform that would have provided easy access from Plaza D to the platform surface.

After excavation, I reconstruct Group 4 as an elevated patio-focused group of structures located within the Actuncan North civic core. It is positioned on the west side of Plaza D and also forms the eastern edge of Plaza C. Group 4 was constructed on a large rectangular platform that measured approximately 35 m north-south and 20 m east-west (Figure 5.4). This platform rises approximately 1.4 m above Plaza D to the east. Group 4's broad basal platform supports multiple structures that surround a central patio. A broad east-facing staircase, measuring approximately 11.5 m wide, descends from Group 4's patio to the Plaza D surface. Extensive wildfires in 2013 cleared the surface vegetation of Group 4 and allowed for an accurate mapping of Group 4's edges and staircase. It also revealed that the staircase was likely at least partially inset, a characteristic that is uncommon in the Classic period, but becomes common in the Postclassic Petén Lakes region (Schwarz 2013a:316).

Group 4's structures were only located on the northern, western, and southern edges, leaving the east side open. Although access was limited to the central staircase, the open eastern edge would not have restricted the visibility between the Group 4 patio and the western edge of Plaza D. Additionally, the relatively wide staircase points to relative ease of access between the two spaces. While the preexisting organization of Actuncan's site plan would have somewhat restricted access to Plaza D, once in this civic space, Group 4 would have been quite accessible.

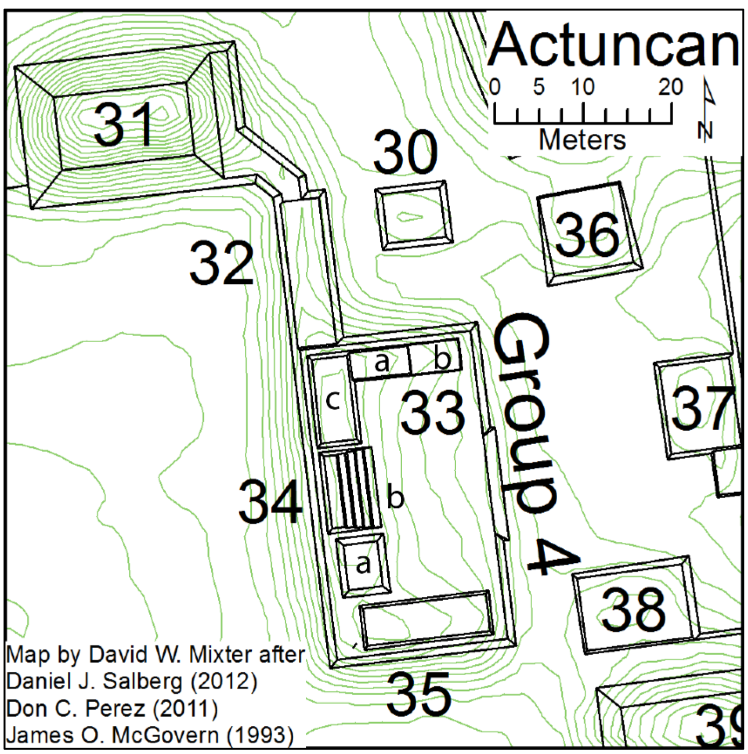

Figure 5.4. Map showing the location and layout of Group 4.

One unusual feature of Group 4 first identified by Mendelsohn and Keller (2011) is that its raised patio is sloped from west to east. While a very slight slope is not uncommon in Maya plazas to allow for proper drainage, the slope of Group 4 declines 25 cm over a 5 m span from west to east. This slope would have created a theatrical effect by elevating individuals standing on the western side of the patio to improve visibility of the whole space from Plaza D.

Prior to excavation, an initial survey mapped the structures on Group 4's north, west, and eastern perimeter (Figure 5.4). Structure 35, along the southern perimeter of Group 4, appears to be a single basal platform measuring 14 m east to west by 4 m north to south that supports a single structure with partial masonry walls. Structure 34, along the western perimeter, appears to be three distinct structures. The southern structure, Structure 34a, is a small building with partial masonry walls featuring at least two small rooms and one bench. Structure 34b, the middle building on the western periphery of Group 4, appears to be an unusual stair up to a narrow platform (Mendelsohn and Keller 2011). Structure 34c is the least well understood of Group 4's superstructures, consisting of a long, low platform. Structure 33 consists of two low platforms, Structures 33a and 33b. Structure 33a abuts Structures 34c to the west and Structure 33b to the east. Each appears to be a low platform that likely supported a perishable structure. The three platforms appear to be connected forming three discrete levels that step down from west to east. In contrast to Structure 33a, Structure 33b is heavily impacted by erosion and bioturbation and its precise boundaries are difficult to identify.

5.3 Excavations on and around Group 4

During the summer field season of 2010, 2012, and 2013, excavations were undertaken on and around Group 4 to understand its architectural layout and sequence of construction.

Additional excavations around the perimeter of Group 4 sought to define the architecture of its platform by looking for garbage middens from activities that took place on the building's surface. Table 5.1 lists all relevant operations. All except Operation 29 are discussed in the section that follows. The detailed results of Operation 29 can be found in Allison Nick's (2013) senior honors thesis.

5.3.1 Overview and Timeline of Excavations

Group 4 was initially mapped by McGovern (1993) as part of his effort mapping Actuncan North in 1993. His nearest test excavations were into Structure 31, connected to the northwest corner of Group 4 by Structure 32, and the southern end of Structure 26. He directed no other excavations into Plaza D. During the 2004 field season, AAP directed limited test excavations into both Structures 29 and 41 (LeCount and Blitz 2005), but otherwise did not excavate around Plaza D until 2010.

Table 5.1. Outline of all relevant operations on and around Group 4

Operation	Location	Goal
8	Group 4 Patio and Structure 34b	Initial centerline trench, Evaluate Group 4's history of construction
29	Center of Plaza D	Evaluate whether a wall divides Plaza D
32	East end of Plaza C	Look for possible middens
34	South of Group 4	Test for possible middens
35	South of Structure 35	Look for middens
36	Structure 35	Horizontal Exposure
37	South of Group 4	Look for middens
40	Group 4 Patio	Collect Activity Area Data
42	Structure 34a	Horizontal Exposure
44	Structure 33a	Horizontal Exposure

During the 2010 field season Group 4 was initially selected for excavation because it resembled the patio-focused domestic groups located around Actuncan's center, but was situated between two major civic plazas (LeCount 2011:6). Archaeological research by Mendelsohn and Keller (2011) sought to evaluate whether Group 4 was domestic or civic in function. Additionally, they excavated into the platform to collect ceramics and carbon from the fill that might provide insight into the structure's date of construction. In 2010, Operation 8 consisted of a 3 m by 2 m deep-sounding excavation into the center of the Group 4 patio near its center point (units 8A-8F) and 41 m^2 of shallow horizontal excavations (units 8G-8II, 8PP-8AAA) that extended from the patio, across Structure 34b, and into Plaza C (Figure 5.2). Additionally, two small test excavations, one measuring 2 m by 2 m (units 8JJ-8MM) and one measuring 2 m by 1 m (units 8NN-8OO), provided a preliminary window into the architecture of Structure 35. The paucity of artifacts recovered from these excavations indicated that the platform was a clean space and unlikely to have been a domestic structure (Mendelsohn and Keller 2011:37). Additionally, the deep penetrating excavations recovered Terminal Classic ceramics from the fill indicating that Group 4 was likely constructed during that time period.

In 2012, research into Group 4 was reinitiated through a program of posthole probes aimed at finding middens, a reassessment of the Mendelsohn and Keller's deep excavations, and Nick's investigation of the wall in the center of Plaza D. Operations 32 and 34 each consisted of a single test pit (units 32A and 34A) and a series of 116 posthole tests (units 32B1-32L7 and 34B1-34H7) aimed at revealing the location of middens along Group 4's west and south sides (Mixter and Craiker 2013). Additionally, I removed the backdirt from units 8A-8F to re-document the pit's stratigraphy. Finally, Nick (2013; Nick and Mixter 2013) excavated a 1 m by 4 m trench (units 29A-29D) to investigate the possible wall located in the center of Plaza D.

In 2013, large scale horizontal excavations targeted Group 4 and its associated structures (Mixter and Nick 2014) (Figure 5.5). Additionally, more limited exposures targeted possible midden areas to the south and southeast of the group. Operation 40 (all units) and an extension of Operation 8 (units 8BBB-8KKK) investigated 209 m^2 of Group 4's patio surface. Operations 36, 42, and 44 each investigated different structures around Group 4's patio. In Operation 36, 67 m^2 were excavated to delineate the layout of Structure 35. Operation 42 was placed on the southern end of Structure 34 and investigated both its terminal and penultimate forms through a 42 m^2 exposure. Operation 44 investigated the layout of Structure 33a and its abutment with the northern end of Structure 34. Operation 35 and 37 investigated possible middens along the southern and eastern edges of Structure 35. Operation 35 consisted of two excavations located along the edge of the Group 4 platform. Operation 37 was located further south on the slope below Group 4 where trash might have been thrown so that it ended up away from the settled area. The location of this excavation was guided by the 2012 testing in Operation 34.

5.4 Excavations on Group 4

In the subsections that follow, I describe the excavations of Group 4, beginning with the initial excavations that established the group's construction history (Figure 5.5). Next, I describe the excavations into each of the buildings located on Group 4, Structure 35, 34a, 34b, and 33a. Finally, I describe excavations off the edge of the site's monumental platform. Together, these excavations anchor my understanding of Group 4's architectural layout.

5.4.1 Excavations into Group 4's Architectural History (Units 8A to 8F)

The following describes the results of deep test excavations originally reported by Mendelsohn

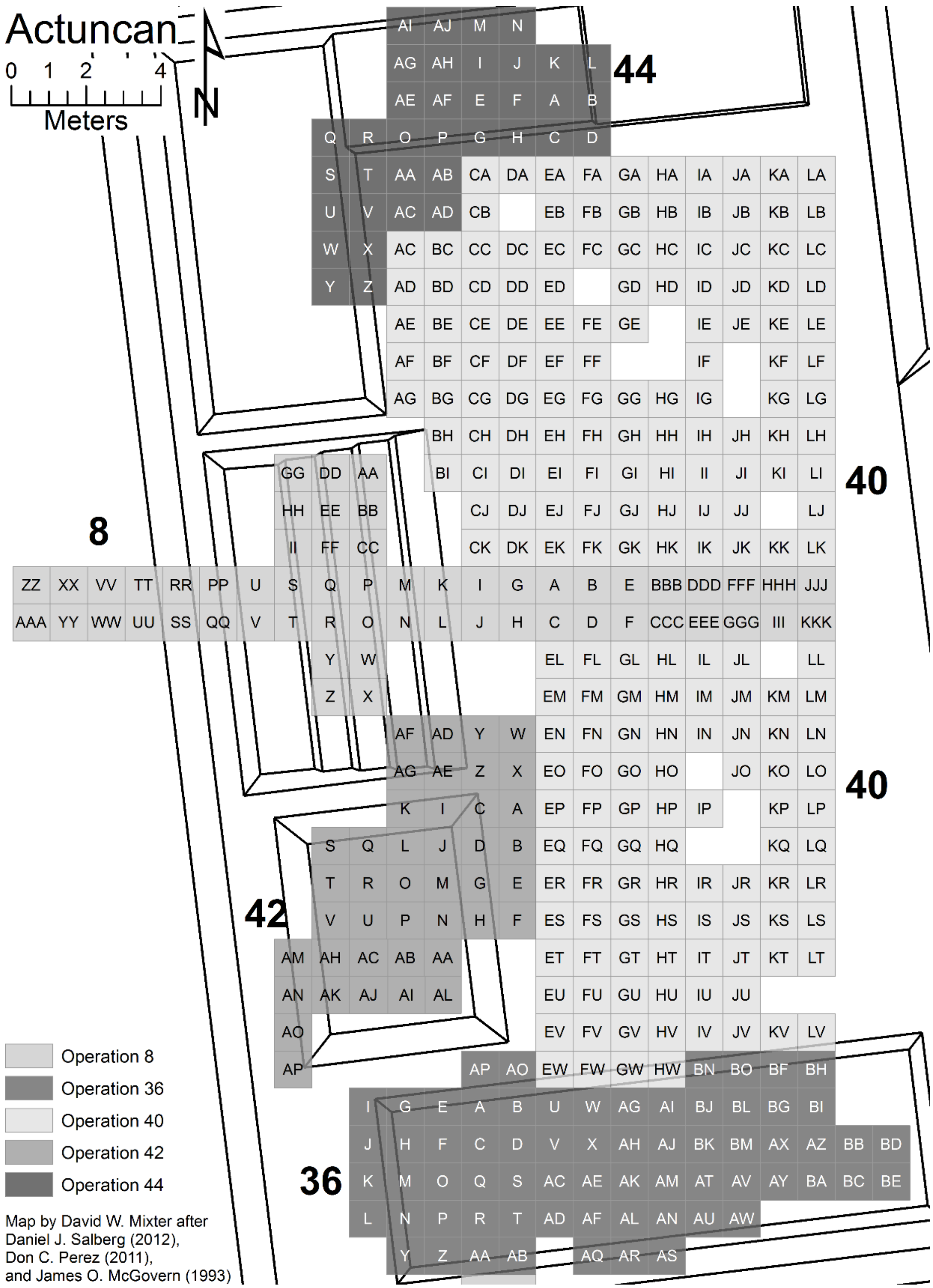

Figure 5.5: Map of Group 4 showing the extent of excavations. The number reflects the division of these excavations into discrete operations.

and Keller (2011) and re-documented by Mixter (Mixter and Craiker 2013) in 2012. These excavations derived from a 2 m by 3 m portion of Operation 8 that included units 8A to 8F (Figure 5.5). This excavation pit provided a window into the construction history of Group 4 as illustrated in Figure 5.6. However, excavations did not reach culturally sterile levels due to the end of the field season in 2010 and the unit's inundation in 2012. Following the heavy rains in the summer of 2012, the re-excavated test pit became filled with water retained by the dense clay matrix at the pit's base. When the water was bailed out of the pit, we found the ground was sufficiently saturated that the open pit simply acted as a sump, refilling quickly from the unit walls. Sadly, this made reaching the natural substrate impossible. However, a comparison to excavations elsewhere at the site (Mixter 2012) indicate that we were likely nearing the natural clay substrate.

The earliest documented occupation is marked by a mix of a small number of terminal Early and Middle Preclassic ceramics (n=27) and lithics (n=47) in a layer of greenish clay. There is not enough evidence to differentiate whether this deposit was gradually accumulated as an occupation surface or represents a filling event prior to the initial construction on this location. This sediment was deposited on an unexcavated strata of "lighter and more yellowy soil" (Mendelsohn 2010), which represents the earliest known strata in the area. Because this stratum was never excavated, it may or may not be cultural. However, its description sounds similar to the yellow clay substrates encountered below Structures 26 and 41 that are associated with Cunil phase ceramics (Mixter 2012; Simova and Mixter 2016).

Moving up the soil profile and later in time, the construction of Glen's Second Floor is the earliest evidence of anthropogenic construction under the Group 4 footprint. This floor was built with a 34 cm thick layer of large flat-laid limestone fill covered by *sascab*. The surface of

Glen's Second Floor was poorly preserved and the underlying fill stones protruded from its surface. However, the upper six cm of the fill itself was consolidated by hardened *sascab*. Although this floor was most likely an early plaza floor, its construction technique resembles that used to build Structure 41-sub, the terminal Early Preclassic platform encountered under Structure 41 (Mixter 2012). Associated ceramics indicate that Glen's Second Floor likely dates to the Late Preclassic period.

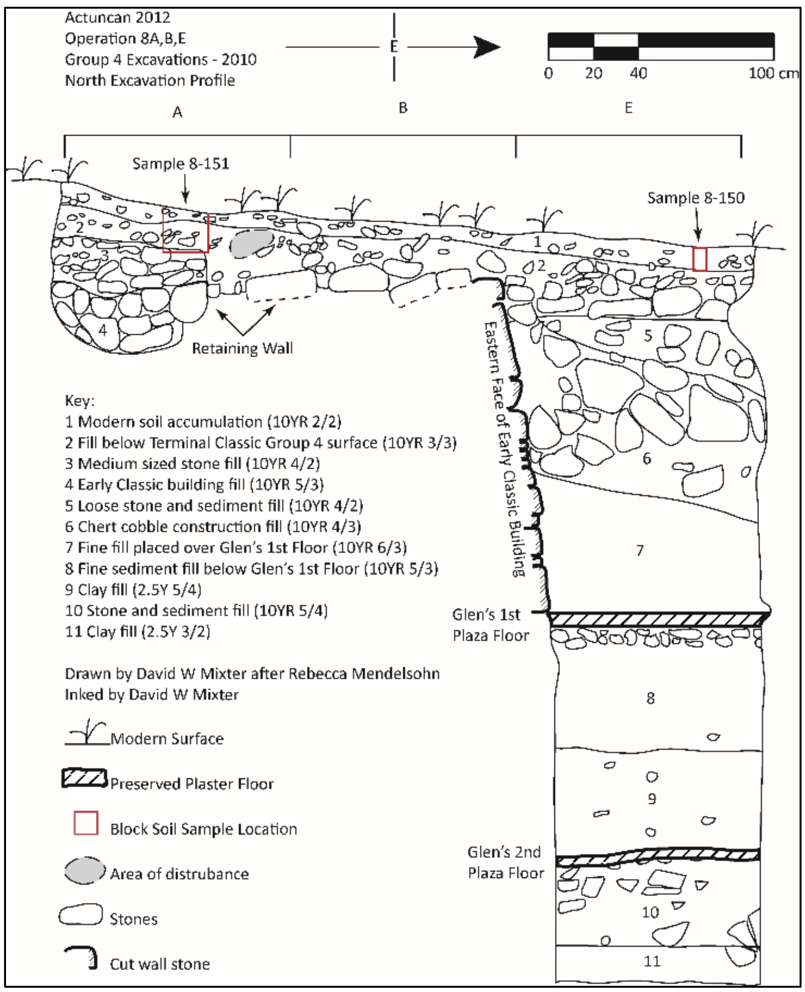

Figure 5.6. Redrawn north profile of Operation 8A, 8B, and 8E. Modified based on new observations from Mendelsohn and Keller 2011:Figure 3.

The second known construction phase is represented by a massive clay fill level topped by Glen's First Floor. The fill was constructed in two distinct layers. The lower layer is approximately 70 cm of thick yellowish gray (2.5Y 5/4) clay fill. This kind of clay fill is typical in Preclassic contexts at the site and results from mining the natural substrate of the alluvial ridge Actuncan sits on. The upper fill layer consists of 32 cm thick layer of looser dark gray clay fill. At the top of this layer, a 4 cm thick plaster floor was laid over a medium sized stone ballast. This plaster was well preserved, retaining in some areas remnants of its original polish. Ceramics from the clay fill below Glen's First Floor include a small quantity of Terminal Preclassic period diagnostics, which place the construction of the floor during this time period.

Because of small size of the excavation—Glen's First Floor was only exposed in a 1 m by 2 m area—it is impossible to confidently know whether this floor was an early version of Plaza D or part of a platform. However, the elevation of Glen's First Floor is approximately 30 cm below the modern surface of Plaza D, perhaps indicating that it was an earlier version of the plaza surface.

In total, the construction of Glen's First Floor raised the surface here by over 1 m. This kind of massive filling event is reminiscent of similar filling events seen under Structure 21A, Structure 41, and Structure 61 that appear to date to the end of the Late Preclassic or beginning of the Terminal Preclassic period (Mixter 2012; Mixter and Freiwald 2013; Rothenberg 2012). In Chapter 2, I argued that these filling events marked the transformation of Actuncan from a village to a formal urban center.

In Units 8E and 8F, the eastern face of an early platform (Structure 34-sub-1) was encountered (Figure 5.7)(Mendelsohn and Keller 2011:39). Structure 34-sub-1 was constructed on Glen's First Floor in a typical Early Classic period style (von Falkenhausen 1985:130-132). In total, the platform is preserved to approximately 1.3 m above the level of Glen's First Floor, and nine course of stone remained of the platform face. The platform face was constructed in a manner quite typical of the Early Classic period at Actuncan. The large rectangular stones are somewhat irregular and are augmented by small chinking stones used to fill small gaps created by stacking the imprecisely cut stones. The wall is also slightly battered—meaning that it slants slightly in from bottom to top. Very little stucco was preserved on the surface of the wall, but there are some traces of red paint on the small patches of remaining stucco.

Figure 5.7. Photograph of Structure 34-sub-1's eastern platform face.

The original surface of Structure 34-sub-1 does not remain intact. Rather, the platform must have been dismantled in antiquity. The top of the platform face terminates suddenly and the upper stones form a jagged edge. To the west of the platform face, no evidence of the original platform surface remains. Instead, excavations extending 2 m west of the platform face encountered Structure 34-sub-1's core fill (Figure 5.8). These excavations also provided evidence of the interior engineering of the platform. Following standard Maya construction, the platform face was an attractive façade. The bulk of the large boulder fill was contained by two lines of stone that form a rough retaining wall. The absence of any evidence of Structure 34-sub-1's original surface and the uneven nature of the platform wall's top indicate that this platform was intentionally dismantled in antiquity, likely during the construction of the Group 4 Patio. Ceramics recovered from the fill of Structure 34-sub-1 place its construction in the Terminal Preclassic or Early Classic period.

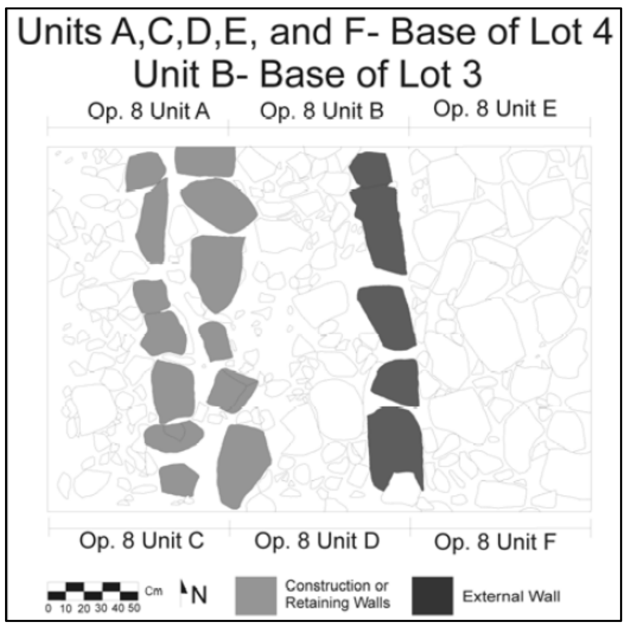

Figure 5.8. Structure 34-sub-1, as seen from above during excavation (Mendelsohn and Keller 2011:Figure 7).

Several distinct strata were identified in the fill used to cover Structure 34-sub-1 (Figure 5.6). I argue that the evidence presented here points to two distinct depositional events. One resulted from a destructive event that took place in the Early Classic period, while the other represents the Terminal Classic period construction of Group 4. Directly above Glen's First

Floor and against the face of Structure 34-sub-1, excavations encountered a 60 cm thick layer of gray clay loam sediment (10YR 7/2) that was substantially lighter in color than found above or typically found in architectural fill contexts at Actuncan. This color may have resulted from the inclusion of ash in the sediment. This fill contained a substantial amount of carbonized organic material. While most of the carbon consisted of small flecks mixed into the sediment, six samples were collected for possible radiocarbon dating. Additionally, many of the ceramic sherds recovered from this deposit were heavily fragmented and burned. The deposit also contained a large quantity of red painted plaster fragments. In total 228 such fragments were recovered from the deposit. Given that plaster fragments are typically not collected unless found in particularly large quantities or exhibiting particular artistic properties, this is a very large number. Mendelsohn (2010) indicates that the plaster fragments were most densely collected right above Glen's First Floor, but were mixed throughout the strata. Given that the plaster fragments were largely not burned, I doubt that the fire took place in the space defined by the excavation unit. However, evidence of burning on Glen's First Floor and the identification of burned sediment in the northern portion of our excavations indicate that the burning may have taken place just outside the area of excavation.

I hypothesize that these sediments are the redeposited remains of a destructive event that impacted Structure 34-sub-1. At least three lines of evidence point to the destructive and ritual significance of this event. First, the presence of red-painted plaster in the ashy deposit points to the stripping of the platform face of its original finish. These plaster flecks likely came from Structure 34-sub-1's platform face, which retained little of its original plaster finish. Second, the mixture of burned and unburned materials in the sediments suggest that these materials were redeposited from a location of primary burning. Given the evidence for burning on the surface of

Glen's Plaster Floor, this burning may have taken place just to the north of our excavations against Structure 34-sub-1's platform face. A radiocarbon date from wood charcoal located in the deposit dates this burning to cal A.D. 416–540 (D-AMS-8162; 1584 ± 24 B.P.; Calibrated at 2σ with the program OxCal 4.2 [Bronk Ramsey 2009])[6]. This date places the deposit within the later part of the Early Classic period, which matches the stylistic dates of the associated ceramics. Third, the corner of a greenstone celt was recovered from the surface of this burned deposit (Figure 5.9). The inclusion of this kind of special object indicates that this deposit is the remains of a ritually significant event.

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[6] The date of this burning deposit fits oddly into the history of Actuncan as a site. Traditionally, AAP has viewed this time period as a hiatus in activity within the site core. The presence of Early Classic and Late Classic 1 ceramics across the site—especially in domiciles—indicate that the site was not abandoned, but we have found limited evidence for construction in civic architecture at the site during this time. The only other radiocarbon dates from this time period were recovered from Structure 41 from a context that I have previously argued was a low terrace off the southern edge of the structure (Mixter 2012). However, in light of the findings along the face of Structure 34-sub, I think this could also be the remains of a destructive event. The large boulders at the face of this "terrace" were not properly stacked and no evidence of a plaster surface was recovered. Additionally, massive burning on the summit of the structure indicate that the masonry building located there during the Terminal Preclassic was dismantled and burned at some point in time (Mixter et al. 2014). This large haphazard pile of stones may have resulted from this destruction rather than a moment of architectural renewal. This kind of destruction better fits the historical context.

Following this burned deposit, Structure 34-sub-1 was likely left for several centuries until fill was placed over the ash during the construction of Group 4's basal platform. This fill was composed of loosely-layered stones. These stones appear to have been fairly intentionally placed in discrete layers rather than thrown haphazardly into a construction bin. Importantly, many of the large fill stones are cut limestone blocks typically used for structure façades, not fill material. This may indicate that Group 4 was constructed using blocks scavenged from the top of Structure 34-sub-1 and the façades of other nearby structures that had fallen out of use. For instance, AAP excavations of both Structure 19, 23, 26, and 29 indicate that many cut stones were missing from the final versions of these buildings' staircases (Donohue 2014; Heindel 2016; Jamison 2013; Nordine 2014). Importantly, ceramics recovered from this deposit date the fill to the Terminal Classic period. This data indicates that Group 4 was built during the Terminal Classic period as the Actuncan community was reorganizing.

Figure 5.9. Photograph of the greenstone celt fragment found in burned deposit against Structure 34-sub-1.

The surface of Group 4's patio was constructed over this cut stone fill and the remains of Structure 34-sub-1 (Figure 5.6). Because the patio surface sloped, fill was placed on top of Structure 34-sub-1 to create the proper level. Then, increasingly small stones were used as fill until a layer of fine gravel was placed on top. In most locations across the surface of Group 4's patio, this fine gravel was our best indication of the patio's ancient surface. In 2013, excavations in Units 8BBB, 8CCC, 8DDD, and 8EEE revealed preserved patches of the thin plaster floor that originally covered the gravel ballast across the surface of Group 4's patio.

In summary, excavations into the Group 4 patio revealed four distinct occupations. The earliest occupation is poorly understood and consists of small quantities of Middle Preclassic artifacts in a clay matrix. The second occupation is marked by the construction of Glen's Second Floor in the Late Preclassic period. Third, Glen's First Floor and Structure 34-sub-1 were constructed during Actuncan's Terminal Preclassic and Early Classic apogee. Finally, Group 4 was built during the Terminal Classic period.

Descriptions of individual analytical units from Operation 8 can be found in Appendix H.1. See H.1 for a Harris Matrix detailing the relationship of analytical units. See Table H.1 for a full list of excavated lots in Operation 36.

5.4.2 Excavations on Structure 35 (Operation 36)

Excavations in Operation 36 focused on the broad horizontal exposure of Structure 35 (Figure 5.10). In total 67 excavation units were opened across a 14 by 6 m space. In the majority of these excavation units, only two levels were identified: AU1, the layer of modern soil development, and AU2, the underlying layer of structural collapse. Only one major construction phase of Structure 35 was identified in our investigations, though evidence suggests that minor modifications were made to the structure's layout over time. The only penetrating excavations, located within the Group 4 patio just east of Structure 35, defined two further analytical units and provided some confusion regarding the original construction of Structure 35. These will be

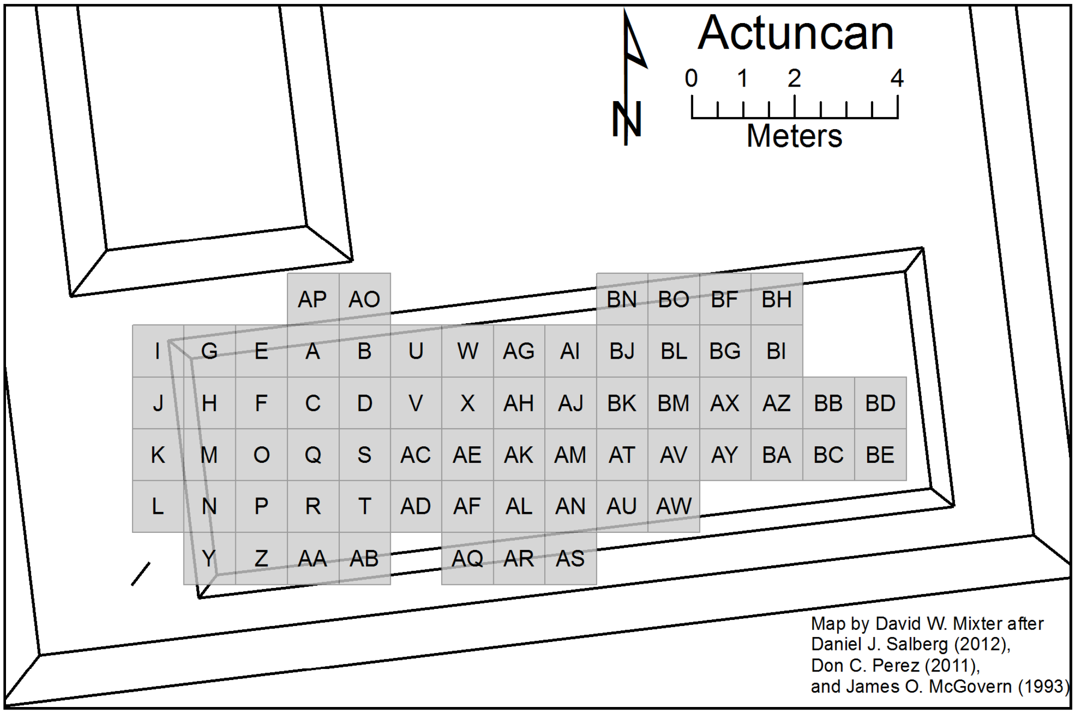

Figure 5.10: Map of units in Operation 36.

discussed in more detail below.

Structure 35 is partial masonry superstructure constructed on a low building platform raised 20 to 25 cm above the level of Radish Floor, Group 4's terminal patio surface. Radish Floor is the same as the terminal patio floor defined in Operation 40. Although we did not encounter preserved plaster in this operation, the level of this floor was identifiable by a layer of small limestone flecks, likely the ballast of a thin plaster floor, on which collapsed stones rested. Only the northern face of the building platform, Apricot Wall, was clearly defined in our excavations. To date, we have uncovered a 12 m long section of Apricot Wall that stretches from Unit BH in the east to Unit G in the north and forms the front façade of the platform (Figure 5.11). Apricot Wall was constructed using small to medium sized cut-limestone blocks pieced together with small chinking stones wedged in the gaps. The majority of Structure 35's walls

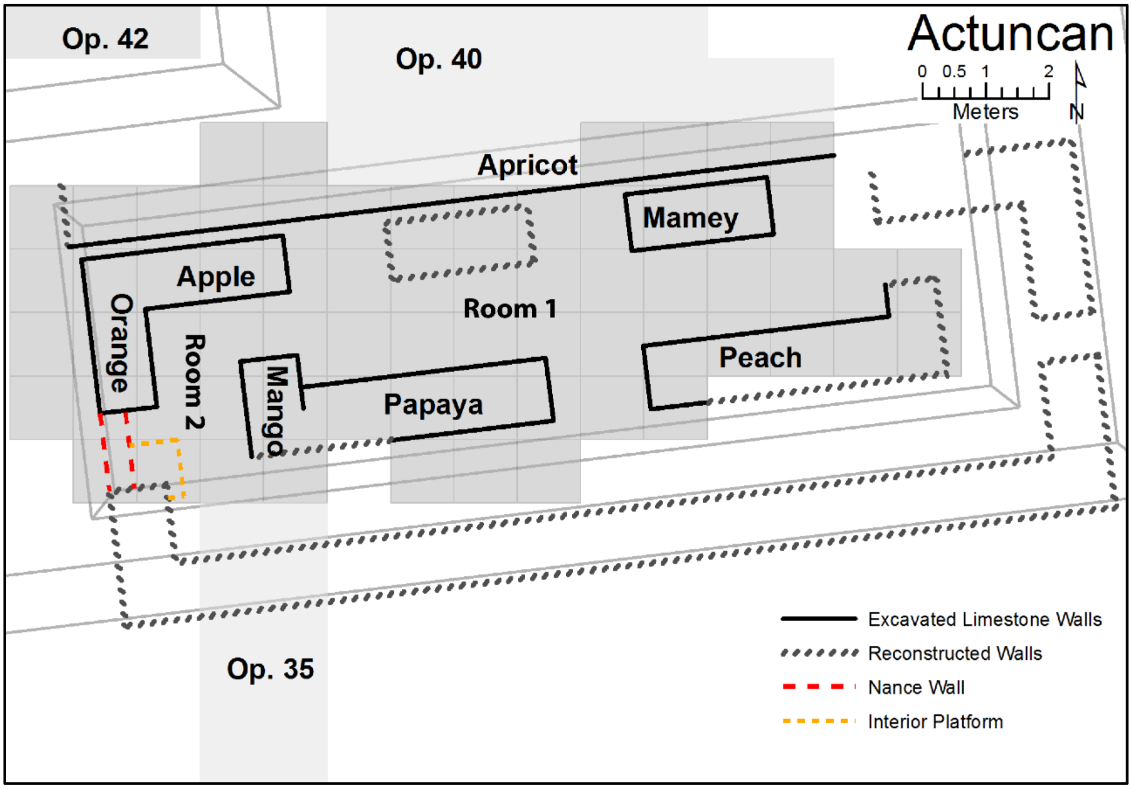

Figure 5.11: Map showing the location of the excavated and reconstructed walls found in Operation 36. Labels are beside the walls and platform faces that they name.

were constructed using unevenly sized stones. This construction method indicates that this wall, like much of Structure 35, was likely constructed using reclaimed cut stones from elsewhere within in the site. This wall currently appears to extend west beyond the limits of our excavation, although it may turn north at some point to form a continuous building platform that also passes under Structure 34a. Our difficulty understanding the western edge of Apricot Wall may be because this area was disturbed by a 2 by 2 m test excavation (Operation 8, Units JJ-MM) placed in this location during the 2010 field season (Mendelsohn and Keller 2011:36).

Atop the building platform, our excavations encountered the remains of a partial masonry superstructure. The building appears to have been constructed of perishable materials anchored

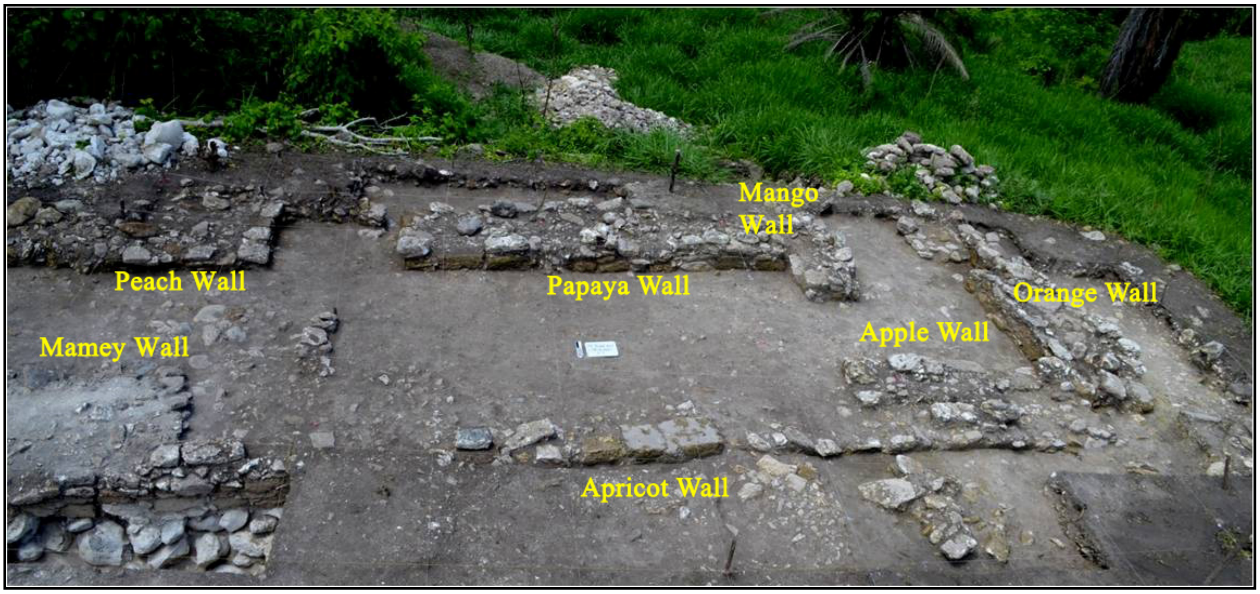

Figure 5.12: Photograph showing the excavated portion of Structure 35. Note the labeled walls described in the text and show as wall blocks in Figure 5.11.

into low masonry walls, preserved up to 40 cm in height, based on remains found in our excavations (Figure 5.12). Given the large quantity of collapse, including many cut stones, we believe these walls may originally have been up to twice as tall as they are currently preserved. Like Apricot Wall, described above, Structure 35's superstructural foundations were constructed of small cut-limestone blocks of a variety of sizes, shapes, and quality, suggesting that stones had been reclaimed from older structures within the site core. Occasionally, flat-faced chert river cobbles were incorporated into the walls. As such, the construction method of each wall will not be described in turn unless it deviates from the general pattern.

Within the boundaries of our excavations, I defined the northern and western boundaries of Structure 35's superstructure and a single long transverse room running east to west. Additionally, a portion of a perpendicular room was identified at the building's west end. As discussed below, I believe this single room only represents a portion of Structure 35's original floor plan. I will begin here by describing what we know about the floor plan, then will continue with a brief commentary on what a possible reconstruction of the full floor plan might have looked like. Please reference Figure 5.11 to see the location of reconstructed architecture.

The northern wall of the building was a series of rectangular stone piers that then supported some kind of perishable superstructure. Two of these piers were well defined during our excavations, although the remains of one additional pier may have been found and a fourth likely existed on the structure's northeastern corner outside our excavations. Based on the size of these piers, we estimate the front wall to have been about 90 cm thick. In fact, throughout Structure 35, the walls appear to have followed this standardized thickness. The space between these piers forms a series of doorways that would have been used to access the interior space.

The northeast corner of the structure is anchored by an L-shaped wall composed of the Apple and Orange Walls, two contemporaneous abutting walls. Apple Wall, the northern component of this corner, is just over 3 m long from the exterior corner to the doorjamb. Apple Wall is the western-most pier of Structure 35's northern wall. The second known pier, Mamey Wall, begins just under 6 m east of Apple Wall. Mamey Wall is a rectangular pier measuring approximately 2 m long by 90 cm wide and would have separated doors located to its east and west. The northern face of each wall is set back only a few centimeters from Apricot Wall, the platform face, leaving no room to stand. Thus, any individual rising to the building platform would have to enter Structure 35.

The gap between Apple and Mamey Walls may have formed a single wide door or might have been separated by a third 2 m wide pier creating two separate doors. We encountered evidence that might support either interpretation. First, excavations through the collapse layer in Units U and AG, where the third pier would have been located, encountered a higher density of misplaced cut stones than seen elsewhere across Structure 35. These stones might derive from a pier that was entirely destroyed. The presence of this third pier would have created a symmetrical northern façade for Structure 35, with three 2 m wide doors. An alternative interpretation is based on several particularly large flat limestone slabs set into the top of Apricot Wall in Units U and W (Figure 5.13). These slabs may be a threshold associated with a single large primary door. In this case, the primary door to the structure would have been placed off center in comparison to the interior door encountered in our findings along the south edge of Structure 35.

Figure 5.13: Photograph showing two large flat stones set into the top of Apricot Wall.

Orange and Apple Wall were constructed in one episode as an L-shaped wall. Orange Wall defines the exterior of Room 2, the perpendicular room located on the eastern end of Structure 35. This wall extends at least 2.5 m south from the exterior northwest corner to a door jamb at its southern end. Based on the presence of south facing cut-limestone blocks, it appears likely that a west facing door jamb once existed south of Orange Wall. In the southern edge of Unit Z, we uncovered the northern end of a line of cut stones that may be the continuation of Structure 35's foundation wall farther to the south. However, at some point, this door jamb was filled by the construction of Nance Wall, a 55 cm thick wall constructed partially of cut-limestone blocks and partially of chert river cobbles. This wall continues south flush with the western (exterior) face of Orange Wall, creating a small alcove along the wall's interior. In Units Z and Y, this alcove was filled to make a small new platform with a 50 cm wide pavement of river cobbles raised approximately 15 cm above the level of Structure 35's substructure floor. Although the function of this platform is currently unknown, it may have been a raised niche for storage or small altar.

Along with Orange Wall on the west and Apple Wall on the north, Mango Wall forms the eastern side of Room 2, was a 1.9 m wide room. Mango Wall was positioned to create a 1.2 m doorway allowing access between Rooms 1 and 2. Our excavations uncovered a 1.5-meter length of Mango Wall; however, it is not clear if the wall continued further south because the southern half of Room 2 was heavily impacted by building's slow collapse off the southern edge of Group 4's substructure (see the description of Operation 35 below).

Room 1 was bounded on its southern edge by Papaya and Peach Walls, which are separated by a 1.1 m wide door way. It is important to note that a 2 m long segment of the northern face of Papaya Wall was previously described as Purple Wall during the 2010 test excavations (Mendelsohn and Keller 2011:36-37). The western jamb of Peach Wall aligns roughly with the jamb of Mamey Wall, and these doorways would likely have formed a central hallway that allowed unimpeded passage through the building. Additionally, the placement of these walls makes Room 1 a long narrow gallery measuring 1.8 m wide. Of course, if the structure had a large northern entrance, this would make the interior space substantially larger. Papaya Wall terminates at Mango Wall to the west, and Peach Wall appears to terminate at a low wall that protrudes north in Units BB and BC. Unfortunately, the eastern edge of Structure 35 is poorly preserved, and only a few stones of this protruding wall were found *in situ*. Together, these walls would have made Room 1 a 9.5 m long gallery.

This reconstruction reflects what we know about the construction of Structure 35. However, it is likely that Structure 35 was composed of at least two more rooms. Unfortunately, we were unable to concretely identify the southern (back) wall of Structure 35 because a 3 m wide section of Group 4's platform appears to have collapsed off the southern edge, as described in the section on Operation 35 below. Additionally, the eastern edge of the structure is heavily disturbed. That said, the central door between Papaya and Peach Walls and the fact that the southern end of Room 2 was never found suggests to us that another existed off this side. Based on our findings in Operation 35, there appears to be sufficient room on the platform to accommodate another room. Additionally, based on the symmetrical principles typical of ancient Maya architecture, we infer another perpendicular room on the building's east end. Therefore, we reconstruct Structure 35 as featuring tandem and transverse rooms with perpendicular rooms on its ends[7]. Figure 5.11 shows the hypothetical room as a dotted line. I will address the significance of this tandem/transverse building in more detail below.

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[7] The terms "tandem" and "transverse" were defined by Harrison (1971:94-104) to describe the organization of rooms within ancient Maya buildings. "Tandem rooms are those rooms parallel to each other, and extending along the longitudinal axis of the building. Transverse rooms are those at right angles to the longitudinal axis of the building" Harrison (1971:94). A simple tandem transverse building, like Structure 35, has two primary tandem rooms with transverse rooms at each end that span the width of the two tandem rooms. See the reconstruction in Figure 5.11.

In addition to our horizontal exposure of Structure 35's plan, vertical excavations in Units BN and BO investigated the relationship between Apricot Wall and Radish Floor, Structure 35's building platform face and the terminal patio surface of Group 4. I observed that Apricot Wall appeared to continue deeper than Radish Floor and excavations were initiated to investigate this observation. Excavations followed the face of Apricot Wall down below Radish Floor through 20 cm of wet-laid fill composed of fine sediment with few stone inclusions, at the base of which we encountered a possible floor on top of dry-laid fill. The possible floor aligned with the original base of Apricot Wall, but was only present in the eastern portion of these two excavation units. Evidence of bioturbation in the form of loose sediment and carbon were encountered in the western part of our excavations, possibly indicating that the floor was destroyed by natural disturbance. Regardless, the additional depth of Apricot Wall makes it clear that the building platform of Structure 35 was once much higher and that the level of the Group 4 patio was raised at some period of time. Therefore, its construction has greater time depth than originally thought.

Excavations then continued into the dry-laid fill below the possible buried floor. Apricot Wall did not continue below. Our excavations continued approximately 40 cm into this fill before excavations were terminated in order to refocus efforts on our horizontal investigations. Ceramics date this subplatform fill broadly to the Late Classic period.

The individual analytical units from Operation 36 are described in Appendix H.2. See Figure H.2 for a Harris Matrix detailing the relationship of analytical units. See Table H.2 for a full list of excavated lots in Operation 36.

5.4.3 Excavations on Structure 34a (Operation 42)

Using a similar strategy to excavations in Operation 36, excavations in Operation 42

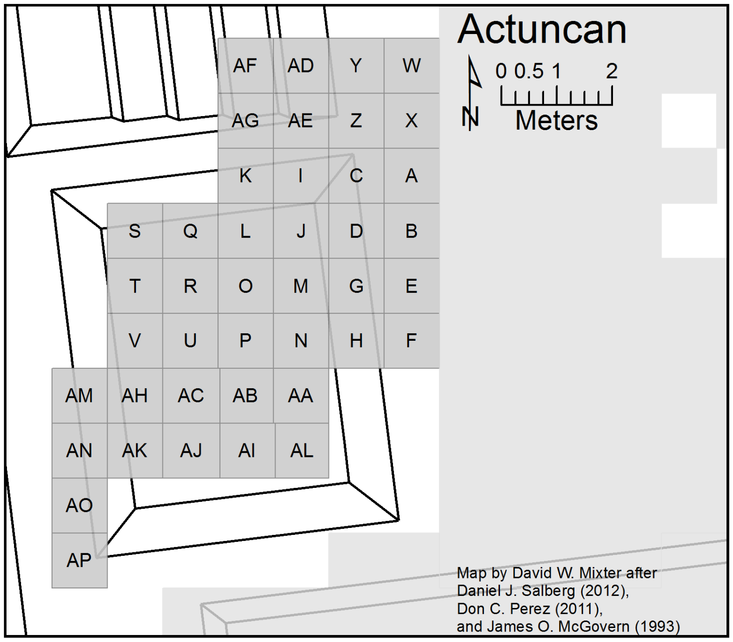

Figure 5.14: Map showing the layout of excavation units in Operation 42.

explored the portion of Structure 34 to the south of test excavations undertaken in 2010 (Figure 5.14). Based on our findings, we divided Structure 34 into three separate structures, Structures 34a, 34b, and 34c. Our research primarily focused on Structure 34a, the southernmost structure along the western side of Group 4, and its connection to Structure 34b, located just to the north. All excavations were executed in 1 by 1 m grid units located within a space measuring 10 m north-south by 7 m east-west. In total, 42 excavation units were opened within this space. Excavations were divided into six analytical units, representing distinct deposits. The majority of the lots in Operation 42 fall into AU1 and AU2, the modern soil development and collapse respectively; however, limited vertical excavations into some units penetrated into different fill deposits.

Two distinct construction phases of Structure 34a were encountered in our investigations. The earlier construction phase, Structure 34a-2nd, appears to have been a narrow linear structure

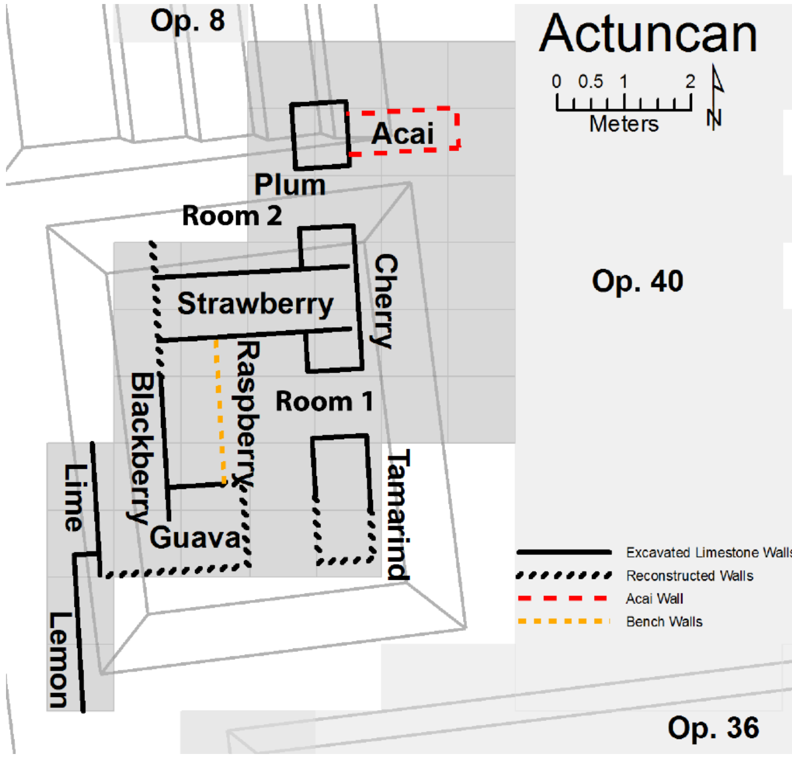

Figure 5.15: Map showing the location of excavated and reconstructed walls of Structure 34a-2nd.

divided into at least 2 small interior rooms. Later, the northern portion of this structure was covered to create a low platform adjoining Structure 34b. In this phase, only the structure's southern room remained open. Here, I will first describe what we know of Structure 34a-2nd, then I will describe the renovations to this structure that led to the construction of Structure 34a-1st.

Structure 34a-2nd is a narrow building containing a number of small rooms running north-south (Figure 5.15). The structure was constructed on a low building platform that was poorly defined in our excavations and may have been partially destroyed by the later renovations aimed at constructing Structure 34a-1st. Excavations in 2014 defined the southern portion of Structure 34a-2nd as consisting of low masonry foundation walls that supported a perishable superstructure. At least 2 rooms aligned in a range have been defined to date, although more may have existed because the northern boundary of the structure was not clearly defined. Rooms 1 and 2, numbered from south to north, were separated by Strawberry Wall, a 1.1 m wide double-faced wall that runs at least 3 m in length from east to west. Generally, the walls forming the architecture of Structure 34a-1st are constructed of nicely cut-limestone blocks, often of different sizes. In contrast, Strawberry Wall was constructed of larger and longer rectangular blocks that are regular in size, and the wall was preserved up to 50 cm in height. The eastern end of this wall also formed part of the superstructure's eastern façade. Short wall segments, 50 cm long and 70 cm wide, extended north and south from the eastern end of Strawberry Wall, which created restricted doorjambs for the entrances to Rooms 1 and 2. These extensions are known in combination as Cherry Wall, and, collectively with Strawberry Wall, they form a 1.9 m long foundation for the eastern face of the structure.

Room 1 is small, providing only 2.2 by 2.2 m of interior space (Figure 5.16). The room's western side is formed by Blackberry Wall, an east facing wall encountered running north-south. Although only the eastern face of Blackberry Wall was uncovered, Lime Wall, which we encountered running along the western edge of the structure, may well have formed the opposite (western) face of Blackberry Wall. The exposed portion of Lime Wall runs approximately 2 m and corners in parallel with Blackberry Wall. Similar to Strawberry Wall, Blackberry Wall's southern end appears to be attached to a wall segment that extends east, possibly forming a door jamb facing to a small open space in the corner of Group 4 between Structures 34a and 35. The northern facing portion of the wall jamb was labeled Guava Wall and was very badly damaged prior to our excavations. Lime Wall appears as though it may have turned in the western edge of Unit AN to form the southern edge of this doorjamb. Unfortunately, this end of Structure 34a is badly damaged, and I had difficulty finding clearly constructed wall lines during our

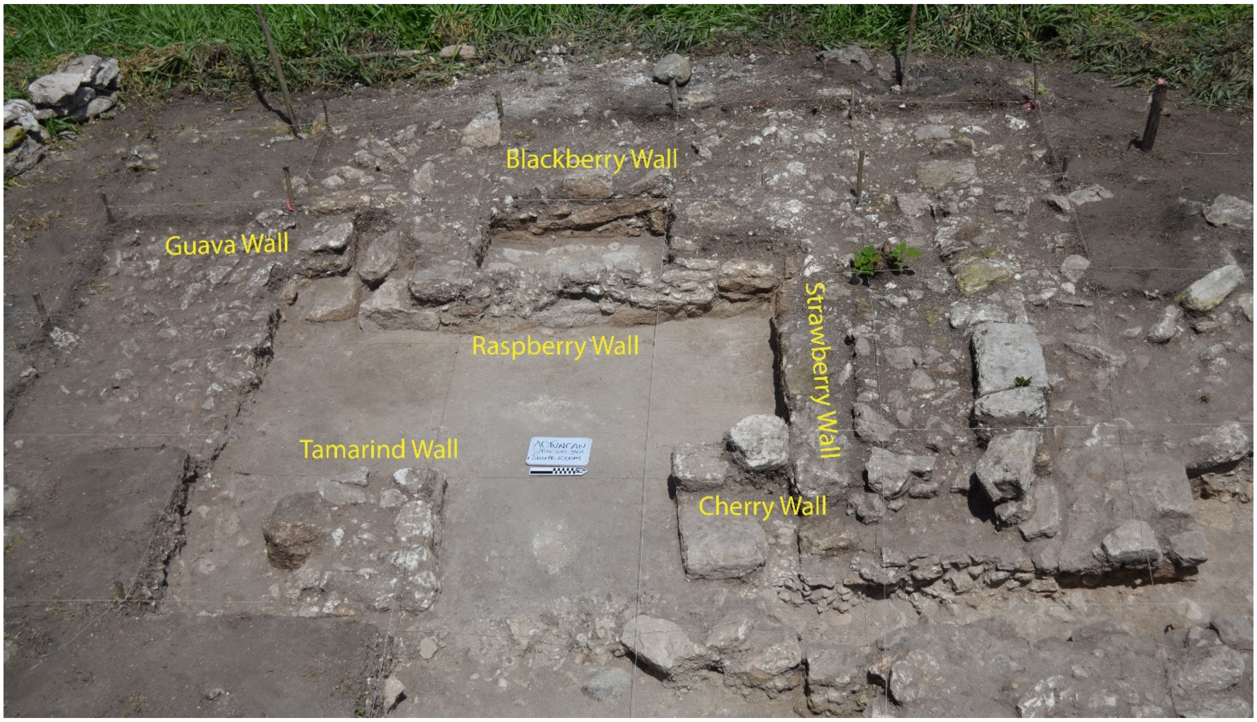

Figure 5.16: Photograph showing the layout of Room 1 of Structure 34a-2nd.

excavations. The damage likely reflects the fact that Room 1 was never filled by a later construction phase as was Room 2 (see below). My reconstruction in Figure 5.15 reflects this uncertainty with dashed lines.

Both entrances to Room 1, on the east and south, were anchored by Tamarind Wall, a stone pier that formed the base for the structure's southeast corner. This pier formed the base of a columnar support for Structure 34-1st's southeast corner. The northern side of the pier was clearly defined in our excavations. This 80 cm wide pier is positioned opposite Cherry Wall to create a 1 m wide entrance to Room 1 from the east. Like Guava Wall, the southern end of Tamarind Wall is not clearly preserved. I suspect that Tamarind Wall originally extended further south to be even with the possible end of Lime Wall, either forming a door to the south or a solid southern wall based on ancient Maya rules of architectural symmetry. The general lack of cut facing stones encountered in Units AI and AL leads me to support the door hypothesis more strongly.

Our excavations in Room 1 terminated at Potato Floor, a plaster floor preserved well across much of the room. Additionally, the floor plaster from Room 1 lipped up onto Strawberry Wall, indicating that the vertical faces of the low wall stubs that we encountered were once plastered. At some time following the initial construction of Structure 34a-2nd, a bench was constructed in the western half of the room extending 90 cm out from Blackberry Wall and located between Guava and Strawberry Walls. This bench may have been approximately 35 cm high based on the preserved height of Raspberry Wall, which forms its eastern face. None of the bench's plaster surface was preserved in our excavations. In total, the bench measured 90 cm by 2.1 m. It is important to note that we do not know whether this bench was a later addition or was simply constructed last during the original construction of Structure 34a.

In contrast to Room 1, Room 2 was not fully excavated, although it seems to parallel the construction of Room 1 (Figure 5.17). Only the southeastern portion of the room was uncovered. Room 2's entrance is formed by the northern portion of Cherry Wall, which extends out from Strawberry Wall and Plum Wall, an approximately 80 by 80 cm masonry pier located approximately 85 cm north of Cherry Wall. Like Room 1, excavations in Room 2 terminated at Potato Floor, which appears to have wrapped around the eastern exterior of Structure 34a to form a continuous plaster floor. Excavations only uncovered the east face of Plum Wall. The other faces were reconstructed based on exposure of the top course of wall stones in Units AE and AG. Excavations in Unit AD to the north of Plum Wall uncovered a continuation of Potato Floor, possibly indicating that the original plan of Structure 34a stretched farther north wrapping around this column. This plan might indicate that undiscovered rooms lay farther north. Our

Figure 5.17: Photograph showing the layout of Room 2 of Structure 34a-2nd. Note metate left on the floor as a dedication offering during the construction of Str. 34a-1st.

excavations did not uncover the western wall of Room 2 or determine whether this room contained a bench similar to that in Room 1.

Although our excavations made it clear that Structure 34a was constructed on a raised building platform, the construction of the platform is poorly understood. The presence of the platform is evident in the difference in elevation between the terminal patio surface (Radish Floor) and Potato Floor. Radish Floor was preserved in places and is at least 15 cm below Potato Floor. However, the only place we were able to locate a platform face was just east of Cherry Wall between the entrances to Rooms 1 and 2. Here, a single course of stones (likely the upper-most course) appeared to be preserved. This single line of stones (Kiwi Wall) rests on top of a jumbled stack of cut-limestone blocks that may be the remains of a disturbed wall or simply fill. Problematically, the top of Kiwi Wall is nearly 10 cm above the level of Potato Wall, possibly making this wall part of the later 34a-1st. Additionally, it is possible that this early platform wall was disturbed during the construction of Structure 34a-1st.

In contrast, the western edge of the building platform is well defined by Lime and Lemon Wall. As discussed previously, Lime Wall doubles as the outer face of the double-faced wall that forms the western wall of the Structure 34a-2nd superstructure and the western face of its building platform. This wall is preserved to a height of 50 cm and is composed of a maximum of 5 courses of stone. Like most walls constructed as part of Structure 34a-2nd, this wall was not constructed using even courses, but rather is a mix of cut stones of different sizes and shapes. At the base of Lime Wall we encountered a preserved plaster floor, Rutabaga Floor, which appears to be part of a narrow space between Lime Wall and the western edge of the Group 4 platform. The elevation of Rutabaga Floor is approximately 20 cm below Potato Floor, indicating that Lime Wall functions as both the west wall of Structure 34a-2nd and the face of the building platform.

As noted above, Lime Wall appears to corner in Unit AN to head east. Here, the platform edge continues south as Lemon Wall. Lemon Wall is actually set approximately 35 cm west of Lime Wall (Figure 5.15). In contrast to Lime Wall, Lemon Wall appears to only be a platform face. However, based on our current findings, it is not clear which platform Lemon Wall was associated with.

Structure 34a-1st. Our excavations revealed that sometime after the initial construction of Structure 34a-2nd, the northern portion of the building was renovated substantially. Room 2 and any northern continuation of the structure was filled in and converted into a narrow platform with no masonry superstructural elements. The southern portion of the structure, Room 1 in particular, was left open as part of Structure 34a-1st. The heavy impact of bioturbation, particularly recent cow trampling, on the terminal architecture of Structure 34a made following the alignments of stone and determining the form of the structure very difficult. Here, I present my best possible reconstruction of our findings.

The platform appears to have been constructed in two distinct parts, a wide staircase to the south and an open platform to the west and north. Understanding this staircase was very difficult because of the quantity of collapse and the broken nature of the stairs. That said, we were able to identify stairs fronted by Kumquat Wall, Starfruit Wall, and Kiwi Wall, from east to west (Figure 5.18). Each stair is approximately 15 cm tall and 50 cm wide and the staircase contains three identified steps. One more step may have existed to reach to the level of the platform. The stairs rise approximately 60 cm from Radish Floor to the east up to the top of a platform created by filling in Room 2. The platform extends south to Strawberry Wall and north to the edge of our excavations. The staircase, on the other hand, is 2.6 m long and begins at the edge of Strawberry Wall and extends north until it terminates at Acai Wall, a double faced balustrade constructed out of stacked chert cobbles (Figure 5.15). Acai Wall is 60 cm wide and preserved to a length of 1.6 m. The western end of the wall was constructed against the eastern face of the earlier Plum Wall.

North of Acai Wall, the construction of Structure 34-1st is not totally clear. The primary platform constructed over the filled-in rooms continues north; however, a large mass of collapsed stones was encountered in the space further east, directly north of Acai Wall. It may be that Acai Wall formed the southern end of an outset platform. Alternatively, these stones could simply be collapse.

Figure 5.18: Photograph showing the three partially preserved stairs to the summit of Structure 34a-1st. From bottom to top, the stairs are faced by Kumquat, Starfruit, and Kiwi Walls.

During our excavations, we encountered a cache of artifacts left in place on the floor of Room 2 when the room was filled in during the construction of Structure 34a-1st. Several large pieces of ceramic, including upside-down jar rims and a large ground stone *metate* fragment appear to have been left as offerings during construction (Figure 5.17).

The individual analytical units of Operation 42 are described in Appendix H.3. See Figure H.3 for a Harris Matrix detailing the relationship of analytical units. See Table H.3 for a full list of excavated lots in Operation 42.

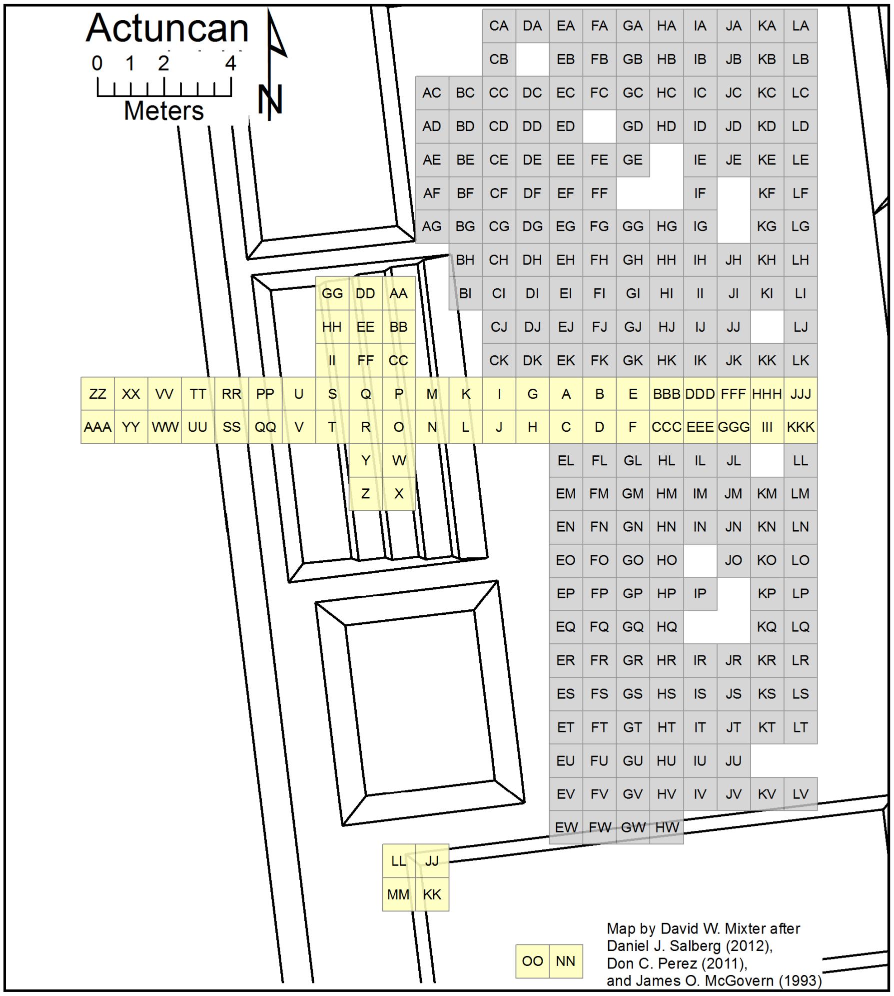

Figure 5.19: Map of units in Operations 8 and 40. Operation 8 is in yellow, while Operation 40 is in gray.

5.4.4 Excavations on Structure 34b (Operation 8, Units G-II and PP-AAA)

In 2010, excavations in Operation 8 extended west from the initial test excavation (Units 8A-8F, described above) across Structure 34b. These excavations were intended to define the architectural arrangement of Structure 34b and its intersection with both the Group 4 patio and Plaza C. Excavations in Operation 8, crossed the center of the structure and in total consisted of a 2 m by 17 m wide exposure with a 3 m by 3 m expansion attached to the north and a 2 m by 2m expansion to the south (Figure 5.19). These findings delineated a portion of Structure 34b's final construction phase (Mendelsohn and Keller 2011).

Structure 34b was very difficult to define because it was subject to heavy disturbance. Mendelsohn and Keller (2011:36) note that “the architecture in this area is poorly preserved, as many stones have been upturned and displaced through the action of roots, cohune palms, and fallen trees.” Additionally, excavations were generally shallow. Only in three units (8AA, 8DD, and 8GG) did excavations continue beyond clearing the modern soil. Fortunately, excavations in those three units cleared collapsed stones revealing the basic form of Structure 34b.

Figure 5.20. Structure 34b steps located in Units 8AA, 8DD, and 8GG. Horizontal lines approximate the level of each stair tread. Photograph faces west.

Structure 34b was found to be a low platform with a narrow summit area. Excavations that removed collapse material from the eastern side of the structure indicate that the building was fronted by a broad staircase that connects the Group 4 patio to the summit of Structure 34b

(Figure 5.20). Mendelsohn and Keller (2011:36) identified four wide and low steps "constructed from large cut stone slabs." These slabs were placed without mortar and did not exceed two courses of stone high. As with the other structures in Group 4, the slabs used to construct Structure 34b were not even in size or form, indicating that they were likely reused from the façades of past structures.

Based on our current, admittedly narrow window into Structure 34b's form, this structure appears to form part of at least two low platforms located along Group 4's western edge in its final form. Structure 34b has a very similar form to Structure 34a-1st. Indeed, the platforms that the two buildings access may be connected. They are not, however, the same building. The foot of Structure 34b's staircase is substantially further west than the foot of Structure 34a-1st's stair case indicating that the staircases do not align. Rather, in its latest for, Group 4 appears to have been an assembly of perishable structures located on low platforms.

Please see Appendix H.1 for a description of Operation 8's analytical units.

5.4.5 Excavations on Structure 33a and 34c (Operation 44)

Excavations in Operation 44 focused largely on the horizontal exposure of Structure 33a and followed the façade of the building platform north to its connection to Structure 34c (Figure 5.21). Similar to Operations 36 and 42, the aim of these investigations is to define the architectural layout of the structures in the northwest corner of Group 4. In contrast to the southwest corner of Group 4, which appears to be a small open space between Structures 35 and 34a, the northwest corner is significantly elevated and one of the highest points of Group 4. Structure 34c, which extends into the northwest corner, appears to be a narrow elevated platform that runs north-south along the western side of the Group 4 basal platform; however, excavations

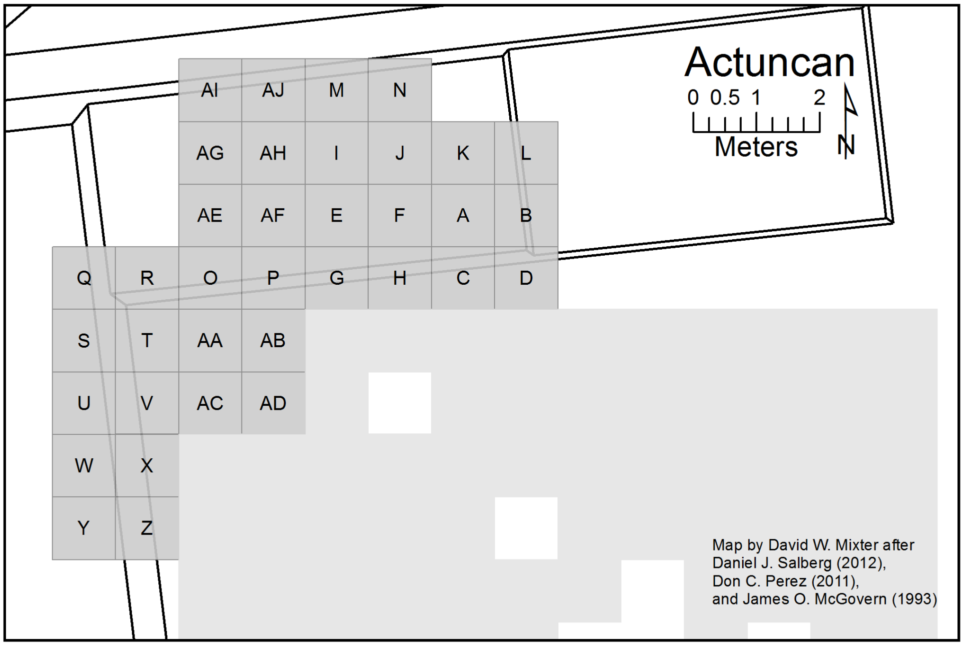

Figure 5.21: Map showing the layout of excavation units in Operation 44.

only revealed its northern platform face. Therefore, it is currently unknown if the modern mound hides multiple construction phases or the remains of a masonry superstructure, similar to Structure 34a.

To the north, Structure 34c connects to Structure 32, which connects in turn to Structure 31. Structures 33a and 33b run along the northern edge of the Group 4 basal platform. They form sequential platforms that step down in height from the northern edge of Structure 34c. The staggered height of these platforms parallel the down-sloping patio. Our excavations indicate that each of these structures was a relatively simple platform. Two distinct construction phases of

Structure 33a were identified. Structure 33a-2nd is a simple low platform, whereas the construction of Structure 33a-1st added an additional slightly elevated platform along the western edge of Structure 33a-2nd (Figure 5.22). Excavations did not focus on Structure 33b because this

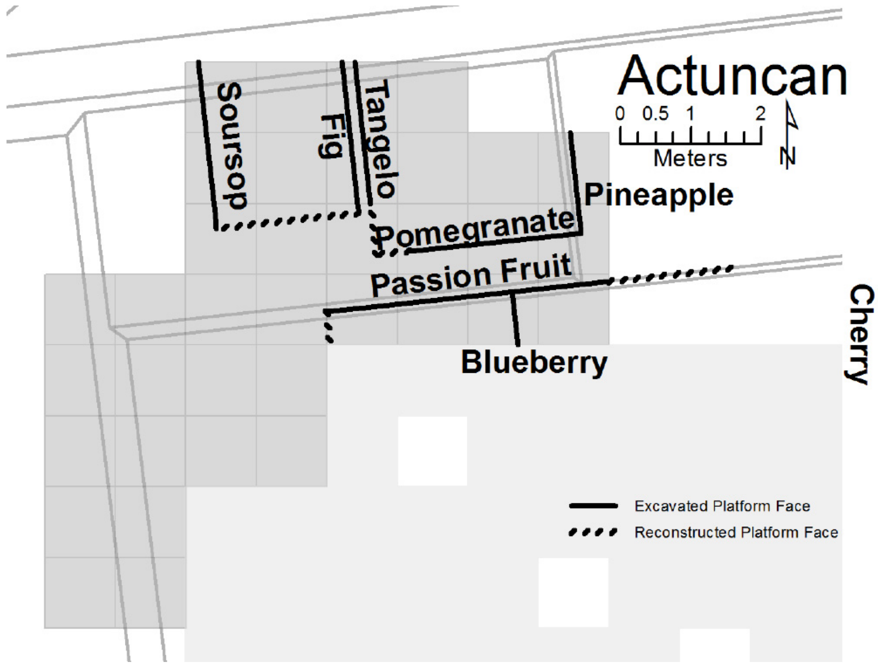

Figure 5.22: Map showing the reconstructed layout of the Structure 33a platform.

structure appears to have collapsed badly. The structure's large chert cobble fill was quite visible sticking through the modern surface. Here, we will begin by describing the results of our horizontal excavations. We will first describe Structure 33a's phases of construction from older to younger, then we will discuss our excavations along the eastern face of Structure 34c.

Structure 33a-2nd is a low, two-tiered platform, which likely once supported a perishable superstructure without a masonry foundation (Figure 5.23). The lower basal platform is fronted by the south-facing Passion Fruit Wall. This wall appears to rise approximately 20 cm above the terminal patio surface. The terminal patio surface of Group 4 rises slightly from east to west. Therefore, the eastern end of Passion Fruit Wall is higher than the western end. Passion Fruit Wall continues east beyond the limits of our excavations and appears to have formed the southern face of Structure 33b's basal platform, as well as that of Structure 33a. Additionally, in Unit C, we encountered a low step (Blueberry Wall) running perpendicular to Passion Fruit Wall

Figure 5.23: Photograph showing the exposure of Structure 33a. Note the double tiered platform created by Passion Fruit and Pomegranate Walls.

jutting into the Group 4 patio. Although only about 10 cm high, this low step might have contributed to the east to west rise in the patio's surface. Large stones found in Operation 40, Units EA and EB may indicate that that this low step continued further into the patio.

The southern face of Structure 33a's building platform is set back approximately 70 cm behind Passion Fruit Wall, which allowed room for a low front terrace above the building platform and above the patio. This platform face, known as Pomegranate Wall, is preserved to a height of approximately 15 cm in comparison to the top of Passion Fruit Wall. Although the southeast and southwest corners of the building platform were largely blown out, we were able to identify its east and west faces in our excavations. The eastern face of the platform, known as

Pineapple Wall, was relatively poorly defined, but appears to run north through Units B and L. A lower course of the southeast corner of the building platform appears to remain in place. In contrast, the entire southwest corner of the platform is blown out, but the remains of the west facing wall, known as Tangelo Wall, were encountered in Units I and M. In total, the building platform appears to have been approximately 3 m wide. We did not conclusively identify the northern edge of the building platform, but we do know that the platform was at least 2 m deep. Our excavations neared the northern edge of the modern mound, so it is unlikely that the platform was much larger than our current exposure.

The connection between Structures 33a and Structure 33b is likely located at the very eastern edge of Operation 44. As a result, the junction between these two structures is poorly defined in my excavations. Structure 33b was not excavated in detail because large fill stones protruding from the modern surface indicate the structure is badly collapsed. As noted above, Passion Fruit Wall, the lower basal platform façade, appears to stretch to the east to also serve as the southern platform face of Structure 33b. From Pineapple Wall, there was likely a step down to the lower elevation of Structure 33b, but we did not clear the face of Pineapple Wall, so the specifics of this junction are unknown.

Sometime after the construction of Structure 33a-2nd, a slightly raised platform was constructed to the east to create Structure 33a-1st. The eastern platform face of this elevated platform, known as Fig Wall, faces and covers Tangelo Wall creating a 10 cm high step up from one platform to the next. This elevated platform is 2.0 m wide, and Soursop Wall forms the platform's western face (Figure 5.24). Unfortunately, the western side of this wall was not cleared, so we do not know its height. Presumably, it descended to a narrow alleyway that

Figure 5.24: Photograph showing Tangelo and Fig Walls facing each other. Construction of the elevated platform faced by Fig Wall marks the transition of Structure 33a-2nd with Structure 33a-1st.

formed the boundary between Structure 33a and Structure 34c. Additionally, the southern wall of this elevated platform was collapsed and not well defined in our excavations.

Our excavations continued north to define the junction between Structures 33a and 34c. However, our findings difficult to interpret due to the limited nature of these excavations and the collapsed character of these structures. Following Passion Fruit Wall west, our excavations did not clearly define its end. It appeared to get smaller (lowering to the north as the patio level rose) and eventually ended as a defined wall at the line between Units G and P. Two possible interpretations exist. Either the terminal patio floor rose to the level of Structure 33a’s basal platform, or a few east facing stones in the south east corner of Unit P may indicate that the platform face cornered to the south, forming an additional step up in a similar manner to Blueberry Wall, discussed above. The latter possibility could not be confirmed because no evidence of a line of stones was uncovered in Operation 40 further to the south.

Excavations in Unit R uncovered a small patch of preserved plaster floor, indicating the elevation of the patio floor surface between Structures 33a and 34c. This plaster floor was covered by collapse stones from Structure 34c. More evidence of this plaster patio floor was found in Units T and V to the south. In Unit V, a large section of the floor appeared to be burned. It is possible that the eastern platform wall of Structure 34c was located right at the unit line between Units T, V, X and Units S, U, W. A broken alignment of cut-limestone blocks was identified on this line; however, further excavations are required to ensure these are not stones collapsed from a line located just a bit further to the west. No evidence of any corners of Structure 34c were recovered. Although it is clear that Structure 33c is a low linear platform, further excavation will be required to define its shape.

Overall, excavations in Operation 44 defined the two phases of Structure 33a's form, documenting the fact that Structure 33 is a composite of platforms that gradually stepped down from west and east. They also document the approximate location of Structure 34c's eastern face. Our data suggest that Structure 33a was a low building platform that would have supported a perishable superstructure.

The individual analytical units of Operation 44 are described in Appendix H.4. See Figure H.4 for a Harris Matrix detailing the relationship of analytical units. See H.4 for a full list of excavated lots in Operation 44.

5.4.6 Excavations into Group 4's Basal Platform

Operations 35 and 37 were initiated to investigate the outer edges of the Group 4 platform with two aims. The primary goal of these investigations was to determine if garbage was deposited off the back edges of Group 4. The Maya often provisionally discarded materials in a toss zone around the perimeter of structures before moving it to more permanent middens further away or incorporating it into new construction (Hayden and Cannon 1983; Robin 2002). The accumulation of discarded materials around public architecture became particularly pronounced during the Terminal Classic period, when removal of refuse from public spaces became less routine (Pendergast 1986; Stanton et al. 2008). Excavations adjacent to a similar Terminal Classic platform at the site of El Perú-Waka' encountered dense midden deposits including a variety of Terminal Classic ceramic diagnostics and faunal remains (Eppich and Mixter 2013; Guenter and Rich 2004). My goal was to locate similar midden deposits and to collect materials for analysis. Ceramic and faunal materials recovered from these middens would then be analyzed to evaluate if Group 4 was used for feasting and, if so, whether these feasting activities were inclusionary or exclusionary (Dietler 1996; Hayden 2001; Keller 2012; LeCount 2001). Unfortunately, these excavations did not yield midden deposits.

The second goal of these excavations was to define the architectural style of Group 4's platform façade. I hoped to determine how the platform edge was constructed and were particularly interested in understanding the degree to which the edges of the platform remained intact or had been destroyed post-abandonment.

In order to pursue these goals, I placed excavations at three locations to the south and east of Group 4's platform (Figure 5.25). Two of these excavations were subsumed into Operation 35. The first is a 2 m wide trench into Group 4's southern platform edge. This excavation

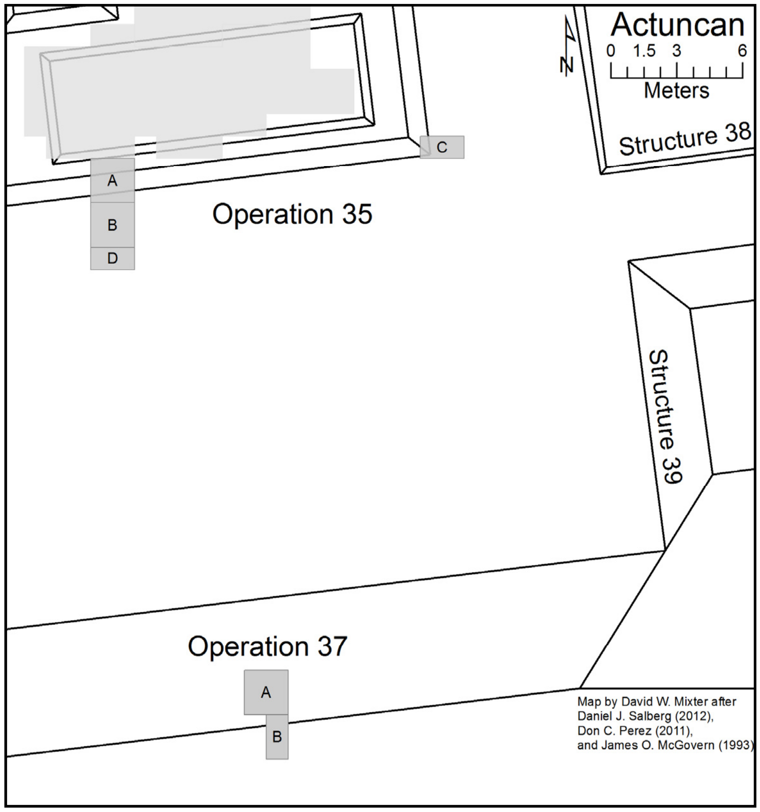

Figure 5.25: Map showing the location of units in Operations 35 and 37 to the south of Group 4.

consists of three different excavation units. Unit D, the southern-most unit, is a 1 by 2 m unit. The other two units are 2 by 2 m units named Units A and B, from south to north. Unit B connects to Units AA and AB at the southern limit of Operation 36. Operation 35, Unit C is a 1 by 2 m unit located along the east edge of the Group 4's platform near the southeast corner. This location is in a narrow alleyway in between Structures 35 and Structures 38 and 39. If activities were taking place on the southeastern edge of Group 4, then refuse may have been swept off the platform into this space. Finally, Operation 37 was placed well south of Structure 35, off the edge of the main site platform. South of Group 4, the edge of civic Plaza C drops off precipitously into a ravine. We placed Operation 37 on the edge of this drop-off to test whether refuse from Group 4 was being carried off and dumped over this edge rather than merely being

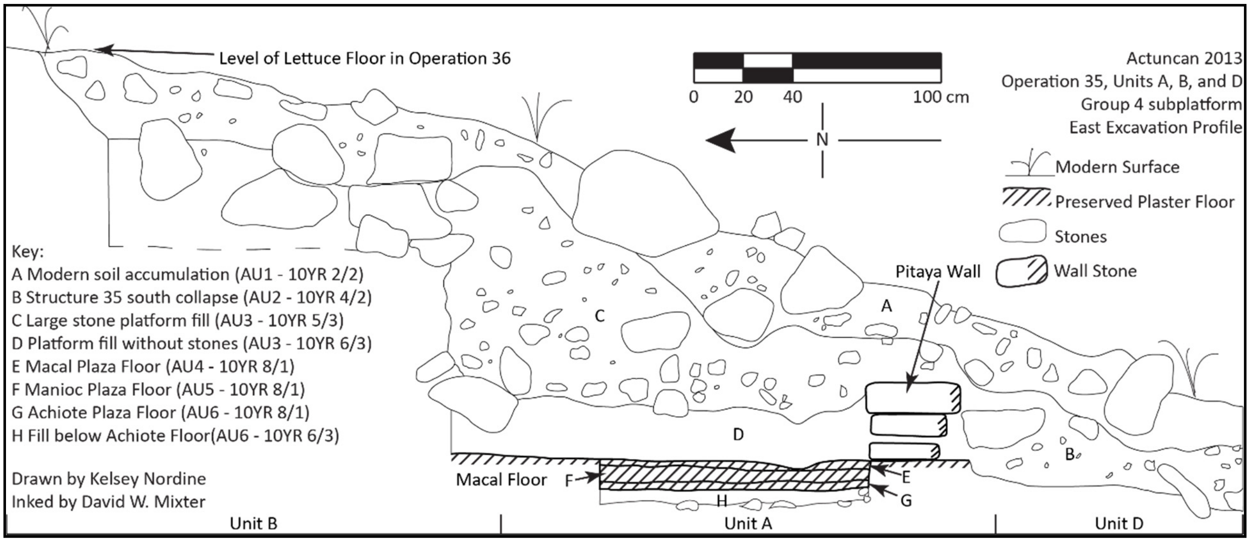

Figure 5.26: East profile of excavations in Operation 35, Units A, B, and D.

swept off the edge of the Group 4 platform. Because this edge is so near Group 4, it seems possible that this edge could have been used as a permanent disposal location, bypassing the provisional discard along the edges of Group 4.

5.4.7 Excavations South of Structure 35 (Operation 35)

Excavations in Units A, B, and D of Operation 35 penetrated into the building platform of Structure 35 and Group 4 substructure. Additionally, excavations defined a sequence of three Plaza C plaster surfaces on which Structure 35 was constructed (Figure 5.26). Excavations did not successfully identify midden deposits in this location. Units A and B were located on and within the building platform of Structure 35 and the underlying substructure of Group 4, while Unit D was located south of terminal platform edge.

Although the Group 4 platform face was badly collapsed, we can reconstruct its height and location based on the terminal surface of Structure 35 identified in the northern part of Unit

B and a single preserved course of the Pitaya Wall, the Group 4 platform face, located on the unit boundary between Units A and D. The eroded floor surface identified in Unit B is continuous with Lettuce Floor identified in Operation 36. Although Pitaya Wall was only preserved to a single course of horizontally set cut-limestone blocks (Figure 5.27), several other courses remained in place where they had collapsed directly south of Pitaya Wall. Based on the distance between the preserved surface in Unit B and the base of Pitaya Wall, this platform face was originally 165 cm tall. Interestingly, Pitaya Wall appears to have never been particularly well constructed. Along with the horizontally set cut stones, we identified at least one flat-faced chert cobble set into the wall. The variety of materials may indicate that the Group 4 substructure was built out of scavenged rather than original materials. Ceramics from within the fill of the Group 4 platform recovered in Units A and B indicates a Terminal Classic construction date that matches the date of materials from the test pit into Group 4's patio (Mendelsohn and Keller 2011).

Figure 5.27: Photograph showing Pitaya Wall resting on Macal Floor.

Pitaya Wall was constructed on Macal Plaza Floor, a 3 cm thick plaster plaza floor. This plaster floor was well preserved underneath the substructure of Group 4 and heavily eroded to the south. It appears to form the terminal plaza surface south of Group 4, between Group 4 and the southern edge of the Actuncan North platform. Regardless, it clearly predates the construction of Group 4. Macal Plaza Floor rests immediately on top of Manioc Plaza Floor and was effectively a resurfacing of this earlier floor. No clear date was established for Macal Plaza Floor; however, ceramics sealed under Manioc Plaza Floor date it to the Early Classic Period. Beneath Manioc Plaza Floor, we uncovered Achiote Plaza Floor, the third oldest plaster plaza floor in this area. Although we excavated through Achiote Plaza Floor, not enough ceramic sherds were recovered to determine *terminus post quem* date with the floor. Excavations terminated below Achiote Plaza Floor because the excavations below the Terminal Classic levels that form the focus of my research.

The individual analytical units of Operation 35, Units A, B, and D are described in Appendix H.5. See Figure H.5 for a Harris Matrix detailing the relationship of analytical units. See Table H.5 for a full list of excavated lots in Operation 35.

5.4.8 Excavations East of Structure 35

Unit C of Operation 35 was placed near the southeast corner of the Group 4 platform in a narrow alley between Structure 35 and Structures 38 and 39 (Figure 5.25). This excavation sought to identify the platform edge in this area and determine if midden deposits were located in this alley. Excavations were very confusing because the eastern platform face of Structure 35 appears to have collapsed badly. Although we encountered many cut-limestone blocks, we found it difficult to determine if any belonged to intact stone alignments. Perhaps a larger excavation

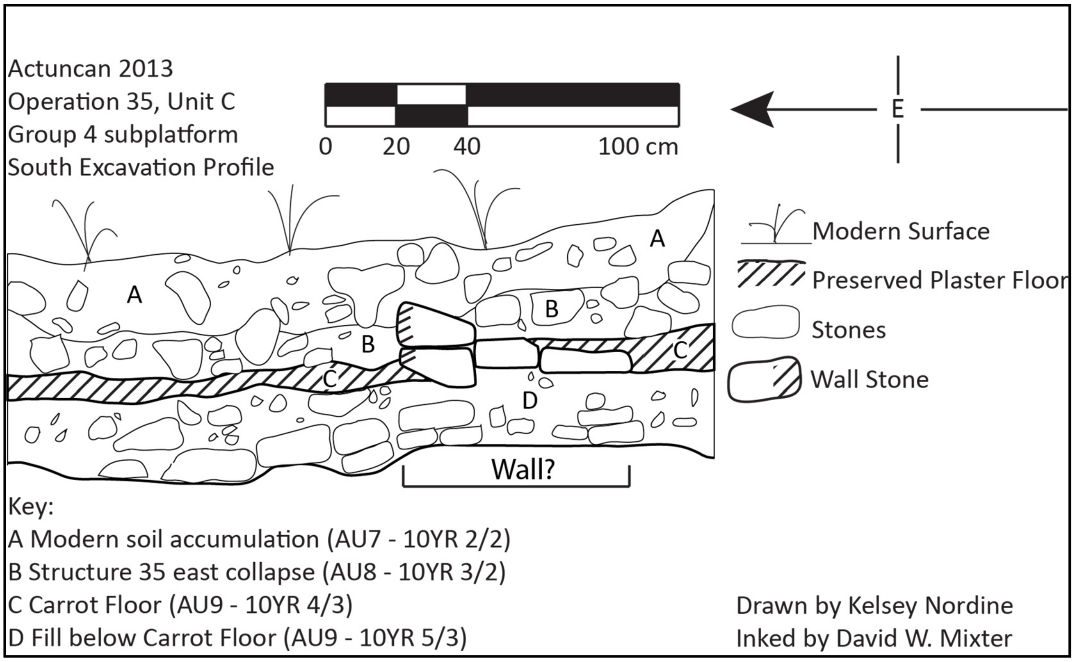

Figure 5.28: South profile of Operation 35, Unit C.

would shed more light onto the construction of this platform edge. Our excavations encountered two versions of Plaza D plaster plaza floor and one possible platform face associated with Group 4 (Figure 5.28). The platform face was only clearly identified in the southern half of our excavation unit.

The possible platform face we encountered was constructed of stacked cut stones three courses high facing east. Additionally, cut stones were identified in the profile to the west of the clearly defined line of stones; however, as best we can tell, these stones formed part of the fill of Group 4's subplatform. Although cut stones were found across the unit, any continuation of this line to the north was not identified in our excavations. If these stacked stone are indeed a wall, then they likely formed the terminal version of Group 4's eastern platform face.

This possible wall was constructed on Carrot Plaza Floor, a heavily eroded plaza floor that appears to have formed the terminal plaster surface of Plaza D just to the east of Group 4.

Carrot Plaza Floor was identified by an even layer of limestone ballast covered by a few patches of preserved plaster. Ceramics recovered from below Carrot Plaza Floor indicate that it was constructed in the second half of the Late Classic period during the Hats' Chaak ceramic phase.

As noted in the description of AU8 below (Appendix H.6), our excavations uncovered a high density of artifacts, particularly broken ceramics, immediately above Carrot Plaza Floor. This area may have been the location of a midden resulting from activities on Group 4. Unfortunately, no animal bone was encountered indicating that either food remains were selectively deposited away from Group 4 or this deposit was not the result of food preparation or disposal.

Approximately 20 cm below Carrot Plaza Floor we identified the preserved plaster of Celery Plaza Floor, the penultimate plaza floor in this location. Like the plastered southern terrace surface of Structure 41 (Mixter 2012), Celery Plaza Floor appears to have been strongly impacted by post-depositional compaction of underlying wet-laid clay fill that resulted in a broken and uneven surface. As a result, the floor appeared to have an undulating surface. Excavation in this area terminated at the level of this floor, so we have no definitive evidence whether or not the floor's substrate that explains its wavy appearance. Curiously, a number of flat cut stones were stacked horizontally in no apparent pattern on Celery Plaza Floor prior to the construction of Carrot Plaza Floor.

The individual analytical units of Operation 35, Unit C are described in Appendix H.6. See Figure H.5 for a Harris Matrix detailing the relationship of analytical units. See Table H.5 for a full list of excavated lots in Operation 35.

5.4.9 Excavations in the Ravine East of Group 4 (Operation 37)

The two units associated with Operation 37 were placed to the south of Group 4 along the slope that forms the edge of Plaza C, the artificially-leveled platform that underlies Actuncan North (Figure 5.25). Unit A, a 2 by 2m unit, was opened first to test for a possible trash deposit as well as to gain a better understanding of the edge of the platform and any architecture associated with the slope down from Group 4. Based on our findings in Unit A, our excavations were extended south into Unit B, a 1 by 2 m unit oriented north to south attached to the southwest square meter of Unit A (Figure 5.29). Although a relatively large quantity of artifacts was found in these two units, there is little evidence of midden deposits at this location. Instead, our excavations yielded a tentative observation about the construction of the civic plaza edges of Actuncan North. We encountered a sequence of stacked stones retaining walls and level clay surfaces that may have formed wide terraces that shored up the large constructed platform on which Actuncan North was built.

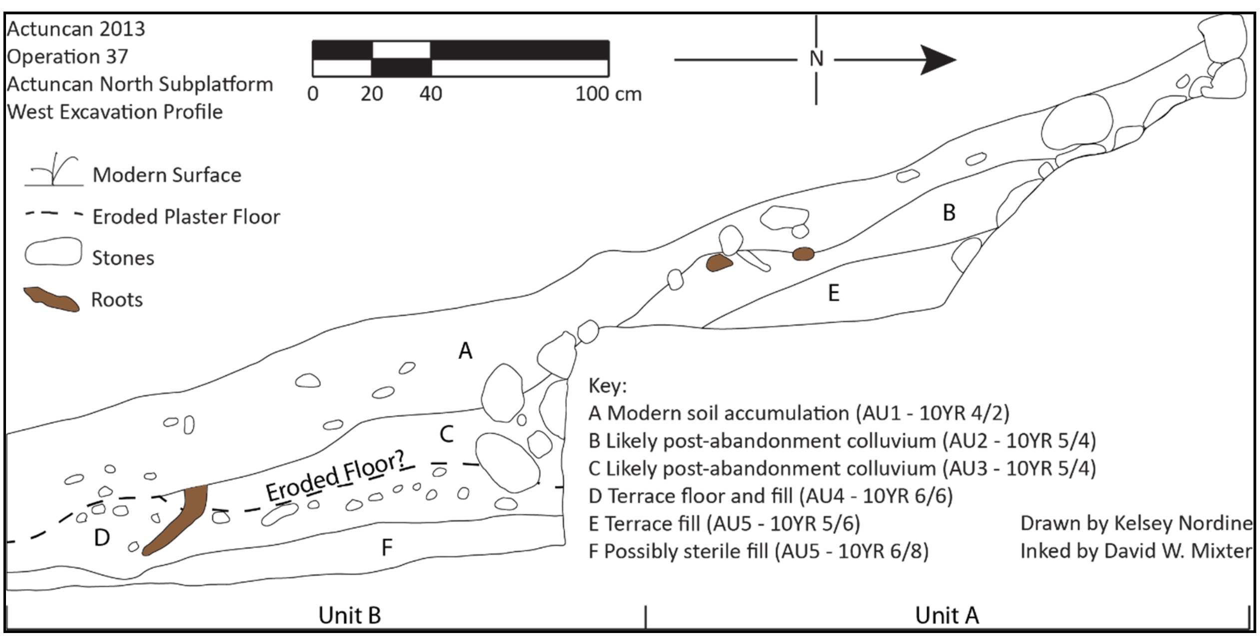

Figure 5.29: West Profile of Operation 37.

Excavations in Units A and B uncovered two terrace faces constructed of stacked chert river cobbles. The upper wall was located in Unit A and was approximately 90 cm tall, while the lower wall located in Unit B was approximately 65 cm tall. The stones in each wall were slightly battered so that they were supported by the sediment they were intended to contain. At the base of the lower terrace wall, our excavations uncovered an even layer of white limestone gravel that may be the remains of an eroded plaster floor. This floor may have formed the surface of a terrace extending southward from the base of the upper terrace wall. The presence of broken plaster points to the possibility that these terraces were once plastered. This kind of treatment would have produced an impressive aesthetic for individuals climbing the road up to the grand entry to Actuncan North (Mixter 2014). Although not yet mapped, this road appears to have been located at the base of this set of terraces.

Test excavations below the terrace surfaces identified a bright yellowish brown (10YR 6/6) clay substrate that appeared to be culturally sterile. Previous research indicates that similar natural clay underlies all of Actuncan North (Mixter 2012). If this clay is culturally sterile, then it might indicate that these artificial terraces were carved out of the natural hillside and supported through the addition of terrace walls. These walls would have helped maintain the shape of the Actuncan North plaza platform by preventing erosion.

Above the terraces, we encountered a talus of bright orange clay pushed up against each terrace face. While the origin of this clay is not entirely known, two possible interpretations exist. I suspect that this matrix was deposited as a result of a post-abandonment erosional event. In this scenario, this material eroded away from the similarly colored clay substrate higher up on the hill, eventually building up in the corner formed by each terrace face and the terrace surface that extends from its base. Alternatively, this orange clay may be an intentional cultural deposit placed on each terrace surface, to support the base of the terrace face above. This interpretation is supported by the clear color differentiation between this orange deposit and the browner deposit above.

Today, the form of these terraces is obscured by a deposit of brownish black (10YR 3/2) to dull yellow brown (10YR 4/3) clay loam ranging from 15 to 40 cm in thickness. The top portion of this layer is under active soil development; however, due to the slope, this development appears to have been frequently superseded by the deposition of erosional wash from higher up the slope onto these lower terraces. As a result, this layer appears to mostly consist of colluvium that is darker near the surface due to active soil development in the recent past.

The individual analytical units of Operation 37 are described in Appendix H.7. See Figure H.6 for a Harris Matrix detailing the relationship of analytical units. See Table H.6 for a full list of excavated lots in Operation 37.

5.4.10 Excavations of the Patio Surface (Operation 40 and Operation 8 Units BBB-KKK)

Operation 40 was initiated during the 2013 field season to understand the pattern of activities that took place within the patio of Group 4. The patio is located on a raised substructure flanked by Structures 33, 34, and 35, and a broad staircase allowed access to the patio from Plaza D to the east. Ancient Maya structures have often been assigned functional interpretations based primarily on their form and the study of artifacts encountered in nearby middens that may or may not have been used in that structure. Although architectural forms can be reliable markers of function, more direct evidence of activities on structure floors provides a more nuanced understanding of the diversity and organization of practices within space. Unfortunately, ancient cleaning often removed large artifacts from their primary context prior to abandonment. In contrast, small materials known as microartifacts (here defined as artifacts between 1.59 and 6.35 mm) usually remain in place during the cleaning process (Schiffer 1987; Sherwood 2001). Additionally, ancient activities produced chemical signatures on floors through the leaching of ions from the material remains of activities into stable occupation surfaces. Recently, multi-elemental assays of compacted soil or plaster surfaces have been used with great success to identify activity spaces (Barba and Manzanilla 1987; Middleton and Price 1996; Terry et al. 2004; Wells et al. 2000). Although these methods have been effectively applied to residential spaces and plazas in the Maya world (Cap 2011, 2012), with few exceptions (Robin et al. 2012b) they have rarely been applied to public architecture.

To better understand the range, intensity, and location of activities across the Group 4 patio, we developed a research strategy aimed at collecting a diversity of activity markers. Excavations in Operation 40 consisted of a broad, shallow, horizontal exposure across the patio. Excavations continued downward only to the level of the terminal patio surface. All artifacts larger than 6.35 mm were collected, as well as soil samples to be processed for microartifacts and elemental signatures. In order to maintain tight horizontal control over the location of artifacts, Operation 40 was divided into a large grid of 1 by 1 m excavation units that covered the majority of the open patio. Operation 40 was bounded by Structures 33, 34, and 35 to the north, west, and south respectively where it abutted Operations 44, 42, and 36. Operation 8 was originally initiated in 2010 (Mendelsohn and Keller 2011), and I continued to label the 2 m wide section of units located on Group 4's approximate midline as Operation 8. We labeled the units on the grid according to a 2 letter assignment (AA, AB, BA, BB, etc.) starting in the grid's northwest corner. The first letter represents the unit's location east of the starting point, while the second letter is the location south of the starting row. In total, 199 units were excavated in Operation 40 following this nomenclature. Ten units were excavated using the same strategy in Operation 8. Following the standard nomenclature used in 2010, these units were labeled BBB to MMM. Each unit was dug to the terminal floor surface of the platform, approximately 10 cm below the modern surface. In two units, GC and HL, we dug a second 10 cm lot through the terminal floor surface to ensure that we were accurately terminating excavations at the terminal patio floor. We skipped several units in the grid that contained large disturbances such as surface burning, large trees or roots, and excessive rocks. These units are not named and are represented by empty blocks on our map of units (Figure 5.19).

Because of the narrow focus of these excavations, we followed a slightly different protocol from standard AAP excavation procedures. We proceeded rapidly by focusing on four or five units at a time, stringing up one row of five units and then digging them sequentially. Excavation lots were dug by cultural levels, each approximately 10 cm in depth, until we reached the recognizable layer of small limestone flecks that represented the level of the eroded patio floor. After we dug the lot, the excavated matrix from each unit was screened in ¼" screens and all macroartifacts were kept. Once all five of the units in the group were excavated we collected samples for microartifact and soil chemistry analyses. First, a point sample was collected from the center of the unit at the level of the terminal occupation surface. Approximately 10 oz of soil was collected in a sterile Whirl-Pak plastic sample bag for all lots. Then, a 4 L soil scrape was collected from across every other unit. These soil scrapes were later water screened for the recovery of microartifacts.

Overall, excavations in AU1, the level of modern soil development over the ancient plaza surface, uncovered what we expected – a relatively uniform patio surface with variable degrees of erosion. This analytical unit consisted of 10YR 3/2 clay loam containing mostly 1 to 6 cm stone inclusions. Occasional larger stones from collapse or pulled up from below by bioturbation were encountered. Only in Operation 8, Units BBB, CCC, DDD, and EEE did we find any patches of clearly preserved plaster (Figure 5.30). Around the edges of Operation 40, near the raised platforms of Structures 33, 34, and 35, our excavations penetrated through a slightly thicker level of collapse before reaching the plaza floor. The presence of collapse was particularly noted in Units IV, JV, KV, LV, JW, and GW, where a second lot was excavated after we realized the first lot hadn't reached the terminal patio surface. Here, large tumbled cut blocks were identified in the western halves of these units, likely collapse from Structure 35. Across most of Operation 40, our excavations terminated at an even layer of small limestone flecks. In some areas, this layer was interrupted by concentrations of boulders, the presence of which may have a mix of explanations. I suspect that the majority of these concentrations are the result of bioturbation. In total, 102 microartifact samples and 206 soil chemistry samples were collected across the surface of the Group 4 patio.

In two locations, three units penetrated through the terminal floor into a second analytical unit. AU2 consists of the Group 4 patio floor and its ballast. Lots GL/2 and HL/2 were excavated near the beginning of the field season to check whether we had accurately identified the patio floor previously identified in excavations in Operation 8 during the 2010 field season (Mendelsohn and Keller 2011). We determined that we had indeed identified the correct elevation, a conclusion that was confirmed by the discovery of plaster fragments in Operation 8 Units CCC and EEE.

Figure 5.30: Photograph of the small preserved plaster patch of the Group 4 patio floor.

In contrast, Lot EP/2 was excavated on the western periphery of Operation 40 near Structure 34a. Unit EP formed the center of an aggregation of large rocks and I wanted to be sure we had excavated below any collapse that may have been falling from the collapse of Structure 34. Excavations determined that some stones in the upper portion of the lot may be related to collapse, but the stones were most likely displaced from the structure's fill by bioturbation. However, at the base of the lot, excavations did find what appeared to be an even level of flat cut limestone slabs (Figure 5.31). In the future, research may investigate whether these stones cover some kind of feature.

Overall, excavations in Operation 40 and 8 succeeded in collecting large quantities of artifacts, microartifacts, and soil chemistry samples, which will allow for a better understanding of the kinds of activities that might have taken place in this space. Analysis of this material is ongoing.

Figure 5.31: Photograph showing the alignment of flat limestone slabs at the base of Lot 40EP/2.

5.5 Summary and Discussion

The excavations of Group 4 were undertaken with two primary goals in mind. First, by reconstructing Group 4's architecture I aimed to understand the shifts in political ideology represented by this construction. This goal requires placing the construction of Group 4 within the context of comparable structures from the Classic, Terminal Classic, and Postclassic periods. Second, a reconstruction of the activities that took place within Group 4 should point to the day-to-day realities of public life under the new political regime. The former question will be taken up here, while the latter will be addressed in the next chapter in conjunction with a distributional analysis of the microartifact and soil chemistry data.

The excavations described in this chapter revealed that Group 4 was not a single structure, but rather a complex architectural space constructed in several phases. Evidence from

Operation 37 indicates that Actuncan North was an artificially levelled hilltop. Operation 37 in particular revealed the extent to which natural clay was used as fill to produce a large level hilltop for the construction of Actuncan North's plazas. Similarly, Operation 32 and the Operation 8 test pit revealed massive clay deposits that included ceramics and other cultural materials – a testament to the quantity of clay moved in this part of the site.

During the Terminal Preclassic and Early Classic periods, a series of plaza floors were constructed beneath Group 4, forming early versions of Plazas C and D. These floors were documented in Operations 8, 32, and 35. Structure 34-sub-1 was constructed in the location of Group 4 during the Early Classic period. Unfortunately, our excavation only exposed a 2 m long segment of Structure 34-sub-1's platform face. As a result, its original size, shape, or function are unknown. However, based on its location between Plazas C and D, I would hypothesize that Structure 34-sub-1 was originally a range structure similar to Structures 12 and 19a. These long rectangular platforms typically support long-narrow buildings with a series of doorways allowing access to multi-room interiors. More importantly, range structures often were built on the edges of plazas. Because of their position, they defined the limits of public space and restricted access from public to private plazas. At some point between cal A.D. 416-540, Structure 34-sub-1 was burned and likely dismantled. At this time, ash and stucco were placed against the façade of the broken building. Evidence of *in situ* burning is evident in a burned section of Glen's First Floor encountered in excavations.

During the Terminal Classic period, the remains of Structure 34-sub-1 were covered by the construction of Group 4. My excavations revealed that Group 4 was a complex architectural space composed of a primary basal platform that supported buildings on the south, west, and north. After the initial excavations in 2010, Keller (LeCount et al. 2011) hypothesized that Group

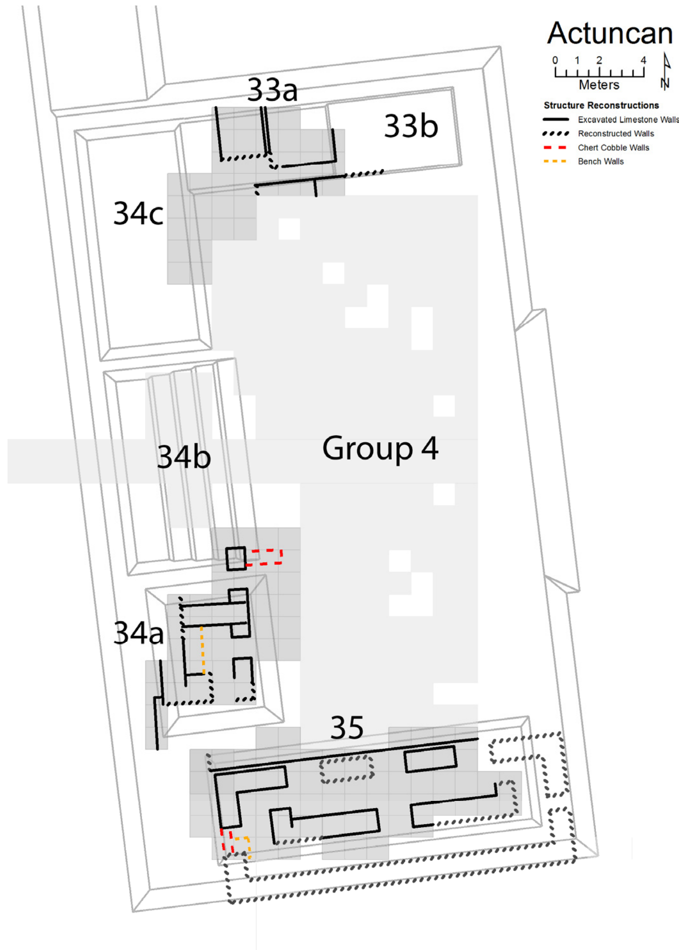

Figure 5.32. Combined reconstruction of Group 4.

4 was a council house based on the C-shape of the mounds situated around Group 4's patio. This hypothesis was partially spawned by McGovern's original mapping of the group as 3 distinct structures arranged in a C-shape and by Richard Leventhal's suggestion during a visit to the site in 2010 that it might have been a council house (LeCount et al. 2011:26). This hypothesis was advanced despite Keller's (LeCount et al. 2011:26) observation that Group 4's C-shaped mounds were likely actually a series of separate buildings.

C-shaped structures have long been considered candidates to be council houses because of their open space and/or the even seating of individuals inhabiting these spaces. C-shaped structures are defined based on either a C-shaped bench or a C-shaped back wall and are evident at Terminal Classic and Postclassic sites in the southern Petén (Tourtellot 1988), the Petén Lakes region (Rice 1986; Schwarz 2009), and in the Northern Lowlands (Bey et al. 1997; Freidel and Sabloff 1984; Proskouriakoff 1962). However, Group 4 is not in fact a C-shaped structure. Although Group 4's buildings do form a C-shape, they are actually individual buildings, not a single C-shaped building. Actuncan did have a C-shaped bench in Room 3 of Structure 19a that was likely used for audiences in the Terminal Preclassic and Early Classic periods, and then again in the Late Classic period when the building was substantially stabilized[8]; however, this building had been collapsed and sealed by the Terminal Classic period (Mixter et al. 2013).

Evidence indicates that Structure 35 was likely a tandem transverse structure built of partial masonry walls on a low basal platform, though this reconstruction is extrapolated based on the building's likely symmetry. The southern and eastern portions of the building were not well preserved. The two primary rooms are organized in tandem and connected by a central doorway. The small transverse rooms were located at eastern and western ends of the building. A door in the western side of the building originally provided access to a small open space on the Group 4 platform's southwest corner. In a later renovation, this door was blocked in and a small altar or plinth was built in the old doorway. Excavations did not reveal if Structure 35 could be accessed from the south or east.

In his analysis of the Central Acropolis at Tikal, Harrison (1970:298-300) interprets tandem transverse buildings like Structure 35 as probable residences based on a combination of

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[8] The eastern portion of the bench was covered as part of the stabilization of Structure 19a's superstructure, converting it to an L-shaped bench (Mixter et al. 2013).

their architectural features and associated artifacts. The absence of residential middens or domestic debris indicates to me that Structure 35 was not a residence. Furthermore, residential structures at Tikal typically only have one entrance to each set of contiguous rooms. A single door would have maximized privacy. Structure 35, in contrast, likely had three doors along its northern face. As a result, the activities in the building's front room would have been readily visible to people in the Group 4 patio. Long open halls are not common in lowland Maya architecture during the Classic period and are certainly not domestic space. In the Northern Maya Lowlands, long halls with many doors, such as Structure 44 at Dzibilchaltun and Structure GT-20 at Ek Balam, are considered to be gathering places and meeting halls (Bey and May Ciau 2014; Kowalski 2003). In the northern lowlands, these halls tend to be standalone buildings. In the Southern Maya Lowlands, long halls are typically integrated into palace complexes at access points to more restricted zones. Examples include several structures on Caana and the Southern Acropolis of Caracol (Chase and Chase 2001) and Structure A-32 at Xunantunich (Leventhal 2010). These buildings may have just been intended to restrict access; however, they could have doubled as public meeting places just outside a ruler's private quarters.

Although these examples are multi-doored halls, they are much larger than Structure 35, which is only 16 m long. More appropriate analogs come from similar standalone tandem structures that become common in the Terminal Classic and Postclassic periods. These buildings are typically residential and follow the basic form of an open front room with benches that served as audience space and a closed back room that provided privacy. Examples of this residence form are evident at Mayapan (Smith 1962:217; but see Masson et al. 2014:202-216) where it was defined, at Cozumel (Freidel and Sabloff 1984), in the Petén Lakes region (Pugh 2009; Rice 1986:309), and at many other sites. Additionally, this building form fits the pattern of the two room residence described by Diego de Landa (1941:85-87) after the Spanish conquest. Although common in the Postclassic period, standalone tandem residences were largely limited to sites within Mayapan's purview. Houses from Dzibilchaltun, Chichén Itzá, and the Puuc area do not conform to the tandem construction style (Kurjack 1974; Smith 1962:Figure 10). Interestingly, Freidel (1981a:317-320) notes that tandem residences have no clear Classic period antecedent. Also keep in mind that our excavations in Group 4 did not encounter domestic refuse.

Structure 34, located on Group 4's western side, is a more complex structure built in multiple stages. This discussion focuses on the central and southern portions of the structure because the northern sections remains poorly understood. Excavations in Structure 34a revealed the two southern rooms and evidence of three doors. The building was likely a range-type construction with a series of evenly spaced doors and multiple rooms arranged along the building's longitudinal access. The original length of the building is unknown, but it may have extended well to the north of the known remnants. Later, a major renovation resulted in the transformation of the building into something wholly different. Alignments of cut limestone blocks just below the modern surface point to the construction of a long narrow platform built over the filled in rooms of the original range structure. Excavations in Operation 8 and 42 show that this platform, Structure 34b, was constructed with paired staircases providing access to an elongated platform over the filled in rooms of 34a. In contrast to the well-constructed double-faced walls of Structure 34a, Structure 34b was crudely constructed. The stairs were built of mismatched cut stone blocks, and Acai Wall, the balustrade of the southern staircase, was crudely constructed of roughly stacked cut stone blocks. During this time, Room 1 of Structure 34a remained open at the building's southern end and likely would have been covered by a perishable superstructure.

Although our understanding of Structure 34 is partial, two aspects of Structure 34 are particularly noteworthy. First, the form of Structure 34b is rather unusual. Paired staircases—like the ones encountered in Operation 8 and in Operation 42—are not common. Importantly, the two staircases are not a matched set. Three stairs were identified in the southern staircase, while the northern staircase likely consisted of approximately five stairs. Furthermore, the foot and summit of the northern stair is further west than the southern stair. This disparity likely indicates that the two stairs did not access a single-function platform, but rather discrete spaces that likely served as the basal platforms for two separate perishable buildings. These two buildings may have been situated on a single platform or separate platforms of slightly different heights. The data is equivocal on this point.

The second important observation is that Structure 34 was built in two construction phases. The original version, Structure 34a-2nd, followed a familiar Classic period tandem architectural form wherein small rooms are aligned side by side with doors facing out. Based on the portion of the building exposed in excavations, the rooms in Structure 34a-2nd are particularly small and separated by frequent doors. Furthermore, Plum Wall is a very small pier, only approximately 1 m by 1 m in size (Figure 5.15). This may reflect a transitional form from the 2 m by 1 m jams used on the façade of Structure 35 that were also common in the Classic period at Actuncan (Jamison 2013). This simple square pier may have been transitional to the columns that became common by the Postclassic period. The presence of two construction phases is significant because it points to Actuncan's Terminal Classic renaissance having some longevity—likely more than one generation. This finding matches the recovery of small quantities of Postclassic ceramics from Actuncan. Identifying this longevity is critical because it indicates that Actuncan's Terminal Classic reorganization was not a flash in the pan, but rather was resilient for a period of time. If Actuncan's political reorganization lasted even 150 years, there would be members of the community that never knew life any other way.

On the northern side of Group 4, Structures 33a and 33b are a pair of platforms that descend from north to south. Structure 33a is composed of two separate constructions joined where Tangelo and Fig walls abut. Again, evidence that these were separate constructions points to multiple construction phases and indicates that Group 4 was used for a period of time. These platforms likely each supported a perishable superstructure, though no evidence remains of their original layout. The buildings on the north side of the patio remain the most enigmatic, though they may have supported the activities that took place in the northeast corner of the Group 4 patio, as described in the next chapter.

5.5.1 Group 4 in the Context of Plaza D

Although Group 4 is the primary object of this dissertation, it forms the focal point of a larger area of Terminal Classic activity focused on Plaza D. In addition to structures 33-35, Plaza D was bordered by Structure 29 and the end of Structure 26 to the north, Structure 41 to the east, and Structures 39 and 40 to the south. Structure 32 delineates an access point between Plaza D and Plaza F to the northwest. Structure 30 is a low platform that partially blocks this access way. This low platform has not been excavated; however, it may have served to control access to Plaza D from the more public spaces to the west. Finally, Structures 36-38 are three low platforms located within Plaza D and may be low shrine structures. Curiously, Plaza D also appears to have been constructed at two different levels. The western half of the plaza is approximately 20 cm higher than the west half. Research by Nick (2013; Nick and Mixter 2013)

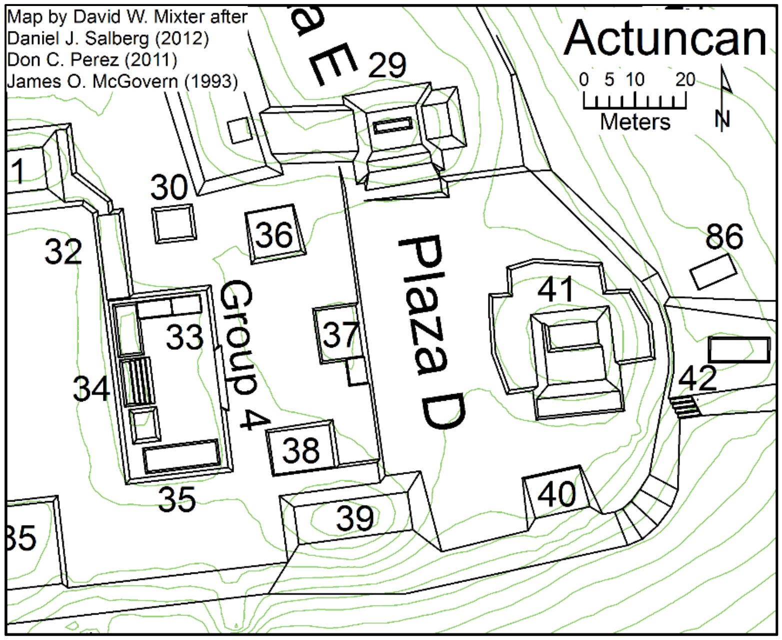

Figure 5.33. Group 4 in relation to Plaza D.

revealed that this division is delineated by a low step and possibly the stone footing for a perishable wall. This division runs north to south along the eastern edge of Structure 37.

This kind of divided plaza is rare within Maya sites. One example is the plaza formed by Structures Q14-Q18 on the eastern Quexil Island (Figure 5.34)(Schwarz 2009). This space was in use from the Terminal Classic to the Early Historic period, indicating that it was contemporaneous with the Terminal Classic period construction of Group 4. Similar to Actuncan's Plaza D, this plaza on the eastern Quexil Island contained two central shrine structures, one of which was situated on the edge of the elevation change in the center of the plaza. The presence of a single shrine in the center of a plaza is the primary criteria for identifying Becker's (2003, 2005) Plaza Plan 4. As Becker (2005) points out, central shrines have Classic period antecedents, typically within residential groups; however, they become increasingly more common during the Terminal Classic period, when they are found in public

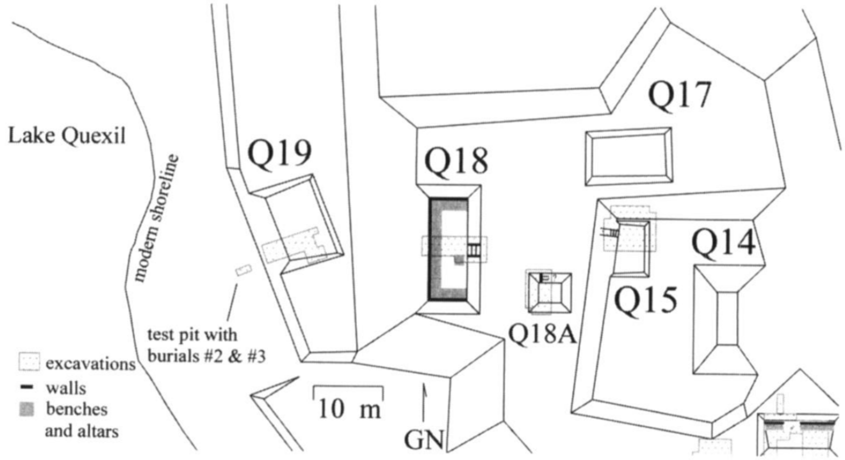

Figure 5.34. Acropolis group on the Eastern Quexil Island. Notice the dual-level plaza between Q14 and Q18. Also, notice the multiple shrines in the plaza's center (Q15 and Q18A). (Schwarz 2009:Figure 10)

plazas at Yaxha, Ceibal, and Baking Pot (Aimers 2004:310-311; Hermes and Źrałka 2012; Schwarz 2009). In the Postclassic period, central shrines become a ubiquitous part of the standardized architectural plans defined at Mayapan and emulated across the Maya Lowlands (Proskouriakoff 1962:90-91; Pugh 2003a, b). It is not common to have several shrines in the center of a plaza, though, again, structures Q15 and Q18a on the eastern Quexil Island provide a contemporary example (Schwarz 2009). While the central shrines at Actuncan have not been excavated, the presence of multiple shrines within a strange bi-level plaza support their construction in the Terminal Classic period.

In contrast, Plaza D's footprint dates to Actuncan's Terminal Preclassic apogee. Excavations in Structures 29, 40, and 41 indicate that those structures were originally constructed during the Terminal Preclassic period when they defined the perimeter of the plaza (Mixter 2012; Nordine 2014). Similarly, Structure 34-sub-1 defined the boundary between plazas C and D during the Early Classic period. It is certainly possible that a yet undiscovered

Preclassic version of this structure exists.

Our excavations indicate that Structures 29, 40, and 41 were all reutilized during the Terminal Classic period. The nature of Structure 29's Terminal Classic reoccupation is unclear because of the heavily disturbed nature of the building's upper surface (Nordine 2014). In contrast, evidence from Structure 41 indicate that it was heavily modified during the Terminal Classic period (LeCount et al. 2011; Mixter et al. 2014). At that time, the masonry structure previously located on the platform's summit was dismantled, and the platform's surface was modified into a two-tiered plan facing south. The new platform surface supported a perishable superstructure and was oriented facing south rather than west. In the southern edge of Structure 41's platform, our excavations encountered Burial 11, an intrusive seated burial dug into the fill of the Early Classic platform (Freiwald and Billstrand 2014; Freiwald et al. 2014; Mixter 2012). Directly dated to between cal A.D. 687 – 870 (LeCount 2015a), this burial dates to the Terminal Classic period or the later part of the Late Classic period. It appears to dedicate the reoccupation of Structure 41 after a period of abandonment (Freiwald et al. 2014). Importantly, Structure 41 forms the eastern boundary of Plaza D—a location often occupied by ancestor shrines and the interments of honored ancestors. Perhaps Burial 11 "provided an important source of ancestral power" (Freiwald et al. 2014:105) during the establishment of Plaza D as Actuncan's primary seat of authority during the Terminal Classic period. Like Group 4, the Postclassic ceramics from Structure 41 indicate that the two spaces continued to be used for a similar period of time (LeCount et al. 2011).

In sum, Actuncan's Group 4 was part of a coherent civic center constructed within Actuncan North during the Terminal Classic period. Although Group 4 was the largest Terminal Classic period construction, the earlier buildings that surrounded Plaza D also played a role in the process of reorganization. Structure 41, in particular, was renovated and reactivated through an explicit dedication event. Additionally, a series of shrines were constructed across the center of Plaza D. These features produced a plaza that fit the new organizational trends that were just coming into use during the Terminal Classic period.

5.5.2 Interpreting Group 4

In Chapter 3, I laid out four hypotheses that would explain the political strategy deployed by the Actuncan Maya. Each of these is rooted in an aspect of the Maya cultural trajectory from the strict hierarchy of the Classic period Maya to the more flexible, lineage-based political system of the Postclassic period. Although Group 4 was not heavily decorated, its architectural form does project a certain set of ideals that contrast heavily with the Maya Classic period. I propose here, based on the evidence, that Group 4 was constructed to facilitate a new inclusive political strategy that contrasted strongly with the privacy and exclusion of the Classic period. Because my data are largely architectural plans, I cannot say with certainty that the Terminal Classic political organization was a *multepal*; however, the data do indicate that Group 4 served many of the functions that typically took place at a council house and clearly facilitated an inclusive political strategy.

Archaeologists derive their interpretation of Maya council houses, or *popol nah*, from Roys (1943) work on ethnohistoric data from Yucatan. Important officials gathered in the *Popol nah* (translated as "house of the mat") to discuss public business and to "learn to dance for the town festivals" (Roys 1943:63). In Postclassic Maya society, these council houses were managed by a local civic leader called the *holpop* (translated as "head of the mat"), who often held an additional title, such as *batab*, which marked the *holpop* as a local official and one who would have participated in ruling councils. The presence of a *popol nah* indicates that a location likely held jurisdiction over a territory large enough to contribute a council of leaders. In the context of the Terminal Classic Mopan River valley, Actuncan is the dominant construction effort on the landscape and certainly was likely the primary local center of political power after the failure of the kings of Xunantunich.

Council houses can be identified in the archaeological record based on a combination of criteria derived from the descriptions of *popol nah* and the jobs of the *holpop* in ethnohistoric texts. The organization of ethnographically described council houses provide a further analogy for identifying council houses. Specifically, I draw on the description of the *cabildo* at Zinacantan, Guatemala (Vogt 1969:272-294). Additionally, pre-Columbian *popol nah* have been identified based on monumental art programs depicting mat motifs, flower motifs, and the images of individuals who likely participated in the council (Canuto and Fash 2004; Fash et al. 1992; Kowalski 2003, 2011; Schele 1998); however, the absence of extant building façades at Actuncan precludes access to this kind of data.

Fash et al. (1992) provide the most thorough synthesis of the ethnohistoric evidence for council houses. They note that both 16th century Yucatec and Cholti dictionaries translate *popol nah* and *popol otot* (both literally "mat house") as "council house" or "community house" ([Martínez Hernández 1929; Morán 1935 [1625]; San Francisco Dictionary 1870] cited in Fash et al. 1992:423). The *holpop* is defined in the Motul dictionary as "Head of the Banquet. Item: The steward, master of house called *popolna*, where they assemble to discuss public affairs and learn to dance for the town festivals" (Martínez Hernández 1929:89 translated by Roys 1940:40). Coe (1965:103) also notes that 16th century Yucatec villages were run by village councils that met at a municipal building run by the *holpop*. Based on this evidence, Coe (1965:103-106) and

Fash et al. (1992:434) conclude the *popol nah* was a venue for community feasting and dancing during festivals. Importantly, this periodic function complements the building's everyday use as a meeting area and center of administration. Fash et al.(1992:434) suggest that council houses can be identified by associated evidence of public feasting and a raised platform that could be used for dance performances.

Group 4's large patio could certainly have served as a stage. Not only does it overlook Plaza D, but its surface is pitched slightly so that individuals on the western side of the patio would have still been visible to an audience gathered in Plaza D. Interestingly, this construction matches the familiar European tradition of the raked stage that spawned the terms upstage and downstage. In the next chapter, I will argue that the activity proxies point to inclusive feasting in the Group 4 patio.

Additionally, council houses would be expected to provide space for the council to meet and hold audiences with community members. In some Postclassic settings, C-shaped benches would have provided equal seating for all council members during meetings (Bey et al. 1997; Freidel and Sabloff 1984; Rice 1986). In other cases, large open halls may have provided venues for councils to gather and mingle (Bey and May Ciau 2014; Kowalski 2003; Proskouriakoff 1962). In this case, benches built of wood could have been brought in to allow the council to sit if needed.

A third council house arrangement that matches the plan of Structure 35 has been less frequently identified by archaeologists. Rather than a single large hall, these council houses have similar tandem floor plans to the Postclassic residences described above. While standalone tandem residences are largely limited to the Postclassic period, tandem public structures date back to at least the Late Classic period. The archetypal tandem council house is Structure 10L-

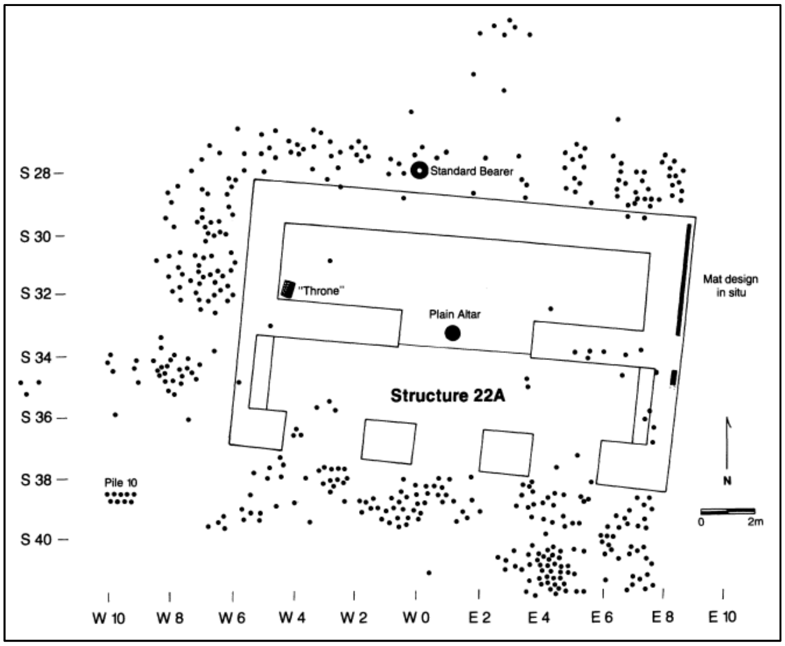

Figure 5.35. Structure 10L-22A at Copán. Notice the similarity in form to Actuncan's Structure 35. (Fash et al. 1992:Figure 11)

22A at Copán, which Fash et al. (1992) defined as a *popol nah* based on its sculptural iconography, associated performance space, and feasting midden. Like Structure 35, Structure 10L-22A has two primary tandem rooms (Figure 5.35) and is located to the side of a large public space. Structure 10L-22A is not the focal point of Copán's East Court. Rather, this small building hidden in the northwest corner of this large public plaza Structure 10L-22A is fronted by a broad platform overlooking the East Court that could have easily been used as a performance stage. Both Structure 35 and Structure 10L-22A had three primary doors that would have made meetings taking place in the front room relatively visible to the outside. To me, these multiple sets of doors eventually evolved into the airy front rooms of Postclassic buildings that either had open fronts or were supported by columns. The bulkier piers of Structure 35 and 10L-22A follow more closely with Late and Terminal Classic masonry construction techniques in the

Southern Maya Lowlands; however, they would have still provided intervisibility. Fash et al. (1992:435-436) argued that Structure 10L-22A was constructed in A.D. 746, which falls during a time of strife for the Copán kingdom (Martin and Grube 2008:206). The construction of the council house may reflect an attempt by Copán's ruler K'ahk' Joplaj Chan K'awiil to consolidate his authority by empowering secondary elites. Although the impetus for Structure 35's construction was likely quite different, it was probably constructed in the 9th century, a relatively short time after the construction of Structure 10L-22A.

Additionally, Vogt has recorded that the modern Maya community of Zinacantan employed a similar structure as a *cabildo* or town hall (Vogt 1969:272-294). The *cabildo* was Zinacantan's central civic structure. The building itself consisted of a roofed back room and a covered front porch. The front porch was used by Zinacantan's civic leaders to organize the town civic functions and adjudicate disputes between members of the community. Zinacantan's elected civic officials would sit on long benches placed on the porch along the outer wall of the *cabildo* in places designated by rank. Together, these officials managed municipal projects and decided the outcomes of disputes between villagers.

Structure 719 at Zacpetén built during the Postclassic period provides a striking parallel to the layout of the *cabildo* (Pugh et al. 2009). Like Structure 35, Structure 719 was a tandem structure (Figure 5.36). However, the front room of Structure 719 had an open front and was occupied by a long masonry bench divided into 11 seats by vertical slabs. Like the *cabildo*, important officials likely sat on this bench in assigned seats, held council, and adjudicated disputes. Pugh et al. (2009:211-212) have interpreted this building as a *popol nah* based on this divided bench and the presence of feasting remains in the back room.

Similar to each of these buildings, I interpret Structure 35 as a *popol nah*. Room 1 of

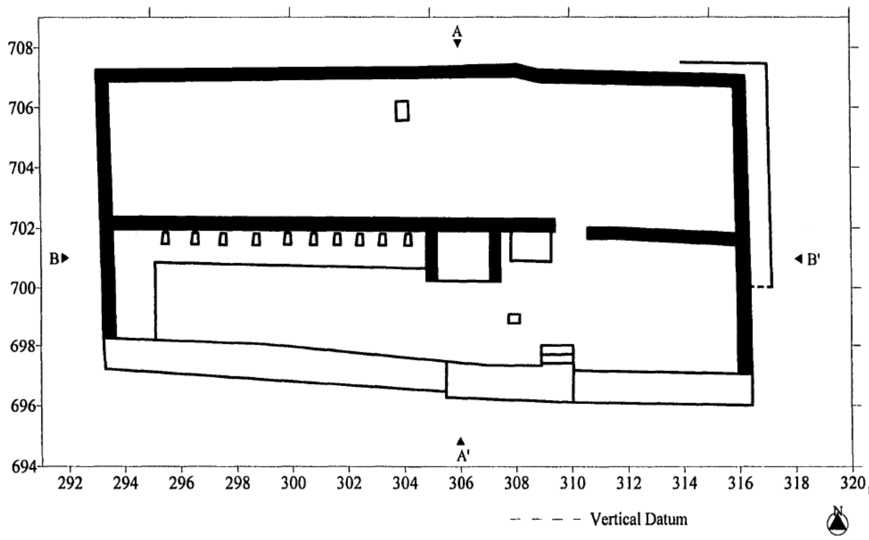

Figure 5.36. Plan of Zacpetén Structure 719 (Pugh 2001:Figure 9-1)

Structure 35 would have provided space for the council to gather in a visible location. Wooden benches could have been brought in for council members to sit on as they adjudicated. The back room could have been used for any number of public functions, including private council meetings or the storage of important communal ritual paraphernalia. However, since most of this room no longer exists, its function is unknowable. Additionally, Group 4's large patio would have provided a setting for both dancing and feasting activities that accompanied the *holpop*'s function. Furthermore, I suggest that Mayanists look more closely at tandem buildings constructed during the Late and Terminal Classic periods, before they became a common residential form, to evaluate whether similar council houses can be identified at other sites. This function indicates that Actuncan's leaders adopted inclusive strategies to build community cohesion after the decline of charismatic divine rule.

5.5.3 Alternative Interpretations

In Chapter 3, I presented three additional hypotheses for the political organization of Terminal Classic Actuncan, each of which depend heavily on an interpretation of Group 4's architecture. Here I briefly discuss each of these hypotheses in light of the architectural findings. I reject the hypothesis that Group 4 supported a continuity of hierarchical rule based on its formal differences to Classic period palaces and the absence of a centralized throne or elevated seat. I also argue that Group 4's architectural arrangement does not match the expectations of a market space; however, the activity area data presented in the next chapter more effectively rejects the hypothesis that Group 4 was a mercantile center. Finally, I compare Group 4 to shrine groups that began to appear in the Terminal Classic period. While Group 4 has some formal similarities to shrine groups, I argue that any ritual function Group 4 may have is secondary to its significance as a political gathering place.

The key to determining if Actuncan's Terminal Classic political organization reflected continuity of hierarchical rule is to determine if the Terminal Classic rulers were engaging in exclusionary political practices intended to create social differentiation between elites and commoners (Blanton et al. 1996). Because hierarchical rule would reflect direct template regeneration (Bronson 2006) of Classic period political institutions, I would anticipate exclusionary strategies to mirror those evident in the Classic period. As such, I would expect Group 4 to serve the exclusionary functions of the Classic period palace.

Classic period palaces and the royal courts that inhabit them have been a subject of deep interest over the past two decades (Christie 2003; Harrison and Andrews 2004; Inomata and Houston 2001; Inomata and Triadan 2010; Miller and Martin 2004; Yaeger 2010a; Yaeger et al. 2013). At Actuncan, we have excavated at Structure 19 and Group 8, which were used jointly as a noble palace during the Late Classic period (LeCount et al. 2016; Mixter et al. 2013). Classic period palaces are typically spatially complex, composed of multiple interconnected courtyards defined by range structures. Classic period palaces served a combination of residential, courtly, and public functions. In addition to sleeping quarters, palaces typically included offices for the polity bureaucracy, workshops where craftspeople produced elite goods with restricted circulation, storage space, and audience spaces for hosting both common petitioners and dignitaries (Martin 2001). During the Classic period, Structure 19a and the Group 8 likely served all these functions (LeCount et al. 2016; Mixter et al. 2013). Group 4, on the other hand, appears to have served only a civic function. Group 4 has no residential space. The rooms in Structure 34a-2nd and perishable buildings located on Structures 33a, 33b, 34a-1st, and 34b likely served as administrative and storage spaces. These functions would have been equally necessary to a council-based government and an apical leader. In the next chapter, I argue that there is very little evidence that Group 4 was used for craft production.

On the other hand, I have argued that Group 4 was constructed to facilitate meetings of local officials and audiences between community leaders and the broader community. However, there are qualitative differences between audience spaces in exclusive Classic period palaces and a council house. Most importantly, both public and private Classic period audience spaces would have focused on a bench or throne intended to place the ruler in a central and elevated position (Demarest et al. 2003; Harrison 2001; Valdés 2001). Indeed, the central room in Structure 19a features a wide central bench that would have accommodated a ruler (Figure 5.37)(Mixter et al. 2013). Furthermore, Structure 19a was built on a tall substructure and would have provided the ruler a centralized, elevated location directly in front of this throne room to appear in front of his assembled subjects. In contrast, Group 4 only has a semi-public meeting space in Structure 35, a building with no benches. Although Structures 24a-2nd and Structure 24b are elevated platforms that look over Plaza D and the Group 4 patio, neither is particularly high nor centered. Therefore, these platforms are unlikely locations for an apical leader to appear and preside. Finally, I only encountered one bench in my excavations. A small bench was found in Room 1 of Structure 34a-1st. However, this room is very small and located in a corner of Group 4. This space would not be a very regal location for a ruler to hold an audience. In short, Group 4 does not have spaces amenable to excusive political strategies, and as such the data do not support its use as the civic center of an apical ruler.

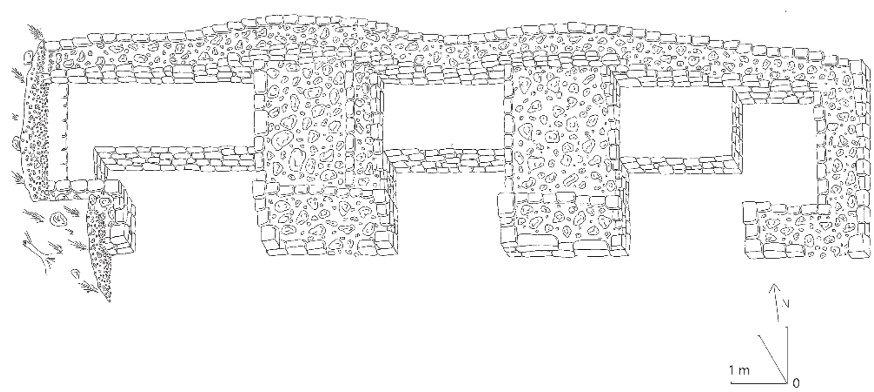

Figure 5.37. Axiomatic drawing of Structure 19a's eastern half. We only excavated three of five rooms. Note the broad bench in the room on the left, which is actually the building's central room. Drawing by Merle Alfaro (Mixter et al. 2013:Figure 5).

In comparison to palaces, Maya mercantilism is much more difficult to identify in the archaeological record. Traditionally, archaeologists have regarded Classic Maya exchange as controlled centrally by royals and elites. In contrast, the Postclassic is viewed as a time of expanding mercantilism (Andrews 1990; Sabloff and Rathje 1975). However, markets are increasingly viewed as a critical piece of the Classic period economy (King 2015; Masson and

Freidel 2012, 2013). Additionally, researchers have devised a set of archaeological expectations for identifying market spaces (Cap 2015a, b; Dahlin et al. 2007; Jones 2015). Maya markets come in at least two varieties: built markets that took place in masonry buildings, such as at Tikal (Jones 2015), and markets with stalls constructed of perishable materials, such as those at Chunchucmil and Buenavista del Cayo (Cap 2015a, b; Dahlin et al. 2007). In either case we would expect evidence of market stalls. At Actuncan, Structure 34a-2nd is a range structure with several small rooms and might be a candidate for a permanent market gallery. Additionally, Plaza D and the Group 4 patio provide a large open space where perishable market stalls could be erected. Despite the breadth of our excavations in Group 4's patios, we found no evidence for any kind of construction in this space. Additionally, activity area data presented in Chapter 6 do not indicate that Group 4 supported discrete activity zones as would be expected in a market space. As a result, I reject the hypothesis that Group 4 was a center of mercantilism. Instead of a market gallery, it is much more likely that the Structure 34a-2nd range structure functioned as an administrative and storage facility.

Finally, in Chapter 3 I presented a hypothesis that Group 4 was a shrine group and that the Terminal Classic community at Actuncan was built on a ritual foundation. In this case, the site may have primarily been a pilgrimage destination. This interpretation also accounts for the Postclassic shrines located elsewhere in the upper Mopan River valley at Chan and Xunantunich Group E (Brown 2011; Robin et al. 2012a). Furthermore, Jaime Awe (personal communication, 2015) believes that Terminal Classic refuse recovered at nearby Cahal Pech was left by pilgrims visiting that site. A formal shrine group at Actuncan would point to the significance of Actuncan as an ancient and sacred place that served as a pilgrimage site or part of a ritual circuit (Coe 1965; Freidel and Sabloff 1984:73-74; Vogt 1968, 1969).

Shrine groups are not a Classic period feature. Rather, they arise during the Terminal Classic period along the Caribbean coast (Andrews and Andrews 1975; Freidel and Sabloff 1984). Freidel and Sabloff (1984:54) indicate that "shrine groups are characterized by the presence of several religious structures and the absence of identifiable dwellings." Shrine groups on Cozumel were patio-focused groups consisting of several buildings constructed around a central space. These groups were primarily made up of small roofed masonry shrines, however, they could include other kinds of non-residential structures (Freidel and Sabloff 1984:99). Considered as a whole, Group 4 and the buildings around Plaza D exhibit some traits of a shrine group. Structures 36, 37, and 38 are simple platforms and may have been shrines; however, they have not been excavated. Any of the perishable buildings on Structures 33 or 34 could have been shrines; however existing data is equivocal. Additionally, very few identifiable censer fragments were recovered from the surface of Group 4, which is unusual for a ritual area. It is certainly possible that Group 4 and Plaza D served some ritual functions, however current evidence points to the space being used primarily for politically motivated gatherings.

5.6 Conclusions

In this chapter, I argue that Group 4 functioned as the primary civic center at Actuncan during the Terminal Classic period. Based on its form, I argue that the complex was primarily used to host community-wide political gatherings that included dancing and feasting. Additionally, Structure 35 served as a council house where Actuncan's community leaders gathered. Architectural evidence of the remaining buildings Group 4 do not point to a specific function, though Structure 34a-2nd's form does hint that it was used for administration. Importantly, evidence for at least two construction phases during the Terminal Classic period indicate that Actuncan's Terminal Classic political organization was not a momentary phenomenon, rather it existed long enough that the community decided to commit additional labor to a renovation effort.

In Chapter 3, I argued that political reorganization is not truly novel. Rather, it is sparked by "remembering," to use the terms of resilience theory. Sometimes societies follow a template regeneration and reorganize nearly the same as they were before (Bronson 2006:140). Other times, however, communities draw on other inspirations to modify their political institutions to fit the needs of a new era. Bronson (2006:138-139) calls this kind of process stimulus regeneration and points specifically to external influences and historical political models as possible stimuli. Bronson (2006:139) provides the example of how in the 1780s the United States adopted the terminology of the Roman republic despite the incredible cultural and historical differences between the formation of the Roman republic and the United States democracy. The two systems are inevitably quite different because of the temporal distance between the two and the partial nature of Roman records. Similarly, Masson et al. (2006) discuss the how the formation of Mayapán was based on a selective remembering of Chichen Itza's political organization.

At Actuncan it is clear that the community did not readopt the hierarchical political organization of their Classic period predecessors. Rather, like the Terminal Classic communities in the Petén Lakes region (Schwarz 2009, 2013b), the Actuncan community exercised its agency to create a new social organization based on the inspiration of known concepts. Importantly, the corporate political strategy adopted by the Actuncan community maps on to trends in the lower Mopan River valley that began in the Late Classic period. LeCount (1999, 2001, 2005) has argued that ceramic evidence points to some inclusive feasting during the Classic period and that elite and commoner ceramic assemblages become increasingly homogenous with the onset of the Terminal Classic period. Additionally, Yaeger (2010a:154) notes that the construction of a building with three thrones at Xunantunich marks a decentralization of power at the end of the Late Classic period. Separately, Robin et al. (2014; 2012b) have documented corporate political strategies at the village level during the Classic period. To some extent, the inclusive political strategies evident at Actuncan are simply an extension of this trend. Indeed, I suspect that the Actuncan community "remembered" the inclusive political strategies practiced in rural secondary centers. These locations were not necessarily dominated by a centralized authority during the Classic period, and their relative egalitarianism could have provided an inspiration for Actuncan during its reorganization. In Chapter 9, I will also argue that the community may also have remembered Actuncan's shared Preclassic power structure as an inspiration for their Terminal Classic inclusive strategies.

Chapter 6. ACTIVITY AREAS ON GROUP 4

6.1 Introduction

The previous chapter presented architectural data, which indicated that Group 4, and specifically Structure 35, was constructed to serve as a council house and to facilitate an inclusive corporate political strategy. While this architectural data embodies the political ideology intended by the Terminal Classic community when they constructed Group 4, it does not directly trace the use of the civic complex. In this chapter, I evaluate direct evidence for the kinds of activities that took place within Group 4. I draw primarily on evidence from microartifacts and the distribution of elemental signatures collected from the floors of Group 4. These proxies provide a direct record of activities that took place *in situ*. In contrast, the distribution of traditional artifacts more often reflects abandonment and post-abandonment processes rather than activities that took place during the building's occupation (LaMotta and Schiffer 1999; Lamoureux-St-Hilaire et al. 2015; Schiffer 1987; Stanton et al. 2008). As a result, artifacts on occupation surfaces are unreliable markers of primary activities. I also targeted excavations in locations likely to yield middens; however, as discussed in the previous chapter, none were encountered. As a result, macroartifacts are largely omitted from the discussion of activities presented in this chapter.

The presence of a council house may indicate that Terminal Classic Actuncan's leaders adopted a corporate power strategy focused on inclusionary social practices (Blanton et al. 1996). Certainly the adoption of a corporate political strategy would fit the Terminal Classic period trend towards increasingly equal distribution of ceramic types in the upper Mopan River valley (LeCount 1999). Based on the detailed description of council houses presented in the previous chapter, these spaces should be associated with public festivals, including feasting and dancing. While dance spaces are difficult to define in the archaeological record, activities related to public food preparation and consumption may be apparent in microartifact and soil chemistry data. Wells et al. (2007) summarized the corpus of ethnoarchaeological research into the chemical signatures left by food production and consumption. Interestingly, food consumption and production typically have different signatures. Food consumption and refuse disposal are associated with high levels of phosphorous, whereas areas dedicated to cooking are often associated low phosphorous (Barba and Bello 1978; Barba and Denise 1984; Barba and Ortiz 1992; Barba et al. 1995). Wells et al. (2007:217) argue that this pattern is produced because the deposition of wood ash prevents phosphorous from being retained in the soil. Cooking has other positive correlates. Wood ash is frequently represented by enriched levels of magnesium and potassium (Barba et al. 1995; Fernández et al. 2002; Middleton and Price 1996).

Activity area data also may provide evidence to falsify the hypothesis that Group 4 served as a council house or indicate that that this space served multiple functions. In Chapter 3, I provided three additional hypotheses for Actuncan's Terminal Classic political organization including continued hierarchical rule, a merchant oligarchy, and a theocratic rule. Each of these would imply that Group 4 was the venue for a different set of functions.

If Group 4 supported a continuation of hierarchical rule similar to the Classic period, I would anticipate that Group 4 would have been used in a manner similar to Classic period palaces. Several studies have targeted the geochemical signatures of palaces as a way to understand the function of a type of space where artifacts are rarely found *in situ* (Cook et al.

2006; Inomata et al. 2001; LeCount et al. 2016; Terry et al. 2004; Wells et al. 2000). Based on these previous palace studies, I would anticipate the presence of different activity areas located in discrete zones within Group 4. Indoor areas, in particular, would each be expected to have a discrete function. Typically, central rooms were reserved for administration and political activities, whereas side rooms were used for elite domestic activities, including food preparation and elite crafting activities. Notably, elite craftwork often involved mineral pigments that leave distinctively high concentrations of heavy metals. Furthermore, evidence for the nature of Late Classic feasting practices in the lower Mopan River valley indicate that elites participated in private, possibly even one-on-one, feasting practices (LeCount 2001). As a result, I would anticipate finding indicators of indoor food consumption including high levels of P and ceramic microartifacts.

It is difficult to know what activity signatures would indicate that Group 4 served a mercantile function. However, the buildings around Group 4 may have served as market stalls and centers of administration. In this case, I would anticipate activity signatures similar to those used to identify ancient Maya markets (Cap 2015b). Like a palace, I would expect to find discrete crafting zones. However, I would expect the microartifacts to indicate that quotidian crafting with widely available materials such as chert and obsidian would be more prevalent then elite craft production. Palace production, in contrast, would have focused on elite crafts, including ceramic painting and lapidary work with exotic stones, such as slate and greenstone.

Ritual activities are difficult to define just using activities proxies. However, macroartifacts are more salient in understanding the possible ritual use of Group 4. In particular, I would anticipate the recovery of a large quantity of censer fragments and artifacts used primarily in ritual situations. In spite of the fragmentary nature of the Group 4 ceramic assemblage, very few censer fragments were recovered from Group 4 and we encountered no evidence of special ritual objects on the surface of Group 4. While ritual practitioners may well have used the Group 4 patio as a performance venue, evidence does not point to Group 4 having a primary ritual function.

In the section that follows, I review the geochemical evidence to identify activity zones located within Group 4. These zones are then compared to the distribution of microartifacts. In conclusion, I determine that activity area proxies support the hypothesis that Group 4 served as a council house and venue for events put on in support of an inclusive corporate political strategy.

6.2 Results of Geochemical Analysis

In total 279 sediment samples collected from the surface of Group 4 were analyzed for this study (Figure 6.1). The samples derived from all operations located on the surface of Group 4 and therefore provide a window all of the group's built spaces and its open patio. Using the methods described in Chapter 4, the calibrated concentrations of 20 elements were determined: barium (Ba), calcium (Ca), cobalt (Co), chromium (Cr), copper (Cu), iron (Fe), mercury (Hg), potassium (K), magnesium (Mg), manganese (Mn), sodium (Na), nickel (Ni), phosphorus (P), lead (Pb), strontium (Sr), titanium (Ti), uranium (U), vanadium (V), yttrium (Y), and zinc (Zn). These concentrations were compared to eight off-site controls collected by Wells and Fulton and first reported by Fulton (2015b:95-97) and LeCount et al. (2016:Table 1). All chemical concentrations were reported in parts per million (ppm) and are presented in full in Appendix G.

The chemical signatures were analyzed in three steps. First, summary statistics and boxplots were produced to evaluate the structure of the data. Second, a series of hypothesis tests considered the difference in elemental concentrations between the Group 4 samples and the off-

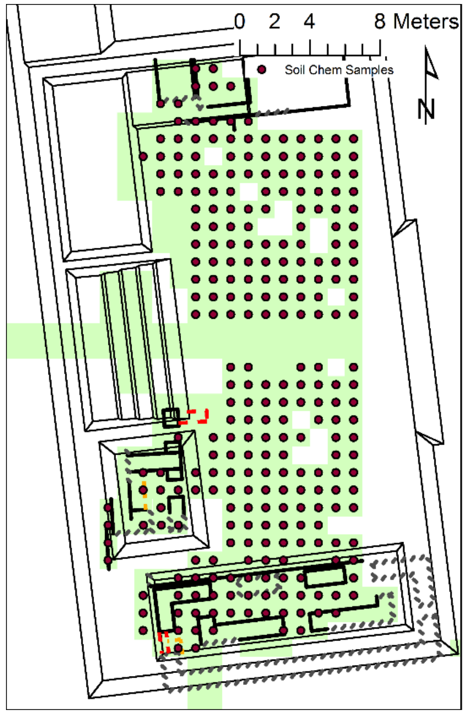

Figure 6.1. Map showing the location on Group 4 of soil chemistry samples discussed in this chapter.

site samples. These tests informed which elemental concentrations were most likely to derive from anthropogenic inputs. Third, a principle component analysis evaluated whether the variation in certain elements might correspond to similar inputs. All statistical analyses were performed in R 3.2.3 (The R Foundation for Statistical Computing, Vienna). Finally, interpolated distribution maps of each considered element were produced in ArcGIS 10.3 (ESRI, Inc., Redlands, California). Similar distribution maps were produced to map the factors output by the principle component analysis.

The first step is to evaluate which elements might be useful for evaluating anthropogenic activities. Table 6.1 and Figure 6.2 summarize the results of the Group 4 samples. Elements with large ranges and high standard deviations are more likely to have resulted from anthropogenic inputs (Wells et al. 2007:221). A large amount of variability indicates that an element was not deposited homogeneously across the space. On Group 4, Ca, K, Mg, Na, and P have large ranges and standard deviations and may have resulted from anthropogenic inputs. Despite being by far the most concentrated element, calcium is excluded from further analysis. Both the plaster surface of Group 4 and the underlying construction materials are primarily composed of Calcium Carbonate ($CaCO_3$). As a result, the sampled sediments are highly calcareous, and Ca overwhelms the concentrations of all other elements. Note that Ca exhibits the smallest coefficient of variation of any element. The low value of this scaled measure of variability points to relative homogeneity of Ca in the sampled sediments.

Table 6.2 and Figure 6.3 summarize the elemental results of the off-site sample analysis. These off-site samples provide a useful base of comparison to evaluate which elemental concentrations resulted from anthropogenic inputs. As with the Group 4 samples, Ca was excluded from the boxplot.

The soils from Group 4 were compared to the soils from the off-site samples to evaluate which elemental concentrations were most likely were impacted by anthropogenic inputs. I used a series of two-tailed Kolmogorov-Smirnov tests to determine if the concentrations of each element from Group 4 and off-site drew from different distributions (

Table 6.3). If an element was impacted by anthropogenic inputs, I would expect to reject the null hypothesis at $\alpha = 0.05$. If the null hypothesis that the Group 4 samples and offsite samples draw from the same distribution of an element's concentrations cannot be rejected, then it is possible the variation in concentration results from variation in the local geology. In total, the null hypothesis was rejected for 14 elements: Ca, Cr, Fe, Hg, K, Mg, Na, P, Pb, Sr, Ti, U, V, and Y. For the other 6 elements, Ba, Co, Cu, Mn, Ni, and Zn, the concentrations on Group 4 cannot be shown to follow a different distribution than those naturally occurring in the local geology.

Table 6.1. Summary statistics of Group 4 soil data.

Summary Statistics for Group 4 Soils							
Element	**Min**	**Max**	**Range**	**Mean**	**Median**	**Standard Deviation**	**Coefficient of Variation**
Ba	0	7.92	7.92	3.67	3.43	1.16	31.52
Ca	113.38	12501.71	12388.32	8958.02	8964.99	1479.88	16.52
Co	0	0.09	0.09	0.04	0.04	0.01	23.17
Cr	0	0.07	0.07	0.03	0.03	0.01	44.45
Cu	0	0.77	0.77	0.18	0.18	0.09	50.66
Fe	0	2.16	2.16	0.44	0.42	0.29	66.52
Hg	0	0.02	0.02	0	0	0	238.26
K	0.54	85.09	84.55	19.74	15.71	15.75	79.8
Mg	0.73	105.87	105.14	57.8	56.49	15.34	26.55
Mn	0.06	12.41	12.36	4.93	4.89	1.46	29.63
Na	0.19	44.04	43.85	15.45	15.63	3.82	24.73
Ni	0	3.45	3.45	0.5	0.5	0.21	41.33
P	0	120.9	120.9	17.69	14.84	14.24	80.51
Pb	0	0.15	0.16	0.03	0.03	0.02	65.3
Sr	0	4.92	4.92	3.67	3.65	0.64	17.44
Ti	0	0.89	0.89	0.19	0.16	0.13	70.44
U	0	0.01	0.01	0	0	0	132.31
V	0	0.81	0.81	0.32	0.29	0.17	54.11
Y	0	0.15	0.15	0.06	0.06	0.03	56.99
Zn	0	4.32	4.32	0.73	0.7	0.42	57.67

The soils from Group 4 were compared to the soils from the off-site samples to evaluate which elemental concentrations were most likely were impacted by anthropogenic inputs. I used a series of two-tailed Kolmogorov-Smirnov tests to determine if the concentrations of each element from Group 4 and off-site drew from different distributions (

Table 6.3). If an element was impacted by anthropogenic inputs, I would expect to reject the null hypothesis at $\alpha = 0.05$. If the null hypothesis that the Group 4 samples and offsite samples draw from the same distribution of an element's concentrations cannot be rejected, then it is possible the variation in concentration results from variation in the local geology. In total, the null hypothesis was rejected for 14 elements: Ca, Cr, Fe, Hg, K, Mg, Na, P, Pb, Sr, Ti, U, V, and Y. For the other six

Table 6.2. Summary statistics for off-site soil data

Summary Statistics for Off-site Soils							
Element	**Min**	**Max**	**Range**	**Mean**	**Median**	**Standard Deviation**	**Coefficient of Variation**
Ba	2.1	6.68	4.59	4.65	4.6	1.62	34.77
Ca	424.16	8332.8	7908.64	4682.45	6326.67	3521.75	75.21
Co	0.02	0.08	0.06	0.04	0.04	0.03	58.73
Cr	0.05	0.1	0.05	0.09	0.09	0.02	18.75
Cu	0.08	0.26	0.17	0.16	0.14	0.06	38.61
Fe	4.53	29.5	24.96	14.03	9.69	9.93	70.78
Hg	0	0	0	0	0	0	0
K	8.65	14.21	5.56	11.53	11.55	2.2	19.13
Mg	17.87	52.25	34.38	36.88	36.76	13.56	36.76
Mn	3.25	7.16	3.91	5.08	5.13	1.38	27.07
Na	1.27	4.09	2.82	2.97	3.42	1.05	35.2
Ni	0.26	0.6	0.34	0.48	0.49	0.11	22.24
P	0	0.83	0.83	0.32	0.19	0.36	114.49
Pb	0.14	0.28	0.14	0.19	0.16	0.06	30.24
Sr	0	2.52	2.52	1.24	1.72	1.05	85.31
Ti	0.07	0.14	0.07	0.11	0.11	0.03	23.21
U	0	0.01	0.01	0.01	0.01	0	43.76
V	1.46	2.02	0.56	1.75	1.72	0.23	13.28
Y	0.4	0.81	0.4	0.69	0.76	0.16	22.98
Zn	0.51	0.82	0.31	0.66	0.62	0.11	16.34

elements, Ba, Co, Cu, Mn, Ni, and Zn, the concentrations on Group 4 cannot be shown to follow a different distribution than those naturally occurring in the local geology.

Among the remaining elements, several exhibit lower concentrations in the anthropogenic environment of Group 4 than off-site. Because activity area studies are based on an analysis of soils enriched through anthropogenic activities, elements of interest should not have concentrations below the level of off-site samples. Either concentrations should exhibit significant enrichment, or if they fall within the natural range, they should exhibit a significantly larger variance. To eliminate elements with lower concentrations in the anthropogenic environment than off-site, I performed a one-sided Welch's *t*-test for each element to evaluate

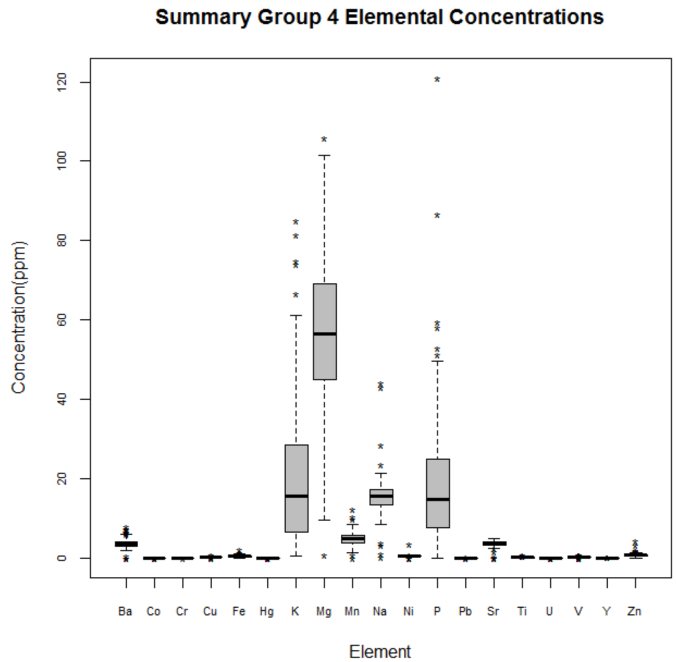

Figure 6.2. Side-by-side boxplots of elemental concentrations from Group 4 samples. Graph generated in R 3.2.3.

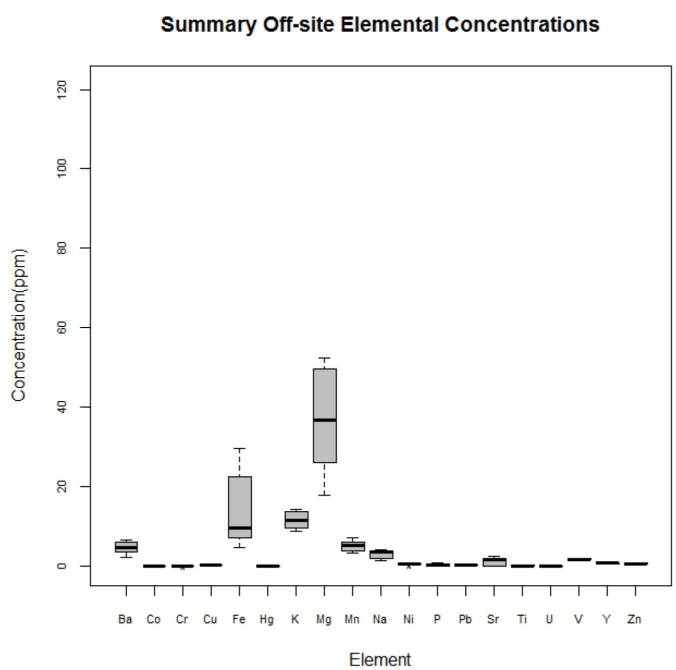

Figure 6.3. Side-by-side boxplots of off-site elemental concentrations. Graph generated in R 3.2.3.

Table 6.3. Statistical comparison of elemental distributions between on- and off-site samples.

Comparisons between Group 4 Soil and Off-site Soils				
Element	**Kolmogorov-Smirnov p-value**	**Reject H_0 at α = 0.05?**	***t*-test p-value**	**Reject H_0 at α = 0.05?**
Ba	0.10	cannot reject	0.07	cannot reject
Ca	1.8E-05	reject	0.99	cannot reject
Co	0.15	cannot reject	0.30	cannot reject
Cr	7.6E-07	reject	8.7E-06	Reject
Cu	0.16	cannot reject	0.79	cannot reject
Fe	3.5E-07	reject	3.1E-03	Reject
Hg	3.5E-05	reject	1.00	cannot reject
K	0.02	reject	1.00	cannot reject
Mg	0.01	reject	1.00	cannot reject
Mn	0.96	cannot reject	0.39	cannot reject
Na	9.6E-13	reject	1.00	cannot reject
Ni	0.76	cannot reject	0.72	cannot reject
P	2.0E-06	reject	1.00	cannot reject
Pb	1.8E-14	reject	4.5E-05	Reject
Sr	6.8E-07	reject	1.00	cannot reject
Ti	0.01	reject	1.00	cannot reject
U	8.8E-14	reject	2.6E-04	Reject
V	3.5E-07	reject	1.9E-07	Reject
Y	2.9E-15	reject	4.9E-06	Reject
Zn	0.33	cannot reject	0.92	cannot reject

the null hypothesis that the mean concentration of each element is greater than or equal to the off-site concentration (

Table 6.3). A rejection of this hypothesis confirms that the anthropogenic concentrations are lower and therefore not analytically useful. Of the elements that remained after the Kolmogorov-Smirnov test, Cr, Fe, Pb, U, V, and Y were rejected by the *t*-test at α = 0.05. For these elements, the mean concentration in Group 4's anthropogenic setting is significantly lower than in the off-site samples. Most likely the difference in the concentrations of these metals results from differences in the tested substrate. On Group 4, the substrate is calcareous – composed mostly of lime plaster and limestone fill. The off-site samples, on the other hand, were collected from the alluvial clay substrate on which Actuncan was constructed. This substrate evidently contains higher concentrations of these metals than local limestone deposits. Because these elements are not enriched above off-site concentrations, they are excluded from further consideration.

After these two tests, Ca, Hg, K, Mg, Na, P, Sr, and Ti remain in consideration. Calcium was previously rejected because lime plaster is a primary component of the sampled occupation surface. Additionally, Na is considered to be too unstable to be analytically useful in archaeological contexts. Ethnoarchaeological studies have shown that Na leaches quickly from occupation surfaces, reaching background levels within five years of abandonment (Fernández et al. 2002:507; Middleton and Price 1996:681). Therefore, Na is also excluded from this study of anthropogenic chemical inputs.

Among the remaining six elements, Hg exhibits the greatest relative variation, likely due to the incredibly very low concentrations of this element. Because of its low concentrations, the concentrations of Hg were below the detection limits of the ICP-AES in most samples, I will not pursue further analysis of Hg. K, P, and Ti vary to a relatively high degree, with coefficients of variation ranging between 70.44% and 80.51%. Mg and Sr vary to lesser degrees (coefficients of variation are 26.55% and 17.44% respectively). According to Pearson's linear correlation coefficients, no significant ($p \leq 0.01$) strong correlations ($r \leq -0.7$ or ≥ 0.7) exist between these six elements.

A principle component analysis (PCA) was conducted using a correlation matrix based on the concentrations of K, Mg, P, Sr, and Ti to determine which chemicals contribute most to variation across the Group 4 samples. The results of the first two factors, which account for 76.8% of the variance, are presented in a scatterplot (Figure 6.4). Factor 1, which explains 56.4% of the variance, K, Mg, P, and Ti contribute nearly equally. In contrast, factor 2, which explains

20.4% of the variance, is heavily driven by variability Sr. I argue that factor 1 likely represents anthropogenic inputs, while factor 2 may represent the natural occurrence of small quantities of $SrCO_3$ in limestone. Indeed, within the Group 4 samples a Pearson's linear correlation coefficient of Ca and Sr returns a significant ($p < 0.01$) strong correlation ($r = 0.7$) indicating that the two elements co-vary across the surface of Group 4.

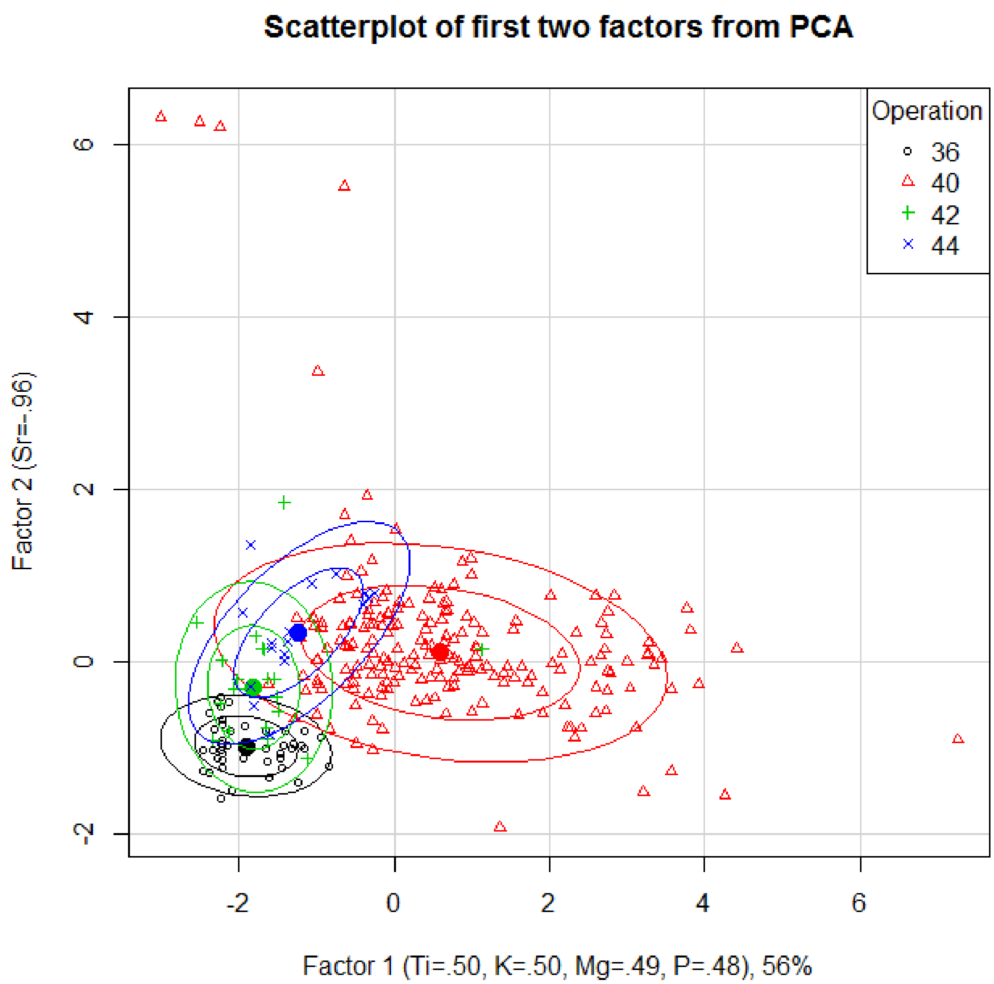

Figure 6.4. Scatterplot of the first two factors of a principle component analysis of the concentrations of K, Mg, P, Ti, and Sr.

In the PCA scatterplot, I have also identified samples from each Group 4 operation with a different symbol and color. This allows me to evaluate whether Group 4's different spaces are differentiated chemically. Colored ovals drawn on the scatterplot show the mean and first two standard deviations of the plotted factors grouped by operation. Overall, the patio shows evidence of substantially more variation than any of the three structure surfaces. Each of the structures shows comparatively little internal variation across their floor surfaces, especially in factor 1. The greater variation and higher values of factor 1 in the patio may indicate that there is more evidence for activities in this patio space than in the comparatively quiet structures.

The PCA shows how the concentrations of different elements co-vary across the occupation surfaces sampled. In addition, it is instructive to evaluate how different elements are distributed spatially across the surface of Group 4. Initially, I chose to map 5 elements, K, Mg, P, Sr, and Ti, using the kriging function in ArcMap 10.3 (ESRI, Redlands, California). Kriging uses the known spatial distribution of data to interpolate unknown values in between known values (Wells et al. 2007). Kriging assumes that variables follow a stochastic process, which is modeled by a variogram model. A stochastic model is appropriate for soil chemistry because it is assumed that local inputs can cause large variation in elemental concentrations between nearby points. As a result, it is undesirable to use a model that smooths the data too heavily. The kriging model allows the degree of correlation to change based on the spatial distribution of the data whereby adjacent samples are treated as having some degree of correlation, while those spread further apart are treated as independent. Variance in the modeled variable acts as a weighting function. The result is a raster density map that estimates the value of every cell, using a variance curve to fill in missing data by producing the best fit.

In ArcMap 10.3, I used the Geostatistical Wizard in the Geostatistical Analyst toolbar to produce kriged density maps of each element. To best model the data for each element, semivariogram models were fit to the data in Geostatistical Wizard. The nugget and partial sill were set to be automatically calculated by Geostatistical Wizard based on the model chosen. Different models were utilized depending on the organization of the data. I present the semivariogram models next to each kriged map included in this chapter. In each semivariogram plot, the x-axis represents the distance between samples while the y-axis represents the variance of the plotted element's concentration between samples. The blue crosses are the means of observations binned by distance. These form the baseline for fitting the semivariogram model, represented by the blue line. Importantly, a close correspondence between the fit line and the binned means indicates that the model used to produce the kriged map is appropriate to the data. In each map, the kriged concentrations are represented by a blue to red color gradient. The more intense the blue, the lower the concentrations of the represented element. The more intense the red color, the higher the concentrations of the represented element.

In terms of expectations, areas with intense concentrations, represented by a stronger red signature, likely represent areas where activities took place that led to the deposition of the represented element. Discrete concentrations of elements likely indicate specialized activity spaces. In contrast, more generalized concentrations with tapering borders may indicate repeated lower intensity use or use for activities are were not location specific. Additionally, areas where high concentrations of multiple elements are observed, may point to activities that deposited multiple elements.

Phosphorous is typically considered to be the most basic measure of human activity, resulting from the breakdown of organic materials. As a result, phosphorous has often been used as a prospecting tool to find middens or buried evidence of human occupation. Importantly, in comparison to the off-site samples P is enriched across the surface of Group 4, indicating that the whole space was the site of generalized human activity. However, the distribution map shows clear patterning as well (Figure 6.5). In general, the Group 4 patio contained substantially higher quantities of P than the structure surfaces. In particular, the northeast portion of the patio shows a particularly high enrichment, centered on a point near the patio's centerline. An additional hotspot is focused in front of Room 2 of Structure 34a. These two zones of high P may represent more location specific zones of activities.

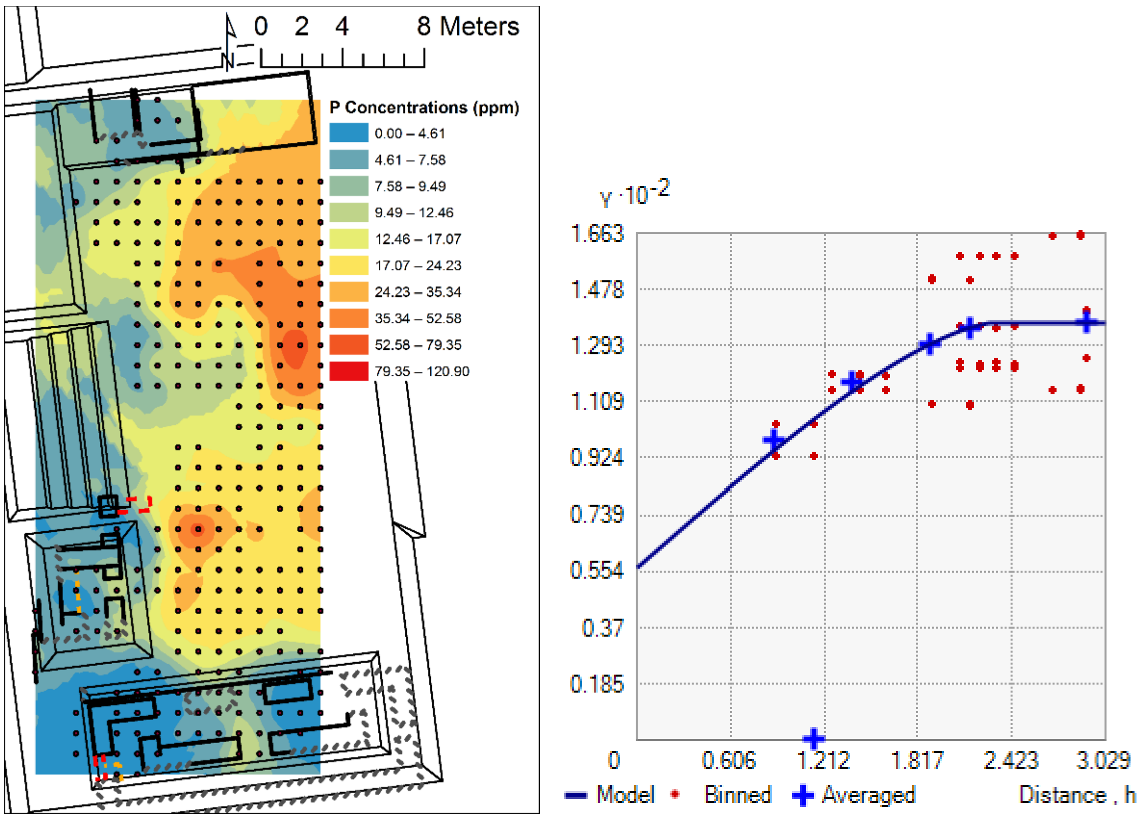

Figure 6.5. Kriged interpolation showing trends in the concentration of P across Group 4. Kriging is based on the variogram on the right.

Potassium concentrations form a different pattern. The offsite values range from 8.65 ppm to 14.21 ppm, therefore there is a higher threshold before we can attribute the elevated concentrations to human activity. As with P, the highest concentrations of K are evident in the northeast corner of the Group 4 patio (Figure 6.6). Interestingly, the area of highest concentration is located several meters north of the most intense concentrations of P. The southern half of the patio also has slightly elevated concentrations of K; however, these concentrations are limited in comparison to the northeast corner of the patio. The distribution of K is often attributed to the deposition of wood ash. As a result, K points to the presence of burning, which can indicate food production (especially when accompanied by P) or ritual activities.

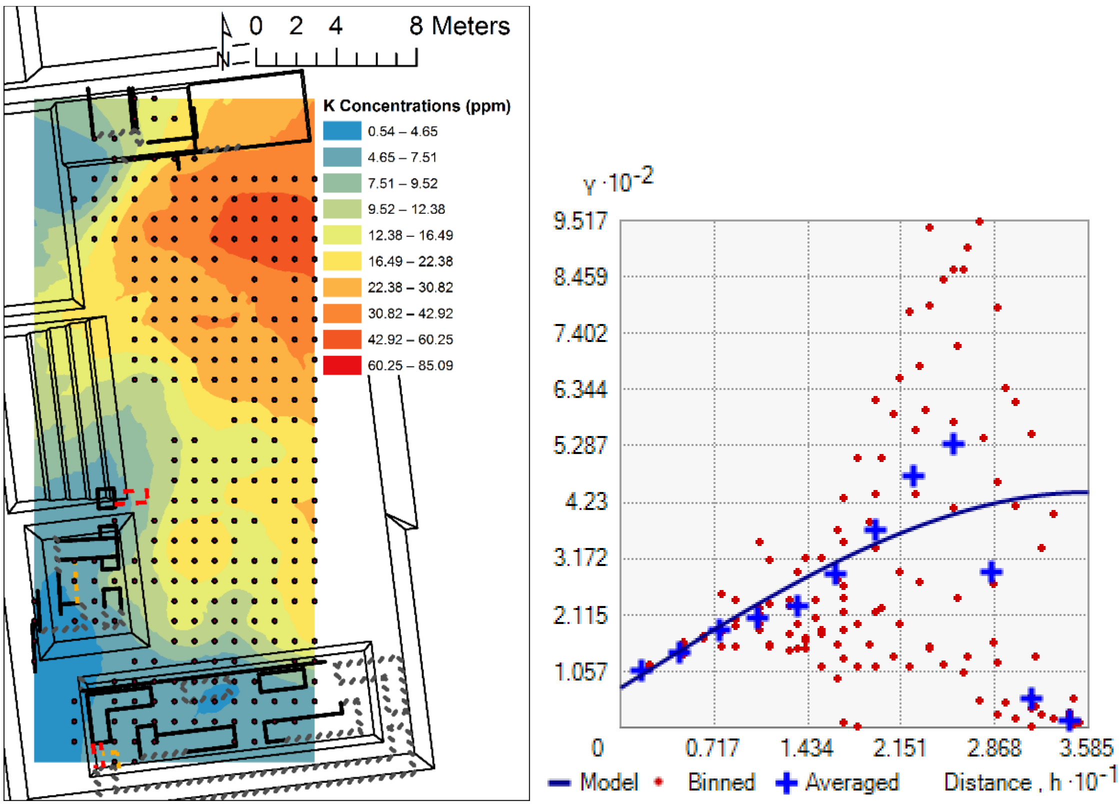

Figure 6.6 Kriged interpolation showing trends in the concentration of K across Group 4. Kriging is based on the variogram on the right.

The spatial distribution of magnesium overlaps substantially with K and P (Figure 6.7). Like K, Mg naturally occurs at above trace levels. The off-site samples registered a natural range between 17.47 ppm and 52.25 ppm. Quantities within this range from Group 4 should not be considered anthropogenic. The largest Mg-enriched zone is located in the northeast corner of the

Group 4 patio, though an additional area of enrichment is located along the front of Structure 35. The overlap between Magnesium and K is strong. The Pearson's correlation coefficient is 0.68 ($p < 0.0001$), just short of the cutoff for a strong correlation. Like K, Mg is associated with the deposition of wood ash, particularly hearths (Wells et al. 2007).

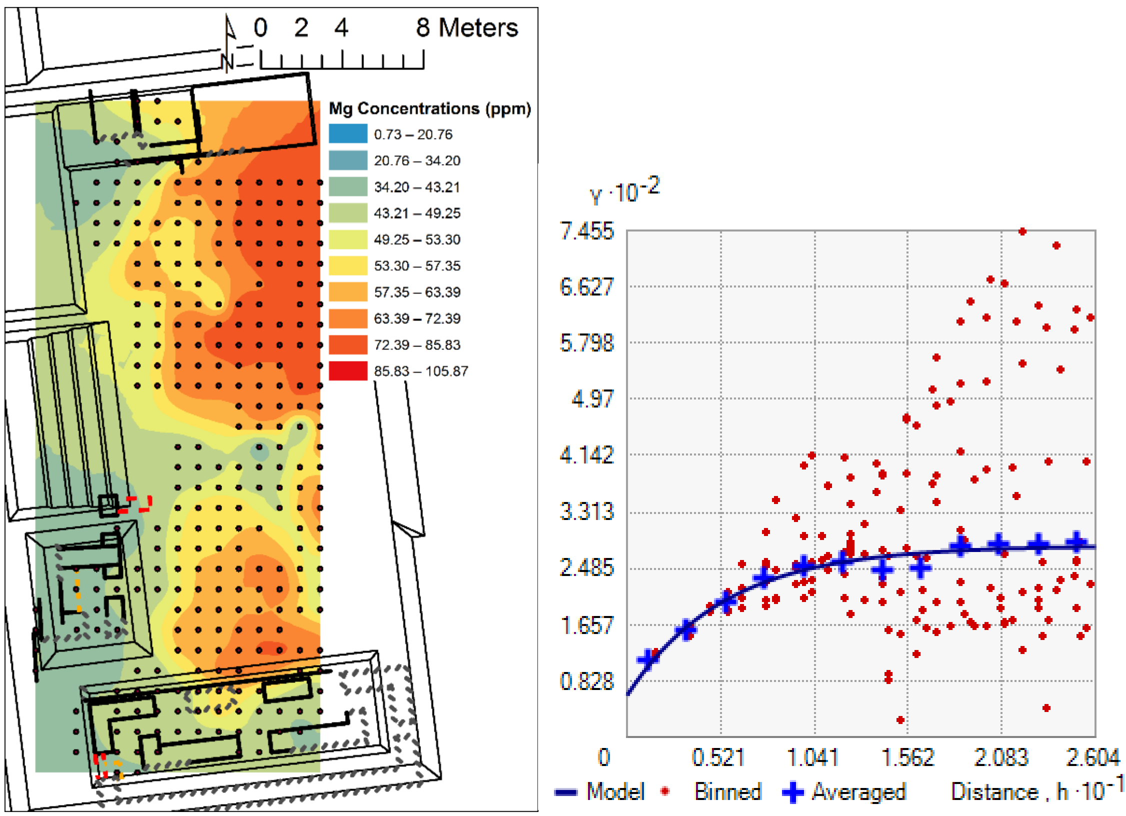

Figure 6.7. Kriged interpolation showing trends in the concentration of Mg across Group 4. Kriging is based on the variogram on the right.

Titanium is only evident in small concentrations; however these concentrations are well above those evident in the off-site samples. In particular, concentrations overlap substantiantially with Mg-enriched zones (Figure 6.8). Ti is often present in trace amounts in areas of burned organics and can be used to distinguish between hearths and ovens. The latter tend to contain elevated levels of Ba and Fe, rather than Ti (Wells et al. 2007:217-218).

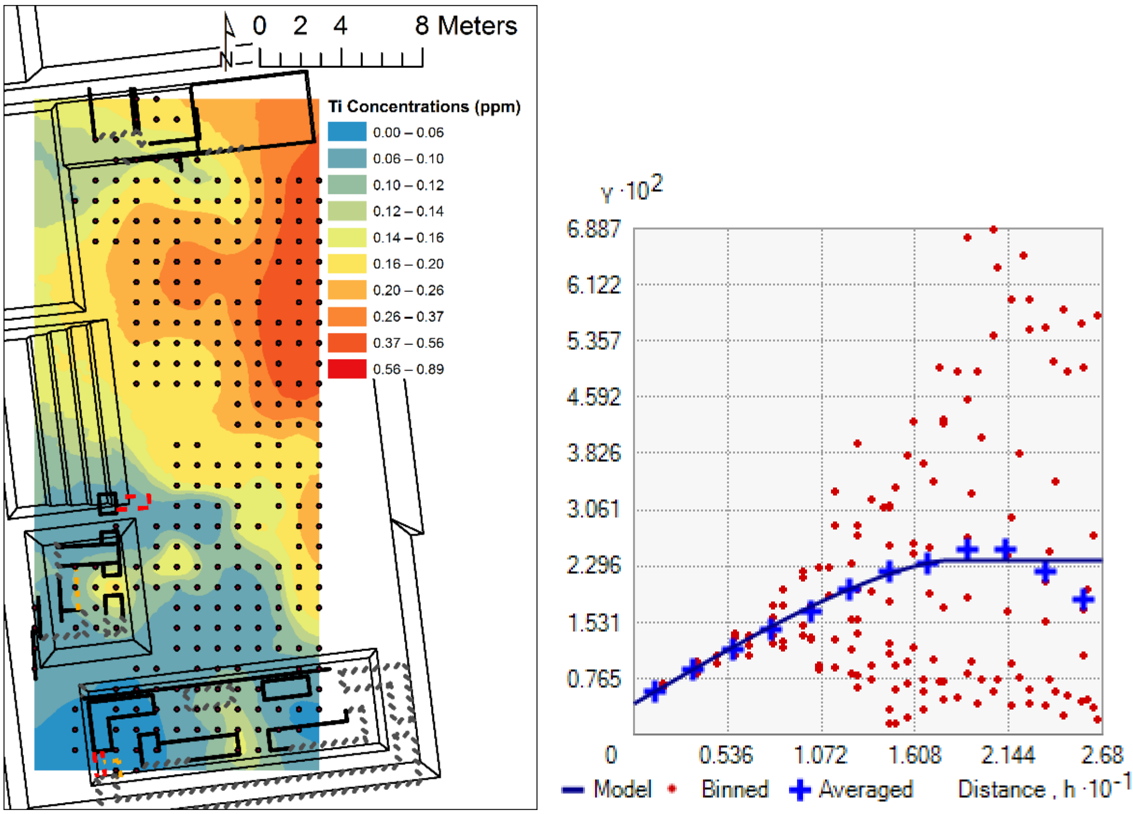

Figure 6.8. Kriged interpolation showing trends in the concentration of Ti across Group 4. Kriging is based on the variogram on the right.

Strontium was the final element that was mapped (Figure 6.9). The distribution of Sr is distinctive because it does not pattern with K, P, Mg, and Ti. Aside from a limited area of concentration in the northeast part of the patio, Sr concentrates in the structures and towards the patio's interior. Strontium is particularly strongly concentrated in Structure 35. Given that the overall variation in Sr is quite small relative to other elements from Group 4 (coefficient of variation = 17.44), the most straightforward anthropogenic explanation is that Sr is present in trace amounts in the lime plaster surfaces of the patio and structures. The greater concentrations of Sr in the buildings may have resulted from the better floor preservation.

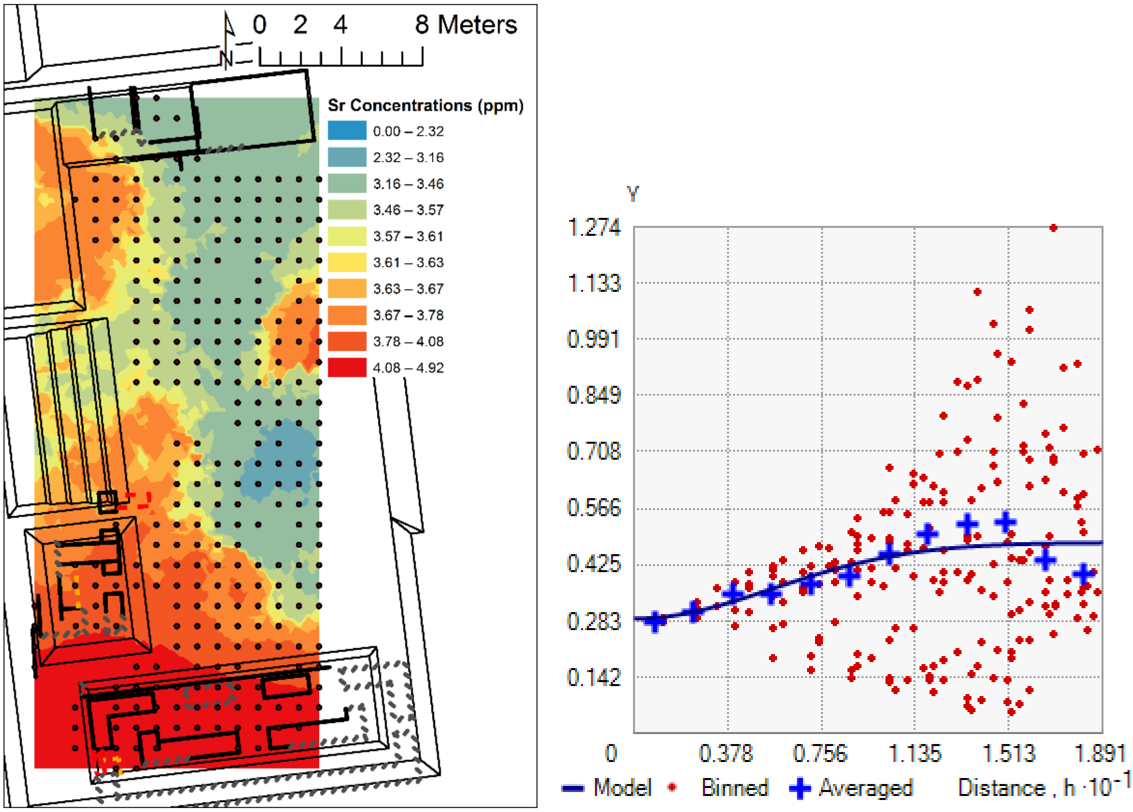

Figure 6.9. Kriged interpolation showing trends in the concentration of Sr across Group 4. Kriging is based on the variogram on the right.

In addition to these individual elements, I mapped the results of the PCA conducted with K, Mg, P, Sr, and Ti to look at how these elements varied together. Based on the individual maps of these elements, P, Mg, K, and Ti seemed to co-occur in the northeast corner of the Group 4 patio, while Sr seemed to largely vary independently of these other variables. As descibed earlier the PCA bore out this distinction. Factor 1 was weighted nearly equally by P, Mg, K, and Ti and described 50% of the variation in the data. The distribution map of factor 1 clearly indicates that the highest concentrations of these elements is located in the northeast corner (Figure 6.10). This combination of chemicals is often associated with food preparation (Fernández et al. 2002; Middleton and Price 1996).

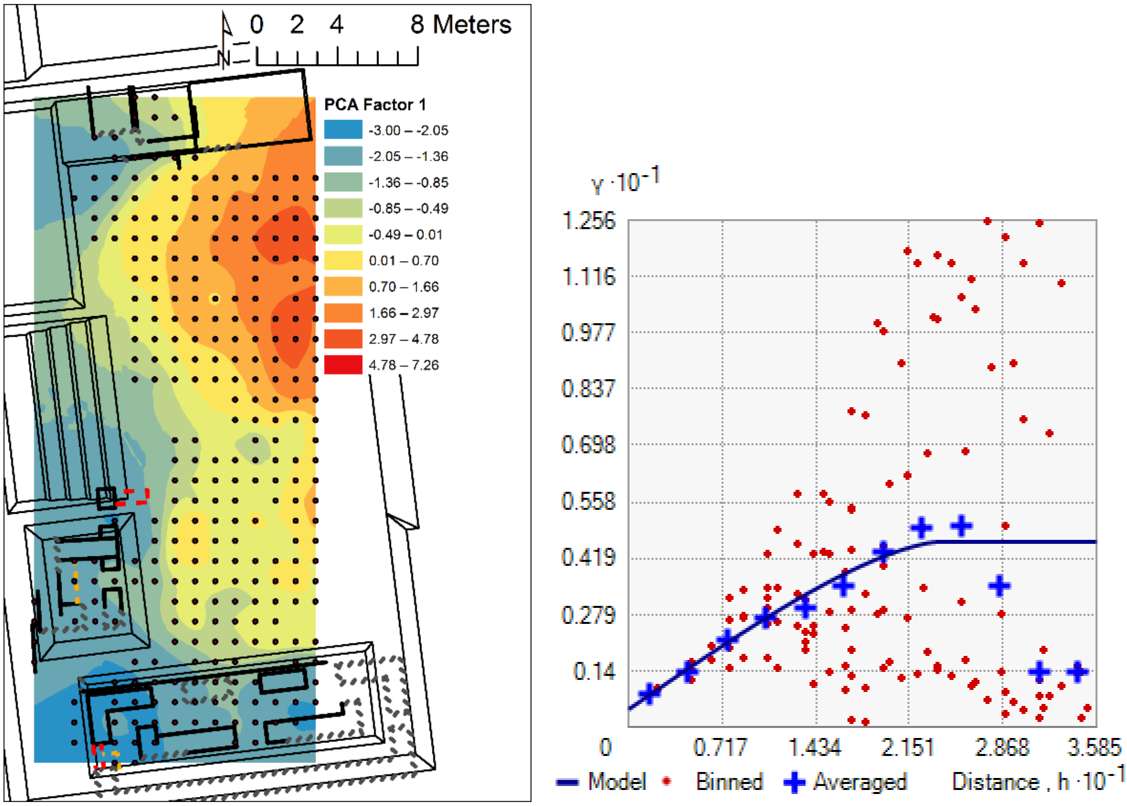

Figure 6.10. Kriged interpolation showing trends in PCA factor 1 across Group 4. Kriging is based on the variogram on the right.

Importantly, however, the proportion of P in food preparation often varies because the deposition of wood ash can alkalinize sediments resulting in lower adherence of P (Wells et al. 2007:215-217). This does not necessarily mean that P was not deposited, but rather that it was not retained by the sediments. Note in the distribution maps for the individual elements that the highest concentrations of P were several meters south of the highest concentrations of K, indicating the presence of a hearth surrounded by the remains of food. In the map of PCA factor 1, this separation is evident in the two separate lobes of the deepest red color.

Factor 3 of the PCA adds nuance to understanding the activity zones located in the northeast corner of Group 4's patio because it distinguishes between the wood ash combination

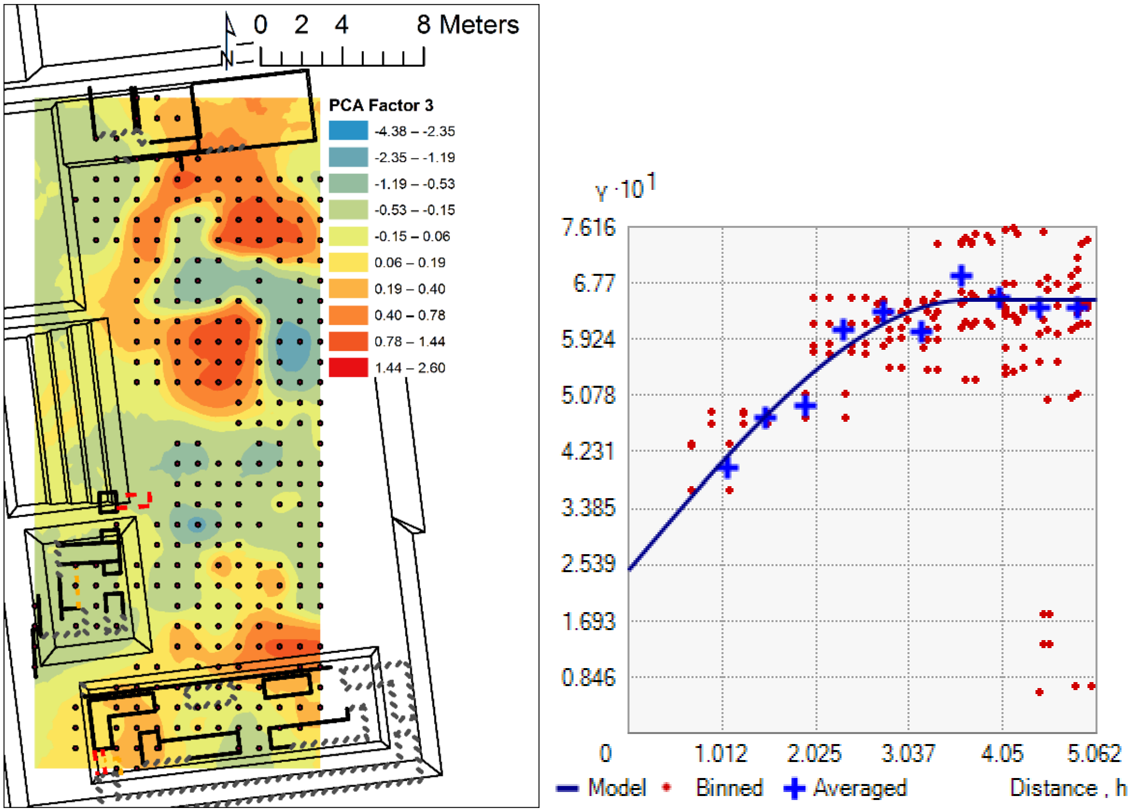

Figure 6.11. Kriged interpolation showing trends in PCA factor 3 across Group 4. Kriging is based on the variogram on the right.

of Mg/K and P. Factor 3 weights K and Mg positively (K=.50, Mg=.47) and P negatively (P=-.64). Therefore, blue zones reflect higher concentrations of P, while red zones reflect higher concentrations of Mg/K (Figure 6.11). It is important to note that factor 3 only reflects 11% of the total variation in the PCA model, much less than factor 1. The covarience of P, Mg, and K is a much stronger driver of the model. However, factor 3 does provide some insight into the nuanced differences in concentrations in the northeast corner where high concentrations of these three elements co-occur. Note that within the most northern portion of the Group 4 patio, factor 3 shows two primary areas of intense red and of intense blue. The blue spot corresponds to the highest concentrations of P, while the northern red lobe points to the highest concentration of K.

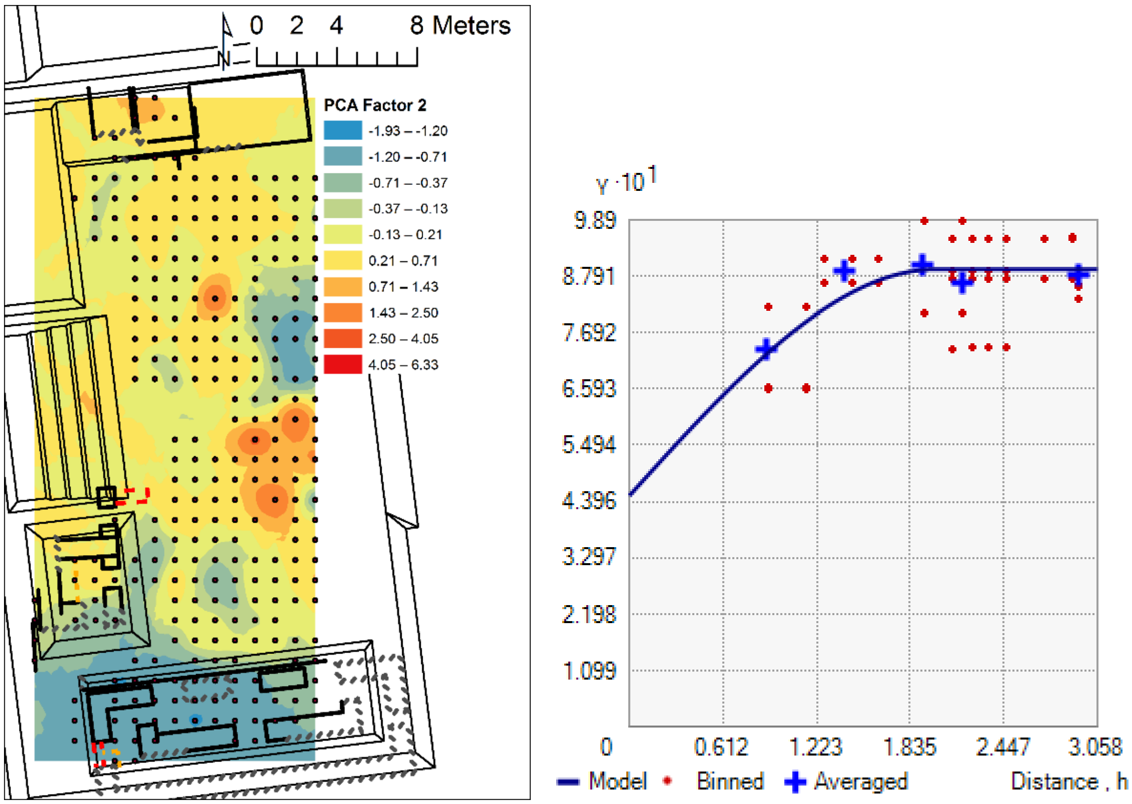

Figure 6.12. Kriged interpolation showing trends in PCA factor 2 across Group 4. Kriging is based on the variogram on the right.

If the area of highest K concentrations reflects the most intense deposition of wood ash, the pH change in this zone may have limited the retention of P in the immediate vicinity of the hearth.

Beyond the hearth, the high phosphorus levels rise again. This area where factor 3 is strongest may actually be the primary location of the hearth used on the surface of the the Group 4 patio. Future pH testing of archived samples could further clarify this possibility. In contrast, the area to the south where P is the highest may reflect the most intense presence of organics away from the fire itself. Interestingly, this location is near the patio's centerline at the top of the stairs. This zone of high phosphorous is located in the optimal location for the public to view food or offerings from Plaza D below. Therefore, the northeast corner may represent a generalized food preparation zone, however, it seems probable that this centerline location reflects an area for the performative presentation or offering of food goods.

PCA factor 2 is most heavily weighted by the inverse of Sr (Sr is weighted at -.96) and therefore shows nearly the inverse distribution of Sr (Figure 6.12). Even though Factor 2 explains 20% of the variation, it is so heavily weighted towards Sr, that it does not provide additional interpretive details.

6.3 Results of Microartifact Analysis

In total, 38970 microartifacts were analyzed from 132 samples collected from across the surface of Group 4. Although each artifact type was counted and weighed, the data here are evaluated in terms of counts. Additionally, I have limited my analysis to culturally produced microartifact types including ceramics, chert, obsidian, slate, and daub. These artifact types are commonly understood to have been produced by humans. In contrast, many of the other artifact types that I quantified are either naturally occurring, are a byproduct of construction materials, or are present in very small quantities. The data presented here are from a combination of the middle and small size fractions, between 0.635 cm and 0.159 cm. Artifacts from the largest size fraction, above .0632 cm, are not included because these fall within the size range of macroartifacts collected during routine screening of all soil and sediment. All presented data have been standardized by the volume of soil collected in a sample and should be understood as count per liter. Although the target volume for microartifact samples was 4 L of soil, in reality between 3.25 and 6 L were processed for each sample. Therefore, standardization was necessary.

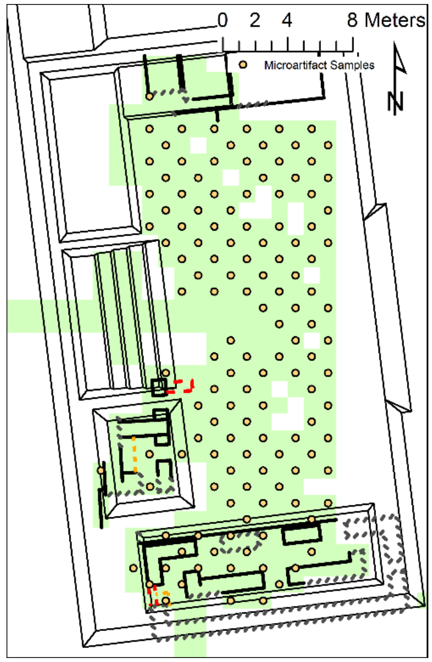

Figure 6.13. Map indicating the locations of microartifact samples analyzed for this study.

Table 6.4 provides summary statistics for five culturally derived microartifact classes. In general, slate, daub, and obsidian occurred only in very small quantities within a small proportion of the samples, whereas ceramics and chert were ubiquitous. There is, however, a fair amount of variation in the quantities of ceramic and chert microartifacts. Kriged maps were produced to evaluate trends in the distribution of ceramic and chert. Because most samples included no daub, obsidian, or slate, these microartifacts quantities are poorly suited to kriged interpolation. Instead, I have presented these data as a map of graduated dots that point to the areas of higher concentration. For all microartifact classes, interpretation must be based on broad spatial trends visible in the microartifact data. This is important because analysis must account for an unknown quantity of microartifacts that entered the sampled strata through bioturbation. Focusing on trends in the spatial data should limit the impact of random variation from bioturbation and instead identify areas of the sampled space with higher or lower quantities of

Table 6.4. Summary statistics of microartifacts from Group 4

Summary Statistics of Group 4 Microartifacts								
Type	**Ubiquity of 132 Samples**	**Min**	**Max**	**Range**	**Mean**	**Median**	**Standard Deviation**	**Coefficient of Variance**
ceramic	132 (100%)	0.29	13.05	12.77	3.65	3.00	2.36	64.54
chert	132 (100%)	3.60	36.75	33.15	9.03	8.21	4.30	47.58
obsidian	5 (3.8%)	0.00	0.22	0.22	0.01	0.00	0.04	506.02
slate	6 (4.5%)	0.00	1.25	1.25	0.02	0.00	0.12	646.30
daub	47 (35.6%)	0.00	4.51	4.51	0.30	0.00	0.64	216.02
All quantities are in count per L.								

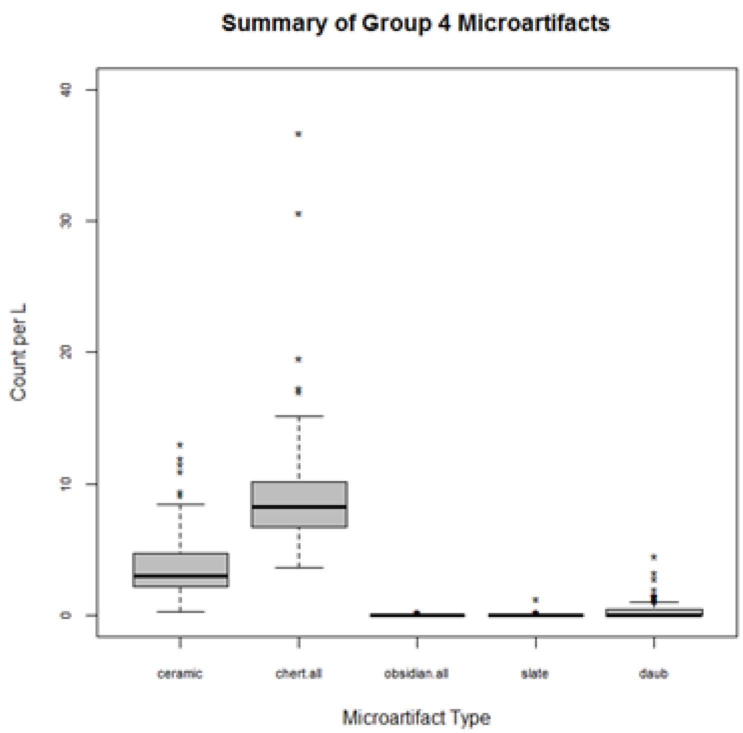

Figure 6.14. Side-by-side boxplots of ceramic, chert, obsidian, slate, and daub microartifact densities from samples collected from Group 4.

microartifacts deposited through human activity.

Ceramic microartifacts are produced through the breakdown of pots, either *in situ* or after deposition. The broad range of microartifact values indicate that microartifacts vary across space, while the presence of several outlier values indicate that a zone of particularly high density may exist. In the distribution map of microceramics, it is clear that microceramics cluster in two zones (Figure 6.15). First, they were encountered in their highest quantities on the northeast portion of Group 4's patio. This distribution clearly corresponds to the area of activity identified in the analysis of soil chemistry above. The highest density of ceramic microartifacts corresponds to the zone of greatest P enrichment. Cap (2015b) suggests that the combination of P and microceramics results from the repeated presence of food either served on or contained in ceramics. Over time, bowls and pots inevitably break, just as food drips and spills. The same accidents that produce broken bits of ceramics also result in the deposition of phosphates as these spilled organics decompose. An additional hotspot is located in the far northeast corner of Group 4, at the farthest reaches of the sampled zone. Widmer (2009) observed that corners often collect microartifacts due to the mechanics of sweeping practices. This location may represent either the deposition of debris from sweeping as provisional discard or the natural accumulation of small materials in corners. Similarly, ceramic microartifacts were encountered in somewhat elevated densities in the southwest corner of Group 4, behind Structures 34a and 35. This small, poorly understood corner would have been an ideal space for the temporary collection of refuse, perhaps before its disposal in the natural ravine just to the south of Group 4.

Returning briefly to the northeast portion of the Group 4 patio, note the dip in microceramic quantities in the area containing the highest concentrations of K. If this area was the primary location of a hearth, the lower microceramic quantities may indicate that ceramic breakage took place most intensely in food consumption areas, rather within the immediate environs of the hearth. This hypothesis is also supported by the elevated P in the area of highest ceramic microartifacts. The primary area of food consumption was also likely the place where the most dishes were accidentally (or intentionally) broken.

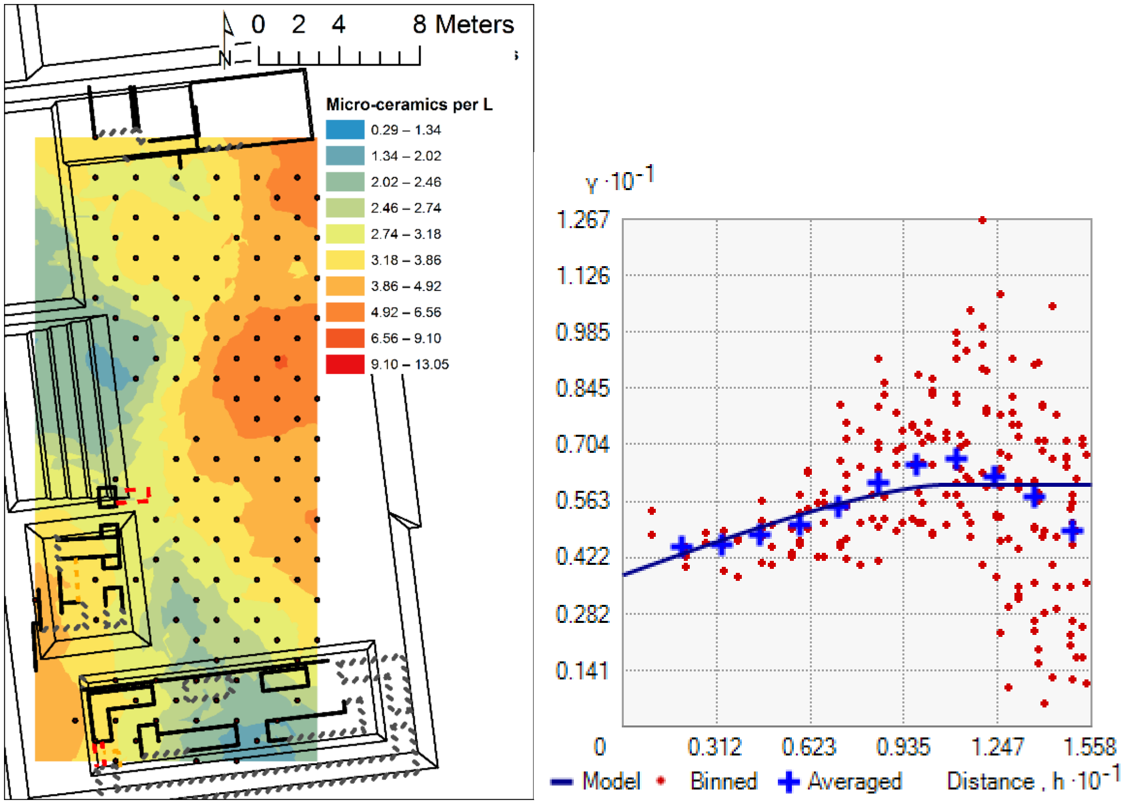

Figure 6.15. Kriged interpolation showing trends in the density of ceramic microartifacts across Group 4. Kriging is based on the variogram on the right.

Despite exhibiting the largest range and standard deviation of the considered microartifacts, the distribution map of chert microartifacts does not show consistent patterning (Figure 6.16). Instead, several high density areas are separated by areas of lower densities. Interestingly, these areas of high density largely do not overlap with the high density areas of ceramic microartifacts. High densities of chert microartifacts are located in three primary zones—in Structure 35, along the center of the Group 4 patio in front of Structure 34, and in the northern part of the patio in front of Structure 33a. Chert Microartifacts are typically associated with areas of chert tool production, use, or sharpening. The cluster of chert microartifacts located in the northern part of Group 4 may be related to the food production processes taking place in the northeast corner of the patio. However, the distribution of chert does not correspond with any of the other studied microartifact classes or the elements discussed above. The lack of correspondence makes clear interpretation difficult.

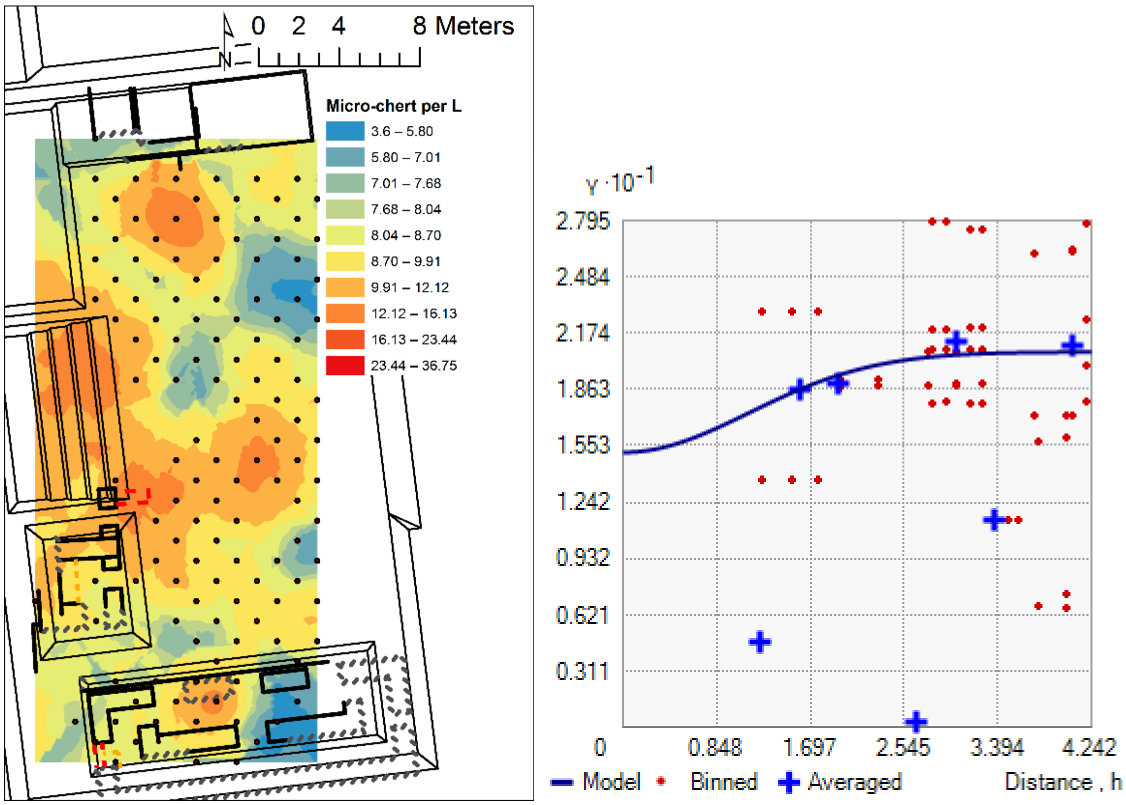

Figure 6.16. Kriged interpolation showing trends in the density of chert microartifacts across Group 4. Kriging is based on the variogram on the right.

For daub, obsidian, and slate the quantities of each microartifact class are small. Daub appears in 35.6% of samples, obsidian appears 3.8% of samples, and slate appears in 4.5% of samples. The figures below show the distributions of these three microartifact types. Daub is most associated with construction material. This likely explains its presence along the edges of Structure 35 and 34a. These microdaub are likely what remains of the *bajareque* upper portions of the superstructures set on the stone foundations encountered in our excavations. Cap (2015b) found that she could trace the outline of perishable structures based on the linear distribution of daub microartifacts. Additionally, the daub in the far northeast corner overlaps with the high concentrations of K and Mg. This daub could be the remains of a clay-lined hearth. The density of daub scattered across the center of the Group 4 patio is more difficult to explain because it does not correspond to high concentrations of any other studied activity area proxy.

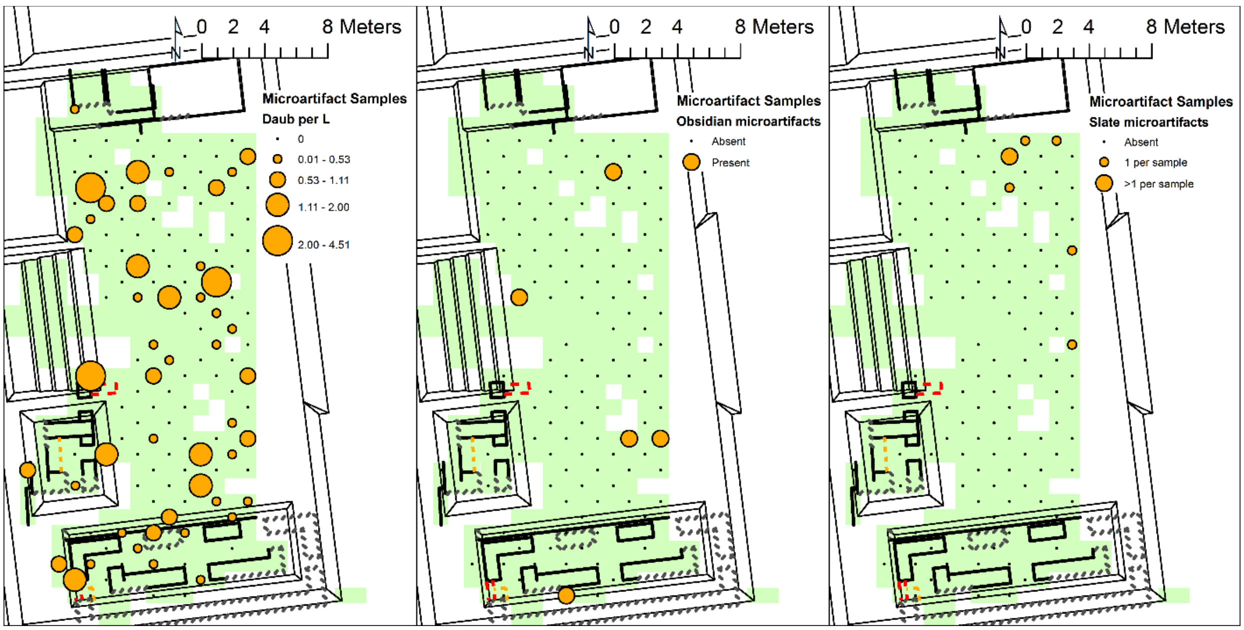

Figure 6.17. Plots showing the distribution of daub, obsidian and slate microartifacts. The plot to the left shows the density of daub microartifacts. The center plot shows where obsidian microartifacts are present. The plot on the right shows where slate microartifacts are present

Slate and obsidian were only found in very limited distributions. However, neither stone is local to Actuncan or the Mopan River valley and must have been brought in from elsewhere. Obsidian was the sharpest stone material available to the Maya and was likely used in all manner of food and craft related tasks. Unfortunately, the observed remains do not seem to cluster in any observable way.

Slate was frequently used as a material for craft production. In contrast to obsidian, slate microartifacts clearly cluster in the northeast corner of Group 4. Clearly some kind of activity involving slate took place either in this corner or in association with Structure 33b. Alternatively, perhaps this debris is debitage swept from the adjacent and poorly-understood Structure 33b.

6.4 Summary and Interpretation of Group 4 Activities

The soil chemistry and microartifact data presented above point to a number of possible activity zones; however, two are particularly apparent based on evidence for overlapping concentrations of different elements and classes of microartifact data. Most significantly, I have interpreted the overlapping concentrations of P, K, Mg and ceramic microartifacts as evidence that the northeast portion of Group 4's patio was used as an area for public food preparation and consumption. In contrast, the interior spaces of Structure 35 and 34a have very quiet chemical signatures, indicating that these spaces were likely used for difficult-to-trace functions such as meeting or storage.

In addition to these clear activity zones, other classes of microartifacts allude to other possible activity areas within Group 4. The distribution of chert microartifacts has several areas of high density spread across the surface of Group 4. Most notably, these high density areas surround the food production zone. This might indicate that food preparation activities involving sharp objects took place away from the food preparation zone or that sharp objects were disposed of away from the active food preparation area. However, this interpretation is currently speculative and requires further investigation. Additionally, all of the small quantity of slate microartifacts that were identified were located in the northeast corner of the Group 4 patio. This may indicate that slate crafting or the storage of slate artifacts took place in this portion of Group 4, perhaps in association with Structure 33b. Again, however, this interpretation is speculative.

Importantly, these functions match the hypothesis that Structure 35 was a council house and that Group 4 was a venue for feasting and performances. The location of these activities on the eastern edge of the Group 4 patio would have facilitated interactions between village principals, located in the patio, and the remainder of the community gathered in Plaza D. The very public nature of the food production that took place in the Group 4 patio points to attempts to include all members of the community in community gatherings and the political process. For a corporate political organization, these kinds of inclusive public events were critical for reminding all community members of their investment in the community and its ruling apparatus.

It is important to remember that the kinds of events that produced the food production signatures were likely periodic. In contrast, the relatively quiet activity signatures in association with Structures 33a, 34a and 35 are likely more indicative of the everyday use of Group 4. The combination of architectural and activity area data indicate that the complex primarily served as a council house and administrative space. Activities related to the daily administration of Actuncan would not have resulted in significant chemical or microartifact deposition.

Briefly, I wanted to return to the correlates for the alternative hypothesis introduced at the beginning of this chapter. First, Group 4's activity signatures do not resemble a Classic period palace. In comparison to Structure 19a, Actuncan's Classic period palace (LeCount et al. 2016), Group 4's elemental concentrations are quite low. Furthermore, heavy metals were only encountered in trace amounts that were not significantly larger than the background concentrations. Second, there is currently almost no evidence for craft production on Group 4. The concentration of slate microartifacts could point to lapidary work in Structure 33b; however, these data are very limited and this interpretation is very tenuous. As a result, there is little evidence that Group 4 served either as palace structure in the Classic period mold or as a mercantile center. Finally, Group 4's importance as a ritual location is much more difficult to evaluate. Certainly the burning that I have interpreted as food production and consumption could have instead been associated with ritual. However, my excavations recovered few recognizable censer sherds and little evidence of ritual paraphernalia. While ritual likely took place in association with the low shrines in Plaza D, the Group 4 platform does not appear to have been primarily associated with ritual activities.

Chapter 7. EXCAVATIONS IN PLAZA A

7.1 Introduction

My excavations in Group 4 investigated at new construction built during the Terminal Classic period to house Actuncan's political institutions. However, these new building were constructed within the shell of an earlier city built by kings ruling centuries earlier. Group 4 itself was built over an Early Classic building within a plaza first constructed in the Terminal Preclassic period and later modified in the Late and Terminal Classic periods. Because of the monumental scale of Actuncan's Terminal Preclassic and Early Classic monumental architecture, these buildings would have served as mnemonics mediating the Actuncan community's memory of its past.

In this and the next chapter, I look at how Actuncan's Terminal Classic community treated their monumental environs to provide insight into the community's process of collective remembering and its renegotiation of the interrelationship between the site's political and religious institutions after the failure of divine kingship. This chapter focuses on excavations in Plaza A (Figure 7.1), while the next draws on the AAP's full body of research to track changes in Actuncan's city plan at the landscape scale.

Actuncan South is a triadic temple group that forms the southern group of Actuncan's two-part urban core. Structures 1, 2, 3, and 4 collectively form the tallest architectural complex at Actuncan, rising 28 m above the surface of Plaza A. Structures 5 and 6 were built on the east and west sides of Plaza A respectively. Collectively, these six structures form a nested

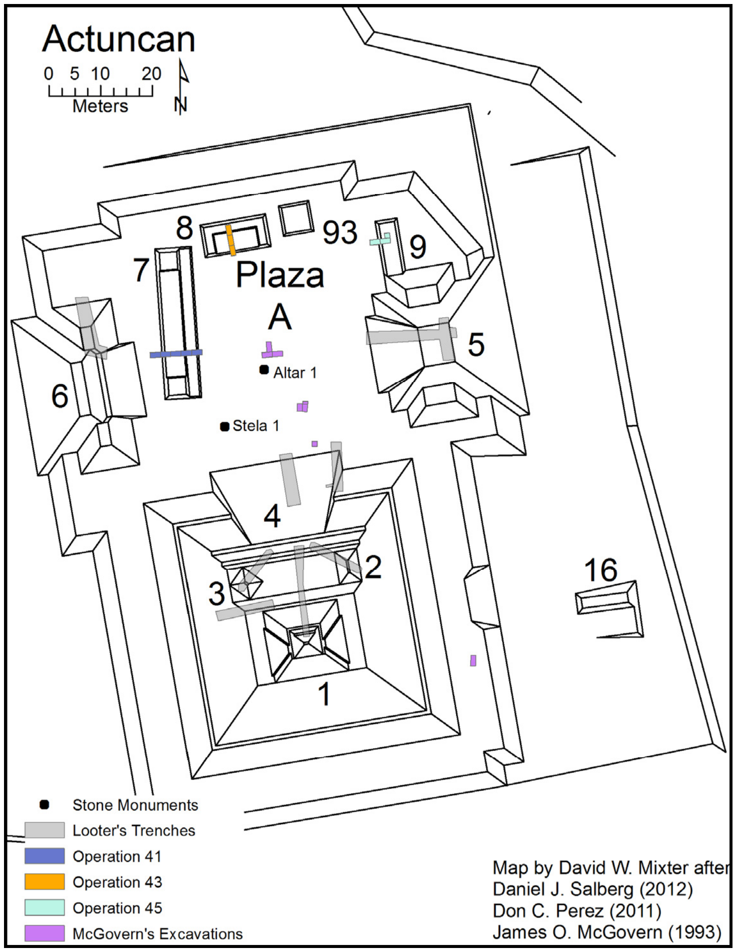

Figure 7.1: Map of Actuncan South showing the location of excavations.

arrangement of triadic temples similar to those constructed across the Maya Lowlands in the Late Preclassic period (Hansen 1998). Drawing on ancient Maya cosmology, triadic temple groups are typically viewed as origin places because their triadic arrangement is reminiscent of the three stone arrangement of Maya hearths (Hansen 1998:80; Taube 1998). The three hearthstone place is known to be the place of creation in Maya cosmology, and consequently triadic groups are a focus of celebrations that connected royal power to the agricultural seasons. Even during Actuncan's hiatus as a local capital, Plaza A would have been recognizable both because it would have been visible for miles around and because the symbolism embedded in the pyramids' layout would have endured.

During the 1990s, McGovern (2004) inspected and mapped the looter's trenches in the triadic group and excavated test pits into Plaza A in order to undertake volumetric analysis of the architecture at Actuncan. A summary of McGovern's findings was presented in Table 2.2, and my reinterpretation of some aspects of McGovern's construction sequence is presented in Appendix A. Broadly, McGovern's data indicate that Plaza A and Structures 1 through 6 were constructed primarily from the Late Preclassic to Early Classic periods, though these spaces continued to be occupied and augmented during the Late Classic period. Additionally, McGovern discovered and removed a portion of Stela 1, a heavily eroded carved stone monument found in front of Structure 4 (Fahsen and Grube 2005:Figure 4; McGovern 1992). The image on the stela represents an early divine king and is rendered in a style reminiscent of the murals at San Bartolo that clearly dates to the Late Preclassic period (Fahsen and Grube 2005:79; Taube et al. 2010). Together, the architecture and monuments of Plaza A point to this location being the focus of ritual at Actuncan during the Preclassic period.

Based on McGovern's (2004:153) data, the majority of construction took place during the Late and Terminal Preclassic periods. Only a single phase of Structures 4 and 5 was built during the Early Classic period (Table 2.2). The limited quantity of building during the Early Classic period agrees with AAP findings in Actuncan North, which have identified limited renovation of monumental architecture during the Early Classic period (see Chapter 2). Furthermore, these data support an end to monumental construction associated with Actuncan's apogee dating to the early part of the Early Classic period, perhaps by the end of the 4th century B.C. Although not visible through ceramic proxies, there was likely a hiatus in intensive use of Actuncan South for the remainder of the Early Classic period as power in the valley shifted to Buenavista del Cayo.

McGovern's (2004:156-157) data also points to a small scale renewal of construction at Actuncan South during the Late Classic Period. This construction includes a single new plaza floor, possibly a new masonry superstructure on Structure 5, and a new vaulted building on the summit Structure 1. My research, presented below and in Appendix H, corroborates McGovern's evidence for a Late Classic plaza floor. This initial renewal of activity is contemporaneous with the rise of Xunantunich and the placement of a vassal of that site in Actuncan's Structure 19a and Group 8. Despite this evidence of a single, small construction episode, Late Classic utilization of Plaza A was probably light. Structure 6 shows no evidence of Late Classic renovation, and I did not identify substantial evidence for Late Classic activities in my excavations. Beyond a single plaza surface, all the architecture that I excavated in Plaza A dated to the Terminal Classic period.

My interest in Actuncan South was drawn not by the large pyramids but by three low structures that McGovern (1992) mapped in Plaza A. Based on the exposed surface architecture, McGovern (1992:79) hypothesized that these structures dated to the Terminal Classic period. The placement of these low structures does not appear to align with the original intended layout of Plaza A. Rather, Structure 8 appears to have intentionally blocked the main northern entrance to the plaza, while Structure 7 blocks the eastern façade of Structure 6. Their construction created a modified architectural layout that refocused Plaza A's center of gravity from Structure 4 to the east towards Structure 5. McGovern never placed any excavations in these low structures, so their chronology remained tentative.

However, McGovern (McGovern 1994:112-113; 2004:159) did identify conclusive evidence of Terminal Classic ritual reuse of Actuncan South that foreshadowed my findings. A dense deposit of burned Terminal Classic ceramics were identified in a masonry room at the summit of Structure 5, the eastern structure of the triadic complex. McGovern (1994:112-113) describes the deposit as:

> "A .6 to .75 m. thick layer of thousands of burnt Late Classic II and Terminal Classic sherds, broken but complete bowls, dishes, and vases, and charcoal resting on the floor and stairs…. They were obviously smashed and burnt in situ in what can only be considered a termination ritual."

Charcoal recovered from this deposit returned a ^{14}C date of cal A.D. 690 – 987 at the 2σ level (LeCount et al. 2002:Table 3).[9] McGovern (2004:171) also reported on the analysis of greater than 6,600 sherds from this deposit. Together, these data point to a Terminal Classic date for the deposit. Similar deposits relating to post-royal activity have been identified across the Maya Lowlands (Braswell et al. 2004; A. F. Chase and D. Z. Chase 2004; Navarro-Farr et al. 2008; Stanton et al. 2008). Because of the remarkable depth of the deposit on Structure 5, it was likely produced through multiple events rather than a single conflagration. Furthermore, if Structures 7, 8, and 9 were constructed during the Terminal Classic period, then the construction of these platforms would have redirected the plaza's attention towards Structure 5, perhaps indicating that it was a stage for Terminal Classic ritual performance.

My investigations in Plaza A focused on investigating Structures 7, 8, and 9. This research focused on two main goals. First, we remapped each of the structures. This resulted in some modification to the site map. Most dramatically, instead of an angled structure in the

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[9] I calibrated this date in OxCal 4.2 (Bronk Ramsey et al. 2009) on the IntCal 13 calibration curve (Reimer et al. 2013). This date was originally published in LeCount et al. (2002) and has a conventional age 1175 ± 60 B.P. (AA-31355).

northeast corner of Plaza A as defined by McGovern (2004:Figure 6), we now understand that Structure 9 abuts the northern edge of Structure 5 and runs north parallel to the site's standard orientation. Additionally, a new structure, named Structure 93, was mapped in the northeastern portion of the plaza between Structures 8 and 9.

Second, excavation trenches were placed across Structures 7, 8, and 9 to date them and look into their function. A 1 m wide trench was excavated through each structure in order to identify the full sequence of construction. My excavations primarily targeted the chronology of these long, low platforms. In contrast to the 1 m by 1 m grids used in the Group 4 excavations, our trenches used 1 m by 2 m units as the standard for recording. The details of these excavations are described below. No attempt was made to match plaza floors across the entirety of Plaza A, so floors have different names depending on the operation.

7.2 Excavations on Structure 7: Operation 41

Structure 7 is a long, low, linear structure located in the western portion of Plaza A. At a width of 6.6 m and a length of 28 m, Structure 7 entirely blocks access to Structure 6, the pyramid located on the western edge of Plaza A. Efforts to remap Structure 7 during the 2013 field season identified two large square platforms measuring 3.4 m by 3.4 m attached to the structure's northern and southern ends. A single 1 m by 10 m trench was placed perpendicularly across Structure 7 north of the structure's center line (Figure 7.2). This trench was composed of five 1 m by 2 m units attached end-to-end and called Units E, C, B, A, and D from east to west. Our excavations uncovered three distinct construction phases of Structure 7 built in association with two plaza surfaces (Figure 7.3). Penetrating excavations uncovered two buried plaza surfaces, which may be related to one another.

Peony Floor, the terminal version of Plaza A that predated the construction of Structure 7, was uncovered in all units. This level plaza floor was variably preserved across the excavation area. In the western half of our excavations, especially under Structure 7, Peony Floor was generally well preserved as a polished plaster floor. On the other hand, the eastern half of the floor was substantially eroded and only preserved in small patches. Penetrating excavations below Peony Floor recovered few ceramics and analysis of these yielded conflicting data on its time of construction. Just below the floor, excavations encountered evidence of Late Classic constructions, while deeper excavations in Unit A date to either the Early Classic or Terminal Preclassic period. This complexity may indicate that we have identified two distinct construction layers that were not clearly bounded by plaster floor surfaces.

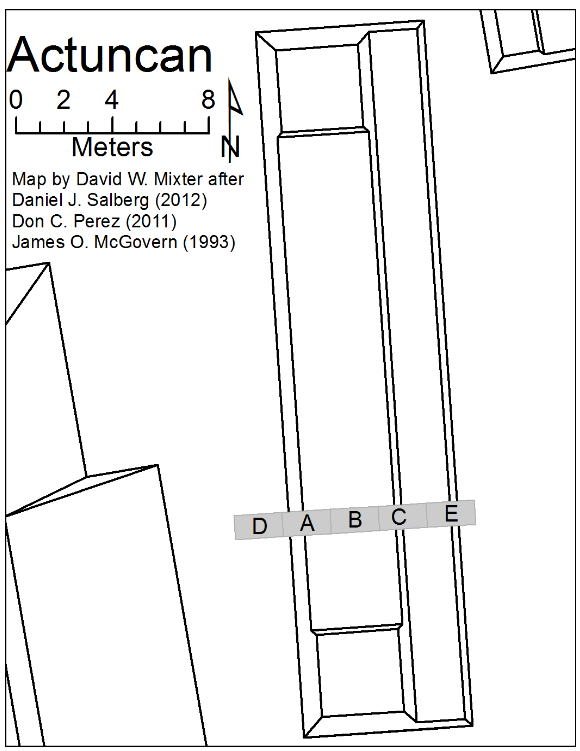

Figure 7.2: Map of Structure 7 showing the location of excavations in Operation 41.

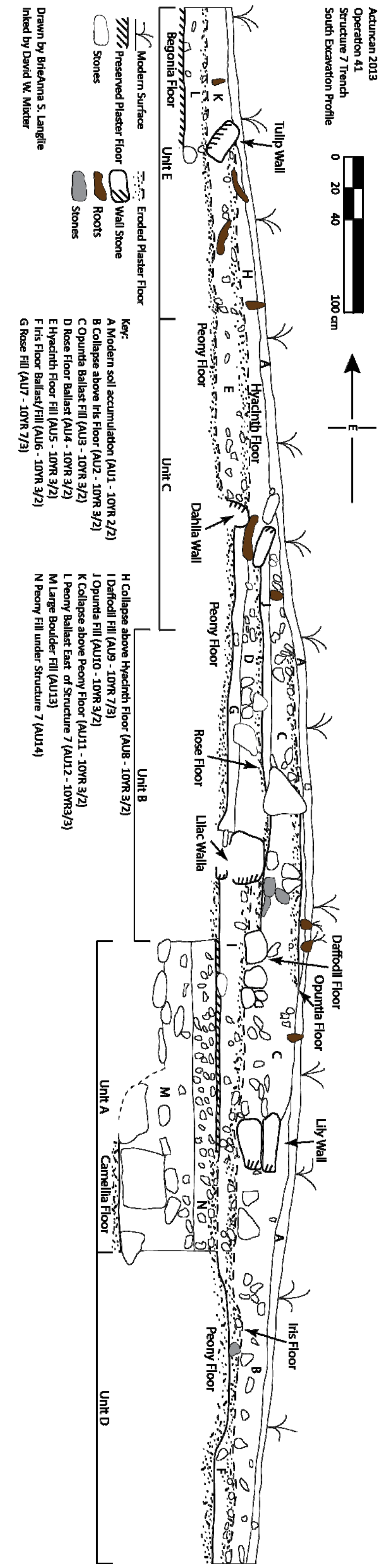

Figure 7.3: South profile of Operation 41 showing the location of architectural features.

These penetrating excavations exposed a plaza floor surface that predates Peony Floor. In Unit E, excavations identified Begonia Floor 15 cm below Peony Floor. Like the section of Peony Floor above, Begonia Floor was eroded and only identifiable by a layer of small white limestone ballast. In contrast, in Unit A, Camellia Floor was identified 65 cm below Peony Floor. This buried plaster floor was a well preserved. Between Peony and Camellia, three distinct fill layers were identified – a 15 cm thick layer containing small white limestone inclusions, a 20 cm thick layer of medium sized stone fill, and a 30 cm thick layer composed of a single layer of large boulders. Although no floor was clearly identified during excavation, it is possible that a plaza surface once existed between the layer of small white limestone inclusions and the larger boulders. A floor at this level would match up with the depth of Begonia Floor. Additionally, above this division, the layer of small limestone inclusions contains Late Classic ceramics, while the lower boulder fill only contains Early Classic and Terminal Preclassic ceramics. Alternatively, the Begonia and Camellia Floors may have been open during the same time period, though the manner of their connection is currently unknown.

Excavations uncovered three discreet construction phases of Structure 7, all apparently built during the Terminal Classic period. The earliest version of the structure, Structure 7-3rd, consists of a 2.4 m wide platform measuring approximately 30 cm high. This platform was constructed directly on Peony Floor and was bounded by Dahlia and Lilac Walls to the east and west, respectively. Dahlia Wall was constructed of a single course of large cut stones topped by additional courses of horizontally laid stones, while Peony Wall is topped by a course of 20 cm tall stones footed on a course of smaller stones. These two walls were then covered by Rose Floor.

Sometime before the construction of Structure 7-2nd, the plaza floor west of Structure 7, between Structures 7 and 6, was raised approximately 15 cm with the construction of Iris Floor. Although largely eroded, the construction of this plaster floor meant that all future versions of Structure 7 were taller to the east than the west. Structure 7-2nd was constructed through a minor modification to Structure 7-3rd. The western side of Structure 7-3rd was extended 50 cm further west with the construction of Daffodil Wall. This wall was a relatively informal construction of small cut stones. It was identified as a distinct construction phase because it covered Lilac Wall and because Rose Wall was extended west to Daffodil Wall.

Structure 7-1st represented a reformulation of the platform's form. The existing platform was raised and further extended to the west. Additionally, a low terrace was added to Structure 7-2nd's eastern side, creating a dual-level platform. Importantly, the relative timing of the main platform expansion and the terrace addition are not understood. Either of these architectural features could have predated the other. The renovation of the main mound incorporated the existing Dahlia Wall. Additional courses of thin, horizontally placed cut stones were placed on the earlier version of Dahlia Wall to extend its height to 50 cm. The western edge of Structure 7-1st was formed by the construction of Lilly Wall, a wall built out of large cut-limestone blocks. Two courses of stone survived, rising to a total height of 25 cm, though at least one more stone course was likely in place in antiquity. These two wall were connected by Opuntia Floor, a plaster structure floor found in terrible condition during excavations. In total, this platform measured 4.3 m wide.

Additionally, a low terrace was added to the east side in the construction of Structure 7-1st. This terrace was fronted by Tulip Wall, a low line of cut-limestone blocks placed on end (Figure 7.4). Although this wall was partly collapsed in our excavations, it likely consisted of a single course of stone rising 25 cm high. The terrace was constructed on Peony Floor and was topped by Hyacinth Floor, a plaster floor that extended from the top of Tulip Wall to Dahlia Wall. This created a two level construction with a 25 cm tall terrace, an additional 25 cm step up to the structure's summit, and likely a 35 cm step down west of the structure to the plaza level.

Figure 7.4: Tulip Wall is constructed of partially collapsed upright stones and forms the eastern face of Structure 7.

A detailed description of the individual analytical units of Operation 41 can be found in Appendix H.8. See Figure H.7 for a Harris Matrix detailing the relationship of the analytical units. See H.7 for a full list of excavated lots in Operation 41.

7.3 Excavations on Structure 8: Operation 43

Structure 8 is a long low linear mound centered on the northern margin of Plaza A. This mound blocks the ancient monumental staircase that served as a point of entry to Plaza A from the *sacbe* connecting Actuncan South to Actuncan North. Excavations were aimed at determining the layout and construction sequence of this building (Figure 7.5). From the modern surface, one long row of upright stones is visible, possibly forming a barrier to the access point at this location. A single 1 m wide trench was placed to determine the sequence and purpose of constructing Structure 8 (Figure 7.6). The trench was made up of three 1 m by 2 m units placed end-to-end. These were called Units A, B, and C from north to south.

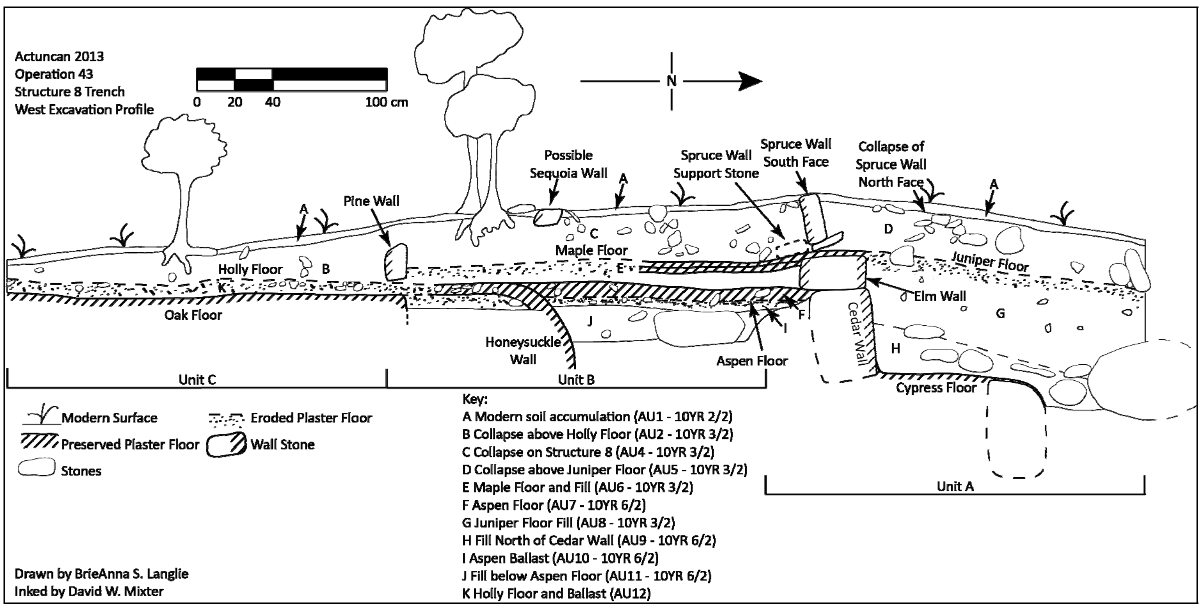

Figure 7.5: West profile of Operation 43 showing the location of architectural features.

In addition to the sequence of construction, our excavations located at least four different versions of the Plaza A monumental staircase located underneath and adjacent to Structure 8. Each of these stairs came to nearly the same elevation. The earliest identified stair, Mahogany Stair, was 3 cm below the surface of the next two staircases: Honeysuckle and Cedar Stairs. The final version of this staircase is located north of our excavations.

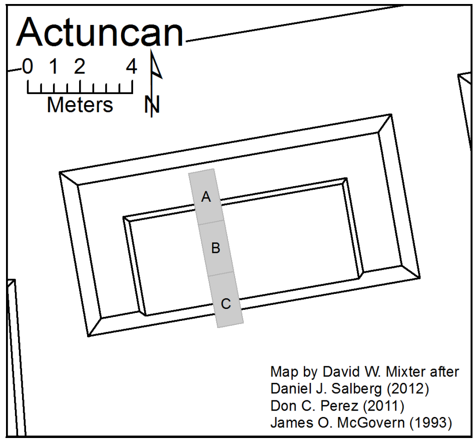

Figure 7.6: Map of Structure 8 showing the location of excavations in Operation 43.

The earliest known version of the staircase, Mahogany Stair, was only exposed in a very limited manner. The stair is only known from the corner of Oak Floor near the boundary between Units B and C. Here, Oak Floor, the penultimate version of Plaza A's plaster floor, connects to a vertical stair riser. Only 4 cm of this stair riser was uncovered in our excavations.

The third youngest version of the staircase, Honeysuckle Stair, was encountered in Unit B. Honeysuckle Stair connects the terminal surface of Plaza A, Holly Floor, to the vertical Honeysuckle Wall. The top 15 cm of Honeysuckle Wall was exposed. The stair is created by a smooth layer of plaster. Interestingly, the junction between Holly Floor and Honeysuckle Wall forms a curved corner. This stair would have resulted in a 45 cm extension on the northern boundary of Plaza A that buried Mahogany Stair and Oak Floor.

The penultimate version of the staircase, Cedar Stair, represents a further 80 cm expansion of Plaza A. In contrast to Honeysuckle Stair, Cedar Stair was constructed of large stone slabs placed vertically to form stair risers. These large stones formed square corners. Both these and the stair treads connecting them were covered with a thin coat of plaster. One full stair was uncovered in Unit A. This stair's tread measured 45 cm and had a rise of approximately 42 cm. The fill behind this stair was composed of a dense sediment fill containing layered large-stone rubble, with individual blocks as large as 25 cm in diameter. Aspen Floor was constructed on this fill to connect the top of Cedar Wall to Holly Floor, which then continues towards the center of Plaza A.

The terminal version of the staircase was not located within our excavation area and the upper stairs may have collapsed off the Plaza A platform. In the future, the best chance of reconstructing this stair would be excavations beginning at the base of the staircase. That said, excavations in Unit A indicate that the terminal staircase was constructed contemporaneously with a version of Structure 8. The earliest construction of Structure 8 was initiated through the placement of Elm Wall directly on Cedar Wall. Structure 8-2nd was built in two stages, Maple and Juniper Platforms. Together, these two platforms form a single wide platform approximately 9 cm above Holly Floor. Unfortunately, the order of their construction is indeterminable since either could incorporate Elm Wall on one side. Thus, we present two possible reconstructions of Structure 8-3rd, either Maple Platform or Juniper Platform.

For the first possible reconstruction of Structure 8-3rd, the northern platform, Juniper Platform, was constructed contemporaneously along with the terminal plaza stair. Under this scenario, Elm Wall formed the southern boundary of Structure 8-3rd and Juniper Floor was constructed running north to the edge of the terminal stair. The replacement of Cedar Stair is evident because of continuity between the fill below Juniper Floor and the fill overlaying Cedar Stair. This fill was composed of compact sediment with small inclusions placed directly on Cedar Stair overlaid with a single layer of very large (25 to 50 cm) boulders. Juniper Floor, the surface of Juniper Platform was then laid over this construction. The northern edge of Juniper Floor, where it connected to the terminal stair, was not located in our excavations.

Alternatively, the second possible scenario for the reconstruction of Structure 8-3rd resulted from the construction of Maple Platform while Cedar Stair remained exposed. The construction of Maple Platform resulted from the erection of Elm Wall to the north and Pine Wall to the south. The space between these two walls was filled and capped by the construction of Maple Floor. Under this scenario, Elm Wall extended the height of Cedar Wall from 20 to 30 cm. Our excavations revealed two stacked versions of Maple Floor, indicating that this platform was renovated at least once. Only further excavation will determine which reconstruction of Structure 8-3rd is correct.

Eventually, Structure 8-2nd was constructed through the combination of Juniper and Maple platforms into a single wide structure blocking the Plaza A's terminal staircase. This platform then served as the base for Structure 8-1st, which can be split into two sub-phases. The earlier version, Structure 8-1st-b consisted of the construction of Spruce Wall, a 35 cm tall wall constructed of vertically set limestone slabs. These vertical slabs form the second course of a wall that was at least 2 courses high. The lower course of thin horizontal stones indicates that Spruce Wall faced south. Additionally, a low row of cut stones were placed along the southern face of the vertical stones, possibly to supply structural support for the stones standing on end. The line of vertical stones is visible on the modern surface to the east and west, indicating that this alignment continued in both directions along the mound. A gap roughly in the center of Structure 8 may indicate that these upright stones formed a barrier with a small entrance in the center. Additionally, excavations show that some portions of the line are formed by multiple courses of smaller stacked stones. The incoherence in construction technique may indicate that Spruce Wall was built from reclaimed stones rather than purposely shaped ones, possibly in rapid order. Alternatively, the gaps filled with smaller stones may indicate a sequence of doors that were filled in after construction.

The precise form of Spruce Wall remains somewhat enigmatic. A large quantity of collapsed cut stone was found north of this wall. Some of these stones appear to have been stacked horizontally facing north. These stones provide evidence that Spruce Wall was originally a double sided wall, though how wide it may have originally been remains elusive. I speculate that these fallen stones may have also been stacked vertically, leading to a fairly thin wall wide enough to support a set of posts. The interpretation that Spruce Wall may have supported a perishable superstructure is supported by our inspection of the east and west ends of the Structure 8 mound. At each end, rectangular alignments of upright stones are visible protruding south from Spruce Wall, possibly forming the base for north-south alignments of poles. In this case, Structure 8-1st may have had a semi-enclosed interior space with no southern wall and a single doorway or series of doorways on the more formally constructed northern side to allow access from the *sacbe* to the plaza. In other words, the structure would have been built like a perishable range structure blocking access between the *sacbe* and Plaza A's ceremonial precinct.

Finally, our excavations indicate that a further renovation may have taken place to create Structure 8-1st-a. The surface of the modern mound over Structure 8 extends about 1.8 m south of Spruce Wall. A number of stacked stones, called Sequoia Wall, were identified in the eastern profile and appear to form a line facing south. It is possible that this line may have combined with Spruce Wall to form a low platform at the height of the modern day mound. Bioturbation has heavily disturbed this south facing line, making conclusive evidence for this architectural phase tentative at best.

The final events surrounding Structure 8 appear to have been ritual. Our excavations identified a dense deposit, or cache, of broken ceramic vessels strewn over Pine Wall (Feature 1), at what would have been the southern, plaza-side entrance to the structure (Figure 7.7). Several vessels are reconstructable, indicating that they were smashed in place. Additionally, a quarter of a jade bead was encountered in this deposit. Ceramics in this deposit date to the Terminal Classic period. I tentatively interpret this deposit as a single termination event; however, there is not enough evidence currently to rule out repeated deposition.

Figure 7.7. Terminal Classic feature associated with Structure 8. A) Photograph of the feature *in situ* on the edge of the Structure 8 platform. B) Ceramics that are locally diagnostic to the Terminal Classic period from the feature include two different McCrae impressed dishes, a pie crust jar rim, and a partially reconstructed flared lip jar rim.

A detailed description of the individual analytical units of Operation 43 can be found in Appendix H.9. See Figure H.8 for a Harris Matrix detailing the relationship between analytical units. See Table H.8 for a full list of excavated lots in Operation 43.

7.4 Excavations on Structure 9: Operation 45

Structure 9 is a low, linear platform attached to the southern edge of Structure 5. Because of its attachment, Structure 9 could be named Structure 5b; however, we will maintain the

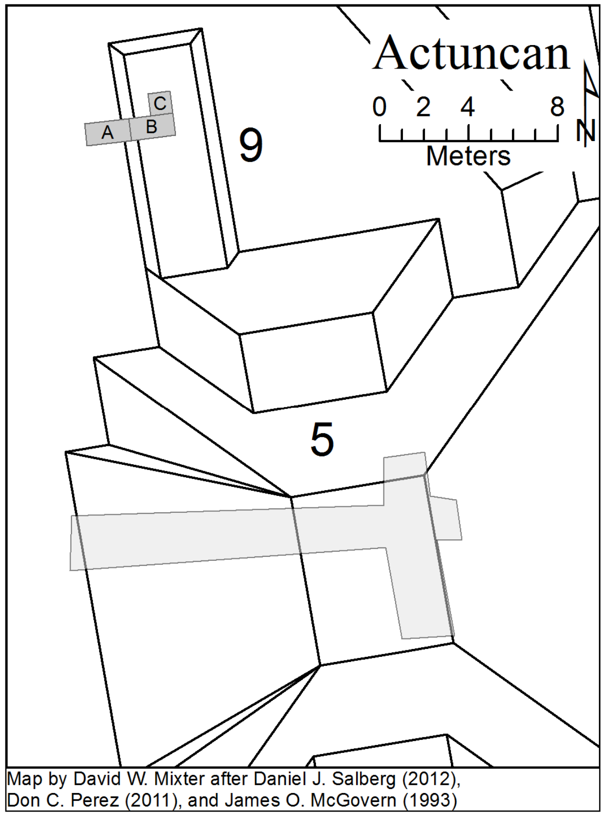

Figure 7.8: Map of Structure 9 showing its articulation with Structure 5, the location of units in Operation 45, and the location of the looter's trench in Structure 5.

structure's original name established by McGovern (1992). Structure 9 is approximately 60 cm tall and 10 m long. Before excavation, large rocks protruding from the surface of the mound, especially its northern end, indicated that the platform was likely constructed with dry-laid cobble fill.

Operation 45 was initiated on Structure 9 in order to determine its date of construction and possibly identify evidence of the activities that may have taken place in association with the structure (Figure 7.8). Following our broader hypotheses, excavations aimed to test whether the building was constructed in association with the Terminal Classic period reoccupation of the site. Initially, a 1 m by 4 m trench was placed to penetrate Structure 9 from Plaza A to the west. The

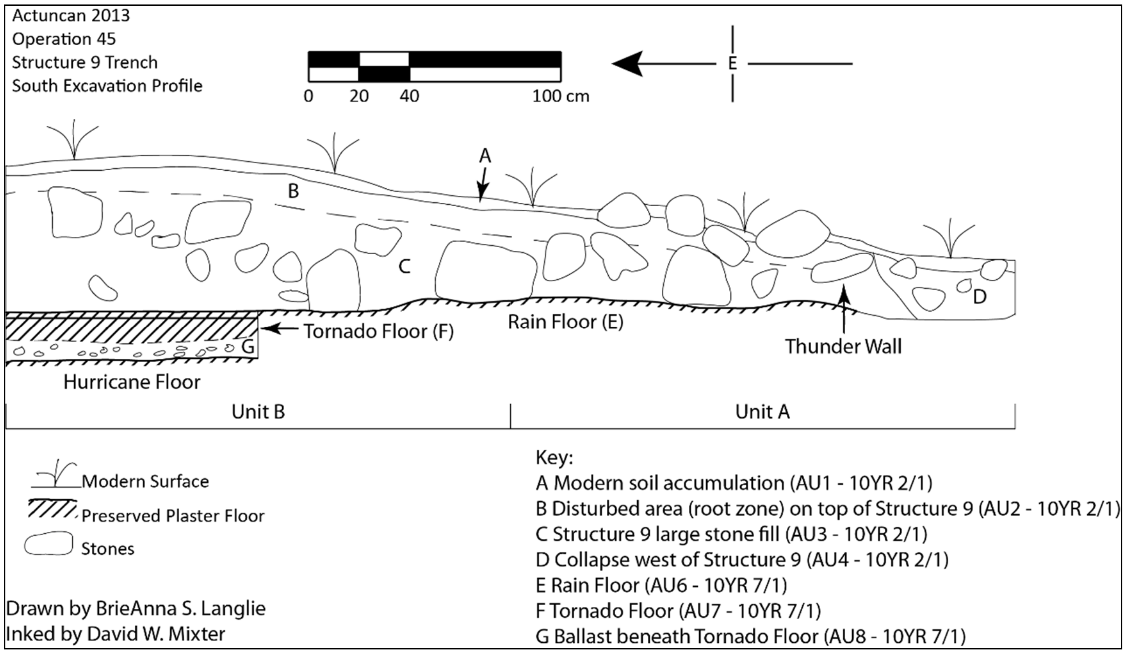

Figure 7.9: South profile of Operation 45 excavations showing a single phase of construction.

trench was split into adjoining 1 m by 2 m units. Unit A was placed to locate the western platform edge of Structure 9. Unit B continued east from Unit A penetrating the building's center. The trench was placed approximately midway between Structure 9's northern edge and its connection to Structure 5. An additional 1 m by 1 m unit was added to the northern edge of Unit B in order to fully expose Feature 1, a ceramic cache, after it was discovered.

Because of crude construction methods and extensive bioturbation on the platform's surface, the edges of Structure 9 proved difficult to define through excavation. Excavations revealed a single construction phase built of large piled river cobbles, similar in technique to that encountered in late household constructions (Figure 7.9). The ancient platform surface that likely topped this structure is now fully eroded. Instead, the structure is topped by a 20 cm thick modern root zone. The combination of bioturbation and soil development has entirely destroyed the platform's ancient surface.

Figure 7.10: Cache vessel found in Structure 9.

Additionally, excavations in Unit A did not uncover a clear platform wall. Because of the large stone fill, distinguishing between fill and collapse became impossible. Either the façade was stripped of its cut-limestone block facing stones in antiquity, or the platform face was constructed of river cobbles piled so that their naturally flattened sides faced outward. A single stone with a roughly flat face was encountered facing west. This may have formed the basal course of the platform wall, named Thunder Wall.

Structure 9 was constructed on top of Rain Floor, the terminal plaster floor that formed the surface of Plaza A. Rain Floor was a polished plaster floor found intact across all excavations in this area. Thunder Wall was placed directly on top of this floor. Additionally, a cached ceramic vessel, Feature 1, was found at the center of Structure 9. The vessel is a long, narrow, rectangular platter with low vertical sides crushed under the weight of the overburden (Figure 7.10). This oddly shaped vessel was placed upright and oriented north-south on Rain Floor. It was then covered in large stones used for the fill of Structure 9. No special space was prepared to contain the vessel, nor was a lid found nearby; therefore, the contents would have been exposed. Placed prior to the construction of Structure 9, Feature 1 was likely a dedication offering intended to ensoul the platform (Freidel and Schele 1989).

Ceramics recovered from Structure 9 indicate that it was likely constructed in the Late or Terminal Classic, with continued occupation through the Terminal Classic period. This timeline follows the hypotheses set out at the beginning of the research. Unfortunately, the surface of the structure had been destroyed by the time we began our research and the fill was left unsealed. Findings elsewhere at the site have shown that ceramics and other materials move post-depositionally through Actuncan's dry laid matrix (Mixter and Freiwald 2013).

Excavations continued below Rain Floor to uncover a sequence of three plaza floors. Rain Floor was the 2 cm thick ultimate floor. Only a few fragmentary ceramic sherds were recovered from this floor. Immediately beneath Rain Floor was the 8 cm thick Tornado Floor. Tornado Floor was exposed in a 2 m by 1 m excavation unit in Unit C and the eastern half of Unit B. Ceramics date the construction of this floor to the Early Classic period. Tornado Floor was constructed on a layer of soft white *sascab*, 6 to 10 cm thick. This unusual layer appears to have served as a soft ballast substitute. Below this *sascab* layer, excavations terminated at Hurricane Floor, Plaza A's antepenultimate polished plaster floor.

The details of Operation 45 are described in Appendix H.10. See Figure H.9 for a Harris Matrix detailing the relationship between analytical units. See Table H.9 for a full list of excavated lots in Operation 45.

7.5 Discussion and Conclusions

The excavations in Plaza A were undertaken with two primary goals in mind. First, I aimed to evaluate the form and construction history of the three low platforms constructed in Plaza A. If they dated exclusively to the Terminal Classic period, then the construction of these platforms points to a change in the use of Plaza A that was contemporaneous with the construction of Group 4. The platforms' construction reflects a change in plaza function, focus, and access. Their construction closed off the primary entrance and refocused attention form Structure 4 to Structure 5. Finally, Structure 7 in particular is very intrusive into the plaza space and would have changed how individuals and ceremonies were arranged in the space. If these platforms were constructed prior to the Terminal Classic period, then they were not critical to the Terminal Classic reoccupation of the space and instead were related to Plaza A's original function in during the site's Preclassic apogee. Alternatively, if they were originally constructed in to the Late Classic period, then perhaps they related to a reuse of Plaza A under the aegis of Xunantunich.

Second, I aimed to test for evidence of ritual activities associated with the Terminal Classic reoccupation of the plaza. McGovern's (2004:159) investigation of Structure 5 revealed that Terminal Classic ritual activity took place within Plaza A. Uncovering evidence of ritual activity in association these buildings would both confirm their hypothesized ritual function and provide evidence for how individuals within the plaza participated in those rituals.

Structure 7 was built in three construction phases all dating to the Terminal Classic period. These data indicate that Structure 7, like Group 4, was in use for a period of time during the Terminal Classic period. The Terminal Classic Actuncan community was able to marshal labor on multiple occasions to expand and refurbish both ritual and civic structures, indicating that the site's Terminal Classic occupation was not short-lived. Our excavations did not indicate that Structure 7 had a specific function; however, the platform's summit was quite narrow with a width of 4 m in the location where we placed our excavations. This space was likely not wide enough to support a perishable superstructure, indicating that this building was a wide platform. It is possible that the square platforms at the structure's north and south ends supported small, shrine-like superstructures; however, further excavation is required to evaluate this hypothesis. The building's length and location fundamentally reorganized the Preclassic layout of Plaza A. Previously, Plaza A was an open plaza focused on Structure 4 and was flanked symmetrically by Structures 5 and 6. The construction of Structure 7 effectively deemphasized Structure 6 and shifted the center of the plaza east towards Structure 5.

Structure 8 was also clearly built in multiple phases during the Terminal Classic period. Based on the alignment of upright stones visible through the modern surface, the building appears to have had perishable C-shaped walls with masonry footings that are open to the south. A series of doors provided access through the building's north wall to the monumental staircase that descends from Plaza A to the causeway below. Structure 8 was built in the Terminal Classic period as an entry structure that limited access to Plaza A. The building's masonry footings do not continue along the southern edge of the building platform. Instead, a masonry step provided access from inside the superstructure to Plaza A. The absence of a masonry footing on the structure's south side likely indicates that Structure 8 was open to the south and would have allowed free interactions from its interior to Plaza A[10]. Along the southern edge of the building

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[10] LeCount (personal communication, 2016) suggests the lack of a masonry footing on Structure 8's southern edge could mean that the wall was constructed of perishable materials as a way to save labor and materials. I do not favor this interpretation because the walls were not full masonry constructions. The food was simply a double line of upright stones, which would not

platform, we uncovered a collection of broken Terminal Classic ceramics resting directly on the step. This collection appears to be an isolated, though dense, deposit and could either be midden from some event that took place in Plaza A or vessels that had been stored in the western portion of Structure 8. These materials included fragments of an Alexander type jar with a flared lip, an imitation Fine Orange vase, at least two large McRae Impressed dishes, and a censer. In addition, we recovered the remains of one other large-mouthed jar, another vase, and several Mount Maloney Black type bowls. Importantly, several of these styles date to the Terminal Classic period. Based on the location, these pots were associated with community rituals and gatherings that took place in Plaza A.

In contrast to Structures 7 and 8, Structure 9 was built in only one large phase. Because we did not encounter a clear platform surface that sealed in Structure 9's fill, this building's date of construction is somewhat ambiguous. Our excavations recovered ceramics diagnostics dating to the Terminal Classic period from the fill; however, these materials could have fallen through

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have required a substantial additional resource investment. To me, there was no evidence, such as postholes or daub, of a constructed wall on the building's south side. Instead, Structure 8 served as a shield wall restricting visibility of Plaza A to individuals entering from the north until they passed through the building's northern wall. This would have provided a formal entrance way, which could have doubled as a low performance platform shelter. Furthermore, buildings with C-shaped walls become more common in the Terminal Classic period (see Bey et al. 1997 for an example), and appear to be the antecedent of the C-shaped open halls (as defined by Proskouriakoff 1962) that are common in the Northern Lowlands and Petén Lakes region during the Postclassic period.

the building's dry-laid stone fill as the building degraded. The construction of Structure 9, when paired with Structures 93 and 7, drew the focus to the patio's northeast. During the Terminal Classic period, Structure 5's central staircase serves as the patio's central axis, replacing Structure 4.

The renewed importance of Structure 5 is emphasized by the massive deposit of ritual materials that McGovern reported from the summit of that building. In sum, these deposits point to a space constructed to facilitate periodic ritual gatherings. The focus on Structure 5 is important because the Terminal Classic community chose to focus on the smaller eastern pyramid rather than the tallest pyramid, Structure 4. I argue that this choice reflects how the community's collective memory of Plaza A was produced through a combination of Actuncan's history and an understanding of Late Classic norms.

It has long been understood that Maya pyramids were metaphors for mountains (Benson 1985; Stone 1992, 1995; Stuart 1997). Halperin (2014) argues that if abandoned or left unused, these pyramid-mountains become part of the wilderness, home to spirits, wild animals, nonspecific ancestors, and other supernatural beings. For the Maya, ruins often reference the time of creation (Hamann 2002), especially when those ruins are constructed in a triadic form that references the Maya three hearthstones of creation. Additionally, both ruins and mountains can be associated with ancestors even if no genealogical connection is known (Borgstede 2010; Halperin 2014).

At Tayasal and El Mirador, Terminal Classic populations reoccupied triadic groups; however, unlike at Actuncan, these places were not continually occupied by the same populations. At El Mirador, a Terminal Classic village was built on the collapse debris from the collapse of the Danta triadic pyramid group (Hansen et al. 2008). At Tayasal, a Terminal Classic village sprung up around Cerro Mo' triadic group and residents passed by and left small offerings within the triadic group (Halperin 2014). The Tayasal community never built on Cerro Mo' during the Terminal Classic period. Rather, it was viewed as a part of the wilderness, a place to leave offerings for the spirits and ancestors. Each of these actions reflect the specific way each of these places was remembered. At El Mirador, Danta's repurposing was purely logistical, whereas at Tayasal the local community did not remember the original importance of Cerro Mo' but understood that it was occupied by someone's ancestors.

Actuncan, on the other hand, was occupied continuously from the construction of Actuncan South during the Late Preclassic period to the Terminal Classic period. Actuncan's pyramids were visually dominant on the landscape and could not have been forgotten by the community located at their bases. The Terminal Classic period focus on the eastern pyramid rather than the largest southern pyramid is telling. During the Classic period in the Belize River valley, the dead were consistently buried in the east. This is evident both in commoner domestic groups, where the eastern structure is very frequently an ancestor shrine in the mold of Becker's (1999) Plaza Plan 2, and in monumental centers, where royal individuals were often buried in pyramids on the eastern edges of plazas (Audet 2006; Awe 2013; Healy et al. 2004b).

To me, the focus on Structure 5, Plaza A's eastern structure, reflects the interpretation of this plaza group by the site's Terminal Classic occupants. The continuity of the Actuncan community preserved the memory of Actuncan as a fundamental ritual place and perhaps as a place occupied by their ancestors. However, the emphasis on the eastern pyramid, Structure 5, clearly shows that this memory was filtered through Classic period cultural norms. I suggest that the local community assumed Structure 5 was a mausoleum for ancestors buried during the site's Preclassic apogee because the east was where important dead individuals were buried during the

Late Classic period. However, during the Preclassic period, when Structure 5 was built, people were typically not buried in triadic temple groups (Hansen 1998:89). Instead, important ancestors were typically buried under households during the Preclassic period (Hammond 1991; McAnany 2004). To the Terminal Classic Maya, their acts of remembrance referenced their ancestors even though those ancestors were not likely buried where the Terminal Classic community believed them to be. Because of the time that had passed the Actuncan community remembered their ancestors through the cultural expectations of their Terminal Classic context, not specific historical details inherited from their ancestors. Those details had been forgotten.

The construction of platforms in Actuncan's South's plaza is important because it points to the community's intentionality in adopting the triadic group as their primary sacred precinct. The community remembered the cosmological significance of Plaza A and likely remembered that it had historical significance, even if the details were not longer known. The pyramids themselves served as mediators to this remembering. Their constant physical presence on the landscape provided a consistent topic of conversation for Actuncan's community members. Additionally, the physical layout of the triadic group provided symbols that could be interpreted within Maya cosmology. The Terminal Classic memory of Actuncan South likely provided a starting point for the community to reconfigure their religious principles when the collapse removed divine kings from the equation.

Chapter 8. URBAN PLANNING AND COMMUNITY RECONSTRUCTION

8.1 Introduction

In this chapter, I investigate the post-collapse articulation of political and religious institutions at the site of Actuncan, Belize through an investigation of the changing organization and use of the site's urban landscape. Before the collapse, Actuncan's layout reinforced the power of the divine kings who ruled there for centuries. Broadly, the site plan followed Late and Terminal Preclassic site planning principles that represented the intertwined nature of political institutions and cosmology during that time (Ashmore 1989, 1991; Ashmore and Sabloff 2002). This urban landscape was created through the careful juxtaposition of the site's constituent architectural components, such as an E-group, the triadic temple complex, and a range structure, which housed administrative, economic, and ritual activities supervised by the king and his agents. Importantly, these functionally discrete spaces were symbolically and spatially connected at Actuncan through their organization and a single formal causeway, or *sacbe*. This interconnectedness would have then been formalized through processions and ceremonies in which the king performed his role as interlocutor between the supernatural and a successful subsistence economy (Houston and Stuart 1996; Inomata 2006a, b; Reese-Taylor 2002; Ringle 1999). The arrangement of Actuncan's monumental architecture was designed in service to the needs of the site's early kings who aimed to secure their roles as leaders through both practical and ideological means.

After the collapse, the organization of the site was transformed through renewed construction, changing uses of existing spaces, and the abandonment of select buildings. Most significantly, Actuncan's new urban plan created two separate realms dedicated to independently serving the civic and religious needs of the community. The religious zone continued to focus on the site's Preclassic triadic temple group, a space transcendently representative of the Maya place of creation. In contrast, the center of political power moved to the newly constructed Group 4 complex. This broad spacious platform reflected the new, more open political organization of the post-collapse era. I assert this division is an example of a resilient strategy to reconcile the crisis brought on by the failure of divine kingship. The community strategically removed the connection between the ruler and the cosmos by physically separating the political and religious spaces and by drawing authority from local ancestors and the cosmological associations of the built landscape. In this way, the community drew on its collective memory to assemble new separate political and ritual spheres.

8.2 Representing Divine Rule in Actuncan's Preclassic Site Design

Based on research by McGovern (2004) and AAP, we know that Actuncan's site plan was largely established in the Late Preclassic period when the earlier Late Preclassic village was buried and replaced by a coherent ceremonial center (see Chapter 2). Renovations during the Terminal Preclassic and Early Classic periods elaborated the site plan and added substantial height and volume, but did not significantly modify the layout of the site, which followed the orientation established with the construction of Plaza A and the triadic temple group. (Donohue 2014; Jamison 2013; McGovern 2004; Simova and Mixter 2016). As Actuncan's early kings attempted to consolidate power, they adopted conventions already in use across the Maya heartland to build the site center. Although the arrangement of structures appears to have been determined by the preexisting topography, Actuncan's architecture includes all the constituent architectural forms most common during the Late Preclassic period. These include ritual spaces such as the triadic temple group, a large E-Group complex, and a ball court (Estrada-Belli 2011; Hansen 1998). More practically, range structures likely functioned as audience spaces and locales where the day-to-day business of administering the polity took place (Reents-Budet 2001:199-204). These structures defined the site's six public plazas and a single, broad causeway, which played critical roles as spaces for day-to-day interaction and venues for periodic rituals.

The construction and arrangement of Actuncan's architecture served to support the king's power in at least three ways. First, the urban core provided a setting for the everyday administration of the polity (Inomata 2001a:29-32). Second, the site's temples and associated plazas served as important ritual performance venues where leaders could act out the cosmological underpinnings of their rule (Inomata 2006a; Schele and Freidel 1990:96-129). Third, these buildings and the broader site plan evoked cosmological principles that emphasized the ruler's place as interlocutor between the population and the supernatural (Ashmore 1989, 1991). As a result, the site plan played a critical role in integrating the sacred and managerial roles of Maya kings by metaphorically connecting spaces associated with periodic ritual and daily administration into a coherent whole.

Before proceeding with a description of Actuncan's site plan, I would like to remind the reader that Actuncan's Preclassic rulers were likely limited by a corporate leadership model (sensu Blanton et al. 1996). As described in Chapter 2, Preclassic Actuncan did not include a primary ruler's residence. Rather, three large urban houses were likely the home to elite lineages. These three collaborated and/or competed to lead the Actuncan polity. This power structure was possible because Preclassic kings were shamanic in nature (Freidel and Schele 1988; Freidel et al. 1993). Because shaman kings gained authority through shamanic transformation, their authority was not necessarily based on birthright, as it was for Classic period kings. Theoretically, any individual could become ruler if he passed through the proper shamanic rituals. Practically, however, elites typically tightly controlled who became king. The shamanic nature of the ruler meant that a member of any of Actuncan's lineage could be selected to be king. However, the authority of shaman kings was still anchored in their ability to intercede with the supernatural. As a result, the construction of a site plan that reified the connection between the king's cosmological and worldly roles served to maintain the ruler's legitimacy. Importantly, I do not see a contradiction between Actuncan's corporate source of leaders and architecture that reifies the importance of the ruler's cosmological power. The community selected a ruler who in turn served the community as administrator and shaman. Preclassic architecture celebrates the king's cosmological role; however, it does not invalidate his corporate source of power.

Actuncan South's large triadic temple group anchors the site's primary ritual architecture around Plaza A. As is common among contemporaneous temple groups, Actuncan South consists of two nested triadic arrangements of temples (Hansen 1998:77-81). Three small pyramids, including the vaulted Structure 1, are located on top of the monumental pyramidal platform, Structure 4. The second triadic arrangement is centered on Structure 4, which is flanked by Structures 5 and 6 to form an impressive architectural triad around Plaza A. Within Preclassic Maya centers, triadic temple groups likely served primary roles as community gathering locations for ritual ceremonies that projected the divine rule of kings. From this perspective, Structure 4's elevated platform provided a stage from which the king could perform and a restricted space for gathering elite confidants in private ceremonies (c.f. El Tajín; Reese-Taylor and Koontz 2001). Celebrations of kingly accessions and annual celebrations of the agricultural cycle took place within a space often interpreted as representing the three hearthstones of creation based on its triadic arrangement (Hansen 1998:80; Taube 1998). Additionally, monumental plaster masks known to have adorned Structures 4 and 5 (McGovern 2004) likely represented the natural cycles the king was responsible for maintaining (Freidel and Schele 1988). As such, the triadic group formed the ultimate symbol of the king's divine power by connecting the act of ritual performance to sacred space filled with cosmological symbolism.

While Actuncan South functioned as sacred space with predominantly periodic use, Actuncan North served as the primary setting for daily urban life at Actuncan. This portion of the site contained intertwined spaces dedicated to sacred and mundane activities. Beside Actuncan South, the most important sacred space at Actuncan is the E-Group complex situated around Plaza F. E-groups are nearly ubiquitous within Late Preclassic centers and were critical to both early community life at these centers and establishing territorial claims (Aimers and Rice 2006; Chase and Chase 1995; Doyle 2012; Estrada-Belli 2011). Consistent with the typical arrangement of E-Group, Plaza F is bounded on the east by a long narrow platform and on the west by a tall radial pyramid. Although studies indicate most E-Groups were not aligned as functioning solar observatories, they were quite standardized in form and size and likely served as metaphorical referents to the passing seasons (Aimers and Rice 2006; Aveni and Hartung 1989; Doyle 2013). Significantly, E-Groups were built around a large levelled plaza. In addition to providing a venue for ritual performance, recent evidence indicates E-Group plazas functioned as an important venue for periodic gatherings that facilitated economic exchange (Doyle 2012; Freidel 1981b; Stanton and Freidel 2003). The multifaceted and communal function of Plaza F is an important symbol of the interrelatedness of ancient Maya politics and economies with cosmology. This interrelationship would have resonated if the power of early divine kings originated in their ability to facilitate market exchange networks, as long argued by Freidel (1979; Freidel and Reilly 2010). As a result, the E-Group and activities located in Plaza F represented the intertwined ritual and practical roles played by shaman kings through the explicit spatial linkage of their role as economic facilitators with the rituals of seasonality implied by the setting.

The dual nature of the E-Group is important because it glosses the broader message of ritual, political, and economic integration inscribed in the Actuncan urban layout. Aside from the E-Group, Actuncan North was composed of facilities dedicated largely to polity administration and urban residences. Actuncan North features several range structures, including Structures 12, 19a, 31, and 39, which likely served as venues for a variety of functions related to polity administration. Research on range structures from across the Maya Lowlands indicates that activities in these spaces include audiences and meetings hosted by rulers and elite administrators, the storage of tribute and ritual regalia, and the production of specialized elite crafts (Inomata and Triadan 2000; Reents-Budet 2001; Terry et al. 2004). Although occasionally implicated in the preparations for rituals, these spaces are most often dedicated to the political and managerial roles of kings and their supporting bureaucracy, reflecting the practical rather than supernatural role of kings.

In contrast to Actuncan South, Actuncan North was an integrative space designed to facilitate the mundane interactions required for the daily construction of community and operation of the polity. Individuals living in the urban elite and commoner residences surrounding Actuncan North would have interacted with each other and the government apparatus as they went about their daily lives within Actuncan's large public plazas and administrative structures. These individuals would have developed community level social and economic relationships through encounters and conversations during their daily transit of the urban core (Low 2000). Additionally, community members would have interacted with royal administrators to secure access to public goods, such as water from the site's *aguada*, and to pay the tribute or taxes required to finance the government and provide for the ruler's livelihood (Fash 2005; Reents-Budet 2001). As a whole, Actuncan North functions as the city's economic and social hub and highlights the role the king as head of polity plays in facilitating these interactions.

For the ancient Maya, the interconnectedness of divine kings' roles in facilitating daily life and ensuring the continuation of that life through appeals to the supernatural formed the basis of these rulers' power (Freidel 2008; Freidel and Shaw 2000; Houston and Stuart 1996). This integration would have been manifest in ritual processions connecting the cosmologically charged Actuncan South to Actuncan North – the hub of everyday life (Figure 8.1). These spaces were coupled by a broad formal causeway or *sacbe*. Previous research into the uses of *sacbeob* have drawn on ethnographic sources, ancient Maya site plans, and ancient Maya depictions to show that these roads were used for ritual processions as well as daily access (Keller 2006, 2010; Reese-Taylor 2002). The *sacbe* at Actuncan places Structure 19a, the site's tallest range structure, in opposition with the broad staircase that forms the formal entrance to Actuncan South's Plaza. During the Preclassic period, Structure 19a was likely the largest range structure at Actuncan. As such, it was probably the central location of polity administration. Importantly, we (Mixter et al. 2013) do not believe that Structure 19a was a residence prior to the Late Classic period, just the geographic setting of administrative and political power. Thus, the *sacbe* physically joins the venue for the king's most important political

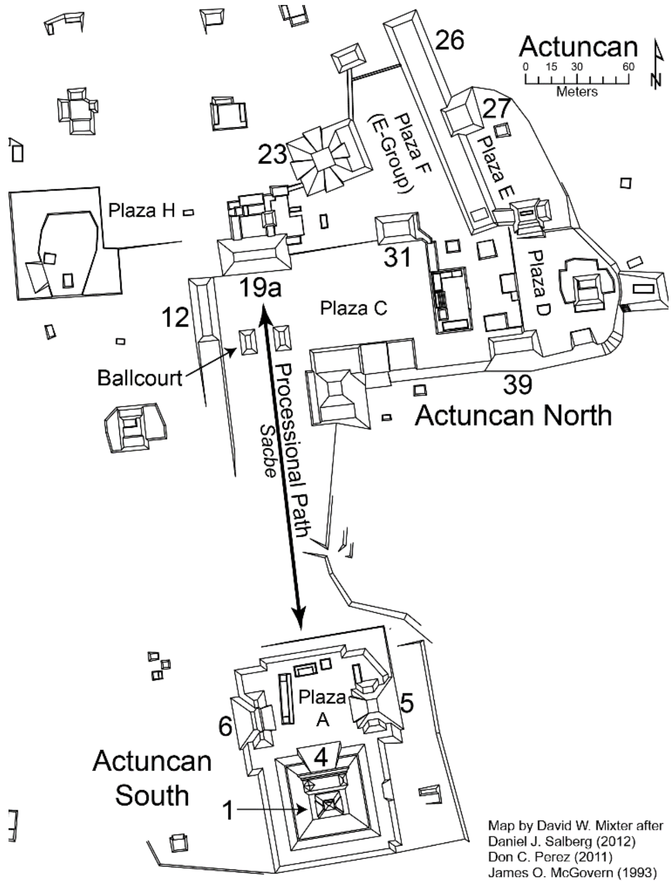

Figure 8.1. Map of Actuncan highlighting the location of Late Preclassic ceremonial architecture. Note the route of the processional path linking Actuncan North to Actuncan South.

duties—where he would have hosted foreign dignitaries and community petitioners—to the most important venue for performing his divine role, metaphorically joining his roles as divine interlocutor and head of polity. The act of parading across the *sacbe* from Plaza C to Actuncan South would have served to materialize this connection. The king would have first passed from Structure 19a—his center of worldly power—through the ball court located at the northern end of the *sacbe*. Ballcourts are often interpreted as portals (Ashmore 1989, 1991; Reese 1996; Schele and Freidel 1991). In this case, the king and his entourage were passing from the world of humans to the supernatural place of creation located at Actuncan's triadic temple group. Because the king's divine power is sourced from his ability to intercede with the supernatural world, the *sacbe* serves as a conduit through which that power can be connected to the daily workings of the polity. The king's ritual procession down the *sacbe* from the human world through the portal into the supernatural world would have performed this connection. Through this performance, the king would have symbolically reminded the community of his role in ensuring the success of their crops and trade and, in turn, their survival and prosperity.

Designed under the authority of Actuncan's earliest kings, the plan of the site's public architecture included built-in references to the fundamental entanglement of the king's roles as administrator and shaman. The king's power to intercede with the supernatural legitimized his continued rule and provided justification for his actions within the political arena. The juxtaposition of Actuncan's ritual and administrative hubs and the construction of an E-Group as a community gathering place inscribed the king's dual nature into the urban landscape.

However, the expectation that the king provided the basic requirements for life was also part of his downfall (Freidel and Shaw 2000). After the Maya collapse, Actuncan's early civic monuments were either abandoned or substantially reworked, illustrating how the utility of these architectural metaphors disappeared along with the institution of divine kingship. In the next section, I will discuss the ways in which the local urban landscape was used differently following the collapse.

8.3 Separating Divine from Rule

When the local community abandoned the rule of divine kings during the Terminal Classic period after the failure of Xunantunich, they were tasked with reconstructing their political institutions to ensure continued order in community interactions (Schwartz 2006).

Because the collapse included the failure of divine kingship, the resilience of the community depended on members' ability to separate new authority structures from their understanding of the cosmos. At Actuncan, the community appears to have decided to separate political and religious institutions by physically isolating the spaces dedicated to each of these spheres. as argued in the previous chapter.

The several-century gap in Actuncan's use as a center of authority from the early part of the Early Classic period to the Terminal Classic period resulted in a clear discontinuity in the use and function of monumental architecture and public space. This gap provides an unusual opportunity to look at how a Terminal Classic community repurposed an earlier center during the post-collapse period. There is only limited evidence that Actuncan's monumental architecture was utilized during the Late Classic. The major exception is Structure 19a, Actuncan's tallest most centrally located range structure. During the Late Classic, the Preclassic building was converted into an elite residence, which likely served as the palace of a secondary elite who ruled Actuncan under the auspices of Xunantunich's king (Mixter et al. 2013). Contemporaneously limited renovations took place on the ball court, along the *sacbe* (Structure 12), and within the triadic temple group (McGovern 2004; Table 2.2). Effectively, these renovations appear to have reified the major processional route established during the Preclassic period. However, these activities presumably took place under the aegis of Xunantunich and were intended to emphasize the power of the noble vassal inhabiting Group 8 and may have been used to strengthen Xunantunich's claim on the earlier site's history (Ashmore 1998).

In contrast, excavations into other Preclassic ritual and civic architecture indicate that these locations were not renovated and remained largely unused during Late Classic period (Donohue 2014; McGovern 2004; Simova and Mixter 2016). Furthermore, many of the site's public plazas do not appear to have been maintained after the Early Classic period (Mixter 2012; Mixter and Craiker 2013). The lack of investment in public architecture during the second half of the Early Classic period likely reflects the move away from local rule, while the select reoccupation of ritual and administrative spaces during the Late Classic reflects the site's utilization as a secondary center during Xunantunich's apogee. Importantly, the site's urban patio-focused groups remained occupied continuously and witnessed Actuncan's fluctuating role in the local political geography. In contrast, the site's elite houses were initially abandoned in the Early Classic period, indicating that the participants in the site's Preclassic ruling structure felt the site's decline most strongly.

During the Terminal Classic period, the local community systematically reengineered Actuncan's site plan by constructing a new monumental political center and selectively revering, renovating, ignoring, and actively dismantling public architecture remaining from the era of royal rule. This reorganization effectively divided the center into two disconnected parts, a political center focused on Actuncan North and a ritual center based in Actuncan South. While the original site plan spatially integrated Actuncan's political and ritual functions through the *sacbe* and shared space, Terminal Classic patterns of architectural disuse disconnected the major centers of political and ritual life. Whereas the original plan served as a metaphor for the divine underpinnings of political power, the Terminal Classic plan severed this connection, creating distinct spaces for political and ritual life that better fit post-royal rule.

As described in Chapter 5, monumental construction efforts during the Terminal Classic period focused primarily on the construction of Group 4 and especially on its large basal platform. This construction was the largest labor investment martialed by the Terminal Classic community, indicating its centrality to the organization of the post-collapse community. Group 4 served as a council house and community gathering place. In contrast to the exclusive nature of Classic period polity business located inside the small interior space of elevated range structures, Group 4 is an open and easily accessible space.

One particularly interesting aspect of Group 4's construction is its location within the heart of Actuncan North on top of a razed Early Classic building that originally separated Plazas C and D. Despite the existing public infrastructure located within the site core, current evidence indicates that the community did not reuse the site's early range structures or E-Group during the Terminal Classic period. Initially constructed as part of the integrated site plan aimed at supporting the institution of divine kingship, these spaces were no longer revered by the site's residents. Instead, these buildings appear to have been actively dismantled. The treatment of Structures 19a, 23, 26, and 27 by the Terminal Classic community provides two cases for understanding its perception of Actuncan North's Preclassic and Classic monumental architecture. Prior to the Terminal Classic period, Structure 19a served two previous roles in the Actuncan community, first as the site's largest Preclassic and Early Classic administrative structure and then as the focal point of a Late Classic ruler's residence. During the Terminal Classic period, this structure's vaulted roof and masonry walls were removed and the interior rooms filled and sealed, effectively terminating the use life of this structure (Mixter et al. 2013). The structure's vault stones were specifically selected for incorporation into the filling process (Jamison 2013:20). Similarly, dramatic acts of filling or burying palace structures at other Maya sites are directly associated with transitions in leadership or the end of royal rule (Iannone 2005; Laporte 1989; Yaeger 2010a). Excavations at the base of Structure 19a uncovered only a small amount of collapse debris, indicating that the stones from the deconstructed superstructure were not simply hurled off the platform, but rather carefully removed (Jamison 2013:21-23).

Additionally, the majority of the blocks composing the staircase used to access the summit of Structure 19a appear to have been removed in antiquity. The general lack of *in situ* stones and absence of substantial collapse debris points to the removal of these stones, an act which would have rendered the summit of Structure 19a unreachable through any formal route.

Excavations on Structures 23, 26, and 27 indicate that the site's E-Group was treated in a similar manner. Structure 23 is tall pyramid with a square base that forms the western boundary of Plaza F. Structure 26 is the long linear platform that formed the eastern boundary of Plaza F. Together, Structures 23 and 26 formed the site's E-Group. Structure 27 is a pyramidal platform attached to the eastern side of Structure 26 to mark the centerline of that eastern platform. Structure 27 would have symbolically marked the place of the rising sun on the spring and fall solar equinoxes. Despite its deep cosmological significance and association with Preclassic community gatherings, the E-Group does not appear to have been part of the Terminal Classic use of the site. Instead, current evidence indicates that the summit of the building was abandoned. At this time, the Terminal Preclassic altar located at the summit of Structure 27 was buried under a layer of rubble, ending the structure's use as a ritual space (Donohue 2014). The dismantlement of Structure 26's façade followed the abandonment of Structure 27. Similar to Structure 19a, the Terminal Classic Maya removed most of the cut stones from Structure 26's staircase, leaving in place only the fill below (Donohue 2014). The fact that a small number of stones were left in place indicates that this dismantling happened somewhat casually rather than as a concerted effort to destroy the staircase. Additionally, the complete absence of fallen cut stones at the foot of the stairs indicates that natural processes did not lead to the dismantling of Structure 26. Recent excavations on the eastern side of Structure 23 also found few facing stones (Heindel 2016). Rubble core was largely what remained of the final construction phase, indicating that the building's façade was dismantled in antiquity.

The removal of cut stones from Structures 19a, 23, and 26 fit an intriguing pattern of destruction that likely extends to most of Actuncan North's monumental architecture. Most of Actuncan's unexcavated public structures are visually remarkable because they appear from the surface to be piles of large river stones rather than nicely formed Maya platforms (Figure 8.2). Like the excavated examples, these buildings likely featured cut stone façades that fronted the nearly ubiquitous large stone fill. Yet during excavations we have not encountered enough cut-limestone blocks in collapse contexts to account for those missing from the façades of these buildings. At the same time, excavations into the Group 4 platform indicate that the Actuncan Maya largely used cut stones to fill this large substructure. The use of attractive dressed stone contrasts with the roughhewn or unhewn river cobbles used to fill the site's Preclassic constructions. The local community appears to have had little reason to maintain the monumental architecture associated with the administration of the previous regime. Instead, after ritually closing these spaces, they systematically mined them for stone. Practically speaking, these buildings provided the most readily accessible source of construction material. More importantly, the act shows a clear disregard for the remnants of royal authority at the site. The community chose to build a new political center and intentionally disassemble the old surrounding infrastructure, patterns that point to the community's break from Classic period structures of authority.

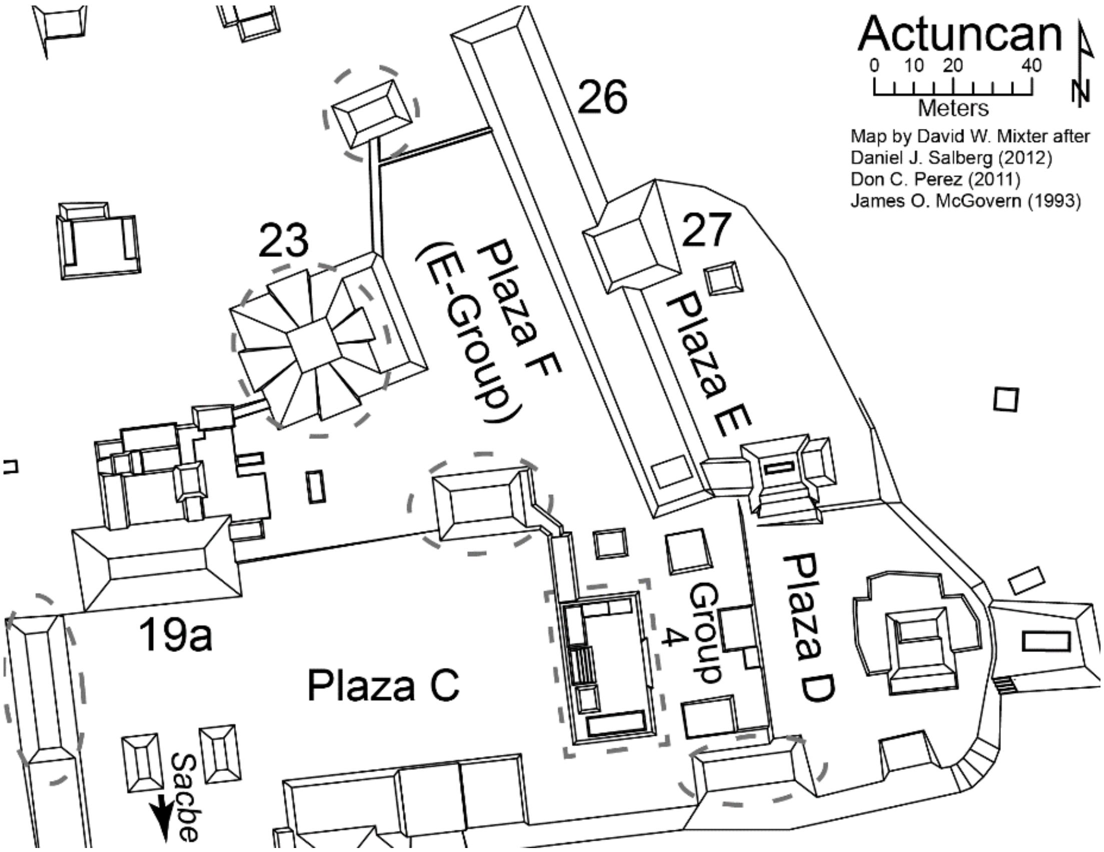

Figure 8.2. Map of Actuncan North highlighting Terminal Classic alterations to the site core. The Late and Terminal Classic construction or modification of labeled structures is discussed in the text. The dashed gray ellipses circumscribe structures that appear to have been intentionally dismantled in a similar manner to Structures 19a, 23, 26, and 27. The dashed rectangle highlights Group 4.

These Terminal Classic actions also destroyed the integration of the political and ritual spheres built into the original site layout. The eastern structure of the E-Group, previously a complex symbol of communal and cosmological forces, was capped and dismantled. Structure 19a, the location of royal administrative authority, was similarly dismantled. The destruction on Structure 19a broke the metaphorical connection between the site's political and religious centers created by the *sacbe* connecting Actuncan North to Actuncan South by eliminating one terminus of this ritual path. Instead, Group 4 replaced the administrative and gathering spaces previously located in Structure 19a and the E-Group. Group 4 was built facing away from Plaza C and the *sacbe* and was not connected to Actuncan South by any direct path. This organizational shift physically divided Actuncan into two separate and unconnected realms. Abandoned and partially dismantled buildings in the center of the city formed a buffer between Group 4 and the remaining religious space located in Actuncan South. The result was a reorganized urban core in which historic venues of royal authority were no longer spatially connected to the Terminal Classic political process.

Despite these changes, the old ritual space at Actuncan South did not go out of use. In contrast to the site's E-Group and range structures, the triadic temple group was the location of minor construction and renewed ritual activity described in detail in Chapter 7 (Figure 8.3). McGovern's (2004) research on Structure 5 and my research on the plaza structures indicate that Plaza A was used repeatedly as a ritual venue during the Terminal Classic period. During Actuncan's apogee, Plaza A was easily accessible from the *sacbe* up a monumental staircase as part of the primary processional route south from Structure 19a. However, in the Terminal Classic period Structure 8 was constructed across the main entrance to Plaza A, dividing this space from the *sacbe* to the north. This building had three or five narrow doors that community members would have had to pass through to access Plaza A. Structure 8 would have impeded processions along the *sacbe*, effectively isolating Plaza A from the remainder of this site core. This allowed Actuncan South to remain a place for ritual appeals to supernatural forces and ancestors, without implying that these forces underpinned the community's ruling institutions.

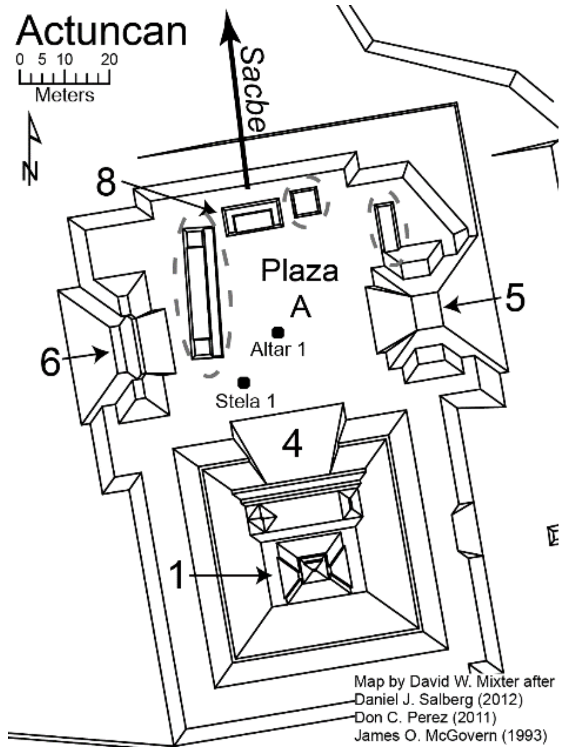

Figure 8.3. Map of Actuncan South highlighting the Terminal Classic uses of this space. Note how Structure 8 blocked the central access from Plaza A to the *sacbe*, interrupting the previously unimpeded processional path.

While the original Late Preclassic formulation of Actuncan's site layout emphasized the role of the king as a divine interlocutor presiding over the daily political and economic activities of the polity and its constituents, the modified landscape explicitly breaks these bonds. When only the buildings in active use are considered, Actuncan's Terminal Classic landscape was clearly divided between a southern ritual group and a northern political space. These spaces are no longer attached by a ritual processional path. Processions were prohibited by the construction of a low entry building blocking access to Plaza A and the separation of the triadic group from the remainder of the site. Similarly, Structure 19a, the range structure at the northern terminus of the site's *sacbe*, was terminated, and Group 4 was built facing east, away from the site's unused Preclassic public plazas. In this way, the Actuncan Maya dismantled the monumental trappings of divine kingship in Actuncan North rendering them unusable and their associations defunct.

8.4 Discussion

In the moments immediately after a political failure, a community's resilience is entirely dependent on its ability to rebuild the basic rules of social relations between those who remain in place. For the Maya, this process included a widespread, but fraught, desire to disentangle the justification for leadership from cosmological principles. In areas where new principles of leadership could not be agreed upon, population numbers declined and centers were quickly abandoned. That said, Actuncan's strategies for managing the dissolution of divine kingship only represent one of a mosaic of variably successful options adopted by Terminal Classic period communities. While some supported rejuvenated royal lineages freed from the bonds of failing Classic period hegemons (Inomata and Triadan 2013; Źrałka and Hermes 2012), other centers built new institutions anchored in cultural connections to the more stable northern Maya Lowlands (Harrison-Buck 2007; Masson and Mock 2004; McAnany 2012). Like Actuncan, other centers likely followed more innovative locally determined paths that drew heavily on local historical contingencies. Importantly, reorganization strategies were successful where communities bought in to new institutions and remained intact. Where communities atomized, people emigrated.

In all cases, the establishment of new political institutions resulted in substantial modifications to the built landscape as communities reconsidered authority structures and their relationship to cosmological principles. Despite ongoing innovation, communities that remained in the Southern Maya Lowlands remained surrounded by the remains of the Classic period cities, which served as constant reminders of the past. Even where new capitals were established away from historical centers, the physical size of Maya pyramids ensured they would have remained present in the local consciousness. In fact, many abandoned Preclassic and Classic period centers became pilgrimage destinations (Andres and Pyburn 2004; Brown 2011; Hansen et al. 2008; Robin et al. 2012a). Where populations dwelled amongst the monumental ruins, they continued to interact with the past on a daily basis (Halperin 2014; Navarro-Farr 2009; Navarro-Farr et al. 2008; Pendergast 1986). Perhaps because of a transcendent cosmological association with mountains of sustenance and the three stone hearth of creation, triadic pyramid groups in particular remained places of reverence (Halperin 2014). In contrast to the pomp and circumstance of royal performance during the Classic period, the Terminal Classic ritual activities taking place within these spaces were modest and may have represented individuals or household groups placing offerings. This kind of practice, as seen at Actuncan, may indicate direct contact between individuals and the supernatural, without the need for royal intercession.

For the residents of Actuncan, the eighth century A.D. failure of divine leadership at Xunantunich led to a series of institutional reforms evident in the built landscape. In contrast to the many lowland communities that failed in their reorganization attempts, the Maya of the Mopan River valley adopted a series of strategies that proved to be successful for a time. The centerpiece of this strategy was the establishment of a new capital within the old Actuncan site core. Because of the placement of the new seat of authority within the remains of an old royal capital, the community was forced to decide how to treat the tangible architectural remains of divine kingship (Halperin 2014; Stanton and Magnoni 2008). Rather than constructing a new capital, Actuncan's new leaders managed this dilemma by functionally separating the venues for cosmological rituals and political life. The Classic period site plan had served to integrate the different parts of the site by facilitating movement and building cosmological metaphors. These connecting principles were dissolved in the Terminal Classic as the active political and ritual spaces were circumscribed and spatially separated. Furthermore, the post-collapse community did not utilize the architectural infrastructure of divine kings. Instead, they dismantled administrative and ritual buildings in Actuncan North for use as fill for the construction of their new political center.

The construction of public spaces provides the opportunity to embed powerful political messages expressed explicitly through shared symbols and ceremonies and implicitly by changing the daily practices of those inhabiting the site center. During the Terminal Classic period, the local community considered both broad and local social trends in the process of reorganizing their authority structures. First, memory of the failed sacred covenant behind kings' right to rule likely led to a desire to disentangle the underpinnings of authority from cosmology. Actuncan's new leaders did not attempt to tap into the site's historical power centers for legitimacy. By severing the physical connection between the site's political and ritual centers, the new leaders effectively disavowed the previous claim that their rule was based in any ability to serve as arbiters of the supernatural. This shift meant that after the collapse rulers faced greater accountability for their decision making. They could no longer claim access to supernatural power. Further, the deconstruction of Preclassic political and administrative buildings indicates that new leaders did not attempt to graft their right to rule onto past leaders.

Societal compression would have provided an additional motivation to move away from cosmological underpinnings of rule. Emigration of the Mopan River valley's ruling families and the poorest residents indicates that remaining households were on a more even socioeconomic level (Ashmore et al. 2004). With the failures of divine kings in recent memory, the leaders of these households would likely have been hesitant to give absolute power to one of their peers.

Instead, a form of council-based rule would have preserved the valley's newly found socioeconomic equality. The modifications to Actuncan's landscape indicate the outcome of these decisions. By destroying the Preclassic political and administrative buildings, new leaders indicated a distancing from both past kings and the exclusive and hidden spaces they used to conduct the business of governance. These structures were replaced by Group 4, which included a council house and inclusive performance spaces.

During the Terminal Classic and Postclassic periods in Yucatan, council houses are symbols of more inclusive, secular rule led by the heads of powerful lineages who met in council (Bey et al. 1997; Bey and May Ciau 2014; Fash et al. 1992; Proskouriakoff 1962; Pugh et al. 2009). While it is often true that individual lineage heads held primacy for a period of time, the maintenance of their realms was dependent on the continued support of their peers who controlled the affiliation of outlying towns and provinces (Marcus 1993; Ringle and Bey 2001). The ability of these towns and provinces to change affiliation provided a powerful buffer against aspiring tyrants (Okoshi-Harada 2012). As such, authority was likely more dispersed, placing all household leaders on a more equal footing.

Just as the shifting political organization at Actuncan likely followed the pan-Maya trend towards greater accountability, the physical separation of the new political complex from the reconceived ritual space mirrored a broader, pan-Maya trajectory towards a separation between political and religious institutions. As recently detailed by Masson and colleagues (2006:194-197), during the Postclassic period the process of disentangling the dual roles held by Classic period divine kings culminated in the establishment of a powerful priesthood separate from the ruling class. This priesthood provided an additional set of checks on the power of the ruling elite. The Postclassic separation of political and religious authority in the hands of lineage heads and priests is attested to in the ethnohistoric literature at Mayapan, Uxmal, and in the Petén Lakes (Jones 1998:94; Landa 1941:35n173; 2013:19-20) and represented in the art of Chichén Itzá (Ringle 2004:213). This arrangement contrasts strongly with the Classic period, where ritual specialists were likely members of the royal court who took on ritual roles part time in support of kings' intercession with the gods (Houston and Stuart 2001:60).

8.5 Conclusions

Untangling political and religious institutions was a critical task for any community that proved resilient in the fact of the Maya collapse. In the long term, political institutions evolved into organizations that restricted the influence of individuals by empowering councils of elites and founding a set of religious institutions separate from the political establishment. The reorganization of space at Actuncan indicates that sociopolitical regeneration was conditioned by local contingency. The city's existing Preclassic urban plan had to be rearranged to better fit the new principles underlying the post-collapse community structure. The urban design strategies adopted in the Terminal Classic period were resilient because they backed a form of local leadership that matched the social conditions on hand at the end of the collapse.

Chapter 9. ACTUNCAN: A COMMUNITY THAT SURVIVED

9.1 Introduction

The data presented in the preceding chapters demonstrate the changes to Actuncan's political and ritual organizations from the Preclassic to the Terminal Classic periods and how these changes manifested themselves on Actuncan's urban landscape. I have argued that after the Maya collapse the Actuncan community adopted a councilor form of governance based in a newly built council house. Additionally, the community took action to separate their political and religious institutions by creating physically separate political and ritual zones. Ritual activities were associated with cosmology and ancestors from the site's apogee, which was beyond the range of genealogical memory. These findings show how sociopolitical reorganization happened in the Belize River valley.

But Actuncan was only one of many Classic period communities strung along the banks and valley margins of the Mopan, Macal, and Belize Rivers. Each of these communities gathered together for feasts and calendrical festivals, even if they were built on diverse principles (Connell 2003; Yaeger and Robin 2004). Evidence shows that hinterland villages, such as Chan, built solidarity around relatively equal prosperity and a site center that could be claimed by all (Robin et al. 2014). Other communities, such as Chaa Creek and Nohoch Ek, had public gathering spaces but appear to have been dominated by affluent households (Coe and Coe 1956; Connell 2000, 2010; Taschek and Ball 2003). Even hamlets like San Lorenzo and neighborhoods on Buenavista del Cayo's outskirts had communal gathering places that symbolized and reified a community identity (Peuramaki-Brown 2012, 2013; Yaeger 2000a). Despite the variability in the composition and social organization of communities in the lower Mopan River valley, the community centers facilitated integration by providing a space for interaction and a material marker of the communities' shared past. These spaces and the interactions they facilitated formed the basis of mnemonic communities that collectively remembered the specific history of each town, village, and neighborhood, and that provided a lens for understanding official narratives projected by the valley's hegemonic forces.

During the Late Classic II period, Actuncan was probably known to most of the valley more for the striking silhouette Structure 1 formed on the horizon than for the community at its base. However, for Actuncan residents these earlier buildings were its community center. Through their daily routines, the denizens of this old center remembered Actuncan's past and the past of their community. Actuncan's grand history was materialized by its little-used pyramids and range structures. These monuments stood in contrast to the adversity faced by some community members while under foreign rule.

Figure 9.1. View of Actuncan from the alluvial terraces on the opposite bank of the Mopan River. Structure 1, the tallest at Actuncan, is indicated.

9.2 The Roots of Actuncan's Remembering: Prosperity and Political Organization in the Preclassic

In Chapter 1, I argued that memory plays two roles in the process of reorganization. The past serves as both a motivator of organizational change and provides the structuring principles for reorganization. When the society "remembers" in the reorganization phase, it has the potential to draw deeply and creatively on the past to build new institutions. Indeed, Actuncan's Preclassic kin-based corporate political structure could have provided a template for the site's Terminal Classic reorganization. This hypothesis certainly fits McAnany's (1995) suggestion that Classic period kingship actively suppressed latent lineage-based authority, which could emerge as an organizing principle in the absence of kings.

I want to briefly consider what the Actuncan community was remembering. Beyond the data we have about Actuncan's early household occupation and the sequence of its monumental construction, the site's Preclassic occupation remains a bit enigmatic. Part of this enigma results from broader questions about the nature of social organization and political authority during the Preclassic period. While monumental architecture and iconography clearly indicate that Late and Terminal Preclassic rulers were divine kings (Estrada-Belli 2011; Freidel and Schele 1988), these kings did not record dynasties. Rather, San Bartolo's west wall shows the king being crowned by the Maize God (Saturno 2009; Taube et al. 2010). His authority derived from divinity, not ancestry. Furthermore, although some sites may have Preclassic palaces (Clark and Hansen 2001; Ringle 1999), others like Actuncan do not.

Like other major Preclassic centers, Actuncan clearly seems to be the seat of a Preclassic king. The carving on Stela 1 seems to depict an individual of importance, and the site's monumental architecture indicates that the city's leader possessed the appropriate authority.

However, we have never been able to identify a palace suited to a king. Rather, we have excavated three very similar looking Preclassic houses (LeCount and Blitz 2005; Mixter 2011b, 2012; Nordine 2014; Simova 2012; Simova et al. 2014). Pursuant to LeCount's (2001) original hypotheses regarding Preclassic power at Actuncan, we now believe that our data point to a corporate leadership strategy at Actuncan during the Preclassic period (LeCount 2014a). In this scenario, the three lineages that occupied Actuncan's elite Preclassic houses shared power, with the king more *primus inter pares* than autocrat. Without hereditary rule, the king would likely have been selected from among these leading households, with the selection process providing a check on any individual king or lineage's power. During the Late and Terminal Preclassic periods, Actuncan thrived under the rule of its Preclassic kings. The three noble houses grew and the commoner households in the northern neighborhood were established and thrived.

The past as collectively remembered by the members of the Terminal Classic Actuncan community was not straightforward. Sometime in the Early Classic period monumental construction halted at Actuncan, and the center was superseded as the local seat of authority. At this time, Actuncan's elite households were abandoned for a time, leaving only the occupants of the northern neighborhood to maintain the memory of Actuncan's past greatness. Although the site's monumental landscape helped to preserve the community's memory, the content of the community's narratives would have drifted through thousands of retellings, impacted not only by mistakes but also influenced by the contemporary context of current events and competing narratives.

In the next section, I explore how Actuncan's past was remembered and how this memory impacted the Terminal Classic reorganization. Having reviewed our understanding of Actuncan's Preclassic foundations, I will review how the process of remembering was affected over time by the historical trajectory of the Belize River valley. In particular, I will look at how Xunantunich attempted to recast the narrative about Actuncan during the Late Classic period. Xunantunich's official narratives and evidence for their assertion of authority play a crucial role in understanding how Actuncan's Terminal Classic community interpreted their past. Finally, I demonstrate that Actuncan's Terminal Classic revitalization indicates that the community maintained an alternative narrative of the past. The form of the Terminal Classic reorganization can be explained by how the community remembered both Actuncan's early apogee and its period of subordination.

9.3 Official Narratives in the Late Classic: Actuncan under as a Subordinate Center

During the Early Classic period, the Actuncan community underwent substantial political changes. The slowing of renovation to Actuncan's monumental architecture was accompanied by its end as the local capital in the valley. During the Early and Late Classic periods, authority shifted first to Buenavista del Cayo then to Xunantunich (Ashmore 2010; Ball and Taschek 2004; Leventhal and Ashmore 2004). These centers were the seats of power for divine kings that ruled the kingdoms known as *Kokom* and *Katyaatz Witznal* respectively (Helmke and Awe 2012; Yaeger et al. 2015). Both Buenavista and Xunantunich developed official narratives of the local past that were advantageous to their own power. As part of these polities, Actuncan's community members would have been exposed to both these official narratives. In fact, Actuncan's antiquity appears to have been utilized as part of the official narrative that Xunantunich used to legitimize its authority. However, as I will show, the official narratives of these local lords were not accepted by hinterland communities without question.

9.3.1 Xunantunich: Actuncan's Late Classic overlord.

Here I focus specifically on Xunantunich's rapid rise during the Late Classic period and the material indicators that a new polity ideology was propagated by its leaders. Beginning in the 7th century, Xunantunich grew rapidly into a great settlement featuring three plazas, many pyramids, and numerous stone monuments, including 12 monuments, six of which are carved with hieroglyphic inscriptions (Helmke et al. 2010:98; LeCount et al. 2002). The dramatic rise of Xunantunich may have been spurred by the influence of larger regional hegemons and appears to have come at the expense of Buenavista del Cayo.

Xunantunich's layout was designed to imply cosmological connections to the four corners of the Maya world and political connections to more powerful regional hegemons (Ashmore and Sabloff 2002). The most important indicator of Xunantunich's new power was the Castillo, a 39 m tall pyramid complex (Leventhal 2010). The Castillo was visible across the valley, just as Actuncan's largest structure was before. The construction and visibility of this edifice would have established Xunantunich's power and fixed in people's memory the center's ability to secure regional labor. Furthermore, Fields (2004) has argued that the stucco friezes located at the summit of the Castillo reflect the site's royal charter. The site's carved monuments represent the most explicit propagation of an official narrative. The images and texts carved on these monuments recorded the official history of specific rulers' deeds and geopolitical importance (Helmke et al. 2010). The monumental architecture and artistic programs in the Xunantunich city center form the foremost material manifestation of the site's official narratives.

9.3.2 Xunantunich and Actuncan.

In addition to material manifestations of legitimizing narratives within the Xunantunich site, Ashmore (1998) has argued that the rulers of Xunantunich claimed Actuncan as their ancestral home. Because Xunantunich was rapidly constructed as a royal capital, their claims for legitimacy may have been partially rooted in the creation of a narrative of descent from the region's oldest divine kings. Several lines of evidence point to Xunantunich's adoption of this official narrative. First, Xunantunich was constructed to the south of Actuncan. As a result, Actuncan was located to the north of Xunantunich, the direction where the ancestors reside (Figure 9.2)(Ashmore 1998). The placement of Xunantunich in this directional relationship with Actuncan would have invoked Maya cosmological principles to emphasize the narrative that Actuncan was ancestral to Xunantunich (Ashmore 1989, 1991).

Second, a portion of a *sacbe*, a formal processional road that connected Xunantunich to Actuncan, was mapped by the Xunantunich Settlement Survey (Ashmore 1998). The only other *sacbeob* associated with other sites are major ritual processional roads that connect spaces within the ceremonial cores of these centers. The construction of a formal *sacbe* connecting Xunantunich to Actuncan would have created space to have formal processions between the two city centers and is an indication that Xunantunich was officially claiming Actuncan as part of its territory.

Third, Xunantunich's ancient name may point to an association with Actuncan. Helmke (Helmke and Awe 2012:67-68) has read the Xunantunich emblem glyph as the toponym *Katyaatz Witznal*, which he glosses as "Clay-bearing Mountain." Xunantunich was constructed on top of a tall limestone hill; however, there is currently no evidence that this hill is composed of clay or that clay was mined from this location. Actuncan, on the other hand, was constructed on an alluvial terrace above the Mopan River. Because of the depth of this natural alluvial clay deposit, our excavations have never reached bedrock. This indicates that the rulers of

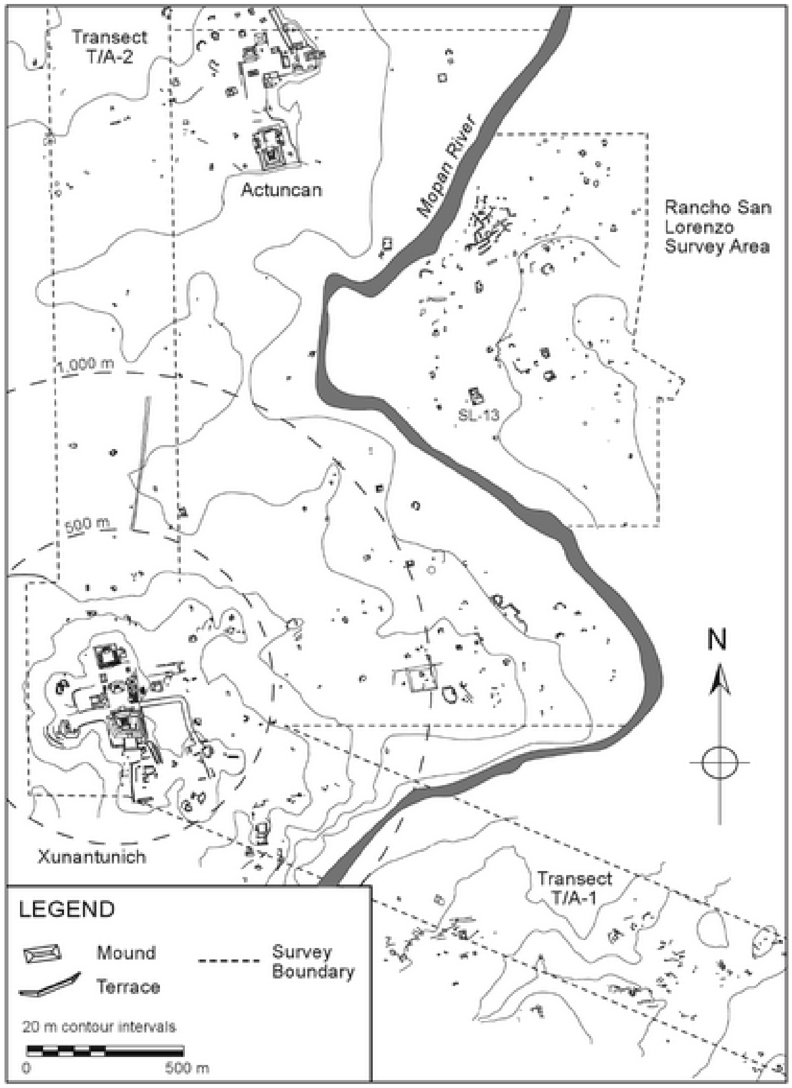

Figure 9.2. Image showing Actuncan in relationship to Xunantunich. Note Actuncan's position to the north of Xunantunich. (Yaeger 2010b:Figure II.1)

Xunantunich may have borrowed the ancient name of Actuncan for their new polity, creating a direct and explicit reference between the two.[11]

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[11] It is entirely possible that the Maya considered the entire region to be a single settlement rather than separate settlements on neighboring hilltops. Nonetheless, under the scenario described,

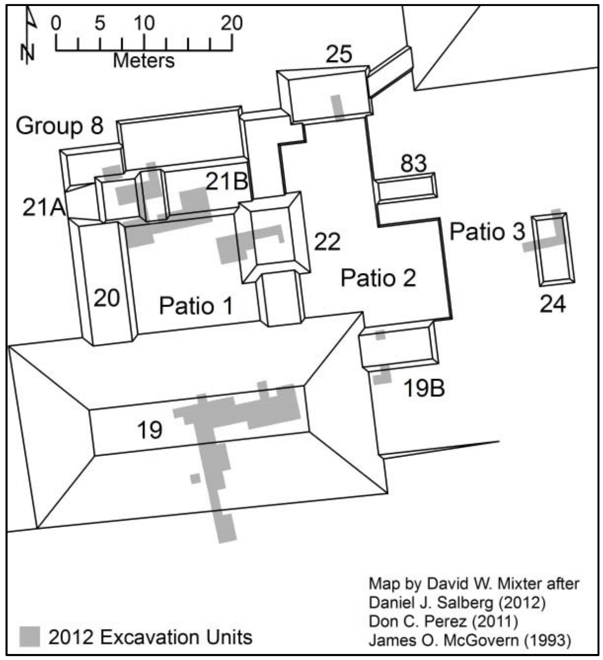

Figure 9.3. Map of Structure 19a and Group 8 layout showing location of excavations

Furthermore, developments at Actuncan during the Late Classic period point to direct attempts by Xunantunich to exert its authority over the Actuncan community. After a period of disuse in the Early Classic period, Actuncan's largest Preclassic administrative structure, Structure 19a, was converted into Group 8, a multi-patio household compound reminiscent of the large palace complexes inhabited by kings and elites at other Late Classic sites (Figure 9.3)(Mixter et al. 2013). Unlike palaces at major Late Classic capitals, the palace at Actuncan is oddly proportioned for a ruler or even an important elite. Even though the household includes three patios, all of the constituent mounds aside from Structure 19a are quite low. In contrast,

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Xunantunich may have been utilizing an ancient name originally associated with the rulers based at Actuncan.

Structure 19a had a corbel-vaulted roof and sat on a 6 m tall platform, all constructed centuries earlier. Based on chemical data collected from the floors of Structure 19a, we (LeCount et al. 2016) have argued that in the Late Classic period it served primarily as an administrative space for hosting small events and storing ritual goods. Based on these data, my colleagues and I (Mixter et al. 2013) have argued that Structure 19a and its associated dwellings were occupied by an administrator placed at the site by Xunantunich.

To secure their position within the Actuncan community the members of Group 8 built a structure for a household that appeared much older than it was. They constructed Structure 22, a large shrine on the eastern side of the largest patio in the position usually reserved for ancestor shrines in Actuncan's households. However, our excavations revealed that the shrine held no ancestors (Mixter and Freiwald 2013). Instead the building and the multi-patio group created an appearance of deep history, where in reality, Group 8 was the newest residence constructed at the site. This act speaks to a very intentional attempt to construct memory and influence collective remembering. By occupying Structure 19a and building a multi-patio household—the only one at Actuncan—with an overly large but empty ancestor shrine, the residents of Group 8 acted as though they were deep-rooted members of local community while simultaneously differentiating themselves through their elaborate palace architecture. Placing a local administrator at Actuncan would have benefited Xunantunich's rulers by advertising their claim to the earlier site's rulers. Part of this claim may have been to create the appearance that their vassal living in Group 8 was a long-lived affluent member of the Actuncan community. Of course, members of the Actuncan community likely remembered the real impetus for the construction and occupation of Group 8 and may have resented the attempt by Xunantunich to rewrite their past.

Additionally, McGovern (2004) reported evidence that several buildings along

Actuncan's processional route were refurbished during the Late Classic period. As described in Chapter 8, this construction was likely under the aegis of Xunantunich. The reestablishment of Actuncan's primary ritual path may have been intended to legitimize the noble ruler located in Group 8 and to strengthen the connection between Xunantunich's claim on Actuncan's past. Further research in Plaza A and along the *sacbe* may provide evidence to test this hypothesis.

9.3.3 Symbols of Subjugation and Resistance in the Xunantunich Hinterland.

That said, at Actuncan and other Belize River valley settlements, there is a strong indication that the narratives propagated by Xunantunich were accepted, at least superficially. LeCount (2010a) has identified the Mount Maloney Black ceramic types as a clear marker of affiliation with the Xunantunich polity. This ceramic type appears in the Late Classic period and becomes the most common pottery type in the region discussed in this study. However, at sites outside this region, the type is relatively rare (Gifford 1976). In the Xunantunich center, Mount Maloney pottery is ubiquitous in ritual deposits, and sherds were used in the fill to protect the Castillo's stucco friezes when they were covered during a renovation event (LeCount 2010b). At many settlements in Xunantunich's hinterland, the introduction of Mount Maloney Black marks a gradual transition from assemblages dominated by red slipped pottery to greater quantities of black slipped pottery. This transition likely points to communities' decisions to affiliate themselves with Xunantunich rather than other contemporaneous capitals (Connell 2000, 2010).

While the use of Mount Maloney pottery marks the adoption of Xunantunich's official narrative, some evidence indicates that, for at least a few members of the Xunantunich polity, this acceptance was largely a public transcript that obscured collectively remembered hidden transcripts. Scott (1990) differentiates between public transcripts—narratives and practices adopted in public contexts—and hidden transcripts—practices and narratives maintained solely in the private contexts. Hidden transcripts are viewed as tools of resistance to hegemonic power that demands adherence to official doctrines. Although all households within the Xunantunich polity possessed some Mount Maloney Black ceramics, there is evidence from Chan that enthusiasm varied for this black-slipped symbol of Xunantunich's rule. Interestingly, households founded during Xunantunich's rule possess a high percentage of Mount Maloney Black pots, while Chan's older households maintain a greater balance between red and black slipped pots (Kosakowsky 2012; Robin 2013). This indicates that older households and communities were actively maintaining their deep-seated, collectively remembered traditions. Maintaining larger quantities of red wares constitutes a subtle kind of resistance—a hidden transcript to the public transcript of black wares.

Chan, like Actuncan, is an old continuously-occupied community. In both communities, proximity to common public facilities enabled intensive intracommunity interactions. It is no accident that the oldest households limited their adoption of black-slipped ceramics. These are the households that have interacted the longest and developed the strongest local concept of community. Chan provides an example of how Xunantunich's official narratives impacted the practices of local communities and of how these communities resisted. Although we have little evidence from Actuncan for direct resistance to Xunantunich's power during the Late Classic period, evidence from the Terminal Classic period after the fall of Xunantunich point to how the rule of the Late Classic hegemon impacted the collective remembering of the older site.

9.4 Evidence of Collective Remembering: Actuncan in the Terminal Classic Period

During the 9th century the divine kings of Xunantunich failed and eventually disappeared.

Evidence from the Xunantunich Settlement Survey indicates that the valley began to depopulate by the beginning of the Terminal Classic period around A.D. 780 (Ashmore et al. 2004). Even as the rulers of Xunantunich continued to create history through the erection of carved monuments, all its monuments were dragged into a single public plaza, a wall was constructed around it, and other public plazas were largely abandoned. Simultaneously, evidence from other centers indicates that their communities gained new autonomy. Elaborate Terminal Classic tombs have been encountered at both Buenavista del Cayo and Cahal Pech that appear to point to claims of royal status—claims that would have contested Xunantunich's hegemony (Awe 2013; Helmke et al. 2008).

As I have previously established, a different kind of political renewal took place at Actuncan. As Xunantunich's power waned, Actuncan's Terminal Classic building program was initiated leading to the construction of Group 4 and Structures 7, 8, and 9. These constructions marked the establishment of councilor rule. As previously discussed, the population of Actuncan's community remained relatively stable during the Terminal Classic period when other settlements were experiencing depopulation. With the return of political authority to Actuncan in the Terminal Classic period, evidence of renewed practices in association with the site's Preclassic architecture provides evidence for collective remembering by Actuncan's deep-rooted community.

Here I consider three periods of remembering, which imbued these ancient structures with a dynamic palimpsest of meanings. The actions seen in the Terminal Classic period reflect the final results of this remembering process. The first period correlates with Actuncan's Terminal Preclassic to Early Classic apogee. During this time period, Actuncan was built and its mnemonic community was established. The site's early success serves as a baseline for understanding the past that the later community was remembering.

The second period of remembering took place during the rule of Xunantunich. At this time, the Actuncan community dwelled within the empty shell of the former Preclassic capital, and the memory of Actuncan's political past likely slowly transformed from recent history to myth (sensu Gosden and Lock 1998). Furthermore, a new version of the local past was being promoted by Xunantunich to support its divine right to rule. This new official narrative likely included an aspect that cast Actuncan as Xunantunich's ancestral seat of power. Structure 19a, in particular, was transformed into the domicile of an administrator and would have been directly associated with Actuncan's subordination.

Finally, during the Terminal Classic period political power returned to Actuncan and these collective remembrances came into the public light. Scott (1990) talks about the power of the moment when hidden transcripts are spoken publicly for the first time, thwarting and recasting public transcripts into a new image. In this case, these remembrances are used to simultaneously legitimize Actuncan's new form of rule and devalue Xunantunich's narratives about Actuncan.

9.4.1 Evidence of Collective Remembering at Actuncan.

Evidence for Actuncan's collective remembering comes from the data presented in Chapters 7 and 8. First, in Plaza A, I determined that Structures 7, 8, and 9 were built during the Terminal Classic period and were likely related to ritual activities that took place in that space. The deposit of large partially-reconstructable serving vessels left on the south edge of Structure 8's platform provides the clearest evidence that these buildings were associated with a ritual space. Additionally, this deposit included about two thirds of a jade bead. The prevalence of serving vessels in this deposit indicates that it was likely either the smashed remains of a single commensal ceremony or the storage place for vessels used in repeated public ceremonies.

Additional evidence of Terminal Classic ritual in the triadic group comes from Structure 5 where McGovern (2004) identified a 65 to 70 cm thick deposit of burned ceramic material located on the floor of the summit building's final version. The size and density of this deposit points to an accumulation of materials over time. reflecting repeated reverential ritual during the Terminal Classic period.

As noted in Chapter 8, we have encountered little evidence of Terminal Classic reverential ritual in public space outside of the triadic group. I would argue that the choice of the triadic group as the primary locus of ritual derives from collective remembering. Importantly, all of these deposits are located in the shadow of Structure 1, the site's tallest pyramid and greatest testament to Actuncan's past greatness. By reinitiating rituals in this zone, the community is remembering the site's early greatness and drawing on this past to legitimize its new power.

Why then was the triadic group specifically singled out for reverence and not other Preclassic structures such as the E-Group? Excavations into Structures 23 and 26, the site's E-Group, found little evidence of concerted Terminal Classic ritual engagement except a scattering of eccentrically worked chert objects (Donohue 2014; Heindel 2016). To the contrary, all structures associated with the E-Group were systematically dismantled and mined for stone. This treatment does not align with the expectations for any kind of ritual treatment. Instead, this kind of casual dismantlement indicates apathy. I would argue this treatment is evidence for a kind of unintentional forgetting—a "structural amnesia" that is inherent in collective remembering (Connerton 2008). Over time, the importance of the E-Group appears to have been forgotten, whereas the triadic group perpetuated in memory.

Of course, the Terminal Classic Actuncan community also collectively remembered the period during which it was subjugated by Xunantunich. If Xunantunich established the residence of a vassal administrator at Actuncan to strengthen its claim to Actuncan's past, then Actuncan explicitly rejected that connection after Xunantunich's fall. Structure 19a, the five-room administrative building connected to the administrator's residence, was abandoned by the Terminal Classic period. Sometime in the final days of the Late Classic period, the building's corbel vault was intentionally collapsed, its vault stones were placed in its doorways, and the rooms were filled and capped by a layer of plaster (Mixter et al. 2013). When plaster or *sascab* is used to seal a space, it is typically considered a desecratory act (Pagliaro et al. 2003) and, I argue, represents the community's ritual killing of the residence of their oppressor. This action would have served as an explicit rejection of Xunantunich's official narrative and any claim Xunantunich might have on Actuncan's history.

Furthermore, the resumption of ritual activity in the triadic groups reflects the emergence of hidden transcripts in the form of alternative versions of the past collectively remembered by the local community. There is limited evidence of ritual activity around the triadic group during the Late Classic period, presumably because Xunantunich elites limited the Actuncan community's formal ceremonial activities. Instead, the community was likely coerced or cajoled to attend events hosted at Xunantunich, and the triadic group was likely left mostly alone. As discussed in Chapter 8, forested ruins were viewed by the ancient Maya as effigy mountains and the homes of ancestors. The evidence from our research in the triadic group supports this idea. During the Terminal Classic, the deposits on Structure 5 and the arrangement of Structures 7, 8, 9, and 93 redirected the plaza's focus towards the east, where Classic period ancestors were typically buried. This action indicates that the Terminal Classic community understood the triadic group to be occupied by important ancestors. Of course, this understanding shows how remembering is influenced by the contemporary cultural context. Although it was standard practice to bury ancestors in eastern buildings during the Classic period, Preclassic triadic groups were rarely burial places.

The memory and associations connected to the triadic group changed and drifted over time, even as its monumentality retained the memory of its past importance. After the collapse of Preclassic Actuncan, memory of the triadic group's importance faded as the tropical forest overtook the mounds. It would have become associated with a nonspecific past; however, the continuity in occupation ensured that this past was tightly bound to Actuncan's community identity. Xunantunich may have attempted to coopt Actuncan's legacy to its own purposes in the Late Classic period, however Actuncan's residents seem to have collectively remembered their own version of their past. When the failure of Xunantunich brought autonomy, the Actuncan community treated the triadic group as though it was a sacred place that could be harnessed in support of the site's Terminal Classic political legitimacy. The Actuncan community collectively remembered a local version of their past that did not match Xunantunich's official narratives. In this sense, the deposits found around the triadic group represent the transformation of these hidden transcripts into public transcripts, now in the service of Actuncan's new, post-royal authority.

9.5 Discussion

During Actuncan's 2,000 years of occupation, the site's political context shifted dynamically depending on the amount of authority held by local leaders. In contrast, the daily life of Actuncan's commoner households remained quite stable from their founding. Over many generations, the site was occupied by community members who passed down the narratives they had heard from their parents, grandparents, and neighbors. Members of Actuncan’s northern neighborhood passed each other every day in the fields, forests, and plazas. They exchanged stories and opinions on the events of the day. From the Late Preclassic onward, the Actuncan community met under the shadow of pyramids, first as members of the capital city, then subordinate to Xunantunich. Through these interactions, both with each other and with Actuncan’s monuments, the memory of the site’s apogee and the treatment of the local people by the Xunantunich polity was collectively remembered.

The evidence for memory from the Terminal Classic period reflects Actuncan’s collective memory at a particular moment in time. In the historical context of the Maya collapse, the local divine kings had fallen into disfavor, but Classic period cultural norms remained largely intact. Within this context, the Actuncan community constructed an understanding of the past that derived both from the immediate context and from the site’s collectively remembered past. The triadic temple group became the site of reverence for residents, while the Late Classic palace was dismantled and desecrated. These acts likely reflect the residents of Actuncan’s disillusionment during the Terminal Classic with the recently failed rulers at Xunantunich, irreverence for their vassals who lived in Structure 19a and Group 8, and nostalgia for Actuncan’s period of power and authority.

It is important that evidence indicates the Actuncan community did not understand the Preclassic architecture they lived within, because this points to how that past was remembered. After at least 300 years of subjugation, the Actuncan community had probably forgotten the specifics of the site’s apogee. Perhaps the Preclassic kings had been unpopular tyrants or weak leaders. If so, this past was forgotten. Instead, the pyramids and plazas of these early kings became the major ritual venue in the Terminal Classic period. In turn, I infer the site's royal past was invoked to legitimize the authority claimed by the community in the Terminal Classic period.

As far as we know Actuncan's Preclassic past was not recorded in inscriptions or on monuments. Instead, it was remembered relationally through the continued interactions of community members with each other and their urban landscape. Considering remembering within this relational frame provides an opportunity to look at how collective memory both forms communities and impacts political relations. As a hidden transcript, the local memory of Actuncan's past formed a foundation for the return of authority to the site in the Terminal Classic period. Through the reverential and desecratory acts in Actuncan South and Structure 19a, this constructed version of the past became public and thereby gained authority.

9.6 Conclusions

At Actuncan, the success of the Terminal Classic community likely lasted at most 200 years. However, well before the site's final abandonment, most of the other major local centers had been abandoned paralleling the broader collapse of divine kingship. Locally, Actuncan's success was uncommon. Indeed, entire generations were likely born and died within the reconstituted independent Actuncan polity. At this scale, Actuncan's strategy of adopting an inclusive council-based political strategy was a resilient strategy. However, the local process of reorganization was clearly anchored in the community's past.

Resilience theory describes "remembering" as the process by which a reorganizing system borrows from another more stable or more slowly changing system to acquire a template for reorganization. In the case of human societies, this process of remembering is mediated by human agents who have the capability to creatively deploy remembered information in the process of reorganization. In the case of Actuncan, the community "remembered" by drawing on other, more stable systems to resolve their political and cosmological crisis.

The first system the community drew on was their collectively remembered understanding of the past. At Actuncan, this past was mediated by Actuncan's long-standing monumental architecture. This memory includes the recent repudiation of divine rule, seen in the desecration of Structure 19a. Additionally, it includes the locally retained knowledge of Actuncan South's historical importance to the Actuncan community.

The second system drawn on by the community is the corpus of Maya cosmology. Information regarding the importance of eastern pyramids, wooded mountains, and triadic groups of buildings structured the community's interpretation of this space. The development of Plaza A as a Terminal Classic space for ritual was critical to the process of separating the Maya political and religious spheres.

This leads to the final question: where did the concept of an inclusive corporate political strategy come from? Taking a short-term perspective, council-based rule could be seen simply as an outgrowth of the growing importance of elites at the end of the Late Classic period. However, Actuncan's community was composed of households who were commoners during the Late Classic period. Rather than an outgrowth of elite culture, I would argue that Actuncan's Terminal Classic inclusivity derived from the authority of lineage heads that was already operating at the household level. Following McAnany (1995), kin-based authority already operated in Classic period social systems; however, it was masked from the political sphere by the hierarchy of titled elites established during the Late Classic period. Furthermore, Terminal Classic rule may in fact be a return to corporately organized rule. As discussed at the beginning of this chapter, Actuncan may have been ruled by corporately organized leaders during its Terminal Preclassic apogee. It is certainly possible that the community remembered this legacy or that it was stored in the lineage-based social organization of the site's households.

Actuncan is only one of many sites across the Maya world that reorganized during the Terminal Classic period. However, I was able to draw on a combination of concepts from resilience theory and the study of collective memory to detail how this community reorganized and how its reorganization was anchored in the community's specific understanding of their past. Their successful strategies are manifest in the way the local community settled in a center constructed to emphasize the divine power of kings and modified it to reflect post-collapse values and social realities. The key to developing this case study was the combination of a systems approach that allowed me to model and describe the community's choices and collective remembering, a sociological approach that allowed me to consider why the community chose the trajectory it did.

For archaeologists, collective remembering provides a tool for understanding how memory works to define and differentiate communities over time. I have shown how a constructed and relational approach to collective memory provides a way to bridge studies that explore official memory production and those that model memory produced in household practice. In the middle, memory is produced through conversations and interactions with mnemonics on the landscape. The folk interpretations of events produced through these interactions are critical because they need not conform to official narratives. Expressly considering how the common people interpret and remember events may improve archaeologists' ability to understand cohesion, resistance, and the reciprocal relationships involved in exerting authority.

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Appendix A: MODIFICATIONS OF MCGOVERN'S CHRONOLOGY

A.1 Introduction

In this section, I provide minor reinterpretations of the data collected by McGovern (2004), which were presented in summary form in Table 5-1 from his Ph.D. dissertation. These reinterpretations are drawn from his data and reflect a close reading of the assumptions he used to extrapolate the dates of construction phases he encountered. I looked carefully at his descriptions of the construction phases (McGovern 2004:114-145), his records of the ceramic analysis (McGovern 2004:166-181), and his profiles of his excavations and the looter's trenches (McGovern 2004:189-205). This section goes hand-in-hand with Table 2.2 from this dissertation, where I present my reconstruction of the architectural chronology at the site. Here I present any changes I made, while also noting reservations I have regarding aspects of his chronology. In the future, further research within Actuncan South should be able to reconcile these issues with further excavation, the collection of large ceramic collections, and absolute dating.

Broadly, I have three concerns about McGovern's chronology. First, much of his data derive from materials scraped from the walls of Looter's trenches. This data can be very useful for creating chronologies; however, there is great opportunity for deposits to have been mixed during the looting process. Second, McGovern's ceramic sample sizes are mostly very small and imprecisely documented. Few of the contexts, especially within Plaza A, contained more than 100 sherds. Finally, the dates of several of McGovern's construction phases that did not return clear dates from the collected sherds are extrapolated based on stratigraphic assumptions. He both connected construction phases of structures based on the assumption that plaza floor chronologies were the same across the plaza and assumed that earlier stratigraphic levels dated to earlier ceramic phases despite the absence of ceramic diagnostics from the earlier level. Both of these may be problematic assumptions, as I point out below.

A.2 Plaza A

McGovern (2004:114-117) identified five plaza floors, with the earliest three dating to the Late Preclassic period, one dating to the Early Classic period, and the final floor dating to the Late Classic period. Although McGovern's (2004:117) Late Classic floor was dated based on a small sample of sherds from against the base of Structure 4, his construction sequence checks out with my findings. Beneath Structure 7, I also identified Late Classic and Early Classic plaza floors on top of any purely Preclassic construction. This data supports accompanying evidence for Late Classic I construction within Plaza A, perhaps under the influence of Xunantunich.

A.3 Structures 1 and 4

Together, Structures 1 and 4 form the tallest structure at Actuncan. Structure 4 is a tall basal platform that supports a triad of structures, the central Structure 1 flanked by Structures 2 and 3. Structure 2 and 3 are each cut by deep looter's trenches; however, McGovern (2004) did not report on these trenches. Structures 1 and 4 grew over time in tandem, with each version of Structure 4 associated with a version of Structure 1. McGovern identified five versions of Structure 4 based on evidence from the looter's tunnels at the foot of that structure (Looter's Trenches/Tunnels 2 and 3). Four of these were also identified in a looter's trench that penetrated Structure 4 from the west side (Looter's Trench/Tunnel 1) and a looter's trench that followed the final surface of Structure 1, eventually leading to a horizontal excavation that penetrated into the surface of Structure 4-1st (Looter's Trench/Tunnel 4).

McGovern dated the earliest construction phase of both Structures 1 and 4 to the Middle Preclassic period; however, this attribution is based on its stratigraphic position beneath a Late Preclassic phase, not evidence of Middle Preclassic ceramic diagnostics (McGovern 2004:121, 123). Although this phase could be Middle Preclassic, it is possible that it also dates to the Late Preclassic period. Given the lack of evidence that the AAP has found for Middle Preclassic construction at the site (see Chapter 2), a Late Preclassic date may be more likely. I have assigned no date to this construction phase.

McGovern then assigned the following two construction phases to the Late Preclassic period, with the second likely dating to the Terminal Preclassic period. The Late Preclassic date for these construction phases seems sound. McGovern dates the fourth construction phase of Structure 4 to the Early Classic period based on two possible Balanza Black sherds (McGovern 2004:167-171). At Actuncan, "high polished black" (McGovern 2004:170) ceramics such as those described date back to at least the Terminal Preclassic period (LeCount 2015a). While I have not changed the temporal assignment of this phase, further data could confirm a Terminal Preclassic date. This construction phase was not associated with a clearly dated version of Structure 1, though a freestanding wall identified in Looter's Trench/Tunnel 4 may have formed the front wall of this version of Structure 1. McGovern (2004:170) attributed that wall a Late Preclassic date based on three diagnostic sherds.

Perhaps the most difficult question is McGovern's assignment of the final version of Structures 1 and 4 to the Late Classic period. The assignment of Structure 4's last construction phase to the Late Classic was based on five ashware sherds, four of which were slipped red;

seven matte black sherds; and one Late Classic I Mount Maloney Black rim. These sherds were mixed with a variety of Preclassic diagnostics. Additionally, evidence from Looter's Trench/Tunnel 1 places the final construction phase of Structure 4 to the Early Classic period. This last piece of data was important because Looter's Trench/Tunnel 1 was placed on the side of the pyramid where Late and Terminal Classic were not likely interacting with the pyramids. In is unlikely that the ceramic collections from these tunnels could have been contaminated by later occupation debris. If an entirely new version of Structure 4 was built in the Late Classic period, I would expect to see a Late Classic construction phase on the structure's west side. Similarly, Structure 1's Late Classic construction phase was dated based on one Late Classic I Mount Maloney Black rim, nine ashware sherds, and a single lateral ridge. However, the total sample size was ">20" (McGovern 2004:169). Clearly Structures 1 and 4 were utilized during the Late Classic I; however, I hesitate to accept the Late Classic date for the construction of a whole new version of the pyramid. Based on the evidence from Looter's Trench/Tunnel 1 (McGovern 2004:169), I suggest that Structure 4 was likely not subject to wholesale renovation during the Late Classic period. However, the front and surface of the structure was likely the location of Late Classic activities. Structure 1, on the other hand, may well have been subject to a Late Classic construction phase. This would match the evidence for the construction of a Late Classic I plaza floor and a new masonry superstructure on Structure 5 (see below). Given that the data available are limited in quantity, I have not changed McGovern's Late Classic I construction phase on Table 2.2; however, I caution that further data is needed to confirm this date.

A.4 Structure 5

McGovern (2004:125-129) reconstructed Structure 5 in three construction phases dating to the Late Preclassic, Early Classic, and Late Classic II periods respectfully. Based on his mention of a set of postholes penetrating a Late Preclassic floor (McGovern 2004:126), I have added an additional Late Preclassic construction phase to Table 2.2. Additionally, his Early Classic construction phase was dated based on its possible contemporaneity with a version of Structure 4 that McGovern (2004:127-128) believed to be associated with the same plaza floor. Although I did not change the chronological assignment of this phase in Table 2.2, it is important to point out that this chronological assignment is not secure. The final construction phase proposed by McGovern (2004:128-129) is a Late Classic II masonry superstructure, which he dates to the Late Classic II based on two diagnostics sherds from the remains of a free-standing wall. It is clear that Structure 5 was utilized in the Terminal Classic period based on the presence of the large deposit of burned ceramics (from which McGovern [2004:171] collected over 6600 sherds) from within this masonry superstructure. While the superstructure may be Late Classic in date, this chronological assignment may also be the result of sherds from the building's Terminal Classic occupation. Alternatively, this superstructure and Structure 1 could have dated to the Late Classic period, in which case their construction was likely associated with the Late Classic renovations to Structure 19a that resulted in the construction of a noble palace. In this case, I suspect that this earlier use of the space was associated with efforts by Xunantunich's rulers to graft on to Actuncan's past (Ashmore 1998).

A.5 Structure 6

McGovern (2004:129-131) indicated that all versions of Structure 6 dated to the Late Preclassic period. The absence of renovation to this large pyramid in the Late Classic period encourages my skepticism of Late Classic renovations to Structures 1, 4, and 5.

A.6 Structures 13 and 14, and the Ball Court Alley

McGovern (2004:178-181) provided excellent details for the ceramics that he used to date Structure 13 and the ball court alley. I have left all his construction phases the same, except for his attribution of a Middle Preclassic level. As with Structures 1 and 4, this is based on stratigraphic inference, not clear ceramic data. Structure 14 was omitted because McGovern did not excavate that building. He extrapolated the construction sequence from Structure 13 under the assumption that they were identical (McGovern 2004:145).

A.7 Structure 15

McGovern (2004:131-133, 174) identified five construction phases of Structure 15, three of which he assigned to the Middle Preclassic, one of which he assigned to the Late Classic II, and one of which he assigned no date (though it fell between the Middle Preclassic and Late Classic II phases). All three Middle Preclassic phases are suspect. The earliest was assigned a date based on its stratigraphic position below the other three. The next phase was dated based on four diagnostic sherds, including a Flor Cream sherd, which places this construction phase in the Late Preclassic. The next phase was dated based on five diagnostic sherds, including one Sierra Red and two Aguacate Orange sherds. These data place that phase in the Terminal Preclassic period. The next phase was assigned an Early Classic date, but not included in his Table 5-2. No ceramic diagnostics were listed to justify his chronological attribution. Finally, the last phase was dated to the Late Classic II based on a single Mount Maloney Black rim. This sherd was the only diagnostic among a sample of 464 sherds. To me, this small number of diagnostics makes the temporal assignment questionable. I have placed a question mark in Table 2.2.

A.7 Structure 12

Structure 12 was built in one construction phase and contained a wide variety of Late Classic diagnostics, justifying McGovern's (2004:133-134, 175-176) Late Classic II date of construction. That said, the building was constructed of large rubble fill that allows later material to percolate through its core when the plaster surface is not preserved (as is the case for Structure 12). This formation became evident to AAP when we encountered a colonial pipe stem at the base of our excavation of Structure 24 (Mixter and Freiwald 2013).

A.8 Structure 19a

Structure 19a was updated to reflect AAP findings (Jamison 2013; Mixter et al. 2013). Our research indicated that the building had major Terminal Preclassic construction episodes, an Early Classic modification to the staircase, and a Late Classic renovation of the summit structure associated with the reoccupation of the building and its transformation in part of a noble residence.

A.9 Plaza E

McGovern (2004:139, 180) did not provide details regarding the ceramic analysis from his excavations in Plaza E. He does note that he encountered a pure middle Preclassic refuse deposit beneath a Middle Preclassic to Late Classic midden. I have left this date as is, though renewed testing in this area would be worthwhile.

A.10 Structures 26a and 31

These dates were based on excavations by McGovern (2004:139-145) rather than the examination of looter's trenches. Few ceramic details were provided to support his findings (McGovern 2004:180-181). I have not modified his chronological assignments, though I will note that AAP has not found any evidence of Early Classic construction in our investigations of Structure 26 (Donohue 2014; Simova and Mixter 2016).

Appendix B: SAMPLE LOT FORM

20___ ACTUNCAN ARCHAEOLOGICAL PROJECT LOT RECORD

Date Started ________________

Operation # __________ Unit ______________Lot # ________Feature # ________________

Number of artifact bags__________ Number of gallons__________

Materials: ceramic ____ lithic____ bone____ shell____ jute____ obsidian ____ other ___________

Texture: silt, silty loam, sand, sandy loam, clay, clay loam, loam, other ____________________

Munsell color ___________________________ wet or dry?____________________________

Rock inclusions: chert cobbles, undressed limestone, dressed limestone, other ________________

Inclusion size: 0-1cm, 1-6cm, 6-25cm, 25-50cm, >50 cm ________________________________

Cultural context ____

Below lot(s) _________ Beside lot(s) _________________ Same as lot(s) __________________

Harris Matrix:

Depth below Datum# _____								
	Top				Bottom			
Unit:								
NE								
SE								
CTR								
NW								
SW								

Goals:

Description:

Photos (#'s & Camera)	Photographer	Date	Description

Samples	Soil Chem	Plaster	Bots	Microartifact	C14	Other
Bag ID #s						
#s of bags						

Excavators ____ Recorded by ______________

Date Entered: ______________

Appendix C: TABLE OF OBSIDIAN ARTIFACTS

Operation	Unit	Lot	Type	Condition	Weight	Length	Width	Thickness
8	E	8	Blade	Proximal	0.81g	27.1mm	9.4mm	2.4mm
8	E	12	Blade	Medial	0.34g	17.1mm	7.2mm	2.7mm
8	E	13	Blade	Proximal	0.44g	12.5mm	12.5mm	4.4mm
8	E	14	Blade	Proximal	0.57g	19.0mm	11.8mm	2.2mm
8	E	17	Blade	Proximal	0.29g	10.5mm	11.5mm	2.9mm
8	QQ	1	Blade	Medial	0.18g	8.4mm	9.5mm	2.6mm
35	A	4	Blade	Distal	0.44g	23.3mm	8.0mm	2.3mm
35	A	5	Blade	Medial	0.96g	28.9mm	11.0mm	2.5mm
35	A	5	Blade	Medial	0.23g	12.1mm	8.4mm	2.4mm
35	A	5	Blade	Medial	0.18g	10.0mm	6.9mm	2.1mm
35	A	5	Blade	Proximal	0.46g	22.5mm	9.2mm	2.0mm
35	B	1	Flake	Proximal	0.80g	14.4mm	18.1mm	3.7mm
35	C	1	Flake	Whole	1.34g	22.3mm	15.8mm	6.4mm
35	C	5	Blade	Proximal	1.24g	26.1mm	15.4mm	3.9mm
35	D	2	Blade	Medial	0.34g	11.6mm	10.1mm	2.5mm
36	AC	1	Blade	Proximal	0.29g	8.7mm	11.7mm	4.0mm
36	AE	1	Flake	Whole	0.20g	15.6mm	8.9mm	1.4mm
36	AJ	1	Blade	Medial	0.54g	15.0mm	9.6mm	3.5mm
36	BD	1	Blade	Medial	0.39g	12.4mm	10.9mm	2.7mm
36	BI	2	Blade	Medial	0.44g	12.0mm	12.4mm	2.6mm
36	BN	3	Blade	Medial	0.80g	16.3mm	17.6mm	2.2mm
36	D	3	Flake	Proximal	0.52g	12.1mm	20.9mm	3.0mm
37	A	2	Blade	Medial	0.46g	12.6mm	10.4mm	3.5mm
37	A	2	Blade	Medial	0.44g	12.2mm	14.5mm	2.1mm
37	A	3	Blade	Proximal	0.49g	16.0mm	10.8mm	2.6mm
37	A	3	Blade	Medial	0.41g	13.5mm	9.4mm	2.7mm
37	A	3	Blade	Medial	0.29g	14.4mm	6.9mm	2.9mm
37	A	5	Blade	Medial	0.14g	11.3mm	6.6mm	2.1mm
37	B	2	Blade	Medial	0.06g	7.6mm	9.0mm	1.1mm
40	BI	2	Flake	Proximal	0.34g	15.9mm	7.7mm	2.4mm
40	FB	1	Blade	Medial	0.65g	15.8mm	13.6mm	3.2mm
40	GH	1	Blade	Medial	0.20g	12.8mm	7.5mm	2.1mm
40	IT	1	Blade	Medial	1.34g	21.0mm	16.4mm	4.1mm
40	LA	1	Blade	Distal	0.60g	23.4mm	9.6mm	2.9mm
40	LJ	1	Blade	Medial	0.27g	16.6mm	9.4mm	1.4mm
41	A	1	Blade	Medial	0.24g	13.8mm	7.3mm	1.8mm
41	C	4	Blade	Proximal	1.39g	25.8mm	13.7mm	2.8mm

Operation	Unit	Lot	Type	Condition	Weight	Length	Width	Thickness
41	C	5	Blade	Medial	0.33g	11.5mm	10.3mm	2.3mm
41	D	2	Blade	Proximal	0.79g	21.6mm	9.9mm	3.0mm
41	D	2	Blade	Proximal	1.14g	27.7mm	13.1mm	2.7mm
41	D	2	Shatter		0.38g	20.1mm	5.2mm	2.8mm
42	A	3	Blade	Proximal	1.10g	19.4mm	15.4mm	3.7mm
42	AA	2	Blade	Proximal	0.58g	22.7mm	7.8mm	2.9mm
42	AP	1	Blade	Distal	0.15g	10.3mm	7.6mm	1.5mm
42	H	2	Blade	Proximal	0.34g	17.6mm	7.6mm	2.2mm
42	M	1	Blade	Proximal	0.43g	18.6mm	7.8mm	3.1mm
42	P	1	Blade	Medial	0.48g	25.9mm	7.8mm	2.5mm
42	S	1	Blade	Medial	0.23g	17.3mm	6.9mm	1.5mm
43	A	4	Blade	Medial	0.30g	10.6mm	9.2mm	2.9mm
43	B	1	Blade	Proximal	0.61g	15.9mm	11.9mm	2.8mm
43	B	3	Blade	Proximal	0.76g	15.0mm	14.3mm	3.7mm
43	B	7	Blade	Proximal	1.23g	39.3mm	11.2mm	3.5mm
43	C	1	Shatter		0.14g	18.0mm	3.6mm	2.8mm
43	C	5	Blade	Medial	1.04g	19.5mm	12.6mm	4.0mm
44	AF	1	Flake		0.30g	11.8mm	9.9mm	2.7mm
44	D	3	Blade	Medial	0.25g	11.7mm	8.3mm	2.5mm
44	J	1	Blade	Medial	0.39g	18.1mm	7.7mm	2.0mm
44	R	1	Blade	Medial	1.06g	23.0mm	12.3mm	3.2mm
44	T	1	Blade	Proximal	0.18g	13.5mm	11.4mm	2.3mm
44	W	1	Blade	Medial	0.62g	19.2mm	9.0mm	3.3mm
45	A	3	Blade	Medial	1.00g	21.8mm	10.7mm	3.7mm
45	A	3	Blade	Medial	0.44g	12.6mm	10.7mm	2.4mm
45	B	5	Blade	Proximal	1.30g	43.0mm	11.5mm	2.9mm
45	BI	3	Blade	Proximal	0.70g	21.1mm	8.6mm	3.1mm
45	BI	3	Blade	Proximal	1.14g	26.5mm	15.1mm	3.3mm

Appendix D: MICROARTIFACT SORTING FORM

20__ Actuncan Archaeological Project **Operation ______ Sample _______**

Microartifact Analysis Subsample (if needed) __________

Clarissa Falls Lab, Cayo, Belize Unit ___________ Lot ___________

Analyst ___________ Date Analyzed _____ - _____ - 20____

Volume (L) ________ % Analyzed _____________________

Fraction	> 1/4 inch		< 1/4 inch; > 1/8 inch		<1/8 inch; > 1/16 inch	
Fraction Weight (g)						
Type	**Count**	**Weight (g)**	**Count**	**Weight (g)**	**Count**	**Weight (g)**
chert flake						
chert chunk						
chert blade						
chert tool						
chert other						
Chert Total						
obsidian blade						
obsidian flake						
obsidian chunk						
obsidian tool						
obsidian other						
Obsidian Total						
slate						
quartz						
limestone						
other stone						
shell economic						
shell other						
ceramics						
daub						
carbon						
bone						
dirt						
organics						
unidentified						
other:						

Take Notes on Back if Necessary

Appendix E: SUMMARY OF MICROARTIFACT SAMPLES

List of all microartifact samples sorted in 2013 with the volume of soil before water screening and the weight of each fraction of materials before sorting.

Fraction 1: > 6.35 mm

Fraction 2: 3.175 mm – 6.35 mm

Fraction 3: 1.5875 mm – 3.175 mm

Operation	Unit	Lot	Sample #	Volume (L)	Fraction 1 Weight (g)	Fraction 2 Weight (g)	Fraction 3 Weight (g)
8	BBB	1	255	4.75	1198	148.73	123.11
8	EEE	2	256	4.00	1337	149.12	121.92
8	FFF	1	257	4.50	1738	222	161.6
8	III	1	258	4.50	1847	215	152.2
8	JJJ	1	259	4.00	1674	268.9	180.67
36	B	3	29	4	916	173.1	245.5
36	C	3	30	4.25	970	238.1	334
36	E	2	31	4.25	650	203.3	272.9
36	N	2	32	3.50	656	113.82	194.03
36	O	2	33	4.50	797	195.41	288.9
36	R	2	34	3.50	1186	198.41	220
36	S	2	35	4.75	1108	224.6	305.5
36	K	2	36	4.50	699	187	256.8
36	V	2	43	4.00	766	165.9	207.7
36	W	2	44	4.75	1063	148.52	188.4
36	Z	2	45	4.50	956	176.9	186.57
36	AE	1	46	5.00	908	160.98	225.5
36	AH	2	59	6.00	878	254.17	229.2
36	AI	2	60	3.25	476	123.3	148.5
36	AM	2	61	4.75	811	179.76	238.1
36	AQ	1	62	4.75	701	195.3	234.5
36	AS	1	63	4.25	563	165.09	191.69
36	AU	1	64	4.00	680	170.7	181.6
36	AV	1	65	4.50	778	203.7	259.9
36	AX	1	66	5.00	775	196	264.4
36	BF	1	67	4.00	434	135.4	192.9
40	EM	1	9	3.50	358.1	97.91	112.69
40	FL	1	10	4.75	1922	192.3	192
40	GM	1	11	3.75	621	140.1	126.6
40	IM	1	12	3.25	897	129.93	94.92
40	JN	1	17	4.50	2697	220.3	134.5
40	JL	1	18	4.00	2910	167.6	126.2
40	KO	1	22	4.50	1775	286.1	186.06

Operation	Unit	Lot	Sample #	Volume (L)	Fraction 1 Weight (g)	Fraction 2 Weight (g)	Fraction 3 Weight (g)
40	KM	1	23	4.00	2067	194.1	139.7
40	LN	1	28	4.00	1665	155.8	108.77
40	LL	1	29	4.00	1656	167.45	118.69
40	IS	1	33	4.25	1000	196.4	184.49
40	HT	1	38	4.00	937	173.2	163.1
40	HR	1	39	4.50	1049	195.9	222.7
40	GS	1	44	4.25	720	159.6	132.8
40	GQ	1	45	4.00	907	153.3	133.07
40	FT	1	50	4.75	537	148.12	139.18
40	FR	1	51	4.75	602	190.5	199.2
40	ES	1	56	3.50	387.6	158.8	173.65
40	EQ	1	57	3.50	522	146.86	147.62
40	FP	1	63	3.50	1091	141.4	115.69
40	HP	1	64	4.25	1113	197.3	149.4
40	EO	1	66	4.50	778	182.83	155.17
40	GO	1	70	4.50	1037	219.5	190.6
40	FN	1	76	4.25	863	171.51	156.61
40	HN	1	77	4.75	1171	206.5	189.88
40	LP	1	83	4.25	1733	223.1	170.38
40	LR	1	84	4.50	1602	255.3	208.5
40	LT	1	85	4.75	1270	197.4	191.2
40	KQ	1	91	4.00	1929	203.36	119.04
40	KS	1	92	4.75	918	200.26	156.37
40	JR	1	96	4.50	1457	235.5	168.77
40	JT	1	97	5.00	822	219.2	162.42
40	EU	1	104	4.75	502	125.03	110.39
40	GU	1	105	4.25	1089	203.2	166.8
40	IU	1	106	3.75	754	218.1	196.24
40	FV	1	111	5.00	1087	197.71	150.33
40	HV	1	112	4.50	721	260.5	22.5
40	GW	1	115	4.50	1243	182.16	205.91
40	JV	1	121	4.50	893	191.5	205.31
40	LV	1	122	4.75	811	208	184.96
40	EK	1	125	5.00	1058	237.4	239.9
40	FJ	1	127	4.00	994	124.4	106.92
40	EI	1	131	4.25	1492	173.34	139.61
40	FH	1	133	4.25	1245	148.91	118.25
40	GK	1	136	4.50	1105	182.88	138.35
40	HJ	1	144	4.50	1587	154.14	122.83
40	GI	1	145	4.75	1486	139.25	121.47
40	HH	1	146	4.25	1470	125.04	105.54
40	IK	1	149	4.25	1350	188.2	127.48
40	II	1	152	4.50	1369	153.92	116.88
40	GG	1	157	4.50	1200	130.41	90.13
40	EG	1	158	4.50	1127	166.3	135.8
40	FF	1	161	4.00	1604	183.34	133.44

Operation	Unit	Lot	Sample #	Volume (L)	Fraction 1 Weight (g)	Fraction 2 Weight (g)	Fraction 3 Weight (g)
40	EE	1	165	4.50	1374	214.6	188.88
40	GE	1	166	4.50	1393	144.93	99.89
40	EC	1	169	4.00	1350	172.74	184.84
40	GC	1	173	4.50	1068	165.1	120.19
40	IG	1	174	4.50	1707	157.18	91.89
40	IE	1	178	4.50	1747	179.8	98.43
40	IC	1	183	4.50	955	171.19	112.51
40	HD	1	184	4.75	1700	211.9	139.29
40	HB	1	189	4.00	1225	173.62	122.56
40	EA	1	190	4.50	934	155.36	124.65
40	IA	1	193	4.50	1370	241.3	148.89
40	FB	1	196	5.00	755	153.99	131.31
40	GA	1	199	4.75	836	170.46	144.56
40	KA	1	202	4.50	1339	190.46	162.99
40	JB	1	205	4.75	1699	252.5	180.5
40	KC	1	210	4.75	1177	233.5	154.52
40	JD	1	211	4.25	1246	152.22	104.48
40	KE	1	214	5.00	806	143.17	100.12
40	LB	1	220	4.00	886	144	104.5
40	LD	1	221	4.50	966	167.77	166.85
40	LF	1	226	4.50	1269	171.12	116.42
40	KG	1	227	4.50	1592	209.2	159.5
40	LH	1	232	4.50	1669	212	162.88
40	KI	1	233	4.50	1688	218	146.8
40	KK	1	238	4.75	1932	218.5	125.1
40	JH	1	243	4.25	1578	210.5	123.7
40	JJ	1	244	4.25	1950	213.8	137.4
40	CC	1	264	4.00	848	168.52	123.3
40	DD	1	265	4.25	896	183.45	147.56
40	CE	1	270	5.00	1094	238.7	203.9
40	DF	1	271	4.00	926	153.78	153.98
40	CG	1	276	4.50	1046	207.45	180.9
40	DH	1	277	4.50	859	146.4	130.8
40	CI	1	284	4.75	1097	229	215.5
40	DJ	1	285	4.50	857	204.4	171.2
40	CK	1	286	4.50	1160	176.56	165.46
40	CA	1	290	4.25	465	133.6	134
40	AC	1	295	3.25	596	98.8	107.08
40	BD	1	296	4.22	1431	146.4	123.61
40	AE	1	317	4.75	808	208	250.5
40	BF	1	318	3.75	719	138.1	173.23
40	AG	1	319	4.50	704	135.46	177.33
40	BH	1	320	4.00	782	169	195.08
42	A	3	21	3.25	460	135.07	157.9
42	E	2	22	4.00	445	146.2	198.3
42	H	2	23	4.00	682	240.4	321.1

Operation	Unit	Lot	Sample #	Volume (L)	Fraction 1 Weight (g)	Fraction 2 Weight (g)	Fraction 3 Weight (g)
42	I	2	24		402	309.7	408
42	P	2	25	4.75	477	254.1	369.3
42	AI	2	26	5.00	593	239.8	317.8
42	AM	1	27	4.00	532	218	26.3
42	AD	1	28	4.00	718	139.6	159.5
44	AA	1	18	4.50	904	176	192.4
44	AD	1	19	4.50	922	130.07	66.58
44	AE	1	20	4.50	783	148.1	185.4
			Totals	565.47	148951.13	25040.22	23096.84

Appendix F: MICROARTIFACT DENSITIES BY SAMPLE

	Chert Artifacts		Ceramic		Obsidian		Slate		Daub		Economic Shell	
Provenience	Cnt	Wght (g)	Cnt	Wght (g)	Cnt	Wght (g)	Cnt	Wght (g)	Cnt	Wght (g)	Cnt	Wght (g)
8BBB1-255	5.68	0.12	3.58	0.15	0	0	0	0	0	0	0.63	0.01
8EEE2-256	15.50	0.54	11.50	0.38	0	0	0	0	0	0	3.00	0.10
8FFF1-257	5.78	0.24	3.56	0.23	0	0	0	0	0.22	0.02	0	0
8III1-258	6.00	0.20	2.89	0.17	0	0	0	0	0.44	0.02	0	0
8JJJ1-259	11.75	0.35	7.50	0.36	0	0	0	0	0	0	1.25	0.01
36B3-29	7.25	0.11	3.00	0.13	0	0	0	0	0.50	0.01	1.50	0.02
36C3-30	8.94	0.12	6.12	0.10	0	0	0	0	0	0	0.94	0.02
36E2-31	7.76	0.23	0.94	0.07	0	0	0	0	0	0	0	0
36N2-32	10.00	0.22	2.86	0.12	0	0	0	0	1.43	0.05	0.86	0.02
36O2-33	6.89	0.28	2.22	0.05	0	0	0	0	0.22	0.01	0	0
36R2-34	9.71	0.27	2.00	0.12	0	0	0	0	0	0	0.57	0.01
36S2-35	7.37	0.13	1.68	0.14	0	0	0	0	0	0	0	0
36K2-36	4.89	0.08	7.11	0.20	0	0	0	0	0.67	0.04	1.11	0.04
36V2-43	7.50	0.19	3.00	0.12	0	0	0	0	0.25	0.02	0	0
36W2-44	6.74	0.19	1.26	0.07	0	0	0	0	0.63	0	0.21	0
36Z2-45	5.11	0.16	4.00	0.14	0	0	0	0	0	0	0	0
36AE1-46	8.40	0.15	2.40	0.05	0	0	0	0	0.20	0.02	0.20	0.01
36AH2-59	29.00	0.55	4.83	0.15	0	0	0	0	0	0	0	0
36AI2-60	3.69	0.13	1.54	0.02	0	0	0	0	0.31	0	0	0
36AM2-61	2.95	0.05	1.89	0.13	0	0	0	0	0	0	0.63	0.01
36AQ1-62	6.11	0.11	1.68	0.10	0.21	0	0	0	0	0	0	0
36AS1-63	8.71	0.27	1.18	0.06	0	0	0	0	0	0	1.88	0.04
36AU1-64	3.75	0.10	1.25	0.07	0	0	0	0	0.50	0.01	0	0
36AV1-65	4.00	0.09	0.67	0.02	0	0	0	0	0	0	0	0
36AX1-66	5.00	0.22	2.60	0.10	0	0	0	0	0	0	0	0

Provenience	Chert Artifacts		Ceramic		Obsidian		Slate		Daub		Economic Shell	
	Cnt	Wght (g)	Cnt	Wght (g)	Cnt	Wght (g)	Cnt	Wght (g)	Cnt	Wght (g)	Cnt	Wght (g)
36BF1-67	4.75	0.22	6.25	0.19	0	0	0	0	0.50	0.02	0.50	0.01
40EM1-9	12.00	0.24	2.00	0.12	0	0	0	0	0	0	0	0
40FL1-10	5.47	0.12	5.47	0.34	0	0	0	0	0.21	0.02	0	0
40GM1-11	8.80	0.23	5.87	0.37	0	0	0	0	0.53	0.02	0	0
40IM1-12	11.69	0.37	2.77	0.13	0	0	0	0	0	0	0	0
40JN1-17	11.33	0.42	2.89	0.14	0	0	0	0	0	0	0.67	0.01
40JL1-18	11.50	0.43	3.50	0.17	0	0	0	0	0.50	0.02	0	0
40KO1-22	8.67	0.31	6.67	0.26	0	0	0	0	0	0	0	0
40KM1-23	7.75	0.18	5.00	0.32	0	0	0	0	0	0	0	0
40LN1-28	6.25	0.23	3.00	0.13	0	0	0	0	1.00	0.04	0	0
40LL1-29	6.75	0.22	3.00	0.12	0	0	0.25	0.06	0	0	0.50	0
40IS1-33	7.53	0.20	4.24	0.20	0	0	0	0	1.18	0.07	1.18	0.02
40HT1-38	7.75	0.16	5.00	0.12	0	0	0	0	0	0	0	0
40HR1-39	7.33	0.16	4.22	0.17	0	0	0	0	0	0	0	0
40GS1-44	5.88	0.12	3.06	0.15	0	0	0	0	0	0	0	0
40GQ1-45	5.75	0.20	3.00	0.17	0	0	0	0	0	0	0	0
40FT1-50	8.42	0.37	1.26	0.09	0	0	0	0	0	0	0	0
40FR1-51	6.32	0.21	3.16	0.16	0	0	0	0	0.21	0.01	0	0
40ES1-56	14.00	0.33	1.71	0.14	0	0	0	0	0	0	0.57	0
40EQ1-57	8.86	0.27	0.29	0.02	0	0	0	0	0	0	0.29	0
40FP1-63	3.43	0.11	6.29	0.27	0	0	0	0	0	0	0	0
40HP1-64	8.47	0.32	3.53	0.17	0	0	0	0	0	0	0	0
40EO1-66	13.56	0.35	2.22	0.08	0	0	0	0	0	0	0.67	0.01
40GO1-70	9.78	0.31	3.33	0.20	0	0	0	0	0	0	1.56	0.03
40FN1-76	8.24	0.31	3.06	0.11	0	0	0	0	0.71	0.07	0.71	0
40HN1-77	14.11	0.45	2.74	0.08	0	0	0	0	0	0	0	0
40LP1-83	7.53	0.27	9.18	0.54	0	0	0	0	0	0	0.47	0
40LR1-84	3.11	0.10	7.11	0.35	0.22	0	0	0	0.67	0.05	0	0

	Chert Artifacts		Ceramic		Obsidian		Slate		Daub		Economic Shell	
Provenience	Cnt	Wght (g)	Cnt	Wght (g)	Cnt	Wght (g)	Cnt	Wght (g)	Cnt	Wght (g)	Cnt	Wght (g)
40LT1-85	11.37	0.29	2.95	0.12	0	0	0	0	0	0	1.05	0.01
40KQ1-91	4.25	0.23	2.75	0.19	0	0	0	0	0.25	0	0	0
40ks1-92	6.11	0.25	3.16	0.18	0	0	0	0	0.42	0.01	0.63	0.01
40JR1-96	5.78	0.17	3.11	0.12	0.22	0.01	0	0	0	0	0.89	0.04
40JT1-97	6.60	0.24	2.00	0.16	0	0	0	0	0	0	0.80	0.02
40EU1-104	3.58	0.10	1.68	0.05	0	0	0	0	0	0	0	0
40GU1-105	4.00	0.18	1.88	0.08	0	0	0	0	0	0	1.18	0
40IU1-106	10.40	0.29	2.67	0.14	0	0	0	0	1.33	0.06	0.27	0.02
40FV1-111	6.80	0.14	2.20	0.12	0	0	0	0	0	0	0	0
40HV1-112	9.78	0.27	2.00	0.11	0	0	0	0	0	0	0.44	0.01
40GW1-115	5.33	0.10	2.89	0.14	0	0	0	0	0.89	0.05	0	0
40JV1-121	6.22	0.11	1.33	0.03	0	0	0	0	0.44	0	0.67	0
40LV1-122	8.84	0.17	3.37	0.17	0	0	0	0	0.21	0.03	0.21	0.05
40EK1-125	3.00	0.09	3.20	0.12	0	0	0	0	0.20	0	0	0
40FJ1-127	6.00	0.14	1.75	0.07	0	0	0	0	0	0	0	0
40EI1-131	7.76	0.19	3.76	0.14	0	0	0	0	1.41	0	0.71	0.01
40FH1-133	6.12	0.17	2.59	0.16	0	0	0	0	0	0	0.47	0.01
40GK1-136	6.22	0.28	6.67	0.23	0	0	0	0	1.56	0.10	0.89	0.03
40HJ1-144	8.89	0.26	6.22	0.31	0	0	0	0	0	0	0	0
40GI1-145	6.95	0.15	4.84	0.18	0	0	0	0	0	0	0	0
40HH1-146	8.24	0.28	3.76	0.16	0	0	0	0	0	0	0	0
40IK1-149	8.47	0.32	9.41	0.34	0	0	0	0	0.47	0.05	0	0
40II1-152	5.78	0.13	4.67	0.22	0	0	0	0	0.44	0	0.89	0.04
40GG1-157	7.78	0.22	2.67	0.19	0	0	0	0	0	0	0	0
40EG1-158	6.00	0.26	2.22	0.16	0	0	0	0	0	0	0	0
40FF1-161	9.75	0.22	5.00	0.33	0	0	0	0	0	0	0.25	0
40EE1-165	5.56	0.22	2.00	0.10	0	0	0	0	1.11	0.04	0	0
40GE1-166	11.56	0.47	5.11	0.24	0	0	0	0	0	0	0.22	0.01

	Chert Artifacts		Ceramic		Obsidian		Slate		Daub		Economic Shell	
Provenience	Cnt	Wght (g)	Cnt	Wght (g)	Cnt	Wght (g)	Cnt	Wght (g)	Cnt	Wght (g)	Cnt	Wght (g)
40EC1-169	35.25	0.23	4.00	0.20	0	0	0	0	2.00	0.03	0.50	0.01
40GC1-173	5.33	0.11	2.44	0.09	0	0	0	0	0.22	0	0.89	0.01
40IG1-174	3.78	0.09	5.56	0.34	0	0	0	0	0	0	0	0
40IE1-178	4.44	0.23	3.78	0.24	0	0	0	0	0	0	0.44	0.03
40IC1-183	6.44	0.20	4.00	0.16	0.22	0	0	0	0	0	0.67	0.03
40HD1-184	6.95	0.27	2.74	0.12	0	0	0.21	0	0	0	0.21	0.01
40HB1-189	6.75	0.23	2.25	0.17	0	0	1.25	0.05	0	0	0	0
40EA1-190	5.56	0.18	1.33	0.03	0	0	0	0	0	0	1.33	0.02
40IA1-193	8.44	0.28	3.33	0.15	0	0	0.22	0	0	0	0.44	0
40FB1-196	5.40	0.15	2.40	0.15	0	0	0	0	0	0	0.60	0
40GA1-199	4.00	0.16	2.11	0.09	0	0	0	0	0	0	0	0
40KA1-202	6.44	0.27	2.67	0.15	0	0	0.22	0.01	0	0	0	0
40JB1-205	8.63	0.43	13.05	0.57	0	0	0	0	0	0	1.05	0.03
40KC1-210	8.63	0.31	3.16	0.17	0	0	0	0	0.42	0.02	0.42	0.01
40JD1-211	7.29	0.19	5.18	0.16	0	0	0	0	0.71	0.01	0	0
40KE1-214	5.20	0.14	0.60	0.14	0	0	0	0	0	0	0.40	0.01
40LB1-220	5.50	0.20	11.00	0.42	0	0	0	0	0.75	0.03	0.50	0.01
40LD1-221	8.67	0.17	2.44	0.11	0	0	0	0	0	0	0	0
40LF1-226	4.44	0.14	4.67	0.29	0	0	0	0	0	0	0.67	0.03
40KG1-227	4.00	0.14	2.89	0.14	0	0	0	0	0	0	0	0
40LH1-232	5.33	0.24	6.89	0.32	0	0	0.22	0	0	0	0.67	0
40KI1-233	5.11	0.24	3.78	0.11	0	0	0	0	0	0	0	0
40KK1-238	6.32	0.53	6.32	0.18	0	0	0	0	0	0	0	0
40JH1-243	7.29	0.35	6.35	0.26	0	0	0	0	0	0	0	0
40JJ1-244	11.06	0.44	12.00	0.33	0	0	0	0	2.82	0.06	0	0
40CC1-264	7.75	0.27	6.00	0.22	0	0	0	0	0	0	2.00	0.03
40DD1-265	5.41	0.13	2.59	0.16	0	0	0	0	0	0	0.94	0.01
40CE1-270	9.20	0.25	8.40	0.30	0	0	0	0	1.00	0.07	1.60	0.06

	Chert Artifacts		Ceramic		Obsidian		Slate		Daub		Economic Shell	
Provenience	Cnt	Wght (g)	Cnt	Wght (g)	Cnt	Wght (g)	Cnt	Wght (g)	Cnt	Wght (g)	Cnt	Wght (g)
40DF1-271	4.75	0.12	2.75	0.16	0	0	0	0	0	0	0.50	0.01
40CG1-276	6.44	0.26	2.67	0.16	0	0	0	0	0	0	0	0
40DH1-277	5.11	0.12	3.33	0.12	0	0	0	0	0	0	0	0
40CI1-284	16.42	0.35	1.05	0.08	0	0	0	0	0	0	0.63	0.05
40DJ1-285	4.44	0.13	1.11	0.07	0	0	0	0	0	0	0.22	0.02
40CK1-286	9.78	0.28	1.11	0.05	0.22	0	0	0	0	0	1.33	0.02
40CA1-290	6.12	0.20	3.06	0.13	0	0	0	0	0	0	1.41	0.01
40AC1-295	5.54	0.13	1.85	0.05	0	0	0	0	0	0	0.31	0.02
40BD1-296	6.64	0.18	1.42	0.05	0	0	0	0	4.51	0.02	0	0
40AE1-317	6.11	0.23	2.53	0.09	0	0	0	0	0	0	1.05	0.01
40BF1-318	6.67	0.13	3.73	0.06	0	0	0	0	0.53	0	0	0
40AG1-319	14.00	0.29	1.56	0.04	0	0	0	0	0.67	0.02	0	0
40BH1-320	4.00	0.10	1.50	0.02	0	0	0	0	0	0	0.75	0.02
42A3-21	8.92	0.14	4.62	0.20	0	0	0	0	0	0	0.31	0
42E2-22	5.50	0.14	0.50	0.02	0	0	0	0	0	0	0.75	0
42H2-23	7.00	0.16	5.25	0.12	0	0	0	0	1.50	0.09	1.25	0.02
42P2-25	4.63	0.14	4.21	0.13	0	0	0	0	0	0	0	0
42AI2-26	6.60	0.11	2.60	0.04	0	0	0	0	0.40	0.03	1.20	0.02
42AM1-27	8.75	0.47	5.25	0.19	0	0	0	0	0.75	0	0	0
42AD1-28	11.25	0.29	2.50	0.07	0	0	0	0	3.25	0.12	0	0
44AA1-18	5.33	0.17	1.11	0.06	0	0	0	0	0	0	0	0
44AD1-19	8.00	0.21	2.67	0.10	0	0	0	0	0	0	0.67	0.02
44AE1-20	4.22	0.11	6.67	0.14	0	0	0	0	0.22	0.01	0	0
% Frequency	100.0%		100.0%		3.8%		4.5%		35.6%		50.8%	
Mean	7.62	0.22	3.65	0.16	0.01	0.00	0.02	0.00	0.30	0.01	0.40	0.01
Stand. Dev.	4.04	0.10	2.35	0.10	0.04	0.00	0.12	0.01	0.64	0.02	0.53	0.01

Appendix G: RAW GEOCHEMICAL DATA

Part 1 of Foss-extracted chemical data

Op	Unit	Lot	Sample Weight	Ba	Ca	Co	Cr	Cu	Fe	Hg	K	Mg
8	BBB	1	1.99 g	3.69	10052.16	0.05	0.03	0.17	0.73	0.00	31.01	59.39
8	CCC	1	2.00 g	3.59	10355.36	0.05	0.03	0.13	0.45	0.00	12.34	63.17
8	DDD	1	1.99 g	3.92	9799.80	0.05	0.03	0.17	0.74	0.00	18.30	67.84
8	EEE	1	2.00 g	4.12	9903.54	0.05	0.04	0.16	0.60	0.00	13.79	71.29
8	FFF	1	1.98 g	4.40	9842.33	0.05	0.03	0.15	0.54	0.00	23.48	79.02
8	GGG	1	2.01 g	4.17	9663.98	0.05	0.03	0.17	0.79	0.00	35.28	70.70
8	HHH	1	1.98 g	4.61	9091.06	0.05	0.03	0.17	0.55	0.00	49.80	73.62
8	III	1	2.02 g	0.04	113.38	0.00	0.00	0.00	0.03	0.00	0.54	0.73
8	JJJ	1	1.98 g	4.99	8378.21	0.03	0.03	0.20	0.73	0.00	32.41	69.28
8	KKK	1	1.99 g	4.42	8873.65	0.05	0.03	0.19	0.54	0.00	22.95	67.82
36	A	3	1.99 g	2.87	10945.54	0.04	0.02	0.05	0.02	0.00	3.06	41.86
36	B	3	1.99 g	3.03	10227.69	0.04	0.05	0.10	0.17	0.00	9.85	50.87
36	C	3	1.99 g	3.03	10481.11	0.04	0.02	0.03	0.02	0.00	3.63	42.52
36	D	3	2.00 g	2.77	10503.00	0.04	0.02	0.03	0.02	0.00	5.01	42.73
36	E	2	2.00 g	2.78	10047.50	0.04	0.02	0.07	0.00	0.00	5.96	43.96
36	F	2	2.02 g	2.89	10841.72	0.04	0.02	0.03	0.03	0.00	4.50	44.17
36	J	2	1.99 g	2.77	10669.16	0.04	0.02	0.04	0.02	0.00	4.28	44.22
36	K	2	2.00 g	2.63	10871.51	0.04	0.02	0.04	0.02	0.00	2.68	39.49
36	L	2	2.00 g	3.06	10087.33	0.04	0.02	0.02	0.02	0.00	3.50	40.34
36	O	2	2.01 g	3.66	10010.45	0.03	0.03	0.08	0.09	0.00	9.14	47.90
36	P	2	2.02 g	3.45	9949.28	0.03	0.01	0.02	0.01	0.00	6.34	43.29
36	Q	2	2.00 g	3.36	10216.49	0.03	0.01	0.05	0.01	0.00	4.54	43.92
36	R	2	2.00 g	3.67	10697.75	0.03	0.01	0.06	0.00	0.00	9.87	45.92
36	S	2	2.00 g	3.63	10372.80	0.04	0.01	0.05	0.00	0.00	4.98	45.93
36	T	2	2.01 g	3.48	10269.63	0.03	0.02	0.04	0.01	0.00	3.83	43.32
36	U	2	2.01 g	3.16	10127.00	0.04	0.02	0.02	0.01	0.00	4.74	44.70
36	V	2	1.99 g	3.28	10021.35	0.04	0.01	0.04	0.02	0.00	3.70	42.79
36	W	2	1.99 g	3.48	10303.92	0.04	0.04	0.10	0.14	0.00	4.73	45.76
36	X	2	1.99 g	3.42	9904.86	0.04	0.04	0.19	0.27	0.00	5.65	53.62
36	Z	2	2.01 g	3.01	9909.81	0.03	0.01	0.03	0.02	0.00	4.41	41.45
36	AA	2	1.99 g	3.51	9997.42	0.03	0.01	0.02	0.01	0.00	5.57	41.26
36	AC	2	1.99 g	3.35	9749.62	0.04	0.05	0.10	0.24	0.00	4.92	48.67
36	AE	2	2.01 g	3.77	10333.76	0.04	0.02	0.02	0.02	0.00	4.70	46.19
36	AG	2	2.01 g	3.54	9744.42	0.04	0.04	0.13	0.20	0.00	3.60	50.48

Op	Unit	Lot	Sample Weight	Ba	Ca	Co	Cr	Cu	Fe	Hg	K	Mg
36	AH	2	1.99 g	3.62	9972.45	0.04	0.04	0.15	0.23	0.00	4.02	64.02
36	AI	2	1.98 g	3.42	10493.84	0.04	0.04	0.11	0.17	0.00	3.05	53.52
36	AJ	2	2.01 g	4.36	10378.49	0.04	0.03	0.11	0.45	0.00	4.50	53.64
36	AK	2	1.99 g	3.64	10323.97	0.04	0.02	0.03	0.01	0.00	4.09	44.19
36	AM	2	1.98 g	3.98	10015.19	0.04	0.05	0.13	0.18	0.00	4.40	49.29
36	AN	2	2.02 g	4.36	9957.62	0.04	0.04	0.07	0.08	0.00	6.03	44.73
36	AO	1	2.00 g	3.24	10563.75	0.04	0.02	0.05	0.02	0.00	3.84	41.61
36	AP	1	2.00 g	3.26	10215.40	0.03	0.02	0.07	0.00	0.00	6.52	46.24
36	AT	1	1.98 g	4.17	10587.04	0.04	0.02	0.03	0.00	0.00	8.57	48.20
36	AU	1	2.01 g	4.36	10629.91	0.04	0.03	0.05	0.05	0.00	6.49	46.56
36	AV	1	1.98 g	3.43	10430.81	0.04	0.05	0.11	0.13	0.00	4.08	44.07
36	AX	1	2.00 g	3.39	10233.17	0.03	0.01	0.03	0.00	0.00	7.21	44.05
36	AY	1	1.98 g	3.43	9590.67	0.03	0.01	0.03	0.00	0.00	6.41	39.75
36	AZ	1	2.01 g	3.28	10004.72	0.03	0.01	0.04	0.00	0.00	4.27	43.41
36	BF	1	2.00 g	3.27	10804.81	0.04	0.02	0.04	0.02	0.00	4.66	41.20
36	BH	1	2.02 g	3.32	10049.69	0.03	0.02	0.05	0.00	0.00	4.34	43.49
36	BI	2	2.01 g	3.37	9842.28	0.04	0.04	0.19	0.32	0.00	5.85	49.13
36	BJ	1	2.01 g	4.11	9724.98	0.03	0.03	0.07	0.17	0.00	4.91	48.12
36	BK	1	2.02 g	3.83	9542.02	0.03	0.03	0.10	0.11	0.00	4.27	46.48
36	BM	1	1.98 g	3.72	9843.80	0.03	0.01	0.03	0.00	0.00	4.53	42.83
40	AC	1	2.00 g	3.13	7985.53	0.03	0.00	0.19	0.55	0.00	7.61	44.63
40	AD	1	1.97 g	3.34	8382.45	0.03	0.01	0.24	0.47	0.00	10.54	44.05
40	BC	1	1.99 g	3.26	7381.93	0.03	0.00	0.25	0.58	0.00	18.77	42.29
40	BD	1	2.01 g	3.48	8079.97	0.03	0.01	0.21	0.54	0.00	26.72	49.90
40	CA	1	1.99 g	2.70	8096.13	0.03	0.02	0.31	0.49	0.00	13.05	48.22
40	CB	1	2.01 g	3.02	8074.39	0.03	0.03	0.35	0.75	0.00	20.67	48.73
40	CC	1	1.98 g	2.95	9134.05	0.05	0.03	0.20	0.55	0.00	44.14	61.48
40	CD	1	1.99 g	3.25	9090.88	0.05	0.04	0.22	0.69	0.00	33.86	57.86
40	CE	1	2.00 g	3.72	9621.45	0.05	0.03	0.17	0.51	0.00	16.53	67.20
40	CF	1	1.99 g	3.66	9928.18	0.05	0.03	0.18	0.45	0.00	33.14	64.84
40	CG	1	2.01 g	3.14	8156.99	0.04	0.04	0.17	0.43	0.00	12.43	47.12
40	CH	1	2.00 g	3.18	8169.41	0.05	0.04	0.16	0.35	0.01	25.68	46.39
40	CI	1	1.98 g	3.19	7664.92	0.05	0.03	0.19	0.55	0.01	27.36	49.78
40	CJ	1	2.00 g	2.92	7814.27	0.04	0.03	0.13	0.33	0.00	11.88	49.22
40	CK	1	2.00 g	2.60	7917.83	0.04	0.04	0.16	0.46	0.00	7.24	51.44
40	DA	1	2.02 g	2.79	8866.18	0.03	0.03	0.30	0.59	0.00	20.68	49.02
40	DC	1	2.00 g	2.62	7792.92	0.04	0.04	0.22	0.55	0.00	43.68	62.33

Op	Unit	Lot	Sample Weight	Ba	Ca	Co	Cr	Cu	Fe	Hg	K	Mg
40	DD	1	2.00 g	2.81	8530.14	0.05	0.03	0.24	0.64	0.00	38.35	56.03
40	DE	1	2.02 g	3.30	8927.39	0.05	0.04	0.16	0.41	0.00	38.97	54.55
40	DF	1	1.99 g	3.89	8542.51	0.05	0.03	0.20	0.49	0.00	17.12	61.57
40	DG	1	1.98 g	4.28	8732.99	0.05	0.03	0.22	0.33	0.00	14.16	51.14
40	DH	1	2.01 g	3.05	8294.60	0.05	0.04	0.18	0.57	0.02	32.24	48.55
40	DI	1	1.98 g	2.97	7703.55	0.04	0.04	0.16	0.48	0.00	16.39	46.85
40	DJ	1	1.98 g	3.95	9505.09	0.04	0.04	0.13	0.34	0.00	15.48	56.28
40	DK	1	1.99 g	2.67	8040.79	0.04	0.03	0.16	0.39	0.00	5.11	49.85
40	EA	1	2.01 g	3.10	8228.25	0.03	0.04	0.16	0.81	0.00	66.77	86.57
40	EB	1	2.02 g	2.11	8112.66	0.03	0.04	0.18	0.46	0.00	27.17	63.08
40	EC	1	2.00 g	3.24	7641.33	0.04	0.05	0.19	0.22	0.00	19.55	50.61
40	ED	1	2.01 g	3.77	8052.83	0.04	0.05	0.14	0.23	0.00	27.75	51.07
40	EE	1	2.00 g	4.30	7794.86	0.04	0.05	0.21	0.28	0.00	30.69	55.55
40	EF	1	2.00 g	5.27	7918.48	0.04	0.04	0.21	0.32	0.00	24.49	55.90
40	EG	1	2.00 g	5.70	7668.76	0.04	0.04	0.21	0.34	0.00	23.06	58.47
40	EH	1	1.99 g	4.20	9769.17	0.03	0.02	0.18	0.94	0.00	20.95	78.70
40	EI	1	1.98 g	2.54	8354.67	0.03	0.05	0.29	0.78	0.00	20.74	65.31
40	EJ	1	1.99 g	3.25	10165.24	0.03	0.03	0.07	0.44	0.00	22.25	66.29
40	EK	1	2.01 g	2.59	9182.34	0.04	0.06	0.23	0.62	0.02	5.83	71.15
40	EL	1	2.00 g	3.09	8369.50	0.04	0.05	0.13	0.26	0.00	7.68	43.82
40	EM	1	2.01 g	3.03	8073.37	0.04	0.04	0.15	0.41	0.00	10.46	38.98
40	EN	1	2.00 g	3.61	7215.49	0.04	0.05	0.27	0.36	0.00	12.20	49.35
40	EO	1	2.00 g	5.76	7107.31	0.03	0.00	0.12	0.33	0.00	13.58	51.04
40	EP	1	2.00 g	5.87	6434.55	0.03	0.01	0.25	0.45	0.00	14.36	52.24
40	EQ	1	1.99 g	5.98	7575.90	0.04	0.04	0.19	0.35	0.00	33.47	57.08
40	ER	1	1.98 g	5.55	7239.62	0.04	0.04	0.22	0.43	0.00	25.30	54.65
40	ES	1	1.99 g	3.90	7334.95	0.02	0.00	0.15	0.46	0.00	7.02	51.44
40	ET	1	2.02 g	6.54	7388.25	0.03	0.02	0.18	0.34	0.00	10.79	56.71
40	EU	1	2.00 g	3.10	11352.48	0.03	0.02	0.16	0.43	0.00	22.79	63.56
40	EV	1	2.01 g	3.31	11778.80	0.04	0.03	0.10	0.26	0.00	7.26	59.80
40	FA	1	2.02 g	2.09	7777.32	0.03	0.04	0.23	0.42	0.00	39.56	65.74
40	FB	1	2.01 g	2.07	7597.89	0.03	0.04	0.20	0.49	0.00	37.31	55.65
40	FC	1	2.01 g	4.92	7453.70	0.04	0.04	0.21	0.36	0.00	20.39	56.57
40	FE	1	2.02 g	5.22	7953.33	0.04	0.05	0.20	0.30	0.00	26.19	57.17
40	FF	1	1.98 g	5.58	8352.14	0.04	0.05	0.21	0.33	0.00	28.49	56.49
40	FG	1	1.99 g	6.00	8438.35	0.04	0.05	0.16	0.29	0.00	31.02	63.73
40	FH	1	2.00 g	4.16	8835.49	0.03	0.03	0.20	0.77	0.00	49.32	77.64

Op	Unit	Lot	Sample Weight	Ba	Ca	Co	Cr	Cu	Fe	Hg	K	Mg
40	FI	1	2.02 g	3.13	8558.46	0.03	0.02	0.24	0.59	0.00	37.31	67.62
40	FJ	1	1.99 g	2.92	8816.63	0.03	0.03	0.26	1.20	0.00	14.32	72.04
40	FK	1	1.99 g	3.05	8880.43	0.03	0.02	0.18	0.72	0.00	26.41	71.65
40	FL	1	1.98 g	3.47	8115.61	0.04	0.05	0.08	0.23	0.00	13.87	44.60
40	FM	1	2.02 g	3.23	8424.24	0.04	0.05	0.15	0.28	0.00	12.53	41.35
40	FN	1	1.99 g	3.89	7879.91	0.04	0.05	0.16	0.44	0.00	13.49	51.48
40	FO	1	2.01 g	3.79	8705.48	0.03	0.00	0.21	0.42	0.01	14.10	55.98
40	FP	1	2.00 g	3.92	8964.99	0.02	0.00	0.14	0.45	0.00	13.85	59.77
40	FQ	1	2.00 g	2.89	10390.62	0.03	0.03	0.26	0.71	0.00	32.03	54.91
40	FR	1	2.00 g	3.16	10743.08	0.04	0.04	0.27	0.68	0.00	20.84	58.64
40	FS	1	2.00 g	3.32	10355.84	0.04	0.04	0.24	0.55	0.00	18.40	59.18
40	FT	1	2.01 g	3.13	10996.45	0.04	0.04	0.77	0.50	0.00	12.14	58.95
40	FU	1	2.01 g	2.46	8510.23	0.04	0.04	0.19	0.63	0.00	20.96	64.25
40	FV	1	1.98 g	2.65	11673.94	0.03	0.02	0.23	0.62	0.01	12.32	60.37
40	FW	1	2.00 g	3.34	12501.71	0.04	0.03	0.08	0.13	0.00	4.43	58.07
40	GA	1	1.99 g	2.47	8597.74	0.04	0.04	0.21	0.49	0.00	40.07	67.14
40	GB	1	2.01 g	2.70	9571.92	0.03	0.04	0.15	0.55	0.00	21.07	72.48
40	GC	1	2.01 g	4.05	8110.10	0.04	0.05	0.13	0.24	0.00	29.56	54.15
40	GD	1	1.99 g	2.97	8724.88	0.03	0.04	0.19	0.51	0.00	81.50	74.28
40	GE	1	2.00 g	6.61	7616.03	0.04	0.04	0.22	0.53	0.00	27.15	60.91
40	GG	1	2.01 g	0.00	2536.14	0.00	0.00	0.00	0.14	0.00	4.01	13.32
40	GH	1	2.02 g	4.44	9792.61	0.03	0.01	0.18	0.78	0.00	39.43	81.66
40	GI	1	2.00 g	3.86	8909.03	0.03	0.01	0.19	0.75	0.00	27.01	79.89
40	GJ	1	2.01 g	3.17	8196.22	0.03	0.01	0.30	0.78	0.00	16.61	64.17
40	GK	1	2.01 g	3.23	8309.09	0.03	0.01	0.30	1.10	0.00	40.70	63.17
40	GM	1	2.02 g	3.19	7700.78	0.04	0.04	0.14	0.23	0.00	22.53	46.91
40	GN	1	2.01 g	3.58	7603.54	0.04	0.05	0.21	0.27	0.00	20.28	51.22
40	GO	1	2.00 g	5.09	7672.00	0.02	0.00	0.10	0.35	0.00	10.38	60.37
40	GP	1	1.98 g	3.50	7016.65	0.04	0.04	0.28	0.45	0.00	15.30	44.23
40	GQ	1	2.02 g	3.52	10004.97	0.04	0.03	0.14	0.96	0.00	21.00	53.10
40	GR	1	2.00 g	3.62	12043.39	0.04	0.04	0.15	0.36	0.00	29.40	65.84
40	GS	1	1.98 g	3.59	11299.41	0.04	0.04	0.17	0.41	0.00	18.89	61.60
40	GT	1	1.98 g	3.08	11388.28	0.04	0.03	0.19	0.41	0.00	7.91	55.27
40	GU	1	2.02 g	2.97	10348.69	0.03	0.03	0.22	0.45	0.00	7.71	54.95
40	GV	1	2.01 g	2.36	8619.41	0.03	0.04	0.20	0.46	0.00	12.64	62.42
40	GW	1	2.01 g	3.08	9539.12	0.03	0.02	0.18	1.13	0.00	5.34	72.37
40	HA	1	1.99 g	2.88	8137.42	0.04	0.04	0.24	0.56	0.00	43.30	74.40

Op	Unit	Lot	Sample Weight	Ba	Ca	Co	Cr	Cu	Fe	Hg	K	Mg
40	HB	1	2.01 g	3.02	7614.57	0.04	0.04	0.24	0.67	0.00	57.68	71.83
40	HC	1	1.99 g	3.04	8615.82	0.03	0.04	0.20	0.93	0.00	74.05	84.49
40	HD	1	2.00 g	3.07	7531.27	0.03	0.04	0.24	0.74	0.00	39.91	67.13
40	HG	1	2.00 g	5.35	10149.48	0.04	0.01	0.12	1.30	0.02	33.90	97.75
40	HH	1	1.99 g	4.22	8997.37	0.03	0.01	0.25	0.86	0.00	40.16	78.47
40	HI	1	2.00 g	3.91	9107.55	0.03	0.01	0.19	0.88	0.00	34.23	82.65
40	HJ	1	2.01 g	3.46	8976.47	0.03	0.01	0.34	1.08	0.00	32.22	74.29
40	HK	1	2.02 g	3.04	7595.58	0.03	0.01	0.31	1.06	0.00	28.29	70.43
40	HM	1	1.98 g	4.02	8084.27	0.04	0.04	0.18	0.37	0.00	9.35	60.22
40	HN	1	2.01 g	3.43	7381.58	0.04	0.04	0.25	0.39	0.00	18.42	44.13
40	HO	1	2.01 g	3.48	10028.95	0.09	0.05	0.60	0.61	0.00	22.84	63.94
40	HP	1	2.00 g	6.03	6873.45	0.04	0.03	0.26	0.49	0.00	9.48	54.41
40	HQ	1	1.99 g	3.88	11754.21	0.04	0.03	0.16	0.31	0.00	16.98	66.58
40	HR	1	2.02 g	3.78	10786.67	0.04	0.03	0.21	0.34	0.00	11.89	58.42
40	HS	1	2.00 g	3.87	12130.07	0.04	0.03	0.14	0.35	0.00	8.61	66.16
40	HT	1	1.98 g	3.54	11585.26	0.04	0.03	0.11	0.24	0.00	5.54	63.48
40	HU	1	2.00 g	2.58	8707.58	0.04	0.04	0.18	0.63	0.00	8.58	68.90
40	HV	1	1.98 g	3.08	11894.33	0.04	0.03	0.14	0.28	0.00	3.47	57.45
40	HW	1	2.01 g	2.97	9430.33	0.03	0.02	0.16	0.67	0.00	5.53	77.65
40	IA	1	1.98 g	2.80	7750.98	0.04	0.05	0.36	0.99	0.00	22.34	80.79
40	IB	1	1.98 g	2.04	8090.47	0.03	0.04	0.21	0.48	0.00	38.64	66.28
40	IC	1	2.01 g	3.32	7115.77	0.03	0.05	0.20	0.74	0.00	56.23	77.63
40	ID	1	2.02 g	6.60	8489.84	0.03	0.04	0.18	0.97	0.00	85.09	95.44
40	IE	1	2.00 g	6.61	7663.38	0.04	0.04	0.20	0.39	0.00	31.83	72.24
40	IF	1	2.01 g	7.44	7954.13	0.05	0.04	0.16	0.41	0.00	22.86	63.74
40	IG	1	2.00 g	7.92	7272.78	0.04	0.04	0.20	0.51	0.00	25.10	75.19
40	IH	1	2.00 g	5.02	8944.84	0.03	0.01	0.15	0.85	0.01	29.87	101.36
40	II	1	1.98 g	3.69	9069.87	0.03	0.01	0.24	0.86	0.00	11.56	79.70
40	IJ	1	2.00 g	3.59	8022.76	0.03	0.02	0.27	1.31	0.00	25.48	67.40
40	IK	1	2.01 g	3.59	8288.86	0.03	0.01	0.24	1.06	0.01	14.08	72.94
40	IL	1	1.99 g	0.00	1506.08	0.00	0.00	0.00	0.06	0.00	3.31	9.63
40	IM	1	2.00 g	3.36	8315.12	0.04	0.05	0.20	0.27	0.00	13.34	45.04
40	IN	1	1.98 g	3.63	6880.21	0.03	0.02	0.29	0.36	0.00	20.34	44.50
40	IP	1	2.02 g	7.09	6727.14	0.04	0.03	0.22	0.46	0.00	10.31	60.54
40	IR	1	2.00 g	3.69	11489.37	0.04	0.03	0.15	0.45	0.00	9.86	71.38
40	IS	1	1.99 g	3.35	9954.91	0.03	0.02	0.20	0.46	0.00	17.43	56.24
40	IT	1	2.02 g	3.01	11017.73	0.03	0.03	0.20	0.41	0.00	6.01	57.21

Op	Unit	Lot	Sample Weight	Ba	Ca	Co	Cr	Cu	Fe	Hg	K	Mg
40	IU	1	2.00 g	2.78	9253.57	0.04	0.04	0.12	0.59	0.00	32.14	72.93
40	IV	1	2.00 g	2.84	8996.76	0.03	0.05	0.16	0.97	0.00	8.15	81.06
40	JA	1	1.98 g	4.20	9580.44	0.05	0.03	0.20	0.77	0.00	32.82	74.44
40	JB	1	2.00 g	4.21	8943.17	0.05	0.03	0.24	0.97	0.00	46.10	76.15
40	JC	1	2.01 g	4.78	9551.16	0.05	0.02	0.19	0.53	0.00	51.25	83.72
40	JD	1	2.01 g	4.36	9153.89	0.05	0.03	0.24	0.69	0.00	60.54	91.05
40	JE	1	2.02 g	5.19	9937.76	0.05	0.02	0.14	0.41	0.00	56.78	86.73
40	JH	1	1.99 g	6.07	8769.82	0.05	0.03	0.23	0.53	0.00	41.96	65.31
40	JI	1	2.01 g	5.58	9366.74	0.05	0.03	0.17	0.48	0.00	21.33	73.55
40	JJ	1	1.99 g	5.01	9288.45	0.05	0.03	0.21	0.55	0.00	34.72	67.25
40	JK	1	1.99 g	4.65	9006.15	0.04	0.03	0.21	0.54	0.00	28.76	58.83
40	JL	1	1.99 g	4.11	8038.77	0.04	0.04	0.19	0.31	0.00	14.89	53.00
40	JM	1	2.00 g	3.35	6586.87	0.04	0.04	0.24	0.32	0.00	12.93	45.64
40	JN	1	1.98 g	4.47	7451.69	0.04	0.04	0.22	0.36	0.00	15.71	49.13
40	JO	1	1.99 g	0.41	8940.24	0.00	0.00	0.02	0.83	0.00	31.71	39.34
40	JR	1	2.01 g	2.95	9043.14	0.04	0.04	0.17	0.53	0.00	10.47	74.73
40	JS	1	2.01 g	3.05	8694.91	0.04	0.04	0.16	0.51	0.00	25.78	82.03
40	JT	1	1.99 g	2.33	7813.88	0.03	0.04	0.27	0.47	0.00	6.74	61.26
40	JU	1	1.99 g	3.19	11117.55	0.04	0.02	0.17	0.30	0.00	6.73	60.58
40	JV	1	2.02 g	2.85	8717.19	0.03	0.03	0.22	0.93	0.00	16.25	86.04
40	KA	1	1.99 g	4.85	9499.63	0.05	0.02	0.21	0.87	0.00	36.66	82.15
40	KB	1	1.99 g	5.16	10106.80	0.05	0.03	0.16	0.56	0.00	48.50	78.81
40	KC	1	1.99 g	4.31	8986.42	0.05	0.02	0.23	0.57	0.00	74.82	75.95
40	KD	1	1.99 g	4.46	9414.34	0.05	0.03	0.23	0.69	0.00	61.12	86.09
40	KE	1	1.98 g	4.68	9022.99	0.05	0.03	0.22	0.78	0.00	42.33	75.53
40	KF	1	1.99 g	5.19	8903.48	0.05	0.03	0.17	0.36	0.00	25.30	72.12
40	KG	1	1.98 g	5.19	8408.08	0.05	0.03	0.24	0.61	0.00	45.10	70.00
40	KH	1	1.99 g	7.28	10013.84	0.04	0.03	0.07	0.07	0.00	42.68	82.58
40	KI	1	2.01 g	5.59	7211.89	0.06	0.03	0.26	1.01	0.00	38.98	105.87
40	KK	1	2.00 g	6.43	9304.92	0.05	0.03	0.15	0.54	0.00	34.24	86.30
40	KM	1	2.01 g	4.10	7548.60	0.04	0.04	0.17	0.29	0.00	21.07	60.08
40	KN	1	2.02 g	4.24	7354.95	0.04	0.04	0.17	0.24	0.00	13.81	58.26
40	KO	1	2.00 g	4.94	8075.55	0.04	0.04	0.22	0.37	0.00	31.21	63.80
40	KP	1	1.98 g	4.18	7863.45	0.04	0.03	0.19	0.28	0.00	10.39	45.41
40	KQ	1	2.00 g	3.61	7357.30	0.04	0.03	0.23	0.37	0.00	19.17	45.41
40	KR	1	2.01 g	3.83	7588.49	0.04	0.04	0.21	0.35	0.00	16.02	49.65
40	KS	1	2.01 g	4.24	7903.72	0.04	0.04	0.19	0.37	0.00	24.64	59.90

Op	Unit	Lot	Sample Weight	Ba	Ca	Co	Cr	Cu	Fe	Hg	K	Mg
40	KT	1	2.02 g	4.00	8182.46	0.04	0.04	0.16	0.27	0.00	20.42	50.35
40	KV	1	2.02 g	3.80	9293.22	0.03	0.02	0.16	0.55	0.00	21.74	82.77
40	LA	1	2.01 g	4.70	9616.02	0.05	0.03	0.23	0.99	0.00	31.27	72.54
40	LB	1	1.99 g	4.78	9715.27	0.05	0.03	0.18	0.70	0.00	37.04	74.55
40	LC	1	2.01 g	4.86	10568.47	0.05	0.02	0.15	0.41	0.00	33.77	85.39
40	LD	1	1.98 g	4.68	9364.44	0.05	0.03	0.20	0.62	0.00	50.13	72.24
40	LE	1	2.02 g	4.52	9762.57	0.05	0.03	0.20	0.55	0.00	60.66	74.07
40	LF	1	2.00 g	4.81	8896.11	0.05	0.03	0.20	0.45	0.00	42.55	77.14
40	LG	1	2.00 g	5.04	7813.87	0.05	0.03	0.23	0.59	0.00	34.19	81.86
40	LH	1	1.99 g	5.60	9199.81	0.05	0.03	0.20	0.62	0.00	27.66	72.02
40	LI	1	1.99 g	4.64	8999.32	0.04	0.03	0.28	0.39	0.00	29.26	66.92
40	LJ	1	2.01 g	4.81	9316.89	0.04	0.04	0.22	0.42	0.00	21.79	67.47
40	LK	1	1.98 g	5.00	9552.54	0.04	0.03	0.17	0.43	0.00	30.61	74.70
40	LL	1	1.99 g	4.14	10909.10	0.04	0.02	0.17	0.58	0.00	22.41	75.25
40	LM	1	2.01 g	2.14	3530.89	0.02	0.02	0.11	0.16	0.00	7.94	38.65
40	LN	1	1.98 g	4.87	8668.77	0.04	0.04	0.16	0.34	0.00	25.73	70.42
40	LO	1	1.98 g	6.66	9144.03	0.05	0.05	0.34	0.56	0.00	21.58	72.69
40	LP	1	1.99 g	5.60	7736.07	0.04	0.04	0.23	0.38	0.00	36.91	69.43
40	LQ	1	2.00 g	4.78	6583.82	0.03	0.04	0.29	0.38	0.00	16.88	59.40
40	LR	1	2.00 g	3.87	7389.65	0.04	0.03	0.25	0.33	0.00	22.53	45.18
40	LS	1	2.00 g	3.63	6812.42	0.03	0.02	0.24	0.32	0.00	23.59	43.98
40	LT	1	2.00 g	3.56	7899.03	0.04	0.05	0.21	0.35	0.00	16.04	43.87
40	LV	1	1.99 g	3.34	9231.98	0.03	0.02	0.13	0.98	0.00	30.72	82.79
42	A	3	1.98 g	3.32	10181.16	0.03	0.03	0.10	0.10	0.00	6.14	44.97
42	B	3	2.01 g	2.91	10101.57	0.03	0.01	0.04	0.00	0.00	4.62	44.64
42	E	2	2.00 g	3.64	10444.64	0.04	0.04	0.09	0.29	0.00	11.48	45.42
42	F	2	1.98 g	3.52	10389.51	0.04	0.03	0.16	0.15	0.01	6.70	40.43
42	G	3	1.98 g	2.96	9358.31	0.04	0.03	0.14	0.21	0.00	6.47	45.26
42	H	2	1.99 g	3.22	10109.84	0.04	0.01	0.06	0.00	0.00	8.68	42.97
42	I	2	2.00 g	2.19	9127.36	0.04	0.00	0.15	0.18	0.01	3.90	34.57
42	N	1	1.99 g	4.71	9008.66	0.04	0.03	0.27	0.42	0.00	28.36	62.41
42	O	1	1.98 g	2.43	9837.93	0.05	0.04	0.23	0.24	0.00	3.46	37.70
42	P	2	1.98 g	2.71	10167.00	0.04	0.03	0.30	2.16	0.00	4.10	34.14
42	R	2	2.02 g	2.44	9498.80	0.05	0.04	0.37	0.43	0.00	5.61	42.89
42	U	2	1.99 g	2.53	10505.26	0.05	0.01	0.10	0.06	0.01	3.05	36.26
42	AB	2	2.00 g	3.35	10886.01	0.04	0.02	0.03	0.01	0.00	5.15	38.81
42	AI	2	1.98 g	2.66	8202.91	0.03	0.01	0.25	0.48	0.00	2.67	35.80

Op	Unit	Lot	Sample Weight	Ba	Ca	Co	Cr	Cu	Fe	Hg	K	Mg
42	AJ	2	2.01 g	2.48	8185.00	0.03	0.01	0.32	0.46	0.00	2.85	36.49
42	AL	2	2.02 g	2.81	8144.75	0.03	0.01	0.19	0.42	0.00	4.13	39.22
42	AM	1	1.98 g	2.36	8476.91	0.03	0.00	0.15	0.83	0.00	6.27	40.54
42	AN	1	1.98 g	2.55	9032.57	0.03	0.02	0.33	0.39	0.00	2.27	39.76
42	AO	1	1.99 g	3.04	8314.08	0.03	0.00	0.18	0.42	0.00	4.82	46.91
42	AP	1	2.00 g	2.67	8697.77	0.03	0.02	0.35	0.62	0.00	3.38	43.01
44	C	3	2.00 g	2.61	8619.18	0.04	0.02	0.02	0.12	0.00	7.93	40.92
44	D	3	2.01 g	2.72	8176.65	0.04	0.03	0.18	0.44	0.00	15.16	58.83
44	G	2	2.00 g	2.85	9039.88	0.03	0.02	0.38	0.32	0.00	11.89	42.12
44	H	2	1.99 g	2.56	8831.52	0.03	0.02	0.25	0.34	0.00	10.21	38.91
44	I	1	1.98 g	2.36	8557.63	0.04	0.04	0.17	0.46	0.00	17.17	48.37
44	J	1	2.01 g	2.76	7880.23	0.04	0.04	0.19	0.46	0.00	11.60	59.64
44	K	1	2.01 g	2.56	8540.10	0.05	0.04	0.14	0.35	0.00	23.86	53.35
44	M	1	2.00 g	2.51	8206.76	0.04	0.04	0.21	0.51	0.00	11.56	62.90
44	N	1	1.99 g	2.38	8044.92	0.04	0.04	0.15	0.41	0.00	8.52	47.86
44	P	2	1.98 g	2.76	9772.61	0.03	0.07	0.13	0.17	0.00	3.97	41.56
44	V	2	2.00 g	2.03	8496.95	0.04	0.04	0.12	0.30	0.00	3.10	39.29
44	AA	1	2.00 g	2.47	8403.57	0.03	0.02	0.32	0.59	0.00	5.57	39.83
44	AB	1	1.98 g	2.72	10315.32	0.03	0.03	0.13	0.17	0.00	4.14	42.84
44	AC	1	2.02 g	3.00	9690.39	0.03	0.03	0.20	0.24	0.00	4.66	44.36
44	AD	1	1.99 g	2.85	8020.42	0.03	0.02	0.31	0.46	0.00	5.19	40.65
44	AE	1	2.02 g	2.41	8134.33	0.03	0.02	0.33	0.47	0.00	7.56	41.26
44	AF	1	2.01 g	2.52	8666.98	0.03	0.03	0.27	0.63	0.00	7.10	41.30

Part 2 of Foss-extracted chemical data

Op	Unit	Lot	Mn	Na	Ni	P	Pb	Sr	Ti	U	V	Y	Zn
8	BBB	1	4.63	16.02	0.47	15.21	0.03	3.74	0.25	0.00	0.30	0.08	0.80
8	CCC	1	4.77	16.00	0.47	12.87	0.03	3.77	0.21	0.00	0.30	0.07	0.61
8	DDD	1	5.59	15.79	0.45	17.91	0.04	3.70	0.29	0.00	0.29	0.08	0.88
8	EEE	1	5.28	15.83	0.46	16.39	0.03	3.74	0.27	0.00	0.30	0.08	0.82
8	FFF	1	6.18	16.59	0.48	21.66	0.03	3.79	0.37	0.00	0.28	0.08	0.95
8	GGG	1	5.51	15.83	0.47	17.05	0.04	3.68	0.29	0.00	0.30	0.08	0.89
8	HHH	1	5.96	15.45	0.47	22.80	0.03	3.53	0.41	0.00	0.24	0.09	0.98
8	III	1	0.06	0.19	0.01	0.28	0.00	0.03	0.01	0.00	0.00	0.00	0.02
8	JJJ	1	5.61	16.25	0.46	27.97	0.05	3.63	0.35	0.00	0.26	0.10	1.20
8	KKK	1	5.18	15.34	0.45	15.78	0.04	3.51	0.29	0.00	0.22	0.10	0.74
36	A	3	3.08	10.72	0.57	0.53	0.00	4.72	0.04	0.00	0.37	0.00	0.19
36	B	3	3.87	11.14	0.56	8.69	0.01	4.40	0.15	0.00	0.37	0.03	0.72
36	C	3	2.70	11.80	0.58	0.42	0.00	4.54	0.04	0.00	0.36	0.00	0.08
36	D	3	3.06	11.53	0.56	1.64	0.00	4.68	0.05	0.00	0.37	0.00	0.17
36	E	2	3.33	14.14	0.58	1.30	0.00	4.92	0.05	0.00	0.28	0.00	0.27
36	F	2	2.99	11.51	0.57	0.88	0.00	4.51	0.04	0.00	0.35	0.00	0.14
36	J	2	3.43	11.29	0.59	1.91	0.00	4.49	0.05	0.00	0.29	0.00	0.29
36	K	2	3.18	10.87	0.59	0.56	0.00	4.57	0.04	0.00	0.36	0.00	0.18
36	L	2	2.96	11.46	0.58	0.42	0.00	4.73	0.03	0.00	0.30	0.00	0.07
36	O	2	3.58	15.63	0.50	9.04	0.01	4.44	0.13	0.00	0.27	0.02	0.52
36	P	2	2.98	14.98	0.54	0.89	0.00	4.57	0.04	0.00	0.20	0.00	0.11
36	Q	2	2.88	14.84	0.54	0.37	0.00	4.30	0.04	0.00	0.27	0.00	0.13
36	R	2	3.30	15.87	0.56	1.49	0.00	4.60	0.05	0.00	0.35	0.00	0.25
36	S	2	3.41	16.20	0.57	0.00	0.00	4.48	0.03	0.00	0.26	0.00	0.12
36	T	2	2.65	16.12	0.58	0.06	0.00	4.38	0.03	0.00	0.32	0.00	0.08
36	U	2	2.86	11.68	0.58	0.65	0.00	4.54	0.03	0.00	0.29	0.00	0.10
36	V	2	3.10	11.71	0.57	2.40	0.00	4.60	0.06	0.00	0.19	0.00	0.26
36	W	2	3.58	11.97	0.59	7.97	0.01	4.66	0.13	0.00	0.30	0.03	0.60
36	X	2	3.86	11.28	0.54	8.16	0.01	4.33	0.15	0.00	0.29	0.05	0.66
36	Z	2	3.31	14.30	0.52	1.68	0.00	4.46	0.06	0.00	0.33	0.00	0.17
36	AA	2	3.13	14.41	0.55	1.34	0.00	4.62	0.04	0.00	0.21	0.00	0.10
36	AC	2	3.57	11.29	0.58	9.74	0.01	4.36	0.15	0.00	0.30	0.03	0.71
36	AE	2	2.70	11.85	0.58	2.36	0.00	4.81	0.06	0.00	0.37	0.00	0.11
36	AG	2	3.57	11.95	0.56	7.92	0.01	4.43	0.12	0.00	0.26	0.04	0.48
36	AH	2	3.72	12.42	0.54	9.82	0.01	4.39	0.15	0.00	0.33	0.05	0.51
36	AI	2	3.70	12.23	0.56	7.71	0.01	4.51	0.12	0.00	0.37	0.05	0.45
36	AJ	2	3.40	13.49	0.58	9.93	0.01	4.61	0.14	0.00	0.31	0.02	1.04

Op	Unit	Lot	Mn	Na	Ni	P	Pb	Sr	Ti	U	V	Y	Zn
36	AK	2	2.98	11.91	0.58	1.16	0.00	4.51	0.04	0.00	0.34	0.00	0.09
36	AM	2	3.71	12.25	0.57	14.72	0.01	4.27	0.19	0.00	0.29	0.05	0.66
36	AN	2	3.23	11.98	0.55	13.16	0.00	4.27	0.18	0.00	0.28	0.01	0.61
36	AO	1	3.05	10.88	0.53	1.35	0.00	4.33	0.06	0.00	0.28	0.00	0.28
36	AP	1	3.32	15.31	0.57	2.85	0.00	4.32	0.06	0.00	0.33	0.00	0.51
36	AT	1	3.27	12.67	0.56	7.41	0.00	4.52	0.11	0.00	0.29	0.00	0.24
36	AU	1	2.79	44.04	0.58	9.22	0.00	4.41	0.13	0.00	0.35	0.00	0.44
36	AV	1	3.53	11.83	0.58	8.31	0.01	4.45	0.13	0.00	0.36	0.03	0.50
36	AX	1	3.40	15.17	0.55	0.91	0.00	4.39	0.04	0.00	0.30	0.00	0.21
36	AY	1	3.23	14.34	0.54	0.00	0.00	4.31	0.02	0.00	0.14	0.00	0.13
36	AZ	1	3.29	15.29	0.56	0.49	0.00	4.21	0.03	0.00	0.24	0.00	0.29
36	BF	1	2.91	11.02	0.57	0.76	0.00	4.15	0.05	0.00	0.29	0.00	0.21
36	BH	1	3.26	14.84	0.57	1.66	0.00	4.16	0.05	0.00	0.30	0.00	0.41
36	BI	2	3.92	11.14	0.51	6.78	0.02	4.27	0.14	0.00	0.30	0.07	0.65
36	BJ	1	3.67	15.74	0.51	7.08	0.01	4.53	0.11	0.00	0.25	0.03	0.53
36	BK	1	3.78	15.17	0.52	7.32	0.01	4.31	0.10	0.00	0.22	0.03	0.55
36	BM	1	2.94	14.62	0.52	0.00	0.00	4.18	0.03	0.00	0.24	0.00	0.18
40	AC	1	4.55	13.85	0.46	13.92	0.03	3.99	0.15	0.00	0.19	0.05	0.88
40	AD	1	4.61	13.94	0.41	14.24	0.03	3.96	0.17	0.00	0.23	0.05	0.61
40	BC	1	6.77	13.76	0.37	16.01	0.04	3.70	0.18	0.00	0.24	0.07	0.80
40	BD	1	5.19	13.87	0.40	17.79	0.03	3.83	0.21	0.00	0.29	0.05	0.79
40	CA	1	4.60	14.37	0.42	12.62	0.03	3.58	0.18	0.00	0.34	0.08	0.80
40	CB	1	4.84	15.14	0.41	14.22	0.04	3.59	0.21	0.00	0.29	0.07	0.80
40	CC	1	5.17	14.93	0.43	13.24	0.03	3.44	0.25	0.00	0.23	0.07	0.68
40	CD	1	4.53	15.06	0.47	11.19	0.03	3.61	0.23	0.00	0.29	0.06	0.81
40	CE	1	5.14	15.79	0.45	14.71	0.03	3.67	0.25	0.00	0.27	0.05	0.91
40	CF	1	4.38	15.27	0.46	12.57	0.03	3.79	0.22	0.00	0.25	0.04	0.82
40	CG	1	4.01	12.91	0.45	5.27	0.02	3.43	0.16	0.00	0.20	0.04	0.61
40	CH	1	4.15	12.95	0.46	5.91	0.02	3.54	0.18	0.00	0.17	0.04	0.72
40	CI	1	4.44	13.10	0.44	6.93	0.03	3.28	0.23	0.00	0.16	0.04	0.79
40	CJ	1	4.05	12.01	0.43	5.15	0.02	3.48	0.16	0.00	0.21	0.03	0.59
40	CK	1	4.25	12.34	0.41	6.34	0.02	3.38	0.19	0.00	0.24	0.04	0.60
40	DA	1	5.06	15.57	0.45	14.01	0.04	3.78	0.21	0.00	0.37	0.09	0.63
40	DC	1	4.98	13.21	0.42	9.72	0.03	3.05	0.25	0.00	0.25	0.07	0.82
40	DD	1	5.06	14.81	0.42	13.91	0.04	3.15	0.25	0.00	0.28	0.07	0.79
40	DE	1	4.99	13.90	0.45	9.95	0.03	3.30	0.22	0.00	0.27	0.05	0.81
40	DF	1	5.04	14.48	0.44	13.72	0.03	3.40	0.29	0.00	0.25	0.05	0.94
40	DG	1	4.53	12.10	0.51	21.38	0.03	3.83	0.24	0.00	0.29	0.05	0.94

Op	Unit	Lot	Mn	Na	Ni	P	Pb	Sr	Ti	U	V	Y	Zn
40	DH	1	4.75	13.46	0.47	7.59	0.03	3.53	0.24	0.00	0.14	0.05	0.93
40	DI	1	4.12	12.29	0.42	6.41	0.03	3.28	0.20	0.00	0.22	0.04	0.74
40	DJ	1	5.12	12.39	0.53	17.70	0.02	4.35	0.20	0.00	0.34	0.05	0.83
40	DK	1	4.15	12.40	0.42	4.85	0.02	3.38	0.15	0.00	0.23	0.04	0.52
40	EA	1	6.97	17.63	0.40	29.24	0.03	3.15	0.16	0.00	0.16	0.07	0.95
40	EB	1	5.94	16.28	0.39	14.33	0.03	3.31	0.10	0.00	0.13	0.07	0.72
40	EC	1	4.54	17.31	0.60	24.58	0.03	3.71	0.26	0.00	0.61	0.07	0.96
40	ED	1	4.63	18.25	0.64	23.25	0.03	3.86	0.26	0.00	0.59	0.06	0.78
40	EE	1	4.55	18.06	0.62	26.07	0.03	3.75	0.29	0.00	0.58	0.06	1.24
40	EF	1	5.24	18.49	0.62	30.75	0.03	3.72	0.27	0.00	0.47	0.05	1.17
40	EG	1	5.04	17.79	0.59	31.13	0.03	3.48	0.30	0.00	0.46	0.05	0.87
40	EH	1	6.68	19.35	0.36	15.43	0.03	3.60	0.22	0.00	0.29	0.10	0.71
40	EI	1	5.19	18.01	0.43	12.03	0.03	3.63	0.13	0.00	0.15	0.06	1.07
40	EJ	1	5.24	18.95	0.38	10.14	0.01	3.65	0.14	0.00	0.41	0.07	0.54
40	EK	1	5.34	18.15	0.64	11.48	0.03	4.15	0.14	0.01	0.13	0.06	0.78
40	EL	1	3.77	16.52	0.66	14.70	0.03	3.90	0.19	0.00	0.74	0.04	0.59
40	EM	1	3.90	15.11	0.61	13.43	0.03	3.65	0.14	0.00	0.55	0.05	0.61
40	EN	1	4.95	17.99	0.57	18.57	0.03	3.77	0.24	0.00	0.79	0.07	0.51
40	EO	1	3.99	16.87	0.45	26.58	0.02	2.69	0.00	0.00	0.19	0.04	0.33
40	EP	1	3.73	17.04	0.52	36.55	0.03	2.74	0.07	0.00	0.31	0.05	0.50
40	EQ	1	4.19	17.21	0.70	27.59	0.04	3.99	0.30	0.00	0.62	0.06	0.57
40	ER	1	3.86	17.01	0.62	25.04	0.03	3.53	0.26	0.00	0.70	0.06	0.50
40	ES	1	3.84	17.18	0.32	35.42	0.02	2.84	0.00	0.00	0.00	0.05	0.22
40	ET	1	3.58	17.44	0.60	29.21	0.03	3.34	0.11	0.00	0.48	0.04	0.60
40	EU	1	4.89	15.05	0.49	14.69	0.02	3.66	0.07	0.00	0.07	0.04	0.60
40	EV	1	5.26	14.99	0.55	13.89	0.02	4.09	0.07	0.00	0.16	0.04	0.45
40	FA	1	5.60	15.87	0.43	18.99	0.03	3.37	0.11	0.00	0.23	0.07	0.61
40	FB	1	5.46	14.70	0.45	25.00	0.03	3.27	0.11	0.00	0.22	0.07	0.90
40	FC	1	4.31	18.06	0.59	31.09	0.04	3.25	0.30	0.00	0.70	0.07	0.61
40	FE	1	5.18	17.96	0.60	31.02	0.03	3.64	0.33	0.00	0.74	0.05	0.91
40	FF	1	5.15	18.58	0.64	34.49	0.04	3.77	0.35	0.00	0.69	0.05	1.09
40	FG	1	5.14	18.58	0.64	45.48	0.03	3.86	0.38	0.00	0.79	0.04	1.19
40	FH	1	7.01	18.59	0.32	21.00	0.03	3.10	0.24	0.00	0.38	0.09	0.92
40	FI	1	5.92	17.81	0.30	14.17	0.03	2.91	0.18	0.00	0.36	0.09	0.66
40	FJ	1	5.96	18.52	0.32	12.87	0.03	3.08	0.17	0.00	0.45	0.10	0.70
40	FK	1	5.62	17.14	0.35	11.18	0.03	3.27	0.15	0.00	0.33	0.10	0.58
40	FL	1	4.13	15.95	0.66	17.70	0.03	3.93	0.20	0.00	0.78	0.05	0.68
40	FM	1	4.65	16.18	0.63	20.49	0.04	3.67	0.21	0.00	0.80	0.06	0.69

Op	Unit	Lot	Mn	Na	Ni	P	Pb	Sr	Ti	U	V	Y	Zn
40	FN	1	4.61	17.70	0.64	19.91	0.02	4.14	0.23	0.00	0.63	0.06	0.60
40	FO	1	5.29	18.40	0.48	0.00	0.02	3.98	0.00	0.00	0.00	0.07	0.58
40	FP	1	5.20	18.49	0.39	120.90	0.02	3.61	0.00	0.00	0.00	0.06	0.47
40	FQ	1	5.12	16.12	0.50	16.82	0.03	3.47	0.09	0.00	0.21	0.07	0.62
40	FR	1	5.18	16.51	0.53	27.67	0.03	3.76	0.15	0.00	0.29	0.07	0.86
40	FS	1	5.45	15.47	0.57	22.31	0.03	3.97	0.12	0.00	0.32	0.07	1.37
40	FT	1	5.37	16.54	0.59	19.49	0.15	3.90	0.10	0.00	0.24	0.06	4.32
40	FU	1	5.71	21.35	0.45	23.51	0.03	3.69	0.11	0.00	0.25	0.06	0.84
40	FV	1	5.09	17.72	0.45	14.54	0.02	3.43	0.07	0.00	0.00	0.06	0.62
40	FW	1	4.39	15.33	0.58	12.18	0.01	4.14	0.05	0.00	0.13	0.03	0.41
40	GA	1	5.97	17.53	0.46	29.55	0.03	3.51	0.12	0.00	0.18	0.07	0.68
40	GB	1	6.33	19.66	0.46	30.16	0.02	3.53	0.12	0.00	0.26	0.06	0.70
40	GC	1	4.77	19.76	0.63	28.49	0.03	3.73	0.30	0.00	0.78	0.07	1.45
40	GD	1	6.39	18.34	0.44	24.95	0.03	3.38	0.13	0.00	0.19	0.06	0.79
40	GE	1	5.14	19.76	0.65	46.69	0.04	3.54	0.37	0.00	0.61	0.05	1.01
40	GG	1	1.27	3.88	0.00	8.01	0.00	0.00	0.00	0.00	0.03	0.00	0.00
40	GH	1	6.19	18.83	0.38	13.40	0.03	3.64	0.26	0.00	0.19	0.11	0.73
40	GI	1	6.57	18.07	0.35	16.37	0.03	3.45	0.22	0.00	0.29	0.11	0.76
40	GJ	1	5.08	17.46	0.33	9.13	0.04	3.23	0.19	0.00	0.30	0.13	0.63
40	GK	1	5.03	18.05	0.34	9.33	0.04	3.29	0.19	0.00	0.26	0.13	0.64
40	GM	1	4.05	15.21	0.62	17.26	0.03	3.42	0.16	0.00	0.52	0.06	0.69
40	GN	1	4.62	17.37	0.60	22.51	0.03	3.83	0.22	0.00	0.61	0.07	0.52
40	GO	1	3.91	17.07	0.34	27.68	0.02	2.44	0.00	0.00	0.00	0.03	0.16
40	GP	1	3.71	0.99	0.55	16.76	0.03	3.83	0.10	0.00	0.33	0.07	0.69
40	GQ	1	4.71	13.61	0.59	18.09	0.02	3.90	0.09	0.00	0.20	0.06	0.63
40	GR	1	5.99	15.95	0.59	20.94	0.03	4.02	0.10	0.00	0.28	0.06	1.18
40	GS	1	6.12	15.73	0.60	22.13	0.03	4.21	0.11	0.00	0.30	0.06	0.96
40	GT	1	5.41	15.85	0.58	17.11	0.02	3.92	0.08	0.00	0.22	0.07	0.83
40	GU	1	5.08	14.66	0.48	17.00	0.02	3.60	0.09	0.00	0.10	0.06	0.66
40	GV	1	5.20	16.79	0.44	19.63	0.02	3.56	0.09	0.00	0.23	0.05	0.60
40	GW	1	5.86	18.84	0.35	10.08	0.02	3.68	0.11	0.00	0.18	0.11	0.75
40	HA	1	6.11	17.41	0.45	29.42	0.03	3.36	0.14	0.00	0.21	0.08	0.82
40	HB	1	6.40	16.95	0.44	46.10	0.04	3.41	0.18	0.00	0.25	0.08	0.95
40	HC	1	7.07	19.28	0.38	23.57	0.04	3.33	0.16	0.00	0.15	0.07	0.99
40	HD	1	6.56	17.68	0.36	20.67	0.04	2.93	0.13	0.00	0.15	0.07	1.04
40	HG	1	9.90	28.60	0.33	16.12	0.04	3.76	0.38	0.01	0.00	0.10	0.94
40	HH	1	6.79	19.50	0.34	14.84	0.04	3.30	0.25	0.00	0.34	0.13	0.79
40	HI	1	6.47	18.84	0.34	11.88	0.03	3.55	0.27	0.00	0.14	0.12	0.68

Op	Unit	Lot	Mn	Na	Ni	P	Pb	Sr	Ti	U	V	Y	Zn
40	HJ	1	5.82	19.09	0.34	12.01	0.05	3.36	0.21	0.00	0.28	0.14	0.69
40	HK	1	5.16	23.51	0.34	13.20	0.05	3.14	0.20	0.00	0.38	0.14	0.85
40	HM	1	4.71	16.47	0.58	20.75	0.06	3.29	0.22	0.00	0.80	0.08	1.03
40	HN	1	4.37	15.78	0.54	21.90	0.08	3.34	0.19	0.00	0.74	0.11	0.80
40	HO	1	6.47	15.83	3.45	22.89	0.04	3.62	0.13	0.00	0.33	0.08	0.92
40	HP	1	4.10	17.87	0.59	25.48	0.04	3.16	0.22	0.00	0.62	0.07	0.79
40	HQ	1	6.24	16.29	0.60	21.00	0.02	3.86	0.09	0.00	0.12	0.06	0.64
40	HR	1	5.54	15.63	0.53	18.10	0.02	3.76	0.09	0.00	0.18	0.06	0.67
40	HS	1	5.73	16.84	0.56	18.41	0.02	3.94	0.09	0.00	0.20	0.06	0.52
40	HT	1	5.34	15.89	0.60	16.93	0.02	4.15	0.07	0.00	0.16	0.06	0.61
40	HU	1	5.70	17.29	0.47	20.01	0.02	3.83	0.09	0.00	0.31	0.06	0.55
40	HV	1	4.89	15.30	0.53	13.64	0.02	3.79	0.06	0.00	0.19	0.05	0.41
40	HW	1	5.84	18.48	0.32	7.17	0.02	3.52	0.10	0.00	0.31	0.10	0.37
40	IA	1	6.75	17.21	0.46	21.28	0.04	3.51	0.18	0.00	0.12	0.09	1.08
40	IB	1	6.29	16.36	0.44	17.74	0.03	3.36	0.11	0.00	0.22	0.07	0.82
40	IC	1	6.53	16.16	0.40	29.56	0.04	3.43	0.21	0.00	0.14	0.08	1.16
40	ID	1	8.58	19.90	0.40	31.02	0.05	3.41	0.19	0.00	0.17	0.06	1.42
40	IE	1	6.73	20.22	0.60	48.68	0.04	3.64	0.41	0.00	0.76	0.07	1.46
40	IF	1	6.96	19.58	0.63	45.26	0.03	3.72	0.37	0.00	0.59	0.07	0.98
40	IG	1	6.26	18.98	0.60	49.74	0.04	3.57	0.39	0.00	0.58	0.07	1.29
40	IH	1	7.10	18.35	0.35	15.18	0.03	3.72	0.34	0.00	0.03	0.12	0.97
40	II	1	6.27	19.32	0.34	12.15	0.04	3.37	0.26	0.00	0.23	0.14	1.10
40	IJ	1	5.48	17.79	0.40	14.27	0.05	3.26	0.23	0.00	0.37	0.14	0.82
40	IK	1	5.84	16.66	0.33	11.03	0.05	3.40	0.27	0.00	0.04	0.15	0.75
40	IL	1	0.93	3.26	0.00	4.63	0.00	0.00	0.00	0.00	0.07	0.00	0.00
40	IM	1	4.35	16.62	0.66	19.92	0.04	3.63	0.19	0.00	0.54	0.08	0.78
40	IN	1	4.04	15.61	0.50	22.18	0.05	3.15	0.12	0.00	0.19	0.07	1.02
40	IP	1	4.09	17.49	0.64	30.34	0.05	3.42	0.24	0.00	0.52	0.06	0.57
40	IR	1	7.22	16.55	0.50	19.78	0.03	3.65	0.10	0.00	0.23	0.07	0.70
40	IS	1	5.56	15.57	0.47	19.94	0.03	3.38	0.09	0.00	0.15	0.08	0.62
40	IT	1	5.50	15.33	0.48	14.71	0.03	3.42	0.07	0.00	0.20	0.07	0.49
40	IU	1	6.66	17.69	0.49	23.07	0.03	4.06	0.10	0.00	0.29	0.06	0.82
40	IV	1	5.66	16.92	0.33	7.58	0.02	3.18	0.11	0.00	0.35	0.09	0.47
40	JA	1	6.01	16.34	0.45	27.26	0.04	3.49	0.40	0.00	0.30	0.08	0.85
40	JB	1	5.88	16.20	0.41	27.56	0.05	3.26	0.42	0.00	0.32	0.10	0.95
40	JC	1	6.76	17.19	0.41	31.70	0.04	3.36	0.42	0.00	0.27	0.09	1.10
40	JD	1	8.17	16.73	0.41	39.04	0.05	3.24	0.50	0.00	0.29	0.10	1.27
40	JE	1	6.80	16.82	0.43	31.96	0.03	3.42	0.39	0.00	0.30	0.08	0.97

Op	Unit	Lot	Mn	Na	Ni	P	Pb	Sr	Ti	U	V	Y	Zn
40	JH	1	6.23	13.39	0.49	51.24	0.04	3.64	0.57	0.00	0.30	0.08	1.85
40	JI	1	6.57	13.94	0.51	59.39	0.03	4.04	0.62	0.00	0.24	0.09	1.48
40	JJ	1	6.63	13.30	0.49	49.19	0.04	3.91	0.53	0.00	0.37	0.10	1.64
40	JK	1	5.60	12.48	0.50	36.06	0.04	3.72	0.39	0.00	0.24	0.11	0.98
40	JL	1	5.16	16.17	0.62	25.70	0.04	3.57	0.20	0.00	0.57	0.07	0.91
40	JM	1	4.08	15.11	0.59	16.55	0.04	3.11	0.17	0.00	0.38	0.09	0.81
40	JN	1	4.91	16.73	0.62	20.84	0.05	3.44	0.18	0.00	0.46	0.07	1.24
40	JO	1	10.38	13.89	0.07	6.19	0.00	0.36	0.00	0.00	0.11	0.01	0.06
40	JR	1	6.59	18.64	0.47	20.47	0.03	3.69	0.10	0.00	0.28	0.08	0.57
40	JS	1	6.10	17.61	0.46	21.43	0.03	3.73	0.10	0.00	0.27	0.07	0.63
40	JT	1	5.68	16.60	0.42	18.41	0.03	3.35	0.09	0.00	0.24	0.09	0.55
40	JU	1	4.86	14.65	0.51	12.18	0.02	3.66	0.06	0.00	0.16	0.06	0.41
40	JV	1	7.19	17.37	0.34	9.94	0.03	3.19	0.13	0.00	0.25	0.11	0.52
40	KA	1	6.74	16.49	0.42	34.44	0.05	3.53	0.48	0.00	0.26	0.09	1.06
40	KB	1	6.58	17.12	0.45	28.46	0.04	3.56	0.40	0.00	0.30	0.09	0.92
40	KC	1	6.69	16.90	0.41	30.84	0.05	3.22	0.42	0.00	0.27	0.11	0.95
40	KD	1	6.80	17.40	0.41	26.55	0.05	3.35	0.36	0.00	0.31	0.12	0.93
40	KE	1	7.12	16.39	0.41	29.97	0.06	3.35	0.43	0.00	0.32	0.13	1.03
40	KF	1	6.20	13.10	0.51	34.79	0.04	3.82	0.38	0.00	0.28	0.10	1.17
40	KG	1	5.73	13.06	0.48	45.70	0.05	3.48	0.49	0.00	0.33	0.10	1.55
40	KH	1	3.47	13.92	0.54	40.97	0.01	4.37	0.45	0.00	0.30	0.01	1.17
40	KI	1	12.41	12.46	0.42	86.78	0.07	3.38	0.89	0.00	0.26	0.09	3.16
40	KK	1	8.37	13.28	0.53	58.15	0.04	4.20	0.61	0.00	0.27	0.08	1.65
40	KM	1	4.71	16.54	0.59	21.35	0.04	3.33	0.23	0.00	0.76	0.07	0.75
40	KN	1	4.35	15.84	0.61	18.62	0.03	3.28	0.18	0.00	0.53	0.06	0.74
40	KO	1	5.54	16.44	0.61	28.41	0.05	3.54	0.22	0.00	0.56	0.06	0.98
40	KP	1	4.44	16.42	0.57	25.39	0.05	3.47	0.19	0.00	0.56	0.08	0.73
40	KQ	1	4.30	14.97	0.55	17.49	0.06	3.28	0.15	0.00	0.53	0.11	0.82
40	KR	1	4.61	15.98	0.55	22.43	0.06	3.18	0.19	0.00	0.67	0.07	0.85
40	KS	1	5.32	16.33	0.56	24.99	0.06	3.45	0.23	0.00	0.78	0.08	0.92
40	KT	1	4.34	15.48	0.62	20.99	0.03	3.80	0.18	0.00	0.56	0.06	0.81
40	KV	1	6.66	18.21	0.36	10.82	0.03	3.80	0.13	0.00	0.16	0.11	0.64
40	LA	1	5.94	16.19	0.43	30.20	0.06	3.37	0.40	0.00	0.32	0.11	0.75
40	LB	1	6.94	16.08	0.43	36.36	0.05	3.49	0.44	0.00	0.32	0.10	0.98
40	LC	1	6.36	18.76	0.46	31.72	0.03	3.73	0.39	0.00	0.31	0.08	0.99
40	LD	1	8.10	16.42	0.46	33.07	0.05	3.50	0.45	0.00	0.30	0.15	0.77
40	LE	1	6.01	16.52	0.44	33.55	0.05	3.52	0.41	0.00	0.34	0.12	0.99
40	LF	1	6.75	12.79	0.50	35.85	0.05	3.84	0.39	0.00	0.34	0.11	1.36

Op	Unit	Lot	Mn	Na	Ni	P	Pb	Sr	Ti	U	V	Y	Zn
40	LG	1	7.64	12.75	0.45	52.82	0.05	3.40	0.56	0.00	0.28	0.10	1.82
40	LH	1	6.54	13.65	0.53	39.48	0.04	3.98	0.43	0.00	0.33	0.09	1.36
40	LI	1	5.31	13.53	0.48	28.45	0.04	3.59	0.31	0.00	0.31	0.10	1.00
40	LJ	1	5.33	13.37	0.49	24.30	0.04	3.90	0.30	0.00	0.37	0.09	1.00
40	LK	1	6.03	13.42	0.50	35.52	0.04	3.92	0.40	0.00	0.36	0.10	1.04
40	LL	1	7.57	16.41	0.50	27.61	0.04	3.55	0.14	0.00	0.14	0.11	0.88
40	LM	1	2.80	8.57	0.29	11.19	0.02	1.59	0.14	0.00	0.42	0.04	1.05
40	LN	1	5.68	18.29	0.65	28.58	0.05	3.61	0.22	0.00	0.49	0.08	0.86
40	LO	1	6.10	43.17	0.83	35.04	0.06	4.74	0.30	0.00	0.63	0.13	1.20
40	LP	1	5.14	19.77	0.59	27.16	0.04	3.61	0.29	0.00	0.81	0.08	0.74
40	LQ	1	4.82	18.17	0.50	23.83	0.04	3.02	0.27	0.00	0.76	0.08	0.66
40	LR	1	4.22	15.26	0.56	19.89	0.06	3.54	0.16	0.00	0.52	0.10	0.71
40	LS	1	3.93	14.67	0.50	19.94	0.06	3.07	0.15	0.00	0.39	0.09	0.80
40	LT	1	4.40	15.71	0.58	26.84	0.06	3.53	0.23	0.00	0.77	0.08	0.97
40	LV	1	6.77	17.22	0.32	10.23	0.03	3.37	0.13	0.00	0.28	0.10	0.49
42	A	3	4.05	14.84	0.54	7.34	0.01	4.39	0.11	0.00	0.32	0.03	0.53
42	B	3	3.29	15.85	0.55	0.00	0.00	4.18	0.02	0.00	0.23	0.00	0.21
42	E	2	4.02	11.26	0.53	10.17	0.01	4.52	0.18	0.00	0.37	0.04	0.60
42	F	2	3.73	10.75	0.50	7.05	0.01	4.33	0.14	0.00	0.16	0.03	0.60
42	G	3	3.91	14.14	0.52	8.59	0.02	4.06	0.11	0.00	0.24	0.04	0.59
42	H	2	3.18	15.63	0.57	0.86	0.00	4.42	0.03	0.00	0.25	0.00	0.21
42	I	2	2.64	14.38	0.43	0.00	0.01	3.65	0.01	0.00	0.00	0.00	0.29
42	N	1	5.25	12.33	0.46	20.10	0.05	3.47	0.34	0.00	0.34	0.10	0.97
42	O	1	3.55	14.61	0.57	8.64	0.01	3.65	0.10	0.00	0.30	0.02	0.57
42	P	2	3.59	14.39	0.53	3.61	0.01	2.58	0.21	0.00	0.34	0.02	0.54
42	R	2	3.21	14.10	0.54	6.80	0.02	3.72	0.09	0.00	0.32	0.05	0.79
42	U	2	3.30	10.28	0.52	2.52	0.00	3.88	0.07	0.00	0.16	0.00	0.40
42	AB	2	3.20	11.50	0.52	1.07	0.00	4.50	0.05	0.00	0.28	0.00	0.06
42	AI	2	4.43	12.35	0.41	7.66	0.02	4.01	0.09	0.00	0.19	0.05	1.00
42	AJ	2	4.26	12.81	0.42	6.45	0.02	4.08	0.09	0.00	0.22	0.06	0.50
42	AL	2	4.51	12.96	0.42	12.99	0.03	4.18	0.15	0.00	0.27	0.06	0.71
42	AM	1	3.79	13.62	0.42	6.21	0.01	3.73	0.11	0.00	0.10	0.03	1.02
42	AN	1	4.11	12.73	0.48	7.18	0.02	4.03	0.10	0.00	0.26	0.06	0.55
42	AO	1	4.34	14.06	0.43	8.56	0.02	3.91	0.09	0.00	0.08	0.05	0.71
42	AP	1	4.20	12.88	0.44	8.31	0.02	3.92	0.12	0.00	0.33	0.06	0.57
44	C	3	2.95	12.94	0.46	2.04	0.00	3.51	0.05	0.00	0.20	0.00	0.07
44	D	3	4.30	12.78	0.43	6.51	0.02	3.12	0.19	0.00	0.24	0.07	0.50
44	G	2	4.32	14.02	0.50	7.61	0.03	3.83	0.11	0.00	0.26	0.07	0.56

Op	Unit	Lot	Mn	Na	Ni	P	Pb	Sr	Ti	U	V	Y	Zn
44	H	2	3.99	13.24	0.47	6.96	0.02	3.76	0.11	0.00	0.32	0.08	0.54
44	I	1	4.45	13.17	0.43	5.66	0.03	3.10	0.17	0.00	0.25	0.06	0.56
44	J	1	5.61	12.66	0.41	7.18	0.03	3.11	0.21	0.00	0.23	0.06	0.58
44	K	1	4.64	12.76	0.44	6.44	0.03	3.32	0.17	0.00	0.24	0.06	0.44
44	M	1	4.69	13.19	0.42	7.71	0.03	3.05	0.20	0.00	0.27	0.06	0.67
44	N	1	4.94	12.44	0.43	5.40	0.03	3.13	0.17	0.00	0.23	0.06	0.51
44	P	2	3.84	14.48	0.52	5.57	0.01	4.02	0.10	0.00	0.25	0.04	0.57
44	V	2	3.67	12.10	0.44	3.32	0.01	2.93	0.09	0.00	0.21	0.03	0.43
44	AA	1	5.11	14.09	0.43	10.89	0.03	3.64	0.16	0.00	0.33	0.08	0.55
44	AB	1	4.03	15.00	0.55	5.84	0.01	4.15	0.10	0.00	0.32	0.04	0.57
44	AC	1	4.36	14.88	0.50	8.07	0.02	4.34	0.13	0.00	0.36	0.06	0.52
44	AD	1	4.53	13.92	0.42	10.22	0.03	3.73	0.15	0.00	0.26	0.07	0.56
44	AE	1	4.04	13.63	0.42	9.46	0.03	3.58	0.14	0.00	0.26	0.08	0.85
44	AF	1	4.01	13.73	0.45	6.75	0.03	3.68	0.11	0.00	0.26	0.08	0.75

Appendix H: Excavation Details and Description of Analytical Units

H.1. Operation 8 and 40 Analytical Units

In this section I present a revised description of the analytical units for Operation 8. I am presenting the technical descriptions of Operation 8 and 40's analytical units here, even though I have only described Units 8A-8F. The excavations in Operation 40 and the remainder of Operation 8 targeted horizontal clearing of Group 4's architecture and patio. These excavations addressed fundamentally different questions than the deep test excavations in 8A-8F. The goals and results of these excavations will be described in more detail later. I present the technical descriptions of their analytical units here in order to keep all the analytical units from these two operations together. For more details about the results of the remainder of the excavations, see the sections on the excavation of Structure 34 and the horizontal patio excavations below. These analytical units are based on those originally defined by Mendelsohn and Keller (2011:45), with some modification.

Modern surface – AU1. This analytical unit consists of the layer of modern soil development over Group 4. The matrix consisted of brownish black (10YR 2/2) clay loam containing small stone inclusions. Excavations terminated at either the thin layer of gravel ballast that was placed under the Group 4's patio surface or layers of larger stones that reflect the collapse of Structure 34.

Collapse – AU2. In this analytical unit, collapsed stones were removed from the eastern façade of Structure 34b to expose the remains of the building below. The matrix consists of brownish black (10YR 3/2) silty loam around large collapsed stones (1 to 25 cm in diameter). At the base of this analytical unit, we uncovered the remains of four disturbed stairs that ascend the eastern side of Structure 34b. These were constructed of mismatched stone slabs laid flat to form stairs.

Group 4 patio ballast and fill – AU3. This analytical unit consisted of the small stone ballast that underlay the Group 4 patio and a thin layer of larger stone fill below that level. This fill was composed of mostly broken limestone from 6 to 25 cm in diameter in a lightening matrix that grades from brownish black (10YR 3/2) at the top to grayish yellow brown (10YR 5/2) at the base of the analytical unit. This color change is likely due to natural processes of soil development post-deposition. The base of this analytical unit was defined by the preserved surface of Structure 34-sub-1 as identified by three parallel lines of cut stones running north to south. These lines turned out to be the face of the Structure 34-sub-1 platform and the interior retaining wall. In units 8A and 8C, several pieces of fired daub were recovered from near the top of Structure 34-sub-1.

Structure 34-sub-1 fill – AU4. In units 8A and 8C, excavations penetrated the fill of Structure 34-sub-1 to collect materials for relative dating. The fill of Structure 34-sub-1 consists of large stones (10-50 cm) and loose dull yellowish brown sediment (10YR 5/3). The ceramics collected from these fill deposits stylistically date Structure 34-sub-1's construction to the Early Classic period.

Group 4 patio fill 2 – AU5. This analytical unit consists of fill below the Group 4 patio collected from along the face of Structure 34-sub-1's east platform face. In this analytical unit, the size of the large stone inclusions increases to 25-50 cm in diameter. Smaller stones and grayish yellow brown (10YR 4/2 to 10YR 5/3) silty loam filled in the gaps between these large stones. The large stones are a mix of cut limestone blocks and large chert river cobbles. The latter are typical fill material used at Actuncan due to the site's proximity to large alluvial cobble deposits. The presence of cut limestone blocks is important because it accounts for the destruction evident on the façades of nearby structures (19, 26, and 34-sub) and the removal of masonry structures on Structures 19 and 41. Excavations in 8E7 and 8F7 appear to have been transitional. These lots began with the removal of the final layer of large stone fill and continued into the more compact clay loam sediment described in AU6 below.

Material at base of Structure 34-sub-1 – AU6. This analytical unit consists of a deposit of light gray (10YR7/2) clay loam packed against the façade of Structure 34-sub-1. In profile, the surface of this deposit is not level, as would be expected for a fill deposit. Rather it slopes down away from the face of Structure 34-sub-1. This may indicate the deposit was placed before the filling process began. The deposit is filled with evidence of burning including the light gray color of the sediment, flecks of black carbonized wood, and burned ceramic sherds. Additionally, the inclusions include a high density of red painted plaster remnants. Pieces of fired daub and aggregated burned sediment were also recovered from these excavations. This analytical unit terminated at Glen's First Floor and the foot of Structure 34-sub-1's platform face. Glen's First Floor was a well preserved plaster floor. Importantly, burning was identified across the floor in the northern portion of Unit E. Additionally, the plaster floor clearly continues under Structure 34-sub-1, indicating that this structure was built on the floor. Thus, the floor may have predated the structure. Above, I interpreted this deposit as the result of an intentional destructive act. It is probable that some of the material at the base of 8E7 and 8F8 properly belongs in this analytical unit, particularly the partial greenstone celt recovered in 8F7.

Glen's First Floor – AU7. This analytical unit is assigned to the lots associated with the removal of Glen's First Floor. The matrix is almost entirely dense nearly white (10YR 8/2) lime plaster. This plaster floor is approximately 4 cm thick and was constructed on a 5 cm thick ballast of small (less than 5 cm in diameter) stones. The excavations in this analytical unit terminated at a layer of darker sediment.

Fill below Glen's First Floor: Dark Clay – AU8. This lot consists of the ballast and fill directly below Glen's First Floor. The floor ballast—only located at the very top of this analytical unit—is composed of stones 5-15 cm in diameter. The ballast rests on an approximately 30 cm thick layer of dull yellowish brown (10YR 5/3) clay containing flecks of reddish-orange, white, and black. The sediment is quite sticky, similar to the local natural substrate. This sediment includes few small (1-5 cm in diameter) stone inclusions. This analytical unit terminated at a change in the color of the sediment.

Fill below Glen's First Floor: Light Clay – AU9. This analytical unit consists of a 70 cm thick stratum of yellowish gray (2.5Y 5/4) clay. There are more white limestone inclusions in this stratum that the darker clay above. The size of these limestone inclusions increases from the top of the analytical unit to the bottom. Aside from the color change, there is no noticeable change in the sediment. It retains the same clay texture and the presence of small discrete yellow, white, black, and red inclusions. Also, a large quantity of carbon was collected from this deposit. The lot terminated with the identification of a gray hardened *sascab* occupation surface (Glen's Second Floor). A higher density of artifacts was collected directly above Glen's Second Floor. This includes a spout from a Mars Orange chocolate pot.

Glen's Second Floor – AU10. In this analytical unit, we excavated through Glen's Second Floor to uncover the next fill layer below. The floor was constructed of *sascab* packed around a ballast of cobbles 4-10 cm in size. The cobbles would have provided stability to the otherwise erosion-prone *sascab* surface. In total the *sascab* layer was approximately 10 cm thick. Additionally, small black flecks of charcoal were evenly distributed within the *sascab*. Excavations terminated at a color change beneath the *sascab* surface.

Large Stone Fill Below Glen's Second Floor – AU11. In this analytical unit, excavations continued through a 30 cm thick layer of large limestone rubble fill consolidated by dull yellowish brown clay (10YR 5/4). Ceramics indicate that this fill is Late Preclassic in date. Excavations terminated in this analytical unit at the base of the large stones.

Sediment below Glen's Second Floor – AU12. In this analytical unit, excavations continued though a 20 cm thick layer of brownish black (2.5Y 3/2) clay loam. This sediment includes a few stone inclusions in the 4-6 cm size range. The excavators noted fewer artifacts were recovered from this lot than above (Mendelsohn 2010). Ceramics recovered from this analytical unit place this deposit in the Middle Preclassic Period. Excavations terminated at a soil change to a lighter, more yellow sediment. Excavations terminated at this level due to the end of the 2010 field season despite not reaching culturally sterile levels.

Table H.1. Operation 8 and 40 analytical units

Analytical Unit Number	**Analytical Unit Name**	**Lots Included (Unit/Lot)**	**Terminus Post Quem**
AU1	Modern Surface	All lots in Operations 8 and 40 not assigned to other Analytical Units	Terminal Classic/ Postclassic
AU2	Collapse	8AA2, 8DD2, 8GG2	Terminal Classic
AU3	Patio Ballast and Fill	8A2, 8A3, 8A4, 8B2, 8B3, 8C2, 8C3, 8C4, 8D2, 8D3, 8D4 8E2, 8E3, 8F2, 8F3, 40GL2; 40HL2; 40EP2	Terminal Classic
AU4	Structure 34-sub-1 Fill	8A5, 8A6, 8C5	Early Classic
AU5	Group 4 Patio Fill	8E4, 8E5, 8E6, 8E7, 8F4, 8F5, 8F6, 8F7	Terminal Classic

AU6	Material at base of Structure 34-sub-1	8E8, 8F8	Early Classic
AU7	Glen's First Floor	8E10	Classic
AU8	Fill below Glen's First Floor: Dark Clay	8E9, 8E11, 8E12	Terminal Preclassic?
AU9	Fill below Glen's First Floor: Light Clay	8E13, 8E14, 8E15	Terminal Preclassic?
AU10	Glen's Second Floor	8E16	Terminal Preclassic
AU11	Large Stone Fill below Glen's Second Floor	8E17, 8E18	Late Preclassic
AU12	Sediment below Glen's Second Floor	8E19	Middle Preclassic

Operation 8 and 40 Harris Matrix

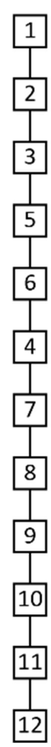

Figure H.1. Operation 8 and 40 Harris Matrix

H.2. Operation 36 Analytical Units

Modern Surface – AU1. This analytical unit consists of the layer of modern soil development over Structure 35. The matrix consisted of a 10YR 4/2 clay loam containing small (1 to 6 cm) stone inclusions. In Units AQ through BO, the modern surface and collapse were combined into a single lot. These are lumped into AU2, below.

Collapse – AU2. This analytical unit contains excavations through the collapse of Structure 35's superstructure. Excavations terminated at Lettuce Floor, the plaster floor that made up terminal occupation surface of Structure 35. The plaster floor was only found preserved in small patches scattered across the structure surface. In a few cases, excavations accidentally penetrated Lettuce Floor slightly where it was particularly poorly preserved. The matrix in this analytical unit consists of 10YR 4/2 clay loam separated from AU1 by the high density of stone inclusions, including collapsed cut-limestone blocks. See the description above for the layout of Structure 35 uncovered at the base of this analytical unit.

Radish Floor Fill – AU3. Lots Excavated: BN, BO/2. This analytical unit consists of the fill below Radish Floor. The matrix consists of 10YR 5/3 clay loam containing few small (1 to 6 cm) limestone inclusions. We terminated the lot when we reached the base of Apricot Wall. We may have found the remains of a floor at the base of the eastern half of these excavations extending out from the base of Apricot Floor. Carbon and loose sediment in the western part of the unit may indicate disturbance or differential treatment of this floor during its burial. However, these excavations were certainly not conclusive. This area may warrant future continued research.

Group 4 Patio Fill – AU4. Lots Excavated: BN, BO/3. This analytical unit consists of the fill below the floor identified in AU3. These lots were excavated to collect a ceramic sample that might date the construction of this floor. This fill consists of dry-laid large (25 to 50 cm) chert river cobbles with 10YR 7/3 silty loam sediment. Ceramics date this analytical unit to the Late Classic II phase, though this date comes from Unit BN, where the floor was broken and there was evidence of disturbance. Ceramics from BO/3 date to the Samal phase. As a result, I assign a non-specific Late Classic date to this analytical unit.

Table H.2: Operation 36 analytical units

Analytical Unit Number	Analytical Unit Name	Lots Included (Unit/Lot)	Terminus Post Quem
AU1	Modern Surface	A,B,C,D,E,F,G,H,I,J,K,L,M,N,O, P,Q,R, S,T,U,V,W,X,Y,Z,AA,AB,AC,AD,AE,AF, AG,AH,AI,AJ,AK,AL,AM,AN/1	Terminal Classic
AU2	Collapse	A,B,C,D,F/2,3; E,G,H,J,K,L,N,O,P,Q,R,S,T,U,V, W,X,Y,Z,AA,AC,AD,AE,AF,AG,AH,AI,AJ,AK,AM,AN,AO,AP, BI/2; AQ,AR,AS,AT,AU,AV,AW,AX, AY,AZ,BA,BB,BC,BD,BE,BF,BG,BH,BI,BJ,BK,BL,BM,BN,BO/1;	Terminal Classic
AU3	Radish Floor Fill	BN,BO/2	Late Classic II
AU4	Group 4 Patio Fill	BN,BO/3	Late Classic

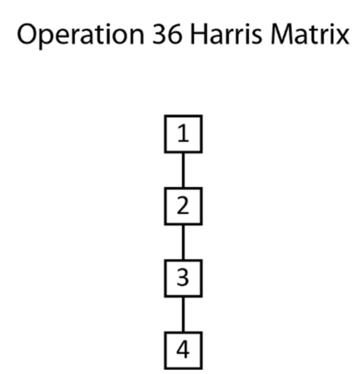

Figure H.2: Operation 36 Harris Matrix.

H.3. Operation 42 Analytical Units

Modern Surface – AU1. Excavations in this analytical unit include the modern soil development in each unit. The matrix consists of grayish yellow brown (10YR 4/2) clay loam containing mostly small (1 to 6 cm) limestone inclusions. At the base of this level, we encountered the top of the structure collapse and the eroded remains of Structure 34a-1st's platform.

Collapse – AU2. Excavation lots in this analytical unit consist of the collapse from Structure 34a-1st located to the east of the structure. The matrix is composed of grayish yellow brown (10YR 4/2) clay loam with mostly medium (6 to 25 cm) stone inclusions, but some larger collapsed cut stones. At the base of these excavations, we uncovered the collapsed remains of Structure 34a-1st, including the well-defined boundaries of Room 1.

Terminal East Stair – AU3. In this analytical unit, we removed the remains of the east staircase, composed of three steps, associated with Structure 34a-1st. The matrix consists of grayish yellow brown (10YR 4/2) clay loam with medium (6 to 25 cm) inclusions and many larger cut stones. These excavations unveiled Cucumber Floor and the broken remains of the east platform face of Structure 34a-2nd.

Raspberry Fill – AU4. In this analytical unit, we excavated into the bench in Room 1 to uncover the face of Blackberry Wall, the western wall of Structure 34a. The matrix consisted of grayish yellow brown (10YR 4/2) clay loam with 6 to 25 cm limestone inclusions. Only 11 ceramic sherds were recovered from these excavations, not enough to confidently assign a construction date to this bench.

Room 2 Fill – AU5. In this analytical unit, we excavated into the fill of Structure 34a-1st located within Room 2. The matrix consisted of clay loam colored 10YR 4/2 at the top, but lightening to 10YR 5/2 by the time we reached the base of excavations. This matrix contains medium (6 to 25 cm) limestone inclusions. Ceramics recovered from this analytical unit date the construction of Structure 34a-1st to the Terminal Classic period. At the base of excavations, we uncovered the layout of Room 2 of Structure 34a-2nd and a dedicatory deposit of a metate fragment and a large ceramic sherd left on Potato Floor in this room.

Collapse West of Structure 34a – AU6. This analytical unit consists of collapse from Structure 34a located to the west. The matrix in this unit consists of grayish yellow brown (10YR 4/2) clay loam containing small (1 to 6 cm) limestone inclusions. This analytical unit covered the western edge of Structure 34a.

Table H.3: Operation 42 analytical units.

Analytical Unit Number	Analytical Unit Name	Lots Included (Unit/Lot)	Terminus Post Quem
AU1	Modern Surface	A,B,C,D,E,F,G,H,I,J,K,L,M,N,O, P,Q,R, S,T,U,V,W,X,Y,Z,AA,AB,AC,AD,AE,AF, AG,AH,AI,AJ,AK,AL/1	Terminal Classic
AU2	Collapse	A,B,C,D,E,F,G,H,O,P,R,U,W,X, Y,Z,AA,AB,AC,AD,AI,AJ,AK,AL/2	Terminal Classic
AU3	Terminal East Stair	A,B,C,D,G/3	Terminal Classic
AU4	Raspberry Fill	V/2	Late Classic
AU5	Room 2 Fill	I,J,K,AE/2	Terminal Classic
AU6	Collapse West of Structure 34	AM,AN,AO,AP/1	Late Classic II

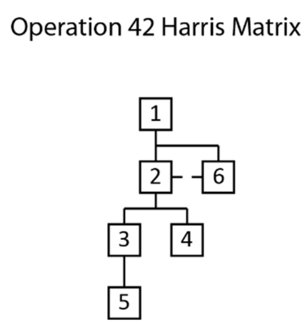

Figure H.3: Operation 42 Harris Matrix.

H.4. Operation 44 Analytical Units

Modern Surface – AU1. This analytical unit consists of the level of modern soil development over Structure 33a. The matrix is a brownish black (10YR 3/2) clay loam containing small to medium (1 to 25 cm) pieces of limestone. Beneath this excavation, we delineated the outline of Structure 33a and its collapse.

Collapse – AU2. This analytical unit consists of the collapse from Structures 33a and 34c that was found on the Group 4 patio and on the Structure 33a basal platform. Matrix consisted of brownish black (10YR 3/2) clay loam containing medium to large (6 to 25 cm) cut-limestone blocks and chert cobbles. These excavations terminated at the terminal patio surface and the terminal architecture. In some units, especially Units C, D, G, H, O, and P, excavations penetrated slightly below the eroded patio surface into the fill of Group 4's subplatform.

Table H.4: Operation 44 analytical units.

Analytical Unit Number	**Analytical Unit Name**	**Lots Included (Unit/Lot)**	**Terminus Post Quem**
AU1	Modern Surface	A,B,C,D,E,F,G,H,I,J,K,L,M,N,O, P,Q,R, S,T,U,V,W,X,Y,Z,AA,AB,AC,A D,AE,AF, AG,AH,AI,AJ/1	Terminal Classic
AU2	Collapse	A,B,C,D,O,P,Q,R,T,V/2	Terminal Classic

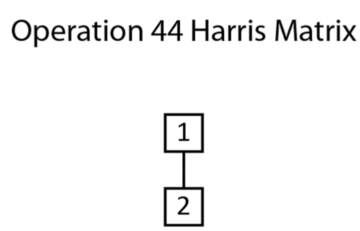

Figure H.4: Operation 44 Harris Matrix.

H.5. Operation 35, Units A, B, and D Analytical Units

Modern Surface (Units A,B,D) – AU1. This analytical unit consists of modern soil development on the slope south of Group 4 and the eroding southern edge of Structure 35. Matrix consists of a grayish yellow brown (10YR 4/2) clay loam containing small 1 to 6 cm bits of undressed limestone. This analytical unit slopes downward from the northern edge of Unit B to the southern edge of Unit D. Excavations terminated at a change in matrix from this organic layer. In most of Units A and B, AU1 overlaid a densely packed layer of large stones that composed the fill of Group 4's platform. In this area, the terminal version of Group 4's platform edge had collapsed off to the south. In the northern part of Unit B, excavations were only 3 cm deep and terminated at a compact layer of small white limestone flecks that resembled the eroded structure floor ballast encountered in Operation 36, directly to the north. This layer appears to represent the original elevation of Group 4's platform surface. In Unit D, excavations terminated at a looser layer of large stones that had collapsed from Group 4's platform edge and ended up on the terminal plaza floor south of Pitaya Wall, the southern face of Group 4's platform.

Structure 35 South Collapse – AU2. This analytical unit consists of a layer of collapse located south of Structure 35, resting on the terminal plaza floor located south of Group 4. The matrix consisted of grayish yellow brown (10YR 4/2) clay loam containing many large (25 to 50 cm) chert cobbles. These stones are collapse that fell from the fill of Group 4's platform. Excavations identified the basal course of Pitaya Wall – the terminal southern platform face of Group 4. This wall is mostly composed of small stacked cut stones, although a large chert cobble with a flattened face took the place of cut stones. A small section of Macal Plaza Floor, the terminal plaza floor south of Group 4, extends out from under Pitaya Wall into Unit D, indicating that the Group 4 platform was constructed on this floor. However, this floor was mostly eroded in our excavations in Unit D. In AU2, we excavated past the level of Macal Plaza Floor down to the level of Manioc Plaza Floor, the penultimate plaza floor. Excavations in Unit D terminated at the level of Manioc Plaza Floor, though this floor was only preserved in one small patch.

Group 4 Subplatform Fill – AU3. In this analytical unit, excavations continued through the large stone fill that makes up the bulk of Structure 35's substructure. This fill consists of large (25-50 cm) stones within a clay loam that lightens in color from grayish yellow brown (10YR 4/2) to dull yellow orange (10YR 6/3) from the top to the base of the analytical unit. The stones are primarily chert river cobbles, although a few limestone blocks are mixed in. At the base of excavations, we encountered the back side of Pitaya Wall, the terminal edge of the Structure 35 platform, and Macal Floor, a preserved plaster floor that Pitaya Wall was built on. As noted in the description of AU2, Macal Plaza Floor is the final version of the plaza floor that extends from Structure 35 south.

Macal Plaza Floor – AU4. In this analytical unit, excavations removed Macal Plaza Floor to determine its date of construction. Excavations were limited to a 1 by 1 m unit located 10 cm from east of the existing unit and 25 cm from the north of existing unit. Macal Plaza Floor appears to have been a 3 cm thick resurfacing of an earlier plaster plaza floor, known as Manioc Plaza Floor. The matrix of this lot is entirely 10YR 8/1 plaster. Interestingly, large amounts of obsidian were found in this lot. There are several burned patches on Manioc Plaza Floor.

Manioc Plaza Floor – AU5. In this analytical unit, excavations removed Manioc Plaza Floor and a layer of chert cobble ballast immediately below. The matrix consists of light gray (10YR 8/1) plaster. Carbon and evidence of burning were found in this analytical unit. At the base of AU5, excavations uncovered Achiote Plaza Floor, the 3rd version of the plaza floor. The Achiote Plaza Floor was only partially preserved and burning was encountered in the northwest part of the floor.

Achiote Plaza Floor – AU6. In this analytical unit, excavations removed Achiote Plaza Floor to find the fill underneath and date the floor. We excavated 12 cm through the floor and ballast until we encountered a layer of wet laid clay and limestone cobble fill below. Matrix consisted of a dull yellow orange (10YR 6/3) clay loam with small (1 to 6 cm) limestone inclusions. The base of this lot represented the end of our excavations in this location. Excavations ended in this area because we were below Terminal Classic levels.

H.6. Operation 35, Unit C Analytical Units

Modern Surface (Unit C) – AU7. See Table H.5 for list of lots excavated. In this analytical unit, we excavated through a thick layer of accumulated modern soil. Since these excavations are located at the base of the platform that supports Structure 35, the deep accumulation (up to 18 cm) is not surprising. The accumulation is much deeper in the eastern part of the unit, away from the Group 4 platform, than in the western portion, up the platform's slope. Excavations continued until we reached a layer of fallen cut-limestone blocks across the entirety of the unit. This layer of collapse sloped down from west to east. Excavations in this analytical unit worked through a 10YR 4/1 clay loam matrix that contained small (1 to 6 cm) limestone bits.

Group 4 Platform East Collapse – AU8. In this analytical unit, we excavated through a thick layer of collapse originating from the eastern edge of Structure 35. The collapse consists of a fill that lightens from 10YR 3/2 to 10YR 6/3 from the top to the base. Excavations in Unit C were very difficult to understand, likely as a result of the collapse. At the base of excavations, we defined a set of stacked cut stones that likely formed a wall or platform edge in the western portion of the unit. Additionally, we encountered an eroded plaster plaza floor, named Carrot Plaza Floor, which passed under this wall. This floor was identified as a thin layer of white limestone flecks resting on a darker brown sediment. In Lot C/5, we excavated down about 4 cm into this brown sediment in the eastern portion of the excavation unit. It is possible that this wall formed the terminal platform edge along this portion of the Group 4 platform. Lot C/6 was excavated in part behind and possibly through this wall. This lot likely contains mixed materials.

Additionally, Lots C/5 and C/6 contained a relatively high density of ceramic material. It is possible that this material forms a small trash midden. However, the absence of bone suggests that this discarded refuse is not related directly to large-scale and rapidly deposited food waste.

Carrot Plaza Floor and Fill – AU9. In this analytical unit, we excavated through Carrot Plaza Floor and into the 10YR 5/3 clay loam fill located directly below. The sub-floor fill contained large chert cobbles and medium-sized limestone rubble inclusions. At the base of these excavations, we encountered Celery Plaza Floor, a well preserved plaster floor. Oddly, this floor is not level, but rather appears to have ripples, similar to those found in 2011 on the surface of Structure 41's Terminal Preclassic southern terrace (Mixter 2012). The Structure 41 surface appeared to have been warped by the compaction of a clay fill substrate. It is certainly possible that this kind of substrate underpins Celery Plaza Floor as well. Several flat cut stones were encountered resting on Celery Plaza Floor. Excavations date the construction of Carrot Plaza Floor tentatively to the Late Classic II phase.

Table H.5: Operation 35 analytical units.

Analytical Unit Number	Analytical Unit Name	Lots Included (Unit/Lot)	Terminus Post Quem
AU1	Modern Surface (Units A,B,D)	A/1; B/1; D/1	Late Classic II
AU2	Structure 35 South Collapse	D/2	Terminal Classic
AU3	Structure 35 Fill	A/2,3,4,5; B/2	Terminal Classic
AU4	Macal Floor	A/6	Not Established
AU5	Manioc Floor	A/7	Early Classic
AU6	Achiote Floor	A/8	Not Established
AU7	Modern (Unit C)	C/1,2	Terminal Classic
AU8	Structure 35 East Collapse	C/3,4,5,6	Terminal Classic
AU9	Carrot Floor and Fill	C/7	Late Classic II

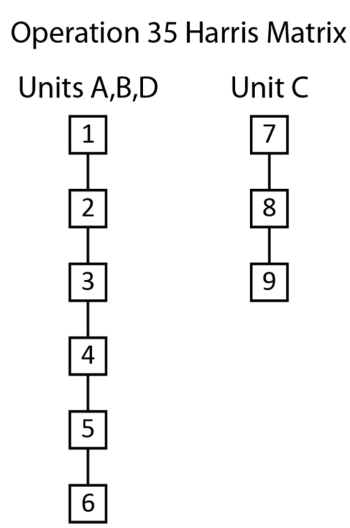

Figure H.5: Operation 35 Harris Matrix.

H.7. Operation 37 Analytical Units

Modern Surface – AU1. This first analytical unit is composed of a grayish yellow brown (10YR 4/2) clay loam matrix indicative of the modern surface. No major modern cultural disturbances were identified on the surface of Units A and B. This analytical unit contained undressed limestone inclusions ranging from small specs (1 to 6 cm) to large 50 cm limestone rocks.

We terminated excavations in this analytical unit at a high density of large (25-50 cm) pieces of undressed limestone along the northern edge of Unit A, mostly likely collapse from higher up on the slope leading up to the surface of Actuncan North's plaza platform. Along the northern part of the unit and 20 cm below the collapse, we identified a vertical stack of large rocks (6-25 cm), marking an abrupt color change from grayish yellow brown (10YR 4/2) to dull yellowish brown (10YR 5/4) that indicated the end of this cultural layer. It is likely that this stack of large rocks is the face of the uppermost identified plaza terrace. The color change in Unit A marked the transition from AU1 to AU2.

The stone collapse identified in Unit A was not found in Unit B. There we identified one large flat stone in the NW corner of Unit B, but not a high density of rock. However, as in Unit A, this cultural layer ended in Unit B with a sharp color change from grayish yellow brown (10YR 4/2) to dull yellowish brown (10YR 5/4) at its base. During excavation, these two dull yellowish brown (10YR 5/4) deposits were not continuous. Therefore, in Unit B, this deposit was divided into a separate analytical unit, AU3.

Orange Sediment 1 – AU2. The matrix in this cultural layer exhibited a sudden change in color and composition from the matrix in AU1, a change from the grayish yellow brown 10YR 4/2 clay loam to a dull yellowish brown 10YR 5/4 clay. Excavations through this cultural layer further exposed the stacked stones mentioned in AU1 that appear to have formed a terrace face. The face was constructed to a total height of 90 cm.

As defined in the broader description of Operation 37 above, two possible interpretations of this orange sediment have been suggested. It may have been slope wash or intentional fill. Importantly, there was also an increase in the density of both small undressed limestone inclusions (6-10 cm) and artifacts. Generally, the artifacts were relatively large pieces of lithics and ceramics. The larger size of these materials may indicate that they were deposited on these terraces in ancient times rather than the result of post-abandonment formation processes. Perhaps these artifacts indicate that this analytical unit was the result of a trash midden or refuse.

Orange Sediment 2 – AU3. This cultural layer is similar in composition to AU2 and is only separated as a separate analytical unit because the two are physically discontinuous. AU3 is located in Unit B in front of a terrace wall constructed of large chert river cobbles, whereas AU2 is located above in Unit A on the surface of the terrace formed by this wall. Like AU2 the matrix of this layer was a dull yellowish brown (10YR 5/4) clay with a large number of artifacts.

In Unit B, this cultural layer also contained undressed limestone inclusions ranging from 6 to 25 cm in size. In the northern half of Unit B, excavations uncovered a stack of limestone boulders that appear to form the face of a 65 cm high terrace. This terrace would be one step down from the terrace defined in Unit A. Excavations terminated at a level of broken white limestone surface that appears similar to the remnants of eroded plaster floors. We interpret this as the constructed surface of the terrace that extends out from the base of the face uncovered in this analytical unit.

Terrace Floor and Fill – AU4. This cultural layer is a mixed deposit containing a continuation of AU3 and the eroded plaster floor that forms the lower boundary of AU3. The majority of this analytical unit contains the orange clay of AU3, but we also excavated through the floor. Interestingly, the quantity of artifacts and limestone inclusions decreases near the plaster floor. This analytical unit is directly above the sterile clay of AU5 and below the base of the terrace wall encountered in the northern portion of Unit B.

Clay Terrace Fill – AU5. This final analytical unit contains a matrix of dense yellowish brown (10YR 5/6) clay that forms the substrate of the terraces identified in this operation. In both units, this layer contains only small bits and pieces of limestone. In comparison with AU2 and AU3, this layer contained a markedly lower density of artifacts and is nearly culturally sterile. The clay in this deposit may have been mined from pure deposits and used for fill, or the terraces may have been cut from the side of a naturally occurring clay hill. We know that Actuncan North was constructed on a large clay ridge and that the ancient Maya moved large amounts of clay around the hilltop for fill. Therefore, either interpretation remains possible.

Table H.6: Operation 37 analytical units.

Analytical Unit Number	Analytical Unit Name	Lots Included (Unit/Lot)	Terminus Post Quem
AU1	Modern Surface	A/1,2,4; B/1	Terminal Classic
AU2	Orange Sediment 1	A/3,5	Late Classic II
AU3	Orange Sediment 2	B/2,3	Terminal Classic
AU4	Terrace Floor and Fill	B/4	Early Classic
AU5	Clay Terrace Fill	A/6; B/5	Late Classic II

Operation 37 Harris Matrix

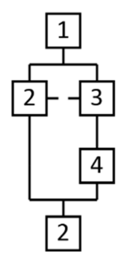

Figure H.6: Operation 37 Harris Matrix.

H.8. Operation 41 Analytical Units

Modern Surface – AU1. This analytical unit consists of the layer of modern soil development over Structure 7. The matrix removed was a loose brownish black (10YR 3/2) loam containing 1 to 25 cm limestone inclusions and a high density of roots and other plant matter. The removal of this layer of active soil development exposed the basic outline of Structure 7 across the 10 m by 1 m excavation trench. In Unit E, excavations uncovered the top of Begonia Wall, an alignment of stones that form the eastern boundary of the lower level of Structure 7-1st's platform. In Unit C, excavations uncovered the top of Dahlia Wall, a platform wall facing east, that forms the eastern edge of Structure 7-1st's upper platform. Running west from Dahlia Wall, removal of the humus revealed the broken remains of Opuntia Floor, represented by a layer of small (1 to 6 cm) limestone ballast. This floor ran across the entirety of Unit B and terminated at Lilly Wall, uncovered in the middle of Unit A. This is a west facing wall that formed the west edge of Structure 7-1st's upper platform. To the east and west of the defined platform, excavations terminated at the top of architectural collapse.

Collapse above Iris Floor – AU2. This analytical unit contains the architectural collapse located to the west of Lilly Wall. The matrix removed was brownish black (10YR 3/2) loam containing medium (6 to 25 cm) stones. Extending from the base of Lilly Wall, excavations encountered the remaining ballast of Iris Floor, the terminal plaza floor located between Structures 6 and 7. Curiously, Iris Floor is approximately 20 cm higher than Peony Floor, the terminal plaza floor to Structure 7's east. Within this collapse deposit, we uncovered a stone projectile point, recovered as Special Find 1.

These excavations also uncovered the face of Lilly Wall, the western face of Structure 7-1st. This wall was preserved to two courses of cut-limestone blocks facing west. These two courses measure 20 cm tall, though the wall was likely originally taller based on presence of cut stones found in fill of AU2. Lilly Wall appears to have been constructed on Iris Floor, which then continued east in association with an earlier version of Structure 7.

Collapse above Hyacinth Floor – AU8. This analytical unit consists of the architectural collapse located on Hyacinth Floor, likely from the collapse of Dahlia Wall and Structure 7-1st's upper platform. The matrix consisted of 10YR 3/2 clay loam containing small (1 to 6 cm) limestone inclusions. Excavations terminated at Hyacinth Floor, a very ephemeral plaster structure surface. Hyacinth Floor ran east from Dahlia wall to the top of Tulip Wall, located in Unit E, to form a low terrace constructed off the eastern side of Structure 7-1st. Excavations also uncovered the top three courses of Dahlia Wall, a platform surface constructed of thin horizontally placed cut-limestone blocks. Because Hyacinth Floor runs into the middle of Dahlia Wall, it appears as though this eastern terrace may have been the final architectural element constructed on Structure 7. Strangely, Dahlia Wall collapsed towards the west, in on itself, indicating that the fill of Structure 7-1st was not well constructed or part of it was a free standing wall with little buttressing.

Collapse above Peony Floor – AU11. This analytical unit removed structural collapse from the eastern edge of Structure 7. This collapse layer consisted of brownish black (10YR 3/2) clay loam containing small (1 to 6 cm) limestone inclusions. Excavations took place in the portion of the unit to the east of Tulip Wall, a low wall that formed the eastern boundary of Structure 7-1st's eastern terrace. Tulip Wall consists of a single course of cut-limestone blocks. These blocks were found at a 30-degree angle, pointing up towards the east (Figures 3 and 4). Based on this strange position, we reconstruct Tulip Wall as an alignment of upright, rather than horizontal, stones. As such, this wall likely originally formed a 25 cm high step from the Plaza A floor to Hyacinth Floor, which topped the terrace (see AU8 above).

At the base of this analytical unit, excavations uncovered the eroded remains of Peony Floor, the terminal version of Plaza A next to Structure 7. Excavations only encountered a thin layer of small limestone ballast demarcating this floor. Tulip Wall was constructed on this floor and continues west under Structure 7-1st's terrace, indicating the terrace postdates the construction of Peony Floor.

Hyacinth Floor Fill – AU5. This analytical unit consists of the construction fill of Structure 7-1st's eastern terrace. This fill is located below Hyacinth Floor and bounded by Dahlia Wall to the west and Tulip Wall to the east. This matrix consisted of brownish black (10YR 3/2) clay loam containing small (1 to 6 cm) chert inclusions. In total, this terrace appears to have been about 25 cm high. Excavations terminated at the heavily eroded remains of Peony Floor, on which Dahlia Wall appears to have been constructed. This relationship indicates that Peony Floor predates all versions of Structure 7. Additionally, these excavations exposed the full height of Dahlia Wall, although the top of the wall had already been removed in excavations before the base was uncovered. At its maximum, Dahlia Wall appears to have been about 50 cm high and constructed in two phases. The first phase was about 30 cm high in association with Structure 7-2nd (see AU10 below), while the additional 20 cm were added for the construction of Structure 7-1st. These two walls connect to Rose and Opuntia Floors, respectively.

Opuntia Ballast/Fill – AU3. This analytical unit was excavated below Opuntia Floor in Units A and B to remove the fill of Structure 7-1st's upper platform. Opuntia Floor was heavily eroded, only recognizable by a layer of ballast at the base of AU1. This analytical unit consisted of brownish black (10YR 3/2) clay loam containing medium-sized limestone fill measuring 6 to 25 cm. In Unit A, we only excavated the eastern portion of the unit, to the east of Lilly Wall.

These excavations date the construction of Structure 7-1st to the Terminal Classic period based on the recovery of a partial Tinaja Red carinated bowl. This analytical unit terminated arbitrarily within the body of Structure 7-1st to recover a more reliably datable fill sample.

Opuntia Fill – AU10. This analytical unit continued to remove the fill of Structure 7-1st's main body. This analytical unit was only separated from AU3 arbitrarily in order to collect a more deeply buried fill sample with less chance of contamination. This analytical unit consisted of brownish black (10YR 3/2) matrix with increasing large stone inclusions (6 to 50 cm in diameter) as we excavated downward. These excavations also removed Lilly Wall, and the top portion of Dahlia Wall to expose Structure 7-2nd below. Additionally, close inspection of the archaeological profile indicates that Lilly Wall rests on top of Iris Floor, which passes east under Structure 7-1st. Further, the construction of Iris Floor appears to predate the construction of 7-2nd.

Structure 7-2nd is a 3.2 m wide platform that rises only 30 cm from Peony Floor to the east. The eastern side is bounded by the original lower portion of Dahlia Wall, which was fully exposed by this analytical unit. The western boundary was formed by Daffodil Wall, a formally constructed wall located in the center of Unit A. Unfortunately, the portion of Daffodil Wall that was exposed was heavily disturbed, either intentionally during the construction of Structure 7-1st or by later root growth. There is evidence of root activity along this wall, so this may have played a role. As a result, excavations revealed set cut stones protruding from both the north and south profiles, but only a jumble of displaced stone along the center of the unit. Regardless, excavations exposed preserved portions of Rose Floor, the plaster floor that connected Daffodil Wall to Dahlia Wall and served as the surface of Structure 7-2nd. Daffodil Wall appears to have been constructed on Iris Floor, indicating that the wall post-dated the floor. On its western side, Structure 7-2nd would have been only about 15 cm tall. Ceramics date this analytical unit to the

Terminal Classic Period. Although included here, Lot A/6 includes some material from below Iris Floor, as this floor was difficult to identify during excavation.

Daffodil Fill – AU9. This analytical unit included the excavation through Daffodil Wall and below Rose Floor. Excavations should have followed Iris Floor, on which Daffodil Floor was constructed, but instead they continued to Peony Floor. The area excavated below Iris Floor should be part of AU6. This analytical unit was composed of a dull yellow orange (10YR 7/3) clay loam matrix containing small (1 to 6 cm) undressed limestone inclusions. Ceramics recovered date this deposit to the Terminal Classic period.

The base of this excavation delineated Structure 7-3rd and its relationship to Iris Floor. Excavations exposed Lilac Wall, the western platform edge of Structure 7-3rd. This wall consists of an upper row of large cut stones set on a foundation of smaller stones. An earlier version of Rose Floor stretches from the top of Lilac Wall to Dahlia Wall, forming the surface of Structure 7-3rd. Iris Floor terminates half way up the wall, indicating that this floor post-dates the construction of Structure 7-3rd.

Iris Floor Ballast/Fill – AU6. In this analytical unit, excavations removed the eroded remains of Iris Floor, the floor's ballast, and the fill layer below the floor. The matrix consists of brownish black (10YR 3/2) clay loam with small to medium (1 to 25 cm) stone inclusions. At the base of this analytical unit, excavations uncovered the partially preserved remains of Peony Floor. Because of the later construction of Opuntia Floor, Peony Floor is the penultimate plaza floor between Structures 6 and 7. As discussed in the description of AU11 above, to the east of Structure 7 and across most of Plaza A, Peony Floor is the terminal plaza Floor. In Units A, B, and D the plaster plaza floor extends west from Lilac Wall. Peony Floor passes under Lilac Wall and as a result, must predate Structure 7-3rd. In fact, based on excavations described below we know Peony Floor predates all versions of Structure 7. Ceramics recovered from this analytical unit date Iris Floor to the Terminal Classic period.

Rose Floor Ballast – AU4. Excavations in this analytical unit removed the eroded remains of Rose Floor and its ballast from between Lilac and Dahlia Wall. This 15 cm thick layer of ballast formed the top half of the fill between Lilac and Dahlia Floor. The matrix consisted of brownish black (10YR 3/2) clay loam with small (1 to 6 cm) undressed limestone inclusions. Excavations terminated at a change in the soil color that appears to represent a change in the fill composition of Structure 7-3rd. Alternatively, this change in fill color may indicate a lower level of bioturbation of the lower fill, described next in AU7. Recovered ceramics date this analytical unit to the Terminal Classic period, although analysis of ceramics from AU7 will likely provide a more secure date.

Rose Fill – AU7. Excavations in this analytical unit continued down between Dahlia and Lilac Walls through the fill of Structure 7-3rd. As mentioned in the description of AU4, this 15 cm thick fill layer was defined by a change in sediment to dull yellow orange (10YR 7/3) clay loam containing small (1 to 6 cm) stone inclusions. At the base of this analytical unit, we uncovered the partially preserved remains of Peony Floor as it passes under Structure 7. Large patches of plaster remained intact. These excavations indicated that Peony Floor predated all versions of Structure 7 and the raising of the plaza level west of Structure 7 to the height of Iris Floor. Ceramic analysis dated this construction to the Hats' Chaak phase of the Late Classic period; however, only 45 sherds were collected making this date tentative. Since AU4 dated to the Terminal Classic period and these likely represent a single construction phase, a later date seems possible.

Peony Floor Ballast East of Structure 7 – AU12. This analytical unit represents excavations undertaken to the east of Structure 7 below Peony Floor. Excavations were only undertaken in the portion of the unit to the east of Tulip Wall. Excavations passed through Peony Floor and a 15 cm thick level of fill immediately below. Excavations were aimed at retrieving a sample of the fill to use for ceramic dating. The matrix of this analytical unit was composed of dark brown (10YR 3/3) clay loam containing a high density of small (1 to 6 cm) limestone inclusions. Excavations terminated at the plastered Begonia Floor, the penultimate surface of Plaza A in this area. A sample of 51 ceramic sherds dated Peony Floor to the Late Classic period; however, in this section, Peony Floor was heavily eroded. A more accurate date may come from excavations in Unit A (AU13 and 14), where Peony Floor was better preserved.

Peony Floor Fill under Structure 7 – AU 14. This analytical unit contains excavations below Peony Floor intended to recover ceramics to date the floor. The matrix is composed of light gray (10YR 8/2) sediment filled with small bits of broken limestone. In total, this analytical unit was about 30 cm thick. At the base of these excavations, we encountered a change in fill to a layer of large boulders, described in AU 13 below. Ceramics from this analytical unit indicate a Late Classic date based on a single ash ware sherd. The total sherd count was only 21, bringing any firm conclusions into doubt.

Large Boulder Plaza Fill – AU13. This analytical unit included excavation through two distinct fill layers. First, excavations penetrated a single layer of large (6 to 25 cm) limestone rubble, approximately 20 cm thick. Below this layer, excavations were limited to only the western meter of Unit A. Excavations encountered a single, 30 cm tall layer of large squared limestone blocks up to 65 cm in diameter. This layer likely is the result of a substantial patio raising event. At the base of these large stone blocks, excavations uncovered Camellia Floor, the plaster floor that preceded Peony Floor. Ceramics from this analytical deposit date tentatively to the Early Classic period.

Table H.7: Operation 41 analytical units.

Analytical Unit Number	Analytical Unit Name	Lots Included (Unit/Lot)	Terminus Post Quem
AU1	Modern Surface	A/1; B/1; C/1; D/1; E/1	Terminal Classic
AU2	Collapse above Iris Floor	A/3,4; D/2,3	Terminal Classic
AU3	Opuntia Ballast/Fill	A/2; B/2	Terminal Classic
AU4	Rose Floor Ballast	A/6; B/4; C/5	Terminal Classic
AU5	Hyacinth Floor Fill	C/3,7; E/4	Terminal Classic
AU6	Iris Floor Ballast/Fill	D/4	Terminal Classic
AU7	Rose Fill	B/5; C/6	Late Classic II
AU8	Collapse above Hyacinth Floor	C/2	Terminal Classic
AU9	Daffodil Fill	A/7; B/6	Terminal Classic
AU10	Opuntia Fill	A/5,6; B/3; C/4	Terminal Classic
AU11	Collapse above Peony Floor	E/2	Late Classic
AU12	Peony Ballast East of Structure 7	E/3	Late Classic
AU13	Large Boulder Fill	A/10	Early Classic?
AU14	Peony Fill under Structure 7	A/8,9	Late Classic I

Operation 41 Harris Matrix

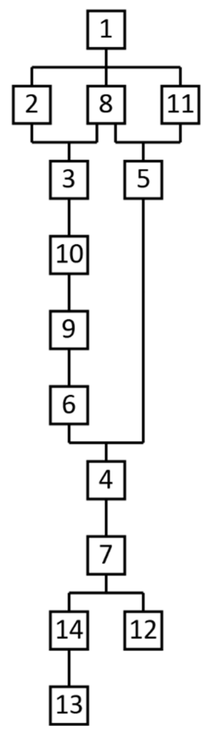

Figure H.7: Operation 41 Harris Matrix.

H.9. Operation 43 Analytical Units

Modern Surface – AU1. This analytical unit describes the layer of modern soil development over the surface of Structure 8. This analytical unit consists of brownish black (10YR 2/2) loam containing only small (0 to 1 cm) stone inclusions. In Unit A, excavations uncovered the top portion of Spruce Wall, an alignment of large upright cut stones visibly protruding from the modern surface. The excavation units run perpendicular to this stone alignment. South of Spruce Wall, on the surface of Structure 8, a particularly dense concentration of rocks and artifacts were identified, though the significance of these materials is not entirely clear. As noted in the description of AU4, these rocks and artifacts may have been turned up from the fill of Structure 8-1st-a by bioturbation.

Collapse above Holly Floor – AU2. This analytical unit consists of collapsed remains from Structure 8 located within Plaza A to the platform's south. The matrix consists of brownish black (10YR 3/2) clay loam containing small (1 to 6 cm) limestone fragments. This deposit is talus shaped, sloping down from the higher structure surface to the north towards the plaza surface to the south.

These excavations uncovered both the southern platform edge of Structure 8-2nd and the terminal plaza floor that the building was constructed on. South of the structure, all that remained of Holly Floor was a layer of small limestone pebbles that are a combination of the floor's eroded plaster and the ballast it was constructed on. On the line between Units B and C, excavations uncovered Pine Wall, a disturbed line of upright stone approximately 10 cm tall. This appears to have been the wall's original maximum height. Only one large wall stone was found in the collapse and it corresponded in size and shape to a modern gap in the wall. Holly Floor continues north under Pine Wall, indicating that the construction of Structure 8 post-dates this plaza floor. Pine Wall formed the southern boundary of Structure 8 and served as a low step to access the structure's surface. Although once a single wall, at least one stone was out of place and the stones remaining in place were no longer even. Although it seems likely that much of this disturbance is the result of post-depositional forces, some evidence indicates that the disturbance may have been cultural. On top and south of Pine Wall, excavations encountered Feature 1, a deposit of smashed ceramic materials. The event that created this cache may have also disturbed the wall. I will separately describe this feature in greater detail below.

Structure 8 Collapse – AU 4. This analytical unit consists of a 20 cm thick layer of dark organic soil containing small (1 to 6 cm) limestone bits located on the surface of Structure 8. This deposit is located between Pine Wall to the south and Spruce Wall to the north. I interpret this deposit as the combination of collapse and fill within an extended root zone. Inspection of the excavation profile indicates that much of this analytical unit may have been excavated through Structure 8's final construction phase. Two pieces of evidence point to the previous existence of a final platform here. First, the level nature of this deposit would seem to indicate its relationship to a constructed platform rather than collapse. In contrast, collapse deposits are typically sloped. Second, the identification of two cut-limestone blocks in the western excavation profile, Sequoia Wall in Figure 5, may delimit the southern boundary of Structure 8-1st-a. Structure 8-1st-a likely consisted of an 85 cm wide upper platform, which stepped down to the south to a 35 cm wide elongated stair fronted by Pine Wall. This division was not identified during excavation; therefore, all these lots are lumped in an analytical unit, although Lots A/2, A/5, B/5 and B/6 might be used to date this construction phase because they were located north of Sequoia Wall. Ceramics from these lots tentatively date this construction phase to the Terminal Classic period.

At the base of this analytical unit, excavations unveiled the form of Maple Platform, the southern portion of Structure 8-2nd. The plastered Maple Floor extends north from the top of Pine Wall forming the surface of Maple Platform. Maple Floor is heavily eroded for about 65 cm north of Pine Wall. In its current state of preservation, evidence of Maple Floor begins about 5 cm below the top of Pine Wall. It is likely that either this floor or a later version once reached the surface of Pine Wall. The next 40 cm of Maple Wall were much better preserved leading up to Spruce Wall.

This excavation also exposed the southern face of Spruce Wall, an approximately 35 cm high wall built on Maple Floor during the construction of Structure 8-1st-b. Two lines of stones have been identified for Spruce Wall. The southern, lower line of stones is a single course of horizontal stones resting on Maple Floor. Remnants of plaster remained on this line of stones, indicating that the southern face of Spruce Wall was once plastered. These flat stones likely provided structural support for a row of upright stones immediately to the north. The largest of these stones are 35 cm tall and protrude from the modern surface in a line running both east and west from our excavation trench. Only one of these upright stones was located in our excavations. Between these large stones, smaller 15 cm tall stones form this wall. It is likely that these lower stones were once topped by an additional course of stones to create a level wall. The southern line of horizontal stones may have provided structural support for the vertical stones they abutted. The horizontal line of stones was not evident in our excavation profile, so its approximate location is drawn in as a dashed line.

Feature 1 – Ceramic Smashing on Pine Wall – AU3. This analytical unit consists of a ceramic smashing encountered on Pine Wall and Holly Floor to the south. This feature consists of several partial vessels that were smashed on Pine Wall, the low step that provided access from

Plaza A to Structure 8. These vessels include two different McCrae Impressed dishes (Figure 7), fragments of a Fine Orange vase, and a piecrust jar rim that date the deposit to the Terminal Classic period. Additionally, a partial jade bead was encountered in B/5 from just below Pine Wall. This bead was located under the displaced stone from Pine Wall located in the east half of the unit, possibly indicating that this stone was displaced during the deposition of Feature 1.

Collapse above Juniper Floor – AU5. This analytical unit consisted of removing the collapse north of Spruce Wall to expose the northern part of this wall and the surface it was resting on. The matrix consists of 10YR 3/2 clay loam with small stones above and to the north and larger cut stones in A/6 near Spruce Wall. At the base of A/4, excavations uncovered Juniper Floor, an eroded plaster floor preserved in patches. This floor also served as the surface of Juniper Platform, the northern portion of Structure 8-2nd. The southern half of the unit contained a heavily jumbled set of cut stones. These cut stones were laid horizontally with their cut sides facing north. Because the stones appear out of their original place, it is not clear whether they originally formed a platform face. If these stones did form a platform face, then it would have been at least 2 courses high. As noted in the description of AU4, the large upright stones that form Spruce Wall, likely faced south based on the orientation of the row of horizontal stones under these vertical stones. The broken line of cut stones likely formed the northern side of a 30 cm thick double-faced wall. Because of the disturbed nature of these stones, it is difficult to tell if they were stacked horizontally or upright.

In Lot A/6, our excavations removed the collapsed stones of Spruce Wall. It became clear that Juniper Wall ran below Spruce Wall and joined Maple Floor to form Structure 8-2nd. At the base of A/6, only the large upright stone remained in place because it ran into the edge of the excavations.

Maple Floor and Fill – AU6. This analytical unit consists of the removal of Maple Floor and ballast. Ceramic from this analytical unit date the construction of the Maple Platform portion of Structure 8-2nd to the Terminal Classic period. All fill from between Spruce Wall and Pine Wall was removed down to the level of Holly Floor in this analytical unit. Excavations uncovered two distinct surfacing episodes of Maple Floor – with the younger placed directly on top of the older. Both were removed as part of the same lot. Matrix consisted of 10YR3/2 sediment with small (1 to 6 cm) limestone inclusions. Excavations revealed that Pine Wall was constructed using two rows of stones, an informal internal retaining wall and an external façade of cut stone. Excavations terminated at Aspen and Holly Floors, which formed an even plaza surface that continues south of Pine Wall into Plaza A. Structure 8 was built on the plaza surface formed by these two floors. Continuing excavations revealed that Aspen Floor was constructed as an extension of Holly Floor when the entire Plaza A platform was expanded by renovating the main northern staircase.

Excavations also revealed Elm Wall, a line of horizontally placed cut stones running east to west. These stones rest on Aspen Floor and were located directly below Spruce Wall. They served as a base for the junction of Juniper and Maple Floors and the division between Maple and Juniper Platforms. Because of the way these two floors join, it is difficult to say whether Maple or Juniper Platform was constructed first. Together, they form Structure 8-2nd, but one of these platforms alone was constructed first to form Structure 8-3rd. Because Maple Floor has two flooring episodes while only one is evident for Juniper Floor, I tentatively suggest that the construction of Maple Platform occurred first.

Juniper Floor Fill – AU8. These excavations consisted of removing Juniper Floor and the fill below it. Immediately below Juniper Floor in A/8, the excavations encountered an intricate set of disturbances from burrowing rodents. Burrow holes ran the entire length of the excavation unit. Below this disturbance, the fill matrix in A/9 and A/10 was 10YR clay loam with small (1 to 6 cm) stone inclusions. In Lot A/9, excavations removed the two large basal stones of Spruce Wall encountered in the base of AU6. Beneath these stones, up to the level of Aspen Floor, the top of a very large upright stone was encountered. This single stone (Cedar Wall) spans the width of the excavation unit. Continuing north of this stone, excavations in Lot A/10 terminated 15 cm below the top of Cedar Wall at a fill composed of large (25 to 50 cm) boulders laid in *sascab*. Curiously, Elm Wall was placed directly on top of Cedar Wall; together, these two stones might have formed a single wall. If targeted in future excavations, the arrangement of these stones may provide further evidence that Maple Platform pre-dated Juniper Platform.

Fill North of Cedar Wall – AU 9. This analytical unit consists of the lots excavated through a layered fill located North of Cedar Wall and below AU8. The matrix is composed of 10YR 6/2 clay loam containing a single layer of large (25 to 50 cm diameter) boulders over a 10 cm layer of compact smaller (1 to 6 cm) limestone bits. At the base of this lot, excavations encountered Cypress Floor, a plaster floor extending 80 cm north from Cedar Wall, likely forming the tread of a monumental staircase or terraced façade for the Plaza A platform. The northern 64 cm of Unit A was filled with an additional layer of large boulder rubble, covering the riser of the next stair down. The top of the monumental stone forming this riser is evident in our excavations. This stair formed by Cedar Wall and Cypress Floor is likely the penultimate stair of the Plaza A platform. Excavations ended because we were primarily interested in the Terminal Classic construction, not earlier constructions.

Aspen Floor – AU7. Excavations continued below the plastered Aspen Floor and its ballast to the south of Elm Wall. We determined that Holly and Aspen Floors were actually a complex, often renovated plaza surface used for multiple versions of Plaza A's platform. In fact, Aspen Floor is an extension of Holly Floor constructed when the northern stairs of Plaza A were renovated, increasing the size of Plaza A's platform by approximately 75 cm to Cedar Wall. This construction episode superseded Honeysuckle Wall, the highest curved plaster stair riser of Plaza A's antepenultimate staircase. These excavations terminated at a change in fill from plaster floor and ballast to a fill of large boulders packed with *sascab*. It is important to note that the difference between Holly and Aspen Floors were not differentiated until after the excavations of this analytical unit were complete. Therefore, Lot B/9 contains material that belongs in both AU7 and AU12.

These excavations terminated at Oak Floor, a similarly complex plaster surface directly beneath Holly Floor. In Unit C, a patched-over dip in Oak Floor may represent the 4th version of the platform. When Oak Floor was exposed in Unit B, the top of the curved stair would still have been exposed.

Aspen Floor Ballast – AU10. This analytical unit continued through the small-stone ballast below Aspen Floor. Excavations uncovered the continuation of Honeysuckle Wall, the curved plaster stair riser discussed in AU9. Excavations terminated at a compact sediment fill located between Honeysuckle Wall and the back of Cedar Wall.

Fill Below Aspen Floor – AU11. This analytical unit consisted of a compact 10YR 6/2 clay loam with large (10 to 25 cm) inclusions below Aspen Floor. Excavations continued 15 cm down and terminated arbitrarily. Excavations revealed an approximately 15 cm deep portion of Honeysuckle Wall in total. This lot completed our excavations in Unit B.

Holly Floor and Ballast – AU12. In this analytical unit, we excavated through Holly Floor in order to obtain a date for its construction. Approximately 8 cm below Holly Floor, our excavations encountered another plaza floor, named Oak Floor. This floor extended across Unit C, before dipping down just south of the line between Units B and C. This dip likely represents Mahogany Stair, the staircase that preceded Honeysuckle Stair. However, only the top 4 cm of this stair was encountered, so further excavation is needed to confirm this interpretation. Ceramic analysis dates this analytical unit to the Terminal Classic period; however, the heavily eroded nature of Holly Floor makes this date suspect.

Table H.8: Operation 43 analytical units.

Analytical Unit Number	**Analytical Unit Name**	**Lots Included (Unit/Lot)**	**Terminus Post Quem**
AU1	Modern Surface	A/1; B/1; C/1	Terminal Classic
AU2	Collapse above Holly Floor	C/2,3	Terminal Classic
AU3	Feature 1: Ceramic Smashing on Pine Wall	B/4; C/4	Terminal Classic
AU4	Structure 8 Collapse	A/2,5; B/2,3,5,6	Terminal Classic
AU5	Collapse on Juniper Floor	A/3,4,6	Late Classic II
AU6	Maple Floor and Fill	A/7; B/7	Terminal Classic
AU7	Aspen Floor	A/11; B/9	Terminal Classic
AU8	Juniper Floor Fill	A/8,9,10	Terminal Classic? Late Classic I?
AU9	Fill North of Cedar Wall	A/12,13	Terminal Classic?
AU10	Aspen Ballast	B/10	Early Classic?
AU11	Fill below Aspen Floor	B/11	Not Determined
AU12	Holly Floor and Ballast	C/5	Terminal Classic?

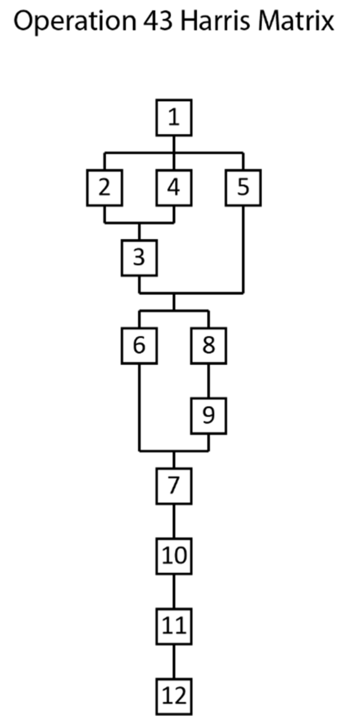

Figure H.8: Operation 43 Harris Matrix.

H.10 Operation 45 Analytical Units

Modern Surface – AU1. This analytical unit consists of the zone of modern soil development removed from the surface of Structure 9. The matrix consisted of a black (10YR 2/1) clay loam with 1-6 cm chert pebbles. In Unit A, this soil was located in the crevices between large chert boulders that formed the fill of Structure 9 and that had collapse off its western side to the plaza surface. On the Structure's summit in Units B and C, excavations ended when the tips of underlying chert cobbles began to appear. This analytical unit lies immediately on top of AU 2 and 4.

Root Zone – AU2. This analytical unit consists of the thick (approximately 15 cm) zone of bioturbation evident on top of Structure 9. The structure's large-stone fill and apparent lack of retaining walls and floors allowed for substantial subsurface penetration of plants and animals. This exposure led to the development of a thick organic layer that penetrated into the building's fill. The matrix in this lot is a black (10YR 2/1) clay loam with medium (1 to 25 cm) stone inclusions. Generally, the size of these inclusions increased from top to bottom as the excavations began to penetrate into the structure's core. Likely, this size grading is the remnant of the structure's prepared surface, which would have been constructed on increasingly smaller stones, possibly overlaid with plaster. This size sorting is the only evidence that the platform had a prepared surface. We found no extant remains of plaster floor or ballast on the buildings surface. This analytical unit overlays AU3.

Large Stone Fill – AU3. This analytical unit consisted of the large boulder fill that forms the core of Structure 9. In Units B and C, this fill was between 35 and 40 cm thick. Lot A/5 was only excavated in the eastern portion of Unit A, east of Thunder Wall, the possible western edge of Structure 9 (see AU4). The matrix is composed of clay loam with small to large (1 to 50 cm) stone inclusions. The color gradually transitions from black (10YR 2/1) near the top of the analytical unit to brownish black (10YR 3/2) at its base. At the base of this analytical unit, excavations encountered Rain Floor, a well preserved plaster floor that runs under Structure 9. This floor appears to be a version of Plaza A's surface on which Structure 9 was constructed.

Excavations in Lots B/5 encountered Feature 1, a whole cached vessel, located among the cobble fill. This vessel will be described in AU5 below. The vessel was not located in a prepared chamber, rather it seems to have been simply placed intact among the fill stones as Structure 9 was constructed.

Ceramics from this analytical unit can be used to date the construction of Structure 9. Because of the unsealed nature of these deposits, material from deeper lots should more accurately represent the structure's date. However, it is important to note that ceramics often move quite dramatically within large-stone fill contexts. A Late Classic construction date is attested to by ceramics including a large Alexander Unslipped Type jar rim and a Mount Maloney Black Type jar rim. A Terminal Classic Mount Maloney Black bowl rim was recovered from Lot A/5, indicating use of the structure continued into this time period. Unfortunately, Lot A/5 is the least secure context of all the lots in this analytical unit.

Collapse West of Structure 9 – AU4. This analytical unit consists of construction material that has collapsed from the surface of Structure 9 to the west of Structure 9. This consists of organic 10YR 2/1 matrix containing small stone inclusions. Excavations through this collapse attempted to define the western edge of Structure 9, with only limited success. Excavations in Lots A/2 and A/3 excavated the entire 1 m by 2 m unit. At the base of Lot A/3, a single stone (labeled Thunder Wall) was identified that appeared as though it may have had a cut-stone face. Excavations in Lot A/4 only continued to the west of this stone and revealed Rain Floor directly below the possible cut-stone façade. Rain Floor is a plastered floor that was the final surface of Plaza A, even though it preceded the construction of Structure 9. I hesitantly suggest that Thunder Wall represents the basal course of Structure 9's western platform wall. Lot A/5, excavated to the east of Thunder Wall, was included as part of Structure 9's fill (AU3); however, I suspect there is some mixing between these two analytical units.

Feature 1 – Cached Ceramic Vessel – AU5. This analytical unit consists of a single cached ceramic platter found resting on Rain Floor. The discovery of a few sherds in the southern excavation balk of Unit B resulted in the excavations of Unit C, a 1 m by 1 m expansion to the south, to uncover the remainder of the vessel. The ceramic vessel was placed on Rain Floor upright and intact then covered over by Structure 9's core fill. No prepared space to hold the vessel was identified. Instead, the fill eventually settled over the vessel, breaking it into at least 66 pieces. After laboratory reconstruction of the vessel, its unusual shape became evident. The vessel is large, unslipped, and shaped like a long narrow rectangular basin. It has high walls that are vertical along the long sides and slightly out-flaring on the short sides. The base is flat and all corners are rounded. A handful of ceramic sherds dating to the Terminal Preclassic were uncovered from the matrix surround this vessel. No other artifacts were uncovered in association with this platter.

Rain Floor – AU6. This analytical unit consisted of the removal of the plaster Rain Floor below Structure 9. Excavations in Unit B were limited to the northern 1 m square of the original 1 m by 2 m unit. This analytical unit consists only of the excavation of the plaster floor surface. The matrix was 10YR 7/1 plaster. In total, a 1 m by 2 m rectangle crossing both Units B and C was excavated. Rain Floor is a 2 cm thick floor. Excavations terminated at Tornado Floor, another polished plaster floor located directly below Rain Floor.

Tornado Floor – AU7. This analytical unit consisted of the removal of the plaster of Tornado Floor, an 8 cm thick plaster floor located immediately below Rain Floor. Because of its association with Rain Floor, Tornado Floor is likely the preceding plaza floor. Unfortunately, with only a 2 m^2 exposure, we cannot be sure of that interpretation. Ceramics recovered from the matrix of Tornado Floor indicate that it was constructed during the Early Classic period.

Tornado Floor Ballast – AU8. This analytical unit contains excavations that proceeded through a 7 to 10 cm thick *sascab* ballast lain to support Tornado Floor. The ballast was white (10YR 7/1) and crumbly in texture. This ballast could be contrasted with the overlying floor based on its softness and lack of artifact inclusions. Curiously, this layer was devoid of stone inclusions. Only one ceramic sherd was uncovered, indicating a Late Preclassic construction date.

Beneath this *sascab* layer, another polished plaster floor (Hurricane Floor) was uncovered. This floor is likely the third oldest version of Plaza A. Excavations terminated at this floor due to the end of the field season.

Table H.9: Operation 45 analytical units.

Analytical Unit Number	Analytical Unit Name	Lots Included (Unit/Lot)	Terminus Post Quem
AU1	Modern Surface	A/1; B/1; C/1	Terminal Classic
AU2	Root Zone	B/2,3; C/2	Terminal Classic
AU3	Large Stone Fill	A/5; B/4,5; C/3,4,5	Late Classic? Early Classic?
AU4	Collapse West of Structure 9	A/2,3,4	Terminal Classic
AU5	Feature 1 – Cached Ceramic Vessel	B/6; C/6	Terminal Preclassic
AU6	Rain Floor	B/7; C/7	Classic
AU7	Tornado Floor	B/8; C/8	Classic
AU8	Tornado Floor Ballast	B/9; C/9	Late Preclassic?

Operation 45 Harris Matrix

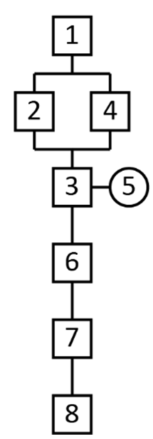

Figure H.9: Operation 45 Harris Matrix.