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Early Horizon Community Organization and Neighborhoods as Seen Through the Spatial Analysis of Residential Architecture at the Urban Center of Caylán, Peru

Ashley Nichols Whitten
Louisiana State University and Agricultural and Mechanical College, ashnwhitten@gmail.com

EARLY HORIZON COMMUNITY ORGANIZATION AND NEIGHBORHOODS AS SEEN THROUGH THE SPATIAL ANALYSIS OF RESIDENTIAL ARCHITECTURE AT THE URBAN CENTER OF CAYLÁN, PERU

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ABSTRACT

This thesis focuses on the spatial analysis of monumental, residential compounds at the Early Horizon urban center of Caylán (800-1 B.C.), Nepeña Valley, Peru. The utilization of space parallels the economic, social political and ideological aspects of human cultures. Hence, through the study of architectural space, aspects of the culture such as social organization can be deduced. This thesis focuses on the residential compounds with the objective of reconstructing patterns of social and community organization at Caylán.

The monumental, residential compounds located at Caylán are organized into a dense urban core. The enclosures abut one another through a complex system of streets and corridors. Based on the data from mapping and excavation operations carried out in 2009-2010, this study presents more detailed spatial information gathered through a fine-grained pedestrian survey realized in 2014. The updated maps are analyzed to delimit the various compounds and reconstruct their respective internal spatial syntax. Surface evidence allows the delimitation of 43 compounds, preliminarily interpreted as supra-household, neighborhood-type of urban spatial units.

The formal descriptions of the compound architecture combined with gamma analysis indicate that the Caylán compounds share similar spatial precepts. They consist of a large public plaza, through which compounds are accessed from outside streets. More than a dozen streets have so far been documented. In each of the compounds, the plaza is the gateway to production and living areas. Those consist of smaller colonnaded patios, and subsequently accessed smaller patios and covered rooms interpreted as resting areas. This pattern is typical of the residential, enclosure-based neighborhoods at Caylán.

To express variability between compounds and to understand their configuration, gamma analyses were completed for the best-preserved architectural structures (n=7). The size and complexity of most compounds suggest they housed several households, perhaps organized in a neighborhood-like urban structure.

CHAPTER 1:
INTRODUCTION

In this thesis I analyze monumental, residential compounds located at Caylán, Nepeña Valley, Peru in the modern Department of Ancash. The archaeological site of Caylán (800-1 B.C.) is currently interpreted as the primary center of a multi-tiered polity that developed in the coastal portion of the valley during the Early Horizon Period. Specifically, I examine the architecture and spatial composition of 43 different monumental residential compounds condensed in an urban core. The goal of this research is to further understand the potential social structure within Caylán through the delineation of residential compounds, and through this, the structure of early urbanization in Nepeña. Pedestrian survey, mapping and gamma analysis are the main methods used for understanding the structural composition of each compound. Through this research, the residential compounds are hypothesized as neighborhoods, separated into specific subdivisions that could have been used by various groups.

The organizational structure of the thesis is as follows. Chapter 2 discusses the importance and definition of spatial analysis. Beginning this chapter is a brief summary of the connection between space and social structures, with the focus on spatial syntax. This gives theoretical grounding for the later Gamma analyses. Next, there is an overview of households and household archaeology, followed by a section on urbanism and neighborhoods. I provide comparison ground for later analyses, and working definitions for terms used throughout the thesis. Finally, the chapter culminates in two sections detailing how spatial theory plays into archaeology and some of the prevailing theories used within the analysis of Caylán.

Chapter 3 discusses the early urbanism and residential architecture in the central Andes, specifically along the north-central coast of Peru. Beginning this chapter is a brief summary on the geography and dating seen in Peruvian archaeology, followed by a section on Peruvian

compound architecture. This gives context to the data presented on Caylán and exemplifies the changes made within residential architecture in Peru and a general movement towards compound structures as residences. I also review the archaeological research done within the Nepeña Valley, and specifically research already completed on Caylán.

Chapter 4 presents the overall methods and results from field research at Caylán. The first section of this chapter states the research goals and methodology. Following this is a view of the overall spatial organization at Caylán with statistical analysis of compound measurements. Finally, I describe each of the individual monumental residential compounds that are analyzed within this thesis.

Chapter 5 discusses the commonalities and differences seen between the monumental residential compounds. The first section notes trends between the building structures, and entrance patterns. I then address the link to other sites in Nepeña Valley, and the possibility of a complex urbanized social structure. This section provides a more complete and concise analysis of Caylán.

Finally in Chapter 6, the overall results discussed in chapters 4 and 5 are reviewed. This chapter mentions the final inferences made about the monumental residential compounds coming from theories discussed within Chapter 2. I conclude with the implications this research has within the broader archaeological community with the analysis of residential space in an urban setting.

CHAPTER 2:
COMMUNITY, SPACE, AND THE ARCHAEOLOGY OF THE RESIDENTIAL ARCHITECTURE OF SPACE

The architectural space within a built environment can reflect social organization and complexity. This chapter contemplates the connection between space and social organization, both within the social concept of a household and the larger construction of an urban center. Specifically, residential architecture can show the complexity between and within the domestic groups. Focusing on the urban core, neighborhoods or districts can show the delineation of residential groups based upon corporate or kinship organization.

2.1 Space and Social Organization

Spatial syntax reflects social organization and complexity of a community. Hillier and Hanson (1984:48) define syntax as "combinatorial structures" that becomes patterns that form a system for the "artificial world." Spatial syntax is then the various artificial patterns arranged by certain ideals expressed by a society (Hillier and Hanson 1984:48). Thus space is continuously shaped by social structure, which can be viewed through architectural remains (Lévi-Strauss 1963; Moore 1996:10-11). The spatial remains are also a useful way to classify groupings through time, place, and societal differences. Location, density, and cultural variation can all be deduced through the differences in spatial use and development (Hillier and Hanson 1984:26-27).

The social organization of residences parallels social structure, and can then in turn influence or perpetuate social norms. The design and use of buildings in this way can represent locations used for affirmation, negotiation and reproduction of social identity. Hanson (1998:13) states, "houses articulate relations between social groupings, not individuals, and so most

dwellings, however simple, are already elaborations of the elementary building." This means that a residence when built already contains aspects of the social ideology. This can be referenced through social class and changes in groupings such as neighborhoods (see section 2.3) (Hanson 1998:13-14).

Architecture in this sense is multivariable as individuals form it, yet the architecture contains symbolic meaning, which is then perpetuated within the community through the existence of the built structure (Smith 2003:86-87). Moore (1996:15) states, "Buildings as cultural constructs are imbued with symbols…the nature of the symbols informed prehistoric societies about the basis of social order." Shanks and Tilley (1987:97-99) state that material culture should be viewed as part of social construction. As pointed out by Rapoport (1982:181): "Environments both reflect communication and modulate it, channel it, control it, facilitate it, inhibit it. Both environments and communication are culturally variable; the nature, intensity, rate, and direction of interaction and withdrawal, is also related to it." Tying into Moore (1996) and Shanks and Tilley (1987), this shows the importance of the built environment, and how it is clearly connected to social constructions. The location, size, layout, and building materials can all potentially be analyzed to further comprehend the social variables of interaction, dominance, and avoidance (Rapoport 1982:181-183).

These ideas on the correlation between space and society form the theoretical framework from which this thesis is based. Specifically, I am focusing on Hillier and Hanson's (1984) work on spatial syntax. Spatial syntax as mentioned previously allows for a geometric and/or mathematical representation on the interior structure of residential architecture (see section 5.2 and 5.3).

2.2 Household Archaeology: Households as Domestic Space

The importance of household archaeology originated with the processual paradigm. Households were treated as indicators of social change, comparative to larger units of social interaction, and indicators of status (Bermann 2014:22-23; Pluckhahn 2010; Sabloff and Ashmore 2001:22). After the 1980s, alternative strategies were formulated as part of the postprocessualist movement. Instead of viewing them as reflecting the larger social structure, households were studied for a better understanding of people's agency in the past. Studying the identity, specifically gender and ethnicity, of individuals within a household became a counter focus. Both processual and postprocessual viewpoints are still utilized (Pluckhahn 2010).

Households are significant units of study within archaeology due to their relatively distinct presence within the archaeological record (Bermann 2014:19). Hirth (1993: 21) gives three main reasons towards the popularity and importance of household archaeology in anthropology. He states that archaeologists have realized that households are the "fundamental unit of organization" and since they exist in most societies, households grant a comparative framework for studying different cultures (Hirth 1993:21). Also, according to Wilk and Rathje (1982), the changes in household organization can bridge the gap in theoretical discussions. In this way, it becomes a "mid-level theory gap" and allows for broader assumptions to be made. Instead of only focusing on the artifact assemblages (i.e., what is present at the site) larger implications can be made. For instance, social stratification, economic variability and social structure of households based on room function. Economic and ecological processes are all articulated at the household level, and so can show directly the adaptation of social groups (Wilk and Rahje 1982).

To understand household archaeology, the household must be defined. The definition of a household however is complex. First, a household does not directly equate family unit. Before 1970, the term was utilized to distinguish families from residential units. However, the kinship system was still the focus, and thought to directly determine the dynamics of residential arrangements. In this way, households were by-products of the kinship system, with social rules dictating the residential group structure (Ashmore and Wilk 1988:2-3). A group of people cooperating economically daily and living together within a single structure qualified as a household (Wilk and Rathje 1982).

Furthermore, evolutionary theory determined that households were continuously shrinking from joint patriarchal family units to the nuclear family units (Engels 1970:123). Engels (1970:137) states that the family or household changed from a community venture into an individual or private affair. This was caused by the rise in monogamous marriage, and private property as well as the presence of a more economically driven society (Netting et al 1984:xiv-xv). This insinuated that more modern societies would have a household containing a nuclear unit. Evolutionary thoughts continued to be prevalent within the academic literature until the 1970s (Ashmore and Wilk 1988). With further ethnographic research and study, the evolutionary view of the household was deemed too linear and simplistic (Netting et al 1984:xviii). As noted by Netting et al. (1984:xviii-xix): "Research has shown the lack of any natural evolutionary stages through which family structure, economic conditions, and urbanization change together and in the same direction."

In the beginning of household archaeology, one of the major points of contention was the definition and view of households by archaeologists (Pluckhahn 2010). Prehistoric archaeologists often viewed the household in a processual manner. The household was seen as

the basic building block for the overall social formations, and the beginning level for understanding the changes made within in the culture at the temporal, spatial and social scales (Pluckhahn 2010). Pauketat (2001) was just one of several scholars that argues against this approach. He states that this viewpoint reduces the value of the household. Households become static for the sake of cross-cultural comparisons, and uniform for better understanding (Pauketat 2001). Tringham (1991:101) agrees and states that households become "faceless, genderless, categories" when reduced to building blocks of a larger societal structure. Wilk (1989:26) makes the point that households are not autonomous building blocks when he write that "households are always connected to each other, and penetrated by other affiliations through age, kinship, gender and class" (Wilk 1989:26).

Hendon (1996) provides a commentary on the archaeological approach towards the institution of domestic labor. She highlights the need for further exploration into the social actors that create or form households. The relationships and demographics within the household can show the possible differences or divisions based on gender, age, social role, and power (Hendon 1996; Pluckhahn 2010). She claims that the "prehistoric and ancient household must be seen as politicized as the modern one" (Hendon 1996: 55). This helps bring about more focus into agency, gender roles, and practice theories when approaching the household archaeologically (Pluckhahn 2010). Pluckhahn (2010:341) notes that specifically archaeologists studying in the Southeastern United States have moved towards an "archaeological reconstruction of pasts *with* households" rather than the "archaeology *of* households." However, archaeologists still utilize the evolutionary approach, with the household representing the basic social unit, while others move towards households as having their own agency (Pluckhahn 2010).

Specifically focusing on Mesoamerica, Carballo (2011) states that household archaeology contains five main themes including (1) the importance of households, (2) how households were used to show social identity, (3) domestic roles within social integration and status differentiation, (4) household status competition, and (5) transformation of domestic life. Theses themes fall into the idea that households are not just residences, but potential social tools and social identifiers (Carballo 2011).

Recently, anthropologists have also begun to separate the term household from kinship. Instead, households are determined to be "elemental social units in the organization of the multiple activities carried out within a society" (Ashmore and Wilk 1988:3). Bender (1967) states that households are distinctly different from families. Families imply a kinship relationship, while households could be communal living depending on the cultural context. He also addresses the fact that cross culturally, many societies that contained groups living communally beneath a single structure would qualify as separate households due to their lack of cooperation daily in any type of economic activity (Bender 1967). Also, the term "household" directly relates to a geographic organization and placement of a residence, not the inhabitants of that residence (Bender 1967; Yanagisako 1979). Ashmore and Wilk (1988) define a household as a primary social unit in communities. Wilk (1991) highlights the importance of viewing them as "activity groups" within a society. Hammel (1980: 251) states that households are "the smallest grouping with the maximum corporate function." In this sense, households serve as a site of production, consumption, co-residence, and reproduction.

The varying ideas on the definition of a household make research difficult between temporal and cultural groups. Pluckhahn (2010) notes a disparity between prehistoric and historic archaeologists on the definition of households. This gap between the two temporal

groups leads to a lack in communication. Thus, comparative studies between historic and prehistoric households are declining (Pluckhahn 2010).

Wilk and Rathje (1982) highlight three elements that make up a household. The first element is social. This covers the social interactions between household members, as well as household demographics. The second element is material. The material element focuses on possessions, activities, structures, and production. Finally, the third element is behavioral, which is the "activities it performs" (Wilk and Rathje 1982:618). However, they also stress that cross-culturally, there are four main categories of function: "production, distribution, transmission, and reproduction" (Wilk and Rathje 1982: 621). That is the limit, according to Wilk and Rathje (1982), of the cross-cultural comparison. Households vary depending on their stages of cultural context, organization, lineages, corporations, neighborhoods, lineages, and task groups. These factors also influence the function of a household and its effect or influence within a community (Wilk and Rathje 1982).

Pluckhahn (2010) also notes common themes studied within household archaeology. He has six themes studied specifically in the Southeastern United States, although he also notes that they appear to be common themes throughout the archaeology of households. These themes are: "production and consumption, status differentiation, agency and power, gender, ritual and symbolism, and identity and ethnicity" (Pluckhahn 2010:334). Hirth (1993:23) further notes that the economic and geographic environment determines the variation between households. Thus, households with similar environments and geography will likely have similar social structures.

2.2.1 Production, Consumption, Distribution, and Transmission

Household production at its most intrinsic value is the activity of gaining resources or increases the value of a resource (Wilk and Rathje 1982). Wilk and Rathje (1982) define the processes of production, consumption, distribution and transmission as the main activities performed in all households, and so define the sphere of function of the household. Production reflects the organization of work cycles, complexity of a task and complementary tasks performed within a society (Hagstrum 2001; Wilk and Rathje 1982). Production and consumption often go together due to the idea of supply and demand. Understanding which portion of society consumed a product and which was producing a product leads to a better understanding of the society as a whole (Vaughn 2004).

Distribution is defined as the movement of resources, either into exchange networks or into concentrated areas. There is diversity in how the various resources are managed, and distributed or pooled into one household. However, the presence of distribution can be found cross-culturally, and often ties into production (Wilk and Rathje 1982). Transmission, on the other hand, involves the transfer of distribution rights, roles and property. Instead of focusing on the distribution of artifacts, transmission follows social movements. The movement between social circles, and the arrangement of property and rights within a culture can be seen for instance through inheritance traditions (Wilk and Rathje 1982). Finally, reproduction focuses on the rearing of children within a society. This can show relative importance of children within the social structure (Wilk and Rathje 1982).

Melissa Hagstrum (2001) discusses household production in Chaco Canyon society in the Southwestern United States. Using a “bottom up” approach, she looks at the organization of technology for the household tasks of farming, architecture, craft and cooking. Through her

analysis of household activities, Hagstrum (2001) endeavors to understand the social and economic organization on a broader scale within the Chaco Phenomenon. Hagstrum's (2001) argument centers on the household being autonomous. Although households during the Chaco phenomenon were not completely self-sufficient, they did produce their own basic resources and relied on exchange networks to fulfill any gaps within their production. Hagstrum (2001) highlights the production of agriculture, crafts, and time scales for each within the seasonality of the site. She suggests the presence of multiple households that potentially strove for autonomy but did follow reciprocity exchanges based on necessity and the presence of specialized craft production.

Kevin J. Vaughn (2004) also uses household archaeology when looking at the production and consumption of Nasca pottery in Peru. Focusing on the Early Nasca (ca. A.D. 1-450) at the site of Marcaya, Vaughn (2004) looks at the production of polychrome Nasca pottery and the evidence of polychromes in both high and low status households, with the shape varying based upon status. His idea challenges the previous assumption that polychrome pottery was predominantly utilized by the elite as prestige-goods. Archaeological excavations at Marcaya found the use of polychrome pottery abundant at all patio groups, with a higher concentration found in the two larger patios, which are presented as higher-status households. The presence of polychrome pottery in every household suggests that it was significant to daily life, and held importance in Nasca society (Vaughn 2004). Through the household excavations and evaluations, Vaughn (2004) discovered that the distribution and consumption of polychrome pottery among the Nasca was more intricate than previously assumed.

Both of the above studies represent how household archaeology can lead to a potentially broader understanding of culture. The arrangement of artifacts within a site, the type of artifact,

and the distribution of said artifact can all lead into middle theories on transportation, economic and social frameworks surrounding the artifact distribution, production, and consumption. Reproduction is not as easily studied within archaeology without ethnographic accounts, because archaeology focuses on the material culture.

2.2.2 Household Architecture

Societal interpretations about households are not only attributed to artifact assemblages, but also feature elements such as architecture. Fisher (2009) utilize the theory of spatial syntax from Hillier and Hanson (1984) to determine the interaction of the built environment with social structure. Spatial syntax is the grammar of space, and uses the floor plans of built structures to formulate numerical representations of access (Hillier and Hanson 1984). Fisher (2009) uses this method to show how the built environment reflects and perpetuates social ideals. Within household archaeology, this method can be applied to consider and understand the relationship between the built form of the household and social structure.

Charlton (1969) for instance takes a household archaeological approach to look at architecture in the Teotihuacán Valley, Mexico. Although he uses the term "house," the implications of house types are considered in a broader context. Charlton (1969) uses the notable change of house structures from small, simple constructions to more elaborate and complex units to show a change in the community. Basing the theory on the idea that extended family households require a larger structure and more specific arrangement of rooms, Charlton (1969) hypothesizes that residences evolved from single family structures to corporate kin groups. Hypothetically, each family would have its own set of rooms in an apartment-like structuring. Charlton (1969) also suggests a rise in economic stability with the introduction of agriculture.

This would account for the resources necessary to sustain large family units within a limited space.

Charlton (1969) is just one example of how architecture alone could contribute to further analysis of household structures. Garth Bawden (1982) takes a similar stance when considering residences at Galindo (ca. A.D. 600-750), a late Moche site located in Moche Valley, Peru. The residences at Galindo are extensive and spread across the lower slopes of Cerro Galindo. The variation in this instance was not in function, but instead in size, shape, and material content. The variations were noted to correspond to specific locations within the entirety of the site (Bawden 1982). Bawden (1982) concludes that the social organization at Galindo relied on the separation of centers of economic, residential, and corporate integration. The results of this study show that the Moche settlement pattern at Galindo was divided into at least three social classes that were separated by residential location, and access to economic locations (Bawden 1982).

These two studies are two examples where household archaeology predominantly relies upon settlement patterns and architectural formations to infer the larger social structure. Households and household organization can reflect social factors that in turn show the adaptations of the community towards physical and cultural environments. Bawden (1982) and Charlton (1969) utilize the presence of household architectural forms to explore social diversity and change.

2.3 Urbanism and Neighborhoods

Manzanilla (1997:5) defines an urban society as "one with complex division of labor, that is, the existence of specialists in activities different from the production of subsistence goods; with institutions that coordinate economic processes; and finally, with specialists in decision-

making that live in an urban center providing specific services to the surrounding region, such as the distribution of a variety of goods." Marcus and Sabloff (2008) state that urbanism is an area with dense populations, differentiated social groups, and interactions with other settlements. Attarian (2003:184) states, "Urban sites form the context in which increased social complexity, craft specialization, and population migration combine to effect the trajectory of cultural change and development."

V. Gordon Childe (1957) pioneered studies on ancient urbanism. Although he did not focus as much on the individual but instead on larger changes seen in the archaeological record. Childe (2003:140-179) explored the change that lead to urbanism. Childe (2003) utilized known archaeological materials, predominantly from Mesopotamia, Egypt and the Indus Valley, to formulate his Urban Revolution model. His idea is that changes in means and modes of production led to increasing importance of status goods and the need to acquire exotic materials. For him, urban centers and their elites detached from primary subsistence activities drove the development of ancient civilizations. Childe cites the rise in monumental architecture, metallurgy, wheel-made pots, weapons, and jewelry seen within the archaeological record as evidence for a change in status. The presence of these items suggests classes of artisans, priests, and warriors, which would require a larger social diversity than previously seen. Also, the items were usually located within a confined geographical area. This leads to the consideration of a rise into urbanism through social stratification, rise in populations, and spatial presence (Childe 2003: 140-145). Childe's (2003) general idea of social change is valid, however his hypothesis was that this occurred rapidly rather than over thousands of years, which has since been proven incorrect.

A factor commonly seen in conjunction with urbanism is coordinated systems of redistribution and reciprocity (Service 1975:172-173). Flannery and Coe (1966) discuss the

significance of redistribution within a city or urban center. According to Flannery and Coe (1966), redistribution networks within an urbanized location are more necessary than reciprocity between urban centers. Manzanilla (1997) agrees with this viewpoint and states that the presence of redistribution in conjunction with complex administration was necessary for early urban formation in Mesopotamia. Redman (1978:335-338) states that redistribution was necessary to alleviate tensions between groups within an urban center. He terms this as "positive feedback" with the elite administrations and temples supported through the redistribution (Redman 1978:335-338). Following Redman's (1978) reasoning, Hole (1974) hypothesizes that the amount of surplus is equal to the degree of stratification. So, redistribution, surplus production, and social stratification found within urban landscapes are all interrelated.

Generally, urbanism can be linked to social stratification and segregation located within settlement patterns. The structure of settlement patterns in an urban landscape can reflect these segregations, such as through neighborhoods. Smith (1975) states that a neighborhood is a form of cohesion between groups. Thus, the level of cohesion, with cohesion defined as the group solidarity, is reflective of a sociospatial group, or neighborhood (Smith 1975:145). The level of "friendly social interaction" is the most common dimension of measurement with the definition of a neighborhood (Smith 1975:144). Working with this understanding of a neighborhood, the level of neighborhood can be configured as level of daily social interaction. Within the consideration of households (section 2.2) is the larger idea of community, as addressed previously. This idea of community between households often extends into consideration of neighborhoods and urban settlements.

Through focusing on the placement of households within the urban structure, the structural formation of the community and the society can be inferred. Hanson (1998:13) states,

"houses articulate relations between social groupings, not individuals, and so most dwellings, however simple, are already elaborations of the elementary building." This means that the household when built already contains aspects of the social idea. This can be referenced through social class and changes in groupings such as neighborhoods. The residences can thus change in use or patterning over time depending on the variations in societal changes (Hanson 1998:13-14).

Pacifico's (2014:30) work on neighborhoods at El Purgatorio in the Casma Valley, Peru highlights the adaptation of household archaeology and community archaeology into 'neighborhood archaeology.' Neighborhood archaeology, according to him, focuses on the residential and social groupings of a group at a larger scale. This grants a broader and more comprehensive view of the social differences between neighborhood groups, and the variations found within neighborhood groups (Pacifico 2014:page number). Smith (1975) defines the neighborhood as a social unit based upon the patterns and frequency of daily interaction between neighbors. Here, I use Smith and Novic's (2012) definition of neighborhood as the basic spatial units of face-to-face daily interactions. The solidarity or cohesion between neighborhood groups can vary (Smith 1975).

Similar to modern neighborhoods, social groups usually gather in a specific manner. For example, the Maya located in Mesoamerica are considered to have various spatial arrangements that could be indicative of a specific political or social order (Ashmore and Sabloff 2002; Blackmore 2011). Ashmore and Sabloff (2002) hypothesize that the placement of structures within the Mayan sites Copán, Tikal, Xunantunich, Sayil and Seibal is indicative of cosmological and/or political standing within the spatial order. The placement of buildings, open spaces, and monuments suggest central planning (Ashmore and Sabloff 2002). Ashmore and Sabloff (2002) hypothesize that the spatial ordering embodies the political and social dynamics at each site.

Each settlement displays unique layouts based upon the cultural and political influences found within that area. Thus, the various planning methodologies found within the Maya sites are suggestive of urban planning, and possibly distinct separations between areas based upon cultural and political differences. Blackmore (2011) expands upon this idea, specifically within the site of Chan, Belize. She hypothesizes the presence of neighborhoods at Chan, with identity and status defined through ritual. Both Blackmore (2011) and Ashmore and Sabloff (2002) note marked areas within an urban core that signify different social or political groups.

These examples of urban settlements and neighborhoods are used to set the stage for the spatial analysis of residential compounds at the site Caylán, Peru. It is one of the early urban settlements within Peru, and as such marks a change towards higher density populations, social stratification and potentially craft specialization.

2.4 Space within Anthropology and Archaeology

Spatial information in archaeology is integral to understanding archaeological data and spatial theories regarding human behavior (Clarke 1977:1-3). Scholars have been investigating the relevance of the built environment since the Enlightenment Period (Harris 2001). Some contributing scholars were Claude Lévi-Strauss and Émile Durkheim in the twentieth century. Lévi-Strauss (1963: 283-295) was an anthropologist that formulated the hypothesis that understanding social space and social time are integral to understanding social structures. Durkheim (1984: 132-139) was a sociologist that also believed that structures influenced moral phenomena. Thus, the variety of groupings form a social cohesion that Durkheim (1984: 132-139) likens to segments of a larger organism.

Lévi-Strauss and Durkheim helped shape the investigation of the built environment anthropologically and hence archaeologically. They were some of the early forerunners into the field, and attempted to further understand the impact and reasoning behind both social changes and the environment (Harris 2001; Trigger 2006). Another scholar, Willey (1956) wrote "Prehistoric Settlement Patterns in the New World" which was a peak within the field of both settlement studies and more generally spatial patterning (Clarke 1977:3). Following Willey (1956), social and spatial patterning within archaeology continued to be studied with a wider range of understanding. The following two scholars within anthropology and archaeology were mentioned due to their contributions within spatial analysis and research topics, which parallel those within this thesis.

Cowgill (1997) focuses on the social and cultural developments at the site Teotihuacán. This analysis utilizes the spatial variation seen at Teotihuacán, specifically with the divisions of enclaves, barrios (i.e., neighborhoods) and districts. Cowgill (1997) notes a change within the structuring of the city over time, which could point to differences in the social and cultural environment at Teotihuacán. His research shows how built structures can reflect potential changes in the social structure.

Morton et al (2012) take a spatial syntax approach to the communities seen at Teotihuacán. They note a grid pattern aligned with the Street of the Dead and multi-apartment compounds. They utilize spatial analysis to hypothesize the level of community present within the city and between compounds. Morton et al (2012) hypothesize that the urban center at Teotihuacan had competing forms of interaction between spatial units (i.e., compounds).

CHAPTER 3:
BACKGROUND: RESIDENTIAL ARCHITECTURE IN THE ANCIENT ANDES

The construction of space in the Andes moved from regional ceremonial centers towards a more urbanized landscape during the Formative Period (1600-0 B.C.). This heralded the development of new architectural themes. The move towards urbanism brought about a change in the social and architectural landscape. This can be seen through the addition of compound-like structures within an urban setting. This chapter describez the developments in architecture in the Andes over time, with an emphasis on urbanized centers, and thus show the transition that lead to the site of Caylán in the Nepeña Valley. Also, this section highlights late prehistoric societies, especially the Chimú, which are noted for having walled off compounds as common residences.

3.1 Andean Coastal Geography

This thesis focuses on the north-central coast of Peru, located within the Central Andes. The coastal region consists of the lower portion of river systems stemming from the Andean Mountains to the land along the Pacific coast (Willey 1971). This region is characterized by dry desert landscapes. The cold waters of the Humbolt or Peru Current limit precipitation from the Pacific and provide nutrients for the coastal fisheries (Thiel et al 2007). However, during periods of El Niño Southern Oscillation or ENSO warmer waters intrude coastal Peru and disrupt local fisheries (Thiel et el 2007). El Niño also causes the rain patterns to change. Instead of raining upon the highland ranges, the desert is flooded (Veblen et al 2007). This rapid flooding leads to short periods of plant growth, and potential migration of lower river systems. It also presages a shortage of water in later months due to rainfall shortages in the upper mountain headwaters (Veblen et al 2007).

3.2 Andean Chronology

There are two primary chronological frameworks utilized within Andean archaeology. The first system focuses on "horizons" with intermediate periods between them (Lanning 1967; Rowe 1962). This unit of dating was originally formulated by Max Uhle, based on geologic stratigraphic methods, and then expanded upon by John Rowe (1962) and Edward Lanning (1967). The second system is based on the work of Luis Lumbreras (1974) and is called the Formative chronology. This thesis will utilize both types of dating, with a primary focus within the "horizon" method of dating due to its prevalence within Anglophone literature.

3.3 Architectural Comparisons

The Early Horizon Period is usually associated with the rise of the Chavín Phenomenon centered at the ceremonial center of Chavín de Huantar located in the north-central highlands of Peru. The phenomenon comes from shared symbols, beliefs, and ritual items that are noted as Chavin (Burger 1988, 1992). Research suggests that the spread of Chavin lead to a homogeneous community between the north-central coastal and highland groups (Burger 1988, 1992).

Recent research at Chavín de Huantar questions the site chronology (Kembel and Rick 2004; Rick et al. 2011) and suggests that the center heydays were during the late Initial Period (but see Burger and Salazar 2008). At the same time, research away from the Chavín core indicates that some groups rejected or avoided its religious iconographies. It appears to be the case for some groups in the lower Nepeña during the Early Horizon (Chicoine 2006). Here, groups nucleated around the center of Caylán in what is preliminarily interpreted as a multi-tiered regional polity (Chicoine and Ikehara 2014).

After the Early Horizon, there is noted presence of more urbanized settlements with residential compounds. Some examples of urban residential compounds can be seen through the Moche (A.D. 100-800), Wari (A.D. 600-1000) and Chimú (A.D. 1000-1470). These three cultural phenomena are some of the best researched within Peruvian archaeology. To add to the comparison, I consider Teotihuacán. Teotihuacán is located in Mesoamerica and is an early city with residential compounds. The four cultural comparisons below will add further information on how compounds can be analyzed and what has been discovered about the compound construction

3.3.1 Moche

The Moche culture developed on the north coast between A.D. 100 and 800 (Chapdelaine 2011). The capital of the southern Moche world was Huacas de Moche, consisting of Huaca de la Luna and Huaca del Sol in the Moche Valley (Hastings and Moseley 1975). Moche is traditionally split into northern and southern spheres geographically, with the northern sphere along the north coast and the southern Moche along the central coast (Chapdelaine 2011). The northern and southern portions of the Moche are distinguished based on differences in ceramic styles, mainly the presence of fine-line drawings in the North (Quilter 2002). Moche occupation was split into phases. Moche Phase I to Moche Phase V, also based on ceramic style differences. However when discussing the Moche, the northern portion is usually what is discussed as more research has occurred there.

The Moche are usually associated with royal tombs, economic specialization, palaces, warrior elite, roads and regional polities. They are recognized as one of the early state societies within South America (Stanish 2001). However, they were not under a homogeneous rule, but

instead are hypothesized to contain distinct, perhaps peer polities. The exact size or extent of those polities is still heavily debated (Quilter 2002) The Moche is usually determined archaeologically through their distinctive ceramic style. Their ceramics were produced through molds and hand-sculpted, usually with a cream-to-white slipped surface that was decorated (Quilter 2002). Their ceramics remain one of the best ways to distinguish a Moche archaeological site.

Besides their earthenware, the Moche culture is also known for their large ceremonial structures. These ceremonial structures, called *huacas*, were monumental adobe mounds with platforms and marked rooms (Swenson 2011). Research has primarily focused on the *huacas* and palace structures at Moche sites (Chapdelaine 2011). Research into the urban sectors of Moche archaeological sites is still ongoing. However, Santiago Uceda Castillo (2010) noted that the urban area at Huacas de Moche, between Huaca de la Luna and Huaca del Sol, are centers of specialized production with defined multifunctional residential areas.

Van Gijseghem (2001) analyzes several compounds located at Huacas de Moche and concludes that they were multifamily households based on multiple hearths located in one compound. Also, he notes the presence of a possible public patio area within two of the compounds (AA#7 and AA#9). The presence of wall abutments and circulation patterns also indicates subunits within the Moche compounds (Van Gijseghem 2001). Van Gijseghem's (2001) final conclusions show that the Moche had clear variances in size, internal segmentation, quality of construction, and occupations within the compounds. The variations between size and function are hypothesized to show the level of importance in the economic structure found at Huacas de Moche (Van Gijseghem 2001).

At the Moche site of Pampa Grande, residences were described as multi-roomed with a single access point usually into the kitchen area, segregating the other rooms from direct entrance (Shimada 1994:168-169). Shimada (1994:168-169) noted that the rooms within the compounds were usually utilized for one form of production or activity. Thus, the rooms were utilized for specific functions.

3.3.2 Wari

The Wari Empire of Peru extended along the central and southern highlands and coast of Peru and dates to the Middle Horizon (A.D. 600-1000) (Cook 2004:146). The capital of Wari was the city Huari located in the Ayacucho Valley in the central highlands of Peru (Isbell 1997). The Wari state architecture is typically characterized by orthogonal cellular construction, which is most notable in the provincial centers (Isbell 1991; Isbell and Vranich 2004).

The enclosures found at the archaeological site of Huari typically consisted of a central courtyard surrounded by room complexes. The size varied based on the enclosure, and many of the buildings were several stories tall. The central courtyard was typically ringed by benched platforms. Also, entrances into the smaller rooms off of the courtyard were small doorways, which would have limited the light within those areas (Isbell and Vranich 2004:173-180). Isbell (1997:201-203) further suggests that the enclosures found at Huari were originally planned as an open space in the form of a square or rectangle, which was then subdivided into smaller patio structures.

Lumbreras (1979:161) suggests that Huari was further separated into various precincts by occupation specialization. This hypothesis stemmed from the frequency of pottery production supplies, such as molds and prepared clay, found localized within one section of the site

(Lumbreras 1979:161). This would place each sector of Huari as a different division of specialized production.

3.3.3 Chimú

The Chimú or Chimor Kingdom (A.D. 1000-1470) extended along the northern coast of Peru, with the capital city of Chan Chan in the Moche Valley. The capital of the Chimú is Chan Chan, and is most notably recognized for its monumental palaces or ciudadelas. The palaces of Chan Chan are typically divided into three different spatial areas: the private residential area, the storage or administrative area, and the public plazas (Topic 2003). Long corridors that control the procession into various locations within the palace separate each room. Also, all of the rooms and corridors are highly decorated with friezes (Klymyshyn 1982:119-123).

Other Chimú sites are considered peripheral or rural settlements that contributed to the prosperity of Chan Chan. These settlements were divided into barrios, or neighborhoods, that were self-contained. Narrow alleys connected the structures together. Most residences noted were stated as single-family, based on the kitchen patterning (West 1970). The residences were structured in a block pattern similar to that seen within the elite residences of Chan Chan. However, they lack the size and complexity of elite residences (Topic 1982: 147-175, West 1970).

3.3.4 Teotihuacán

Teotihuacán is located in current day Mexico in the Teotihuacán Valley. The Teotihuacán Period lasted from A.D. 200-700, and was the largest city in Mesoamerica at that time. The total population at its peak was approximately 125,000 people, with the area of 18 sq km (Sanders and

Webster 1988). Two of the largest temples in Mesoamerica are located in the center of the city of Teotihuacán (Saunders and Webster 1988). These temples, called the Moon Pyramid and Sun Pyramid, are located along the religious precinct on the Street of the Dead, which runs through the center of the urban core (Sanders and Webster 1988).

There were several sectors or neighborhoods organized throughout the city that reflect corporate organization (Manzanilla 2012:55-56). Saunders and Webster (1988) state that surface surveys of Teotihuacán show that roughly a third of the city demonstrate craft specialty with foreign commerce. Charlton (1969) notes the presence of enclosed residences consisting of two to three conjoined rooms, a patio, and platform as early as A.D. 500. Kurtz (1987) however states that urbanization began to occur between 300-100 B.C. Manzanilla (1996) references the use of multifamily compounds from the third century A.D. onward. She terms these compounds as "apartment" compounds that generally consist of multiple rooms situated around an open space, such as a courtyard. Each household group was found to hold different activities, which would imply household specialization (Manzanilla 1996). Saunders and Webster (1988) further state that each apartment style residence probably held between 30-100 people.

Teotihuacán was organized into different sectors based on corporate groups (Manzanilla 2012:55-56). Manzanilla (2012:57-61) notes craft sectors, administrative sectors, ritual sectors, and residential sectors. Neighborhoods located in the various sectors held three basic forms Manzanilla (2012:59). The first is three-temple plazas with apartment rooms surrounding the plazas. The second is multiethnic neighborhoods with a central noble controlling the area. Finally, the third are the elite neighborhoods with specific architecture for each function, such as festivities, residence, ritual, and craft activities (Manzanilla 2012:59).

3.4 Research in the Nepeña Valley

Julio C. Tello conducted the first documented archaeological excavations in Nepeña Valley in 1933. Tello excavated two sites, Punkurí (late Preceramic) and Cerro Blanco (late Initial Period). After Tello's research, Donald A. Proulx surveyed Nepeña Valley twice in 1967 and 1971 and located over 200 archeological sites (Proulx 1968, 1973). Building on Proulx's research, Richard Daggett (1984, 1987) documented an additional 143 sites. After Daggett, research did not continue again in Nepeña Valley until 2002 with the excavation of Cerro Blanco by Shibata (2010). The excavation at Cerro Blanco was helpful in updating the chronology for the Initial Period and the Early Horizon specific to Nepeña Valley. Shibata (2011) suggests four phases of dating within Nepeña Valley based upon changing patterns of monumental architecture, ceramic styles and religious images. The first phase is Huambocayán (1500-1100 B.C.), the second Cerro Blanco (1110-800 B.C.), the third Nepeña (800-450 B.C.) and the fourth Samanco (450-150 B.C.).

The Cerro Blanco phase corresponds to the construction of U-shaped temples with conical adobes, and polychrome murals. The site Cerro Blanco, during the Cerro Blanco phase, along with the archaeological sites Huaca Partida, and Pañamarca appear to have similar religious monuments with iconography focused on supernatural beings similar to those seen in Cupisnique, Sechín, and Chavín images (Shibata 2010:302-303). The following Nepeña phase phase resulted in the abandonment of the temple structures.

Contrary to the sites of Cerro Blanco, Pañamarca and Huaca Partida, dense settlements began to appear on the valley margins during the Nepeña and Samanco phases. Some of these sites include Caylán, Samanco, Sute Bajo, and Huambacho. There is a lack in documentation on the Huambocayán and Cerro Blanco phase residential architectures. However, the enclosed stone

compounds during the Nepeña and Samanco phases do not appear to be present elsewhere (Ikehara and Chicoine 2011).

Archaeological excavation in Nepeña Valley continued with David Chicoine (2006, 2011) at Huambacho during 2003 and 2004. Huambacho dates to the Early Horizon, and consists of walled compounds with attached plazas, colonnaded patio rooms, small roofed areas, and storerooms (Chicoine 2006). Huambacho is relatively limited in size, and hypothesized as a small elite center, which contrasts with the larger center of Caylán. Caylán's spatial and architectural patterning parallels Huambacho, but consists of over 40 walled compounds. Chicoine and Ikehara (2014) hypothesize that Caylán served as a core structure with the periphery settlements of Huambacho, Sute Bajo, and Samanco. More recently, Matthew Helmer (2014) carried out excavations at the coastal settlement of Samanco, an Early Horizon fishing town interpreted as a specialized maritime community. Finally, excavations in the lower valley have also focused on the Early Intermediate Period occupation at Pañamarca (Rengifo 2014; Trever 2013; Trever et al. 2013).

CHAPTER 4:
RESEARCH AT CAYLÁN

This chapter addresses the research goals, methodology and results. The following sections outline the prevailing methods used in the analysis of the main monumental residential compounds, the structure of each of the compounds themselves, and the overall spatial organization seen at Caylán. Much of the site has been destroyed through the construction of a reservoir, modern roads, fortification walls, farmland, and El Niño events. Thus, the structures discussed below are just a sample of what Caylán probably was in the past. There is evidence that more compounds probably existed that is no longer visible today.

4.1 Previous Research at Caylán

Caylán consists of an urban nucleus containing cross-cutting streets, walled compounds, and delimiting access ways. The southeastern portion of the site is marked by low hills with a lagoon and marshlands. Fields extend north of the marshlands. The southern portion contains a narrow ridge called Cerro Cabeza de León. It contains the fortress, irregular walled compounds, and terraces. The remainder of the site is delimited by Cerro Caylán, which forms a V-shape around the pampa floor containing the urban sector (Chicoine and Ikehara 2010).

Archaeological excavations occurred at Caylán during the field seasons of 2009 and 2010. Methods included pedestrian survey, vertical and horizontal area excavations, test pits, and the clearing of looters pits with more than 500 sq m excavated. Excavations of Compounds A plaza and Compound E were completed during the field seasons (see section 4.3). Survey showed dense ceramic scatters, plant remains, mixed midden areas, and over 200 grinding stones distributed throughout the site. Lithic materials include large anvils (batanes), two-handed grinding stones (chungos) and smaller hammers (manos). The distribution of grinding stones

throughout the site suggests both the importance of plant processing and the extent of the activity in the urban sector.

Ceramic materials located at the site include rim sherds, body sherds, sherd discs, pan pipes, and spindle whorls. The dominant vessel form based on the rim and body sherds are the neckless jars, or ollas, which were predominantly cooking or storage vessels. Decoration on the ceramic material includes incision, zoned punctate, stamped circle-and-dot, painted, textile impressed, and appliqué. Overall, the ceramic style coincides with the Nepeña and Samanco phases and with other sites excavated in the valley (Chicoine 2010; Shibata 2011).

The walled compounds were erected based on the orthostatic building technique (Chicoine 2006). This consisted of large stone slabs erected vertically in the soil, creating a chamber for fill and debris. Rocks were then placed horizontally within a mud mortar matrix on top of the large stone slabs (Brennan 1982; Cotrina et al 2003; Mujica 1975). A plaster of fine clay mix was then added to form a smooth façade. Friezes are noted as wall decoration in the plaza of Compound A, but no other decoration has been discovered.

4.2 Research Questions and Methodology

The research questions utilized for this thesis focus on the spatial variability and distinction as they apply to the housing compounds at Caylán. The specific questions asked are:

What is the spatial organization of residential compounds?

How does spatial variability inform on social composition of co-residential groups?

How does spatial variability inform on potential degrees of functional/occupational specialization?

Within the entire urban complex, does the spatial organization and location of access ways and streets suggest the existence of neighborhoods?

Cayán was mapped and excavated by members of the Proyecto de Investigación Arquelógica Caylán (PIAC) directed by David Chicoine and Hugo Ikehara, during the 2009 and 2010 field seasons. The excavations included test pits and block excavations at two compounds (Compounds A and E). The compounds are hypothesized to be residential based on architectural and material remains (see section 4.3). Due to the large extent of the site, these excavations only represent a limited view of the potential variability that could have existed during Early Horizon at Caylán. However, for the purpose of this thesis, the presented data will be considered as indicative of Early Horizon Caylán.

During the month of July 2014, I conducted field research at Caylán with Dr. David Chicoine. Utilizing surface survey, we walked the site and compared the architectural remains visible at the surface including walls, entrances, and streets. The surface structures consist of predominantly wall fall, which created rough outlines of entrances, rooms, and streets. These new details were added to the past maps, created during the 2009 and 2010 field seasons. Dr. David Chicoine added the new additions from surface survey to the computer maps within AutoCAD. AutoCAD is a software program used to draw and represent three-dimensional or two-dimensional structures. The map is currently more comprehensive, and accurate.

Using the AutoCAD maps, I analyzed the plazas and compound structures, focusing on the size of the compounds, size of the plazas, entrance locations, compound shape, and plaza formation (i.e., bench locations and height, presence of columns). To obtain this information, I took area measurements with AutoCAD of the compounds, and the rooms within each

compound. I also individually drew the compounds within AdobeIllustrator to clarify the physical structures and provide clearer visual reconstructions (see section 4.3).

Also, I completed a gamma analysis of the compounds, following theory of analysis as presented by Hillier and Hanson in *The Social Logic of Space* (1984). Gamma analysis is used to understand internal structuring of individual constructions within a settlement (Hillier and Hanson 143:1984). This method of analysis highlights the connections between the external and internal variables of a structure. Cell diagrams represent the internal separations within a structure and the link between the internal rooms. Gamma analysis gives a clear view of accessibility to rooms (Hillier and Hanson 1984:143-163). Gamma analysis is a descriptive and quantitative method utilized to consider spatial variability within a built environment. The spatial variability is expressed through linked cell diagrams, which show permeability patterns. The amount of links between the cells (i.e., rooms) in the diagrams is representative of the number of accesses connecting cells. This representation shows ringiness and spatial depth of constructions. Ringiness is the distribution of rooms, and the boundaries of control between each room. Essentially, ringiness is the number of route options available to reach a space. Spatial depth is the amount of space necessary to enter any a room. The level of segregation or integration thus determines the spatial depth (Hillier and Hanson 1984). The spatial depth and ringiness represents the private and public space, and how that space is arranged.

Using this data, I also consulted with the known excavation data from 2009 and 2010. The research methods allow for a comprehensive view of Caylán based on the visible surface. The areas provide information on size variability within and between compounds. The gamma analysis shows the spatial syntax of each compound. Finally, the individual maps of each compound address the actual shape and visible structure.

CHAPTER 5:
RESULTS AND SPATIAL ANALYSIS

This chapter presents the cumulative results from the mapping operations at Caylán from 2009 to 2014, with individual maps for each of the compounds. The organization and categorization of the compounds are described, with maps of the site marking the geographic placement of the structures in relation to each other. Finally, gamma analyses present the spatial variations seen in Caylán and between especially well preserved compounds.

5.1 Spatial Organization at Caylán

Our team was able to recognize and delimit a total of 43 residential compounds within the urban core of Caylán. The compounds were assigned a letter(s) of the Greek alphabet in chronological order of discovery. Individual compounds were delineated based on access patterns; each compound having a single, independent entrance connected to one of the dozen streets at the site. The total area of each compound was taken as well as the area of each room and plaza that could be determined (see section 5.2). All measurements are expressed in meters, and a basic descriptive statistics was run to determine standard deviation, mean, median, maximum and minimum for the plaza and compound areas. There are only 42 clear plazas, as Compound AI lacks a visible plaza structure.

Table 1: Complete Compound Measurements

Compound Measurements (in square meters)	
Small Compounds	
Compound K	**Area**
TOTAL	1691.228
Plaza	482.992
Room 1	366.31
Room 2	35.565
Room 3	132.101

(Table 1 Continued)

Room 4	410.149
Room 5	70.705
Room 6	61.908
Compound L	**Area**
TOTAL	1661.572
Plaza	596.003
Room 1	514.171
Room 2	80.739
Room 3	73.782
Room 4	247.277
Compound Q	**Area**
TOTAL	1845.08
Plaza	689.684
Mound	112.063
Room 1	144.63
Room 2	235.345
Room 3	3.912
Room 4	59.251
Room 5	82.223
Room 6	41.465
Room 7	74.56
Compound R	**Area**
TOTAL	1550.875
Plaza	778.769
Room 1	255.067
Room 2	28.136
Room 3	65.684
Room 4	62.789
Room 5	39.674
Compound S	**Area**
TOTAL	720.473
Plaza	301.8
Room 1	51.513
Room 2	190.288
Room 3	47.141
Room 4	48.308
Room 5	22.862
Compound T	**Area**
TOTAL	1271.93
Plaza	533.716

(Table 1 Continued)

Room 1	76.259
Room 2	279.972
Room 3	50.487
Room 4	81.908
Room 5	60.516
Compound U	**Area**
TOTAL	1813.443
Plaza	234.053
Room 1	185.727
Room 2	43.466
Room 3	36.851
Room 4	643.173
Room 5	96.546
Room 6	88.966
Room 7	35.653
Room 8	22.198
Room 9	45.374
Room 10	14.163
Room 11	14.793
Room 12	110.933
Room 13	67.16
Compound AA	**Area**
TOTAL	968.191
Plaza	525.381
Room 1	457.942
Compound AB	**Area**
TOTAL	1643.196
Plaza	723.881
Room 1	55.463
Room 2	40.313
Room 3	274.452
Room 4	69.976
Room 5	21.487
Room 6	23.438
Room 7	36.186
Room 8	44.14
Room 9	231.036
Compound AH	**Area**
TOTAL	1791.65
Plaza	614.091

(Table 1 Continued)

Room 1	495.105
Room 2	91.73
Room 3	122.678
Room 4	175.171
Room 5	80.603
Compound AI	**Area**
TOTAL	649.696
Room 1	84.9
Room 2	238.121
Room 3	166.697
Room 4	20.1
Room 5	65.341
Room 6	50.453
Compound AL	**Area**
TOTAL	1037.571
Plaza	392.52
Room 1	262.36
Room 2	59.554
Room 3	46.574
Room 4	147.384
Room 5	94.876
Compound AM	**Area**
TOTAL	1341.015
Plaza	568.643
Room 1	184.334
Room 2	92.349
Room 3	259.519
Room 4	47.627
Room 5	95.419
Compound AN	**Area**
TOTAL	1220.877
Plaza	517.467
Room 1	272.616
Room 2	149.611
Room 3	165.098
Medium Compounds	
Compound E	**Area**
TOTAL	2800.297
Plaza	1169.478

(Table 1 Continued)

Room 1	103.525
Room 2	164.768
Room 3	42.933
Room 4	78.684
Room 5	13.147
Room 6	6.55
Room 7	212.263
Room 8	186.882
Room 9	224.28
Room 10	36.519
Room 11	100.035
Room 12	47
Room 13	27.089
Room 14	13.766
Room 15	101.787
Room 16	12.733
Room 17	13.975
Room 18	15.81
Compound G	**Area**
TOTAL	3284.96
Plaza	1109.507
Room 1	313.065
Room 2	301.596
Room 3	61.908
Room 4	68.935
Room 5	249.867
Room 6	173.747
Room 7	279.877
Room 8	71.702
Room 9	88.449
Room 10	94.453
Room 11	77.643
Room 12	7.803
Room 13	11.856
Room 14	11.106
Compound J	**Area**
TOTAL	3710.309
Plaza	1851.022
Room 1	1467.049
Room 2	368.685

(Table 1 Continued)

Compound M	**Area**
TOTAL	2130.034
Plaza	1178.91
Room 1	483.51
Room 2	148.742
Room 3	19.687
Room 4	33.124
Compound N	**Area**
TOTAL	3872.638
Plaza	1100.592
Room 1	427.799
Room 2	144.691
Room 3	475.956
Room 4	209.963
Room 5	55.41
Room 6	26.49
Room 7	38.533
Room 8	480.334
Room 9	387.051
Room 10	78.944
Room 11	17.078
Room 12	52.836
Room 13	17.906
Room 14	65.764
Compound O	**Area**
TOTAL	2366.241
Plaza	610.658
Room 1	233.1
Room 2	40.991
Room 3	27.717
Room 4	29.823
Room 5	473.391
Room 6	53.459
Room 7	79.419
Room 8	299.117
Room 9	54.648
Room 10	26.687
Room 11	188.075
Compound P	**Area**
TOTAL	2468.283

(Table 1 Continued)

Plaza	637.098
Room 1	145.274
Room 2	106.695
Room 3	163.754
Room 4	69.345
Room 5	250.726
Room 6	253.225
Room 7	71.796
Room 8	15.083
Room 9	168.095
Room 10	166.993
Room 11	200.221
Room 12	49.836
Compound V	**Area**
TOTAL	2587.612
Plaza	1197.585
Room 1	419.368
Room 2	508.7
Room 3	278.964
Compound Y	**Area**
TOTAL	2271.359
Plaza	849.824
Room 1	427.219
Room 2	408.87
Room 3	361.785
Compound AC	**Area**
TOTAL	2454.506
Plaza	1440.717
Room 1	113.205
Room 2	85.275
Room 3	111.314
Room 4	77.821
Room 5	87.486
Room 6	87.589
Room 7	35.267
Room 8	199.492
Room 9	86.341
Room 10	21.401
Room 11	23.242
Compound AD	**Area**

(Table 1 Continued)

TOTAL	3065.657
Room 1	1237.125
Room 2	171.324
Room 3	315.965
Room 4	85.189
Room 5	52.633
Room 6	45.793
Room 7	39.958
Room 8	48.198
Room 9	329.031
Room ?	232.264
Compound AE	**Area**
TOTAL	3971.614
Plaza	1129.95
Room 1	140.06
Room 2	91.748
Room 3	344.297
Room ?	2117.667
Compound AF	**Area**
TOTAL	2030.945
Plaza	1043.58
Room 1	137.369
Room 2	12.476
Room 3	15.483
Room 4	36.439
Room 5	18.407
Room 6	12.673
Room 7	9.405
Room 8	111.709
Room 9	50.721
Room 10	31.639
Room 11	189.229
Room 12	166.832
Compound AJ	**Area**
TOTAL	2314.599
Plaza	848.598
Room 1	120.496
Room 2	41.303
Room 3	25.751
Room 4	22.862

(Table 1 Continued)

Room 5	76.906
Room 6	275.974
Room 7	529.588
Room 8	281.048
Room 9	59.33
Room 10	88.57
Compound AK	**Area**
TOTAL	3201.514
Plaza	1107.455
Room 1	65.978
Room 2	76.43
Room 3	72.591
Room 4	616.41
Room 5	80.294
Room 6	128.632
Room 7	304.252
Room 8	227.547
Room 9	202.805
Compound AO	**Area**
TOTAL	2229.696
Plaza	530.05
Room 1	1686.956
Compound AQ	**Area**
TOTAL	2393.666
Plaza	208.983
Large Compounds	
Compound A	**Area**
TOTAL	4836.893
Plaza	1908.449
Room 1	183.396
Room 2	38.562
Room 3	34.329
Room 4	47.097
Room 5	69.91
Room 6	389.344
Room 7	49.117
Room 8	48.666
Room 9	184.122
Room 10	456.534

(Table 1 Continued)

Room 11	131.483
Room 12	307.56
Compound B	**Area**
TOTAL	5693.693
Plaza	1733.283
Room 1	220.134
Room 2	79.386
Room 3	17.153
Room 4	29.517
Room 5	239.671
Room 6	85.555
Room 7	27.532
Room 8	21.35
Room 9	628.969
Room 10	578.905
Room 11	277.984
Room 12	37.823
Room 13	41.583
Room 14	160.299
Room 15	566.661
Room 16	266.772
Room 18	41.922
Room 19	72.954
Room 20	92.494
Compound H	**Area**
TOTAL	4300.875
Plaza	1052.996
Room 1	501.441
Room 2	311.521
Room 3	32.057
Room 4	44.826
Room 5	40.017
Room 6	58.384
Room 7	235.748
Room 8	210.883
Room 9	172.948
Room 10	79.231
Room 11	34.842
Room 12	54.041
Room 13	114.418

(Table 1 Continued)

Room 14	521.162
Room 15	264.671
Room 16	141.086
Room 17	65.939
Room 18	36.691
Compound I	**Area**
TOTAL	4892.945
Plaza	2945.109
Room 1	69.727
Room 2	299.484
Room 3	620.816
Room 4	324.973
Room 5	48.069
Room 6	100.442
Room 7	29.896
Room 8	24.727
Room 9	36.468
Room 10	23.371
Room 11	34.168
Compound W	**Area**
TOTAL	4193.025
Plaza	888.916
Room 1	1119.466
Room 2	66.078
Room 3	140.634
Room 4	42.44
Room 5	110.491
Room 6	218.415
Room 7	298.619
Room 8	112.653
Room 9	609.217
Room 10	106.551
Room 11	82.749
Room 12	87.97
Room 13	30.377
Compound X	**Area**
TOTAL	4193.214
Plaza	1547.66
Mound	21.564
Room 1	937.574

(Table 1 Continued)

Room 2	166.218
Room 3	29.922
Room 4	51.979
Room 5	259.472
Room 6	65.593
Room 7	30.195
Room 8	361.816
Room 9	221.235
Room 10	31.534
Room 11	52.529
Room 12	30.267
Compound Z	**Area**
TOTAL	4213.411
Plaza	2374.513
Room 1	1843.593
Compound AG	**Area**
TOTAL	5988.736
Plaza	1731.614
Mound	1113.545
Room 1	976.427
Room 2	520.559
Room 3	518.313
Room 4	414.422
Room 5	291.788
Compound AR	**Area**
TOTAL	4671.068
Plaza	403.127
Room 1	181.14
Room 2	404.864
Room 3	3541.436
Miscellaneous Compounds	
Compound D	**Area**
TOTAL	7762.287
Plaza	2196.09
Mound	187.683
Room 1	279.352
Room 2	168.423
Room 3	128.206
Room 4	282.366

(Table 1 Continued)

Room 5	110.616
Room 6	243.234
Room 7	127.488
Room 8	347.765
Room 9	209.417
Room 10	440.504
Room 11	38.917
Room 12	45.425
Room 13	27.958
Room 14	15.056
Room 15	90.016
Room 16	247.534
Room 17	106.62
Room 18	184.894
Room 19	78.886
Room 20	461.838
Room 21	127.323
Room 22	53.225
Room 23	18.608
Room 24	17.878
Room 25	23.57
Room 26	16.582
Room 27	21.551
Room 28	99.145
Room 29	247.333
Compound F	**Area**
TOTAL	8290.386
Plaza/Washed Area	5317.946
Room 1	360.918
Room 2	23.627
Room 3	28.064
Room 4	25.883
Room 5	468.718
Room 6	341.23
Room 7	153.222
Room 8	79.145
Room 9	616.422
Room 10	67.553
Room 11	76.392
Room 12	77.779

(Table 1 Continued)

Room 13	24.955
Room 14	14.902
Room 15	60.746
Compound AP	**Area**
TOTAL	7421.736
Plaza	524.079
Room 1	762.776
Room 2	969.989
Room 3	894.136
Room 4	78.31
Room 5	210.057
Room 6	223.225
Room 7	353.268
Room 8	162.12
Room 9	512.06
Room 10	582.383
Room 11	564.629
Room 12	136.3
Room 13	220.616
Room 14	117.428
Room 15	146.717
Room 16	657.094

Table 2: Total Compound Area Descriptive Statistics

Total Compound Area Descriptive Stats (in meters)	
Mean	3088.8
Median	2454.5
Maximum	8467.5
Minimum	797.8
Standard Deviation	1878.9

Table 3: Total Plaza Area Descriptive Statistics

Plaza Area Descriptive Stats (in meters)	
Mean	1115.1
Median	869.4
Maximum	5317.9
Minimum	209
Standard Deviation	902.5

Due to the large size of the site, for descriptive purposes, the compound structures were divided into four distinct categories based on their overall area, and subcategories based on the number of distinct subdivisions. The four size categories are large, medium, small and miscellaneous. The miscellaneous compounds are considered outliers, due to the level of deterioration in a majority of the compounds. This makes these compounds uncertain in area, and so could potentially be more than one compound. The miscellaneous category ranges between 7000 and 9000 sq m, and consists of three compounds. The large category contains the fewest amount of compounds (n=9) that range between 4000 and 6000 sq m. Medium compounds are 2000 to 4000 sq m with 17 compounds. Finally, small compounds range from 700 to 2000 sq m, and contains 14 compounds.

There are 3 miscellaneous compounds. Compounds D, F and AP are noted as outside of the large, medium and small categories due to the lack of preservation, with only Compound D being well preserved. The plaza size and rooms of Compounds F and AP are uncertain due to destruction, and their composition was determined by visual estimation in the field. The location of Compounds F and AP are towards the western portion of the site next to each other, while Compound D is located in the northeastern portion. There is the possibility that there were more compounds within the area of Compound D that were larger, however this cannot be determined due to the overall destruction of the site. Overall compound area size commonly correlates to the plaza area.

The ratio of the total area of a compound (sq m) compared to the area of the corresponding plaza (sq m) and the corresponding number of subunits for a compound are displayed below (Table 4). The average ratio of total compound area to plaza area remains relatively consistent between the size groupings (Table 5).

Table 4: Total Compound Size Compared to Plaza Size and Subunits

Compounds	Total (sq m)	Plaza (sq m)	Subunits (n)	Ratio plaza/total
Small				
K	1691.228	482.992	2	0.285586568
L	1661.572	596.003	1	0.358698269
Q	1845.08	689.684	1	0.373796258
R	1550.875	778.769	1	0.502148142
S	720.473	301.8	1	0.418891478
T	1271.93	533.716	1	0.419611142
U	1813.443	234.053	3	0.12906554
AA	968.191	525.381	n/a	0.542641896
AB	1643.196	723.881	2	0.440532353
AH	1791.65	614.091	3	0.342751654
AI	649.696	84.9	n/a	0.130676501
AL	1037.571	392.52	2	0.378306641
AM	1341.015	568.643	1	0.424039254
AN	1220.877	517.467	1	0.423848594
Medium				
E	2800.297	1169.478	3	0.417626416
G	3284.96	1109.507	3	0.33775358
J	3710.309	1851.022	n/a	0.498886211
M	2130.034	1178.91	1	0.553470039
N	3872.638	1100.592	3	0.284196974
O	2366.241	610.658	3	0.258070923
P	2468.283	637.098	n/a	0.258113839
V	2587.612	1197.585	n/a	0.46281475
Y	2271.359	849.824	n/a	0.374147812
AC	2454.506	1440.717	n/a	0.586968213
AD	3065.657	118.494	3	0.038652074
AE	3971.614	1129.95	n/a	0.2845065
AF	2030.945	1043.58	3	0.513839617
AJ	2314.599	848.598	2	0.366628518
AK	3201.514	1107.455	2	0.345916026
AO	2229.696	530.05	3	0.23772299
AQ	2393.666	208.983	n/a	0.087306667
Large				
A	4836.893	1908.449	2	0.39456093
B	5693.693	1733.283	3	0.304421577
H	4300.875	1052.996	3	0.24483297
I	4892.945	2945.109	2	0.60190928
W	4193.025	888.916	n/a	0.211998736

(Table 4 Continued)

X	4193.214	1547.66	n/a	0.369086815
Z	4213.411	2374.513	n/a	0.563560735
AG	5988.736	1731.614	n/a	0.289145155
AR	4671.068	403.127	n/a	0.086302961
Miscellaneous				
D	7762.287	2196.09	4	0.282917908
F	8290.386	5317.946	n/a	0.641459396
AP	7421.736	524.079	n/a	0.070614072

Table 5: Compound Total Area Ratio

Ratio plaza/total area average	
Small	0.369328164
Medium	0.347448303
Large	0.340646573
Misc	0.331663792

Moving beyond the plaza and overall compound sizes, there is also significant variation in room sizes. Excluding the plaza from the overall room sizes comparisons, the deviation between sizes in all compounds is relatively high (Table 6). This shows that the rooms differentiate between each other to a large degree. Also the average rooms size for each of the compound categories increases between the size of the compounds (Table 7). To further see the room size variation, three other tables (Tables 8, 9,10) show groupings of rooms called patios, medium rooms and small rooms. The patios were named such due to their relatively large size, and placement within the compound structures (see maps in Appendix). The other rooms were given categories based on their size within the compound. Only compounds with rooms that could be delimited on the maps were used.

Table 6: Compound Room Size Descriptive Statistics

Compound Room Size Descriptive Stats (in square meters)		
Small Compounds	**Average**	**Standard Deviation**
Compound K	179.456	165.363
Compound L	228.992	206.342
Compound Q	91.627	76.488

(Table 6 Continued)

Compound R	90.27	93.459
Compound S	72.022	67.092
Compound T	109.828	95.928
Compound U	108.077	167.794
Compound AB	88.499	94.921
Compound AH	193.057	172.785
Compound AI	104.269	82.079
Compound AL	122.15	87.563
Compound AM	135.85	85.081
Compound AN	195.775	66.995
Medium Compounds		
Compound E	77.875	73.835
Compound G	129.429	111.707
Compound J	917.867	776.661
Compound M	171.266	216.073
Compound N	177.054	183.017
Compound O	136.948	146.006
Compound P	138.42	77.032
Compound V	402.344	115.81
Compound Y	399.291	33.752
Compound AC	84.403	49.991
Compound AD	255.748	362.682
Compound AE	673.443	969.018
Compound AF	66.032	66.437
Compound AJ	152.183	162.859
Compound AK	197.215	178.133
Large Compounds		
Compound A	161.677	147.804
Compound B	183.509	200.948
Compound H	162.217	154.082
Compound I	146.558	191.376
Compound W	232.743	307.508
Compound X	186.528	261.086
Compound AG	544.302	259.135
Compound AR	1375.813	1878.817
Miscellaneous Compounds		
Compound D	146.887	127.392
Compound F	161.304	190.644
Compound AP	411.944	295.827

Table 7: Room Size Descriptive Statistics by Compound Categories

Room Size Descriptive Stats by Compound Categories (in meters)		
	Average	**Standard Deviation**
Small Compounds	123.903	123.163
Medium Compounds	175.58	260.798
Large Compounds	237.331	412.532
Miscellaneous Compounds	221.173	228.185

Table 8: Room Sizes for Small Compounds

Room Sizes for Small Compounds (in square meters)						
Compound	**Patios**		**Medium Rooms**		**Small Rooms**	
	Room	**Area**	**Room**	**Area**	**Room**	**Area**
Compound K	Room1	366.31	n/a	n/a	Room 2	35.565
	Room 4	410.149			Room 3	132.101
					Room 5	70.705
					Room 6	61.908
Compound L	Room 1	514.171	Room 4	247.277	Room 2	80.739
					Room 3	73.782
Compound Q	Room 2	235.345	Room 1	144.63	Room 3	3.912
					Room 4	59.251
					Room 5	82.223
					Room 6	41.465
					Room 7	74.56
Compound R	Room 1	255.067	n/a	n/a	Room 2	28.136
					Room 3	65.684
					Room 4	62.789
					Room 5	39.674
Compound S	Room 2	190.288	n/a	n/a	Room 1	51.513
					Room 3	47.141
					Room 4	48.308
					Room 5	22.862
Compound T	Room 2	279.972	n/a	n/a	Room 1	76.259
					Room 3	50.487
					Room 4	81.908
					Room 5	60.516
Compound AB	Room 3	274.452	Room 4	69.976	Room 1	55.463
	Room 9	231.036			Room 2	40.313
					Room 5	21.487
					Room 6	23.438
					Room 7	36.186
					Room 8	44.14

Table 9: Room Sizes for Medium Compounds

Room Sizes for Medium Compounds (in square meters)						
Compound	**Patios**		**Medium Rooms**		**Small Rooms**	
	Room	**Area**	**Room**	**Area**	**Room**	**Area**
Compound E	Room 7	212.263	Room 1	103.525	Room 3	42.933
	Room 9	224.28	Room 2	164.768	Room 4	78.684
			Room 8	186.882	Room 5	13.147
			Room 11	100.035	Room 6	6.55
			Room 15	101.787	Room 10	36.519
					Room 12	47
					Room 13	27.089
					Room 14	13.766
					Room 16	12.733
					Room 17	13.975
					Room 18	15.81
Compound G	Room 1	313.065	Room 7	279.877	Room 3	61.908
	Room 2	301.596	Room 5	249.867	Room 4	68.935
			Room 6	173.747	Room 8	71.702
					Room 9	88.449
					Room 10	94.453
					Room 11	77.643
					Room 12	7.803
					Room 13	11.856
					Room 14	11.106
Compound M	Room 1	483.51	Room 2	148.742	Room 3	19.687
					Room 4	33.124
Compound O	Room 5	473.391	Room 1	233.1	Room 2	40.991
			Room 8	299.117	Room 3	27.717
			Room 11	188.075	Room 4	29.823
					Room 6	53.459
					Room 7	79.419
					Room 9	54.648
					Room 10	26.687
Compound AF	Room 11	189.229	Room 1	137.369	Room 2	12.476
	Room 12	166.832	Room 8	111.709	Room 3	15.483
					Room 4	36.439
					Room 5	18.407
					Room 6	12.673
					Room 7	9.405
					Room 9	50.721

(Table 9 Continued)

					Room 10	31.639
Compound AJ	Room 7	529.588	Room 6	275.974	Room 1	120.496
			Room 8	281.048	Room 2	41.303
					Room 3	25.751
					Room 4	22.862
					Room 5	76.906
					Room 9	59.33
					Room 10	88.57
Compound AK	Room 4	616.41	Room 8	227.547	Room 1	65.978
	Room 7	304.252	Room 9	202.805	Room 2	76.43
					Room 3	72.591
					Room 5	80.294
					Room 6	128.632

Table 10. Room Sizes for Large Compounds

Room Sizes for Large Compounds (in square meters)						
Compound	**Patios**		**Medium Rooms**		**Small Rooms**	
	Room	**Area**	**Room**	**Area**	**Room**	**Area**
Compound A	Room 6	389.344	Room 1	183.396	Room 2	38.562
	Room 10	456.534	Room 9	184.122	Room 3	34.329
	Room 12	307.56	Room 11	131.483	Room 4	47.097
					Room 5	69.91
					Room 7	49.117
					Room 8	48.666
Compound B	Room 9	628.969	Room 1	220.134	Room 2	79.386
	Room 10	578.905	Room 5	239.671	Room 3	17.153
	Room 15	566.661	Room 11	277.984	Room 4	29.517
			Room 14	160.299	Room 6	85.555
			Room 16	266.772	Room 7	27.532
					Room 8	21.35
					Room 12	37.823
					Room 13	41.583
					Room 18	41.922
					Room 19	72.954
					Room 20	92.494
Compound H	Room 1	501.441	Room 2	311.521	Room 3	32.057
	Room 7	235.748	Room 8	210.883	Room 4	44.826
	Room 14	521.162	Room 9	172.948	Room 5	40.017
			Room 13	114.418	Room 6	58.384

(Table 10 Continued)

			Room 15	264.671	Room 10	79.231
			Room 16	141.086	Room 11	34.842
					Room 12	54.041
					Room 17	65.939
					Room 18	36.691
Compound I	Room 2	299.484	Room 4	324.973	Room 1	69.727
	Room 3	620.816			Room 5	48.069
					Room 6	100.442
					Room 7	29.896
					Room 8	24.727
					Room 9	36.468
					Room 10	23.371
					Room 11	34.168

Table 11. Room Size Descriptive Statistics by Compound Categories and Room Categories

Room Size Descriptive Stats by Category (in square meters)		
	Average	**Standard Deviation**
Small Compounds		
Patios	306.31	103.734
Medium Rooms	153.961	89.018
Small Rooms	54.225	25.26
Medium Compounds		
Patios	346.765	153.667
Medium Rooms	192.554	67.49
Small Rooms	45.184	31.235
Large Compounds		
Patios	464.239	137.653
Medium Rooms	213.624	65.692
Small Rooms	48.466	21.635

As shown in the above tables, the room sizes vary both by overall size category of the compounds and within the compounds themselves. The miscellaneous category was not analyzed in this due to only Compound D having clear rooms. The rather high number for the standard deviation in all categories shows that the rooms are largely different from each other, even when divided into patios, medium and small rooms. The average room size however is relatively

similar between the small rooms, with it actually being a little larger in the small compounds. This goes against the room size increase that correlates with the overall increase in compound size for the patio rooms and medium rooms.

5.2 Description of Compounds

This thesis focuses on the main residential compounds and exclude the three non-residential structures, the empty lots or the most destroyed areas of the site. The three outlying structures are the Fortress, which is located on the southeastern ridge of the site, the Corral, which is in the eastern portion, and the Main Mound Complex, which is towards the southeast. Each of these structures do not fit the general patterning seen in the monumental residential compounds, and so are considered outliers and potentially utilized for different purposes. There are also empty lots, which will be labeled on the maps, but not fully discussed here. Finally, Plaza C also called Plaza Major is not considered part of a residential compound. Plaza Major is hypothesized to be the main open plaza for the urban core. This evidence stems from its larger size and paved, gravel floor.

This section details the composition of each of the 43 residential compounds with maps and measurements of each compound. I wish to test the hypothesis that these compounds represent neighborhoods. In order to do so, I reconstruct the internal spatial organization of each compound. The scale, complexity, and spatial syntax are used as proxies for the size and composition of the social groups using the different compound areas. The area of the compounds, and the observable divisions (called rooms in the tables) are all marked. Room measurements only account for the room size, with corridors and walls not represented. Compound data are organized by size category and the number of subdivisions present, not

geographically. The figure below shows the geographic references for the compounds based on quadrant locations (NE, SE, NW, SW). These locations were chosen based on the main north-south and east-west streets in the urban complex. All corresponding maps are located in the Appendix.

5.2.1 Small Compounds

No Subdivisions

Compound L is located adjacent to the Main Mound complex in the southeastern portion of the site. It has been heavily destroyed through looting, so the wall structures are only roughly known. The overall surface area of the compound is 1661.572 sq m. The plaza size for Compound L is 596.003 sq m. In the plaza, there are three benched structures (1.5 m tall) along the more northern, southern, and eastern sides with columns located along the northern bench. Entrance into Compound L from the street is located on the northern corner of the plaza. Access into the rest of the compound is located in the southern corner of the plaza, which leads into a corridor that connects to the first room, or patio (514.171 sq m) in its southeastern corner. A baffled entrance on the northwestern corner of the patio then leads into the northern corner of room 2 (80.782 sq m). Other entrances are not clear from the surface. However, room 3 (73.782 sq m) could potentially have entrances into rooms 2 and 4. This room is also notable for the pillars along all four sides of the room, built two meters from the walls. Room 4 could potentially connect to any of the other rooms, excluding the plaza.

Table 12: Compound L Measurements

Compound L	**Area (sq m)**
TOTAL	1661.572
Plaza	596.003
Room 1	514.171

(Table 12 Continued)

Room 2	80.739
Room 3	73.782
Room 4	247.277

Compound Q is located in the southeastern quadrant. The overall surface area of the compound is 1845.08 sq m, with the ratio of plaza to total surface area of 0.374. A baffled entrance into the compound from the street is located on the northern corner of the main plaza. The main plaza is 689.684 sq m and has two bench structures, one to the north (1.5 m) and one to the east (2 m). There is also a later structure located along the eastern side of the plaza, and a staircase on the southern end of the western bench. In the southern corner if the plaza, a baffled entrance leads into the southeastern corner of Room 2 (235.345 sq m). Room 1 (144.63 sq m) has no clear entrances, but potentially can connect to Room 2 and the main plaza. Included in Compound Q is a mound structure (112.063 sq m) that is 2 m tall, and has a small room (Room 3=3.912 sq m) located on the top of the structure. Leading from the mound is a series of terraced rooms (Rooms 4-7). These rooms are assumed to connect to the mound, and so to Compound Q, based on their proximity and lack of association to another structure.

Table 13: Compound Q Measurements

Compound Q	**Area (sq m)**
TOTAL	1845.08
Plaza	689.684
Mound	112.063
Room 1	144.63
Room 2	235.345
Room 3	3.912
Room 4	59.251
Room 5	82.223
Room 6	41.465
Room 7	74.56

Compound R is located towards the southwestern quadrant. The overall surface area of the compound is 1550.875 sq m, with the ratio of plaza to overall size at 0.502. The street entrance into this compound is a baffled entrance located on the northwestern corner of the main plaza. The main plaza is 778.769 sq m and has a bench along the southern side with columns. Against this bench, there is a later structure, which will not be considered part of the analysis. It is known as a later structure due to a difference in construction patterns. Leading from the southwestern corner of the plaza is an entrance into Room 1 (255.067 sq m). The access into Room 1 consists of a long corridor along the backside of the bench, which connects to a baffled entrance leading into northwestern corner of the room. Other entrances within this compound are unclear. However, presumably Room 1 has an entrance leading to Room 2 (28.136 sq m), which then opens up into Rooms 3 (65.684 sq m), 4 (62.789 sq m) and 5 (39.674 sq m).

Table 14: Compound R Measurements

Compound R	**Area (sq m)**
TOTAL	1550.875
Plaza	778.769
Room 1	255.067
Room 2	28.136
Room 3	65.684
Room 4	62.789
Room 5	39.674

Compound S is a small compound (720.473 sq m) located in the southwestern portion of the site. The street entrance leading into the compound is a long corridor, followed by a baffled entrance into the southwestern corner of the main plaza (301.8 sq m). This main plaza is benched with columns on the northern, southern and eastern sides. The entrance into further patio structures from the plaza is located in the northeastern corner of the plaza, and consists of a long corridor leading into the southeastern corner of Room 2 (190.288 sq m). Room 1 (51.513 sq m) does not have a clear entrance, but could connect to Room 2 or the main plaza. Rooms 3 (47.141

sq m), 4 (48.308 sq m), and 5 (22.862 sq m) are smaller rooms that could also connect into Room 2. Rooms 3 and 4 do connect to each other through a baffled entrance leading from the northern corner of Room 4 into the southeastern corner of Room 3.

Table 15: Compound S Measurements

Compound S	**Area**
TOTAL	720.473
Plaza	301.8
Room 1	51.513
Room 2	190.288
Room 3	47.141
Room 4	48.308
Room 5	22.862

Compound T is a small compound (1271.93 sq m) located in the southeastern quadrant. The street entrance into this compound is located in the eastern corner of the main plaza. The plaza has two separated benches along its northeastern edge that are each 1.5 m tall. Along the southeastern edge of the main plaza is Room 1 (76.259 sq m) which only connects to the plaza. This room is hypothesized as an annex for the plaza, since it does not connect to the other rooms. On the eastern corner of the plaza is a baffled entrance that leads into the northern corner of Room 2 (279.971 sq m). The other rooms (Rooms 4 and 5) potentially could connect to each other or to Room 2. There appears to be a corridor along the southwestern edge of Rooms 4 (81.908 sq m) and 5 (60.516 sq m), which could have connected them.

Table 16: Compound T Measurements

Compound T	**Area**
TOTAL	1271.93
Plaza	533.716
Room 1	76.259
Room 2	279.972
Room 3	50.487
Room 4	81.908
Room 5	60.516

Compound AM is a small compound (1341.015 sq m) located in the southwestern portion of the urban core. This compound is heavily damaged. The plaza (568.643 sq m) was determined based on its overall size in comparison towards the other rooms found within the compound, and lacks the presence of any bench structures. There are no entrances clear from the surface. Presumably, the main plaza would lead into Room 1 (184.334 sq m). The other rooms would then connect linearly for Rooms 1, 2 (92.348 sq m), and 3 (259.519 sq m). Rooms 4 (47.627 sq m) and 5 (95.419 sq m) could only connect to room 3 and potentially each other.

Table 17: Compound AM Measurements

Compound AM	**Area**
TOTAL	1341.015
Plaza	568.643
Room 1	184.334
Room 2	92.349
Room 3	259.519
Room 4	47.627
Room 5	95.419

Compound AN is a small compound (1220.877 sq m) located in the southeastern quadrant. There are no clear entrances into or within the compound. The main plaza is located towards the center of the compound with rooms located on the eastern and western ends of the plaza. Along the southern edge of the plaza is a bench (2 m). Three other rooms are associated with this compound. Two rooms are to the west (Rooms 1 and 2) and one to the east (Room 3) of the plaza. However, the damage done over time to the site does not allow for further delineation of rooms.

Table 18: Compound AN Measurements

Compound AN	**Area (sq m)**
TOTAL	1220.877
Plaza	517.467
Room 1	272.616

(Table 18 Continued)

Room 2	149.611
Room 3	165.098

Two Subdivisions

Compound K is a small compound (1691.228 sq m) in the southeastern portion of the site. It was partially destroyed by road construction and wall fall. The compound is reached by a corridor and baffled entrance into the southeastern corner of the plaza (482.992 sq m). The main plaza is benched (1 m) on the northeastern, northwestern and southwestern sides with a staircase in the northwestern bench. Entrances into the other six rooms of Compound K are not visible from the surface. Rooms 1 (366.31 sq m) and 4 (410.149 sq m) are hypothesized to be larger patio rooms that would serve as differing subdivisions within the compound. Thus, they would lead into their own sets of smaller rooms. Room 1 would then connect to Rooms 2 (35.565 sq m) and 3 (132.101 sq m). Room 4 would connect to Rooms 5 (70.705 sq m) and 6 (61.908 sq m).

Table 19: Compound K Measurements

Compound K	**Area (sq m)**
TOTAL	1691.228
Plaza	482.992
Room 1	366.31
Room 2	35.565
Room 3	132.101
Room 4	410.149
Room 5	70.705
Room 6	61.908

Compound AB is a small compound (1643.196 sq m) along the northeastern portion of the site. It has also been heavily destroyed over time. The entrance into the compound is located in the eastern corner of the main plaza (723.881 sq m). The main plaza has a benched area (1.5 m) on the southwestern edge with columns. Other entrances within the compound cannot be seen from the surface. However, Rooms 3 (274.452 sq m) and 9 (231.036 sq m) are hypothesized to

be the larger patio rooms and serve as markers for different subdivisions. Both of these larger patios could potentially connect to each other and the main plaza. Room 3 connects to Rooms 1 (55.463 sq m) and 2 (40.313 sq m). These smaller rooms could only connect to each other or to Room 3. The second subdivision begins at Room 9 and then leads into the remaining five rooms. It is currently unclear how these rooms would connect to each other or to Room 9.

Table 20: Compound AB Measurements

Compound AB	**Area (sq m)**
TOTAL	1643.196
Plaza	723.881
Room 1	55.463
Room 2	40.313
Room 3	274.452
Room 4	69.976
Room 5	21.487
Room 6	23.438
Room 7	36.186
Room 8	44.14
Room 9	231.036

Compound AL is a small compound (1037.571 sq m) located in the southwestern portion of the site. This compound is partially destroyed. There are no clear entrances between rooms or leading into the compound on the surface. The main plaza has a bench (80 cm) along the eastern wall. To the south of the plaza, there are two rooms (Rooms 4 and 5), while to the north there is a large patio (Room 1) that leads into smaller rooms (Rooms 2-3).

Table 21: Compound Measurements

Compound AL	**Area (sq m)**
TOTAL	1037.571
Plaza	392.52
Room 1	262.36
Room 2	59.554
Room 3	46.574
Room 4	147.384
Room 5	94.876

Three Subdivisions

Compound U is a small compound (1813.443 sq m) located directly north of Plaza B in the southeastern quadrant of the site. The street entrance into Compound U is uncertain, but appears to be located towards the southwestern portion of the plaza (Plaza-U). The entrance is baffled with a corridor leading to the street. The plaza area of this compound was determined by the presence of a bench structure along the northern wall. However, there is another larger room (Room 4), which potentially could be a future addition. There are columns present along the northeastern wall of Room 4 (643.173 sq m), would could serve as markers for future renovations, but there is not a current bench structure. The main plaza of this compound has two other entrances into other rooms, which are hypothesized as separate subdivisions. The northern corner of the plaza leads into Room 5 (96.546 sq m), which then connects to Rooms 6-11. The southeastern corner of the plaza leads into Room 1 (185.727 sq m), which then connects to Rooms 2 and 3. Finally, Rooms 12 and 13 are hypothesized to belong to their own subdivision with Room 4, as they are not clearly connected to the other two subdivisions and appear to belong to Room 4.

Table 22: Compound U Measurements

Compound U	**Area**
TOTAL	1813.443
Plaza	234.053
Room 1	185.727
Room 2	43.466
Room 3	36.851
Room 4	643.173
Room 5	96.546
Room 6	88.966
Room 7	35.653
Room 8	22.198
Room 9	45.374

(Table 22 Continued)

Room 10	14.163
Room 11	14.793
Room 12	110.933
Room 13	67.16

Compound AH is a small compound (1791.65 sq m) located in the southwestern portion of the site. There are no clear entrances into the compound, or into any of the rooms associated with this compound. The main plaza (614.091 sq m) has a bench structure on the western wall. There is a patio to the north of this plaza (Room 1) that has a bench structure along the northern wall. Room 1 (495.105 sq m) could potentially lead to Rooms 2 (91.73 sq m) and 3 (122.678 sq m). Rooms 4 (175.171 sq m) and 5 (80.603 sq m) are located along the southwestern portion of the compound.

Table 23: Compound AH Measurements

Compound AH	**Area**
TOTAL	1791.65
Plaza	614.091
Room 1	495.105
Room 2	91.73
Room 3	122.678
Room 4	175.171
Room 5	80.603

Unknown Subdivisions

Compound AA (968.191 sq m) is a small compound located on the northeastern corner of the site, near Compound Z. This compound has no clear entrances, and has been heavily destroyed. The only clearly defined structure is the main plaza, which contains one bench on the northwestern side. Room 1 (457.942 sq m) has been attributed to Compound AA based on its proximity to the plaza, and evidence of potential rooms that could have been part of a compound

structure. However, the constructions in Room 1 are not clear enough from the surface to be marked.

Table 24: Compound AA Measurements

Compound AA	Area
TOTAL	968.191
Plaza	525.381
Room 1	457.942

Compound AI is a small compound located along the southwestern potion of the site. There is no discernable plaza associated with this compound. Potentially, there could have been a plaza to the north. However, that area has been heavily destroyed, and there is an ancient street running between the rooms of Compound AI and the potential plaza. Thus, the potential plaza will not be counted within this compound structure. This compound then consists of six rooms, with no clear entrances into any of the rooms. However, the compound itself appears fairly linear with Rooms 1-3 leading into each other sequentially. Rooms 4-6 are the smaller rooms, which potentially could connect with each other, as well as with Room 3.

Table 25: Compound AI Measurements

Compound AI	Area
TOTAL	649.696
Room 1	84.9
Room 2	238.121
Room 3	166.697
Room 4	20.1
Room 5	65.341
Room 6	50.453

5.2.2 Medium Compounds

No Subdivisions

Compound M is a medium compound (2130.034 sq m) located in the southeastern quadrant of the site. The entrance into the compound is a long bended corridor that leads into the

southern corner of the main plaza (1178.91 sq m). The main plaza is benched on all four sides, with columns along the northwestern bench. The northwestern corner of the plaza contains a baffled entrance that leads into the northern corner of Room 1 (483.51 sq m). This would be the main patio room. Room 1 has a baffled entrance in the southern corner, which leads into the western corner of Room 2 (148.742 sq m). The southeastern corner of Room 2 then leads into Room 3 (19.687 sq m). Room 4 (33.124 sq m) does not have a clear entrance but could connect to either Room 3 or Room 2.

Table 26: Compound M Measurements

Compound M	**Area**
TOTAL	2130.034
Plaza	1178.91
Room 1	483.51
Room 2	148.742
Room 3	19.687
Room 4	33.124

Two Subdivisions

Compound AC is a medium compound (2454.506 sq m) located in the northeast portion of the site. The entrance into Compound AC is a baffled corridor leading into the southern corner of the main plaza. The main plaza (1440.717 sq m) has a bench along its western edge. There are no clear entrances within the compound from the surface. There are five rooms (Rooms 1-5) located at the northern end of the main plaza and six rooms (Rooms 6-11) located at the eastern end. Due to the difference in location relative to the plaza, the two groups of rooms are hypothesized as different subdivisions.

Table 27: Compound AC Measurements

Compound AC	**Area**	**Perimeter**
TOTAL	2454.506	211.517
Plaza	1440.717	152.193

(Table 27 Continued)

Room 1	113.205	43.006
Room 2	85.275	38.868
Room 3	111.314	43.807
Room 4	77.821	36.212
Room 5	87.486	37.879
Room 6	87.589	37.87
Room 7	35.267	23.922
Room 8	199.492	56.61
Room 9	86.341	37.335
Room 10	21.401	18.56
Room 11	23.242	19.361

Compound AJ is a medium sized compound (2314.599 sq m) located in the southwestern portion of the site. There are no discernable entrances from the surface leading into or within the compound. The main plaza (848.598 sq m) contains one bench on the western side, and three small rooms along the northern corner of the plaza. These rooms are grouped together into Room 1 (120.496 sq m) due to the mostly destroyed edges of the smaller rooms (estimated walls sown in map). Room 1 along with Room 2 (41.303 sq m) in the western corner of the plaza could potentially serve as annexes for the plaza. Room 6 (275.974 sq m) and Room 7 (529.588 sq m) are hypothesized as two different subdivisions. The subdivision leading with Room 6 includes three other smaller rooms (Rooms 3-5), and runs along the northwestern wall of the plaza. These smaller rooms are isolated from the smaller rooms attributed to the second subdivision. The second subdivision leads with Room 7 and includes three other rooms (Rooms 8-10). It runs along the northeastern wall of the main plaza.

Table 28: Compound AJ Measurements

Compound AJ	**Area**	**Perimeter**
TOTAL	2314.599	193.095
Plaza	848.598	117.318
Room 1	120.496	44.335
Room 2	41.303	26.686
Room 3	25.751	20.374

(Table 28 Continued)

Room 4	22.862	19.37
Room 5	76.906	35.096
Room 6	275.974	66.519
Room 7	529.588	94.342
Room 8	281.048	67.545
Room 9	59.33	30.914
Room 10	88.57	37.823

Compound AK is a medium sized compound (3201.514 sq m) located in the southeastern portion of the site. There are no clear entrances into the compound or between rooms within the compound. The main plaza (1107.455 sq m) contains a bench structure on the northwestern wall. There appear to be several corridors within this compound, but there are no clear thresholds or entrances. However, the presence of corridors suggests a more elaborate method of movement between rooms. Much of Compound AK is destroyed so several sections are estimated based on the remaining structures. The first subdivision of Compound AK is along the northern portion of the compound and begins with Room 4 (616.41 sq m). It contains five other rooms (Rooms 1-3, 5, 6). The second subdivision is located along the southern portion of the compound and consists of Rooms 7-9.

Table 29: Compound AK Measurements

Compound AK	**Area (sq m)**
TOTAL	3201.514
Plaza	1107.455
Room 1	65.978
Room 2	76.43
Room 3	72.591
Room 4	616.41
Room 5	80.294
Room 6	128.632
Room 7	304.252
Room 8	227.547
Room 9	202.805

Three Subdivisions

Compound E (2800.297 sq m) is located towards the southwestern quadrant of the urban core. This compound is relatively known as it has been excavated. Horizontal excavations (*Unidad de Excavación* 6 or UE6) cleared 164 sq m at Compound E, which showed evidence of domestic activities, such as food processing, storing, spinning, weaving, and resting. This discussion focuses on the rooms from the excavation map (see appendix).

Entrance into Compound E is located in the middle of the eastern wall of the main plaza. The plaza (1169.478 sq m) contains one raised platform with columns along the northwestern wall. There is a staircase in the southern corner of the platform. Rooms 8-11 located on the southeastern corner of the plaza are hypothesized as and annex for the plaza. This compound is further delineated into two subdivisions.

The first subdivision consists of Rooms 1-6. Rooms 1-3 are the most remote rooms of the complex. Room 1 is a small roofed area that was probably used for sleeping. Room 2 has a baffled entrance in its northern corner that connects to the southeastern corner of Room 3. Room 2 has columns located on its southeastern edge, and Room 3 has columns located on its southeastern and western edges. Room 3 contains a baffled entrance into a corridor that leads to Room 4.

Rooms 4 and 5 are considered a separate section of the subdivision utilized for domestic activities such as food preparation, storage, and tool manufacture. Room 4 has columns along its northeastern and southwestern edges. There is no clear entrance into Room 5, which is an open room. However in the southwestern corner, there is an entrance into the southeastern corner of Room 6. Room 6 contains columns on all four sides, with a baffled entrance in the northeast corner to a corridor connecting to the southern corner of the main plaza, and a baffled entrance to

the southern corner of Room 7. Rooms 7, 12, 13, and 14 form the second subdivision of Compound E. However, there are no clear entrances or delineation of rooms.

The completely roofed areas within this compound would have been Rooms 1 and 5, as the columns found in the other rooms suggest partial shading. The correlation between roofed areas as dwelling space and the number of inhabitants roughly translates to 4 to 6 sq m per person (Peterson 2006:72). The roofed areas at Compound E cover 275 sq m with 85 sq m utilized as dormitories. Thus, roughly 46 to 68 people could have inhabited Compound E, with probably only 14 to 20 permanently dwelling in the compound. This would suggest permanent residents in a larger number than could be attributed to a nuclear family.

Table 30: Compound E Measurements

Compound E	**Area (sq m)**
TOTAL	2800.297
Plaza	1169.478
Room 1	103.525
Room 2	164.768
Room 3	42.933
Room 4	78.684
Room 5	13.147
Room 6	6.55
Room 7	212.263
Room 8	186.882
Room 9	224.28
Room 10	36.519
Room 11	100.035
Room 12	47
Room 13	27.089
Room 14	13.766
Room 15	101.787
Room 16	12.733
Room 17	13.975
Room 18	15.81

Compound G is a medium sized compound (3284.96 sq m) located in the northwestern portion of the site. Compound G has a corridor entrance off of a blocked street in the southeastern corner that leads into the plaza (1109.507 sq m). The plaza contains three bench structures along the southeastern, southwestern and northwestern walls, with a small bench construction on the northeastern wall. The northwestern wall has columns running along its length. The western corner of the plaza contains a baffled entrance that leads to a corridor. This corridor branches into Rooms 5 (249.867 sq m) and 6 (173.747 sq m). The entrance into Room 5 is in the northwestern corner, while the entrance into Room 6 is in the southeastern corner of the room. Room 5 contains a benched area along its northeastern edge that contains columns, and an entrance into Room 3 (61.908 sq m). Rooms 3-5 are hypothesized to belong to their own subdivision. Another subdivision consists of Rooms 6 and 7 (279.877 sq m). There are no clear delineation of rooms in this subdivision.

Also belonging to Compound G are Rooms 1 (313.065 sq m) and 2 (301.596 sq m). There is a bench structure shared between the rooms, and so they are grouped together within a subdivision. These rooms and the rooms along their northwestern wall (Rooms 8-14) are considered as their own subdivision. Although there is the possibility that this subdivision could be further delimited, there are not enough entrance or clear divisions to make any further separations.

Table 31: Compound G Measurements

Compound G	**Area (sq m)**
TOTAL	3284.96
Plaza	1109.507
Room 1	313.065
Room 2	301.596
Room 3	61.908
Room 4	68.935
Room 5	249.867

(Table 31 Continued)

Room 6	173.747
Room 7	279.877
Room 8	71.702
Room 9	88.449
Room 10	94.453
Room 11	77.643
Room 12	7.803
Room 13	11.856
Room 14	11.106

Compound N is a medium sized compound (3872.638 sq m) located in the southwestern portion of the site. The street entrance is baffled and located in the southeastern corner of the main plaza (1100.592 sq m). The main plaza has a benched area (1.5 m) with columns along its northwestern wall. In the northwestern corner of the plaza, there is an entrance into a corridor that leads to Room 8 (480.334 sq m). Room 8 is entered from its northwestern corner, and has an entrance into the northern corner of Room 9 (387.051 sq m) from its southeastern corner. These two rooms are considered a subdivision, as they are not clearly connected to any other rooms. A second subdivision consists of Rooms 1-7. None of these rooms has a clear entrance, and are grouped together based on location and proximity. Room 1 has a bench running along its western edge. Potentially this subdivision could be further delineated. Finally, the third subdivision consists of Rooms 10-14. Room 10 connects from the middle of its northwestern wall to the southeastern corner of the main plaza.

Table 32: Compound N Measurements

Compound N	**Area (sq m)**
TOTAL	3872.638
Plaza	1100.592
Room 1	427.799
Room 2	144.691
Room 3	475.956
Room 4	209.963
Room 5	55.41

(Table 32 Continued)

Room 6	26.49
Room 7	38.533
Room 8	480.334
Room 9	387.051
Room 10	78.944
Room 11	17.078
Room 12	52.836
Room 13	17.906
Room 14	65.764

Compound O is a medium sized compound (2366.241 sq m) located towards the southwestern portion of the site, directly north of the main mound complex. The compound is entered through a corridor off of the street that leads into western corner of the main plaza. The main plaza (610.658 sq m) is benched on all four sides with columns located on the southeastern bench. There are three hypothesized subdivisions. The first subdivision consists of Rooms 7-8 located behind the southeastern bench. The entrance into the subdivision is located on the northern corner of Room 8 (299.117 sq m). Room 8 also has a bench structure (1.5 m) located on its southeastern wall. The second subdivision is entered from the southern corner of the main plaza into the northern corner of Room 5 (473.391 sq m). Rooms 9-11 are also considered part of the subdivision. The third subdivision consists of Rooms 1-4 located behind the southwestern wall of the plaza. There is no clear entrance into this subdivision, but there is a potential corridor off of the western corner of the plaza that runs along the northwestern wall of the subdivision. This corridor could lead into Room 1 (233.1 sq m), which would serve as the larger patio room.

Table 33: Compound O Measurements

Compound O	**Area (sq m)**
TOTAL	2366.241
Plaza	610.658
Room 1	233.1
Room 2	40.991
Room 3	27.717

(Table 33 Continued)

Room 4	29.823
Room 5	473.391
Room 6	53.459
Room 7	79.419
Room 8	299.117
Room 9	54.648
Room 10	26.687
Room 11	188.075

Unknown Subdivisions

Compound AD is a medium sized compound (3065.657 sq m) located in the northeastern portion of the site. The compound is entered from a corridor into the southeastern corner of the main plaza. The main plaza (118.494 sq m) contains a partially destroyed bench near its northwestern wall. The remaining portion of the compound has been destroyed by the construction of a fortification wall and the modern street. So, other room entrances are not visible from the surface. Due to the estimation of rooms and damage at this compound, subdivisions are not discussed.

Table 34: Compound AD Measurements

Compound AD	**Area (sq m)**
TOTAL	3065.657
Plaza	118.494
Room 1	1237.125
Room 2	171.324
Room 3	315.965
Room 4	85.189
Room 5	52.633
Room 6	45.793
Room 7	39.958
Room 8	48.198
Room 9	329.031
Room ?	232.264

Compound AF is a medium compound (2030.945 sq m) located at the northwestern portion of the site. The street entrance into the compound is a long corridor with a hidden threshold at the southeastern corner of the main plaza. The main plaza (1043.58 sq m) has two benches on the southeastern and southwestern edges. Other entrances within the compound are not visible from the surface due to damage at the site. The 13 rooms (not including the plaza) were estimated based on the remaining portions of wall structure, and attributed to the compound based on vicinity to the plaza. Due to the damage over time at Compound AF subdivisions are not discussed for this compound.

Table 35: Compound AF Measurements

Compound AF	**Area (sq m)**
TOTAL	2030.945
Plaza	1043.58
Room 1	137.369
Room 2	12.476
Room 3	15.483
Room 4	36.439
Room 5	18.407
Room 6	12.673
Room 7	9.405
Room 8	111.709
Room 9	50.721
Room 10	31.639
Room 11	189.229
Room 12	166.832

Compound AO is a medium sized compound (2229.696 sq m) located along the southwestern edge of the site. The street entrance into this compound is located in the southeastern corner of the main plaza. The main plaza (530.05 sq m) has a columned bench on the western side and the presence of columns on the eastern side. The boundaries of other rooms are uncertain due to the location of the site, and the damage that has occurred over time. However other rooms would have been present, based on the amount of wall fall along this

section of the ridge. All other area attributed to Compound AO has been grouped into Room 1 (1686.965 sq m).

Table 36: Compound AO Measurements

Compound AO	Area (sq m)
TOTAL	2229.696
Plaza	530.05
Room 1	1686.956

Compound J is a medium sized compound (3710.309 sq m) located on the southwestern edge of the site. Due to its location along the ridge, much of the compound has been destroyed over time leaving the delineation of smaller rooms (besides the plaza) not possible. The street entrance into this compound is located on the northeastern corner of its main plaza. The plaza (1851.022 sq m) is benched on the northwestern, northeastern and southeastern sizes with noted columns on the northeastern and southeastern benches. There is a parallel entrance in the northeastern corner of the plaza that leads into a series of possible rooms. As there is no clear delineation of rooms, and a lot of wall fall, this section has been grouped together as Room 1 (1467.049 sq m). The area to the west of the plaza is also grouped as part of Compound J, and labeled as Room 2 (368.685 sq m). Both Rooms 1 and 2 most likely have several rooms, but the overall structure is uncertain.

Table 37: Compound J Measurements

Compound J	Area (sq m)
TOTAL	3710.309
Plaza	1851.022
Room 1	1467.049
Room 2	368.685

Compound P is a medium compound (2468.283 sq m) located in the northwestern portion of the site. The street entrance into the compound is a baffled corridor leading into southeastern corner of the main plaza. The main plaza (637.098 sq m) contains a columned bench along its

northwestern wall. The southern corner of the plaza has a corridor that leads into Room 11 (200.221 sq m). Much of this compound has been damaged, so entrances into other rooms are not clear. The other rooms are estimated based on the amount of wall structure visible. Due to the lack of clarity both in entrances and room delineation, this compound was grouped without subdivisions.

Table 38: Compound P Measurements

Compound P	**Area (sq m)**
TOTAL	2468.283
Plaza	637.098
Room 1	145.274
Room 2	106.695
Room 3	163.754
Room 4	69.345
Room 5	250.726
Room 6	253.225
Room 7	71.796
Room 8	15.083
Room 9	168.095
Room 10	166.993
Room 11	200.221
Room 12	49.836

Compound V is a medium compound (2587.612 sq m) located in the northeastern portion of the site. It has been heavily destroyed by the construction of a fortification wall. Other rooms besides the main plaza are hypothesized to belong to Compound V, but the link is uncertain. Thus, subdivisions are not addressed. The possible street entrance into this compound is baffled and leads into the southwestern corner of the main plaza. The main plaza has a raised area (2 m) in the middle, running from east to west. This could be refuse from the later construction of the fortification wall or a destroyed bench. Along the western side of the plaza is a bench structure with further terracing on the northern and southern ends of the bench (Room 3). The entrance into other rooms is located on the northern corner of the main plaza, and leads into the western

corner of Room 1 (419.368 sq m). Room 1 likely connects from its southern corner into the eastern corner of Room 2 (508.7 sq m).

Table 39: Compound V Measurements

Compound V	Area (sq m)
TOTAL	2587.612
Plaza	1197.585
Room 1	419.368
Room 2	508.7
Room 3	278.964

Compound Y is a medium compound (2271.359 sq m) located in the northeastern portion of the site, and has been heavily damaged. There are no clear entrances into or within the compound. The plaza (849.824 sq m) is in the southern part of the compound and has benches on the northwestern and southwestern sides. Three segregated areas can be determined as belonging to compound Y, and are located north of the plaza (Rooms 1-3). Subdivisions cannot be determined currently with the information available.

Table 40: Compound Y Measurements

Compound Y	Area (sq m)
TOTAL	2271.359
Plaza	849.824
Room 1	427.219
Room 2	408.87
Room 3	361.785

Compound AE is a medium sized compound (3971.614 sq m) located in the southeastern portion of the site. This compound has been heavily damaged over time. Thus, the other rooms are estimated through visible surface patterns, and subdivisions are not evident. There are no clear entrances into or within the compound The main plaza (1129.95 sq m) was determined based on the mound (5 m) labeled as Room 3 (344.297 sq m). The other two rooms and open area of the compound were estimated.

Table 41: Compound AE Measurements

Compound AE	Area (sq m)
TOTAL	3971.614
Plaza	1129.95
Room 1	140.06
Room 2	91.748
Room 3	344.297
Room ?	2117.667

Compound AQ is a medium compound (2392.666 sq m) located in the southeastern portion of the site. The structure of Compound AQ relies heavily on estimation based on remaining walls, because the compound was partially damaged. There are no clear entrances within or into this compound, and only the plaza (208.983 sq m) was clearly determined. Other rooms were likely present, based on the amount of wall fall, however they are not visible from the surface. Thus, subdivisions are not discussed for this compound.

Table 42: Compound AQ Measurements

Compound AQ	Area (sq m)
TOTAL	2393.666
Plaza	208.983

5.2.3 Large Compounds

Two Subdivisions

Compound A is a large compound (4836.893 sq m) located in the southeastern portion of the site. The compound is entered from the street into the eastern corner of the main plaza. The plaza of Compound A (1908.449 sq m) has benches located on all four sides with columns noted on the northern and eastern benches. Excavations completed in the main plaza of Compound A note geometric friezes decorating the walls of the plaza. The other rooms that make up the compound are along the northeastern and northwestern sides. Entrances within the compound are not visible from the surface. However, two distinct subdivisions were delimited. Rooms 1-6 are

considered a subdivision, and are located towards the northwestern portion of the compound. The remaining rooms (Rooms 7-12) are located along the southeastern portion of the compound and are considered a separate subdivision. This delineation of the two subdivisions was hypothesized due to the distinct separation between the two areas, making the appearance of two different blocks of rooms.

Table 43: Compound A Measurements

Compound A	**Area (sq m)**
TOTAL	4836.893
Plaza	1908.449
Room 1	183.396
Room 2	38.562
Room 3	34.329
Room 4	47.097
Room 5	69.91
Room 6	389.344
Room 7	49.117
Room 8	48.666
Room 9	184.122
Room 10	456.534
Room 11	131.483
Room 12	307.56

Compound I (4892.945 sq m) is a large compound located in the southwestern portion of the site, near the ridge. The compound is entered via a baffled entrance located at the southeastern corner of the main plaza. The main plaza (2945.109 sq m) is benched on all four sides with visible columns on the eastern bench. Staircases are present in the northeastern and southwestern corners of the plaza. The northeastern corner also has a baffled entrance leading into the northern wall of Room 1 (69.727 sq m) and into a corridor towards the southern corner of Room 3 (620.816 sq m). These two branches are hypothesized as different subdivisions.

The first subdivision contains Rooms 3-11. The southeastern corner of Room 3 contains the entrance into a corridor running along its eastern edge into the northwestern corner of Room

4 (324.973 sq m). Room 4 has Rooms 9-11 along its southern edge, and Rooms 5 and 6 along it eastern edge. Rooms 7 and 8 are positioned directly south of Room 6. The second subdivision consists of Rooms 1 and 2. These rooms were delineated into a different subdivision based on the split entrance from the main plaza and the separation of the rooms from those noted in the first subdivision.

Table 44: Compound I Measurements

Compound I	**Area (sq m)**
TOTAL	4892.945
Plaza	2945.109
Room 1	69.727
Room 2	299.484
Room 3	620.816
Room 4	324.973
Room 5	48.069
Room 6	100.442
Room 7	29.896
Room 8	24.727
Room 9	36.468
Room 10	23.371
Room 11	34.168

Three Subdivisions

Compound B (5693.692 sq m) is a large compound located in the southeastern portion of the site. The entrance into the compound is located on the northern corner of the main plaza. The main plaza (1733.283 sq m) has raised benches on all four sides, with the southeastern, northeastern and northwestern benches containing visible columns. To the southwest of the plaza, there are two subdivisions that parallel each other in room composition. Rooms 5-9 comprise one of the subdivisions. The western corner of the main plaza has an entrance leading into the northern corner of Room 9 (628.969 sq m). Room 9 contains a columned bunch along its northwestern wall. The western corner of this room connects to the northern corner of Room 5

(239.671 sq m). Room 5 contains a baffled entrance in its southern corner that leads to the eastern corner of Room 6 (85.555 sq m). Entrances into other portions of this subdivision are not visible from the surface. However, Rooms 8 (21.35 sq m) and 7 (27.532 sq m) presumably connect to Room 6.

The second subdivision mirrors the first. However, there is no clear entrance into this subdivision. Room 10 (578.905 sq m) mirrors Room 9. It has a columned bench along the southeastern wall of the room. The southern corner of Room 10 contains a baffled entrance into the eastern corner of Room 1 (220.134 sq m). Rooms 2-4 then follow the same patterning as Rooms 6-8 mentioned previously.

The third subdivision includes Rooms 11-20. A corridor leading from the southern corner of the main plaza ends in a baffled entrance into the northern corner of Room 15 (566.661 sq m). Rooms 11-14 are located towards the northern section of this subdivision. Room 11 (277.984 sq m) is actually a raised mound (6 m) with the sequential Rooms 12-14 to the east of the mound. The other rooms (Rooms 16-20) are located south of Room 15.

Table 45: Compound B Measurements

Compound B	**Area (sq m)**
TOTAL	5693.693
Plaza	1733.283
Room 1	220.134
Room 2	79.386
Room 3	17.153
Room 4	29.517
Room 5	239.671
Room 6	85.555
Room 7	27.532
Room 8	21.35
Room 9	628.969
Room 10	578.905
Room 11	277.984
Room 12	37.823

(Table 45 Continued)

Room 13	41.583
Room 14	160.299
Room 15	566.661
Room 16	266.772
Room 17	59.044
Room 18	41.922
Room 19	72.954
Room 20	92.494

Compound H is a large sized "T" shaped compound (4300.875 sq m) located in the southwestern quadrant. Three distinct sections branching to the north, east and west from the main plaza characterize this compound. The main entrance into Compound H is a baffled entrance located on the southwestern corner of the main plaza. The main plaza (1052.996 sq m) is benched on all four sides with columns present. The northeastern corner of the plaza contains the entrance into the eastern subdivision (Rooms 1-6). The eastern subdivision is entered through the southern corner of Room 1. Room 2 contains a later structure, which was determined based on a difference in building methods and materials. Other entrances are not visible from the surface. However, two other subdivisions are evident, based on the overall pattern of Compound H. The second subdivision, branching towards the west, is comprised of Rooms 14-16. The third subdivision consists of Rooms 7-12. Room 13 (114.418 sq m) could belong to either of those subdivisions, as it is located between the two branches and the main plaza.

Table 46: Compound H Measurements

Compound H	**Area (sq m)**
TOTAL	4300.875
Plaza	1052.996
Room 1	501.441
Room 2	311.521
Room 3	32.057
Room 4	44.826
Room 5	40.017
Room 6	58.384

(Table 46 Continued)

Room 7	235.748
Room 8	210.883
Room 9	172.948
Room 10	79.231
Room 11	34.842
Room 12	54.041
Room 13	114.418
Room 14	521.162
Room 15	264.671
Room 16	141.086
Room 17	65.939
Room 18	36.691

Unknown Subdivisions

Compound W is a large sized compound (4193.025 sq m) located along the southeastern edge of the site. Looting has heavily destroyed this compound, so several rooms were unclear or hypothesized. There are no clear entrances into the plaza or rooms of this compound. Thus, subdivisions are not addressed for this compound. The main plaza (888.916 sq m) was assumed based on a vague presence of a bench structure along the northeastern edge of one of the rooms present. The other rooms (Rooms 1-13) are attributed to Compound W based on their proximity to the main plaza, and the architectural patterning on the surface.

Table 47: Compound W Measurements

Compound W	**Area (sq m)**
TOTAL	4193.025
Plaza	888.916
Room 1	1119.466
Room 2	66.078
Room 3	140.634
Room 4	42.44
Room 5	110.491
Room 6	218.415
Room 7	298.619
Room 8	112.653

(Table 47 Continued)

Room 9	609.217
Room 10	106.551
Room 11	82.749
Room 12	87.97
Room 13	30.377

Compound X is a large sized compound (4193.214 sq m) located along the southwestern edge of the site. This compound has been heavily damaged over time. There are no clear entrances into the compound or into any individual rooms. Thus, subdivisions are not mentioned for this compound. The plaza area was estimated due to wall deposits, and the vague presence of a raised area, which is assumed to be a destroyed bench. Other rooms attributed to Compound X were estimated and hypothesized to belong to this compound based on visible structures and proximity to the main plaza (Rooms 1-12). Notably, Room 9 (221.235 sq m) contains a small mound (1 m) in its southwestern corner. Presumably, the rooms are accessed roughly sequentially with the larger rooms passing into the smaller.

Table 48: Compound X Measurements

Compound X	**Area (sq m)**
TOTAL	4193.214
Plaza	1547.66
Mound	21.564
Room 1	937.574
Room 2	166.218
Room 3	29.922
Room 4	51.979
Room 5	259.472
Room 6	65.593
Room 7	30.195
Room 8	361.816
Room 9	221.235
Room 10	31.534
Room 11	52.529
Room 12	30.267

Compound Z is a large sized compound (4213.411 sq m) located in the northeastern portion of the site. It has been severely damaged, so the structure was predominantly estimated. This, subdivisions are not discussed. The only clear structure is the plaza (2374.513 sq m). The main plaza has a raised area that appears to be a destroyed bench along the western wall. Other rooms cannot be determined clearly, but the outline of the compound has been roughly estimated based on visible wall structures (Room 1).

Table 49: Compound Z Measurements

Compound Z	**Area (sq m)**
TOTAL	4213.411
Plaza	2374.513
Room 1	1843.593

Compound AG is a large sized compound (5988.736 sq m) located on the northwestern potion of the site. Compound AG has been heavily destroyed, so the rooms and plaza were estimated based on visible wall structures and patterning. Thus, subdivisions will not be discussed for this compound. The main plaza (1731.614 sq m) has a discernable street entrance in the southeastern corner. However, all other entrances are not visible. To the west of the main plaza, there is a 4-meter tall mound structure (1113.545 sq m). Rooms 3-5 are to the southwest of the mound. Rooms 1 (976.427 sq m) and 2 (520.559 sq m) are located along the northeastern wall of the compound.

Table 50: Compound AG Measurements

Compound AG	**Area (sq m)**
TOTAL	5988.736
Plaza	1731.614
Mound	1113.545
Room 1	976.427
Room 2	520.559
Room 3	518.313
Room 4	414.422
Room 5	291.788

Compound AR is a large sized compound (4671.068 sq m) located in the southeastern portion of the site. The structure of this compound was damaged through the construction of a modern road, fortification walls and looting. The plaza (403.127 sq m) was determined based on the presence of a bench along the southeastern wall of the room. Other rooms were determined to belong to this compound based upon remaining wall structures and proximity to the plaza. However, the overall size of the compound was estimated based on previous patterning viewed within the site. Due to the damage within the compound, most of the possible rooms remain unclear. For instance, Room 3 (3541.436 sq m) is a large portion of the compound, and was probably delimited into several room structures, based on the presence of wall fall. Subdivisions were not addressed with this compound due to the damage.

Table 51: Compound AR Measurements

Compound AR	**Area (sq m)**
TOTAL	4671.068
Plaza	403.127
Room 1	181.14
Room 2	404.864
Room 3	3541.436

5.2.4 Miscellaneous Compounds

Four Subdivisions

Compound D (7762.287 sq m) is located towards the northeastern portion of the site, and contains one major plaza, a mound structure, and twenty-nine other rooms. This compound is one of the miscellaneous compounds due to its size. The entrance into Compound D is a baffled entrance and corridor. The baffled entrance from the street leads into Room 1 (279.352 sq m) and the Mound (187.683 sq m). Room 1 serves as an entrance room into the compound. After Room 1 and the mound, a corridor leads into the southeastern corner of the main plaza. The main plaza (2196.09 sq m) has columned benches running along all four sides. There are also staircases in

the northeastern, southwestern and northwestern corners of the plazas. Along the southern portion of the plaza are Rooms 2 (168.423 sq m) and 3 (128.206 sq m), which are hypothesized as annexes to plaza. In the northwestern corner of the plaza, there is an entrance leading itno the southeastern corner of Room 19 (78.886 sq m) and the northern corner of Room 20 (461.838 sq m).

Compound D is split into four discernable subdivisions. The first subdivision consists of Rooms 20-29. Entrances into the individual rooms are not seen from the surface. Room 20 in the instance is considered the patio room, with the smaller rooms following. However, there are two rooms that could be secondary patios (Rooms 21 and 29), with the smaller rooms following. This suggests a possible further division within the subdivision. Rooms 21-25 would qualify as a unit while Rooms 26-29 would be a secondary unit.

The second subdivision consists of Rooms 13-16, and Room 18. Room 18 (184.894 sq m) is entered from the eastern corner through a baffled entrance from the southern corner of Room 19 (78.886 sq m). The only other clear entrance within this subdivision is from the eastern corner of Room 16 (247.534 sq m) leading into the southern corner of Room 14 (15.056 sq m).

The third subdivision and the four subdivision of Compound D are relatively unclear. However, a rough idea of the delineation of rooms is possible. The third subdivision then consists of Rooms 9-12, 17 and 19. The fourth subdivision consists of Rooms 4-8. These rooms were attributed to different subdivisions because the area roughly has division between the two areas. However, entrances and corridors are not completely clear within this section of the compound.

Table 52: Compound D Measurements

Compound D	Area (sq m)
TOTAL	7762.287
Plaza	2196.09
Mound	187.683
Room 1	279.352
Room 2	168.423
Room 3	128.206
Room 4	282.366
Room 5	110.616
Room 6	243.234
Room 7	127.488
Room 8	347.765
Room 9	209.417
Room 10	440.504
Room 11	38.917
Room 12	45.425
Room 13	27.958
Room 14	15.056
Room 15	90.016
Room 16	247.534
Room 17	106.62
Room 18	184.894
Room 19	78.886
Room 20	461.838
Room 21	127.323
Room 22	53.225
Room 23	18.608
Room 24	17.878
Room 25	23.57
Room 26	16.582
Room 27	21.551
Room 28	99.145
Room 29	247.333

Unknown Subdivisions

Compound F (8290.386 sq m) is located towards the northwestern edge of the site. The main entrance into the compound is a baffled corridor leading into the northeastern corner of the

plaza. There is a large “L” shaped construction within the middle of the main plaza. This could possibly be reconstruction or a later addition. Much of the compound has been damaged, and there is a large washed out area along the eastern portion. Only 15 rooms were delineated. However, due to the damage many of the entrances into specific rooms are unclear. Also, the rooms attributed to Compound F are hypothesized as belonging to the same compound based upon proximity and the delineation of other more clearly defined compounds in the area. Thus, subdivisions are not considered for Compound F.

Table 53: Compound F Measurements

Compound F	**Area (sq m)**
TOTAL	8290.386
Plaza	5317.946
Room 1	360.918
Room 2	23.627
Room 3	28.064
Room 4	25.883
Room 5	468.718
Room 6	341.23
Room 7	153.222
Room 8	79.145
Room 9	616.422
Room 10	67.553
Room 11	76.392
Room 12	77.779
Room 13	24.955
Room 14	14.902
Room 15	60.746

Compound AP (7421.736 sq m) is located in the southwestern portion of the site near Compound F. This compound has been heavily damaged over time. The main plaza was determined based on a bench structure located towards the northeastern end of the room. Other rooms (Rooms 1-16) were linked to this compound based on remaining wall structures. However, the link of these other rooms in conjunction with this compound is not perfectly clear.

Thus, subdivisions will not be considered. For the purpose of this thesis, these rooms will remain as a portion of Compound AP.

Table 54: Compound AP Measurements

Compound AP	Area (sq m)
TOTAL	7421.736
Plaza	524.079
Room 1	762.776
Room 2	969.989
Room 3	894.136
Room 4	78.31
Room 5	210.057
Room 6	223.225
Room 7	353.268
Room 8	162.12
Room 9	512.06
Room 10	582.383
Room 11	564.629
Room 12	136.3
Room 13	220.616
Room 14	117.428
Room 15	146.717
Room 16	657.094

5.3 Gamma Analysis

Gamma analyses are utilized to understand the connection between social structures and built space through mathematical analyses. This analytical method has been applied to architectural data to gain further comprehension on the structural and movement patters within a built environment (see Fisher 2009; Rojas and Mejía 2013). Gamma analysis is implemented as diagrams that show access patterns in a quantitative manner. This allows for interpretation on flow patterns and social interactions at various levels in the built environment. Archaeologically, this type of analyses allows for broader interpretations on potential social interactions and

encoded meanings present within architectural remains. To analyze the various compounds at Caylán, this analysis was applied to discernable compound structures.

Only select compounds were chosen for this type of analysis. Due to the damage over time to a majority of the compounds, the data required for this analysis was not present except for seven of the compounds. Thus, the gamma analyses completed below are a limited representation of possible spatial configurations possible at the site.

Due to the limited number of compounds categorized as miscellaneous (see section 4.3), and the preservation of those compounds, only Compound D will be addressed from this category. The large compounds utilized for the gamma analysis below are Compounds A, B, and I. The medium compound is Compound E. The small compounds utilized are Compounds R and S. Calculations upon the gamma analysis completed are depth, RR and RA. The numerical depth is determined by the location of a room relative to its geographical location within a compound. Rooms consisting of the same depth value are mostly horizontally congruent. RA is the relative asymmetry while RR is relative ringiness. Relative asymmetry represents numerically the dimensions of symmetry between rooms in a compound. Relative ringiness on the other hand is the numerical representation of the distribution pattern within the compound structures (Hillier and Hanson 1984:150-154).

To determine the mean depth, each level within the gamma analysis was given a number based off of its location in the gamma diagram. The carrier point was attributed the value of 0 with each room proceeding in whole numbers accordingly. The carrier point in this instance correlates to the primary entrance of the compound from the street. The rooms towards the end of the spectrum were given higher values, as they would be considered in a deeper location in relation to the carrier point. These values were then averaged for each compound to give a mean

depth. The higher the value, the deeper the compound is considered. To determine the RA values, the following equation was used:

$$\frac{2(MD-1)}{P-2}$$

P is the number of points in a diagram, and MD is the mean depth value. This gives the relative asymmetry values for the compound based off of a carrier point. The carrier point is considered as the entrance location, with its relations to other rooms branching off of its location. The entrance location, in this instance, would be the street access into the main plaza of the compounds. Thus, this point can potentially apply to any room within the compounds analyzed. However, for this analysis only the entrance of the compound was used as a carrier point. The entrance point was considered as the primary location, which would grant a more through opportunity for asymmetry calculations. Finally, the RR values were determined by the following equation:

$$\frac{R}{P-1}$$

P is the number of points in a diagram. R is the number of independent points passing through a point. The relative ringiness shows the amount of connectivity between rooms. This shows how integrated the compound rooms are with each other based on access ways. The following table shows the mean depth, RA and RR of each of the compounds analyzed.

Table 55: Gamma Analysis Calculations

Compound Name	Mean Depth	Relative Asymmetry	Relative Ringinesss
Small Compounds			
Compound R	2.571	0.628	0.167
Compound S	2.625	0.542	0.143
Medium Compounds			
Compound E	3.3	0.256	0.053
Large Compounds			
Compound A	3.2	0.338	0.071
Compound B	4.762	0.396	0.05
Compound I	3.615	0.475	0.083
Miscellaneous Compounds			
Compound D	4.719	0.248	0.032

According to the data above, the compounds in generally appear asymmetrical. The relative asymmetry is a numerical value for how integrated the space within a compound is, using numbers from 0-1. The higher numerical values show integration while the lower values show segregation or higher divisiveness (Hillier and Hanson 1984:108-109). Thus, a majority of the compounds are asymmetrical, or more segregated, with the largest compound being the most asymmetrical. The highest values of symmetry belong to Compound R and S, which are considered smaller compounds. The level of symmetry then could be related to the general size of the compounds, which could potentially lead to fewer options for more asymmetrical constructions, assuming that that was the overall preference in structure.

The spatial ringiness and mean depth suggests that there were limited options of movement within the compound. The mean depth of the compounds just reflects the depth value of each space from the carrier point, and it used to determine the relative asymmetry or measure of integration. Instead, the various additional structures appear to not connect, and there is a primary route to follow. This shows how the compounds could be arranged to create privacy and control over the spatial variables. The further separation between different sections of the compound suggests that there was a division between those sections. The low connectivity and

ringiness is reflective of this separation between rooms and sections of the compound. The small compounds stand out by their higher ringiness value, suggesting that those were perhaps more easily navigated and less hierarchical.

The following diagrams from the gamma analysis show the structural formations found between rooms. All of the maps are vertically aligned, with the carrier space representative of the street outside of the structure. The only exception is Compound D, which was horizontally aligned due to its overall size and complexity. The carrier space then is located to the right of the page, with the rooms spanning outwards to the left.

CHAPTER 6:
DISCUSSION: COMMUNITY AND SPACE AT CAYLÁN

In this chapter, I revisit the data presented in previous chapters and how it shapes the interpretation of spatial organization at Caylán. I begin the discussion with an overview of the spatial organization and residential architecture at the site, and then move onto how this compares to the other sites in Nepeña Valley. Following this, the comparisons from Chapter 3 are revisited in association with the new data from Caylán. Concluding the chapter is a section on the future research suggestions that could broaden our understanding of the site.

I began this thesis with an overview of spatial theory, focusing on the study of households and neighborhoods within an urban context. I use this theoretical framework as a basis for understanding and interpreting the compounds at Caylán. The forty-three compounds are located in a dense urban core and follow similar organizational patterns. Due to the similar organization, and based on the excavation data of Compound E, the compounds are concluded to be residential with large plazas serving as the entrance and focal point. I argue that they are neighborhood communities based on the definitions discussed in Chapter 2.

6.1 Spatial Organization and Residential Architecture at Caylán

Although the general pattern of an entrance into the main plaza, which has entrances into patios and then smaller rooms, is evidenced in most of the compounds, the overall shape of the compounds varies. This could be due to temporal differences, expansion, or destruction over time, however this shows some variability in construction. Also, the room sizes found within the compounds vary within the compounds, and even between the size categories of the compounds (see Chapter 4). This supports the variance seen in the overall construction of the compounds.

The various sized compounds found at Caylán were attributed based on overall compound areas (see chapter 4). The only known decorations, which could attribute status or potential social differentiation, are located in Compounds A, and B, which are larger compounds. Compound E lacks any sort of friezes or decoration. Potentially, the friezes could be limited to larger compounds, or even compounds located closer to the Main Mound Complex, as they are both located in the same quadrant. However as Compound E and Compound A plaza are the main areas that have been excavated, no conclusion can be significantly drawn from this information. However, further research could focus on excavations of larger known compounds to see if size does equate to status in this instance, or if the location of the compounds was more indicative to decoration. Potentially, more centralized locations within the site could have belonged to the more prominent social groups. Also, every compound could have had friezes adorning the main plaza, and the larger complexes could potentially have more elaborate designs. Further data is needed to draw more significant ties to status and compound size or location.

As to the inner construction of the residential monumental compounds, there appear to be three distinct separations in a majority of the compounds. The first is the plaza construction. The plaza stands as the public entrance into the compound, and excavations point to decorations, covered areas and columns in the plazas. They are thus decorated, public, and provide shading along the benches. Hypothetically, the plazas would be utilized as a common area for the compound inhabitants, and potentially for visitors. Feasting would have probably occurred in this area as well.

Secondly, following the plaza are patios. These patios usually do not connect between each other. The plaza serves as the communal entrance into one or more patios. The patio is thus

more separated, and a more private area following the plaza. Since they do not typically connect, these areas could have been smaller central areas of production or common areas for a family group or household. Due to the presence of several of these patios within one compound, it is likely that more than one family unit occupied it at one time. Potentially, one family lived in each branch of compound's structure off of the main plaza. The third division would be the following smaller rooms that are usually covered or roofed, which would stand as potential sleeping quarters.

The linear progression into the various compounds from the plazas follows the trend of a hidden or baffled entrance into patio rooms, which then break apart into covered smaller rooms, presumably used for living quarters. The hidden or baffled entrances would stand as a form of control over the area, and separate the private from the public. They could serve as boundaries between spaces and suggest a need for this clear division of space.

Another method of analysis was gamma analysis. Gamma analysis as a tool for examining the monumental residential compounds at Caylán was beneficial in quantifying the spatial structure. The gamma analyses (see Chapter 5.3) collaborate this information and show that there are clear divisions between areas. The numerical values attributed to the depth, ringiness and relative asymmetry allow for a more detailed discussion on the spatial structure of each of the compounds analyzed. Essentially, gamma analysis shows the spatial connectivity. This was useful when attributed to the compounds available for the analysis, based on surface preservation. Ideally, more of the compounds should be analyzed in this fashion, but this was not feasible due to the level of preservation of compounds. So, this method, like most, is limited by the amount of data available, which was small in this instance. Overall, this method of analysis

was useful and allowed for a better comparison between the small, medium and large sized compounds.

The results of the gamma analysis showed that the compounds were predominantly asymmetrical. This means that the rooms were not heavily integrated within a single compound (see Chapter 4). The higher levels of symmetry appeared in the smaller compounds. This could be due to their smaller size. The smaller size in overall rooms, and entrances could have made them intrinsically more integrated compared to the medium and large compounds. Also, the compounds had relatively low ringiness. This means that spatially the compounds have very limited access patterns. Following the diagrams, the compounds usually only has one main path to follow. This is also evidenced in subdivisions delimited in the compound maps. The subdivisions each typically have only one main path that can be followed to reach rooms located further in the compound. Each branch or section of the compound has an entrance from the plaza, and the different sections do not usually connect to one another. This suggests that each section could have belonged to a different family or group.

The above results hint that the compounds did not involve just one family, but were probably units for neighborhood interactions. This is based on the definition of a neighborhood as daily face-to-face interaction (Smith and Novic 2012). As evidenced with the smaller rooms hypothesized as roofed areas in Compound E (see Chapter 4), the residences were most likely larger than nuclear family units. Hypothetically, each section of the compound would be a household. The data from compound E suggests that craft and tool production was occurring within the smaller patio areas, which proposes that the area would serve similar purpose for other patio groups. As there are no noted workshops at the site, this indicates that they could potentially be serving as units of production, and consumption for tools and crafts. Although

there is a presence of maritime and terrestrial resources, there is no clear method of production for both areas currently. Also, the areas of transmission and reproduction are not as clear from the surface or previous research, and would have to be further investigated in the future. However, this would allow for a preliminary hypothesis that these branches within the compounds could serve as households based on the definition by Wilks and Rathje (1982: 621) (see Chapter 2). Thus, the compounds are potentially multiple households within an enclosed area, and form a neighborhood.

As Compound E is only a medium sized compound, the larger compounds in the urban core further suggest larger social groupings dwelling in the compounds. Caylán is a unique built environment that shows an early manifestation of urbanism, as well as distinct social complexity. The data displayed in Chapter 4 shows the differences within the size of the compounds, suggesting a social variance. The larger structures would then belong to a higher status group, as assumed through the labor costs that would be required to build such structures.

The complexity within the compounds themselves shows the importance of private space versus the public space of the plaza. The plazas were most likely decorated, as seen with excavations completed in 2009 and 2010, and roofed over the benched areas. Interestingly, the more elaborate compounds, Compounds A and B, are within the medium category of size. This could indicate a change over time where elaboration showed status more than size, or the compounds could have been renovated over time.

The sequence of construction of the site is currently unclear. Thus, several of the compounds could have been renovated over time, in the process of renovation, or built at a later time to the other compounds surrounding. The presence of empty lots between some compounds, and the unusual shape of some compounds such as Compound H, suggests that construction

could have occurred over time. Thus temporally, the compound construction was an ongoing projection and should be considered as such. Several of the outlier compounds could be due to temporal differences and land availability at the time of constriction. Also, the compounds could have changed over time based on the economic and cultural changes that probably occurred over time. Thus, the compounds can have these variations based on organic growth over time.

This section of division and segregation suggests that the various branches or sections off of a main plaza could belong to different family groups. This would make each compound essentially its own neighborhood, with any larger division between compound locations a district.

6.2 Early Horizon Community Organization and Neighborhoods

The Early Horizon is primarily noted as related to the Chavín phenomena. However, Caylán does not display any Chavín related artifacts or construction. This places the site as a variance within the local landscape of Nepeña Valley during the Early Horizon. The other sites of Huambacho, Sute Bajo and Samanco follow this trend of remaining free of Chavín influence (see Chapter 3). However, Caylán is the largest of the sites, with 43 walled compounds that are hypothesized as walled neighborhoods within a dense urban core. The urbanism of Caylán could indicate that it served as a regional center to the other sites lacking Chavín influence (see Chicoine and Ikehara 2014).

In comparison with the Early Horizon community organization, Caylán is one of the few noted urban centers. The site of Huambacho has a similar construction to Caylán, with central plazas, patios, colonnaded patios, and smaller rooms. However, Huambacho is relatively limited

in size. This makes Caylán an outlier within Nepeña Valley specifically, and the Andes region in general during the Early Horizon.

6.3 Comparative Perspectives: Early Urbanism and Neighborhoods

The urban core at Caylán is argued to contain neighborhoods in the form of enclosed compounds. The groups dwelling in the neighborhoods could be delimited based upon social or economic means, as with the individuals dwelling in the neighborhoods of Teotihuacán, and Chan Chan. Teotihuacán was delimited by corporate sectors or neighborhoods. The social segregation at the site reflected the economic construction, with the presence of large patios with conjoined rooms and platforms (see Charleton 1969 and Manzanilla 1996, 2012). Crafts production, ritual sectors, and administrative areas defined the neighborhoods at Teotihuacán. Similarly, the site of Chan Chan is also segregated. However, the main factor in neighborhood and residential construction stems from social status. The settlements of the Chimú are considered barrios or neighborhoods with narrow alleys connecting the various residential structures. Similarly, the Wari were separated into specific groups based on craft specialization. There is no current evidence for craft specialization at Caylán, so it was probably not organized like Teotihuacán or the Wari. Future systematic surface collections should test the diversity of surface artifacts, such as stone tools and pottery sherds, to investigate if the compounds were specialized. This would suggest either a religious, political, or familial tie between residences. Much like with Teotihuacán, Caylán could be separated into difference neighborhoods based on economic and political power (see Chapter 3). However with the variable sizes and complexity seen in the compounds, social stratification and organization based upon status could be argued as seen with the Chimú.

Also to consider, the Moche have multifamily households with variation between size, internal segmentation, and occupations within the household (see Van Gijshem 2001). Rooms within the compounds were usually utilized for specific activities. This could potentially coincide with the compounds at Caylán. Although further research will also be needed, the similar pattern of an open space and segmented rooms seen at Moche (see Chapter 3) could suggest a similar social structure. The various rooms within the compounds at Caylán could be used for specific activities, such as the small patios being used for craft and tool production, with the plazas remaining the focus for community and ritual based activities.

Using these four examples and the known data from Caylán, the site probably was not specialized or delimited by craft specialization. However, there is potential segmentation of rooms within a compound that were used for specific activities. This should be further researched in the future. I hypothesize that the compounds are multi-familial, based upon the lack of any sign of specialization and similarities to the Moche compound construction, and segregated by status, as seen with the variations in room size and compound size (see Chapter 4).

6.4 Concluding Remarks

My research focused on the surface remains of forty-three residential compounds that could be determined by surface survey. This method allowed for a non-intrusive view of the site, and helped substantiate potential social groupings in the form of neighborhoods. This survey combined with archaeological data from previous excavations and spatial theory granted an insight into the spatial organization at Caylán, both within the compounds and between the compound structures.

The results from these forty-three residential compounds indicate the variability between residential structures, the presence of size differentiation, and of neighborhood formations. My interpretation of the compounds as neighborhoods consisting of multiple households illustrates the need to consider various forms of social formation. Although more research is required, the presence of larger social categories, such as neighborhoods, shows a more complex social structure between groups. Overall, my research shows that significant data can be assembled from remaining surface architectural structures that can lead to a broader understanding of a site prior to excavation. The data from Caylán suggests that the social structures of neighborhood and household should be considered in a broader context within urban formations. The presence of neighborhoods in comparison to households should be further considered archaeologically.

6.5 Future Research

Future research at Caylán should ideally focus on further excavation of the site, and specifically the more preserved compounds, such as Compound D, Compound R and Compound S. More complete excavations of entire compounds will add to the data already gathered, and allow for a more comprehensive analysis of the residential life within compounds. Specifically, the potential variation between the previously addressed groupings of small, medium, and large could be further evaluated. Excavations in a selection of those categories could add information to the social variability located in those residences. The potential differentiation of labor between family groups, and between residences could be further explored with this information as well. A site-wide survey of ceramics and other material remains could also add to this and show potential areas of specialization or craft production. This would also give broader detail on their use as general residences, and possible connections between social groups. For instance, are the

compounds specialized as seen at Teotihuacán or are they generalized? Previously, the compounds at Caylán were hypothesized as not specialized, however more research should be completed to make this claim more substantiated. This could also potentially highlight the differences or similarities between neighborhood groupings, and the potential division of districts.

Also, the presence of possible administrative structures should be explored with further analysis of structural differences and excavation data. These outlying structures could indicate a more complex society within the urban core of Caylán. Some possible questions that could be asked are, what were the functions of the outlying compounds? How did they fit into the urban complex? Is their location indicative of a planned control areas throughout the urban core?

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APPENDIX:
MAPS AND FIGURES

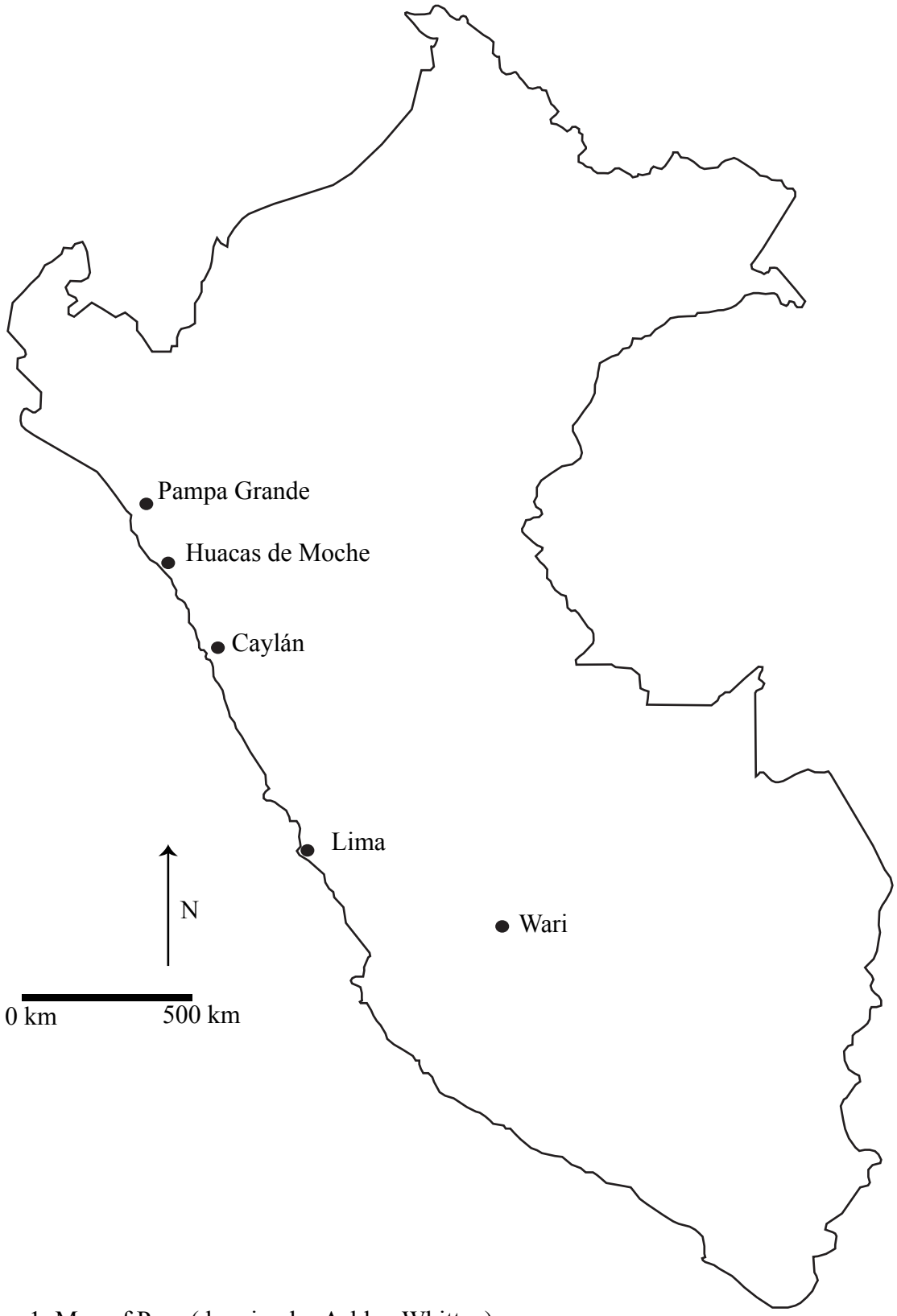

Figure 1: Map of Peru (drawing by Ashley Whitten)

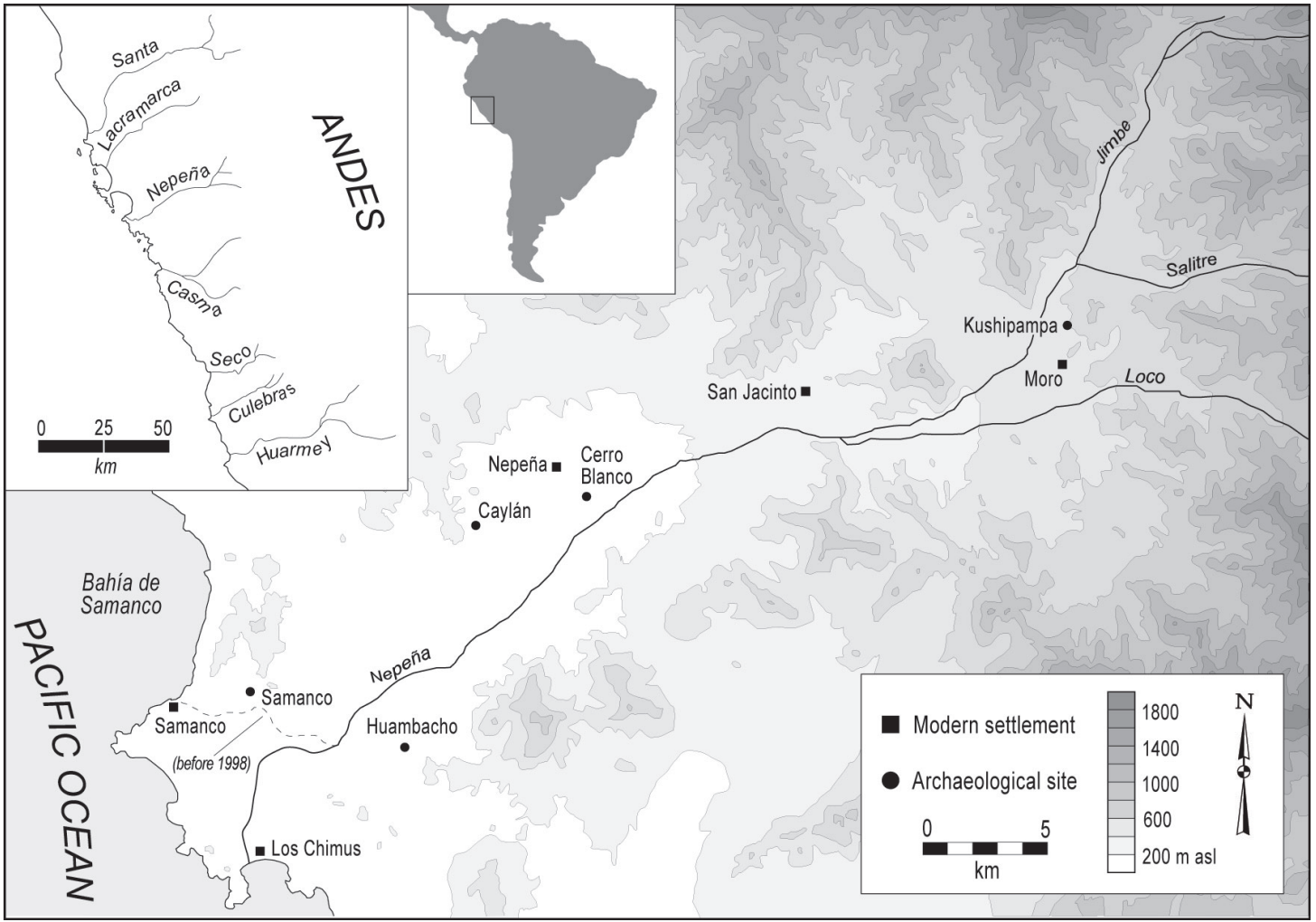

Figure 2: Map of Nepeña Valley (drawing by David Chicoine)

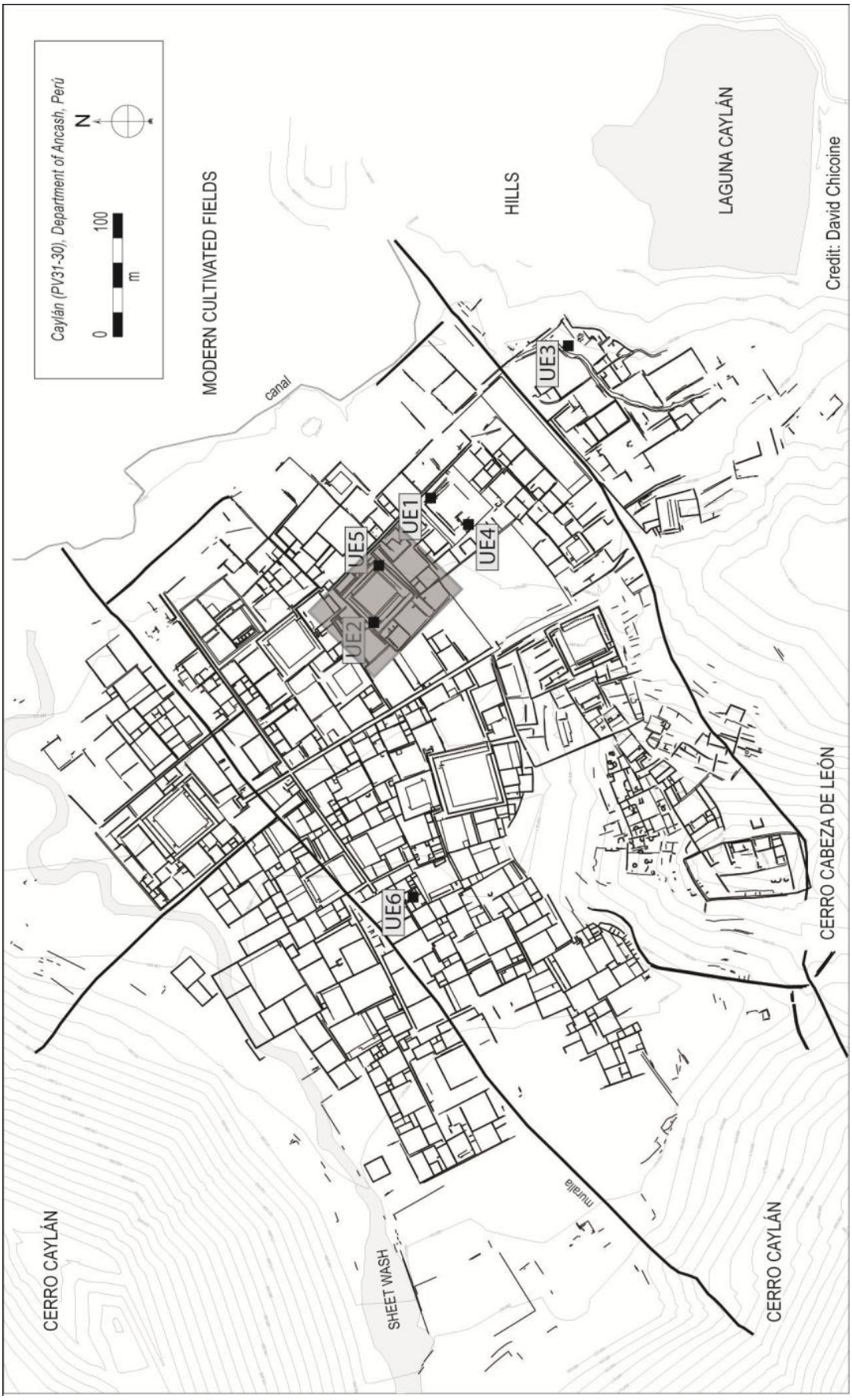

Figure 3: Map of Caylán (drawing by David Chicoine and Hugo Ikehara)

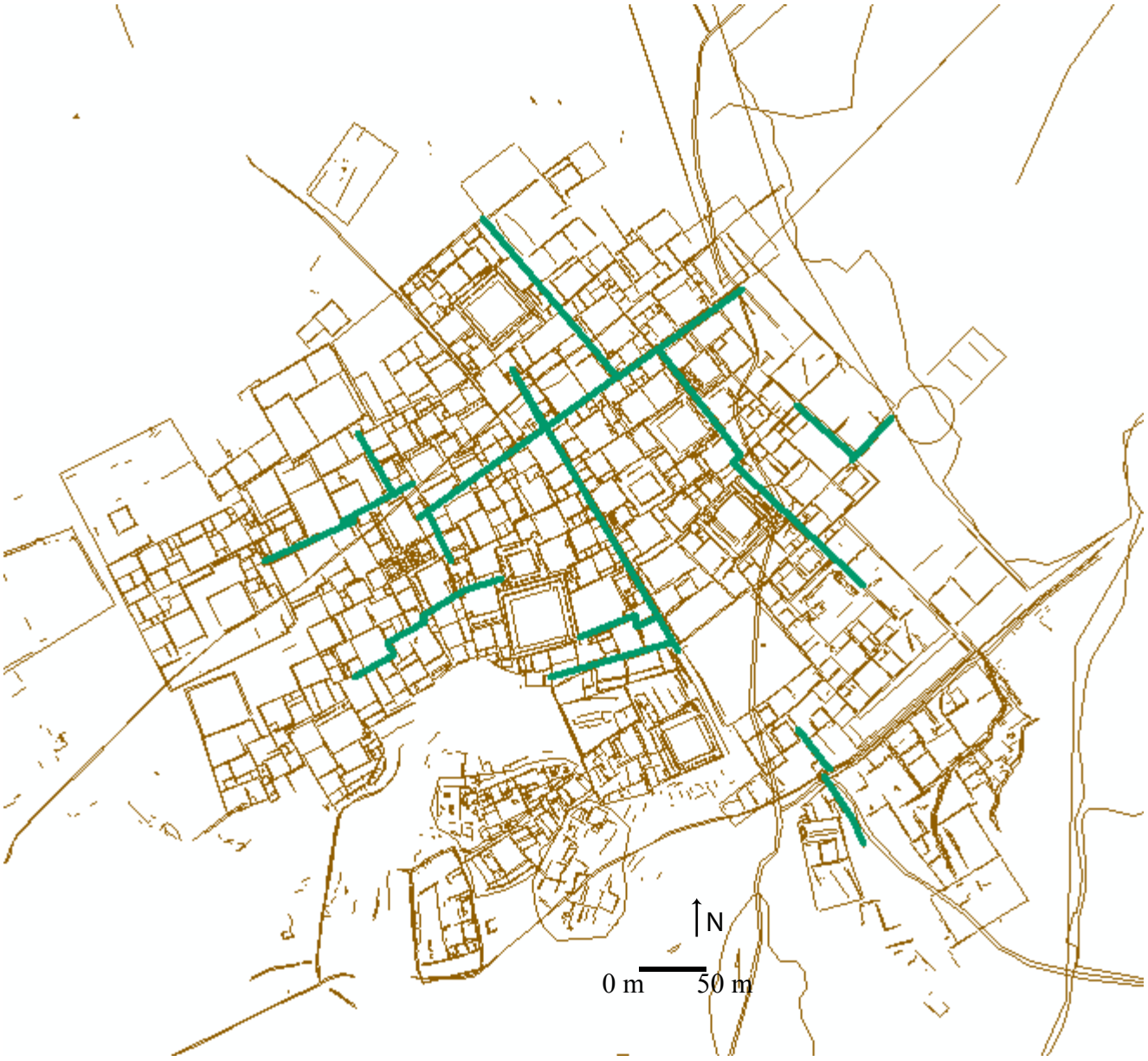

Figure 4: Streets of Caylán (drawing by Ashley Whitten)

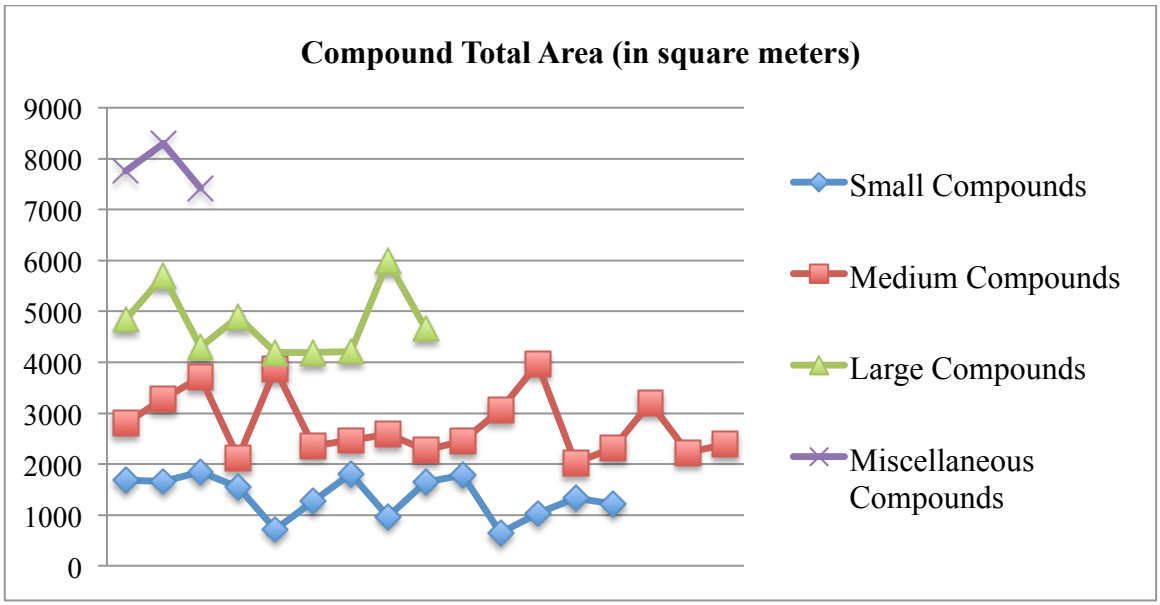

Figure 5: Graph of Total Compound Area

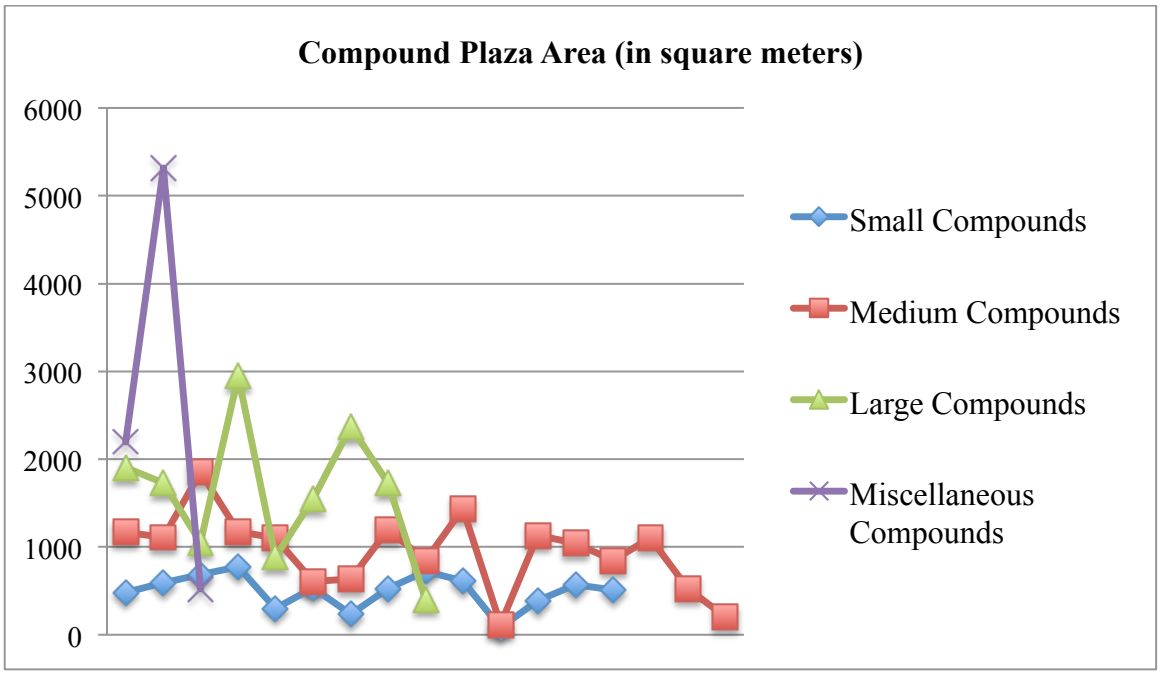

Figure 6: Graph of Total Plaza Area

Figure 7: Small Compounds (600-2000 sq m) with the compounds highlighted in blue (drawing by Ashley Whitten)

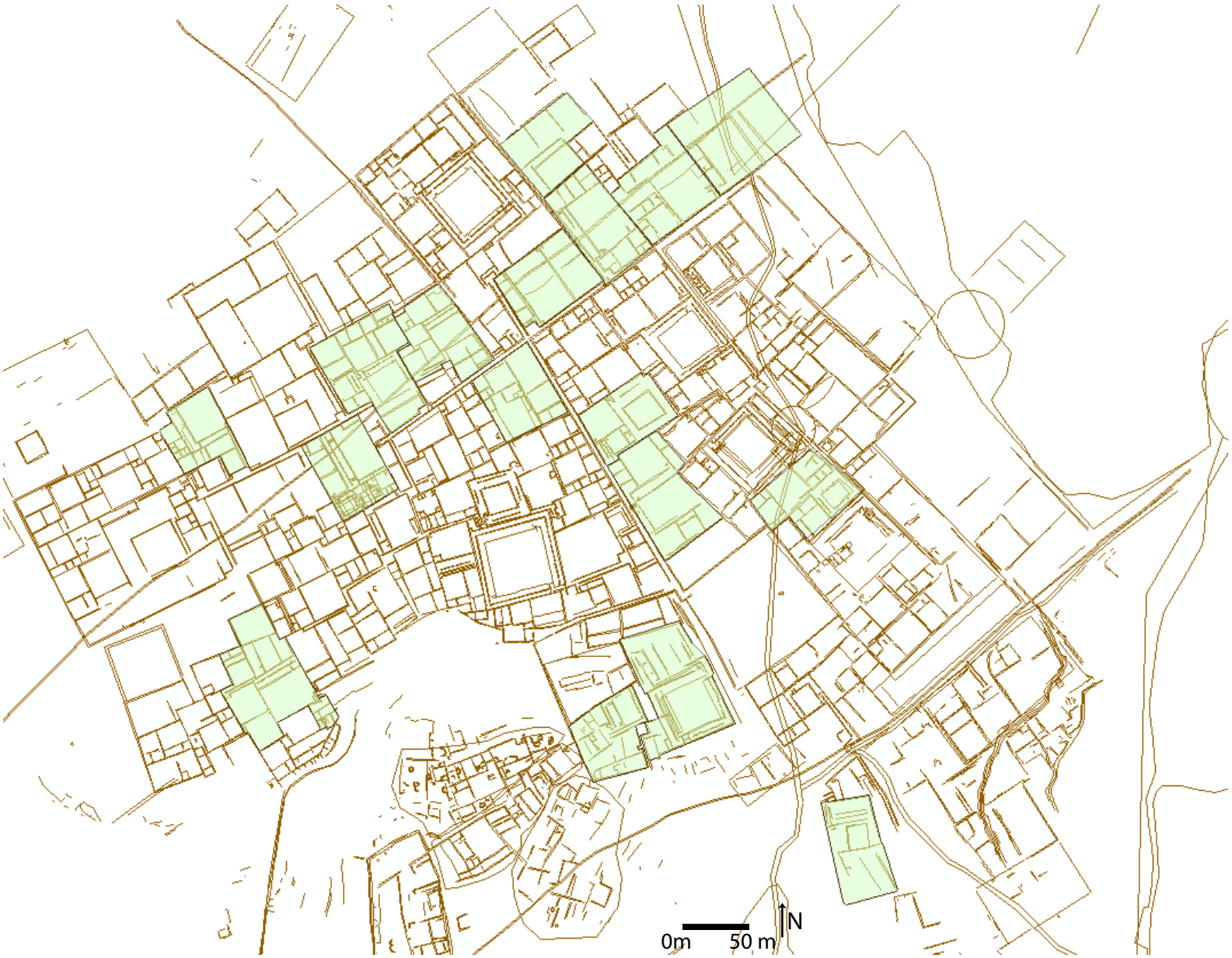

Figure 8: Medium Compounds (2000-4000 sq m) with compounds highlighted in green (drawing by Ashley Whitten)

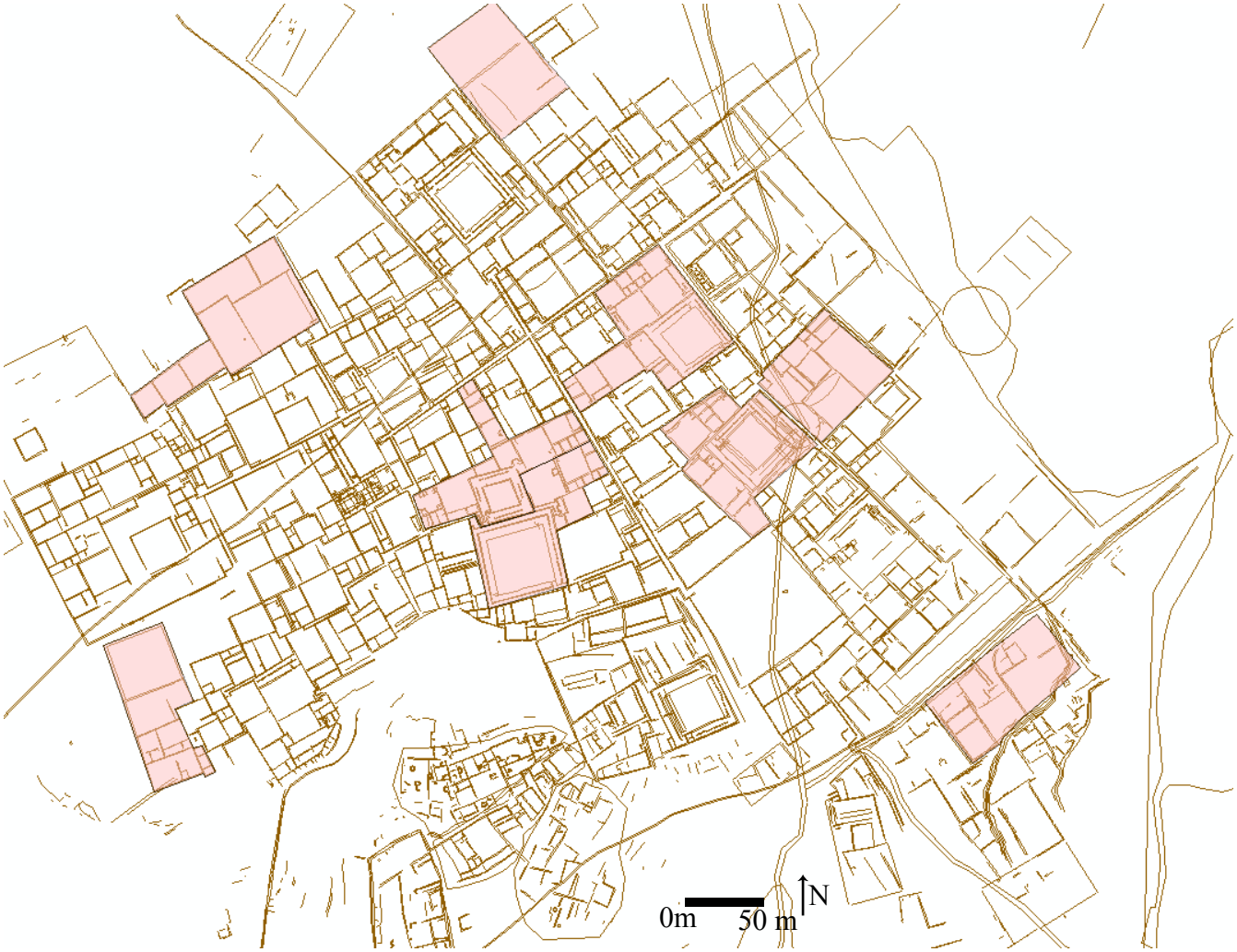

Figure 9: Large Compounds (4000-6000 sq m) with compounds highlighted in red (drawing by Ashley Whitten)

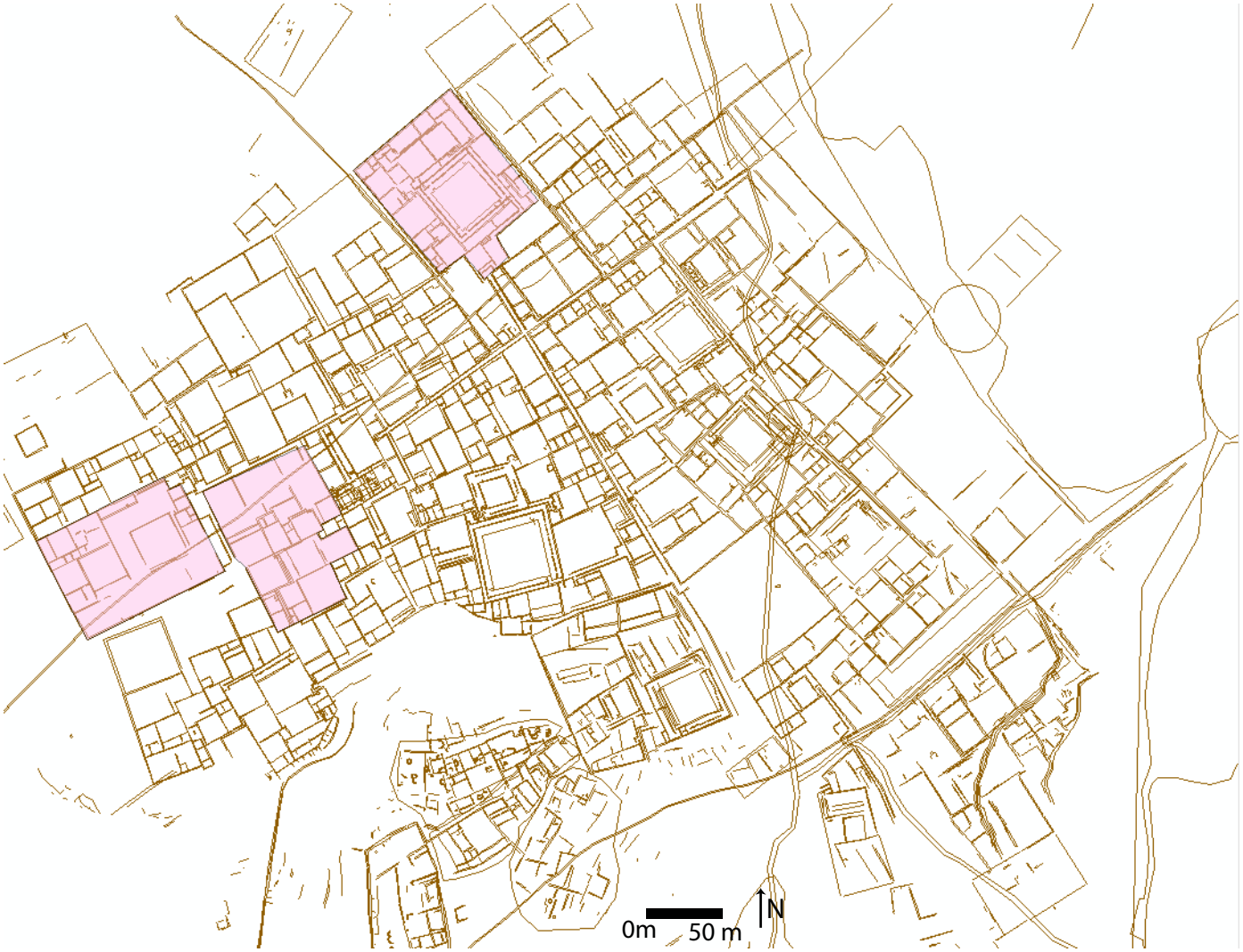

Figure 10: Miscellaneous Compounds (more than 7000 sq m) with compounds highlighted in pink (drawing by Ashley Whitten)

Figure 11: Non-Residential Compounds(drawing by Ashley Whitten)

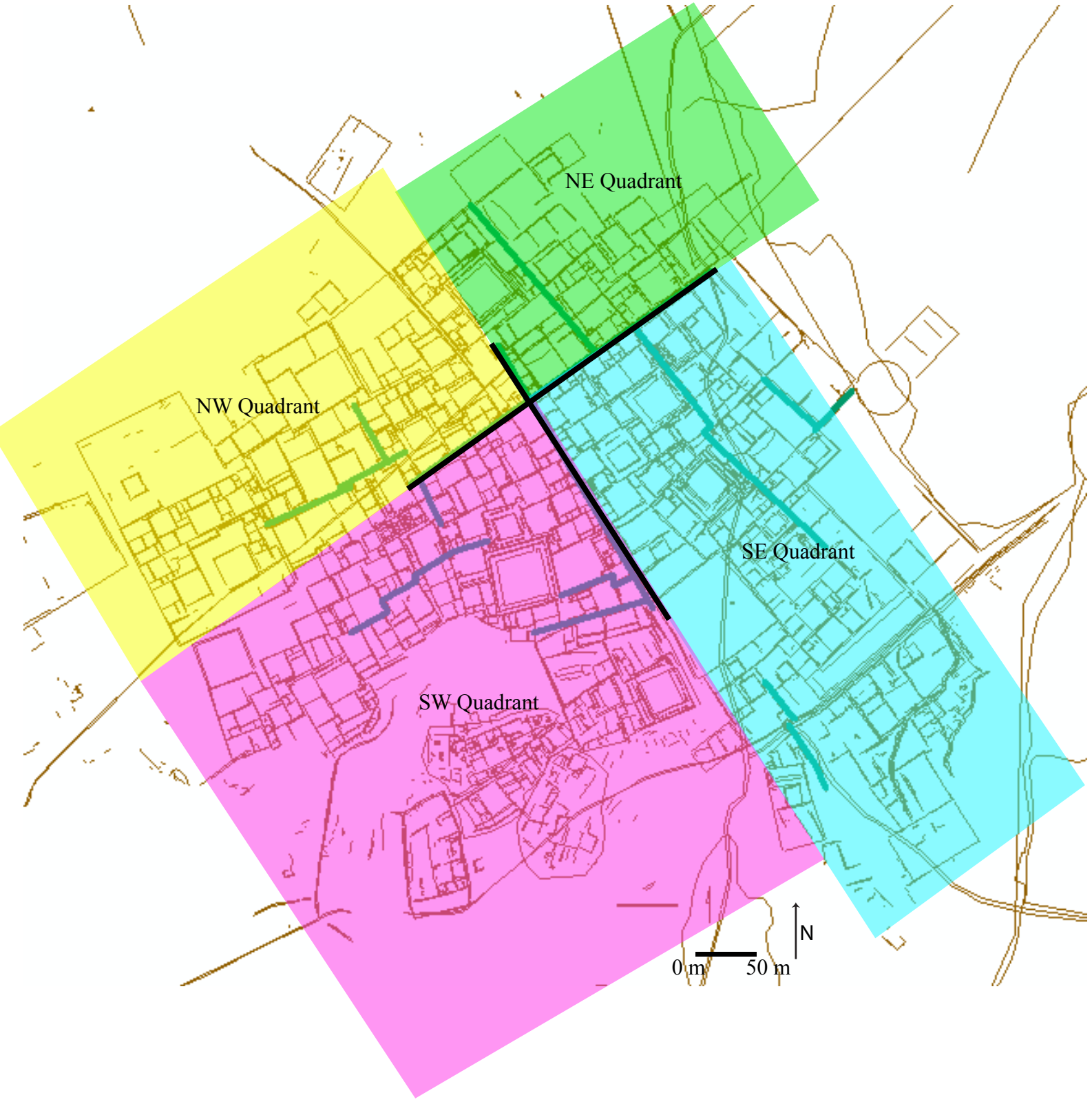

Figure 12: Compound Quadrants (drawing by Ashley Whitten)

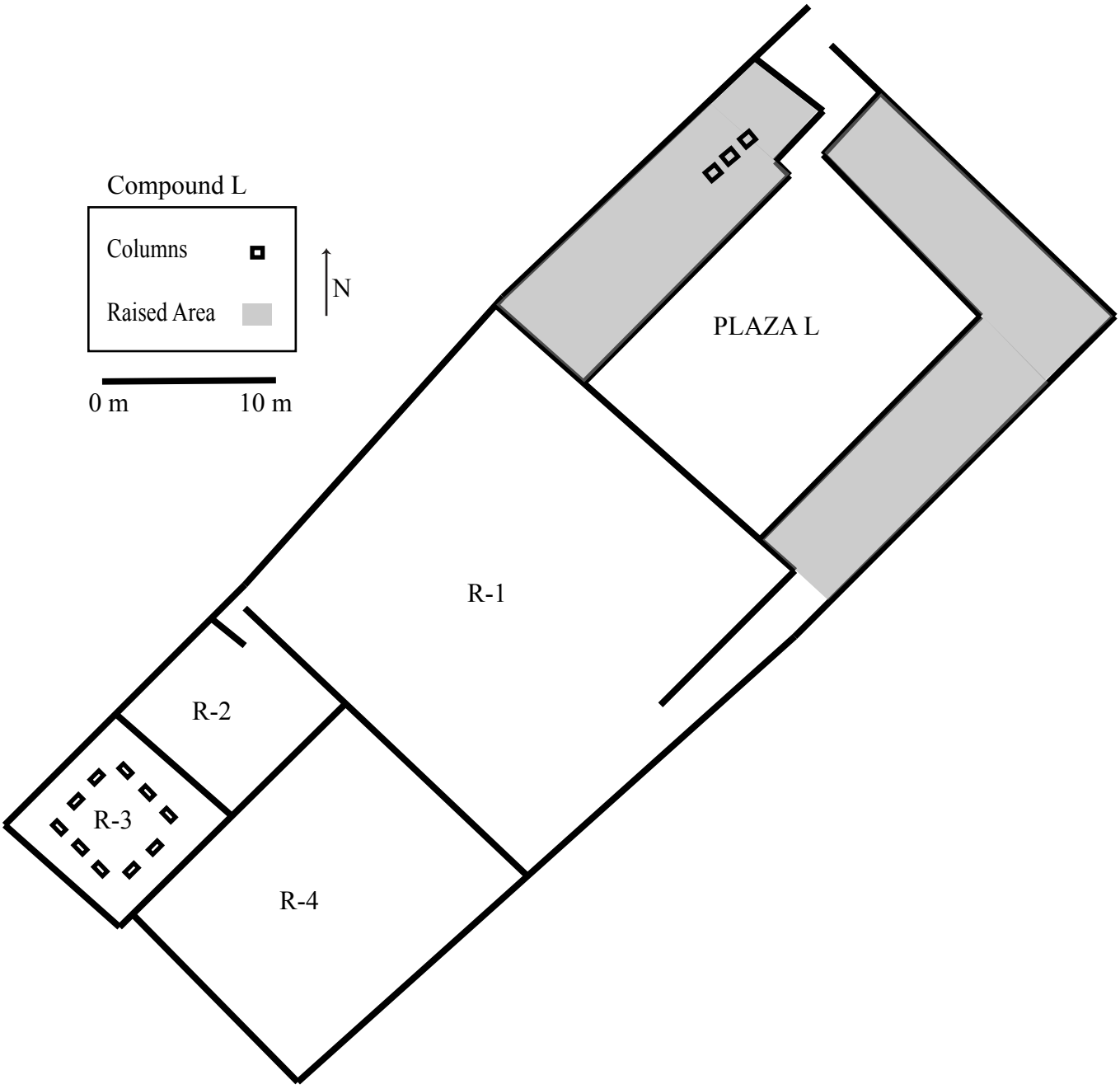

Figure 13: Compound L Map (drawing by Ashley Whitten)

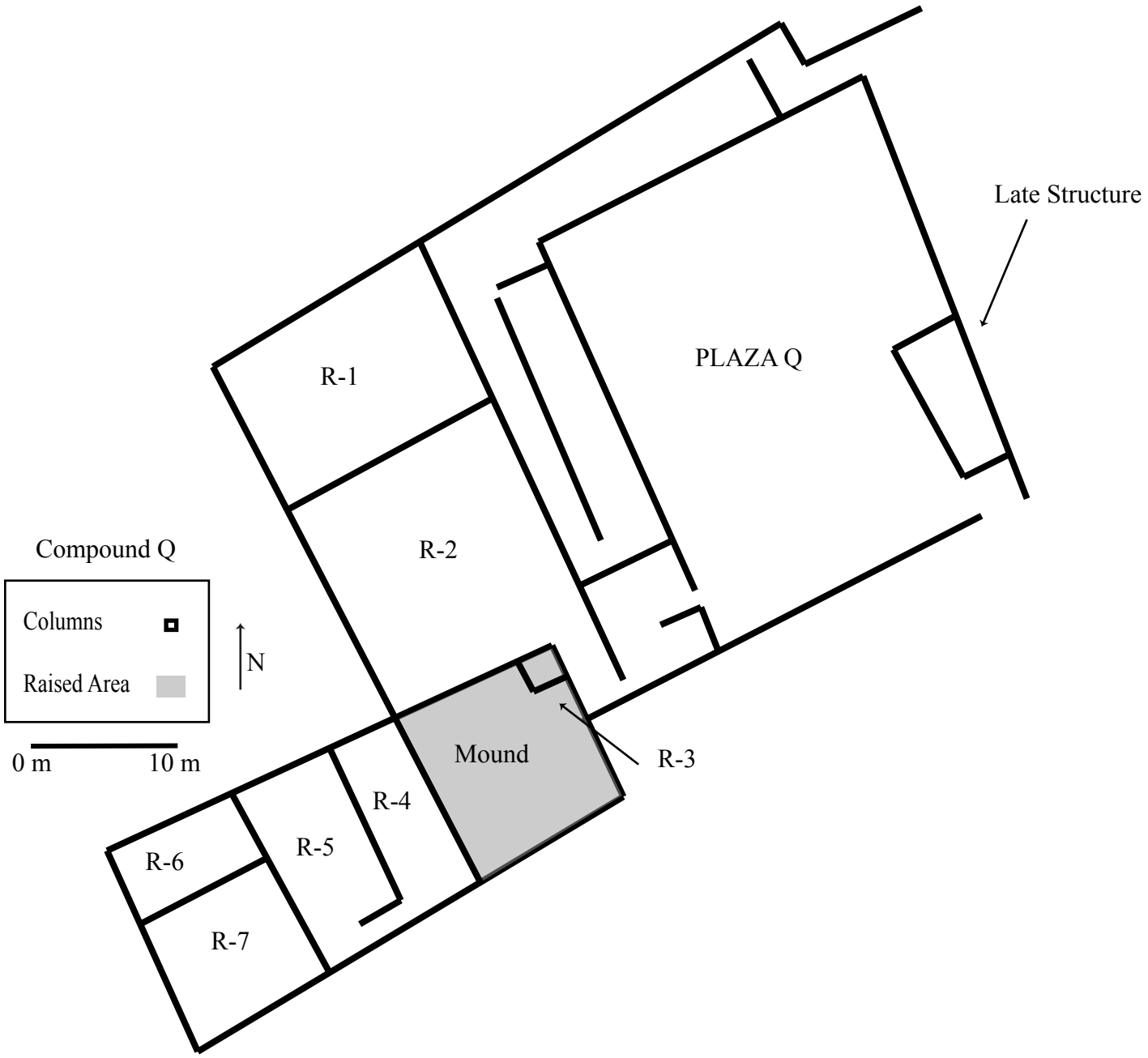

Figure 14: Compound Q Map (drawing by Ashley Whitten)

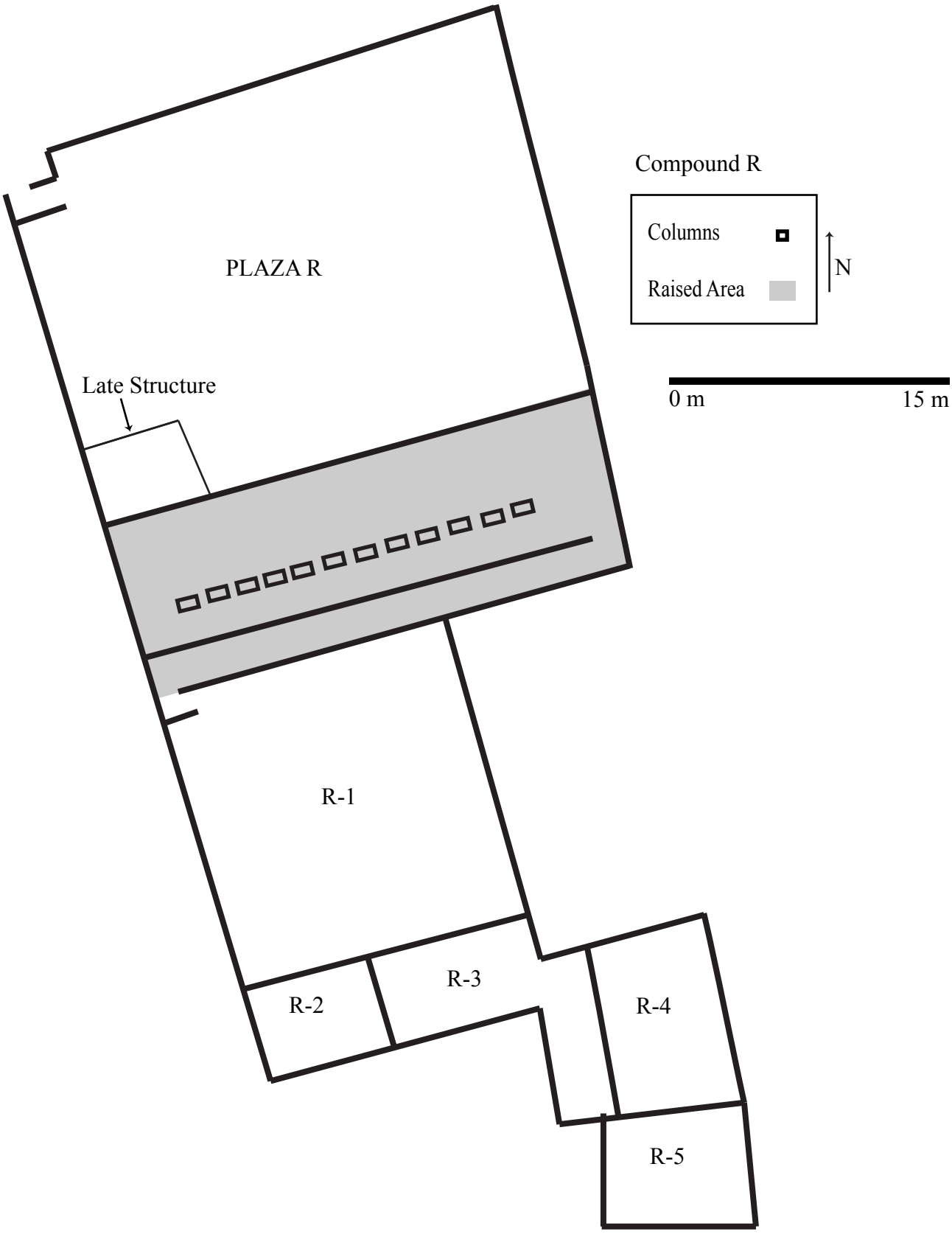

Figure 15: Compound R Map (drawing by Ashley Whitten)

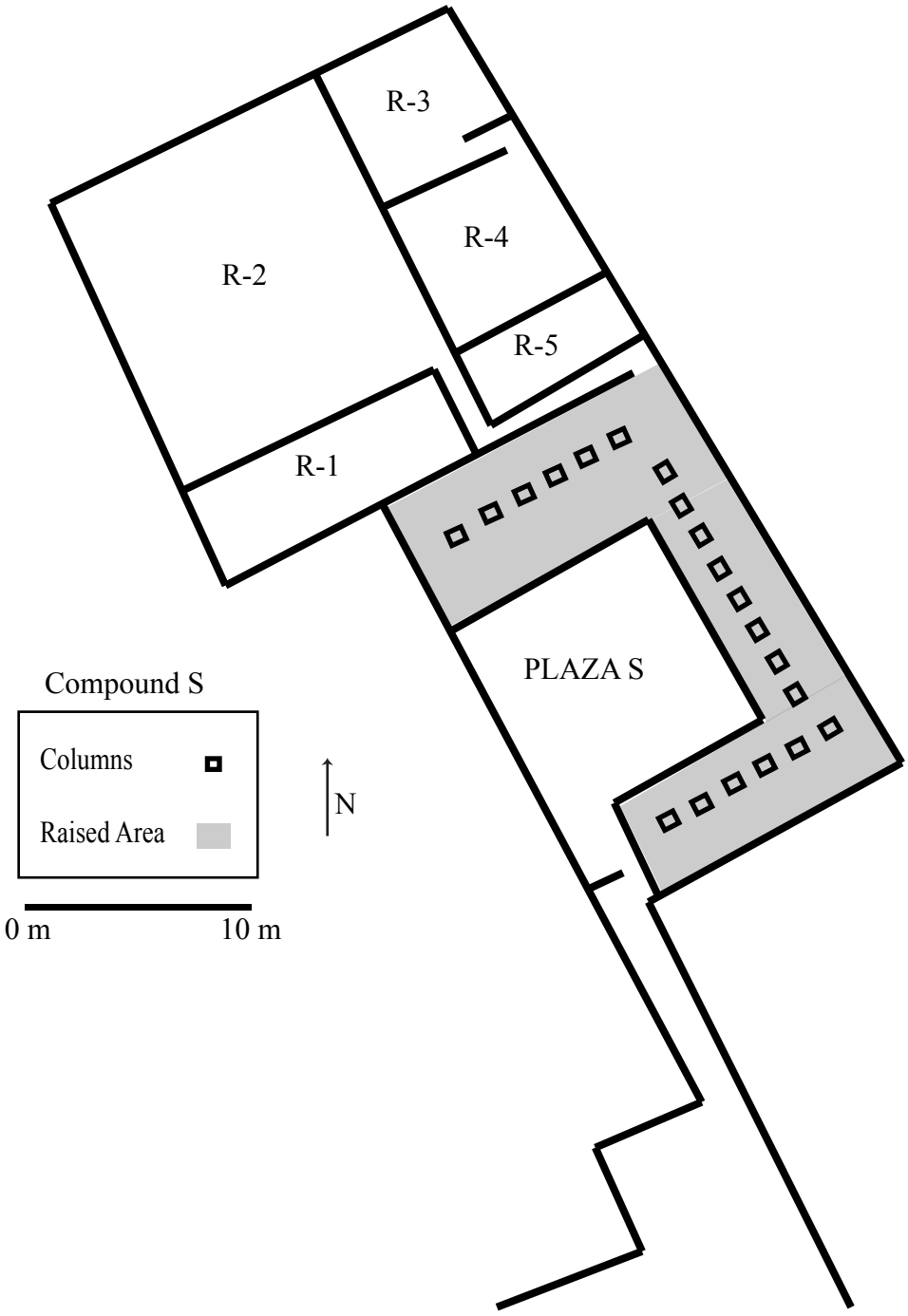

Figure 16: Compound S Map (drawing by Ashley Whitten)

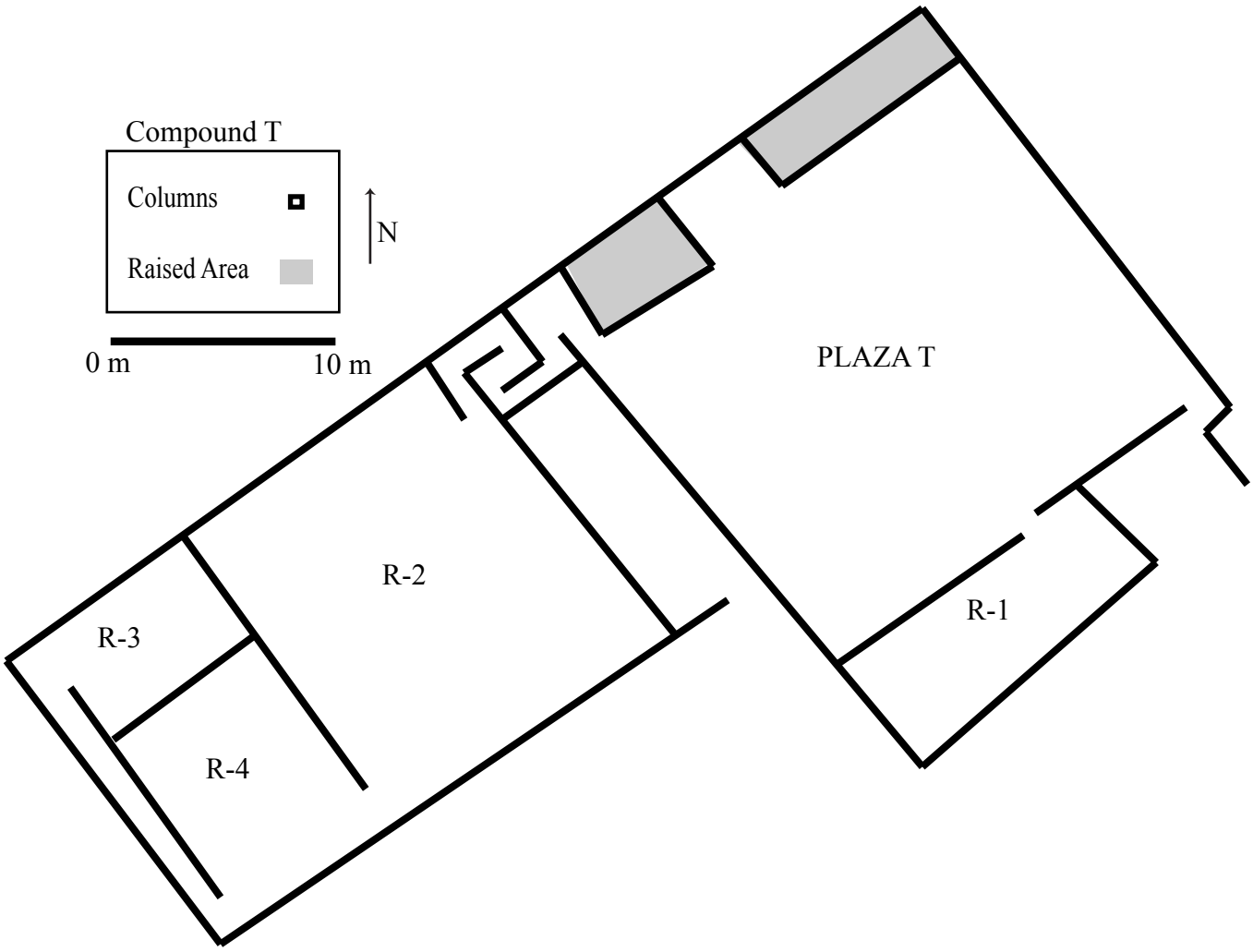

Figure 17: Compound T Map (drawing by Ashley Whitten)

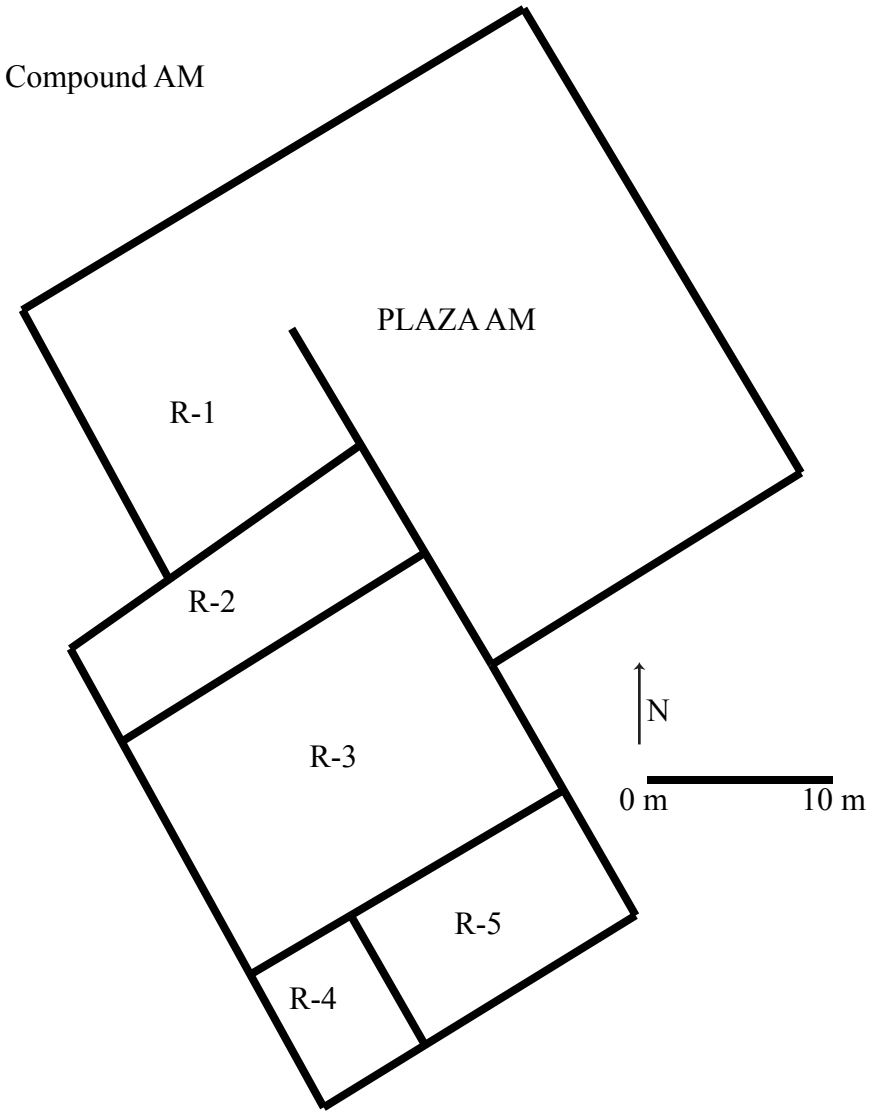

Figure 18: Compound AM Map (drawing by Ashley Whitten)

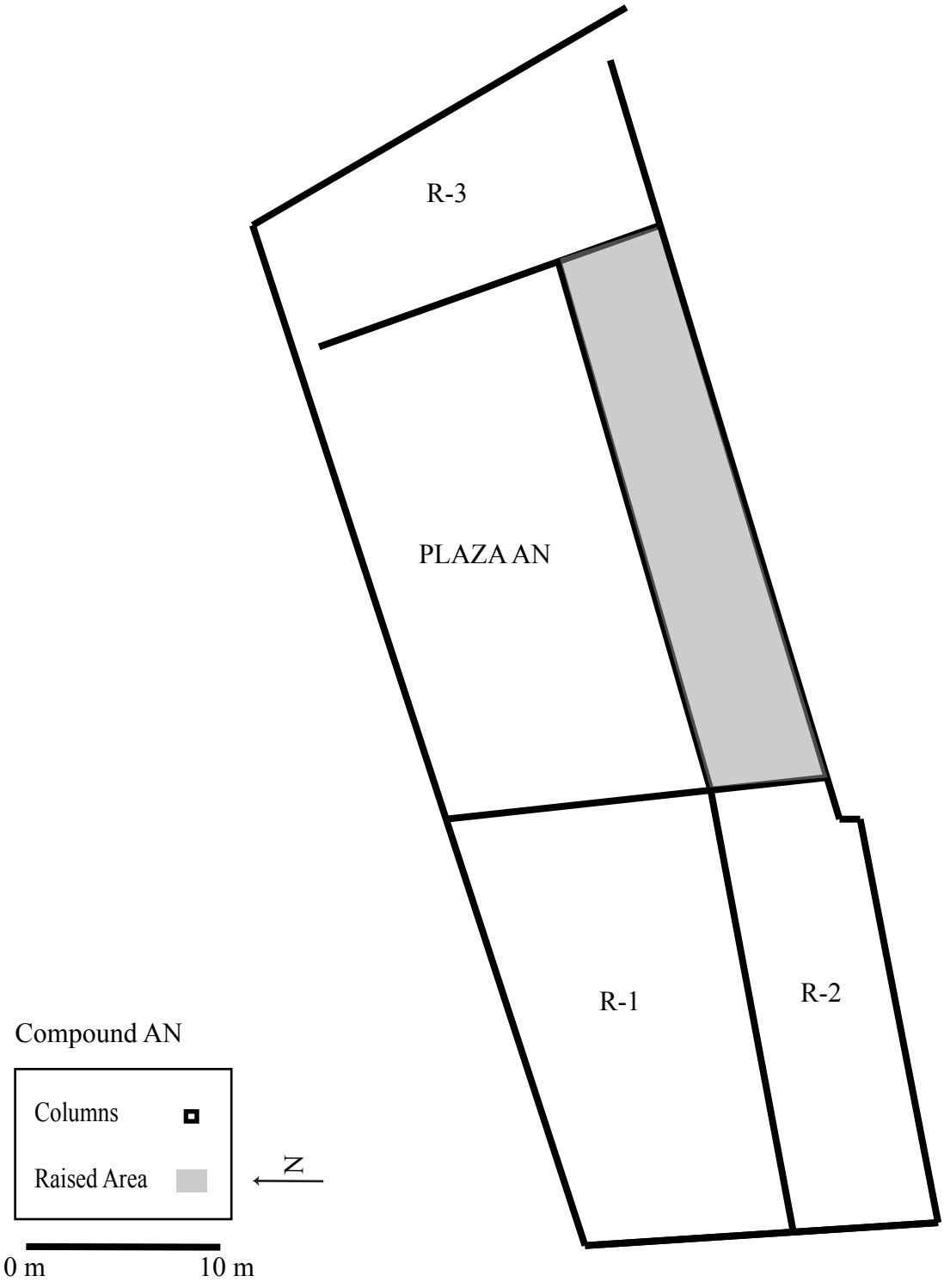

Figure 19: Compound AN Map (drawing by Ashley Whitten)

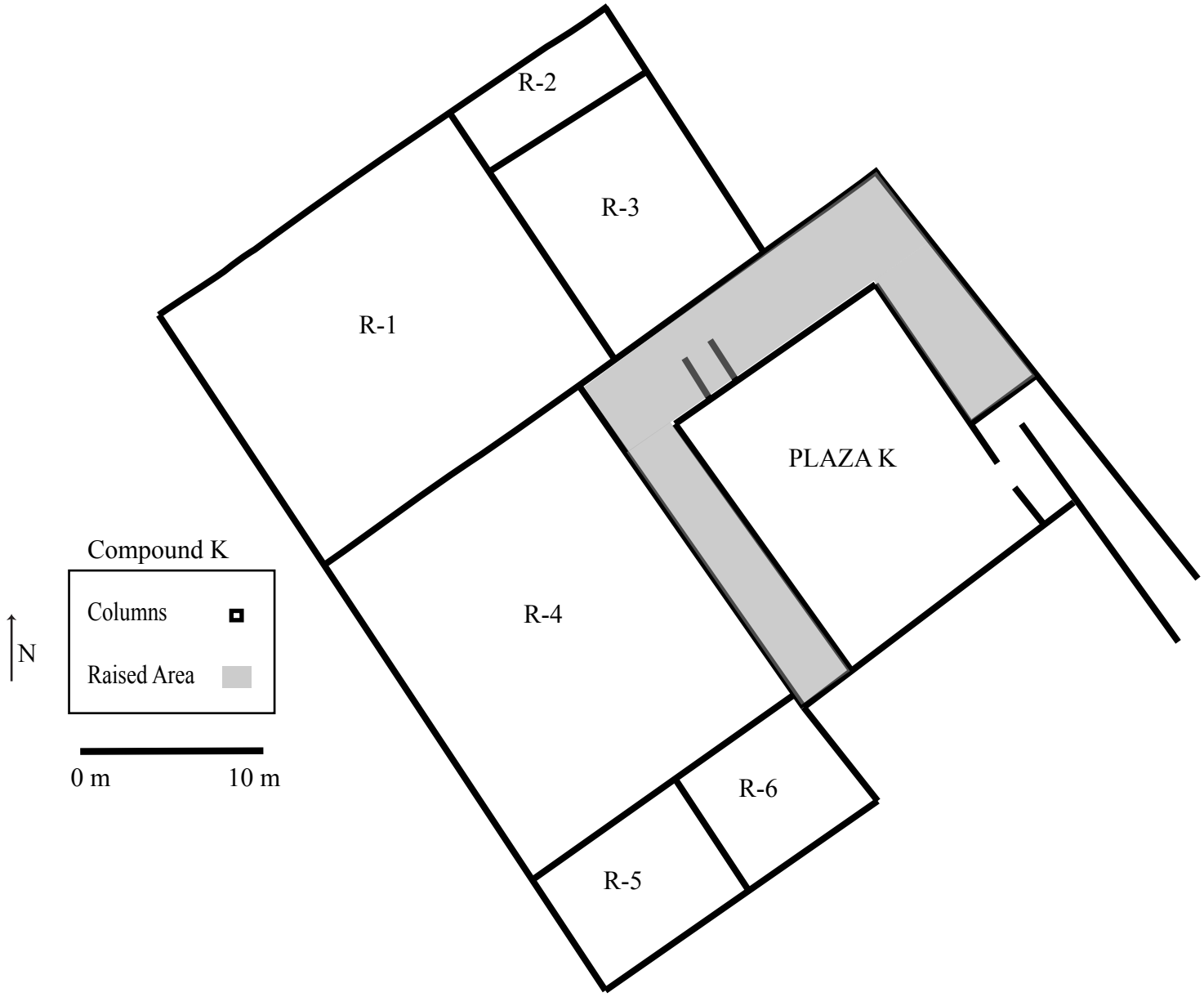

Figure 20: Compound K Map (drawing by Ashley Whitten)

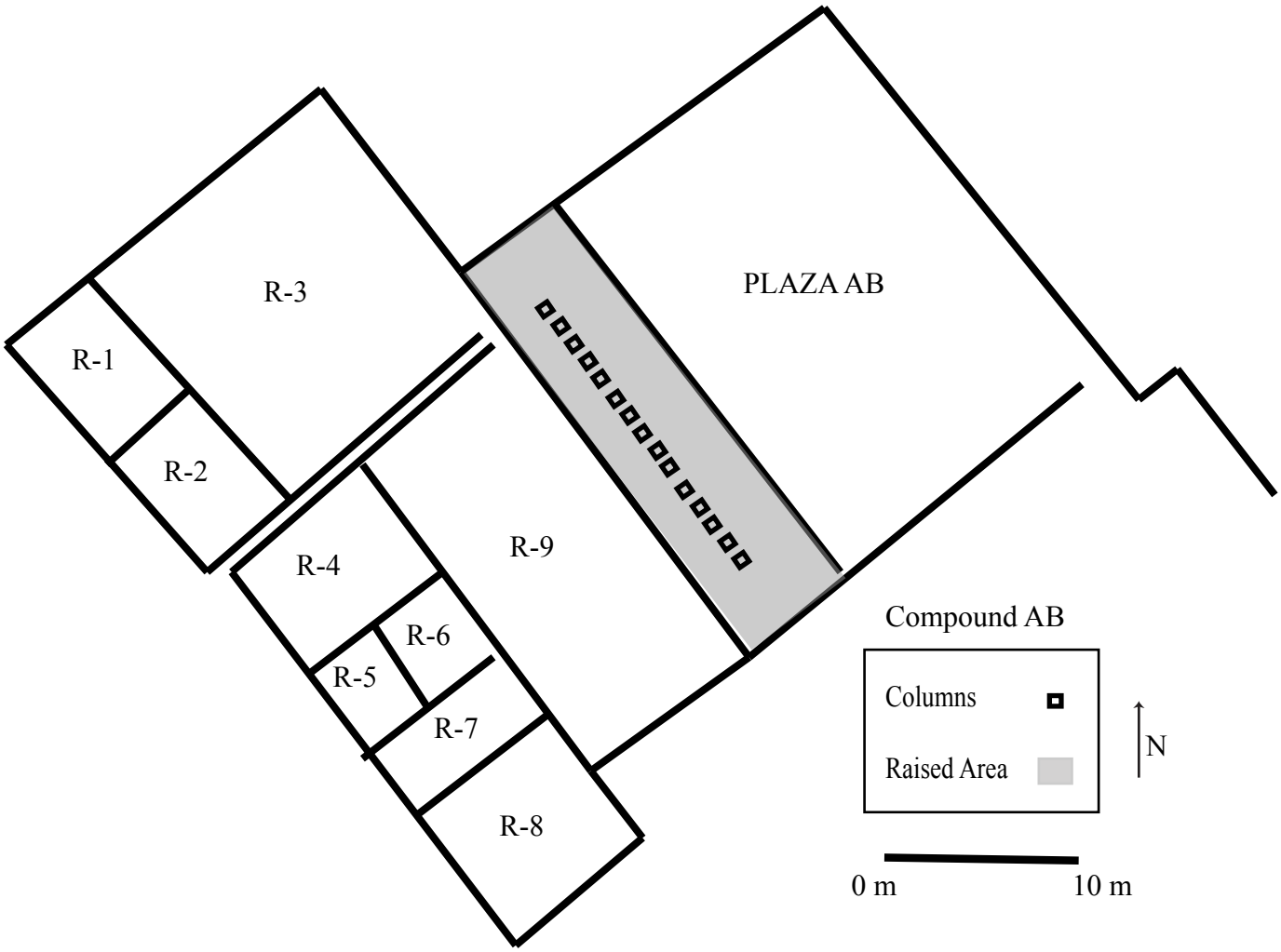

Figure 21: Compound AB Map (drawing by Ashley Whitten)

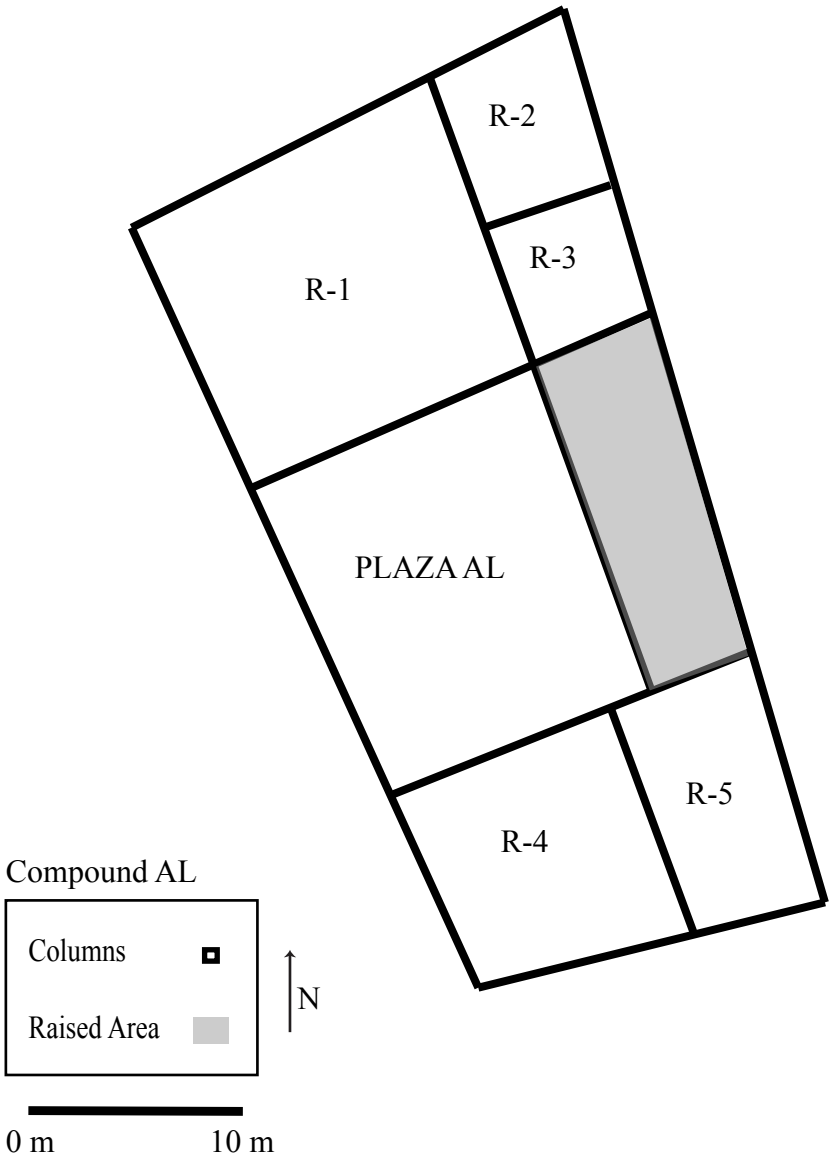

Figure 22: Compound AL Map (drawing by Ashley Whitten)

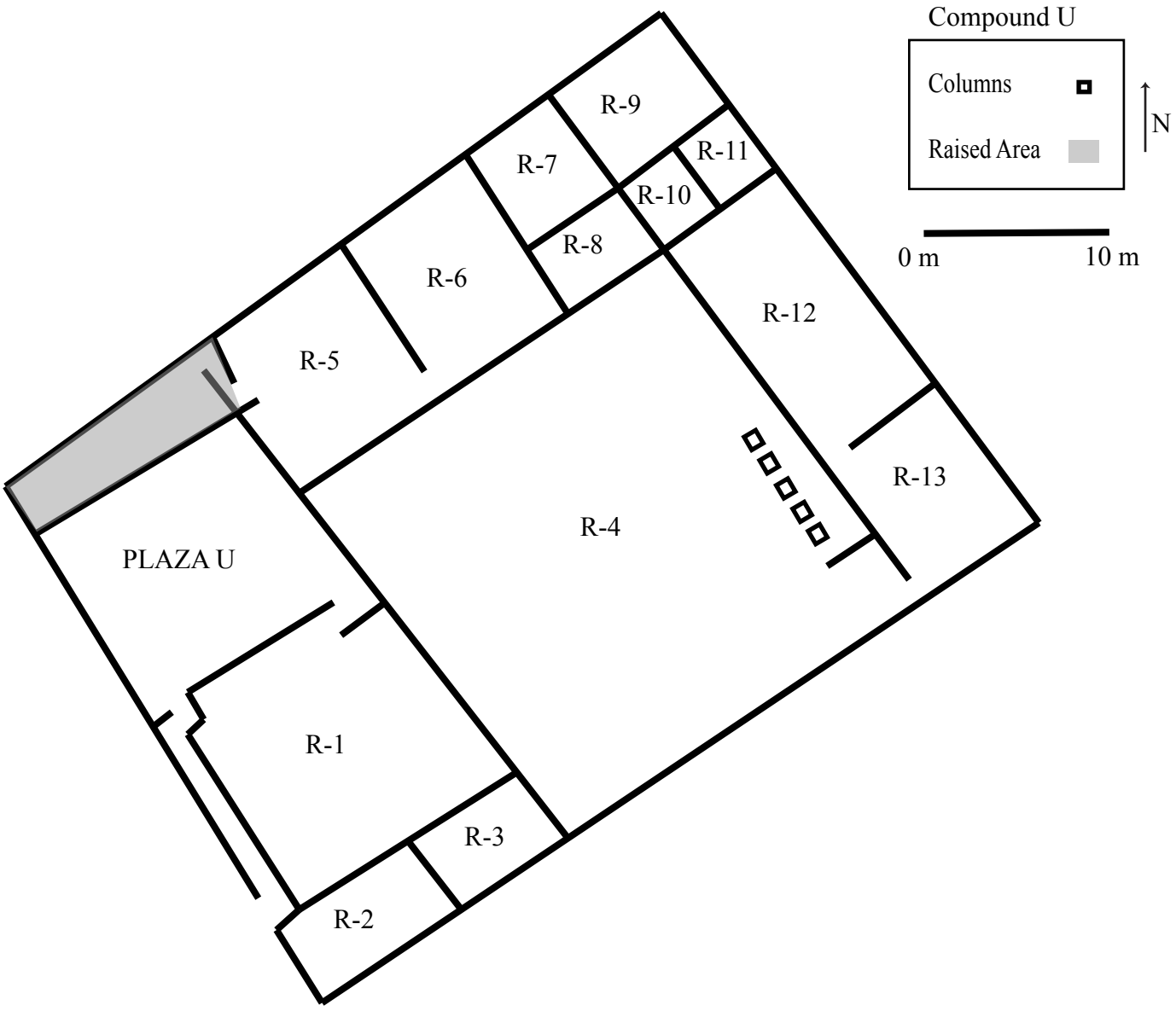

Figure 23: Compound U Map (drawing by Ashley Whitten)

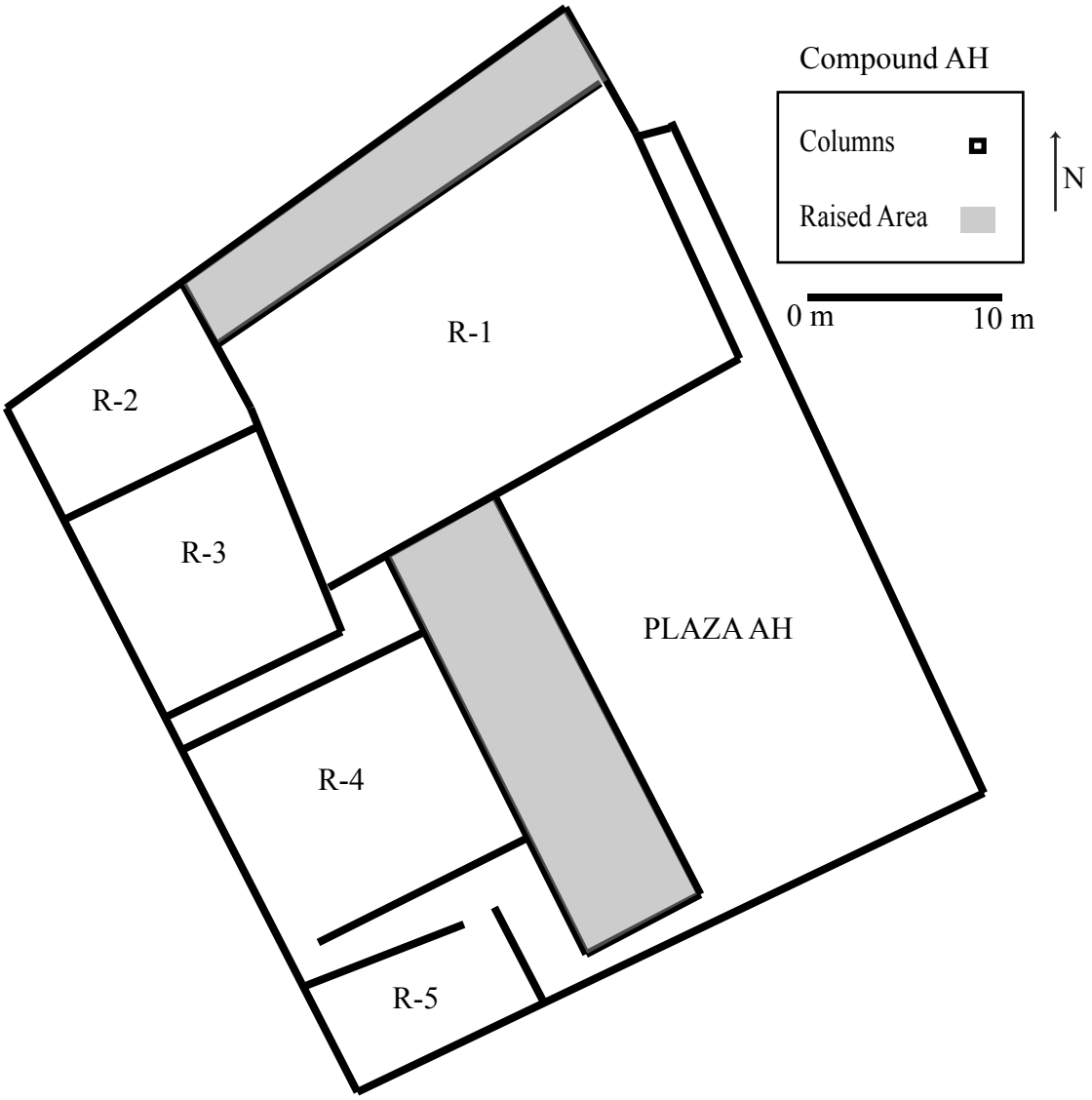

Figure 24: Compound AH Map (drawing by Ashley Whitten)

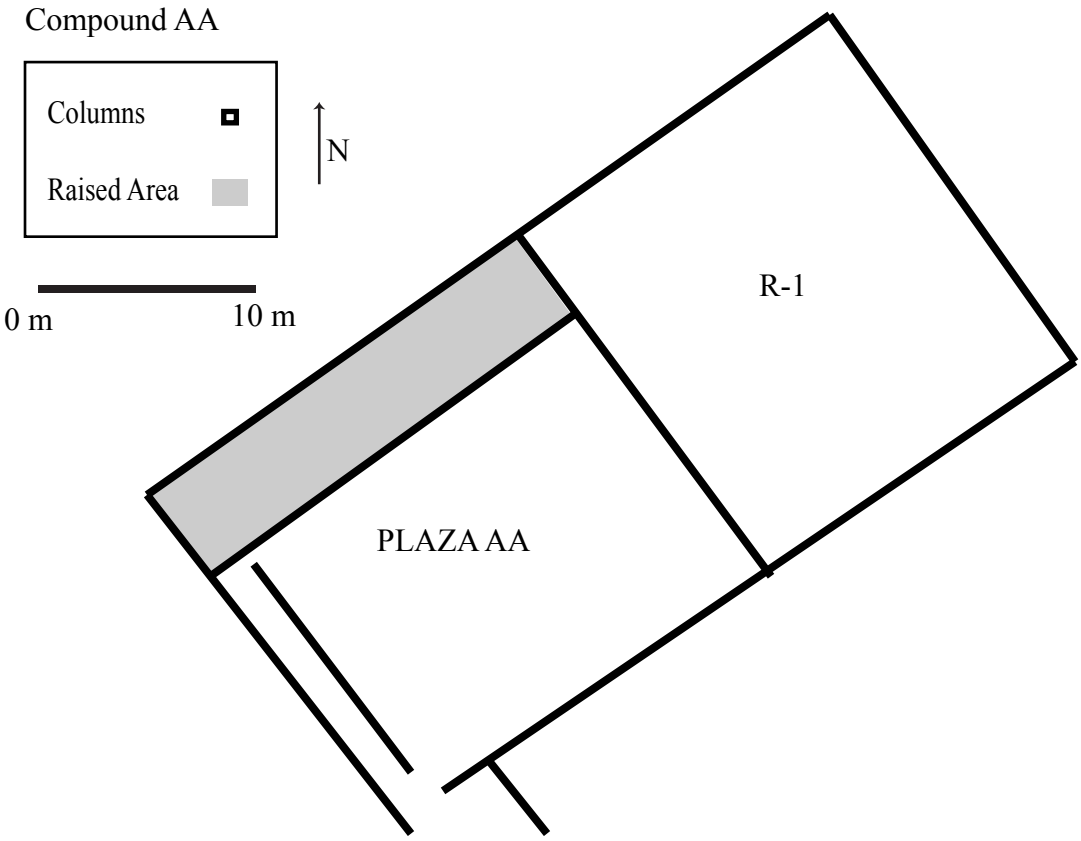

Figure 25: Compound AA Map (drawing by Ashley Whitten)

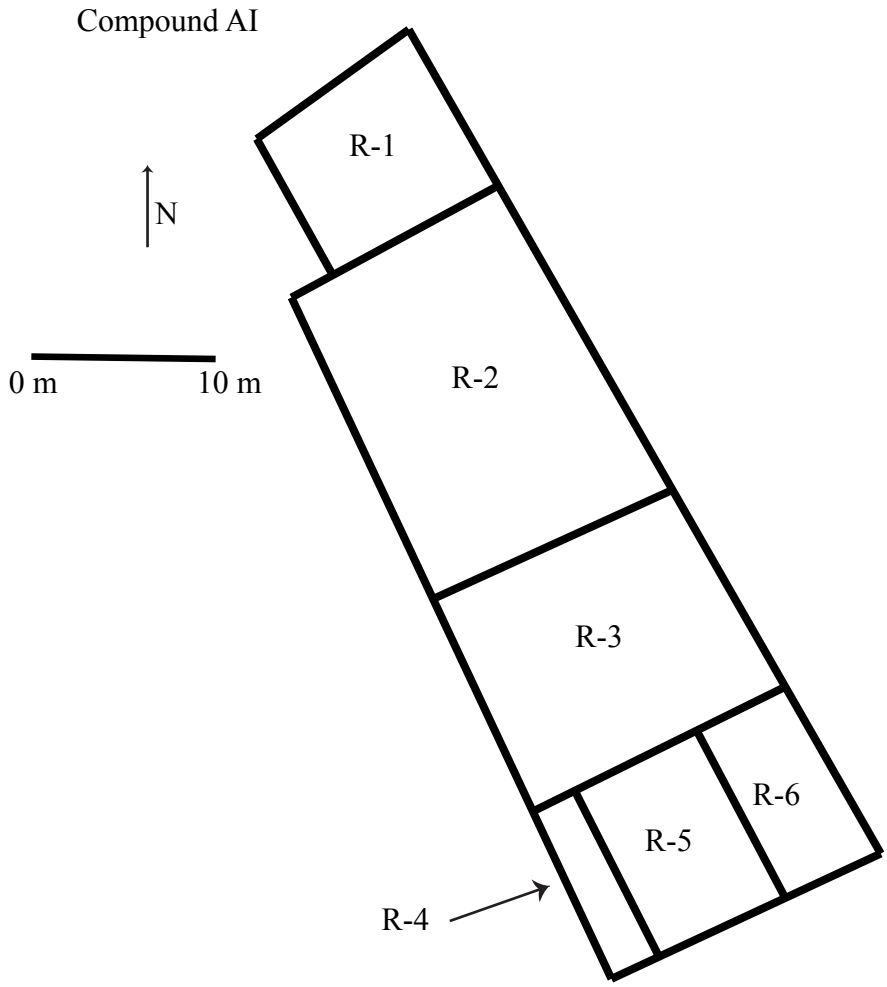

Figure 26: Compound AI Map (drawing by Ashley Whitten)

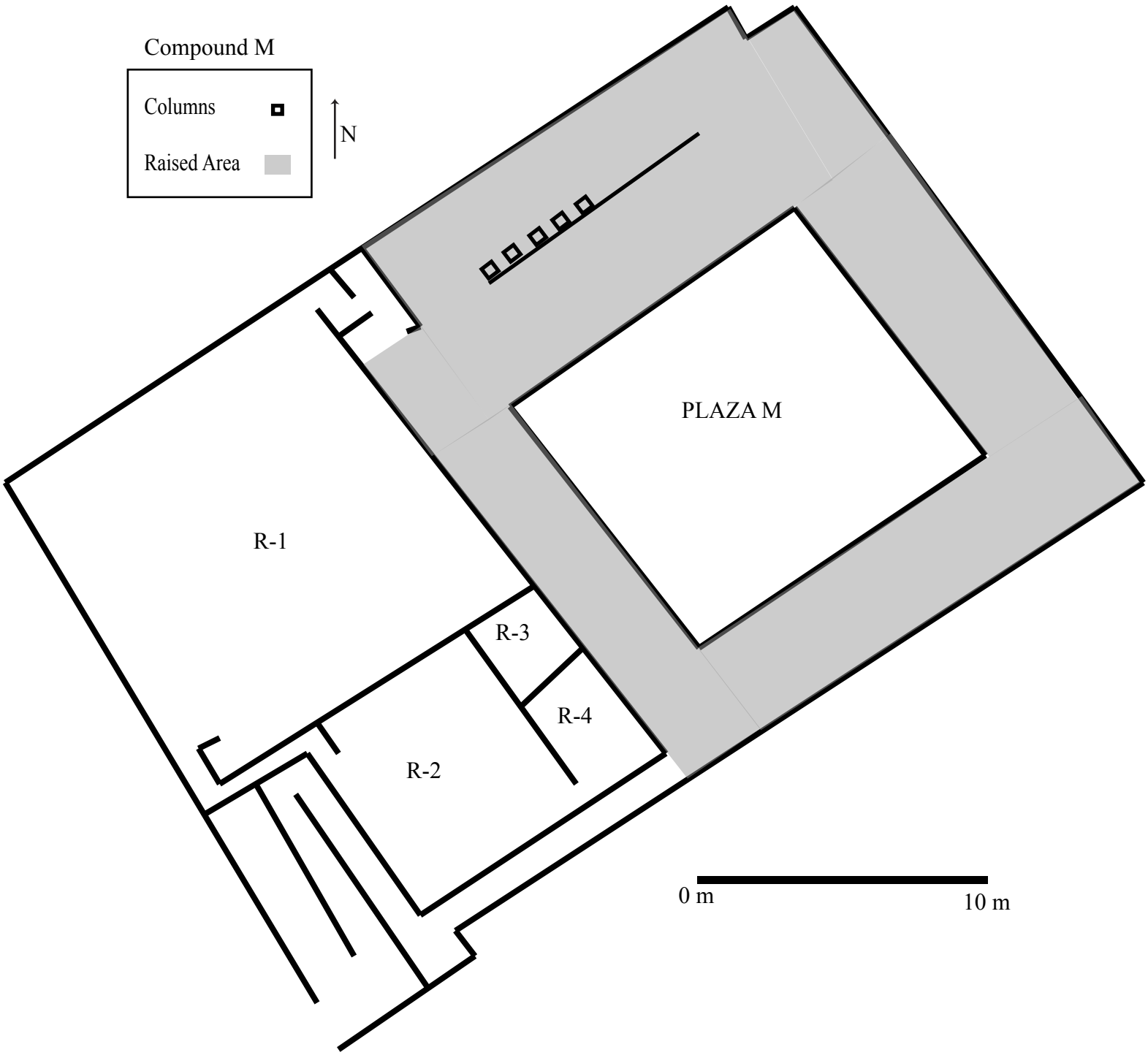

Figure 27: Compound M Map (drawing by Ashley Whitten)

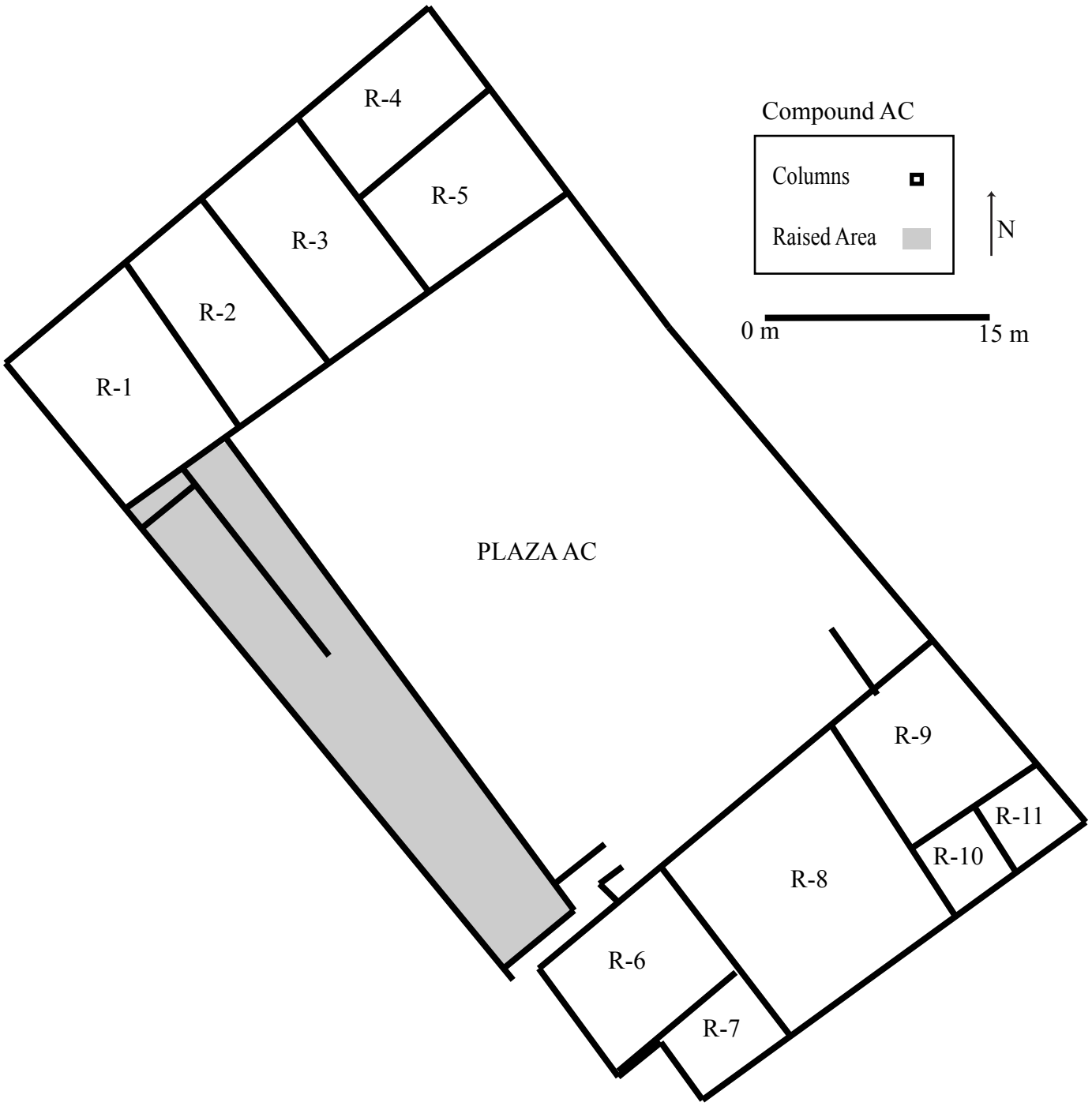

Figure 28: Compound AC Map (drawing by Ashley Whitten)

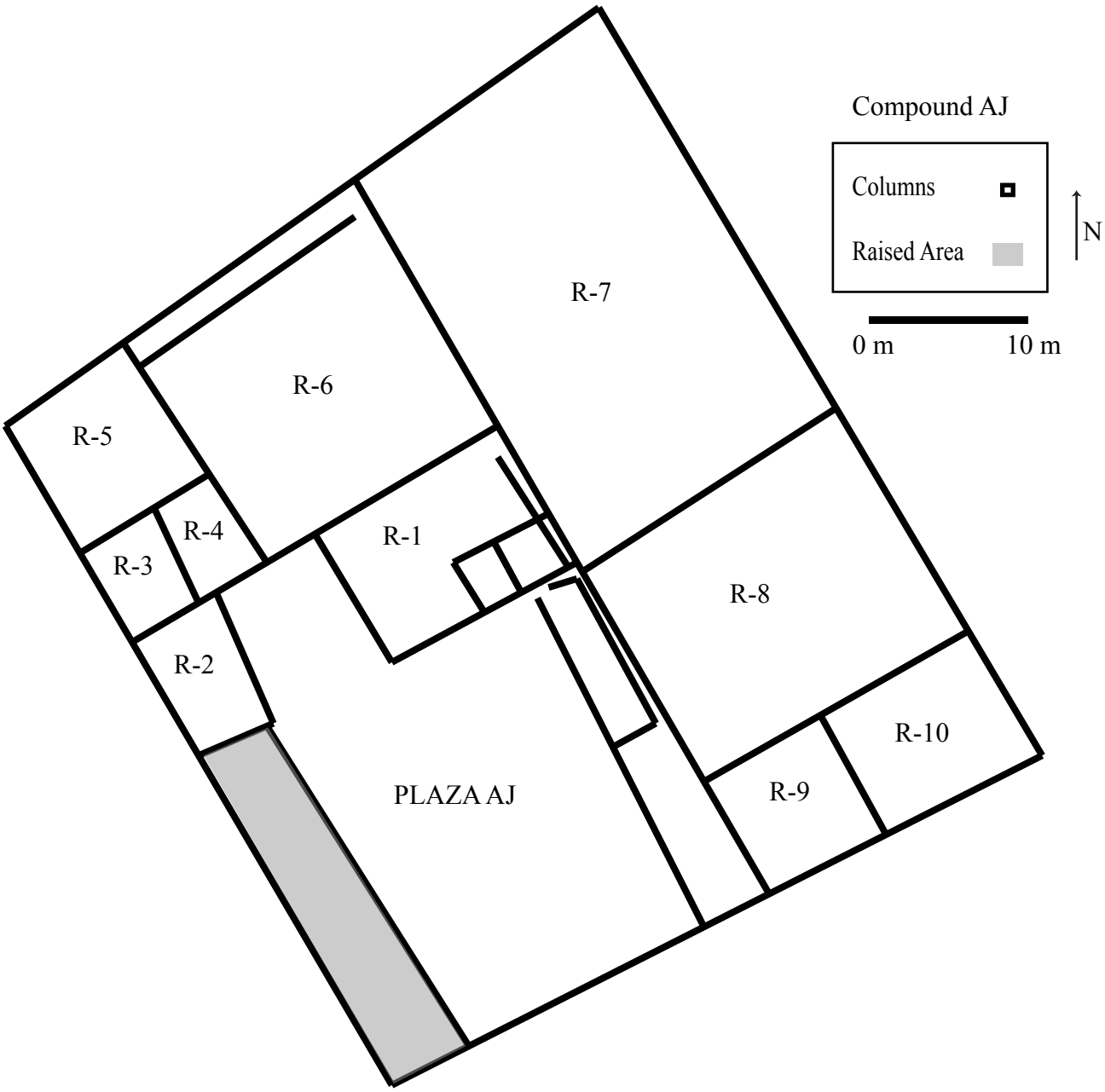

Figure 29: Compound AJ Map (drawing by Ashley Whitten)

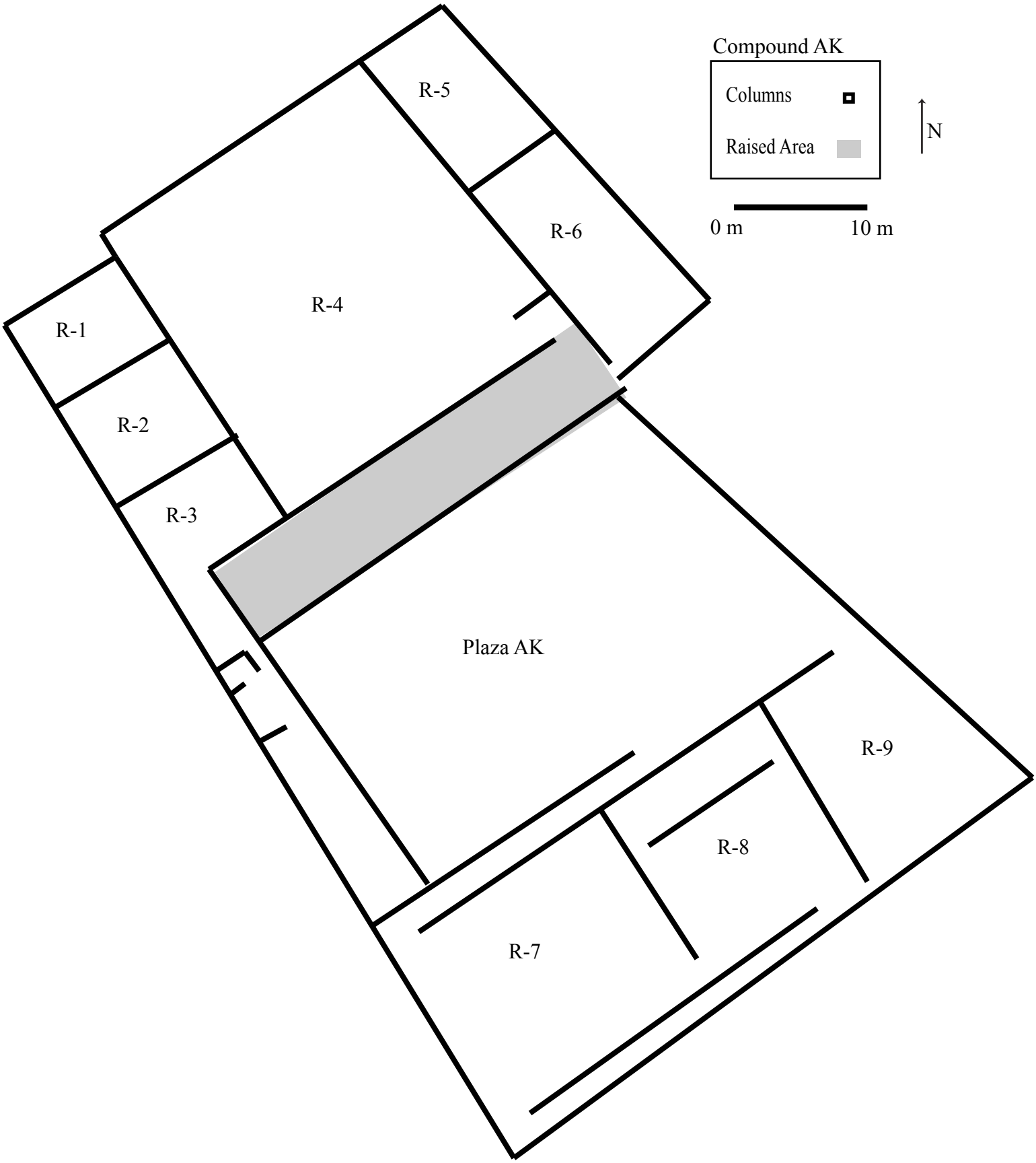

Figure 30: Compound AK Map (drawing by Ashley Whitten)

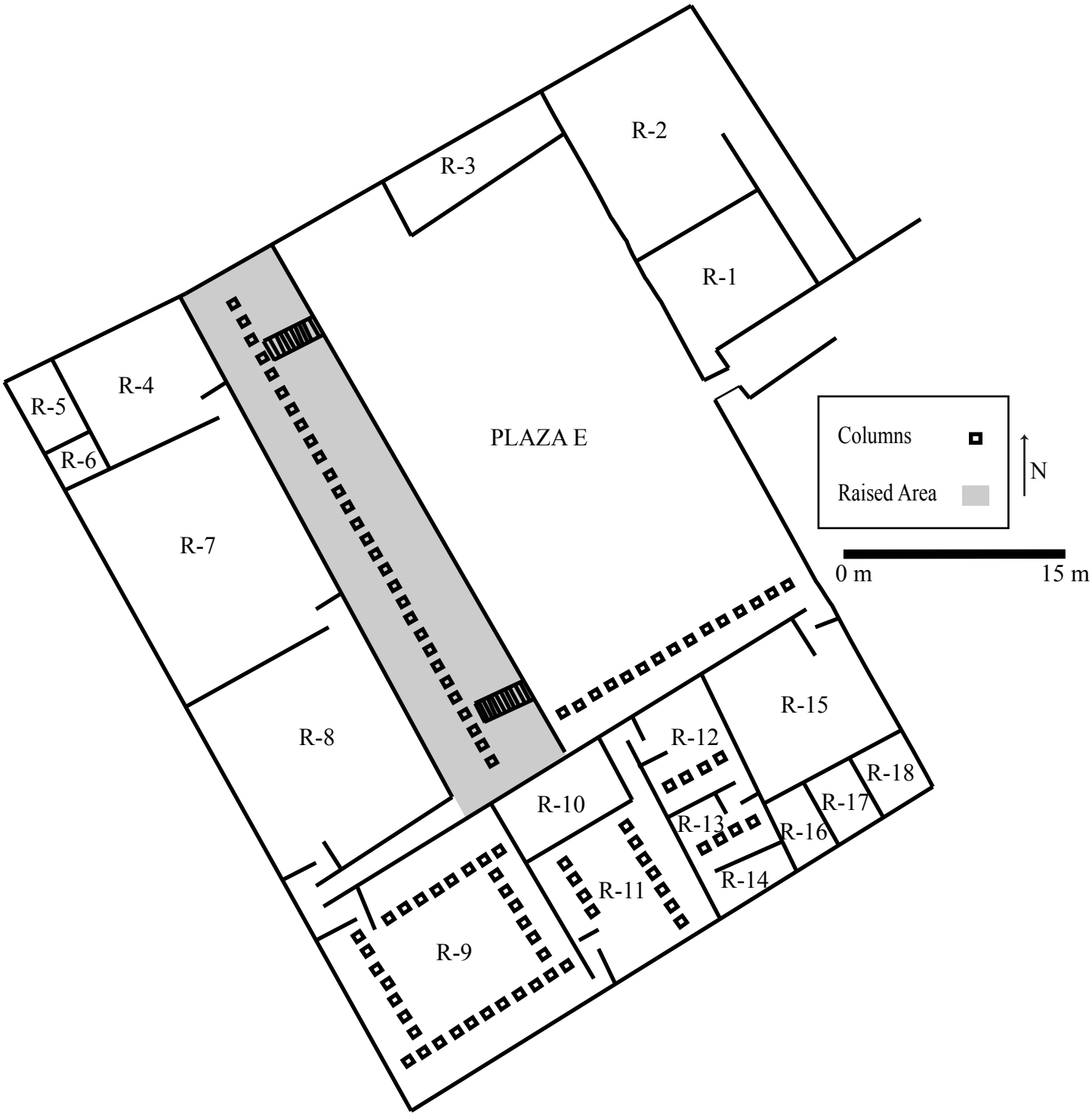

Figure 31: Compound E Map (drawing by Ashley Whitten)

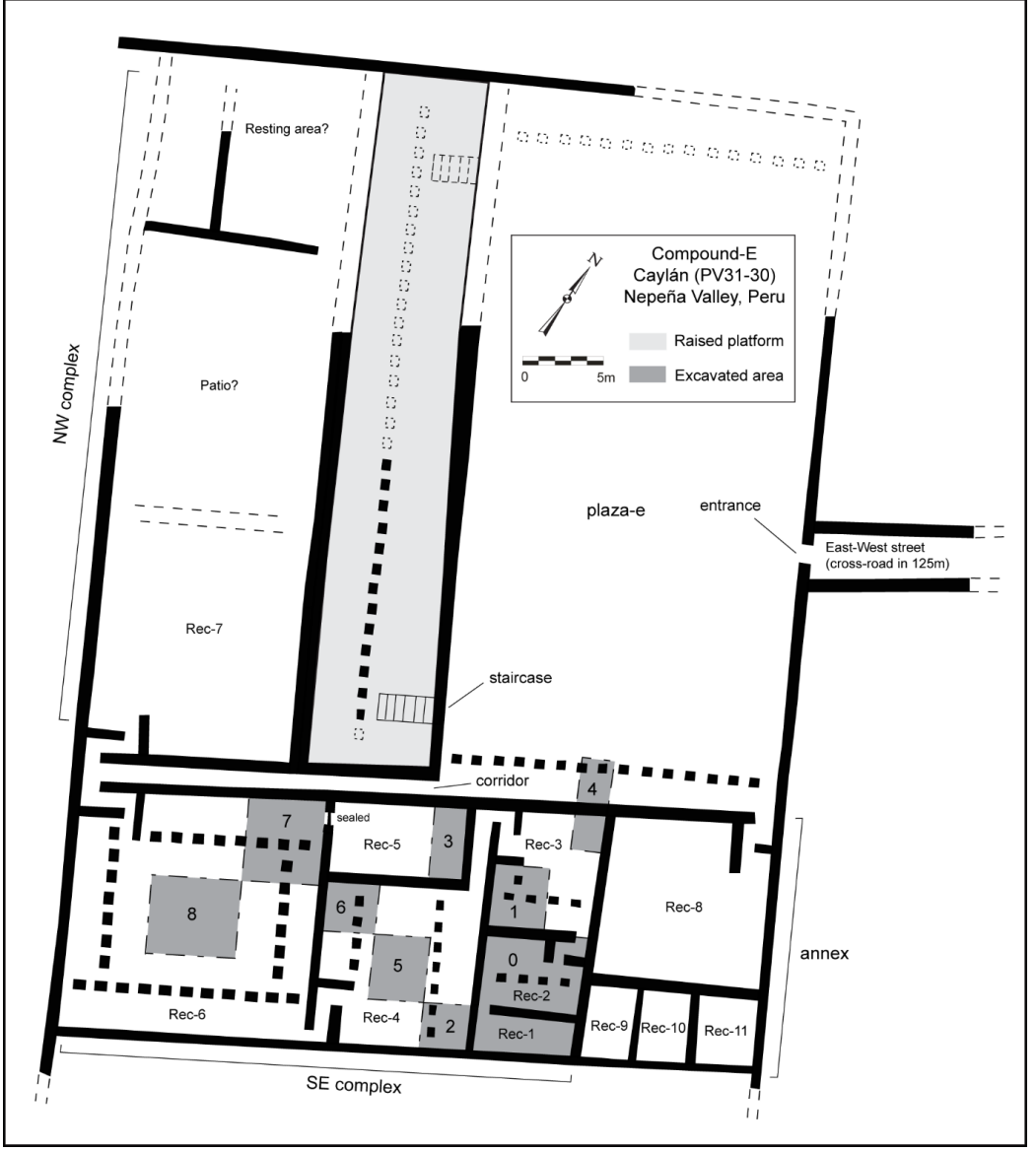

Figure 32: Compound E Excavation Map (drawing by David Chicoine)

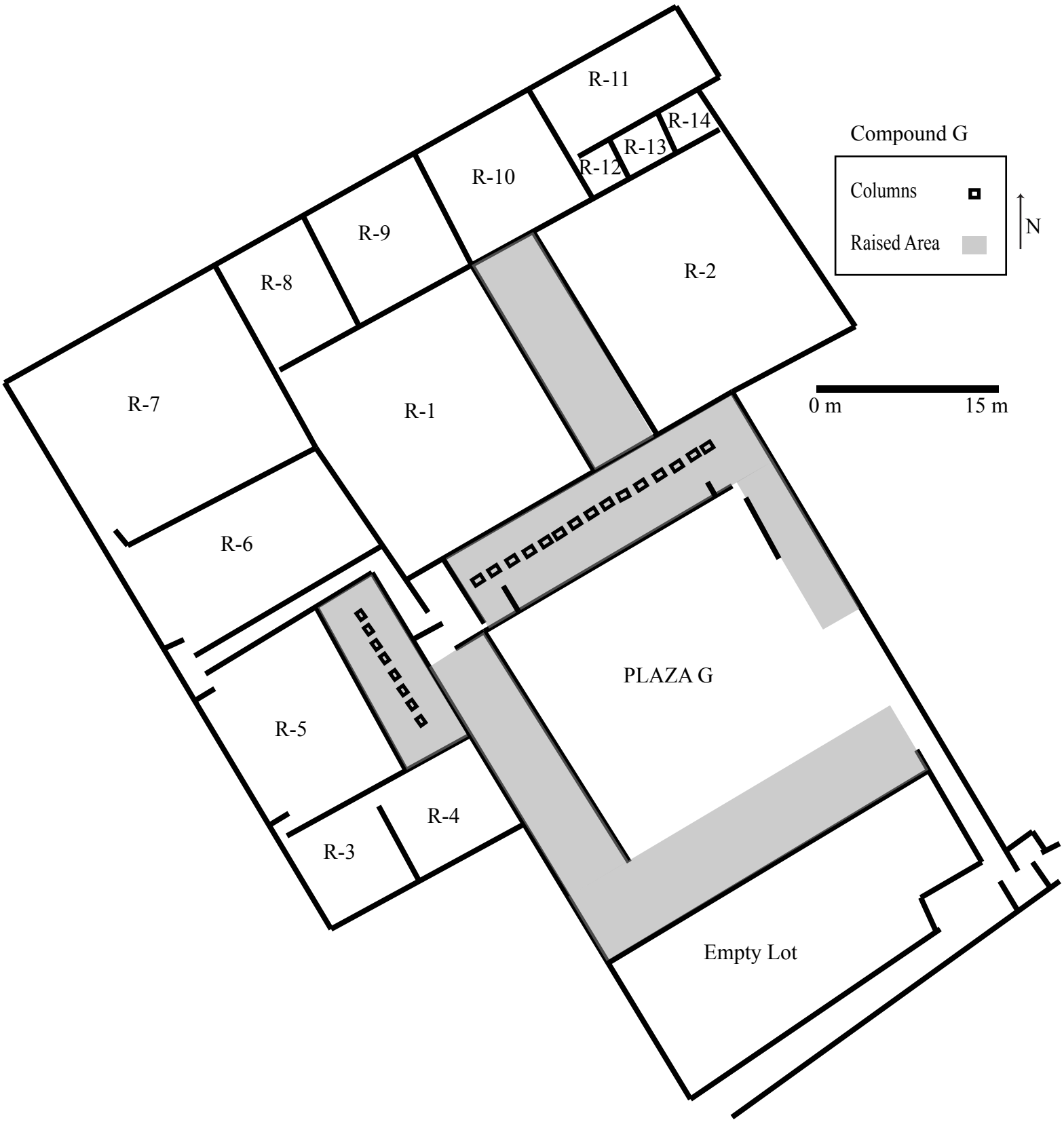

Figure 33: Compound G Map (drawing by Ashley Whitten)

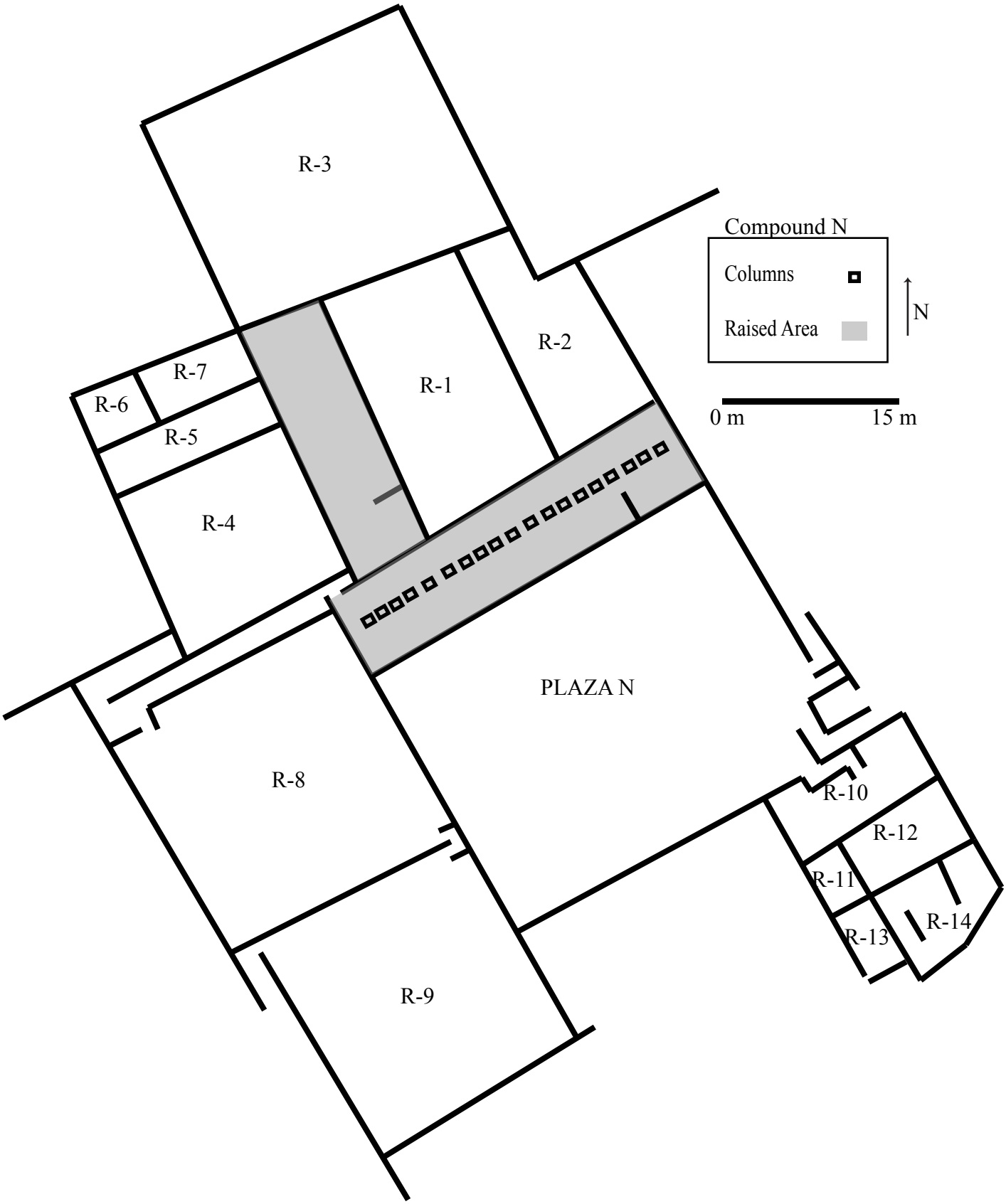

Figure 34: Compound N Map (drawing by Ashley Whitten)

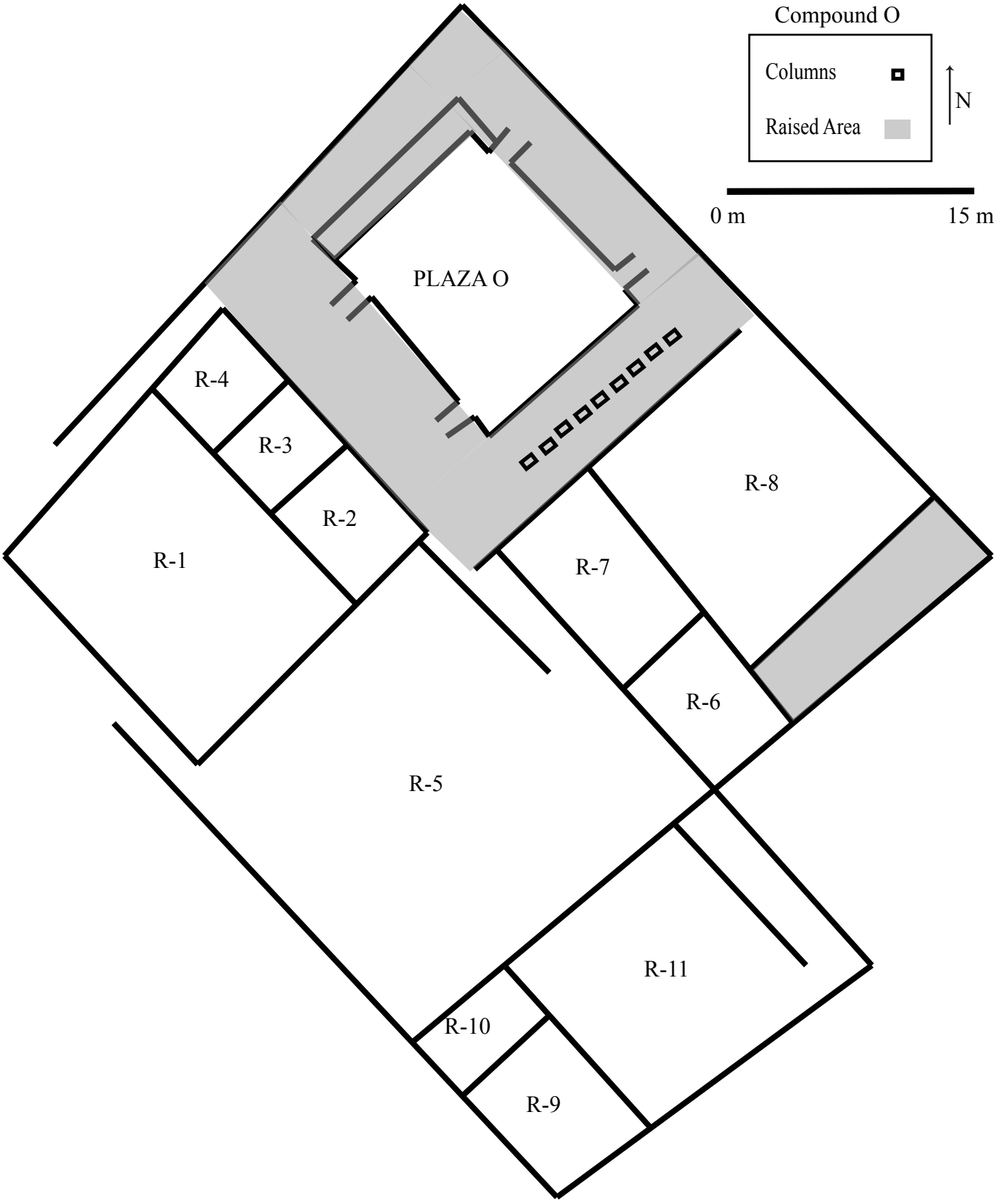

Figure 35: Compound O Map (drawing by Ashley Whitten)

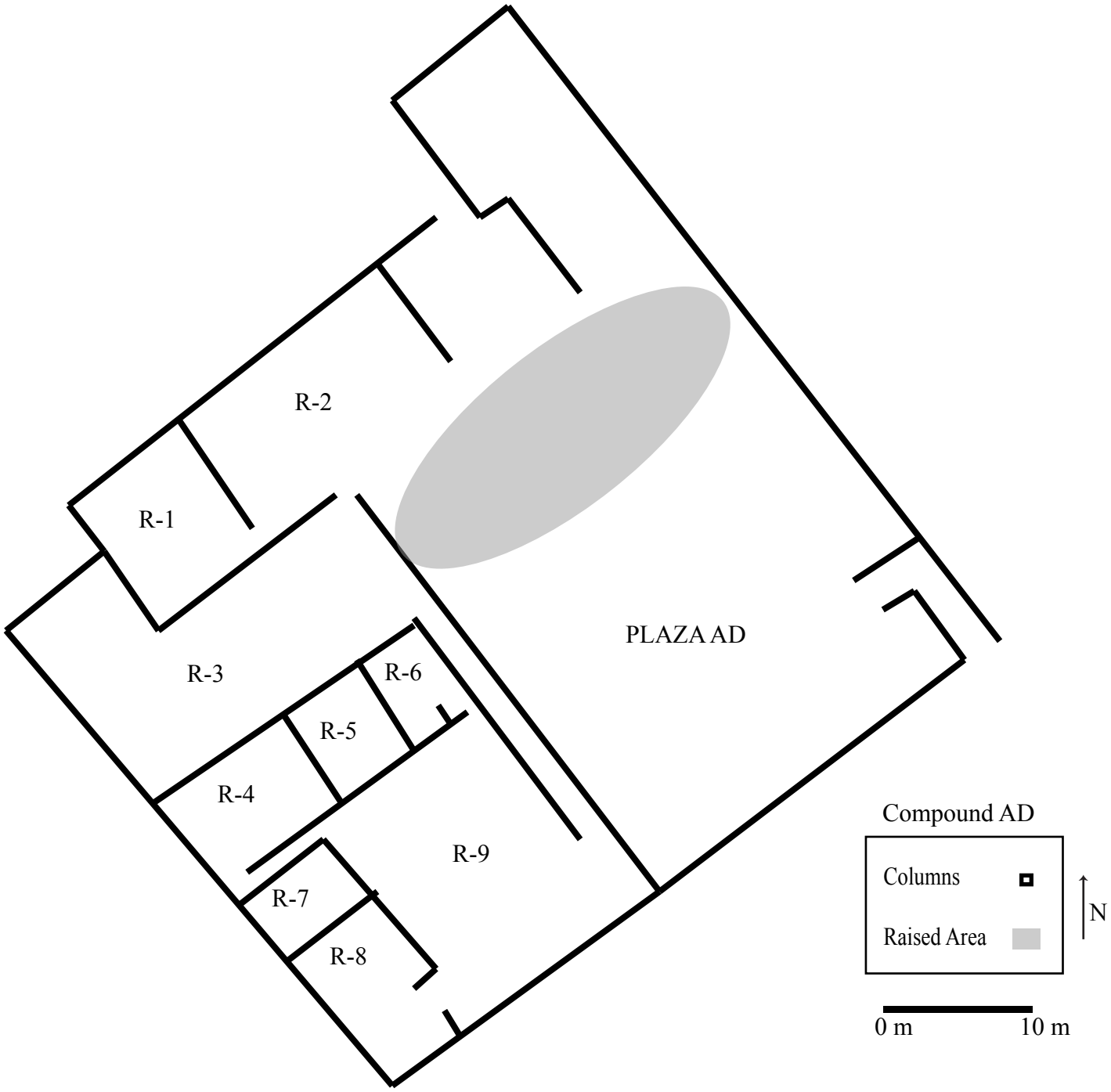

Figure 36: Compound AD Map (drawing by Ashley Whitten)

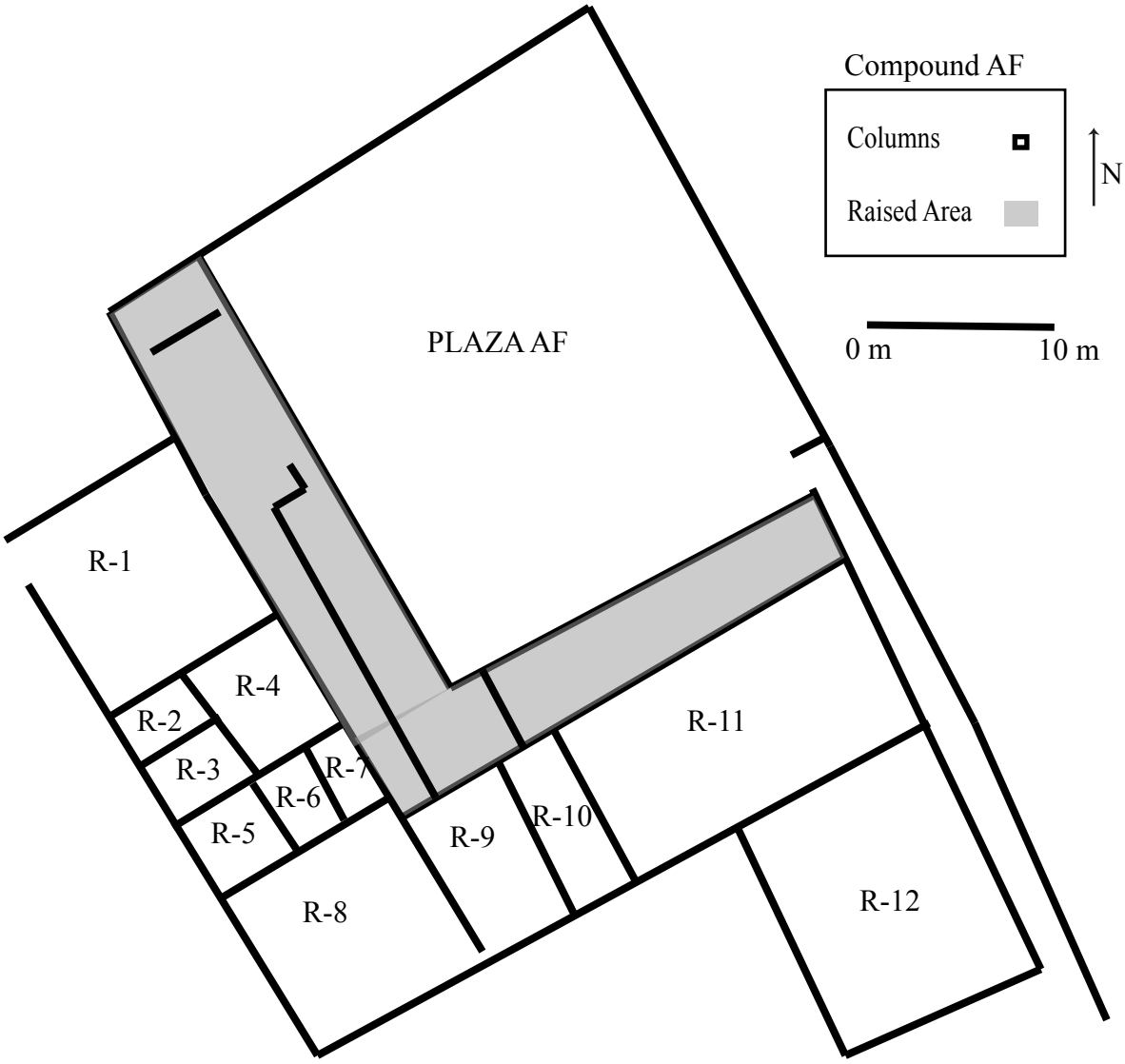

Figure 37: Compound AF Map (drawing by Ashley Whitten)

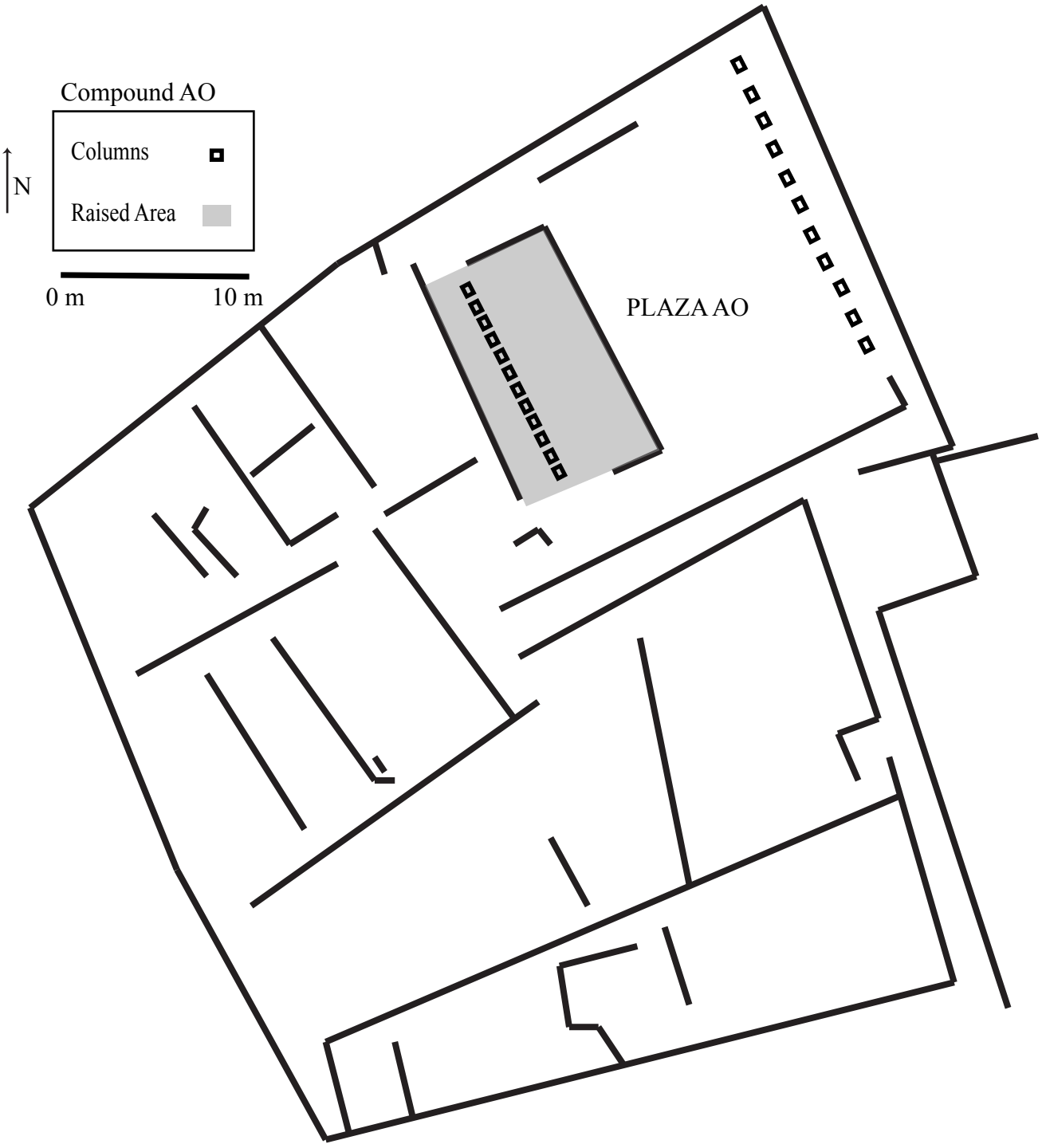

Figure 38: Compound AO Map (drawing by Ashley Whitten)

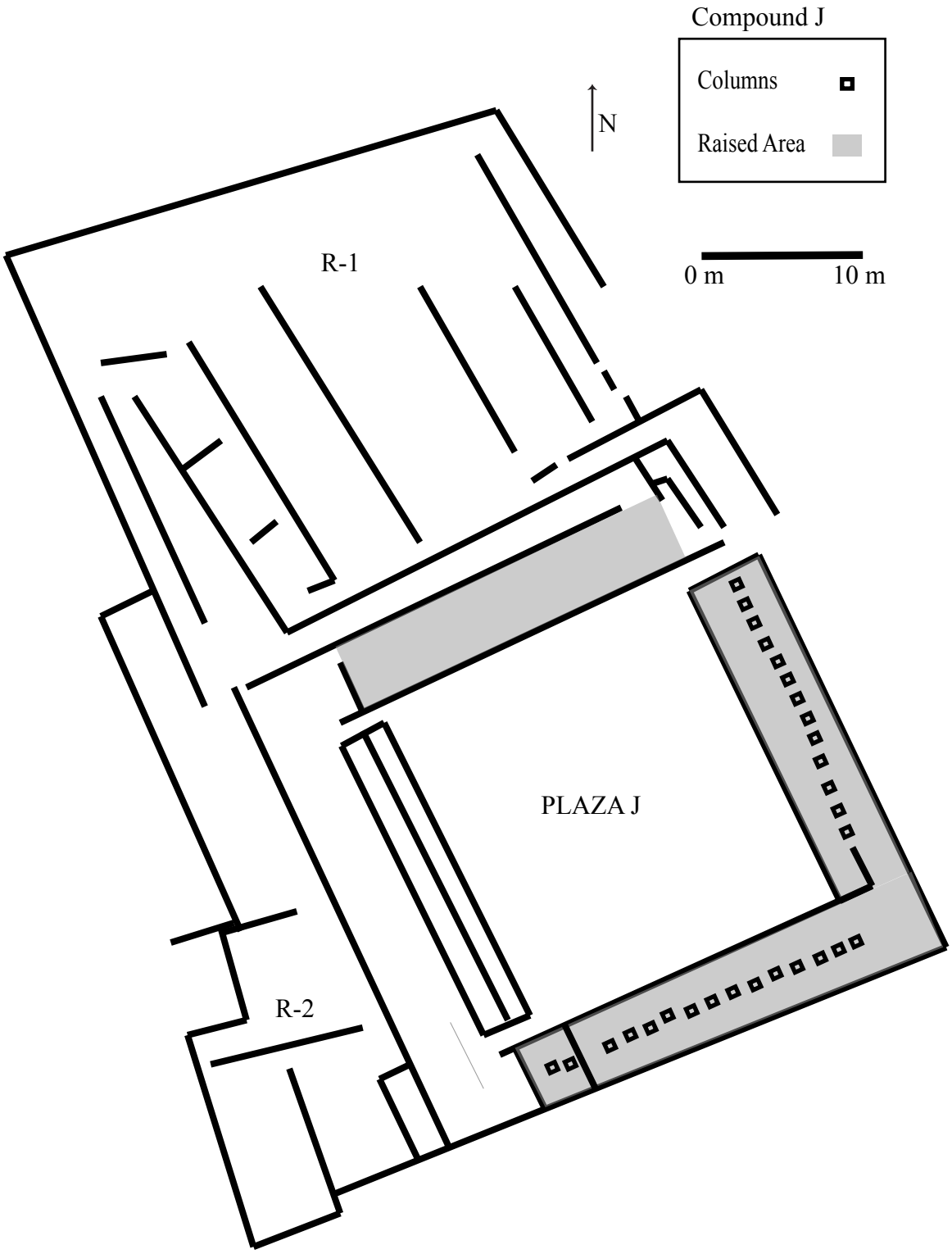

Figure 39: Compound J Map (drawing by Ashley Whitten)

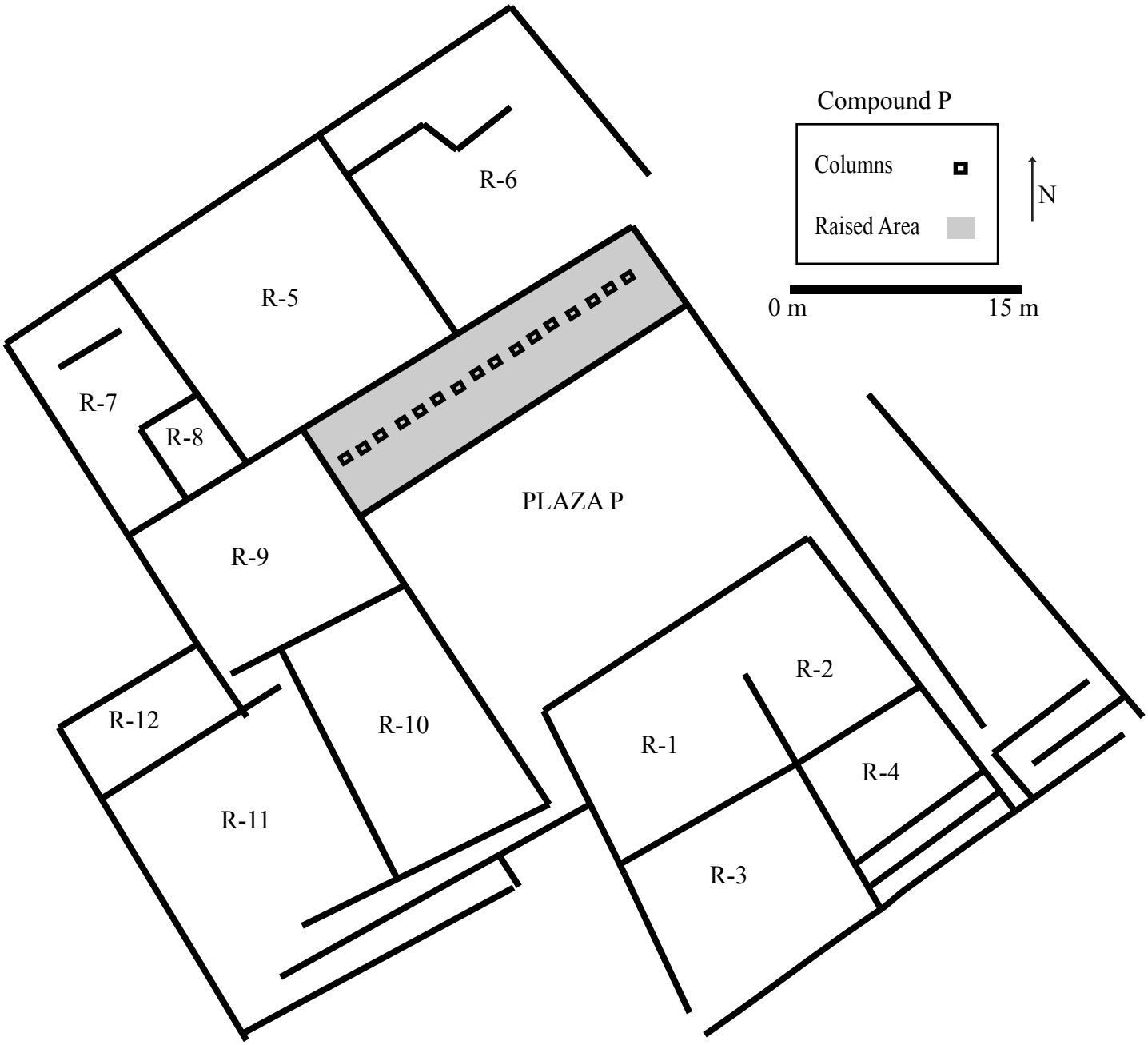

Figure 40: Compound P Map (drawing by Ashley Whitten)

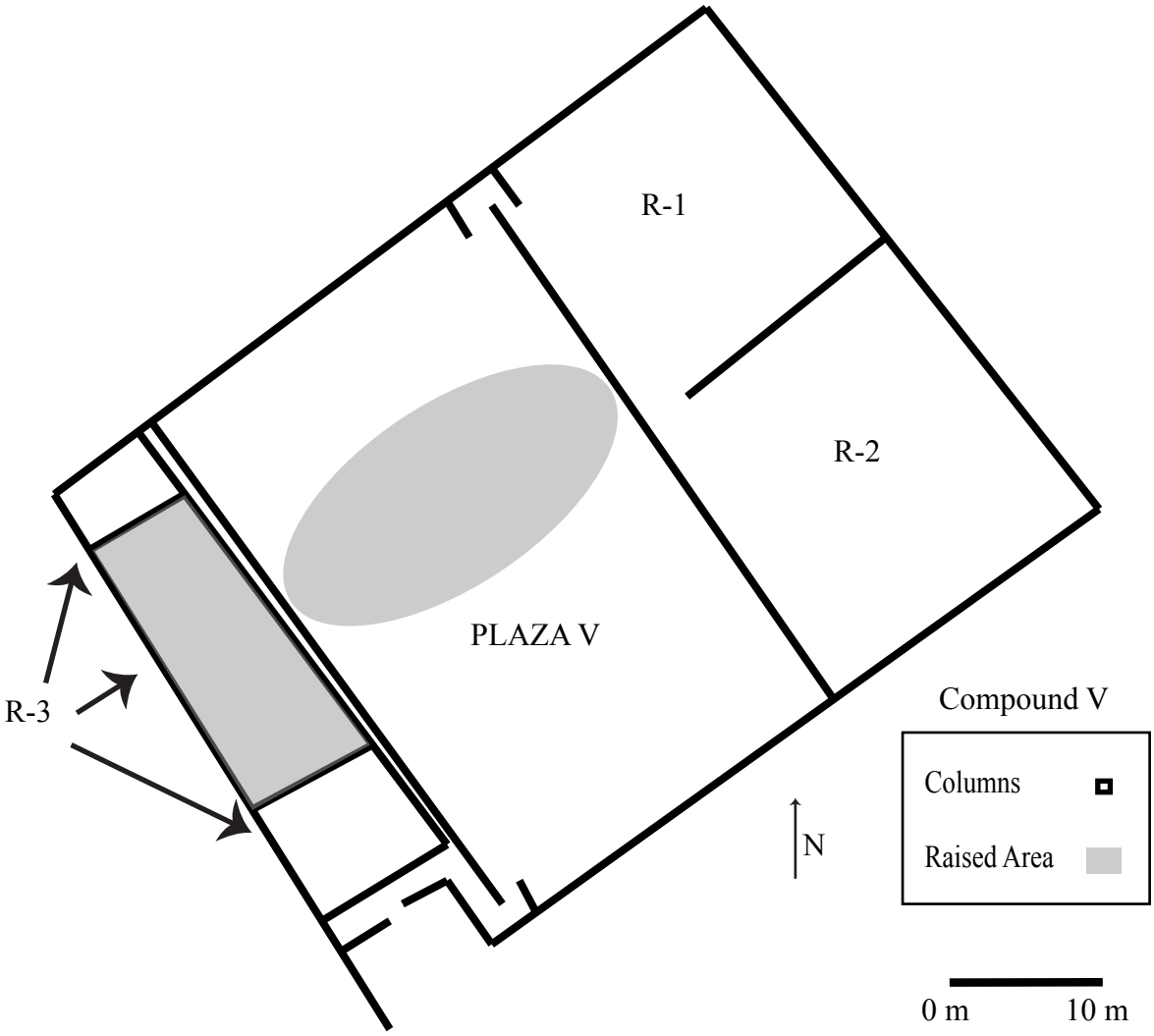

Figure 41: Compound V Map (drawing by Ashley Whitten)

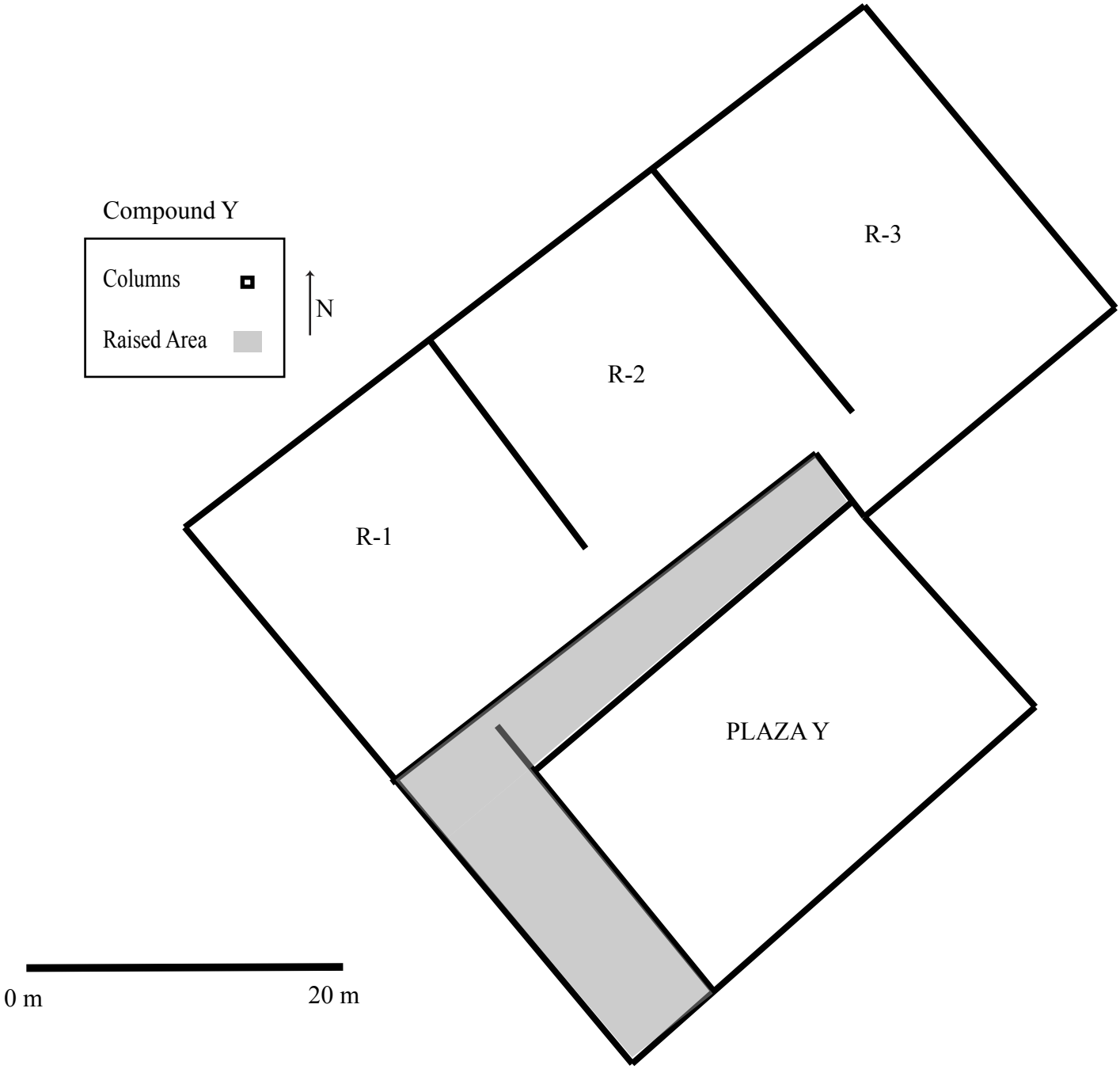

Figure 42: Compound Y Map (drawing by Ashley Whitten)

Figure 43: Compound AE Map (drawing by Ashley Whitten)

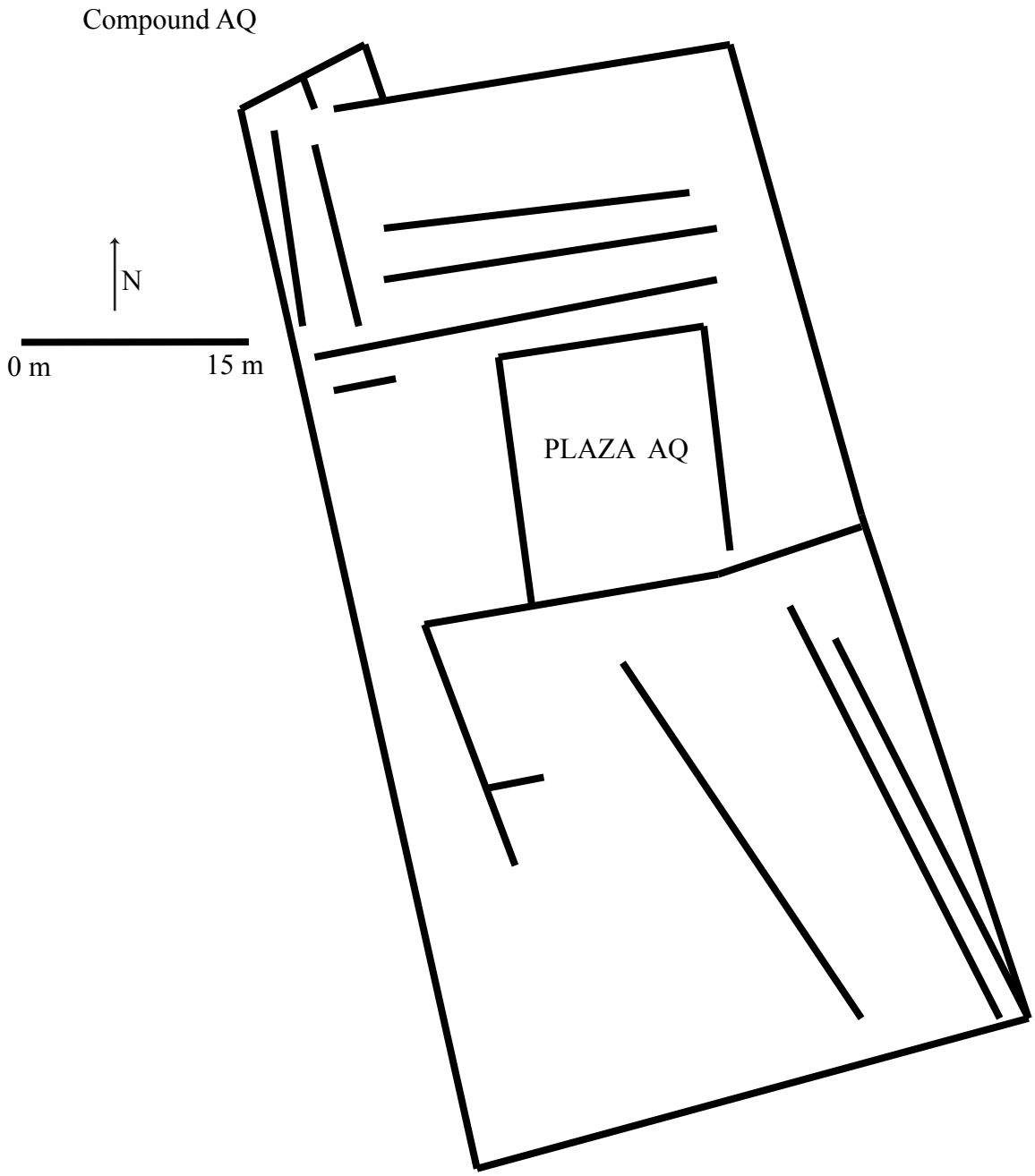

Figure 44: Compound AQ Map (drawing by Ashley Whitten)

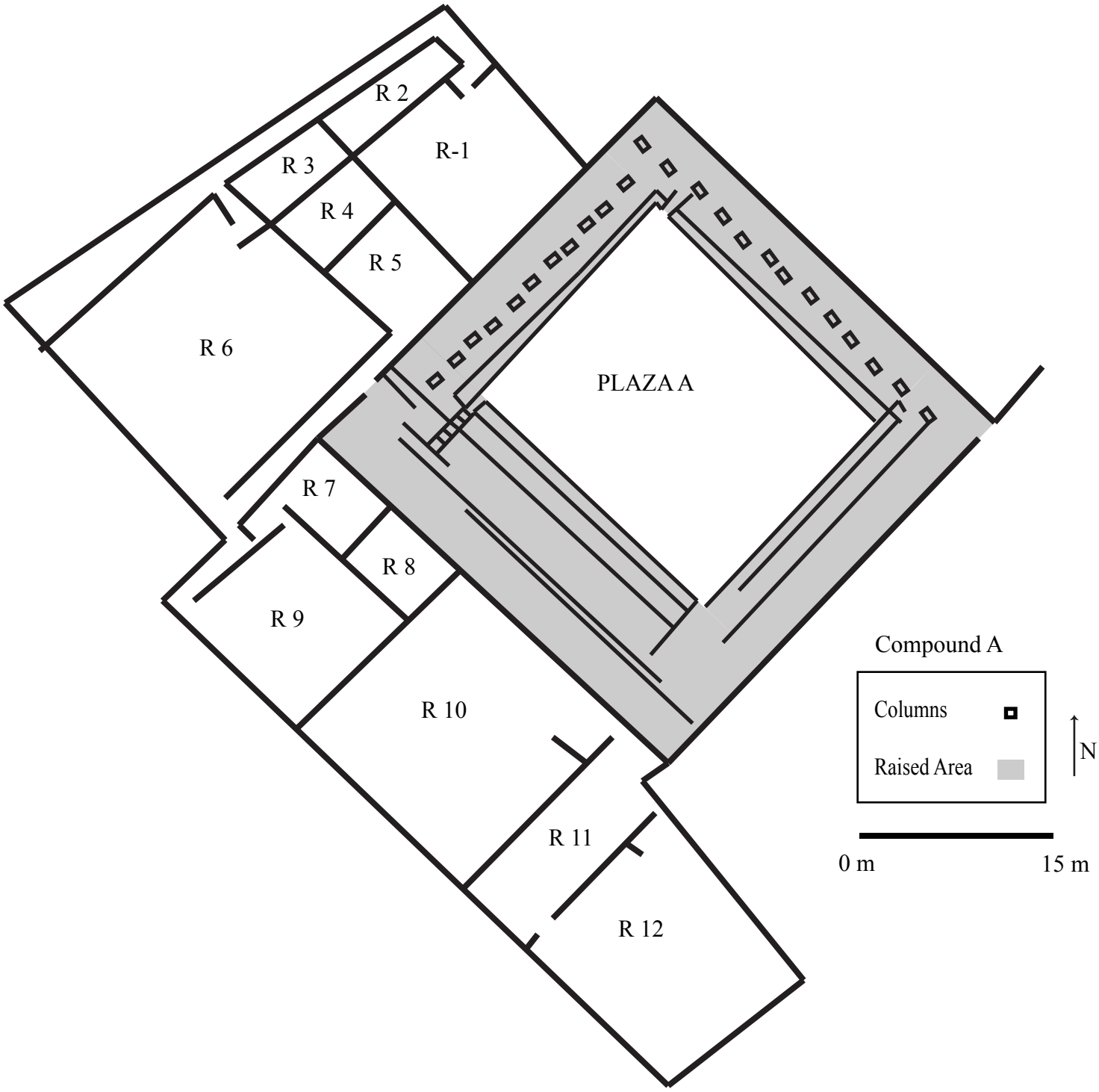

Figure 45: Compound A Map (drawing by Ashley Whitten)

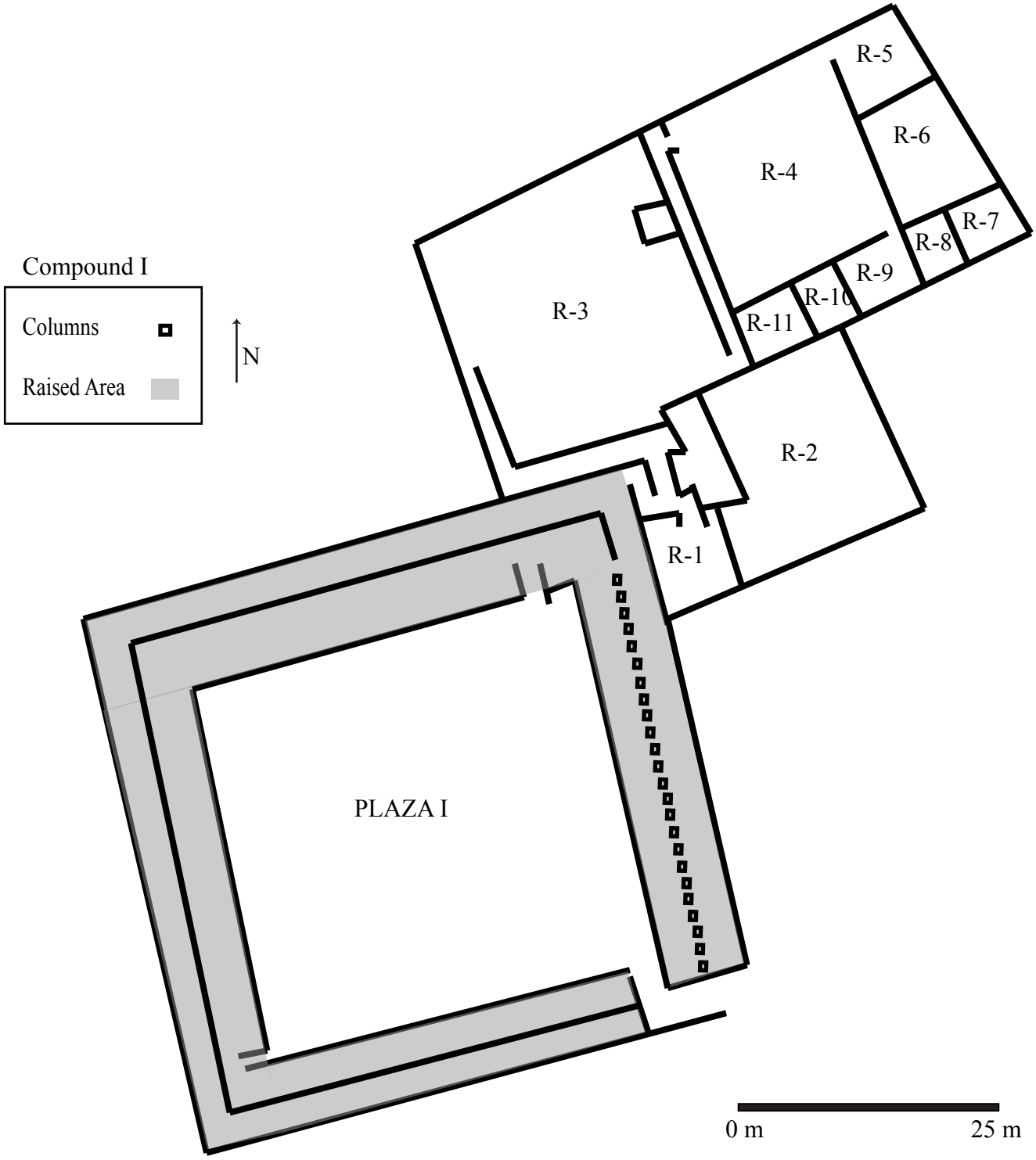

Figure 46: Compound I Map (drawing by Ashley Whitten)

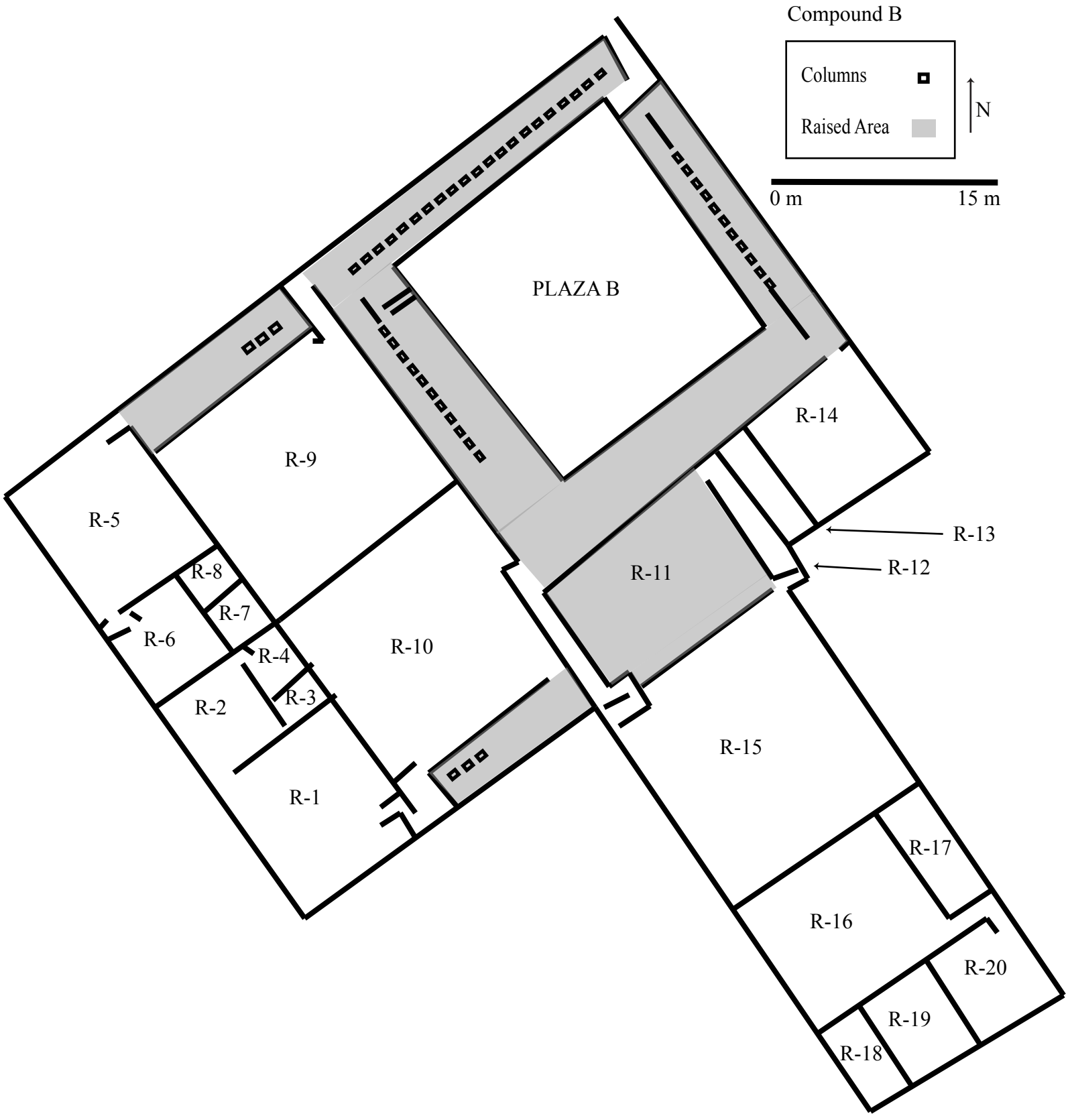

Figure 47: Compound B Map (drawing by Ashley Whitten)

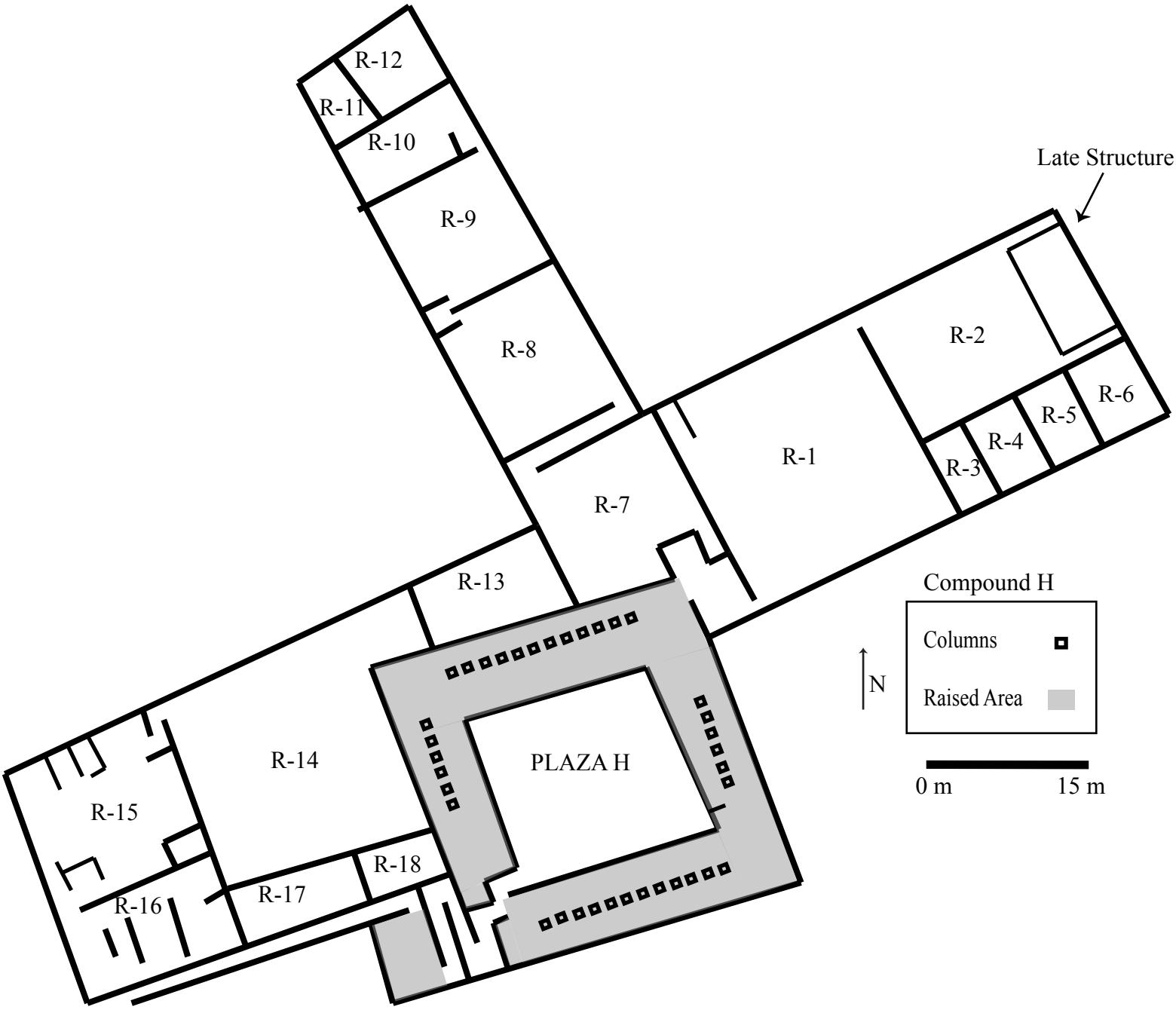

Figure 48: Compound H Map (drawing by Ashley Whitten)

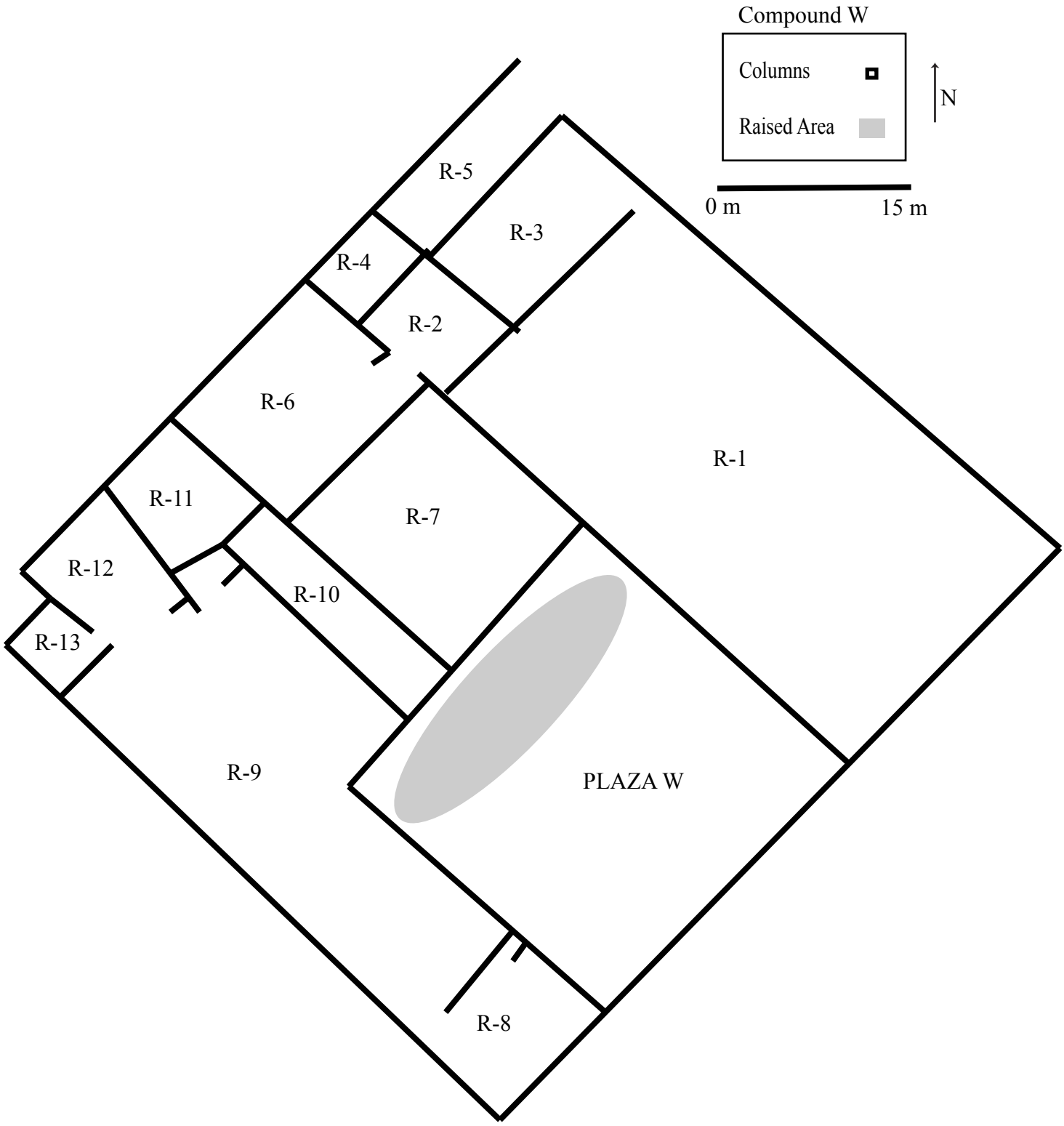

Figure 49: Compound W Map (drawing by Ashley Whitten)

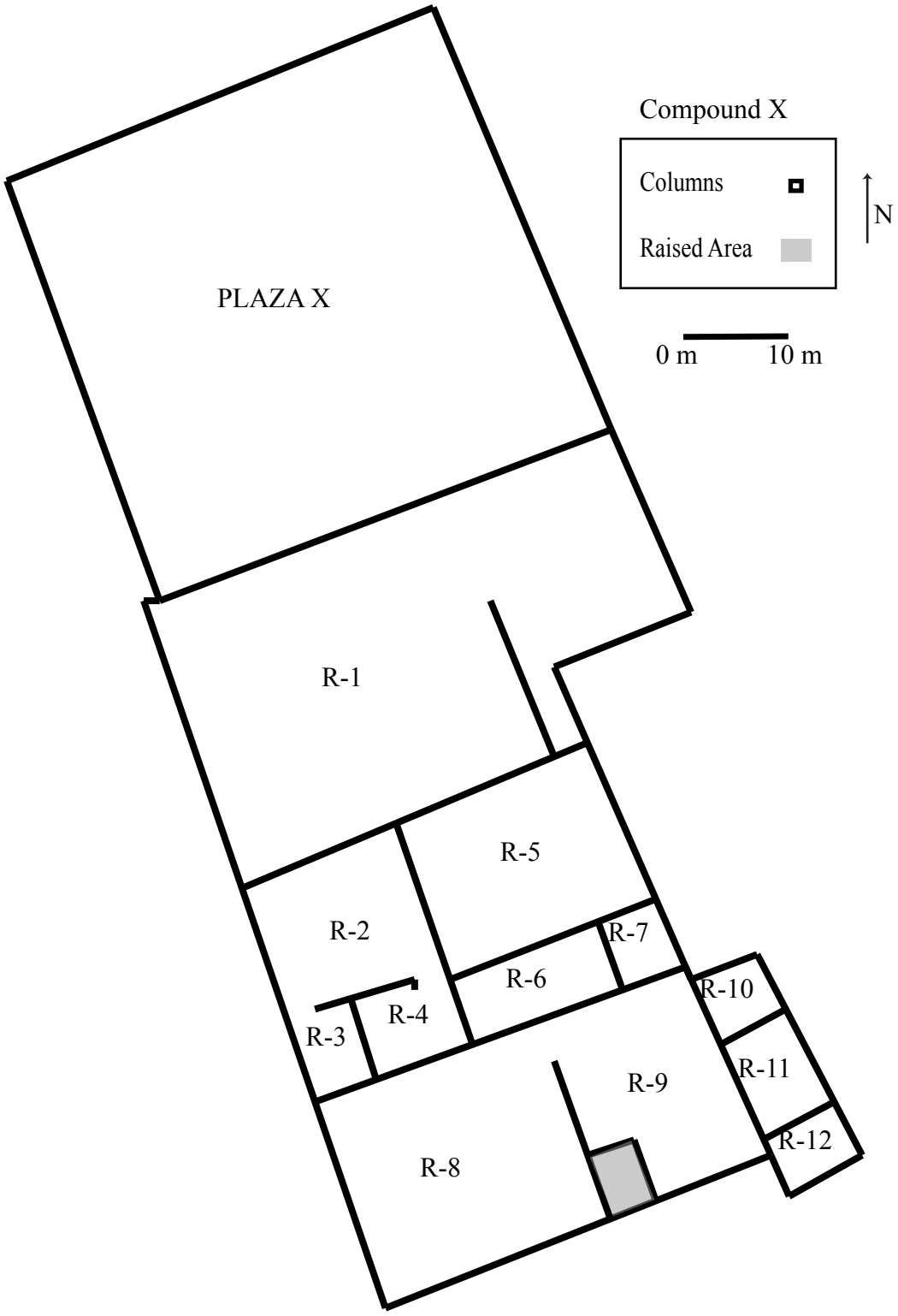

Figure 50: Compound X Map (drawing by Ashley Whitten)

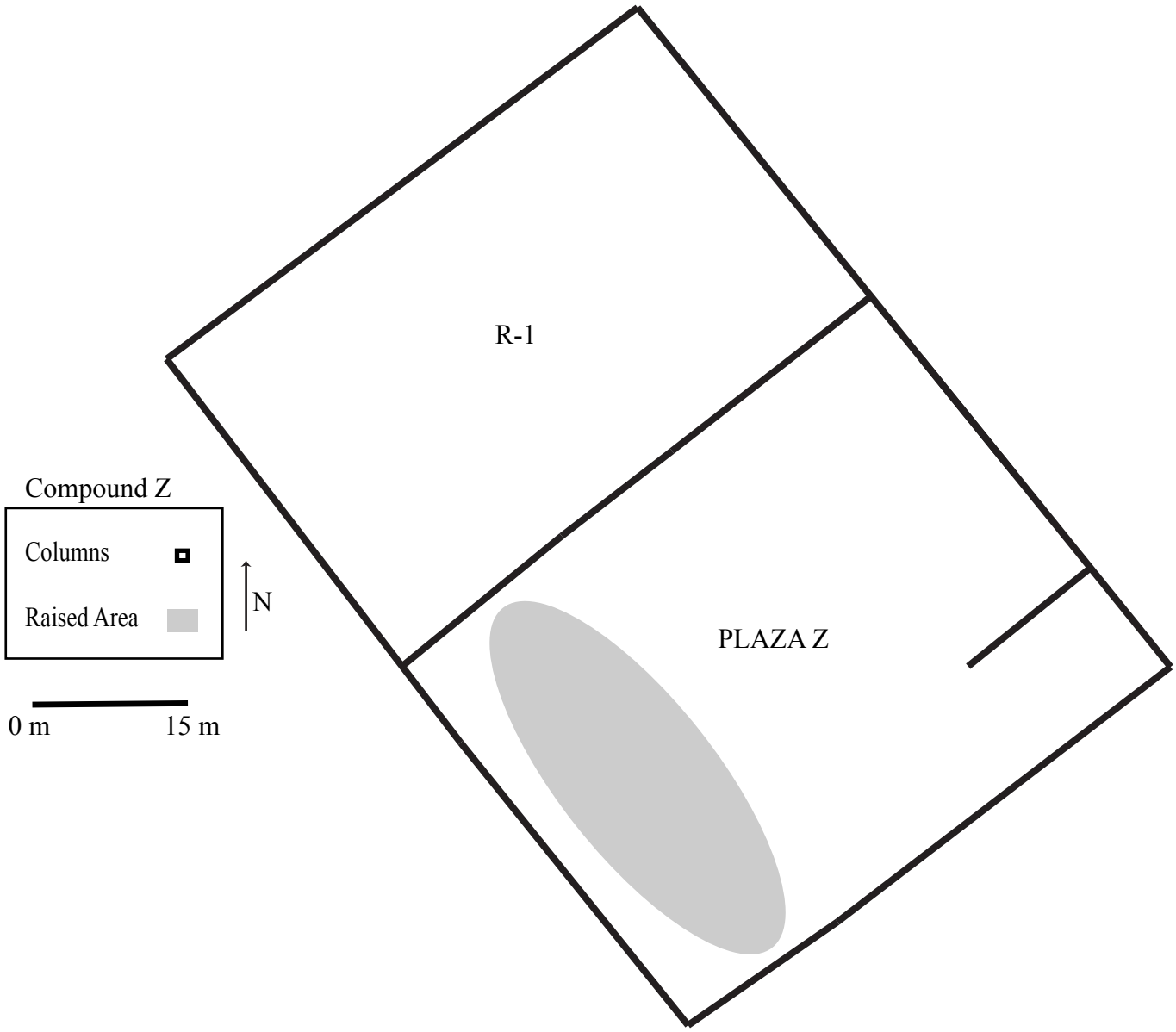

Figure 51: Compound Z Map (drawing by Ashley Whitten)

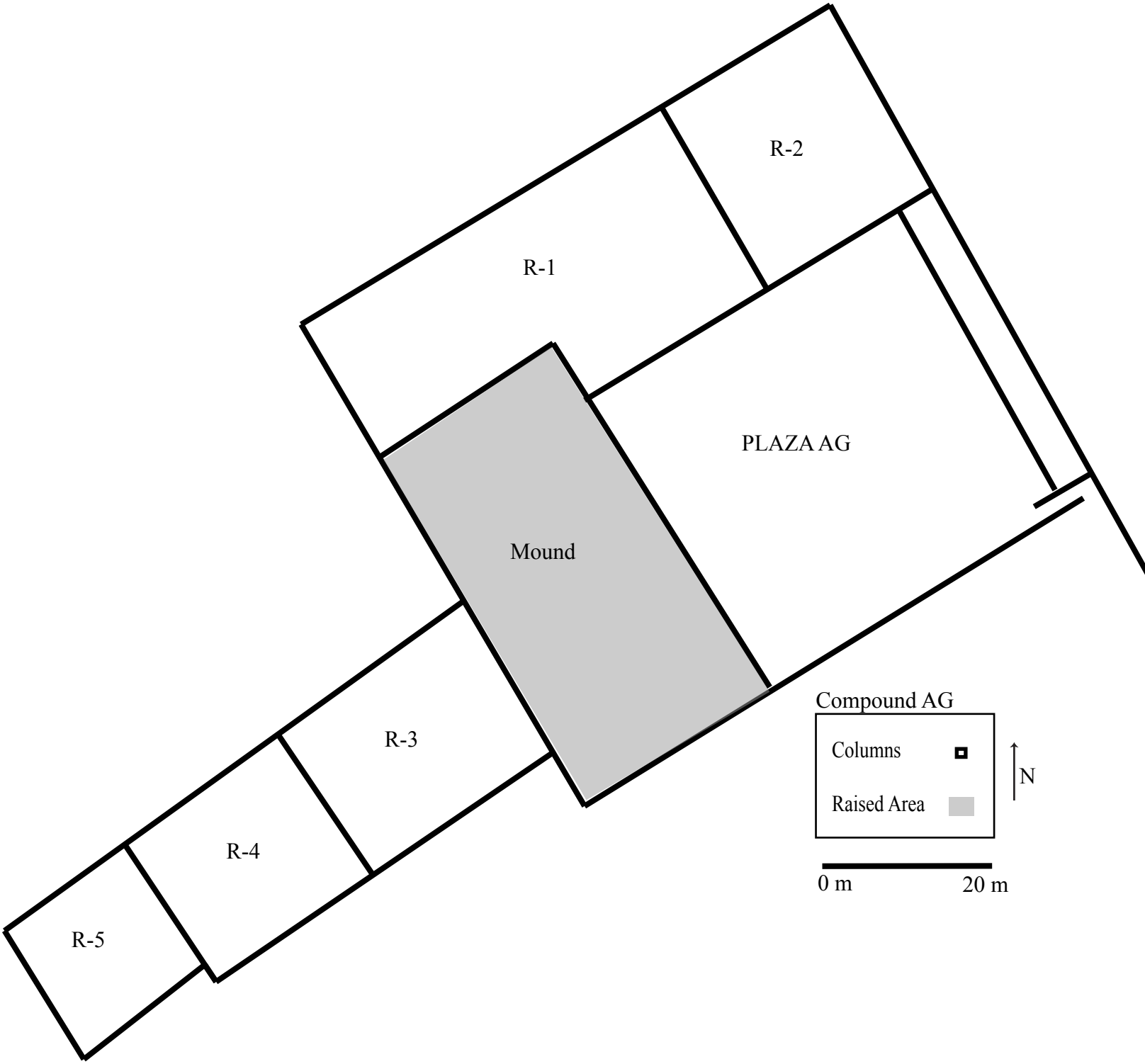

Figure 52: Compound AG Map (drawing by Ashley Whitten)

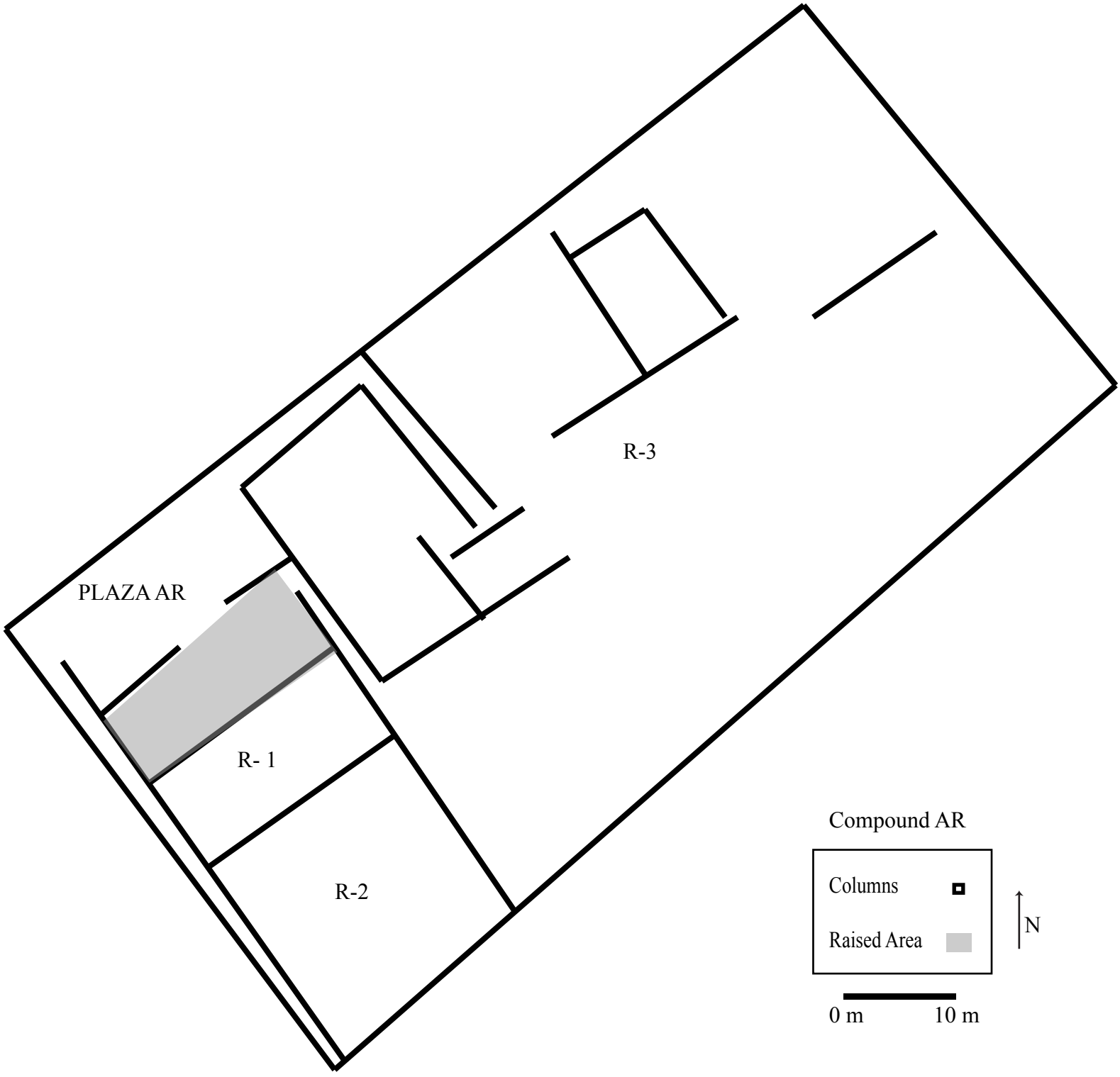

Figure 53: Compound AR Map (drawing by Ashley Whitten)

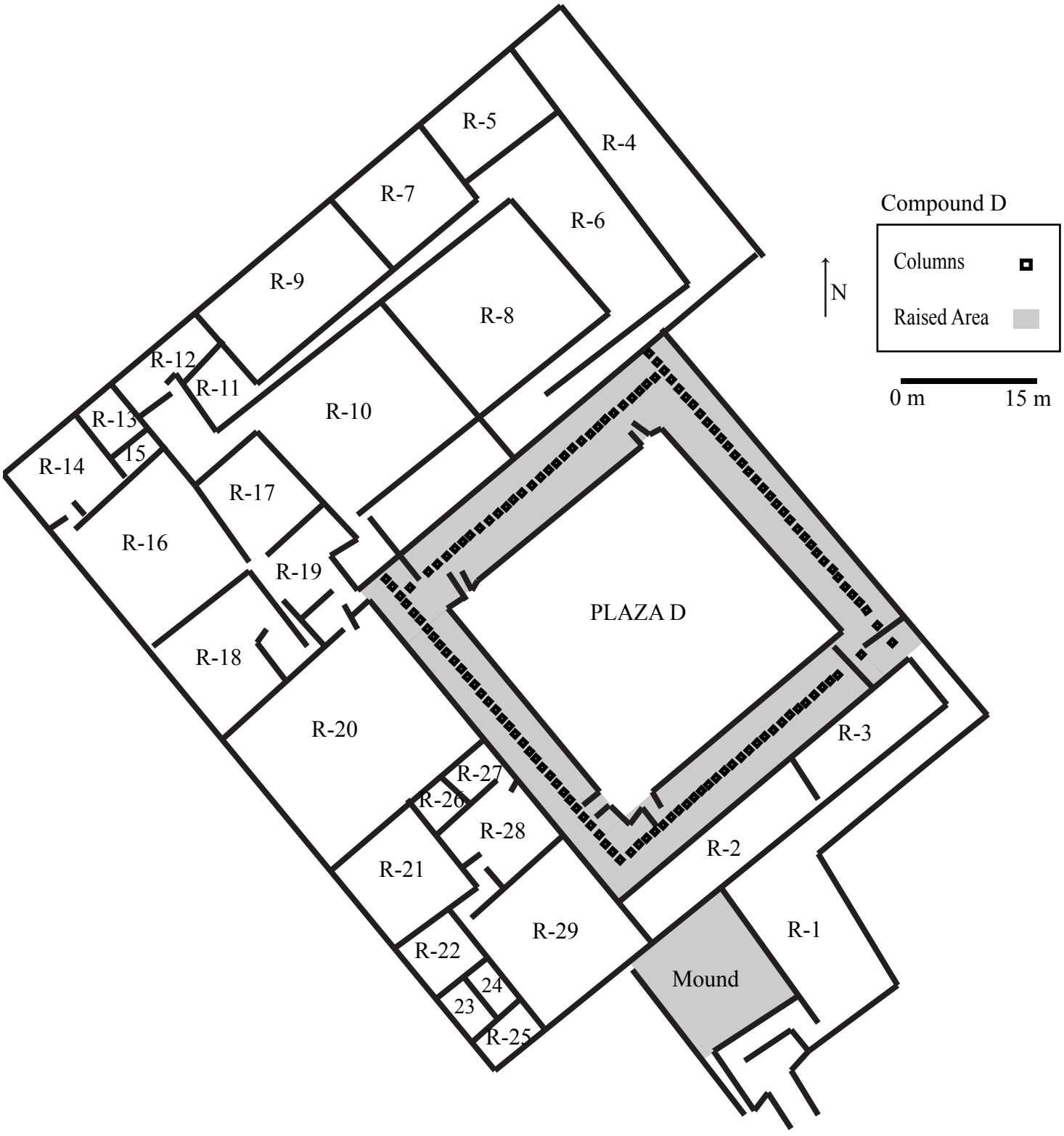

Figure 54: Compound D Map (drawing by Ashley Whitten)

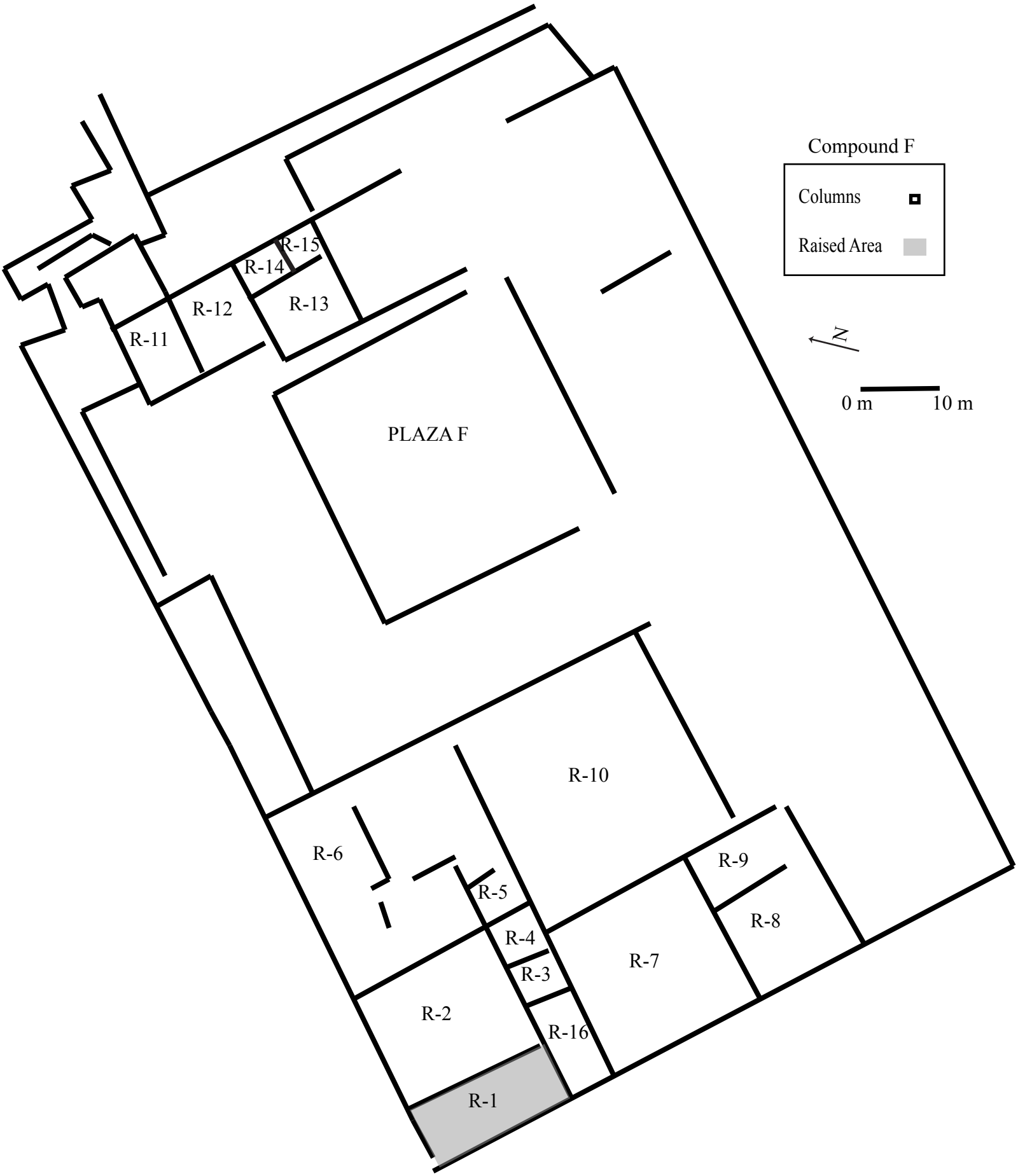

Figure 55: Compound F Map (drawing by Ashley Whitten)

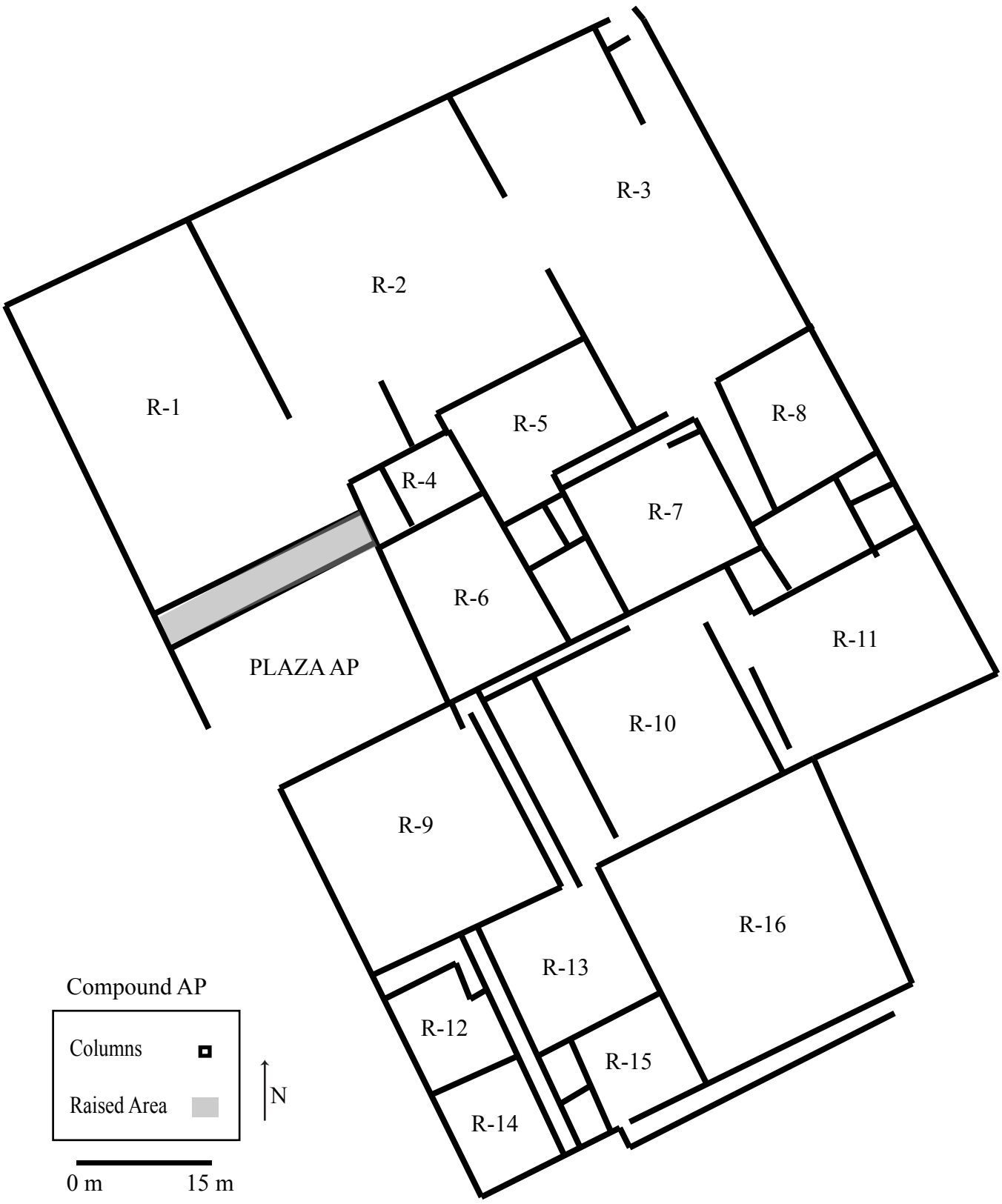

Figure 56: Compound AP Map (drawing by Ashley Whitten)

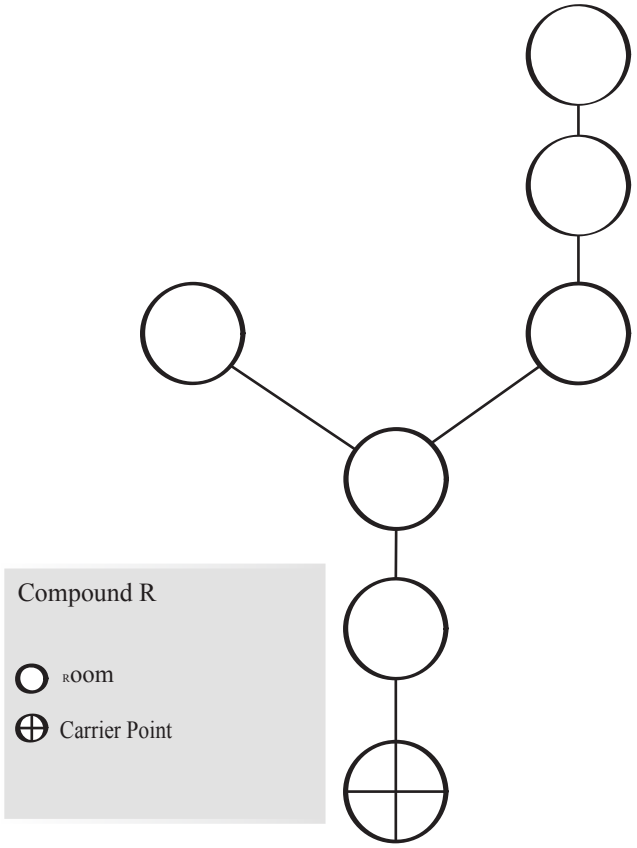

Figure 57: Compound R Gamma Analysis (drawing by Ashley Whitten)

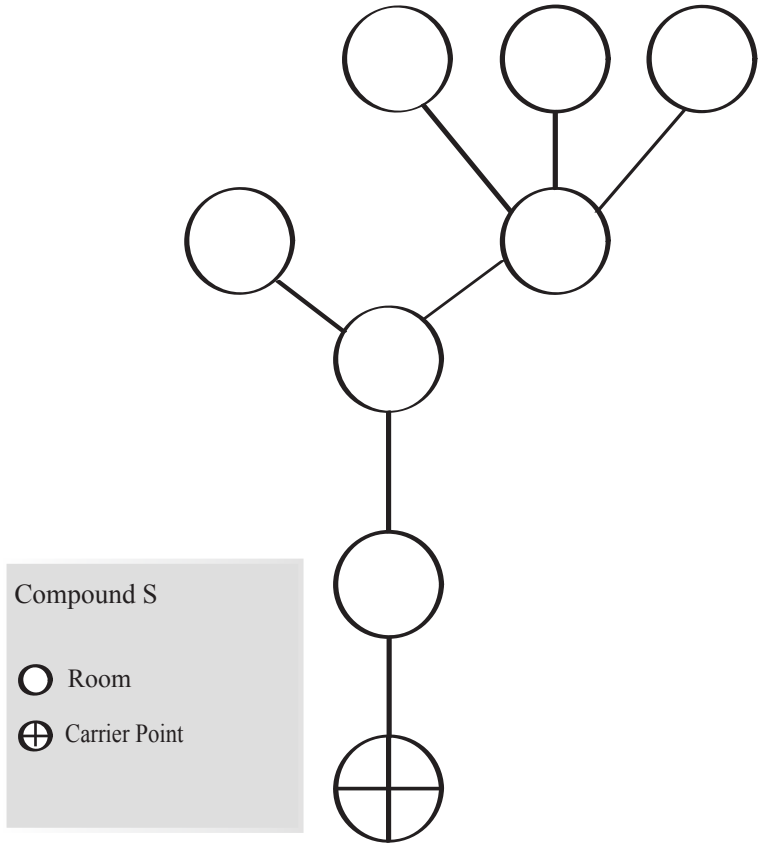

Figure 58: Compound S Gamma Analysis (drawing by Ashley Whitten)

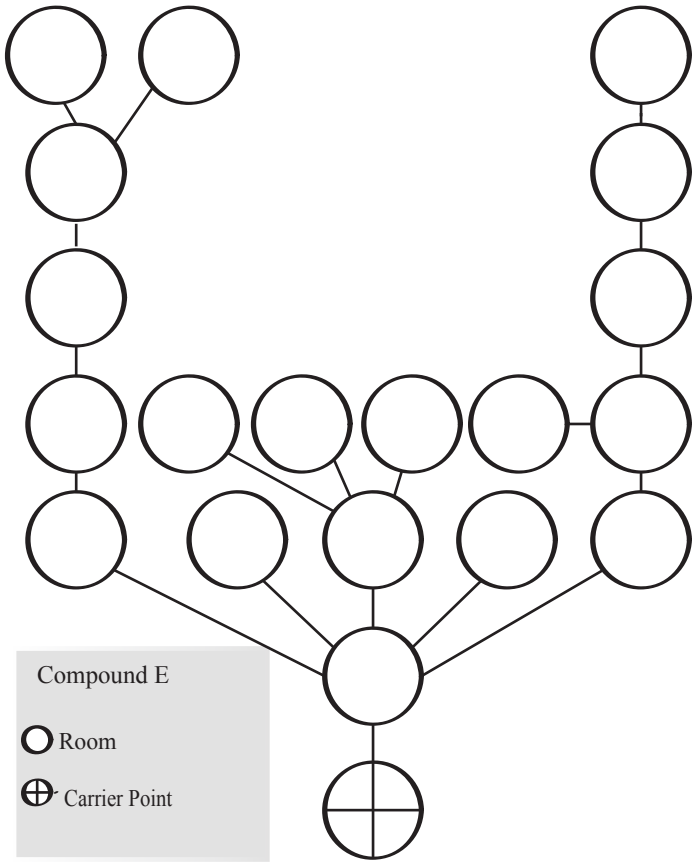

Figure 59: Compound E Gamma Analysis (drawing by Ashley Whitten)

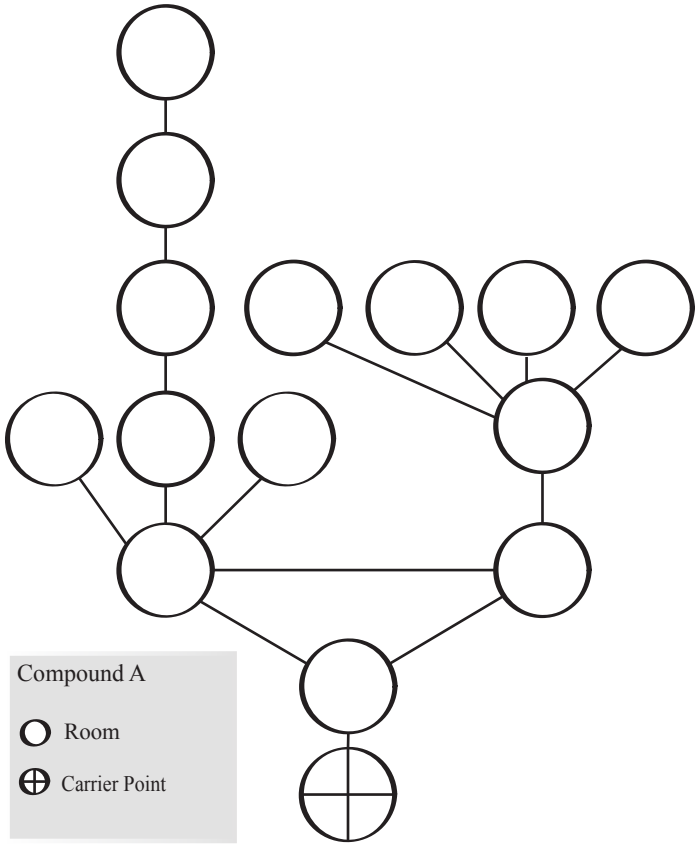

Figure 60: Compound A Gamma Analysis (drawing by Ashley Whitten)

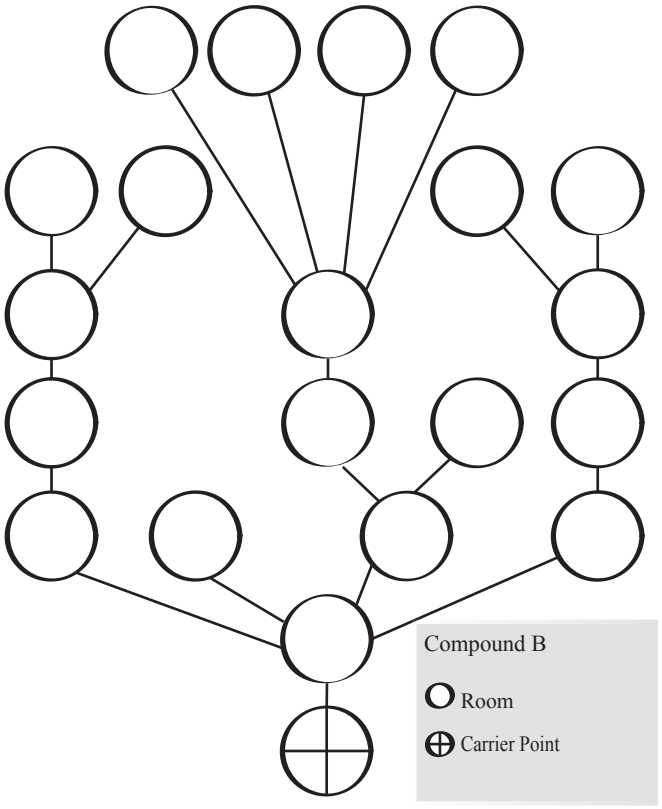

Figure 61: Compound B Gamma Analysis (drawing by Ashley Whitten)

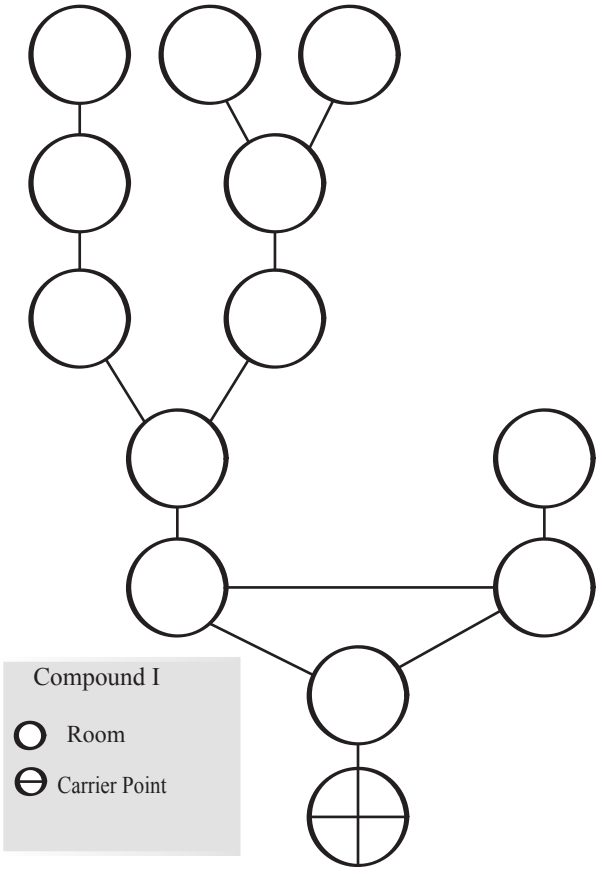

Figure 62: Compound I Gamma Analysis (drawing by Ashley Whitten)

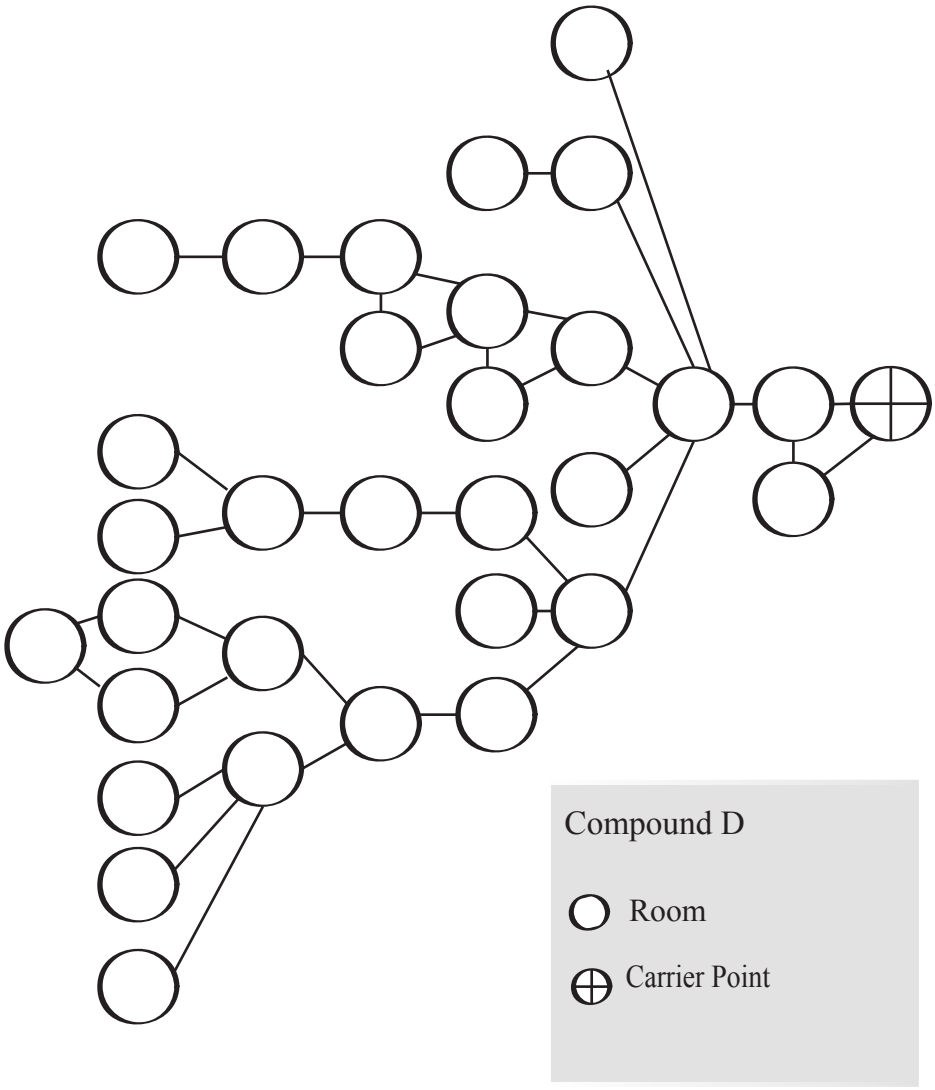

Figure 63: Compound D Gamma Analysis (drawing by Ashley Whitten)

VITA

Ashley Nichols Whitten attended Wake Forest University beginning in 2008 and graduated with a Bachelor of Arts in English, and a minor in anthropology in 2012. Ashley participated in an archaeological field school in Portugal in 2009, and archaeological research in Peru during 2014. Her current research interests are in spatial organization, urbanism, and the Early Horizon in Ancash, Peru. Ashley intends to pursue a doctorate in anthropology at University of Kentucky in the fall of 2015.