Deciphering public spaces from open space in urban contexts: Geophysical survey, multi-element soil analysis, and artifact distributions at the 15th-16th-century AD Swahili settlement of Songo Mnara, Tanzania

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Abstract

Open spaces are an integral part of past urban settlement worldwide. Often large and devoid of visible traces of past activities, these spaces challenge mainstream archaeological approaches to develop methodologies suitable to investigate their history. This study uses geophysical surveys, geochemical sampling and artifact distributions to examine open spaces at the Swahili stonetown of Songo Mnara, Tanzania. Initial, geophysical surveys have revealed a set of anomalies associated with activities across the open spaces at the site; a systematic soil/sediment sampling program was applied to map artifact and geochemical distributions across these areas. The spatial relationship between artifact distributions, specific chemical elements, and patterns of anomalies offers a new way to define areas that may have functioned as 'public spaces' as well as possible activities that were carried out in them. The results suggest that open spaces at this Swahili site contained defined and protected public areas where small-scale production may have occurred.

Keywords: geophysics, space analysis, artifact distribution, geoarchaeology, public space

1. Introduction

The archaeology of open space has challenged researchers to devise methodologies for understanding their functional, socio-political, and ritual uses within a settlement (Canuto et al., 2010; Cap, 2012; Cavanagh, 2001; Hutson et al., 2007; Moore, 1996; Parnell et al., 2002; Robin, 2002; Robin and Rothschild, 2002; Smith, 2008; Swenson, 2012; Wells, 2004). Following Stanley et al. (2012: 1089), we define urban open space as "any urban ground space, regardless of public accessibility, that is not roofed by an architectural structure." Open spaces can include a variety of areas such as house yards, gardens and orchards, plazas, alleys/streets, and cemeteries. These spaces are important for the everyday life of an urban settlement as well as for the settings of important social and political events. While the former may include the daily preparation of food, household production or conversations among neighbors, the latter host performances of feasts, installation ceremonies, and ritual dances, to name just a few. We call these latter settings 'public space,' which are open spaces that are accessible by most, if not all, residents. Yet, open spaces continue to challenge archaeologists as they are difficult to investigate through traditional archaeological methods: often large, with low artifact densities, and the site of recursive activities, they are not well suited to large-scale excavation. Furthermore, we cannot assume that open spaces had single functions, through time or across space.

Using geophysical, geoarchaeological and artifact distribution data, this paper examines the nature and use of open spaces in urban contexts at the Swahili stonetown of Songo Mnara, located on a small island off the Tanzania coast (Fig. 1). By addressing the advantages and problems of combining geophysical and geoarchaeological approaches to spatial analysis in urban contexts, the paper illustrates one way different datasets can be integrated in order to overcome the limitations of each technique and to refine the interpretation of the data they produce individually (Kvamme 2007). This study contributes to the growing literature concerned with enhancing archaeological prospection (e.g. Dirix et al., 2013; Luzzadder-Beach et al., 2011; Oonk et al., 2009;) and deciphering activities of a settlement (e.g. Hutson and Terry, 2006; Hutson et al., 2007; Milek and Roberts, 2013). Building on and attempting to contribute to these issues, our investigations designed a research strategy for urban open space which was applied to Songo Mnara and subsequently refined.

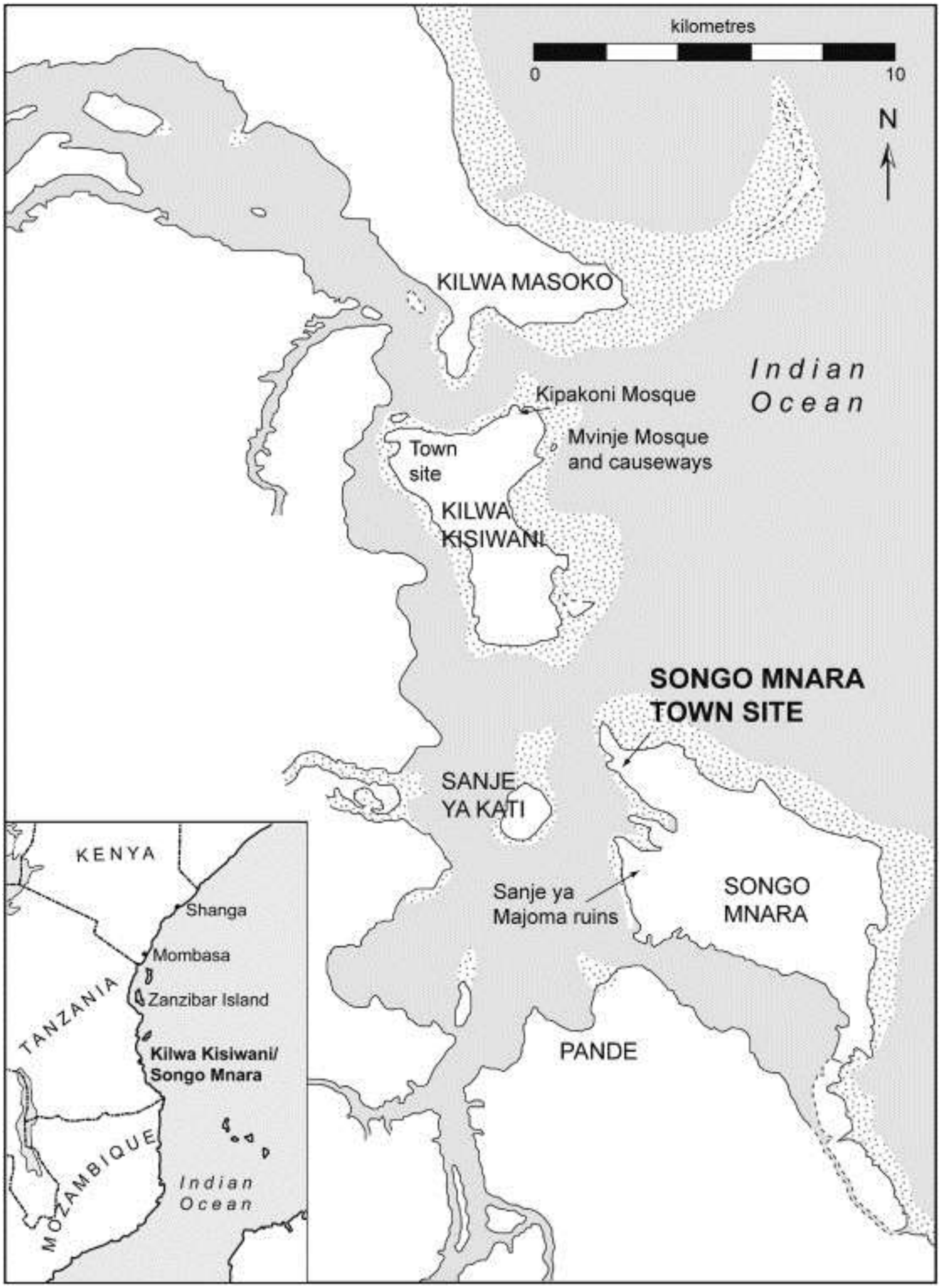

Fig. 1: Map showing the location of Songo Mnara, regional map with inset coast

1.1 Geophysical surveys and geochemical testing

Archaeological prospection, from geophysical and borehole surveys to coring technologies and geochemical testing, now regularly provides sound stratigraphic records and helps to distinguish between disturbed and archaeological deposits, and between the latter and the sterile/bedrock. Archaeological prospection has added considerably to our understanding of sites and their environs (e.g. Aspinall et al., 2008a, 2008b; Campana and Piro, 2008; Dirix et al., 2013; Gaffney, 2008; Scollar, 1990). This includes research advances in the understanding of specific activity areas within urban contexts such as, for example, the geoarchaeological study of a Roman forum in eastern Portugal (Vermeulen et al., 2012). Here, geophysical surveys, excavations and aerial photography conbined with recording of geomorphophological settings allowed for a refined understanding of the topography and evolution of an urban site. The few applications of these approaches to African contexts have also produced significant results. Studies combining archaeological coring, artifact distribution analysis and soil chemical analyses in urban contexts have shown how the integration of such techniques can provide a cost- and time-effective approach to tackle issues concerning settlement pattern, social organization and complexity, and cultural sequences within their horizontal and vertical stratigraphic context (Hoffman et al., 1987; Juma, 2004; McIntosh et al., 1996; Radimilahy, 1998; Sinclair and Petrèn, 2002).

While the understanding of vertical stratigraphy is necessary to situate the archaeological record within an environmental (and temporal) context, human settlement and associated activities take place on a given spatial dimension and, thus, the investigation of horizontal (diachronic or otherwise) data is also an important aspect. In intensively-occupied and large urban landscapes such as at Great Zimbabwe, for example, detailed ground mapping combining chemical and geophysical survey have allowed researchers to delimit the extent of settlement and to define activity areas (Sinclair and Petrèn, 2002). This baseline information is a prerequisite for understanding site formation processes and the socio-cultural aspects linked to settlement and organization. In order to evaluate how the arrangement of town plans may relate to political and social organization, greater attention must be paid to deciphering the layout of towns and the relationships between extant buildings and the open spaces that exist around them (Fleisher, 2013). As Sinclair and Petrèn (2002: 1) put it “archaeological investigations must be conducted at the same scale that people lived in the past.” On the East African coast, for example, the layout of Swahili towns has been studied only through published plans of standing architecture and hints of the use of space offered by modest archaeological testing (Wynne-Jones and Fleisher, in press).

Geophysical survey holds great potential to help delineate more clearly Swahili urban plans. Gaffney et al. (2005) have tested the application of magnetic susceptibility and fluxgate magnetometry surveys at the 19th-century site of KoBulawayo in eastern Zimbabwe, which was occupied only for about a decade, and then burnt down. In addition to revealing the presence of buried structures and fenced spaces previously unknown at KoBulawayo, the geophysical survey also detected well-defined anomalies that, once ground-tested by excavation, proved to be relatively unsubstantial features such as an area associated with a cattle byre. Geophyiscal surveys are just starting to be applied to archaeological sites on the Swahili coast, including resitivity at Unguja Ukuu, Zanzibar (Juma, 2004), magnetometry at Vumba Kuu, Kenya (Wynne-Jones, 2012), and GPR and magnetometry at Kilwa Kisiwani, Tanzania (Fleisher et al., 2012). The prevailing climatic conditions of the region restrict the use of certain common techniques; the ground is, on the whole, too dry to permit the electrical contact needed for conventional earth resistivity survey, hence restricting choice mainly to magnetic and electromagnetic methods (Gaffney and Gater, 2003; Magnavita and Schleifer, 2004).

Despite these challenges, there is considerable scope for the application of geophysical survey as also demonstrated by the recent work at the 14th- to 15th-century site of Vumba Kuu on the south Kenyan coast. Here, the results of a combined magnetometry and electromagnetic survey established the size, boundaries, and layout of the town and detected activity areas including large expanses of magnetic disturbance which were found to represent iron slag, iron-working deposits and burnt daub (GSB Prospection, 2008; Wynne-Jones, 2012). As at Vumba Kuu, the geology of the Kilwa archipelago is composed of bedrock of Upper Cretaceous to Lower Miocene claystones and clays with secondary lithologies of limestone and sandstone (Nicholas et al., 2007). In this respect, work by Křivánek (1997) in Abu Dhabi has demonstrated that magnetometry survey can be successful in identifying extremely low magnetic coral walls in non-magnetic sandy soils where features appear as weakly positive anomalies, providing there is an absence of stronger magnetic anomalies due to recent activity. This is of specific importance for the coral-based geologies of Kilwa, where coral bedrock is covered with shallow sub-soils of degraded coral sands.

By and large, the application of geochemical analyses in African archaeology has been limited to measurement and mapping of phosphate concentrations used in combination with stratigraphic analyses (Juma, 2004; Radihimilahy, 1998; see also Hoffman et al., 1987). For example, intra-site spatial analysis using coring, phosphate testing and artifact distribution analysis together with archaeological survey and excavation at Mahilaka has elucidated the trajectory of urban development in northwestern Madagascar, pushing back the presence of urban communities to the early first millennium AD (Radihimilahy, 1998). Soil multi-element analysis is now well-established in archaeology, affording a broader spectrum of elements for isolating patterns and refining the interpretation of single element concentrations (Oonk et al., 2009; Wilson et al., 2008, 2009). Among the suite of techniques available, multi-element analysis by Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES) is now commonly used in urban landscapes and settlements contexts alike (e.g. Hutson and Terry, 2006; King, 2008; Kudson et al., 2004; Middleton and Price, 1996; Milek and Roberts, 2013; see also Wilson et al., 2008, 2009).

Approaches to open space in urban and other sites often begin with a well-defined space—such as a plaza (e.g. Canuto et al. 2010; Cap, 2012)—within a settlement and use techniques, like geochemical testing, to define activity areas within those spaces. There have been few efforts, however, to characterize or define open space within an urban settlement, especially public spaces that were maintained and protected, but not clearly defined by permanent architecture. This paper, thus, reports on how the Songo Mnara Urban Landscape Project combined geophysical survey, geoarchaeological analysis, and artifact distributions from test pits to investigate open space at the site which, in the process, revealed a previously-unknown public space and activities associated with its use.

2. The East African Coast and Swahili Urban Centers

The island of Songo Mnara hosts one of dozens of urban centers built along the East African coast during the second millennium AD (Horton and Middleton, 2000; Kusimba 1999). These towns participated in long-distance trade activities with merchants from Indian Ocean ports, exported goods from the African subcontinent, such as ivory, gold, skins and timber, and imported Islamic and Chinese ceramics, glass vessels and beads, and most likely foodstuffs, such as oils (LaViolette, 2008). By managing this trade, many coastal towns flourished, led by individual sultans or elite oligarchies. The inhabitants of most coastal towns were Muslim, with large-scale conversions most likely occurring in the 11th and 12th centuries AD. First-millennium villages were built entirely of wattle-and-daub buildings (Fleisher and LaViolette, in press); by the 11th century, however, many mosques were constructed of coral blocks. By the 13th century, houses and other structures in towns were constructed using rough coral fragments and lime mortar, and also had surrounding walls (e.g. Horton, 1996).

Swahili towns were not organized along orthogonal plans. However, most towns exhibit some degree of planning, with a mosque located centrally in the settlement, and houses built surrounding it, often in discernible neighborhoods (Horton, 1994). Wilson (1982) has distinguished between confined and delimited space within Swahili towns, the former including space within buildings, and the latter those spaces created by the placement of buildings and other features on the urban landscape. While the confined spaces have been relatively well-studied in Swahili towns (Allen, 1979; Donley-Reid, 1987; Wynne-Jones, in press), delimited spaces have never been systematically investigated (Fleisher and Wynne-Jones, 2012).

2.1 Songo Mnara and the Kilwa Archipelago

The Kilwa archipelago contains three prominent settlements: Kilwa Kisiwani, the famed port occupied continuously from the 8th century AD (Chittick, 1974), Sanje ya Kati, an 11th-12th-century settlement (Pradines, 2009), and Songo Mnara, a 15th-16th-century town (Wynne-Jones and Fleisher, 2010, 2011; Fig. 1). Research has focused primarily on Kilwa Kisiwani, the seat of power in the archipelago, and one of the most powerful settlements on the entire coast. Kilwa successfully managed the flow of trade, both from the near hinterland but also the movement of gold from the Zimbabwe plateau, as it moved up the coast to the Indian Ocean world. The site of Kilwa covers a vast area and contains deep stratigraphic sequences that demonstrate its centuries-long development; the settlement is notable for its monumental architecture (Husuni Kubwa, Great Mosque) which indicate its political and religious significance. In contrast, the settlement of Songo Mnara is compact and unfolds over 6 ha including a well-defined town wall and dozens of houses arranged around a central open space (Fig. 2). Built rapidly in the late 14th or early 15th century, the settlement was occupied for approximately 150 years, and then abandoned completely in the 16th century. Although once thought to be a retreat for elites from

Kilwa (Mathew, 1959), recent research suggests that the site was a fully functioning town, on par with others of the time (Wynne-Jones and Fleisher, 2010, 2011).

Today, the ‘open spaces’ at Songo Mnara are found in the central, northern and western sectors (Fig. 2). The central open space, surrounded by domestic structures made of coral rag on the north, south and east contains an extensive cemetery that surrounds a mosque and a walled graveyard. Both the northern and western open spaces are covered in grasses, with palm trees common in the latter space; there are no visible structures in these two spaces. All structures and occupation is associated with the 150-year occupation and is represented by a compact and simple stratigraphy. This paper will focus on the western open area, where evidence of a public space was revealed.

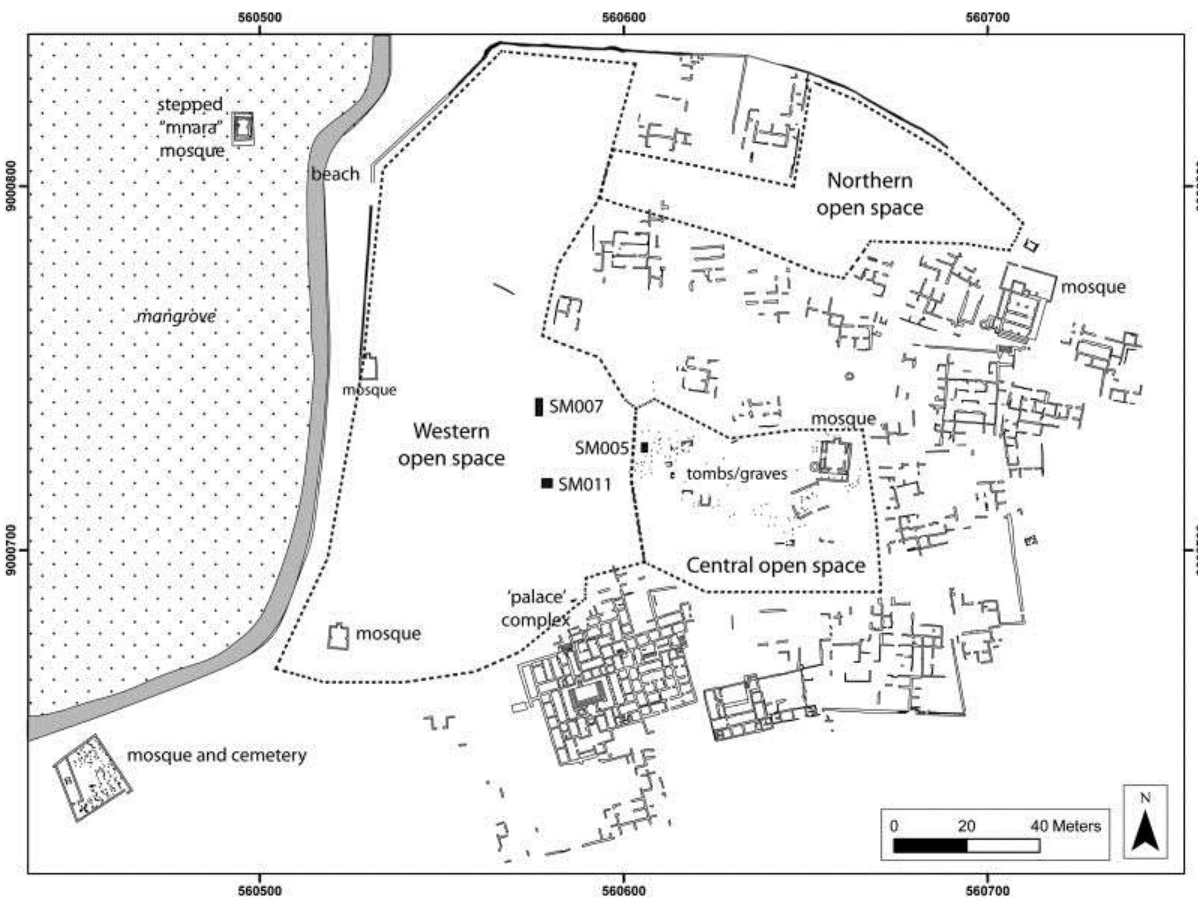

Fig. 2: Songo Mnara site map showing open spaces

Fig. 3: Standing architecture at SM

3. Methodology

Songo Mnara is exceptionally well-preserved, with significant standing architecture and relatively shallow stratigraphic sequences (Fig. 3) that has not suffered from significant disturbance by subsequent settlement or activities. The site is located about 6.5 nautical miles from the nearest mainland town of Kilwa Masoko. Excavations conducted since 2009 have confirmed a single occupation phase and shown that most of the disturbance of archaeological deposits is associated with post-abandonment structure collapse, vegetation growth and biological activities. To some extent, these circumstances simplify the interpretation of the geoarchaeological data, including stratigraphic discontinuities and chemical element concentrations in open areas, as distinct elemental patterns and concentrations can be associated with the occupation of the site. The preservation of archaeological evidence, the narrow chronological timeframe of the occupation, and the complex settlement layout with closed (roofed) and open (unroofed) spaces of different dimensions and types make Songo Mnara an ideal place to develop and test a new integrative methodology to study open spaces in an urban context. The project, thus, sought to explore the combination of geophysical surveys, geoarchaeological test pitting, chemical mapping and artifact distribution analyses as a way of characterizing and interpreting open spaces in urban contexts.

3.1 Site formation and depositional history

Songo Mnara lies on the East African coral reef, which is the main geological unit of the island and responsible for its topographic setting. The ancient town is located on the northern-western tip of the island; the east coast of the island is directly accessible 450 m to the north-east, and Sangarungu Harbor is 300 m to the west. Here, the gentle to flat, open plain of approximately 7 ha is covered by thick vegetation to the south and by mangrove swamps on the coast to the north and west. To the south of the site, the topography rises slightly and small cultivation plots are located on higher ground. This setting affords some protection to the plain against erosion and, at the same time, the sparse vegetation of palm trees and low grasses, with rare baobab trees, keeps land cover in place in the core archaeological area. Coral limestone and quartz give rise to *terra rossa*-type of soils and sediments (Pollard, 2008; Sulas and Madella, 2012). In addition, pockets of dark brown silty loam on the island tend to be associated with cultural deposits both visible on the surface and buried. The general stratigraphic sequence recorded across the site ranges between 40 and 50 cm in thickness and consists of about 15-20 cm topsoil (*terra rossa* soil) overlaying a cultural layer of variable thickness (c. 20-40 cm), which rests on a sterile beach deposit of very fine, beach sands (Fig. 4). The relatively shallow stratigraphy is most likely the result of the stonetown occupation followed by an almost complete abandonment, which allowed vegetation regrowth and surface stabilizing.

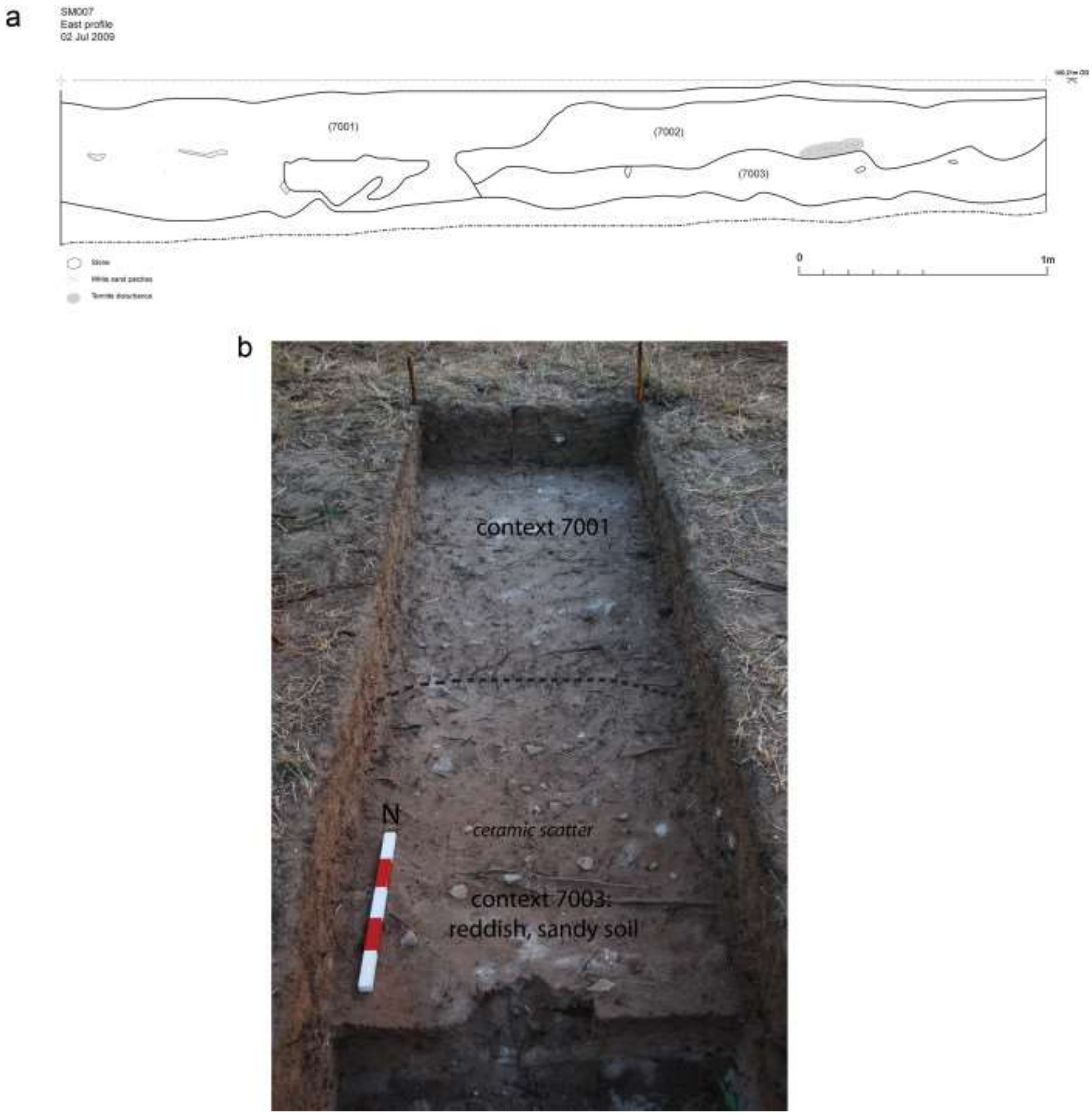

Fig. 4: Representative stratigraphic sequence from Songo Mnara: SM007 profile and excavations.

3.2 Geophysical surveys

Magnetometry surveys were carried out using a Bartington Grad601b (dual fluxgate gradiometers) over 20 x 20 m grids, with readings taken at 0.125 m intervals along north-south traverses spaced 1 m apart, at a resolution of 0.1Nt (Fig. 5). Data were exported to ArcheoSurveyor 2.5 for post-acquisition processing and were de-striped by setting the median traverse to a zero mean in order to remove directional fluctuations and instrumental drift and clipped in order to remove extreme values. Electromagnetic survey was undertaken using a

Geonics EM38B conductivity meter in vertical dipole mode with an intercoil spacing of 1 m. This survey was conducted over 20 x 20 m and 10 x 10 m grids with readings taken at 1 m intervals along north-south traverses spaced 1 m apart. The data acquired were accessed in Geonics DAT software before being output to Geoplot v.3 for processing, typically edge-matching, de-spiking and interpolation (Welham and Steele, 2012).

3.3 Geoarchaeological sampling strategy

Geoarchaeological prospection was conducted by examining and sampling stratigraphic sequences at staggered 5 m intervals on 19 east-west transects along a roughly 130 by 70 m grid, covering 6400 m^2 (Fig. 5). A total of 266 shovel test pits (30 cm diameter) were excavated, most down to the sterile beach sand, and the stratigraphic sequence was fully recorded by describing individual layers as follows: depth; Munsell color on wet samples; texture by eye evaluation and finger-texturing on dry and wet samples (see Fitzpatrick, 1986); mineral and organic fractions were described and contents were estimated on preset categories (common, rare, none), with the exception of shells that were counted; artifacts (potsherds, beads, lithics, metal and glass fragments) were all collected, counted and weighed (supplementary data are provided in appendix).

A total of 240 bulk samples of soil/sediment were collected from the cultural layer as exposed in the test-pits and a sub-sample of fine fraction material (10-11.5 g) was submitted to ALS Global, Minerals (Seville Branch) for Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES) to determine 33 elements. ICP-AES samples were processed using four acid digestion (ME-ICP61; see ASL Minerals, 2009, 2010) which involves: low temperature drying (<60°C) and dry-sieving using a 180μm (Tyler 80 mesh) screen to obtain samples of 0.25g that are then digested with perchloric, nitric, hydrofluoric and hydrochloric acids. The residues are then topped up with dilute hydrochloric acid and analyzed by ICP-AES. The results were corrected for spectral interferences. While total extraction using strong acids may compromise the detection of mobile elements (see Salisbury, 2012; Wells, 2004), four acid digestion had already been tested in soils/sediments from Songo Mnara and the results showed patterns of variations associated with past activities as also detected by other indicators (Sulas and Madella, 2012).

Field data, including sediment/soil characterizations and artifact distribution, and chemical analysis results were first organized in a database, and subsequently integrated into a project GIS. This allowed for the visualization of single-data distributions as well as interpolating multiple datasets.

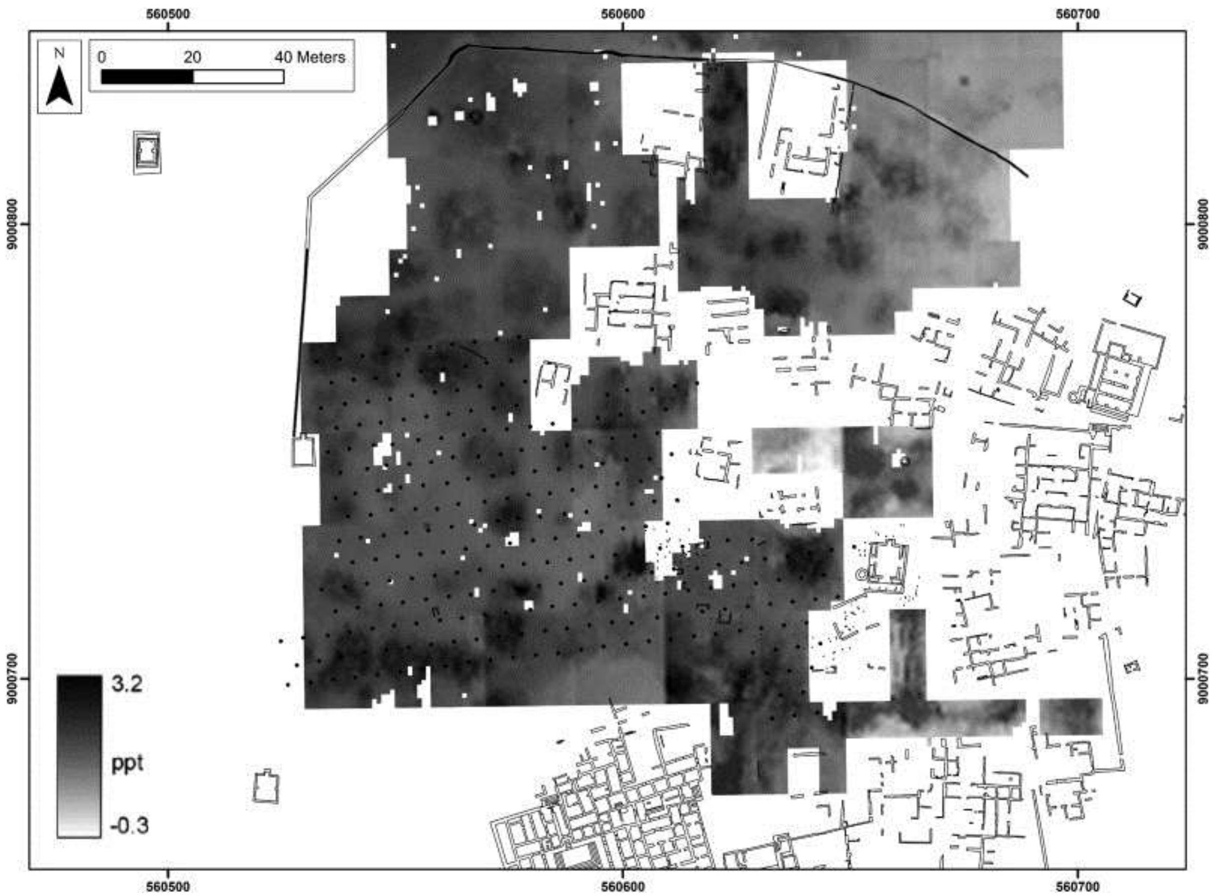

Fig. 5: Composite plan with geophysical anomalies from magnetic susceptibility and location of test pit program.

4. Results

4.1 Defining Open Spaces with Geophysical Surveys and Ground Truthing Excavations

Geophysical surveys in the central, western and northern open areas at Songo Mnara in 2009 revealed more than 50 oval and sub-oval anomalies, between 5 and 10 m in diameter. The most clearly-defined anomalies represent high magnetic susceptibility readings which correlate closely with areas of magnetic disturbance recorded in the magnetometry survey (Fig. 5; Welham and Steele, 2012). In the western open area, a series of 11 anomalies seem to demarcate a rectangular area, approximately 60 (N/S) by 30 (E/W) m in size (Fig. 5). The space demarcated by these anomalies is the only large area observed that is devoid of magnetic disturbances and anomalies of high magnetic susceptibility.

Based on the geophysical surveys in 2009, it was suspected that this demarcated space may represent a defined public space within the western open area (Fleisher and Wynne-Jones, 2012; Fleisher, 2013). A small mosque adjacent to this area is positioned along the town wall, perched on the beach which would have been the point of entrance to the settlement before mangrove swamps choked the harbor. The town wall, extending from the north, seems to terminate at the small mosque, leaving the area south of the mosque open at the beach, and thus allowing access from the beach into the western open area.

In order to investigate the nature and function of this open space, three excavations were carried out to ground truth three anomalies in this area in 2009. Trench SM005 was placed over an anomaly that indicated very high magnetic disturbance and susceptibility west of the open space. These excavations revealed debris associated with iron working, such as fragments of tuyeres, small iron-slag fragments, including evidence of scale and droplets, material diagnostic to iron smithing (Killick, 2009). A second trench, SM007, partially bisected an 8 m diameter anomaly on the eastern edge of the open space, revealing a dense ceramic scatter (Fig. 4) and very slight soil differences, suggesting that the geophysical anomalies were associated with a reddish sandy soil/sediment deposit. A third trench, SM011, revealed archaeological deposits with domestic debris, including pottery scatters, copper coins, beads, and oil lamps, as well as possible hearth stones (Fig. 6). In sum, these excavations suggested that the geophysical anomalies represented a variable set of archaeological deposits, including production areas, midden scatters and possible domestic deposits.

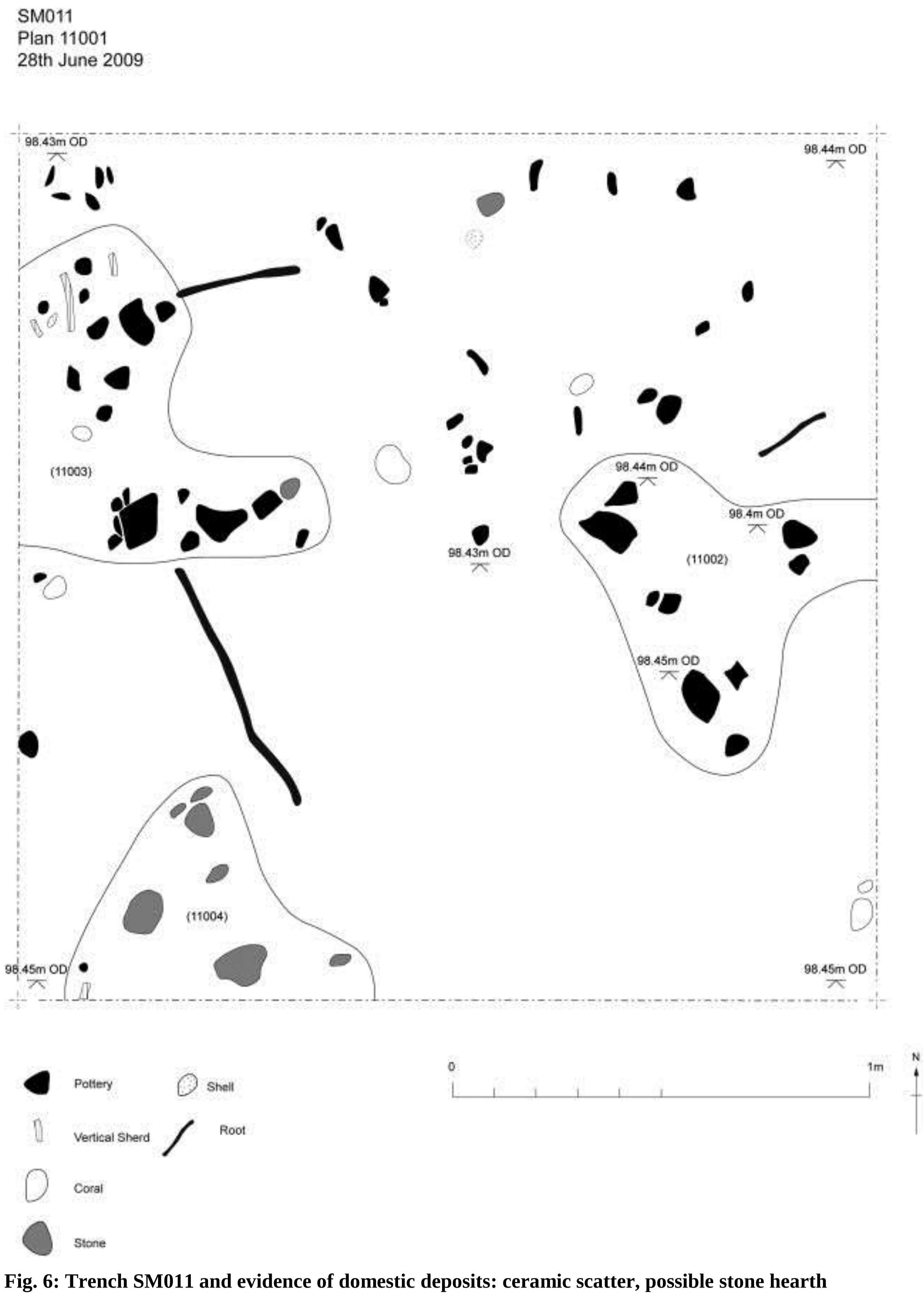

Fig. 6: Trench SM011 and evidence of domestic deposits: ceramic scatter, possible stone hearth

4.2 Determining the Use of Space through Artifact Distributions and Geochemistry

The results of ground truth excavations in 2009 were suggestive but somewhat ambiguous and, thus, research in 2011 focused on a more extensive approach to this area by developing a test pit program to record artifact and geochemical distributions that could be integrated with the geophysical survey data (see supplementary data in appendix). The integrative analysis of these datasets aimed at clarifying the nature of the anomalies as well as exploring the possible use of the open space defined by the anomalies themselves.

The most revealing artifact class collected from the test pits was daub, which is closely correlated with geophysical anomalies found north and south of the rectangular space (Fig. 7). It is noteworthy that daub was not associated with the anomaly in which trench SM011 was dug and where possible domestic debris was recorded. The area around SM011 might be part of a yard deposit, including outdoor cooking areas. It is also possible, however, that other anomalies that were not associated with daub are the remains of earthen houses, but that the way they were abandoned or destroyed did not allow for daub preservation. One signature that points in this direction may be found in the concentration of Fe as detected in the test pits; some of the highest Fe values come from the test pits where daub was most prevalent. However, Fe concentration is also more generally correlated with geophysical anomalies, such as those that were investigated with trenches SM007 and SM011. In the latter case, Fe values are likely to reflect the presence of reddish sandy soils, characterized by relatively high Fe content. As mentioned, these reddish fine sands are part of the regional *terra rossa* soil cover, which is also seen supporting agricultural fields south of the site. Their presence at Songo Mnara and, in particular, in the open space investigated, may have been associated with the building of earthen houses. It is possible that Fe-rich soils were excavated offsite and then moved to Songo Mnara for building earthen houses, and thus areas with higher than normal Fe associated with geophysical anomalies might represent places where earthen houses once stood but where daub no longer exists.

Fig. 7: Geophysical survey and daub from test pits.

The distribution of locally-produced ceramics also provides a means to examine how open space may have been used. Local ceramics were found in most of the test pits, but the distribution of the size and number of ceramics might be used to examine how clear a particular space was kept. To investigate the issue further, the variability in artifact size was also examined. Plotting the ratio of local sherd weight/number allows for an evaluation of whether certain areas contained smaller artifacts or not. One expectation is that smaller artifacts would have been acceptable in a space that was meant to be kept essentially clear, while larger artifacts would be relegated to the margins and/or middens. The plot of this value (gr/sherd) indicates that the space between the anomalies on the western open area, in general, contains smaller sherds than the areas that surround it (Fig. 8). The distribution of other artifacts across this area also illustrates a similar trend, with greater numbers of larger artifacts (e.g. spindle whorls, slag fragments) to the east of the anomalies, while small easily-lost items such as beads were more common to the west.

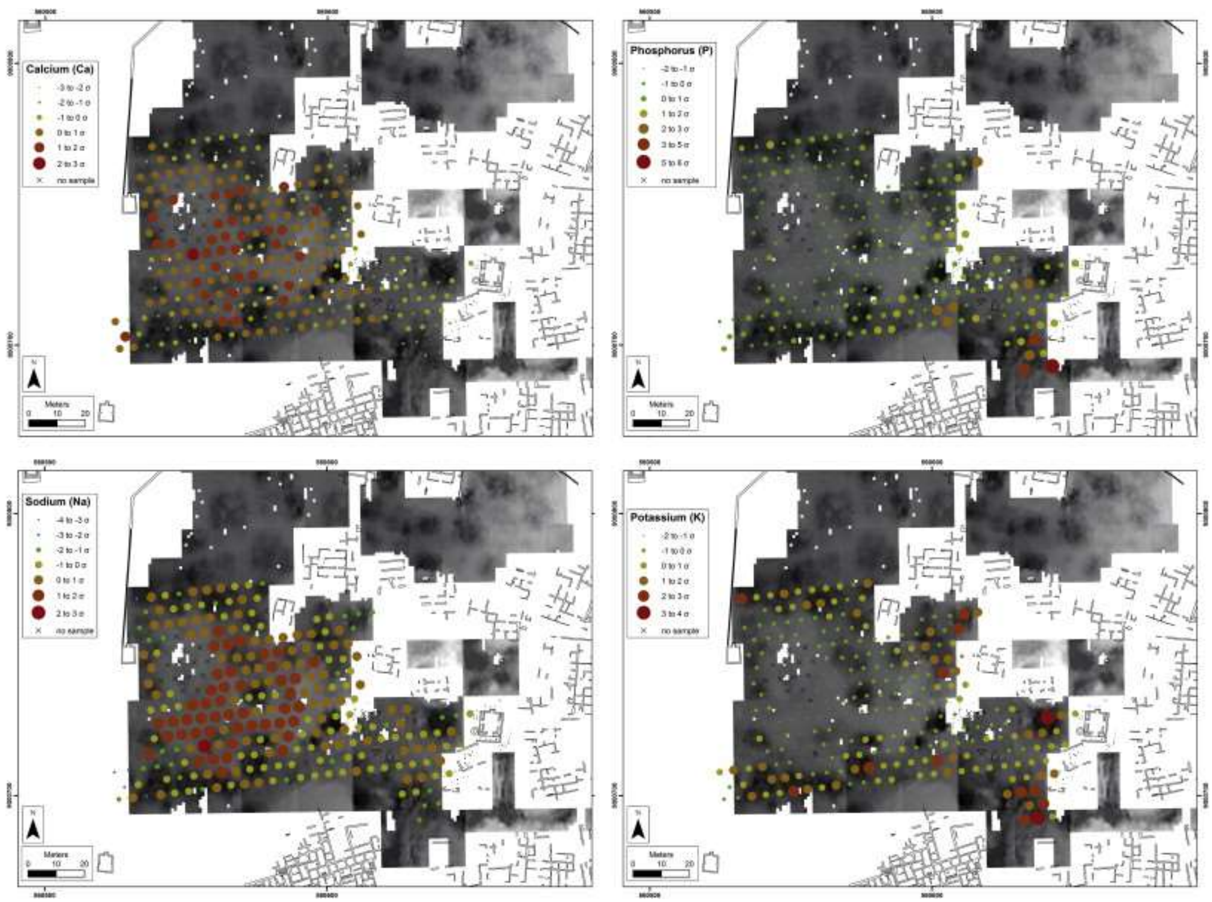

Fig. 8: Distribution of grams/sherd count, showing smaller-sized sherds in the area of the 'public space' and larger ones to the east.

Among the most informative indicators, the distributions of the following elements were particularly revealing: P, Ca, K, Mn, Na, and Sr (Fig. 9, 10; also supplementary data in appendix). Concentrations of these plant macronutrients and the trace element (Sr) are found in elevated levels where plant or animal tissues, or their ashes are deposited (Wilson et al., 2008). Relative concentrations of phosphorus/phosphate in archaeological sediments can be used to distinguish between living/working spaces and areas where organic residues concentrate (e.g. middens, waste disposal areas, stabling and latrine deposits; for example see Holliday and Gartner, 2006; Ottaway and Matthews, 1988; Sarris et al., 2004). At Songo Mnara, low values of P, Mn and K cluster within the rectangular area, extending to the east beyond the area bound by geophysical anomalies as well. This elemental signature suggests that these areas were kept relatively clear of animals, human waste, and other organic materials.

Other elements, however, displayed a reversed pattern with higher than average values for Ca, Na, Mg and Sr found within the rectangular area, while lower concentrations of the same elements were detected to the east. A number of activities that would usually take place outdoors could have contributed to these values. Higher levels of Na, for example, may be expected where drying of nets and salting of fish occur, two activities that are known ethnographically to occur in open fields close to the shore (Prins 1965).

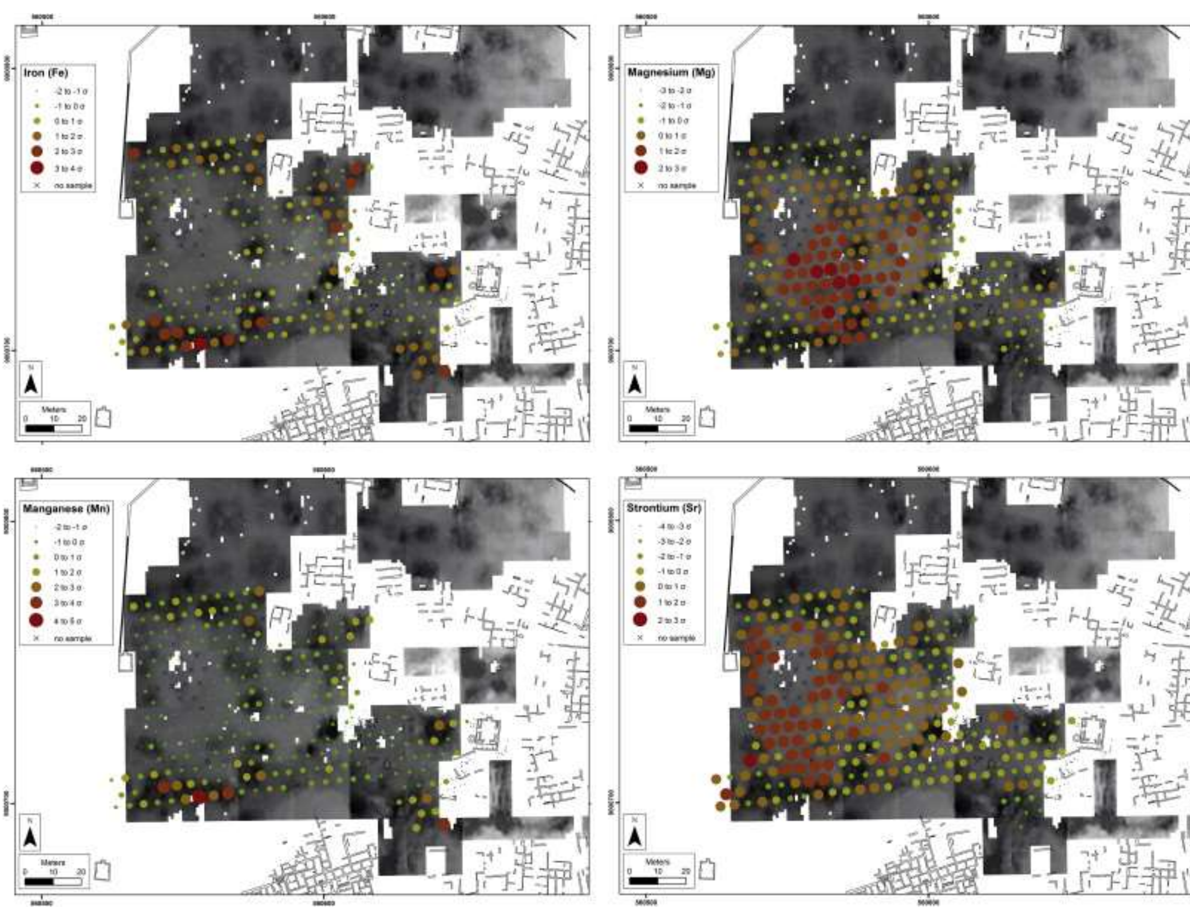

Fig. 9: Element distributions: Ca, Na, P, K

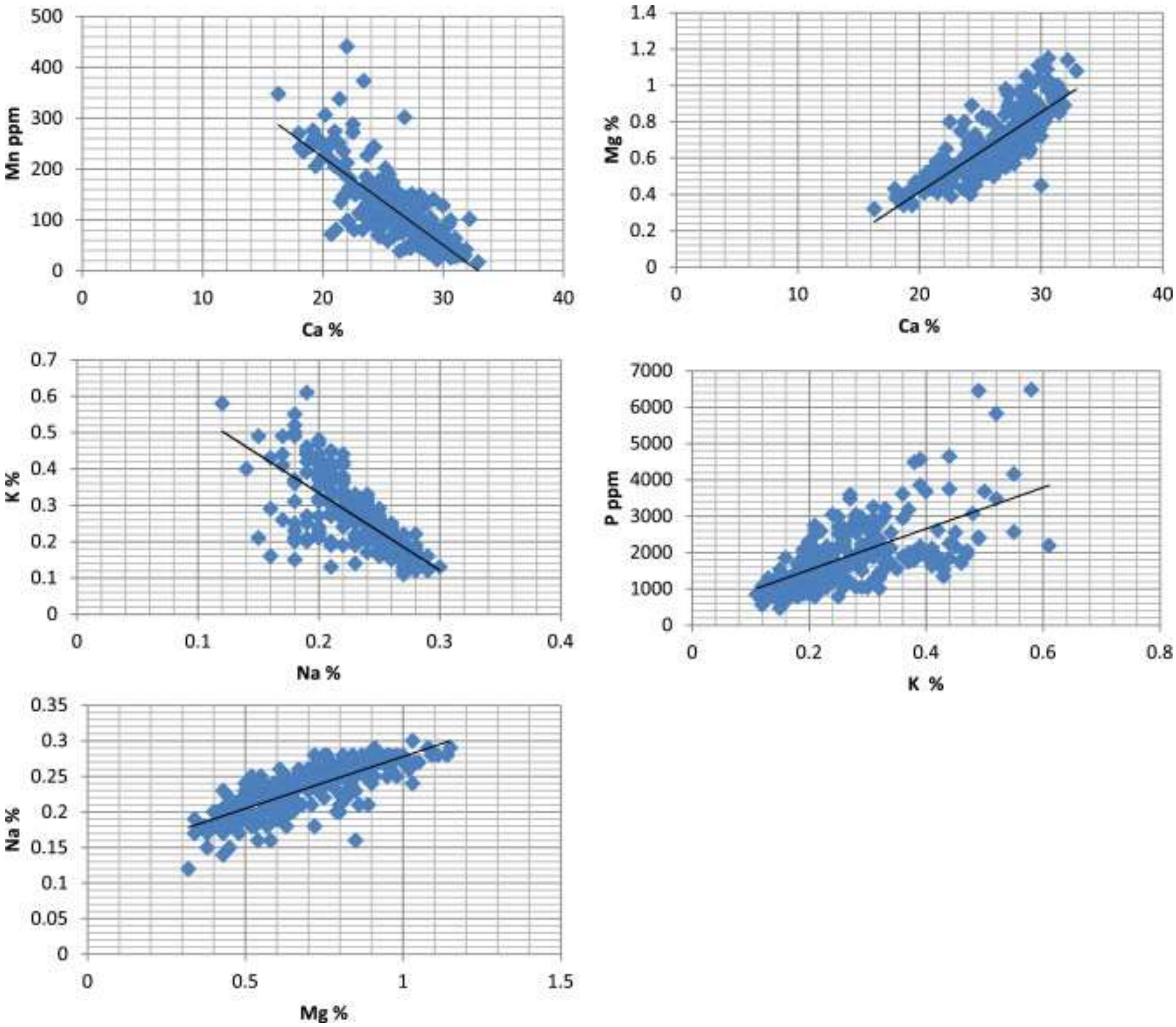

Fig. 10: Element distributions: Fe, Mg, Mn, Sr

The elevated levels of Ca and Sr could be related to the presence and/or use of inorganic material such as lime and shell. Higher levels of Ca in public and private spaces in Mesoamerica are commonly linked to the use of lime, which was used in processing corn (Middleton and Price, 1996: 678; Wells, 2004: 75). Although lime was also produced and used extensively at Swahili sites—used to create plaster for lining floors and facing buildings—it is unlikely that the elevated levels of Ca in the rectangular area relate to these activities. Lime-making involves the firing of coral rag in large mounds (Pollard et al., 2012; see also Sulas and Madella, 2012), the debris of which appear clearly as geophysical anomalies; one of these has been excavated at Songo Mnara, in courtyard off the northern open area (Fleisher and Wynne-Jones, 2013). Thus, the association of high Ca and a lack of anomalies in the rectangular areas are probably not related to lime production.

It is possible that the elevated levels of Ca in the rectangular area are related to the production of shell beads. Shell bead production is known from many coastal sites, and it involved the grinding of shells (Flexner et al., 2008). Although shells are a common feature of the local sediments and soils, some of which are natural to the local, sandy matrix, the distribution of shell beads is discontinuous in the test pits. Greater numbers of shell beads were clustered in test pits in the southern and eastern part of the rectangular space, and in middens surrounding houses, at the eastern extent of the area tested. Therefore, there is an association between parts of the rectangular space (area without anomalies), higher numbers of shell beads, and elevated levels of Ca (Fig. 11), suggesting that shell bead production might have occurred in this area. In this case, the debris from shell bead production would have contributed to the Ca-rich soils. This area would have been open, adjacent to wattle-and-daub houses, and an area that has also been associated with more general domestic debris (based on excavations in SM011).

Fig. 11: Distribution of Ca values and numbers of shell beads located in test pits

One final observation drawn from the geochemical distributions: while there is a spatial association of higher or lower values of certain elements and the rectangular space, the patterning for most element distributions extend beyond the line of the eastern geophysical anomalies that seemed to define the rectangular space. It is possible, therefore, that the open space itself is larger, extending further to the east, with the iron smithing locale marking an eastern boundary. This would locate the dense ceramic scatter observed in SM007 at the center of the open space, rather than at the eastern boundary.

5. Discussion: towards an archaeology/definition of 'public space'

The activities and processes taking place in an open space are complex to define, and this paper only deals with one part of the multifaceted open spaces at Songo Mnara (Fig. 12; see also Fleisher, 2013). The application of multiple techniques for investigating such spaces greatly enhances the spectra of information that can be acquired, though raising new sets of issues. Indeed, the choice of which methods to combine in the first place and, subsequently, how to interpret discrepancies between different datasets poses new challenges for disentangling the history of open spaces.

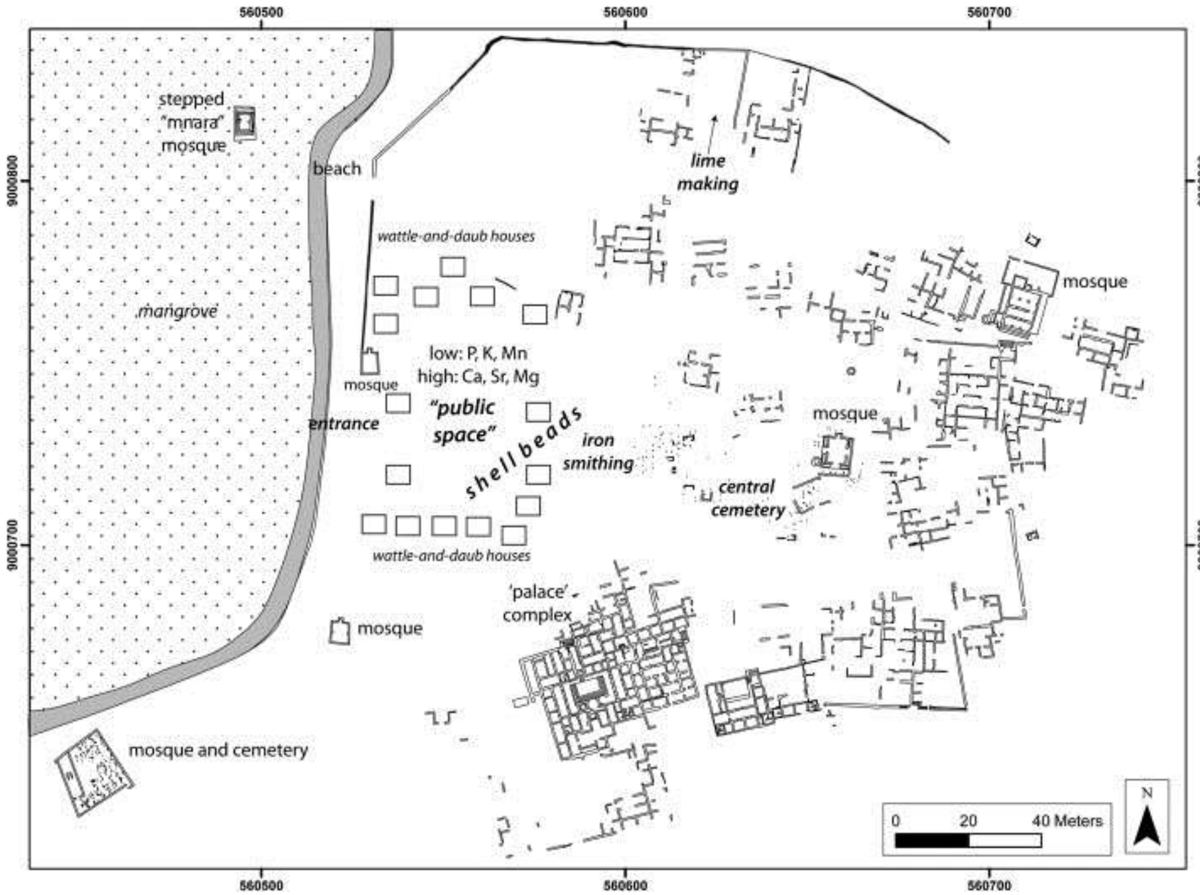

Fig. 12: Interpretation of the western open space at Songo Mnara, showing wattle-and-daub structures, 'public space,' areas of possible shell and iron production, and element values.

At Songo Mnara, the data obtained from each methodology has produced information on the characteristics of, or features present in, the open areas. However, each record alone would not have offered enough resolution to interpret the organization and use of space, let alone the possibility of defining a public space that was bound by impermanent architecture and the location of particular types of activities. This is despite the fact that the plan of Songo Mnara offers some of the best evidence of town layout and a well-defined settlement history.

The combination—and correlation—of various methodologies has thus demonstrated tremendous potential for deciphering features within the open spaces of Songo Mnara and to begin interpreting ancient activities that occurred within them. For example, while the geophysical surveys provided a relatively clear image of the anomalies present within the open spaces, ground truthing through traditional excavations did not offer clarity on these anomalies. In this case, the ability to map out broader artifact patterns and geochemical distributions served to clarify and amplify the interpretations that were made based on the geophysics and excavation. And yet, the ground truth excavations, especially those that exposed ceramic scatters and evidence of domestic deposits, provided important resolution on the specific activities indicated by the geochemistry, geophysics and artifact distributions. These findings thus show the need for addressing discrepancies between multiple datasets, and not only correlations. It is only through the combination of geophysics, artifact distribution, and geochemical datasets that possible human activities across open urban spaces come into focus.

Pulling together all the evidence recorded, the emerging picture is one of an open space busy with different activities. The space included an area that should be considered truly ‘public’ in both the open access accorded to it and the way in which wattle-and-daub structures and daily human activities served to respect and protect it over the long term. The activities that might have been associated with this public space—those related to fishing and the possible production of shell beads—were not obtrusive enough to alter or intrude on the physical space, but were persisted long enough to leave ephemeral and detectable traces on the ground (Fig. 12). It is perhaps not surprising that such a variety of activities may have been best performed outdoors, in an environment not enclosed by buildings or other barriers, yet conveniently located just within the town walls adjacent to the beach entrance to the site. In this sense, our study area at Songo Mnara seem to have functioned as a public open space, a maintained and functional space where people could go on with the business and interact with each other at domestic, social, economic and cultural levels.

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APPENDIX (supplementary data) TABLE 1 Selected artifact distributions and 33 element ICP-AES concentrations

Legend: TP = test pit no; Cl = Munsell color; ST= soil/sediment type (1 and 3 for terra rossa; 2 dark brown fine sand silty loam); SFF = shell fine fragments; SCF = shell coarse fragments; SW = whole shell total count; SB = shell beads total count; GB = glass beads total cour

*Background samples: the average values were obtained through the analysis of surface samples in and around the site (for full data, see Sulas and Madella 2012)

TP	Depth	ST	CL	Shells			LC		Beads		Daub	ICP-AES	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th	Ti	Tl	U	V	W	Zn
n.	*cm*			*SFF*	*SCF*	*SWC*	*count*	*wt.*	*SB*	*GB*	*wt.*	*#*	*ppm*	*%*	*ppm*	*ppm*	*ppm*	*ppm*	*%*	*ppm*	*ppm*	*ppm*	*ppm*	*%*	*ppm*	*%*	*ppm*	*%*	*ppm*	*ppm*	*%*	*ppm*	*ppm*	*ppm*	*%*	*ppm*	*ppm*	*ppm*	*ppm*	*%*	*ppm*	*ppm*	*ppm*	*ppm*	*ppm*
GT 001	35-45	2	7.5YR 4/4	r	n	n/a	12	38.9				1	<0.5	0.54	<5	70	<0.5	<2	25.4	<0.5	3	10	3	0.27	<10	0.20	10	0.61	59	1	0.26	5	1080	<2	0.13	<5	1	4070	20	0.07	<10	10	5	<10	31
GT 002	35-50	2	7.5YR 4/4	r	n	n/a	4	8.8				2	<0.5	0.47	5	80	<0.5	<2	27.3	<0.5	2	9	3	0.18	<10	0.22	10	0.75	45	1	0.28	3	980	2	0.15	<5	1	4270	20	0.03	<10	10	3	<10	11
GT 003	35-56	2	7.5YR 4/4	r	r	n/a	0					3	<0.5	0.56	6	60	<0.5	2	30.1	<0.5	3	11	8	0.24	<10	0.21	10	0.79	70	1	0.2	3	2610	<2	0.14	<5	1	4500	20	0.04	<10	10	4	<10	10
GT 004	18-40	2	7.5YR 4/4	r	n	n/a	18	50				4	<0.5	0.31	<5	60	<0.5	<2	29.5	<0.5	2	10	2	0.12	<10	0.16	<10	0.91	32	1	0.29	3	760	<2	0.17	<5	1	4500	20	0.03	<10	10	2	<10	3
GT 005	10-40	2	7.5YR 4/4	r	n	n/a	12	52.1				5	<0.5	0.51	9	70	<0.5	<2	29.7	<0.5	3	11	4	0.22	<10	0.19	10	0.86	53	1	0.27	4	1890	<2	0.17	<5	1	4630	20	0.05	<10	10	4	<10	6
GT 006	30-38	2	10YR 4/1	c	c	n/a	48	219.7		3		6	0.5	1.62	5	120	<0.5	<2	22.7	<0.5	4	26	10	0.78	<10	0.36	10	0.46	150	2	0.18	12	2940	8	0.11	<5	2	3470	20	0.16	<10	<10	16	<10	18
GT 007	6-43	2	10YR 4/1	c	c	n/a	66	342.2			4.6	7	0.6	1.12	5	90	<0.5	<2	26.4	<0.5	3	20	11	0.58	<10	0.27	10	0.58	117	2	0.2	11	3590	9	0.12	<5	2	4060	20	0.11	<10	10	10	<10	20
GT 008	10-50	2	10YR 4/1	c	n	n/a	17	56				8	<0.5	0.36	<5	70	<0.5	<2	29.6	<0.5	3	9	4	0.15	<10	0.17	<10	0.9	37	1	0.27	2	870	<2	0.16	<5	1	4510	20	0.03	<10	10	2	<10	4
GT 009	6-40	2	7.5YR 4/4	c	n	n/a	51	323		4		9	<0.5	0.58	<5	70	<0.5	<2	28.8	<0.5	2	10	3	0.26	<10	0.19	<10	0.85	55	1	0.27	4	1090	<2	0.16	<5	1	4450	20	0.05	<10	10	5	<10	5
GT 010	7-42	2	7.5YR 4/4	c	n	n/a	21	104				10	<0.5	0.41	<5	70	<0.5	<2	30	<0.5	2	9	3	0.17	<10	0.17	<10	0.87	41	1	0.28	2	1120	<2	0.17	<5	1	4690	20	0.04	<10	10	3	<10	5
GT 011	11-47	2	7.5YR 4/4	c	n	1	12	58				11	<0.5	0.54	<5	70	<0.5	<2	28.4	<0.5	3	11	3	0.26	<10	0.19	10	0.76	66	1	0.27	4	1320	<2	0.16	<5	1	4440	20	0.08	<10	10	5	<10	6
GT 012	17-49	2	7.5YR 4/4	r	n	6	47	316		2		12	<0.5	0.65	<5	70	<0.5	<2	26.2	<0.5	3	12	4	0.29	<10	0.20	10	0.69	74	1	0.24	4	1860	<2	0.14	<5	1	4000	20	0.06	<10	10	5	<10	8
GT 013	6-49	2	7.5YR 4/4	n	n	3	11	44	1	1		13	<0.5	0.7	6	80	<0.5	<2	27.8	<0.5	3	12	2	0.3	<10	0.21	<10	0.84	57	1	0.26	4	780	<2	0.15	<5	1	4160	20	0.05	<10	10	6	<10	4
GT 014	14-37	2	7.5YR 4/4	n	n	12	75	455	2	4		14	<0.5	0.45	<5	70	<0.5	<2	28.4	<0.5	2	10	4	0.21	<10	0.17	<10	0.87	48	1	0.27	1	1130	2	0.16	<5	1	4260	20	0.04	<10	10	3	<10	4
GT 015	14-39	2	7.5YR 4/4	n	n	5	22	91				15	<0.5	0.28	<5	60	<0.5	<2	29.5	<0.5	2	8	2	0.1	<10	0.16	<10	1.02	22	1	0.27	2	650	2	0.16	<5	1	4290	20	0.02	<10	10	2	<10	3
GT 016	16-40	2	7.5YR 4/4	n	n	18	41	334.4	1	2	27.6	16	<0.5	0.94	<5	90	<0.5	<2	26.9	<0.5	4	18	9	0.49	<10	0.27	10	0.62	107	2	0.21	5	3480	11	0.13	<5	1	3970	20	0.1	<10	10	8	<10	15
GT 018	11-48	2	10YR 4/1	n	n	1	84	381		3		17	0.8	1.16	9	90	<0.5	<2	26.4	<0.5	3	16	8	0.54	<10	0.27	10	0.59	119	1	0.21	6	2680	8	0.13	<5	2	4000	20	0.09	<10	10	10	<10	14
GT 019	20-47	2	7.5YR 4/4	n	n	3	14	93			5	18	<0.5	0.52	8	90	<0.5	<2	29.5	<0.5	4	11	6	0.32	<10	0.22	10	0.73	70	1	0.23	3	1830	3	0.15	<5	1	4550	20	0.06	<10	10	4	<10	7
GT 020	10-32	2	7.5YR 4/4	n	n	0	26	197				19	<0.5	0.42	9	80	<0.5	<2	30	<0.5	3	9	4	0.24	<10	0.20	<10	0.88	41	1	0.27	2	1280	<2	0.17	<5	1	4530	20	0.03	<10	10	3	<10	6
GT 021	21-46	2	7.5YR 4/4			2	8	28	2	2		20	<0.5	0.46	8	80	<0.5	<2	28.5	<0.5	2	8	3	0.19	<10	0.19	<10	0.81	42	1	0.27	1	1210	<2	0.16	<5	1	4420	20	0.03	<10	10	3	<10	4
GT 022	6-37	2	5YR 7/3	r	n	3	21	81		1		21	<0.5	1.74	10	110	<0.5	<2	24.6	<0.5	4	24	3	0.79	<10	0.32	10	0.73	126	1	0.24	9	1010	4	0.14	<5	2	3680	20	0.14	<10	10	19	<10	8
GT 023	13-39	2	7.5YR 4/4	n	n		27	54	1	1		22	<0.5	0.58	<5	70	<0.5	<2	27.5	<0.5	3	11	4	0.24	<10	0.19	<10	0.73	57	1	0.25	4	1800	3	0.15	<5	1	4250	20	0.05	<10	10	4	<10	6
GT 024	6-36	2	5YR 7/3	r	n	0	50	361	1	2		23	<0.5	1.19	7	90	<0.5	<2	25	<0.5	4	17	3	0.54	<10	0.27	10	0.69	96	1	0.24	6	1180	4	0.14	<5	2	3780	20	0.09	<10	10	13	<10	7
GT 025	15-45	2	7.5YR 4/4	c	n		15	112				24	<0.5	0.43	<5	70	<0.5	<2	28.7	<0.5	3	8	3	0.21	<10	0.18	<10	0.86	49	1	0.26	2	1390	<2	0.16	<5	1	4450	20	0.04	<10	10	3	<10	7
GT 026	8-33	2	7.5YR 4/4	r	r	9	12	60	1	1		25	<0.5	0.38	<5	80	<0.5	<2	26.4	<0.5	3	7	4	0.19	<10	0.19	<10	0.7	39	1	0.23	1	1320	2	0.14	<5	1	4000	20	0.04	<10	10	2	<10	5
GT 027	12-36	2	7.5YR 4/4	n	n							26	<0.5	0.7	5	80	<0.5	<2	24.9	<0.5	4	12	7	0.47	<10	0.23	10	0.52	87	1	0.2	4	2090	8	0.13	<5	1	3890	20	0.07	<10	<10	5	<10	10
GT 028	9-40	2	10YR 4/1	n	n	0	33	316		1		27	<0.5	1.46	10	120	<0.5	<2	23.6	<0.5	5	20	7	0.65	<10	0.34	10	0.52	130	1	0.22	10	2550	7	0.12	<5	2	3630	20	0.13	<10	<10	13	<10	14
GT 029	11-39	2	10YR 4/1	n	n	12	57	260		1		28	<0.5	1.21	<5	110	<0.5	<2	23.6	<0.5	3	19	6	0.53	<10	0.33	10	0.55	104	1	0.23	7	1710	4	0.12	<5	2	3640	20	0.11	<10	<10	11	<10	12
GT 030	11-39	2	10YR 4/1	r	n	10	16	99		2		29	<0.5	0.44	<5	70	<0.5	<2	27	<0.5	3	10	4	0.3	<10	0.17	10	0.73	47	2	0.24	4	1250	2	0.15	<5	1	4200	20	0.05	<10	10	3	<10	5
GT 031	8-34	2	7.5YR 4/4	n	n	3	24	94		1		30	<0.5	0.43	<5	70	<0.5	<2	26.8	<0.5	3	11	4	0.24	<10	0.19	10	0.75	44	1	0.25	3	1290	2	0.15	<5	1	4140	20	0.04	<10	10	3	<10	6
GT 032	6-48	2	7.5YR 4/4	n	n	5	15	53				31	<0.5	0.5	<5	60	<0.5	<2	28.3	<0.5	3	11	3	0.2	<10	0.18	<10	0.88	44	1	0.26	2	1330	<2	0.16	<5	1	4330	20	0.03	<10	10	3	<10	7
GT 033	6-38	2	5YR 7/3	c	n	9	21	49		2		32	<0.5	1.53	<5	100	<0.5	<2	24.2	<0.5	4	27	4	0.67	<10	0.31	10	0.7	120	2	0.24	12	1240	2	0.14	<5	2	3830	20	0.12	<10	10	15	<10	8
GT 034	11-22	2	7.5YR 4/4	n	n	6	39	125				33	<0.5	0.92	6	80	<0.5	<2	26.7	<0.5	3	19	4	0.4	<10	0.22	10	0.75	88	2	0.25	8	1590	3	0.15	<5	1	4220	20	0.07	<10	10	8	<10	8
GT 035	9-42	2	7.5YR 4/4	n	n	3	22	114				34	<0.5	0.79	<5	80	<0.5	<2	31	<0.5	1	16	3	0.33	<10	0.22	10	0.93	64	2	0.27	6	1270	2	0.16	<5	1	4380	20	0.06	<10	<10	4	<10	6
GT 036	6-42	2	7.5YR 4/4	r	n	22	117	808				35	<0.5	0.77	5	80	<0.5	<2	28	<0.5	1	15	5	0.37	<10	0.21	<10	0.74	93	1	0.24	6	2740	2	0.14	<5	1	3980	20	0.07	<10	<10	3	<10	14
GT 037	5-35	2	7.5YR 4/4	r	n	6	9	78				36	<0.5	0.47	10	80	<0.5	<2	29.4	<0.5	2	10	4	0.44	<10	0.20	<10	0.78	51	1	0.25	4	1280	12	0.15	<5	1	4220	20	0.04	<10	<10	<1	<10	4
GT 038	8-36	2	7.5YR 4/4	r	n	4	44	398				37	<0.5	0.69	<5	100	<0.5	<2	27.5	<0.5	2	11	3	0.37	<10	0.24	<10	0.63	77	1	0.24	4	1490	8	0.13	<5	1	4080	20	0.07	<10	<10	2	<10	7
GT 039	6-41	2	10YR 4/1	n	n	25	106	985				38	<0.5	1.43	5	110	<0.5	<2	27.2	<0.5	3	25	7	0.64	<10	0.32	10	0.59	140	1	0.23	10	2800	5	0.12	<5	2	3820	20	0.14	<10	<10	10	<10	14
GT 040	14-49	2	7.5YR 4/4	n	n	1						39	1.4	2.68	13	170	0.5	<2	20.4	<0.5	5	40	13	1.24	<10	0.55	10	0.41	242	2	0.18	18	4160	13	0.09	<5	4	2800	20	0.24	<10	<10	24	<10	26
GT 041	19-45	2	10YR 4/1	n	n	8				1		40	<0.5	0.76	5	90	<0.5	<2	26.2	<0.5	3	15	9	0.65	<10	0.24	<10	0.63	92	1	0.22	7	2090	20	0.14	<5	1	3770	20	0.07	<10	<10	3	<10	9
GT 042	11-33	2	10YR 4/1	n	n	12				5		41	<0.5	0.56	<5	80	<0.5	<2	28.8	<0.5	1	11	4	0.27	<10	0.20	10	0.78	57	1	0.26	4	1600	<2	0.15	<5	1	4190	20	0.05	<10	<10	1	<10	6
GT 043	11-39	2	7.5YR 4/4	n	n	13				1		42	<0.5	0.9	10	80	<0.5	<2	28.4	<0.5	2	17	4	0.38	<10	0.23	10	0.76	82	1	0.24	5	2160	3	0.14	<5	1	4050	20	0.07	<10	<10	4	<10	11
GT 044	11-35	2	5YR 7/3	c	r	0				1		43	<0.5	2.16	12	140	<0.5	<2	22.2	<0.5	3	30	4	0.96	<10	0.41	10	0.55	180	2	0.2	13	1720	4	0.11	<5	3	3100	20	0.17	<10	<10	19	<10	11
GT 045	6-34	2	5YR 7/3	c	n	6						44	<0.5	2.14	10	130	<0.5	<2	24.2	<0.5	4	31	5	0.97	<10	0.39	10	0.6	243	1	0.21	13	2170	5	0.12	<5	3	3420	20	0.18	<10	<10	19	<10	19
GT 046	11-37	2	5YR 7/3	c	r	18						45	<0.5	2.73	11	130	0.5	<2	22.2	0.7	4	38	4	1.17	10	0.43	10	0.65	181	1	0.2	16	1340	3	0.11	<5	3	3030	20	0.21	<10	<10	25	<10	12
GT 047	15-45	2	10YR 4/1	c	n	20	100	817				46	0.5	1.76	12	110	<0.5	<2	25.8	<0.5	3	28	9	0.79	<10	0.36	10	0.61	174	2	0.21	13	3610	5	0.13	<5	2	3580	20	0.15	<10	<10	13	<10	23
GT 048	11-40	2	10YR 4/1	r	n	2						47	0.5	0.64	5	80	<0.5	<2	25	<0.5	4	15	9	1.03	<10	0.21	<10	0.61	89	2	0.2	10	1800	9	0.12	<5	1	3570	20	0.05	<10	<10	2	<10	10
GT 049	11-40	2	7.5YR 4/4	r	n	13				2		48	<0.5	0.94	12	100	<0.5	<2	27.2	<0.5	2	17	5	0.47	<10	0.28	10	0.59	96	2	0.24	6	1940	10	0.13	<5	1	3970	20	0.09	<10	<10	5	<10	9
GT 050	6-37	2	10YR 4/1	r	n	14	65	366		4	106	49	0.6	1.62	6	130	<0.5	<2	24.2	<0.5	3	27	9	0.74	<10	0.39	10	0.4	171	2	0.2	11	4560	14	0.10	<5	2	3570	20	0.16	<10	<10	11	<10	19
GT 051	11-39	2	7.5YR 4/4	r	n	19	52	191		4		50	<0.5	1.69	9	130	<0.5	<2	24.6	<0.5	3	27	7	0.74	<10	0.44	10	0.45	169	1	0.22	11	3740	5	0.12	<5	2	3670	20	0.16	<10	<10	12	<10	17
GT 052	11-62	2	10YR 4/1	r	n	23	14	50				51	<0.5	0.62	5	90	<0.5	<2	28.3	<0.5	2	12	5	0.42	<10	0.24	<10	0.66	68	1	0.25	5	1520	8	0.14	<5	1	4340	20	0.06	<10	<10	2	<10	6
GT 053	11-38	2	10YR 4/1	r	n	16	60	297	1	3		52	<0.5	0.97	<5	90	<0.5	2	28.2	<0.5	2	18	7	0.44	<10	0.26	<10	0.68	100	2	0.24	8	2600	4	0.14	<5	1	4220	20	0.08	<10	<10	5	<10	12
GT 054	16-43	2	5YR 7/3	r	n	0	61	297		1		53	2.1	3.47	17	160	0.7	<2	19.7	<0.5	5	50	8	1.53	10	0.55	20	0.47	259	2	0.18	23	2560	13	0.10	<5	5	2800	20	0.26	<10	<10	31	<10	22

GT 055	13-66	2	5YR 7/3	r	n	16	42	211	2	1		54	<0.5	1.14	9	90	<0.5	<2	28.2	<0.5	2	22	2	0.5	<10	0.25	10	0.85	97	1	0.25	7	1310	2	0.14	<5	2	3990	20	0.1	<10	<10	8	<10	6
GT 056	6-43	2	7.5YR 4/4	r	n	26	75	575	1	3		55	<0.5	1.13	6	90	<0.5	<2	27.3	<0.5	2	22	4	0.48	<10	0.25	<10	0.71	102	2	0.24	8	2510	3	0.13	<5	2	4000	20	0.09	<10	<10	7	<10	11
GT 057	n/a		5YR 7/3				38	350		2		56	0.5	2.36	12	110	0.5	<2	24	<0.5	3	36	5	1.02	<10	0.38	10	0.68	175	2	0.21	16	2030	5	0.12	<5	3	3380	20	0.18	<10	<10	20	<10	14
GT 058	21-54	2	10YR 4/1	r	n	0						57	<0.5	1.35	7	100	<0.5	<2	25.9	<0.5	3	23	7	0.66	<10	0.32	10	0.62	138	2	0.22	9	2870	4	0.12	<5	2	3790	20	0.13	<10	<10	9	<10	14
GT 059	8-42	2	10YR 4/1	r	n	16	32	187		4		58	<0.5	0.83	8	90	<0.5	<2	25.7	<0.5	3	14	10	0.69	<10	0.26	<10	0.57	104	1	0.22	8	2460	8	0.13	<5	1	3770	20	0.09	<10	<10	4	<10	11
GT 060	16-39	2	7.5YR 4/4	r	n	27	9	69				59	<0.5	0.8	7	90	<0.5	<2	26.5	<0.5	2	14	4	0.34	<10	0.24	10	0.64	84	1	0.22	4	1930	2	0.12	<5	1	3840	20	0.07	<10	<10	3	<10	9
GT 061-A	30-44	3	5YR 7/3	c	n	57	126	646	1	1		60	<0.5	1.56	9	100	<0.5	2	28.1	<0.5	2	26	6	0.69	<10	0.33	10	0.71	149	2	0.24	10	2040	2	0.13	<5	2	3980	20	0.15	<10	<10	11	<10	10
GT 062-A	23-47	3	5YR 7/3	c	n	15	70	399	1	1		62	<0.5	1.38	6	110	<0.5	<2	25	<0.5	2	23	3	0.59	<10	0.32	10	0.59	109	1	0.23	10	1360	2	0.12	<5	2	3650	20	0.13	<10	<10	10	<10	7
GT 063	11-44	2	10YR 4/1	c	n	42	21	87		2		64	<0.5	0.77	7	90	<0.5	<2	25.1	<0.5	2	17	6	0.55	<10	0.25	10	0.51	95	1	0.23	6	2130	17	0.12	<5	1	3810	20	0.1	<10	<10	4	<10	9
GT 064	12-40	2	7.5YR 4/4	c	n	24	124	1049	6	4		65	<0.5	1.28	6	100	<0.5	<2	23.9	<0.5	3	20	9	0.66	<10	0.31	10	0.51	148	1	0.2	9	3250	12	0.12	<5	2	3460	20	0.13	<10	<10	8	<10	16
GT 065-A	30-50	3	5YR 7/3	c	n	27	70	664	2	4		66	0.8	2.44	10	140	0.5	<2	23.3	<0.5	3	34	7	1.06	<10	0.42	10	0.57	162	1	0.21	13	2610	10	0.11	<5	3	3330	20	0.19	<10	<10	21	<10	14
GT 066	15-45	2	7.5YR 4/4	c	n	29	105	528	1	6	11	68	<0.5	1.25	10	100	<0.5	<2	27	<0.5	2	21	6	0.53	<10	0.28	10	0.69	111	1	0.24	8	2680	3	0.13	<5	2	3990	20	0.11	<10	<10	8	<10	11
GT 067	7-35	2	5YR 7/3	r	n	16	56	428	4	3		69	0.5	3.19	12	160	0.6	<2	20.6	<0.5	5	49	9	1.41	10	0.52	20	0.52	252	2	0.18	22	3480	9	0.10	<5	4	2860	20	0.27	<10	<10	31	<10	22
GT 068	11-39	2	10YR 4/1	r	n	16	69	493		3		70	0.5	0.93	6	90	<0.5	<2	27.5	<0.5	1	18	8	0.39	<10	0.25	10	0.62	90	2	0.24	10	2980	7	0.13	<5	1	4180	20	0.08	<10	<10	5	<10	15
GT 069	11-44	2	10YR 4/1	n	n	16	40	161	2	4		71	<0.5	1.05	<5	100	<0.5	<2	27.5	<0.5	1	19	6	0.48	<10	0.28	10	0.6	122	2	0.24	8	2930	4	0.14	<5	2	4150	20	0.09	<10	<10	5	<10	15
GT 071	16-54	2	10YR 4/1	c	r	36	26	182		2		72	<0.5	0.75	<5	100	<0.5	<2	27.1	<0.5	1	15	7	0.32	<10	0.26	<10	0.55	82	1	0.24	6	2270	2	0.13	<5	1	3920	20	0.07	<10	<10	2	<10	10
GT 072	11-62	2	10YR 4/1	c	r	34	45	396	1	1		73	<0.5	1.46	5	100	<0.5	<2	26.8	<0.5	2	24	7	0.62	<10	0.33	10	0.64	145	2	0.23	10	3000	3	0.13	<5	2	3790	20	0.12	<10	<10	8	<10	14
GT 073	9-43	2	7.5YR 4/4	c	r	9	33	83		1		74	<0.5	0.53	5	70	<0.5	<2	28.7	<0.5	1	13	2	0.27	<10	0.18	<10	0.67	69	1	0.26	4	1230	<2	0.14	<5	1	4480	20	0.09	<10	<10	2	<10	4
GT 074	9-45	2	7.5YR 4/4	r	r	19	13	40				75	<0.5	0.51	5	70	<0.5	<2	29.9	<0.5	1	12	1	0.21	<10	0.18	<10	0.84	46	1	0.27	3	780	<2	0.15	<5	1	4570	20	0.05	<10	<10	1	<10	3
GT 075	9-43	2	7.5YR 4/4	n	n	15	8	8				76	<0.5	0.47	8	70	<0.5	<2	30.3	<0.5	1	10	2	0.18	<10	0.18	<10	0.81	47	1	0.28	2	1240	<2	0.15	<5	1	4610	20	0.04	<10	<10	<1	<10	3
GT 076	10-37	2	7.5YR 4/4	n	n	16	15	37				77	<0.5	0.36	7	80	<0.5	<2	30.3	<0.5	1	10	1	0.12	<10	0.18	<10	0.8	37	1	0.27	3	1180	2	0.15	<5	1	4630	20	0.03	<10	<10	<1	<10	3
GT 079	23-43	2	7.5YR 4/4	n	n	2	5	10				78	<0.5	0.54	<5	60	<0.5	<2	30.8	<0.5	1	11	1	0.21	<10	0.16	<10	0.85	44	1	0.16	3	860	<2	0.12	<5	1	4760	20	0.04	<10	<10	<1	<10	3
GT 080	6-39	2	7.5YR 4/4	c	r	10	4	17				79	<0.5	0.87	<5	80	<0.5	<2	29	<0.5	1	18	3	0.37	<10	0.21	<10	0.63	77	1	0.23	6	1260	2	0.14	<5	1	4710	20	0.08	<10	<10	5	<10	5
GT 081	14-41	2	7.5YR 4/4	c	r	4	2	8			7	80	<0.5	0.89	5	80	<0.5	<2	27.9	<0.5	1	15	1	0.37	<10	0.21	<10	0.72	69	2	0.24	5	840	<2	0.14	<5	1	4490	20	0.07	<10	<10	6	<10	4
GT 082	10-56	2	7.5YR 4/4	c	r	11	6	14				81	<0.5	0.62	7	60	<0.5	<2	29.9	<0.5	1	15	1	0.25	<10	0.17	<10	0.76	54	1	0.25	5	1100	<2	0.15	<5	1	4730	20	0.05	<10	<10	2	<10	4
GT 087	14-40	2	7.5YR 4/4	r	n	6	4	11				82	<0.5	0.56	<5	70	<0.5	<2	29	<0.5	1	13	1	0.22	<10	0.18	<10	0.77	55	1	0.26	4	1280	<2	0.15	<5	1	4470	20	0.04	<10	<10	1	<10	4
GT 088	15-45	2	7.5YR 4/4	c	r	8	17	87				83	<0.5	1.29	8	90	<0.5	<2	27.9	<0.5	2	22	3	0.55	<10	0.26	10	0.79	115	2	0.25	9	1280	3	0.14	<5	2	4210	20	0.09	<10	<10	9	<10	6
GT 089	11-40	2	7.5YR 4/4	c	r	8	3	16				84	<0.5	1.18	<5	80	<0.5	<2	29	<0.5	2	21	3	0.53	<10	0.23	10	0.8	103	2	0.26	8	1040	2	0.15	<5	2	4420	20	0.1	<10	<10	9	<10	7
GT 090	10-45	2	7.5YR 4/4	c	r	9	9	48	1		4	85	<0.5	0.72	7	80	<0.5	<2	29	<0.5	1	13	2	0.32	<10	0.21	<10	0.75	73	1	0.27	4	1380	3	0.15	<5	1	4440	20	0.08	<10	<10	3	<10	5
GT 091	17-46	2	7.5YR 4/4	c	r	9	9	41				86	<0.5	0.91	5	80	<0.5	<2	28.7	<0.5	2	14	2	0.4	<10	0.21	<10	0.85	79	1	0.26	5	1250	<2	0.15	<5	1	4160	20	0.07	<10	<10	6	<10	6
GT 092	13-44	2	7.5YR 4/4	c	r	7	9	9				87	<0.5	1.11	8	90	<0.5	<2	28.9	<0.5	2	17	3	0.49	<10	0.25	<10	0.77	104	1	0.25	7	1220	246	0.15	<5	2	4300	20	0.09	<10	<10	7	<10	6
GT 093	15-43	2	10YR 4/1	c	c	11	25	60	1			88	<0.5	0.47	<5	70	<0.5	<2	31.1	<0.5	1	10	2	0.17	<10	0.16	<10	0.91	45	1	0.28	2	1170	<2	0.17	<5	1	4760	20	0.03	<10	<10	<1	<10	4
GT 094	9-46	2	7.5YR 4/4	c	r	4	22	76			1	89	<0.5	0.38	8	60	<0.5	<2	31.9	<0.5	<1	9	3	0.14	<10	0.15	<10	0.89	42	1	0.28	1	1530	2	0.17	<5	1	4760	20	0.03	<10	<10	<1	<10	4
GT 099	8-38	2	7.5YR 4/4	c	c	11	17	84				90	<0.5	0.71	<5	70	<0.5	<2	30	<0.5	1	13	2	0.32	<10	0.18	<10	0.72	82	1	0.25	3	1270	2	0.15	<5	1	4600	20	0.07	<10	<10	3	<10	4
GT 100	9-34	2	7.5YR 4/4	c	r	10	19	61		1		91	<0.5	0.64	7	70	<0.5	<2	29.6	<0.5	1	11	2	0.26	<10	0.19	<10	0.88	53	1	0.26	3	860	2	0.15	<5	1	4440	20	0.04	<10	<10	3	<10	3
GT 101	16-38	2	7.5YR 4/4	c	c	10	12	22				92	<0.5	0.35	6	60	<0.5	<2	31.5	<0.5	1	8	2	0.13	<10	0.14	<10	0.85	33	1	0.23	3	1160	<2	0.15	<5	<1	4800	20	0.03	<10	<10	<1	<10	3
GT 104	12-56	2	7.5YR 4/4	c	r	4	13			2		93	<0.5	0.3	<5	50	<0.5	<2	31.8	<0.5	1	8	1	0.11	<10	0.12	<10	0.96	30	1	0.28	1	890	<2	0.17	<5	<1	4810	20	0.03	<10	<10	<1	<10	2
GT 105	17-44	2	7.5YR 4/4	r	n	6	23	92				94	<0.5	0.31	5	60	<0.5	<2	31.4	<0.5	1	8	2	0.12	<10	0.14	<10	1	32	1	0.28	2	1210	<2	0.17	<5	<1	4700	20	0.02	<10	<10	<1	<10	3
GT 106	14-49	2	7.5YR 4/4	c	r	11	37	135		1		95	<0.5	0.47	<5	60	<0.5	<2	31.1	<0.5	1	10	2	0.17	<10	0.15	<10	0.95	49	1	0.28	2	1190	2	0.17	<5	1	4730	20	0.03	<10	<10	<1	<10	4
GT 107	18-44	2	7.5YR 4/4	r	n	8	39	85	2	1		96	<0.5	1.17	<5	80	<0.5	<2	27.7	<0.5	2	18	3	0.52	<10	0.25	<10	0.78	135	1	0.24	6	1690	2	0.15	<5	2	4030	20	0.1	<10	<10	8	<10	7
GT 108	11-45	2	7.5YR 4/4	c	r	8	41	145	5			97	<0.5	0.7	<5	70	<0.5	<2	29.7	<0.5	2	13	22	0.3	<10	0.19	<10	0.81	82	1	0.25	3	1780	4	0.15	<5	1	4380	20	0.05	<10	<10	2	<10	7
GT 109	12-54	2	7.5YR 4/4	r	c	5	73	183	3	1		98	<0.5	1.34	13	80	<0.5	<2	26.2	<0.5	3	19	4	0.61	<10	0.25	10	0.79	156	1	0.23	8	1640	4	0.14	<5	2	3720	20	0.1	<10	<10	10	<10	8
GT 110	15-41	2	7.5YR 4/4	r	n	4	41	399	1			99	<0.5	1.54	10	80	<0.5	<2	25.7	<0.5	3	22	3	0.69	<10	0.25	<10	0.82	155	1	0.23	8	1300	<2	0.14	<5	2	3730	20	0.11	<10	<10	13	<10	7
GT 111	12-41	2	7.5YR 4/4	c	r	4	37	75	5			100	<0.5	0.46	<5	60	<0.5	<2	29.6	<0.5	1	9	2	0.18	<10	0.16	<10	0.91	51	1	0.25	1	1330	<2	0.15	<5	1	4230	20	0.04	<10	<10	<1	<10	4
GT 112	12-49	2	7.5YR 4/4	c	r	10	15	48	2	1		101	<0.5	0.32	<5	60	<0.5	<2	31.1	<0.5	<1	8	2	0.11	<10	0.13	<10	1	29	1	0.28	2	1000	<2	0.16	<5	<1	4510	20	0.02	<10	<10	<1	<10	2
GT 113	9-43	2	7.5YR 4/4	r	n	20	8	124		2		102	<0.5	0.29	6	50	<0.5	<2	30.9	<0.5	1	7	1	0.11	<10	0.11	<10	0.97	29	1	0.27	2	840	2	0.17	<5	<1	4560	20	0.02	<10	<10	<1	<10	2
GT 114	11-51	2	7.5YR 4/4	c	r	11	7	15	1			103	<0.5	0.23	<5	50	<0.5	<2	32.9	<0.5	1	7	1	0.07	<10	0.12	<10	1.08	17	1	0.29	1	560	<2	0.18	<5	<1	4910	20	0.01	<10	<10	<1	<10	<2
GT 115	11-47	2	7.5YR 4/4	c	r		34	101	2			104	<0.5	0.32	<5	60	<0.5	<2	31.4	<0.5	1	8	1	0.12	<10	0.13	<10	0.86	31	1	0.21	2	960	<2	0.14	<5	<1	4850	20	0.03	<10	<10	<1	<10	2
GT 116	16-45	2	10YR 4/1	n	n	14	20	50			88	105	<0.5	0.52	<5	80	<0.5	<2	29.1	<0.5	1	11	3	0.23	<10	0.19	<10	0.65	60	1	0.22	2	2080	3	0.13	<5	1	4590	20	0.06	<10	<10	1	<10	7
GT 117	13-55	2	10YR 4/1	c	r	14	29	95		2		106	<0.5	0.47	<5	80	<0.5	<2	24.6	<0.5	2	12	4	0.27	<10	0.20	<10	0.59	71	1	0.21	3	1740	<2	0.13	<5	1	4050	20	0.11	<10	10	5	<10	6
GT 118	12-47	2	7.5YR 4/4	c	r	5	11	36		3		107	<0.5	0.3	5	60	<0.5	<2	28.8	<0.5	3	8	2	0.12	<10	0.14	<10	0.83	36	1	0.27	1	780	<2	0.17	<5	1	4840	20	0.04	<10	10	2	<10	3
GT 119	10-49	2	7.5YR 4/4	c	r	8	30	110				108	<0.5	0.31	5	50	<0.5	<2	29.1	<0.5	3	8	2	0.13	<10	0.12	<10	0.84	32	1	0.28	2	960	<2	0.17	<5	1	4930	20	0.04	<10	10	3	<10	3
GT 120	10-42	2	7.5YR 4/4	c	r	4	12	26	1	2		109	<0.5	0.29	<5	60	<0.5	<2	29.3	<0.5	2	8	2	0.11	<10	0.13	<10	0.92	31	1	0.27	1	900	<2	0.17	<5	1	4730	20	0.02	<10	10	2	<10	3
GT 121	17-34	2	7.5YR 4/4	r	n	5	6	12	1	1	6	110	<0.5	0.29	<5	50	<0.5	<2	29.2	<0.5	2	8	2	0.11	<10	0.13	<10	0.91	30	1	0.28	1	850	<2	0.17	<5	1	4760	20	0.03	<10	10	2	<10	3
GT 122	9-44	2	7.5YR 4/4	c	r	8	10	24				111	<0.5	0.29	<5	50	<0.5	<2	30.6	<0.5	2	8	2	0.11	<10	0.13	10	1.15	28	1	0.29	<1	900	<2	0.19	<5	1	4600	20	0.02	<10	10	2	<10	3
GT 123	10-45	2	7.5YR 4/4	c	r	5	17	19				112	<0.5	0.37	<5	50	<0.5	<2	28.8	<0.5	3	9	2	0.17	<10	0.12	<10	1.05	43	1	0.27	2	1070	<2	0.18	<5	1	4310	20	0.04	<10	10	3	<10	4
GT 124	11-40	2	7.5YR 4/4	r	n	5	21	54	8			113	<0.5	0.38	<5	50	<0.5	<2	29.1	<0.5	2	10	2	0.16	<10	0.14	<10	1	42	1	0.27	1	1190	<2	0.18	<5	1	4490	20	0.03	<10	10	3	<10	4
GT 125	12-48	2	7.5YR 4/4	c	r	8	24	96	2	5		114	<0.5	0.57	<5	60	<0.5	<2	28.2	<0.5	3	10	3	0.25	<10	0.18	10	0.96	63	1	0.26	2	1290	<2	0.17	<5	1	4270	20	0.04	<10	10	5	<10	5
GT 126	10-44	2	7.5YR 4/4	c	r	11	38	183	4			115	<0.5	0.56	6	70	<0.5	<2	28	<0.5	2	11	3	0.25	<10	0.20	<10	0.79	64	1	0.26	3	1670	<2	0.16	<5	1	4350	20	0.05	<10	10	5	<10	5
GT 127	13-38	2	7.5YR 4/4			0	6	116				116	<0.5	0.39	<5	60	<0.5	<2	28.8	<0.5	3	10	3	0.17	<10	0.15	<10	0.91	39	1	0.27	3	1190	2	0.17	<5	1	4510	20	0.03	<10	10	3	<10	4
GT 128	16-40	2	7.5YR 4/4	r	n	11	12	64	1			117	<0.5	0.47	<5	50	<0.5	2	30.5	<0.5	2	11	3	0.2	<10	0.13	<10	1.09	48	1	0.28	3	1290	2	0.19	<5	1	4690	20	0.04	<10	10	4	<10	5
GT 129	11-48	2	7.5YR 4/4	c	r	9	23	155				118	<0.5	0.55	6	60	<0.5	<2	29.8	<0.5	3	11	2	0.24	<10	0.15	<10	1.11	45	1	0.28	3	740	<2	0.19	<5	1	4540	20	0.05	<10	10	5	<10	3
GT 130	11-45	2	7.5YR 4/4	c	r	6	20	55	1	2		119	<0.5	0.97	6	70	<0.5	<2	27.3	<0.5	3	17	4	0.44	<10	0.22	10	0.95	97	1	0.25	6	1630	<2	0.17	<5	1	4060	20	0.07	<10	10	9	<10	7
GT 131	14-38	2	7.5YR 4/4	r	n	19	18	61	1	1		120	<0.5	0.81	7	70	<0.5	<2	28.3	<0.5	3	14	3	0.35	<10	0.19	10	0.97	70	1	0.27	5	1190	<2	0.17	<5	1	4420	20	0.06	<10	10	7	<10	5
GT 132	6-32	2	7.5YR 4/4	r	n	15	60	273	2			121	<0.5	0.5	<5	60	<0.5	<2	29.9	<0.5	3	11	3	0.23	<10	0.15	10	0.89	59	1	0.28	2	1360	<2	0.18	<5	1	4890	30	0.06	<10	10	4	<10	5
GT 133	10-45	2	7.5YR 4/4	c	r	14	98	250		9		122	<0.5	0.48	<5	70	<0.5	<2	29.1	<0.5	2	9	3	0.2	<10	0.17	<10	0.87	48	1	0.27	1	1350	3	0.17	<5	1	4700	20	0.04	<10	10	4	<10	4
GT 134	10-39	2	7.5YR 4/4	r	n	4	16	39	2	2		123	<0.5	0.45	<5	60	<0.5	<2	29.2	<0.5	2	9	4	0.22	<10	0.16	10	0.73	53	1	0.27	3	1160	3	0.16	<5	1	5030	30	0.06	<10	10	4	<10	5
GT 135	13-36	2	7.5YR 4/4	r	n	8	12	42	1	1		124	<0.5	1.71	9	100	<0.5	<2	22.8	<0.5	4	23	5	0.81	<10	0.31	20	0.5	155	1	0.2	9	1230	6	0.12	<5	2	3890	20	0.15	<10	10	17	<10	8
GT 137	13-48	2	7.5YR 4/4	c	r	15	13	58		2	103	125	<0.5	0.35	<5	60	<0.5	<2	29.5	<0.5	2	8	2	0.15	<10	0.15	<10	0.76	41	1	0.28	1	470	<2	0.16	<5	1	5160	20	0.05	<10	10	3	<10	3
GT 138	18-53	2	7.5YR 4/4	c	c	6	24	80	1	1	5	126	<0.5	0.81	<5	80	<0.5	<2	26.6	<0.5	3	13	4	0.38	<10	0.20	<10	0.62	75	1	0.19	4	2310	4	0.12	<5	1	4580	20	0.08	<10	10	8	<10	7
GT 139	10-38	2	7.5YR 4/4	r	n	3	34	77	1	5		127	<0.5	0.91	<5	90	<0.5	<2	24	<0.5	3	17	6	0.45	<10	0.25	10	0.44	109	1	0.18	6	2700	7	0.13	<5	1	3980	20	0.12	<10	<10	8	<10	12
GT 140	9-32	2	7.5YR 4/4	c	n	15	34	177	1	2		128	<0.5	0.4	<5	60	<0.5	<2	28	<0.5	3	9	93	0.18	<10	0.15	10	0.71	48	1	0.26	3	1390	4	0.16	<5	1	4790	20	0.05	<10	10	3	<10	66
GT 141	13-48	2	7.5YR 4/4	c	r	16	43	88	1	3		129	<0.5	0.27	<5	50	<0.5	<2	30.6	<0.5	2	7	2	0.1	<10	0.13	<10	1.03	26	1	0.3	<1	730	<2	0.19	<5	<1	5010	30	0.02	<10	10	2	<10	2
GT 142	14-37	2	7.5YR 4/4	r	c	3	36	142	4	3		130	<0.5	0.79	<5	70	<0.5	<2	28.2	<0.5	4	13	4	0.36	<10	0.20	10	0.88	83	1	0.26	5	1750	3	0.17	<5	1	4490	20	0.07	<10	10	7	<10	7
GT 143	11-45	2	7.5YR 4/4	c	r	8	23	83	2			131	<0.5	0.56	<5	60	<0.5	<2	29.8	<0.5	2	11	3	0.24	<10	0.16	<10	1.04	65	1	0.27	3	1850	<2	0.18	<5	1	4540	20	0.04	<10	10	4	<10	6
GT 144	11-33	2	7.5YR 4/4	r	n	2	8	85	4			132	<0.5	1.11	8	80	<0.5	<2	27.1	<0.5	3	17	3	0.51	<10	0.21	10	0.98	111	1	0.25	5	1990	2	0.16	<5	2	3960	20	0.09	<10	10	10	<10	8
GT 145	10-37	2	7.5YR 4/4	n	n	10	30	111		1		133	<0.5	1.34	7	90	<0.5	<2	25.6	<0.5	5	19	6	0.74	<10	0.28	10	0.81	141	1	0.22	9	1890	8	0.15	<5	2	3750	20	0.11	<10	<10	14	<10	10

	GT 146	13-47	2	5YR 7/3	r	r	6	3	6				134	<0.5	1.33	8	90	<0.5	<2	25.2	<0.5	4	18	3	0.6	<10	0.28	10	0.83	119	1	0.24	8	1050	2	0.14	<5	2	3710	20	0.09	<10	<10	13	<10	6
	GT 147	9-47	2	7.5YR 4/4	c	r	3	62	158	1	4		135	<0.5	0.84	<5	80	<0.5	<2	27.3	<0.5	3	13	4	0.37	<10	0.23	10	0.88	75	1	0.25	3	1990	3	0.15	<5	1	4100	20	0.08	<10	10	7	<10	7
	GT 148	12-41	2	7.5YR 4/4	r	r		9	101		1	4	136	<0.5	1.77	5	110	<0.5	<2	23.7	<0.5	4	25	6	0.79	<10	0.36	10	0.8	168	1	0.21	10	1890	4	0.14	<5	2	3470	20	0.14	<10	<10	16	<10	13
	GT 149	9-39	2	7.5YR 4/4	r	n	1	14	90	1	1	2	137	<0.5	1.61	6	90	<0.5	<2	25.2	<0.5	5	23	5	0.76	<10	0.30	10	0.82	202	1	0.22	10	2250	5	0.15	<5	2	3790	20	0.14	<10	<10	15	<10	12
	GT 150	10-40	2	7.5YR 4/4	r	r	5	21	121				152	<0.5	0.83	9	60	<0.5	<2	32.2	<0.5	3	16	2	0.37	<10	0.18	<10	1.14	102	<1	0.28	5	1490	2	0.18	<5	1	4710	20	0.06	<10	<10	9	<10	7
	GT 151	12-47	2	7.5YR 4/4	c	r	13	38	95	1	6		138	<0.5	0.42	<5	60	<0.5	<2	29.2	<0.5	3	9	3	0.18	<10	0.15	<10	0.93	44	1	0.28	2	1220	2	0.18	<5	1	4830	20	0.04	<10	10	4	<10	4
	GT 152	12-36	2	7.5YR 4/4	r	n	5	12	29				139	<0.5	0.43	<5	60	<0.5	<2	28.9	<0.5	3	10	3	0.18	<10	0.15	10	0.77	48	1	0.27	4	1340	2	0.16	<5	1	4930	30	0.04	<10	10	3	<10	5
	GT 153	11-34	2	7.5YR 4/4	c	n	2	7	12	2	1	69	140	<0.5	0.7	6	70	<0.5	<2	27.3	<0.5	3	13	4	0.31	<10	0.19	10	0.64	78	1	0.23	3	1680	2	0.15	<5	1	4700	30	0.06	<10	10	6	<10	7
	GT 154	10-45	2	10YR 4/1	c	r	5	12	51	1	1		141	0.5	1.2	<5	90	<0.5	<2	24.1	<0.5	4	19	7	0.58	<10	0.26	10	0.48	145	1	0.17	7	2660	4	0.12	<5	2	4100	20	0.11	<10	10	10	<10	14
	GT 155	13-47	2	7.5YR 4/4	c	r	6				1	335	142	<0.5	2.92	11	130	0.5	<2	21.3	<0.5	4	39	6	1.3	10	0.44	10	0.48	252	<1	0.19	18	1840	8	0.11	<5	4	3420	20	0.22	<10	<10	30	<10	17
	GT 156	11-33	2	7.5YR 4/4	r	n	5	5	19			312	143	<0.5	1.37	5	90	<0.5	<2	26.1	<0.5	3	20	4	0.63	<10	0.27	10	0.5	150	<1	0.19	9	1930	4	0.13	<5	2	4270	20	0.13	<10	<10	14	<10	11
	GT 157	14-46	2	7.5YR 4/4	n	n	7	41	230		1	452	144	<0.5	2.58	11	130	<0.5	<2	21.1	<0.5	5	35	4	1.15	10	0.43	20	0.54	210	<1	0.16	17	1530	6	0.09	<5	3	3190	30	0.21	<10	<10	28	<10	14
	GT 158	14-31	2	7.5YR 4/4	c	n	7	14	95			12	145	<0.5	1.31	11	100	<0.5	<2	27.2	<0.5	3	20	3	0.6	<10	0.29	10	0.58	113	<1	0.16	9	1500	3	0.11	<5	2	4330	20	0.12	<10	<10	15	<10	10
	GT 159	8-23	2	10YR 4/1	c	c	13	13	55		1	10	146	<0.5	1.17	<5	70	<0.5	<2	30	<0.5	3	19	4	0.57	<10	0.21	10	0.45	128	<1	0.15	14	2000	2	0.13	<5	2	5090	30	0.09	<10	<10	12	<10	10
	GT 160	12-24	2	7.5YR 4/4	c	n	3	21	140		1	6	147	<0.5	1.54	11	100	<0.5	<2	26	<0.5	3	24	5	0.71	10	0.30	10	0.56	154	<1	0.21	11	2670	3	0.13	<5	2	4110	20	0.13	<10	<10	15	<10	12
	GT 162	14-33	2	10YR 4/1	r	n	9	21	103			307	148	<0.5	3.15	11	130	0.6	<2	21.4	<0.5	7	43	7	1.45	10	0.44	10	0.58	338	<1	0.2	21	2240	9	0.12	<5	4	3200	20	0.24	<10	<10	32	<10	19
	GT 163	12-43	2	7.5YR 4/4	r	n	5	3	8		1	5	149	<0.5	3.1	13	130	0.6	<2	20.2	<0.5	7	42	5	1.47	10	0.46	10	0.47	307	<1	0.19	21	1790	10	0.11	<5	4	3120	20	0.27	<10	<10	36	<10	16
	GT 164	11-40	2	5YR 7/3	r	n	6	11	69	1	1		150	<0.5	1.86	8	100	<0.5	<2	25.5	<0.5	5	28	3	0.89	10	0.33	10	0.62	190	<1	0.23	12	1980	4	0.14	<5	3	4030	20	0.17	<10	<10	21	<10	12
	GT 165	13-39	2	7.5YR 4/4	r	r		5	37	1		13	151	<0.5	1.16	<5	70	<0.5	<2	29.2	<0.5	3	19	2	0.52	<10	0.24	10	0.83	141	<1	0.26	9	1710	<2	0.16	<5	2	4660	20	0.09	<10	<10	12	<10	9
	GT 166	7-36	2	7.5YR 4/4	r	n	1	12	76	1		7	153	<0.5	0.78	5	60	<0.5	<2	30.5	<0.5	2	15	2	0.34	<10	0.18	10	0.98	91	<1	0.28	7	1690	<2	0.16	<5	1	4740	20	0.07	<10	<10	8	<10	7
	GT 167	8-32	2	7.5YR 4/4	c	c	5	8	54				154	<0.5	0.83	<5	70	<0.5	<2	30.6	<0.5	3	16	2	0.36	<10	0.20	10	1.02	100	<1	0.26	7	1780	4	0.17	<5	1	4540	20	0.06	<10	<10	8	<10	9
	GT 168	13-38	2	7.5YR 4/4	r	r	4	28	161		2	109	155	<0.5	2.58	10	120	<0.5	<2	24.3	<0.5	5	37	5	1.19	10	0.40	10	0.89	243	<1	0.21	18	2000	6	0.13	<5	4	3230	20	0.2	<10	<10	29	<10	18
	GT 169	12-37	2	7.5YR 4/4	r	r	1	14	98	2		845	156	<0.5	3.18	10	130	0.6	<2	22.5	<0.5	6	42	7	1.46	10	0.47	10	0.8	288	<1	0.2	20	1950	10	0.12	<5	4	2930	20	0.23	<10	<10	37	<10	19
	GT 170	10-51	2	7.5YR 4/4	r	n	5	31	130		2		157	<0.5	1.41	5	100	<0.5	<2	26.8	<0.5	4	21	5	0.65	<10	0.32	10	0.64	143	<1	0.2	9	2810	4	0.13	<5	2	3970	20	0.13	<10	<10	14	<10	13
	GT 171	10-48	2	7.5YR 4/4	r	r	6	52	247	2	1		158	<0.5	1.29	<5	110	<0.5	<2	27.5	<0.5	4	19	5	0.61	<10	0.33	10	0.65	144	<1	0.23	8	3210	6	0.13	<5	2	4050	20	0.15	<10	<10	13	<10	16
	GT 172	9-35	2	10YR 4/1	c	n	1	71	203		9		159	<0.5	0.74	<5	70	<0.5	<2	29	<0.5	2	13	4	0.31	<10	0.21	10	1.03	80	<1	0.24	7	2470	2	0.16	<5	1	4030	20	0.06	<10	<10	8	<10	10
	GT 173	13-39	2	7.5YR 4/4	r	r	5	30	126				160	<0.5	1.37	5	90	<0.5	<2	27.4	<0.5	3	22	3	0.63	<10	0.26	10	0.9	151	<1	0.24	10	2500	4	0.16	<5	2	4010	20	0.12	<10	<10	14	<10	12
	GT 174	16-43	2	7.5YR 4/4	c	c	7	16	72		1	627	161	<0.5	3.07	12	120	0.6	<2	23.4	<0.5	6	44	6	1.45	10	0.42	10	0.75	373	<1	0.22	22	1780	11	0.13	<5	4	3470	20	0.25	<10	<10	33	<10	17
	GT 175	11-35	2	7.5YR 4/4	r	n	6	25	178		2	178	162	<0.5	2.13	8	90	<0.5	<2	26.8	<0.5	5	32	4	1.02	10	0.31	10	0.72	302	<1	0.24	15	2070	6	0.15	<5	3	4170	20	0.16	<10	<10	22	<10	16
	GT 176	9-41	2	5YR 7/3	c	n		24	77	1	1	2137	163	<0.5	3.64	21	120	0.7	<2	22	<0.5	8	49	5	1.77	10	0.46	10	0.6	441	<1	0.19	26	1710	7	0.11	<5	5	3280	20	0.27	<10	<10	45	<10	17
	GT 177	13-50	2	5YR 7/3	c	c		58	245	2	1	53	164	<0.5	3	14	130	0.5	<2	21	<0.5	6	43	5	1.41	10	0.47	20	0.5	274	1	0.2	20	2040	7	0.11	<5	4	3260	20	0.26	<10	<10	34	<10	17
	GT 178	12-42	2	7.5YR 4/4	r	n	2	10	49				165	<0.5	1.58	5	90	<0.5	<2	25.2	<0.5	4	23	3	0.72	<10	0.27	10	0.65	145	<1	0.23	10	1650	6	0.13	<5	2	3920	20	0.13	<10	<10	17	<10	10
	GT 179	11-36	2	7.5YR 4/4	c	n	3	6	2		1	0.75	166	<0.5	1.41	7	100	<0.5	<2	25.7	<0.5	4	20	2	0.63	<10	0.30	10	0.67	120	<1	0.24	9	1040	5	0.14	<5	2	4100	20	0.13	<10	<10	17	<10	7
	GT 180	12-41	2	7.5YR 4/4	r	r	1	6	31			11	167	<0.5	2.49	5	120	<0.5	2	22	<0.5	4	33	5	1.09	10	0.40	10	0.43	212	<1	0.14	16	1890	6	0.09	<5	3	3410	20	0.21	<10	<10	26	<10	13
	GT 181	12-45	2	5YR 7/3	c	c	25	18	96		2	113	168	<0.5	1.24	5	80	<0.5	<2	27	<0.5	3	18	1	0.55	<10	0.25	10	0.84	117	<1	0.26	9	790	3	0.15	<5	2	4280	20	0.12	<10	<10	16	<10	6
	GT 182	10-29	2	7.5YR 4/4	r	r	10	45	241	2	2		169	<0.5	1.01	<5	70	<0.5	<2	27.8	<0.5	4	18	6	0.5	<10	0.21	10	0.57	107	<1	0.18	8	2110	8	0.13	<5	2	4490	20	0.11	<10	<10	12	<10	10
	GT 183	10-39	2	7.5YR 4/4	r	n	8	46	234		2		170	<0.5	1.94	<5	100	<0.5	<2	21.9	<0.5	4	29	4	0.92	10	0.35	10	0.52	188	<1	0.2	14	1550	3	0.11	<5	3	3280	20	0.21	<10	<10	22	<10	12
	GT 184	10-41	2	7.5YR 4/4	c	n	8	13	56		1		171	<0.5	1.15	5	90	<0.5	<2	24.1	<0.5	3	17	2	0.52	<10	0.26	10	0.66	110	<1	0.23	9	1060	<2	0.13	<5	2	3660	20	0.12	<10	<10	14	<10	7
	GT 185	13-43	2	7.5YR 4/4	r	n	9	11	29				172	<0.5	0.39	<5	60	<0.5	<2	28.1	<0.5	2	9	1	0.16	<10	0.17	10	0.71	51	<1	0.26	3	1120	<2	0.15	<5	1	4420	20	0.05	<10	<10	5	<10	4
	GT 186	13-47	2	7.5YR 4/4	r	n	13	11	44				173	<0.5	0.42	<5	70	<0.5	2	29.5	<0.5	3	9	1	0.17	<10	0.19	<10	0.72	51	<1	0.28	4	960	2	0.15	<5	1	4680	20	0.05	<10	<10	4	<10	4
	GT 187	13-46	2	7.5YR 4/4	r	n	12	23	76				174	<0.5	0.37	<5	60	<0.5	<2	28.2	<0.5	2	9	<1	0.16	<10	0.15	10	0.73	47	<1	0.26	3	920	<2	0.14	<5	1	4390	20	0.05	<10	<10	5	<10	4
	GT 188	19-33	2	10YR 4/1	r	n	21	45	221	2			175	<0.5	0.63	<5	80	<0.5	<2	28.1	<0.5	2	12	2	0.26	<10	0.20	10	0.68	70	<1	0.25	4	1730	2	0.15	<5	1	4340	20	0.06	<10	<10	7	<10	7
	GT 190	6-43	2	7.5YR 4/4	r	n	2	1	63				176	<0.5	0.78	<5	70	<0.5	<2	27.8	<0.5	3	12	1	0.33	<10	0.20	10	0.72	72	<1	0.18	3	860	<2	0.12	<5	1	4670	20	0.06	<10	<10	8	<10	5
	GT 191	17-36	2	10YR 4/1	r	n	3	30	148		1	124	177	<0.5	0.91	<5	70	<0.5	2	29	<0.5	3	16	3	0.4	10	0.20	10	0.63	94	<1	0.18	5	1760	<2	0.14	<5	1	4700	20	0.07	<10	<10	9	<10	8
	GT 192	12-36	2	7.5YR 4/4	r	n	8	9	64			3	178	<0.5	0.82	7	80	<0.5	<2	29.2	<0.5	2	14	3	0.37	10	0.22	10	0.7	75	1	0.26	4	1600	3	0.14	<5	1	4710	30	0.07	<10	<10	9	<10	7
	GT 193	22-46	2	7.5YR 4/4	r	n	2					1	179	<0.5	0.67	6	70	<0.5	4	28.1	<0.5	1	13	4	0.3	10	0.20	10	0.64	81	<1	0.24	4	2280	5	0.15	5	1	4430	30	0.06	<10	<10	7	<10	9
	GT 194	16-37	2	10YR 4/1	r	n	16	6	39			1.6	180	<0.5	0.71	7	90	<0.5	<2	28.2	<0.5	2	13	4	0.33	<10	0.23	10	0.63	96	<1	0.25	6	2000	<2	0.15	<5	1	4410	30	0.09	<10	<10	8	<10	8
	GT 195	13-44	2	7.5YR 4/4	r	n	17	13	88			72	181	<0.5	0.55	7	80	<0.5	<2	29.4	<0.5	<1	13	2	0.22	<10	0.19	10	0.76	68	<1	0.26	4	1350	4	0.15	<5	1	4780	30	0.05	<10	<10	5	<10	5
	GT 196	16-39	2	10YR 4/1	r	n	13	9	40			212	182	<0.5	1.09	<5	100	<0.5	<2	26.3	<0.5	1	19	3	0.49	10	0.24	10	0.68	132	<1	0.24	8	1180	6	0.13	<5	2	4220	20	0.11	<10	<10	11	<10	8
	GT 197	19-40	2	5YR 7/3	r	n	9	3	7			393	183	<0.5	1.65	14	120	<0.5	2	23.6	<0.5	1	27	5	0.77	10	0.32	20	0.6	185	<1	0.21	9	1450	6	0.12	<5	2	3760	20	0.16	<10	<10	17	<10	11
	GT 198	9-50	2	7.5YR 4/4	c	n	16	9	38	1			184	<0.5	1	6	100	<0.5	2	26.4	<0.5	2	19	4	0.58	<10	0.26	10	0.62	118	<1	0.25	7	1540	2	0.13	<5	2	4210	20	0.14	<10	<10	11	<10	8
	GT 199	12-52	2	7.5YR 4/4	r	n	11						185	<0.5	1.92	5	120	<0.5	<2	22.5	<0.5	4	34	5	1.05	10	0.37	20	0.49	272	1	0.22	12	1980	8	0.12	5	3	3550	20	0.29	<10	<10	24	<10	16
	GT 201	9-40	2	7.5YR 4/4	c	n	4	6	31				186	<0.5	1.18	<5	110	<0.5	<2	24.7	<0.5	3	24	5	0.7	10	0.29	20	0.54	178	1	0.23	8	1970	4	0.12	<5	2	3890	20	0.25	<10	<10	16	<10	13
	GT 202	13-40	2	7.5YR 4/4	r	n	7	4	34				187	<0.5	0.87	9	90	<0.5	<2	25.5	<0.5	1	16	3	0.45	<10	0.26	10	0.52	120	<1	0.25	6	1550	3	0.12	<5	2	4150	20	0.14	<10	<10	11	<10	8
	GT 203	16-43	2	10YR 4/1	c	n	24	3	35			36	188	<0.5	1.47	5	110	<0.5	<2	22.5	<0.5	3	22	4	0.72	<10	0.33	20	0.47	159	1	0.21	10	1570	6	0.11	<5	2	3540	20	0.18	10	<10	17	<10	10
	GT 204	16-50	2	5YR 7/3	r	r	10	30	156	1	3	33	189	<0.5	2.3	8	140	0.5	<2	19.7	<0.5	5	34	7	1.13	10	0.42	10	0.46	250	1	0.19	17	1880	14	0.10	<5	3	3000	20	0.23	<10	<10	27	<10	14
	GT 205	16-38	2	7.5YR 4/4	r	n	21	5	15		1	2	190	<0.5	2.02	9	130	<0.5	<2	21.7	<0.5	5	31	4	1	10	0.38	20	0.46	235	<1	0.2	13	1790	6	0.11	<5	3	3320	20	0.21	<10	<10	22	<10	12
	GT 206	11-35	2	7.5YR 4/4	r	n	13	4	15			8	191	<0.5	1.62	<5	240	<0.5	<2	24	<0.5	3	27	4	0.79	10	0.32	20	0.5	142	<1	0.23	10	1430	4	0.13	<5	2	3900	20	0.17	<10	<10	18	<10	11
	GT 207	23-39	2	10YR 4/1	r	n	12	3	22			1047	192	<0.5	2.02	10	120	<0.5	<2	23.7	<0.5	3	31	5	0.98	10	0.36	20	0.61	227	<1	0.22	13	1880	5	0.12	<5	3	3600	20	0.19	<10	<10	23	<10	13
	GT 208	19-36	2	7.5YR 4/4	r	n	12	2	5		1		193	<0.5	0.94	<5	80	<0.5	<2	27.9	<0.5	1	18	6	0.43	10	0.22	10	0.71	126	<1	0.25	6	2590	2	0.14	<5	1	4410	20	0.08	<10	<10	9	<10	13
	GT 209	10-38	2	7.5YR 4/4	r	n	6	9	39			22	194	<0.5	0.58	<5	60	<0.5	<2	20.7	<0.5	2	13	3	0.27	<10	0.15	10	0.44	72	<1	0.18	4	1320	3	0.09	<5	1	3140	<20	0.06	<10	<10	6	<10	7
	GT 210	14-21	2	7.5YR 4/4	r	n					1	1086	195	<0.5	2.93	7	160	0.6	<2	18.4	<0.5	3	44	7	1.33	10	0.49	20	0.38	234	1	0.15	18	2380	8	0.10	5	4	3010	20	0.24	<10	<10	28	<10	19
	GT 211	10-34	2	7.5YR 4/4	r	n		8	45		1	173	196	<0.5	1.16	<5	100	<0.5	<2	28.6	<0.5	1	19	5	0.53	<10	0.27	20	0.75	131	<1	0.25	7	1840	2	0.14	<5	2	4490	30	0.11	<10	<10	11	<10	11
	GT 212	16-33	2	10YR 4/1	r	n	9	3	11				197	<0.5	1.28	7	100	<0.5	<2	25.2	<0.5	2	21	7	0.62	10	0.29	10	0.56	166	1	0.22	7	2960	3	0.12	<5	2	3950	20	0.13	<10	<10	13	<10	15
	GT 213	13-36	2	7.5YR 4/4	r	n	12	2	6			108	198	<0.5	2.44	10	140	0.5	<2	18.1	<0.5	4	35	5	1.18	10	0.41	10	0.38	243	<1	0.17	15	1640	9	0.09	<5	3	2710	20	0.2	<10	<10	27	<10	14
	GT 214	22-37	2	7.5YR 4/4	r	n	6						199	<0.5	1.36	5	100	<0.5	<2	25.9	<0.5	1	24	4	0.63	10	0.29	10	0.6	159	1	0.24	10	2020	5	0.13	<5	2	4070	20	0.11	<10	<10	14	<10	11
	GT 215	13-42	2	7.5YR 4/4	r	n	4	4	42				200	<0.5	1.48	<5	110	<0.5	2	24.4	<0.5	2	24	4	0.72	10	0.31	10	0.5	167	1	0.24	10	2310	2	0.12	<5	2	3900	20	0.16	<10	<10	16	<10	14
	GT 216	22-38	2	7.5YR 4/4	r	n	20	11	52				201	<0.5	1.33	6	110	<0.5	2	24.6	<0.5	3	24	5	0.66	<10	0.32	10	0.56	156	1	0.24	10	2370	4	0.12	<5	2	3800	20	0.17	<10	<10	15	<10	12
	GT 217	13-45	2	7.5YR 4/4	c	n	15	34	119				202	<0.5	1.13	8	100	<0.5	<2	25.3	<0.5	3	21	7	0.62	<10	0.28	20	0.53	163	<1	0.23	7	2540	3	0.12	<5	2	4060	30	0.2	<10	<10	14	<10	12
	GT 218	9-43	2	7.5YR 4/4	c	n	6	5	45				203	<0.5	0.97	<5	90	<0.5	<2	21.5	<0.5	2	18	4	0.51	<10	0.24	10	0.41	136	1	0.2	7	1600	6	0.10	<5	2	3250	<20	0.15	<10	<10	12	<10	10
	GT 219	17-40	2	5YR 7/3	n	n	6	4	6				204	<0.5	2.04	9	120	<0.5	<2	19.2	<0.5	4	34	5	1.16	<10	0.37	20	0.37	276	1	0.18	15	1740	6	0.09	<5	3	2850	<20	0.34	<10	<10	26	<10	15
	GT 220	20-36	2	7.5YR 4/4	r	n	13	14	48				205	<0.5	0.84	<5	70	<0.5	<2	29.1	0.5	2	16	3	0.36	<10	0.19	10	0.71	81	<1	0.21	6	1630	5	0.12	<5	1	4180	20	0.06	<10	<10	8	<10	8
	GT 221	11-37	2	7.5YR 4/4	r	n	14	24	68				206	<0.5	0.68	<5	60	<0.5	<2	25.8	<0.5	<1	13	2	0.28	<10	0.19	10	0.63	70	<1	0.22	4	1700	4	0.11	<5	1	3820	<20	0.05	<10	<10	7	<10	8
	GT 222	16-39	2	7.5YR 4/4	r	n	7	30	153	2			207	<0.5	1.16	<5	90	<0.5	<2	22	<0.5	2	18	4	0.51	<10	0.25	10	0.54	98	<1	0.19	8	2150	6	0.10	<5	2	3140	<20	0.1	<10	<10	11	<10	10
	GT 223	10-34	2	5YR 7/3	r	n	16	35	274				208	<0.5	3.2	10	150	0.6	<2	20.1	<0.5	5	43	7	1.43	<10	0.49	10	0.47	242	1	0.18	20	2420	11	0.09	<5	4	2840	<20	0.25	<10	<10	35	<10	20
	GT 224	20-41	2	7.5YR 4/4	r	n	16	58	235	1	5		209	1	1.87	10	130	<0.5	<2	21	<0.5	3	27	13	0.88	<10	0.39	10	0.43	206	1	0.19	13	3850	17	0.10	<5	3	3160	20	0.17	<10	<10	17	<10	24
	GT 225	9-24	2	7.5YR 4/4	c	n		17	81			16	210	<0.5	1.15	13	80	<0.5	<2	26.4	<0.5	2	18	4	0.53	<10	0.23	10	0.53	86	<1	0.18	7	1280	4	0.12	<5	2	4220	20	0.1	<10	<10	12	<10	7

	GT 226	20-39	2	7.5YR 4/4	r	n	27	50	251				211	<0.5	1.21	13	100	<0.5	<2	24.9	<0.5	2	21	4	0.52	<10	0.29	10	0.6	89	<1	0.23	7	1720	4	0.11	<5	2	3700	20	0.11	<10	<10	10	<10	9
	GT 227	12-49	2	5YR 7/3	c	r	12	15	71		3		212	<0.5	1.18	9	100	<0.5	<2	24.7	<0.5	2	19	2	0.48	<10	0.29	10	0.66	67	<1	0.23	7	1050	4	0.11	<5	2	3520	20	0.09	<10	<10	11	<10	5
	GT 228	20-44	2	7.5YR 4/4	r	n	7	17	80				213	<0.5	1.56	13	120	<0.5	<2	22.1	<0.5	2	23	4	0.67	10	0.34	10	0.49	98	<1	0.21	9	1700	3	0.10	<5	2	3250	20	0.14	<10	<10	13	<10	8
	GT 229	9-36	2	10YR 4/1	r	r	20	33	133	1	3		214	<0.5	1.07	<5	110	<0.5	<2	23.6	<0.5	3	18	11	0.49	<10	0.31	10	0.43	111	2	0.23	11	2940	8	0.12	<5	2	3840	20	0.13	<10	10	9	<10	17
	GT 230	10-48	2	7.5YR 4/4	c	r	25	38	121		5		215	<0.5	1	5	120	<0.5	<2	24.2	<0.5	3	15	6	0.44	<10	0.31	10	0.52	96	1	0.24	5	1860	2	0.12	<5	2	3850	20	0.12	<10	<10	8	<10	10
	GT 231	16-40	2	7.5YR 4/4	r	r	4	11	84		1		216	<0.5	1.85	<5	110	<0.5	<2	22.1	<0.5	4	27	7	0.78	<10	0.37	10	0.49	185	1	0.2	12	3180	4	0.13	<5	3	3470	20	0.13	<10	10	15	<10	19
	GT 232	12-42	2	7.5YR 4/4	r	n	7	42	195	2	3		217	0.5	1.44	<5	140	<0.5	<2	21.7	<0.5	3	22	7	0.64	<10	0.40	10	0.44	147	1	0.21	9	3680	6	0.11	<5	2	3450	20	0.15	<10	10	12	<10	16
	GT 233	13-49	2	10YR 4/1	c	r	17	26	99				218	<0.5	1.15	8	100	<0.5	2	25.9	<0.5	3	17	5	0.48	<10	0.29	10	0.68	101	1	0.25	7	2020	2	0.14	<5	2	4090	20	0.1	<10	10	9	<10	11
	GT 234	15-33	2	7.5YR 4/4	c	r	8	13	97		2		219	<0.5	1.06	<5	100	<0.5	<2	25.1	<0.5	3	18	5	0.43	<10	0.29	10	0.55	90	1	0.24	7	2220	3	0.13	<5	2	4030	20	0.08	<10	10	8	<10	11
	GT 235	11-50	2	5YR 7/3	c	r	11	40	263				220	<0.5	2.21	13	130	<0.5	<2	22.2	<0.5	4	33	6	0.95	<10	0.41	10	0.54	163	1	0.22	14	2120	4	0.11	<5	3	3440	20	0.19	<10	<10	20	<10	13
	GT 236	21-50	2	10YR 4/1	r	n	5	26	275				221	<0.5	2.61	6	150	0.5	<2	20.5	<0.5	5	34	9	1.14	<10	0.48	10	0.49	223	2	0.2	16	3070	7	0.11	<5	3	3090	20	0.21	<10	<10	25	<10	20
	GT 237	12-49	2	10YR 4/1	r	n	48	240	1118	1	4	2	222	0.8	2.7	6	170	0.5	3	19.3	<0.5	6	37	15	1.23	<10	0.52	20	0.36	263	2	0.18	17	5820	9	0.10	<5	4	2900	20	0.25	<10	<10	25	<10	29
	GT 239	10-53	2	10YR 4/1	c	r	9	131	616	2	6		223	<0.5	2.56	<5	160	0.5	<2	19	<0.5	5	36	11	1.2	<10	0.50	30	0.41	245	1	0.18	16	3680	10	0.09	<5	4	2770	30	0.28	<10	<10	26	<10	21
	GT 240	21-38	2	10YR 4/1	r	n	8	109	260	2	6		224	0.9	2.25	11	150	0.5	<2	20	<0.5	5	40	13	1.02	<10	0.44	10	0.43	223	2	0.17	15	4640	13	0.10	<5	3	2740	20	0.19	<10	<10	22	<10	22
	GT 241	11-40	2	7.5YR 4/4	r	n	16	159	901	3	20	4	225	1	2.08	<5	170	<0.5	<2	18.7	<0.5	5	33	14	0.99	<10	0.49	20	0.34	244	2	0.17	15	6450	17	0.09	<5	3	2780	20	0.22	<10	<10	18	<10	31
	GT 243	10-33	2	10YR 4/1	c	r	20	189	2049	1	3	8	226	1.8	3.4	13	160	0.7	<2	16.3	<0.5	7	56	32	1.6	10	0.58	20	0.32	348	2	0.12	30	6480	21	0.08	<5	5	2260	20	0.26	<10	<10	33	<10	38
	GT 244	16-34	2	7.5YR 4/4	r	n		10	34	2	1		227	<0.5	1.43	5	100	<0.5	<2	22.6	<0.5	4	23	9	0.67	<10	0.31	10	0.39	164	1	0.18	11	2620	3	0.12	<5	2	3620	20	0.15	<10	<10	13	<10	15
	GT 245	10-47	2	7.5YR 4/4	r	n	9	11	70				228	<0.5	1.37	<5	110	<0.5	<2	23.6	<0.5	3	20	5	0.57	<10	0.34	10	0.54	107	1	0.22	9	2120	3	0.12	<5	2	3680	20	0.11	<10	<10	11	<10	11
	GT 246	18-49	2	10YR 4/1	r	n	4	28	117	1	3		229	<0.5	1.12	8	100	<0.5	<2	25	<0.5	4	18	5	0.45	<10	0.30	10	0.65	94	1	0.24	7	2620	3	0.14	<5	2	3920	20	0.09	<10	10	9	<10	13
	GT 247	15-51	2	7.5YR 4/4	c	r	14	29	149	1	1	3	230	<0.5	0.9	<5	90	<0.5	<2	26.1	<0.5	2	16	5	0.38	<10	0.26	10	0.72	91	2	0.24	6	2160	2	0.14	<5	1	3890	20	0.09	<10	10	7	<10	11
	GT 248	17-44	2	7.5YR 4/4	r	n	27	15	149		1		231	<0.5	0.88	<5	90	<0.5	<2	26.1	<0.5	3	15	5	0.36	<10	0.26	10	0.66	86	1	0.24	5	2270	2	0.14	<5	1	3960	20	0.07	<10	10	6	<10	10
	GT 251	9-37	2	7.5YR 4/4	r	n	26	27	247	1	2		232	<0.5	0.95	5	110	<0.5	<2	23.3	<0.5	3	14	4	0.4	<10	0.29	10	0.53	81	1	0.22	5	1960	<2	0.12	<5	1	3570	20	0.09	<10	10	8	<10	9
	GT 252	21-39	2	7.5YR 4/4	r	n	10	11	68				233	<0.5	0.78	<5	90	<0.5	<2	25.2	<0.5	3	14	4	0.33	<10	0.26	10	0.52	97	1	0.23	6	2320	<2	0.14	<5	1	3920	20	0.07	<10	10	6	<10	11
	GT 253	15-45	2	7.5YR 4/4	c	n	30	53	314	1	1		234	<0.5	1.03	<5	100	<0.5	2	25	<0.5	4	18	6	0.44	<10	0.28	10	0.5	116	1	0.22	7	3040	3	0.13	<5	2	3720	20	0.09	<10	10	8	<10	14
	GT 254	12-42	2	7.5YR 4/4	c	r	12	28	110		1		235	<0.5	1.56	<5	120	<0.5	<2	23.2	<0.5	5	23	7	0.68	<10	0.38	10	0.55	155	1	0.22	10	4480	2	0.13	<5	2	3540	20	0.15	<10	10	13	<10	25
	GT 255	16-35	2	7.5YR 4/4	r	n	9	28	254	1	1		236	<0.5	2.41	14	130	0.5	<2	21.6	<0.5	5	37	7	1.06	<10	0.45	20	0.59	195	1	0.21	16	2170	5	0.12	<5	3	3150	20	0.19	<10	<10	23	<10	16
	GT 256	12-46	2	5YR 7/3	c	c	25	11	86		4		237	<0.5	1.31	<5	110	<0.5	<2	24.1	<0.5	4	19	4	0.54	<10	0.32	10	0.7	94	1	0.24	7	1290	3	0.13	<5	2	3580	20	0.1	<10	10	11	<10	8
	GT 257	26-46	2	10YR 4/1	n	n	11	22	89		1	23	238	<0.5	0.94	<5	90	<0.5	<2	23	<0.5	3	17	14	0.43	<10	0.28	10	0.56	113	1	0.21	6	2890	5	0.14	<5	2	3710	20	0.11	<10	<10	8	<10	18
	GT 258	15-44	2	7.5YR 4/4	r	n	9	140	1962		1		239	0.7	2.21	<5	140	<0.5	<2	19.4	<0.5	5	32	8	1	<10	0.45	10	0.34	206	2	0.19	13	2550	1065	0.11	<5	3	3080	20	0.21	<10	<10	20	<10	15
	GT 259	10-42	2	5YR 7/3	c	c	27	9	78				240	<0.5	3.53	10	180	0.7	<2	18	<0.5	6	47	9	1.55	10	0.61	20	0.43	270	2	0.19	21	2190	9	0.10	<5	5	2760	20	0.29	<10	<10	34	<10	19
	GT 262	21-44	2	10YR 4/1	r	n	13	3	217				241	<0.5	0.64	5	90	<0.5	<2	25.8	<0.5	2	12	4	0.26	<10	0.25	10	0.55	67	1	0.25	4	1590	<2	0.14	<5	1	4020	20	0.08	<10	10	5	<10	6
	GT 263	12-45	2	7.5YR 4/4	r	r	24	18	368				242	<0.5	0.62	5	70	<0.5	<2	21.1	<0.5	3	12	5	0.26	<10	0.21	10	0.44	81	1	0.19	3	2120	<2	0.12	<5	1	3200	20	0.06	<10	<10	5	<10	11
	GT 264	10-47	2	7.5YR 4/4	c	r	19	6	120		2		243	<0.5	0.72	<5	70	<0.5	<2	22.6	<0.5	3	12	5	0.32	<10	0.22	<10	0.56	81	1	0.2	3	2000	<2	0.12	<5	1	3400	20	0.07	<10	10	6	<10	12
	GT 265	18-33	2	10YR 4/1	r	r	28	11	69	1			244	<0.5	0.78	<5	90	<0.5	<2	25.7	<0.5	4	14	6	0.34	<10	0.24	10	0.52	116	1	0.24	4	3040	2	0.15	<5	1	4060	20	0.07	<10	10	6	<10	13
	GT 266	12-44	2	10YR 4/1	r	r	55	61	510	1	1		245	<0.5	0.9	6	90	<0.5	<2	25.8	<0.5	3	15	6	0.38	<10	0.27	10	0.67	93	1	0.24	5	2690	2	0.14	<5	1	3860	20	0.09	<10	<10	7	<10	11
	SM007	3-16		7.5YR 4/4									4	<0.5	1.03	13	80	<0.5	<2	22.3	<0.5	2	15	<1	0.43	<10	0.22	20	0.86	99	<1	0.22	7	820	6	0.13	<5	2	3230	20	0.07	<10	<10	11	<10	3
		18-38		7.5YR 4/4									8	<0.5	0.89	10	80	<0.5	<2	22.7	<0.5	1	13	<1	0.38	<10	0.21	20	0.76	92	<1	0.19	5	1660	3	0.12	<5	1	3280	20	0.08	<10	<10	10	<10	3
	Background samples*																																													
	Average													<0.5	1.81	10	122	0.7	2	14.4		2.8	23	2.6	0.84	10	0.33	18	0.32	193	1	0.15	12	1690	5.58	0.08	5	2.8	2237	20	0.18	<10	<10	19	<10	9.6

Fleisher and Sulas: *Deciphering public spaces in urban contexts*

APPENDIX (supplementary data) **- TABLE 2 Selected ICP-AES element concentrations in Terra Rossa-derived sediments from cultural layer**

Legend: **#** = ICP-AES sample number; OS. western open space; ES. samples from the eastern sector.

TP	**I-A**	**Ca**	**Fe**	**K**	**Mg**	**Mn**	**Na**	**P**	**Sr**	**Location**
n.	*#*	*%*	*%*	*%*	*ppm*	*ppm*	*%*	*ppm*	*ppm*	
GT 001	1	25.4	0.27	0.2	0.61	59	0.26	1080	4070	
GT 002	2	27.3	0.18	0.22	0.75	45	0.28	980	4270	
GT 003	3	30.1	0.24	0.21	0.79	70	0.2	2610	4500	
GT 004	4	29.5	0.12	0.16	0.91	32	0.29	760	4500	
GT 005	5	29.7	0.22	0.19	0.86	53	0.27	1890	4630	
GT 009	9	28.8	0.26	0.19	0.85	55	0.27	1090	4450	
GT 010	10	30.0	0.17	0.17	0.87	41	0.28	1120	4690	
GT 011	11	28.4	0.26	0.19	0.76	66	0.27	1320	4440	
GT 012	12	26.2	0.29	0.2	0.69	74	0.24	1860	4000	
GT 013	13	27.8	0.3	0.21	0.84	57	0.26	780	4160	
GT 014	14	28.4	0.21	0.17	0.87	48	0.27	1130	4260	
GT 015	15	29.5	0.1	0.16	1.02	22	0.27	650	4290	
GT 016	16	26.9	0.49	0.27	0.62	107	0.21	3480	3970	
GT 019	18	29.5	0.32	0.22	0.73	70	0.23	1830	4550	
GT 020	19	30.0	0.24	0.2	0.88	41	0.27	1280	4530	
GT 021	20	28.5	0.19	0.19	0.81	42	0.27	1210	4420	
GT 022	21	24.6	0.79	0.32	0.73	126	0.24	1010	3680	
GT 023	22	27.5	0.24	0.19	0.73	57	0.25	1800	4250	
GT 024	23	25.0	0.54	0.27	0.69	96	0.24	1180	3780	
GT 025	24	28.7	0.21	0.18	0.86	49	0.26	1390	4450	
GT 026	25	26.4	0.19	0.19	0.7	39	0.23	1320	4000	
GT 027	26	24.9	0.47	0.23	0.52	87	0.2	2090	3890	
GT 031	30	26.8	0.24	0.19	0.75	44	0.25	1290	4140	ES
GT 032	31	28.3	0.2	0.18	0.88	44	0.26	1330	4330	ES
GT 033	32	24.2	0.67	0.31	0.7	120	0.24	1240	3830	ES
GT 034	33	26.7	0.4	0.22	0.75	88	0.25	1590	4220	ES
GT 035	34	31.0	0.33	0.22	0.93	64	0.27	1270	4380	ES
GT 036	35	28.0	0.37	0.21	0.74	93	0.24	2740	3980	ES
GT 037	36	29.4	0.44	0.2	0.78	51	0.25	1280	4220	ES
GT 038	37	27.5	0.37	0.24	0.63	77	0.24	1490	4080	ES
GT 040	39	20.4	1.24	0.55	0.41	242	0.18	4160	2800	ES
GT 043	42	28.4	0.38	0.23	0.76	82	0.24	2160	4050	ES
GT 044	43	22.2	0.96	0.41	0.55	180	0.2	1720	3100	ES
GT 045	44	24.2	0.97	0.39	0.6	243	0.21	2170	3420	ES
GT 046	45	22.2	1.17	0.43	0.65	181	0.2	1340	3030	ES
GT 049	48	27.2	0.47	0.28	0.59	96	0.24	1940	3970	ES
GT 051	50	24.6	0.74	0.44	0.45	169	0.22	3740	3670	ES
GT 054	53	19.7	1.53	0.55	0.47	259	0.18	2560	2800	ES
GT 055	54	28.2	0.5	0.25	0.85	97	0.25	1310	3990	ES
GT 056	55	27.3	0.48	0.25	0.71	102	0.24	2510	4000	ES
GT 057	56	24.0	1.02	0.38	0.68	175	0.21	2030	3380	ES
GT 060	59	26.5	0.34	0.24	0.64	84	0.22	1930	3840	ES
GT 061-A	60	28.1	0.69	0.33	0.71	149	0.24	2040	3980	ES
GT 062-A	62	25.0	0.59	0.32	0.59	109	0.23	1360	3650	ES
GT 064	65	23.9	0.66	0.31	0.51	148	0.2	3250	3460	ES
GT 065-A	66	23.3	1.06	0.42	0.57	162	0.21	2610	3330	ES
GT 066	68	27.0	0.53	0.28	0.69	111	0.24	2680	3990	ES
GT 067	69	20.6	1.41	0.52	0.52	252	0.18	3480	2860	ES
GT 073	74	28.7	0.27	0.18	0.67	69	0.26	1230	4480	OS
GT 074	75	29.9	0.21	0.18	0.84	46	0.27	780	4570	OS
GT 075	76	30.3	0.18	0.18	0.81	47	0.28	1240	4610	OS
GT 076	77	30.3	0.12	0.18	0.8	37	0.27	1180	4630	OS
GT 079	78	30.8	0.21	0.16	0.85	44	0.16	860	4760	OS
GT 080	79	29.0	0.37	0.21	0.63	77	0.23	1260	4710	OS
GT 081	80	27.9	0.37	0.21	0.72	69	0.24	840	4490	OS
GT 082	81	29.9	0.25	0.17	0.76	54	0.25	1100	4730	OS
GT 087	82	29.0	0.22	0.18	0.77	55	0.26	1280	4470	OS
GT 088	83	27.9	0.55	0.26	0.79	115	0.25	1280	4210	OS
GT 089	84	29.0	0.53	0.23	0.8	103	0.26	1040	4420	OS
GT 090	85	29.0	0.32	0.21	0.75	73	0.27	1380	4440	OS
GT 091	86	28.7	0.4	0.21	0.85	79	0.26	1250	4160	OS
GT 092	87	28.9	0.49	0.25	0.77	104	0.25	1220	4300	OS
GT 094	89	31.9	0.14	0.15	0.89	42	0.28	1530	4760	OS

GT 099	90	30.0	0.32	0.18	0.72	82	0.25	1270	4600	OS
GT 100	91	29.6	0.26	0.19	0.88	53	0.26	860	4440	OS
GT 101	92	31.5	0.13	0.14	0.85	33	0.23	1160	4800	OS
GT 104	93	31.8	0.11	0.12	0.96	30	0.28	890	4810	OS
GT 105	94	31.4	0.12	0.14	1	32	0.28	1210	4700	OS
GT 106	95	31.1	0.17	0.15	0.95	49	0.28	1190	4730	OS
GT 107	96	27.7	0.52	0.25	0.78	135	0.24	1690	4030	OS
GT 108	97	29.7	0.3	0.19	0.81	82	0.25	1780	4380	OS
GT 109	98	26.2	0.61	0.25	0.79	156	0.23	1640	3720	
GT 110	99	25.7	0.69	0.25	0.82	155	0.23	1300	3730	OS
GT 111	100	29.6	0.18	0.16	0.91	51	0.25	1330	4230	OS
GT 112	101	31.1	0.11	0.13	1	29	0.28	1000	4510	OS
GT 113	102	30.9	0.11	0.11	0.97	29	0.27	840	4560	OS
GT 114	103	32.9	0.07	0.12	1.08	17	0.29	560	4910	OS
GT 115	104	31.4	0.12	0.13	0.86	31	0.21	960	4850	OS
GT 118	107	28.8	0.12	0.14	0.83	36	0.27	780	4840	OS
GT 119	108	29.1	0.13	0.12	0.84	32	0.28	960	4930	OS
GT 120	109	29.3	0.11	0.13	0.92	31	0.27	900	4730	OS
GT 121	110	29.2	0.11	0.13	0.91	30	0.28	850	4760	OS
GT 122	111	30.6	0.11	0.13	1.15	28	0.29	900	4600	OS
GT 123	112	28.8	0.17	0.12	1.05	43	0.27	1070	4310	OS
GT 124	113	29.1	0.16	0.14	1	42	0.27	1190	4490	OS
GT 125	114	28.2	0.25	0.18	0.96	63	0.26	1290	4270	OS
GT 126	115	28.0	0.25	0.2	0.79	64	0.26	1670	4350	
GT 127	116	28.8	0.17	0.15	0.91	39	0.27	1190	4510	
GT 128	117	30.5	0.2	0.13	1.09	48	0.28	1290	4690	OS
GT 129	118	29.8	0.24	0.15	1.11	45	0.28	740	4540	OS
GT 130	119	27.3	0.44	0.22	0.95	97	0.25	1630	4060	OS
GT 131	120	28.3	0.35	0.19	0.97	70	0.27	1190	4420	OS
GT 132	121	29.9	0.23	0.15	0.89	59	0.28	1360	4890	OS
GT 133	122	29.1	0.2	0.17	0.87	48	0.27	1350	4700	OS
GT 134	123	29.2	0.22	0.16	0.73	53	0.27	1160	5030	OS
GT 135	124	22.8	0.81	0.31	0.5	155	0.2	1230	3890	OS
GT 137	125	29.5	0.15	0.15	0.76	41	0.28	470	5160	OS
GT 138	126	26.6	0.38	0.2	0.62	75	0.19	2310	4580	OS
GT 139	127	24.0	0.45	0.25	0.44	109	0.18	2700	3980	OS
GT 140	128	28.0	0.18	0.15	0.71	48	0.26	1390	4790	OS
GT 141	129	30.6	0.1	0.13	1.03	26	0.3	730	5010	OS
GT 142	130	28.2	0.36	0.2	0.88	83	0.26	1750	4490	OS
GT 143	131	29.8	0.24	0.16	1.04	65	0.27	1850	4540	OS
GT 144	132	27.1	0.51	0.21	0.98	111	0.25	1990	3960	OS
GT 145	133	25.6	0.74	0.28	0.81	141	0.22	1890	3750	
GT 146	134	25.2	0.6	0.28	0.83	119	0.24	1050	3710	
GT 147	135	27.3	0.37	0.23	0.88	75	0.25	1990	4100	
GT 148	136	23.7	0.79	0.36	0.8	168	0.21	1890	3470	OS
GT 149	137	25.2	0.76	0.3	0.82	202	0.22	2250	3790	OS
GT 150	152	32.2	0.37	0.18	1.14	102	0.28	1490	4710	OS
GT 151	138	29.2	0.18	0.15	0.93	44	0.28	1220	4830	OS
GT 152	139	28.9	0.18	0.15	0.77	48	0.27	1340	4930	OS
GT 153	140	27.3	0.31	0.19	0.64	78	0.23	1680	4700	OS
GT 155	142	21.3	1.3	0.44	0.48	252	0.19	1840	3420	OS
GT 156	143	26.1	0.63	0.27	0.5	150	0.19	1930	4270	OS
GT 157	144	21.1	1.15	0.43	0.54	210	0.16	1530	3190	
GT 158	145	27.2	0.6	0.29	0.58	113	0.16	1500	4330	
GT 160	147	26.0	0.71	0.3	0.56	154	0.21	2670	4110	
GT 163	149	20.2	1.47	0.46	0.47	307	0.19	1790	3120	
GT 164	150	25.5	0.89	0.33	0.62	190	0.23	1980	4030	
GT 165	151	29.2	0.52	0.24	0.83	141	0.26	1710	4660	
GT 166	153	30.5	0.34	0.18	0.98	91	0.28	1690	4740	
GT 167	154	30.6	0.36	0.2	1.02	100	0.26	1780	4540	
GT 168	155	24.3	1.19	0.4	0.89	243	0.21	2000	3230	
GT 169	156	22.5	1.46	0.47	0.8	288	0.2	1950	2930	
GT 170	157	26.8	0.65	0.32	0.64	143	0.2	2810	3970	
GT 171	158	27.5	0.61	0.33	0.65	144	0.23	3210	4050	
GT 173	160	27.4	0.63	0.26	0.9	151	0.24	2500	4010	
GT 174	161	23.4	1.45	0.42	0.75	373	0.22	1780	3470	
GT 175	162	26.8	1.02	0.31	0.72	302	0.24	2070	4170	
GT 176	163	22.0	1.77	0.46	0.6	441	0.19	1710	3280	
GT 177	164	21.0	1.41	0.47	0.5	274	0.2	2040	3260	
GT 178	165	25.2	0.72	0.27	0.65	145	0.23	1650	3920	
GT 179	166	25.7	0.63	0.3	0.67	120	0.24	1040	4100	
GT 180	167	22.0	1.09	0.4	0.43	212	0.14	1890	3410	
GT 181	168	27.0	0.55	0.25	0.84	117	0.26	790	4280	

GT 182	169	27.8	0.5	0.21	0.57	107	0.18	2110	4490	
GT 183	170	21.9	0.92	0.35	0.52	188	0.2	1550	3280	
GT 184	171	24.1	0.52	0.26	0.66	110	0.23	1060	3660	OS
GT 185	172	28.1	0.16	0.17	0.71	51	0.26	1120	4420	OS
GT 186	173	29.5	0.17	0.19	0.72	51	0.28	960	4680	OS
GT 187	174	28.2	0.16	0.15	0.73	47	0.26	920	4390	OS
GT 190	176	27.8	0.33	0.2	0.72	72	0.18	860	4670	OS
GT 192	178	29.2	0.37	0.22	0.7	75	0.26	1600	4710	OS
GT 193	179	28.1	0.3	0.2	0.64	81	0.24	2280	4430	OS
GT 195	181	29.4	0.22	0.19	0.76	68	0.26	1350	4780	OS
GT 197	183	23.6	0.77	0.32	0.6	185	0.21	1450	3760	OS
GT 198	184	26.4	0.58	0.26	0.62	118	0.25	1540	4210	OS
GT 199	185	22.5	1.05	0.37	0.49	272	0.22	1980	3550	OS
GT 201	186	24.7	0.7	0.29	0.54	178	0.23	1970	3890	
GT 202	187	25.5	0.45	0.26	0.52	120	0.25	1550	4150	
GT 204	189	19.7	1.13	0.42	0.46	250	0.19	1880	3000	
GT 205	190	21.7	1	0.38	0.46	235	0.2	1790	3320	
GT 206	191	24.0	0.79	0.32	0.5	142	0.23	1430	3900	
GT 208	193	27.9	0.43	0.22	0.71	126	0.25	2590	4410	
GT 209	194	20.7	0.27	0.15	0.44	72	0.18	1320	3140	
GT 210	195	18.4	1.33	0.49	0.38	234	0.15	2380	3010	
GT 211	196	28.6	0.53	0.27	0.75	131	0.25	1840	4490	
GT 213	198	18.1	1.18	0.41	0.38	243	0.17	1640	2710	
GT 214	199	25.9	0.63	0.29	0.6	159	0.24	2020	4070	
GT 215	200	24.4	0.72	0.31	0.5	167	0.24	2310	3900	
GT 216	201	24.6	0.66	0.32	0.56	156	0.24	2370	3800	
GT 217	202	25.3	0.62	0.28	0.53	163	0.23	2540	4060	
GT 218	203	21.5	0.51	0.24	0.41	136	0.2	1600	3250	
GT 219	204	19.2	1.16	0.37	0.37	276	0.18	1740	2850	
GT 220	205	29.1	0.36	0.19	0.71	81	0.21	1630	4180	
GT 221	206	25.8	0.28	0.19	0.63	70	0.22	1700	3820	
GT 222	207	22.0	0.51	0.25	0.54	98	0.19	2150	3140	ES
GT 223	208	20.1	1.43	0.49	0.47	242	0.18	2420	2840	ES
GT 224	209	21.0	0.88	0.39	0.43	206	0.19	3850	3160	ES
GT 225	210	26.4	0.53	0.23	0.53	86	0.18	1280	4220	
GT 226	211	24.9	0.52	0.29	0.6	89	0.23	1720	3700	
GT 227	212	24.7	0.48	0.29	0.66	67	0.23	1050	3520	
GT 228	213	22.1	0.67	0.34	0.49	98	0.21	1700	3250	
GT 230	215	24.2	0.44	0.31	0.52	96	0.24	1860	3850	
GT 231	216	22.1	0.78	0.37	0.49	185	0.2	3180	3470	
GT 232	217	21.7	0.64	0.4	0.44	147	0.21	3680	3450	
GT 234	219	25.1	0.43	0.29	0.55	90	0.24	2220	4030	
GT 235	220	22.2	0.95	0.41	0.54	163	0.22	2120	3440	
GT 241	225	18.7	0.99	0.49	0.34	244	0.17	6450	2780	
GT 244	227	22.6	0.67	0.31	0.39	164	0.18	2620	3620	
GT 245	228	23.6	0.57	0.34	0.54	107	0.22	2120	3680	
GT 247	230	26.1	0.38	0.26	0.72	91	0.24	2160	3890	
GT 248	231	26.1	0.36	0.26	0.66	86	0.24	2270	3960	
GT 251	232	23.3	0.4	0.29	0.53	81	0.22	1960	3570	
GT 252	233	25.2	0.33	0.26	0.52	97	0.23	2320	3920	
GT 253	234	25.0	0.44	0.28	0.5	116	0.22	3040	3720	
GT 254	235	23.2	0.68	0.38	0.55	155	0.22	4480	3540	
GT 255	236	21.6	1.06	0.45	0.59	195	0.21	2170	3150	
GT 256	237	24.1	0.54	0.32	0.7	94	0.24	1290	3580	
GT 258	239	19.4	1	0.45	0.34	206	0.19	2550	3080	
GT 259	240	18.0	1.55	0.61	0.43	270	0.19	2190	2760	
GT 263	242	21.1	0.26	0.21	0.44	81	0.19	2120	3200	
GT 264	243	22.6	0.32	0.22	0.56	81	0.2	2000	3400	
Average		26.4	0.522	0.26	0.71	113	0.235	1726.2	4045.98	
Background samples*										
Average		14.4	0.84	0.33	0.32	193	0.15	1690	2237	

Fleisher and Sulas: *Deciphering public spaces in urban contexts*

APPENDIX (supplementary data) - TABLE 3a Selected ICP-AES element concentrations in the Public Space (Rectangular space)

*Background samples: the average values were obtained through the analysis of surface samples in and around the site (for full data, see Sulas and Madella 2012)

Legend: # = ICP-AES sample number.

TP	**I-A**	**Al**	**Ba**	**Ca**	**Cr**	**Fe**	**K**	**Mg**	**Mn**	**Na**	**P**	**Sr**	**Zn**
n.	*#*	*%*	*ppm*	*%*	*ppm*	*%*	*%*	*ppm*	*ppm*	*%*	*ppm*	*ppm*	*ppm*
GT 073	74	0.53	70	28.7	13	0.27	0.18	0.67	69	0.26	1230	4480	4
GT 074	75	0.51	70	29.9	12	0.21	0.18	0.84	46	0.27	780	4570	3
GT 075	76	0.47	70	30.3	10	0.18	0.18	0.81	47	0.28	1240	4610	3
GT 076	77	0.36	80	30.3	10	0.12	0.18	0.8	37	0.27	1180	4630	3
GT 079	78	0.54	60	30.8	11	0.21	0.16	0.85	44	0.16	860	4760	3
GT 080	79	0.87	80	29	18	0.37	0.21	0.63	77	0.23	1260	4710	5
GT 081	80	0.89	80	27.9	15	0.37	0.21	0.72	69	0.24	840	4490	4
GT 082	81	0.62	60	29.9	15	0.25	0.17	0.76	54	0.25	1100	4730	4
GT 087	82	0.56	70	29	13	0.22	0.18	0.77	55	0.26	1280	4470	4
GT 088	83	1.29	90	27.9	22	0.55	0.26	0.79	115	0.25	1280	4210	6
GT 089	84	1.18	80	29	21	0.53	0.23	0.8	103	0.26	1040	4420	7
GT 092	87	1.11	90	28.9	17	0.49	0.25	0.77	104	0.25	1220	4300	6
GT 094	89	0.38	60	31.9	9	0.14	0.15	0.89	42	0.28	1530	4760	4
GT 099	90	0.71	70	30	13	0.32	0.18	0.72	82	0.25	1270	4600	4
GT 100	91	0.64	70	29.6	11	0.26	0.19	0.88	53	0.26	860	4440	3
GT 101	92	0.35	60	31.5	8	0.13	0.14	0.85	33	0.23	1160	4800	3
GT 104	93	0.3	50	31.8	8	0.11	0.12	0.96	30	0.28	890	4810	2
GT 105	94	0.31	60	31.4	8	0.12	0.14	1	32	0.28	1210	4700	3
GT 106	95	0.47	60	31.1	10	0.17	0.15	0.95	49	0.28	1190	4730	4
GT 107	96	1.17	80	27.7	18	0.52	0.25	0.78	135	0.24	1690	4030	7
GT 110	99	1.54	80	25.7	22	0.69	0.25	0.82	155	0.23	1300	3730	7
GT 111	100	0.46	60	29.6	9	0.18	0.16	0.91	51	0.25	1330	4230	4
GT 112	101	0.32	60	31.1	8	0.11	0.13	1	29	0.28	1000	4510	2
GT 113	102	0.29	50	30.9	7	0.11	0.11	0.97	29	0.27	840	4560	2
GT 114	103	0.23	50	32.9	7	0.07	0.12	1.08	17	0.29	560	4910	<2
GT 115	104	0.32	60	31.4	8	0.12	0.13	0.86	31	0.21	960	4850	2
GT 118	107	0.3	60	28.8	8	0.12	0.14	0.83	36	0.27	780	4840	3
GT 119	108	0.31	50	29.1	8	0.13	0.12	0.84	32	0.28	960	4930	3
GT 120	109	0.29	60	29.3	8	0.11	0.13	0.92	31	0.27	900	4730	3
GT 121	110	0.29	50	29.2	8	0.11	0.13	0.91	30	0.28	850	4760	3
GT 122	111	0.29	50	30.6	8	0.11	0.13	1.15	28	0.29	900	4600	3
GT 123	112	0.37	50	28.8	9	0.17	0.12	1.05	43	0.27	1070	4310	4
GT 124	113	0.38	50	29.1	10	0.16	0.14	1	42	0.27	1190	4490	4
GT 125	114	0.57	60	28.2	10	0.25	0.18	0.96	63	0.26	1290	4270	5
GT 128	117	0.47	50	30.5	11	0.2	0.13	1.09	48	0.28	1290	4690	5
GT 129	118	0.55	60	29.8	11	0.24	0.15	1.11	45	0.28	740	4540	3
GT 130	119	0.97	70	27.3	17	0.44	0.22	0.95	97	0.25	1630	4060	7
GT 131	120	0.81	70	28.3	14	0.35	0.19	0.97	70	0.27	1190	4420	5
GT 132	121	0.5	60	29.9	11	0.23	0.15	0.89	59	0.28	1360	4890	5
GT 133	122	0.48	70	29.1	9	0.2	0.17	0.87	48	0.27	1350	4700	4
GT 134	123	0.45	60	29.2	9	0.22	0.16	0.73	53	0.27	1160	5030	5
GT 135	124	1.71	100	22.8	23	0.81	0.31	0.5	155	0.2	1230	3890	8
GT 137	125	0.35	60	29.5	8	0.15	0.15	0.76	41	0.28	470	5160	3
GT 138	126	0.81	80	26.6	13	0.38	0.2	0.62	75	0.19	2310	4580	7
GT 139	127	0.91	90	24	17	0.45	0.25	0.44	109	0.18	2700	3980	12
GT 140	128	0.4	60	28	9	0.18	0.15	0.71	48	0.26	1390	4790	66
GT 141	129	0.27	50	30.6	7	0.1	0.13	1.03	26	0.3	730	5010	2
GT 142	130	0.79	70	28.2	13	0.36	0.2	0.88	83	0.26	1750	4490	7
GT 143	131	0.56	60	29.8	11	0.24	0.16	1.04	65	0.27	1850	4540	6
GT 144	132	1.11	80	27.1	17	0.51	0.21	0.98	111	0.25	1990	3960	8
GT 148	136	1.77	110	23.7	25	0.79	0.36	0.8	168	0.21	1890	3470	13
GT 149	137	1.61	90	25.2	23	0.76	0.3	0.82	202	0.22	2250	3790	12
GT 150	152	0.83	60	32.2	16	0.37	0.18	1.14	102	0.28	1490	4710	7
GT 151	138	0.42	60	29.2	9	0.18	0.15	0.93	44	0.28	1220	4830	4
GT 152	139	0.43	60	28.9	10	0.18	0.15	0.77	48	0.27	1340	4930	5
GT 153	140	0.7	70	27.3	13	0.31	0.19	0.64	78	0.23	1680	4700	7
GT 155	142	2.92	130	21.3	39	1.3	0.44	0.48	252	0.19	1840	3420	17
GT 156	143	1.37	90	26.1	20	0.63	0.27	0.5	150	0.19	1930	4270	11
GT 184	171	1.15	90	24.1	17	0.52	0.26	0.66	110	0.23	1060	3660	7
GT 185	172	0.39	60	28.1	9	0.16	0.17	0.71	51	0.26	1120	4420	4
GT 186	173	0.42	70	29.5	9	0.17	0.19	0.72	51	0.28	960	4680	4
GT 187	174	0.37	60	28.2	9	0.16	0.15	0.73	47	0.26	920	4390	4
GT 190	176	0.78	70	27.8	12	0.33	0.2	0.72	72	0.18	860	4670	5

GT 192	178	0.82	80	29.2	14	0.37	0.22	0.7	75	0.26	1600	4710	7
GT 193	179	0.67	70	28.1	13	0.3	0.2	0.64	81	0.24	2280	4430	9
GT 195	181	0.55	80	29.4	13	0.22	0.19	0.76	68	0.26	1350	4780	5
GT 197	183	1.65	120	23.6	27	0.77	0.32	0.6	185	0.21	1450	3760	11
GT 198	184	1	100	26.4	19	0.58	0.26	0.62	118	0.25	1540	4210	8
GT 199	185	1.92	120	22.5	34	1.05	0.37	0.49	272	0.22	1980	3550	16
Average		0.73	71	28.6	13	0.32	0.19	0.82	75.36	0.25	1289	4479	6
Background samples*													
Average		1.81	121	14.4	23	0.84	0.33	0.32	193	0.12	1690	2237	10

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APPENDIX (supplementary data) **- TABLE 3b Selected ICP-AES element concentrations in the East samples**

TP	Depth	#	Ca	Fe	K	Mg	Mn	Na	P	Sr
GT 031	8-34	30	26.8	0.24	0.19	0.75	44	0.25	1290	4140
GT 032	6-48	31	28.3	0.2	0.18	0.88	44	0.26	1330	4330
GT 033	6-38	32	24.2	0.67	0.31	0.7	120	0.24	1240	3830
GT 034	11-22	33	26.7	0.4	0.22	0.75	88	0.25	1590	4220
GT 035	9-42	34	31	0.33	0.22	0.93	64	0.27	1270	4380
GT 036	6-42	35	28	0.37	0.21	0.74	93	0.24	2740	3980
GT 037	5-35	36	29.4	0.44	0.2	0.78	51	0.25	1280	4220
GT 038	8-36	37	27.5	0.37	0.24	0.63	77	0.24	1490	4080
GT 040	14-49	39	20.4	1.24	0.55	0.41	242	0.18	4160	2800
GT 043	11-39	42	28.4	0.38	0.23	0.76	82	0.24	2160	4050
GT 044	11-35	43	22.2	0.96	0.41	0.55	180	0.2	1720	3100
GT 045	6-34	44	24.2	0.97	0.39	0.6	243	0.21	2170	3420
GT 046	11-37	45	22.2	1.17	0.43	0.65	181	0.2	1340	3030
GT 049	11-40	48	27.2	0.47	0.28	0.59	96	0.24	1940	3970
GT 051	11-39	50	24.6	0.74	0.44	0.45	169	0.22	3740	3670
GT 054	16-43	53	19.7	1.53	0.55	0.47	259	0.18	2560	2800
GT 055	13-66	54	28.2	0.5	0.25	0.85	97	0.25	1310	3990
GT 056	6-43	55	27.3	0.48	0.25	0.71	102	0.24	2510	4000
GT 057	n/a	56	24	1.02	0.38	0.68	175	0.21	2030	3380
GT 060	16-39	59	26.5	0.34	0.24	0.64	84	0.22	1930	3840
GT 061-A	30-44	60	28.1	0.69	0.33	0.71	149	0.24	2040	3980
GT 062-A	23-47	62	25	0.59	0.32	0.59	109	0.23	1360	3650
GT 064	12-40	65	23.9	0.66	0.31	0.51	148	0.2	3250	3460
GT 065-A	30-50	66	23.3	1.06	0.42	0.57	162	0.21	2610	3330
GT 066	15-45	68	27	0.53	0.28	0.69	111	0.24	2680	3990
GT 067	7-35	69	20.6	1.41	0.52	0.52	252	0.18	3480	2860
GT 222	16-39	207	22	0.51	0.25	0.54	98	0.19	2150	3140
GT 223	10-34	208	20.1	1.43	0.49	0.47	242	0.18	2420	2840
GT 224	20-41	209	21	0.88	0.39	0.43	206	0.19	3850	3160
Average			25.1	0.71	0.33	0.64	136.8	0.222	2194.5	3642.76
Background samples										
Average			14.4	0.84	0.33	0.32	193	0.15	1690	2237

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APPENDIX (supplementary data)

TABLE 4 Local Sherd weights and counts, sherd wt. (gr.)/count ratio

n.	*wt.(gr.)*	*count*	*ratio wt/count*
GT 001	38.9	12	3.2
GT 002	8.8	4	2.2
GT 003	0	0	0.0
GT 004	50	18	2.8
GT 005	52.1	12	4.3
GT 006	219.7	48	4.6
GT 007	342.2	66	5.2
GT 008	56	17	3.3
GT 009	323	51	6.3
GT 010	104	21	5.0
GT 011	58	12	4.8
GT 012	316	47	6.7
GT 013	44	11	4.0
GT 014	455	75	6.1
GT 015	91	22	4.1
GT 016	334.4	41	8.2
GT 018	381	84	4.5
GT 019	93	14	6.6
GT 020	197	26	7.6
GT 021	28	8	3.5
GT 022	81	21	3.9
GT 023	54	27	2.0
GT 024	361	50	7.2
GT 025	112	15	7.5
GT 026	60	12	5.0
GT 027	0	0	0.0
GT 028	316	33	9.6
GT 029	260	57	4.6
GT 030	99	16	6.2
GT 031	94	24	3.9
GT 032	53	15	3.5
GT 033	49	21	2.3
GT 034	125	39	3.2
GT 035	114	22	5.2
GT 036	808	117	6.9
GT 037	78	9	8.7
GT 038	398	44	9.0
GT 039	985	106	9.3
GT 040	0	0	0.0
GT 041	0	0	0.0

GT 042	0	0	0.0
GT 043	0	0	0.0
GT 044	0	0	0.0
GT 045	0	0	0.0
GT 046	0	0	0.0
GT 047	817	100	8.2
GT 048	0	0	0.0
GT 049	0	0	0.0
GT 050	366	65	5.6
GT 051	191	52	3.7
GT 052	50	14	3.6
GT 053	297	60	5.0
GT 054	297	61	4.9
GT 055	211	42	5.0
GT 056	575	75	7.7
GT 057	350	38	9.2
GT 058	0	0	0.0
GT 059	187	32	5.8
GT 060	69	9	7.7
GT 061-A	646	126	5.1
GT 062-A	399	70	5.7
GT 063	87	21	4.1
GT 064	1049	124	8.5
GT 065-A	664	70	9.5
GT 066	528	105	5.0
GT 067	428	56	7.6
GT 068	493	69	7.1
GT 069	161	40	4.0
GT 071	182	26	7.0
GT 072	396	45	8.8
GT 073	83	33	2.5
GT 074	40	13	3.1
GT 075	8	8	1.0
GT 076	37	15	2.5
GT 079	10	5	2.0
GT 080	17	4	4.3
GT 081	8	2	4.0
GT 082	14	6	2.3
GT 087	11	4	2.8
GT 088	87	17	5.1
GT 089	16	3	5.3
GT 090	48	9	5.3
GT 091	41	9	4.6
GT 092	9	9	1.0
GT 093	60	25	2.4
GT 094	76	22	3.5
GT 099	84	17	4.9

GT 100	61	19	3.2
GT 101	22	12	1.8
GT 104	0	0	0.0
GT 105	92	23	4.0
GT 106	135	37	3.6
GT 107	85	39	2.2
GT 108	145	41	3.5
GT 109	183	73	2.5
GT 110	399	41	9.7
GT 111	75	37	2.0
GT 112	48	15	3.2
GT 113	124	8	15.5
GT 114	15	7	2.1
GT 115	101	34	3.0
GT 116	50	20	2.5
GT 117	95	29	3.3
GT 118	36	11	3.3
GT 119	110	30	3.7
GT 120	26	12	2.2
GT 121	12	6	2.0
GT 122	24	10	2.4
GT 123	19	17	1.1
GT 124	54	21	2.6
GT 125	96	24	4.0
GT 126	183	38	4.8
GT 127	116	6	19.3
GT 128	64	12	5.3
GT 129	155	23	6.7
GT 130	55	20	2.8
GT 131	61	18	3.4
GT 132	273	60	4.6
GT 133	250	98	2.6
GT 134	39	16	2.4
GT 135	42	12	3.5
GT 137	58	13	4.5
GT 138	80	24	3.3
GT 139	77	34	2.3
GT 140	177	34	5.2
GT 141	88	43	2.0
GT 142	142	36	3.9
GT 143	83	23	3.6
GT 144	85	8	10.6
GT 145	111	30	3.7
GT 146	6	3	2.0
GT 147	158	62	2.5
GT 148	101	9	11.2
GT 149	90	14	6.4

GT 150	121	21	5.8
GT 151	95	38	2.5
GT 152	29	12	2.4
GT 153	12	7	1.7
GT 154	51	12	4.3
GT 155	0	0	0.0
GT 156	19	5	3.8
GT 157	230	41	5.6
GT 158	95	14	6.8
GT 159	55	13	4.2
GT 160	140	21	6.7
GT 162	103	21	4.9
GT 163	8	3	2.7
GT 164	69	11	6.3
GT 165	37	5	7.4
GT 166	76	12	6.3
GT 167	54	8	6.8
GT 168	161	28	5.8
GT 169	98	14	7.0
GT 170	130	31	4.2
GT 171	247	52	4.8
GT 172	203	71	2.9
GT 173	126	30	4.2
GT 174	72	16	4.5
GT 175	178	25	7.1
GT 176	77	24	3.2
GT 177	245	58	4.2
GT 178	49	10	4.9
GT 179	2	6	0.3
GT 180	31	6	5.2
GT 181	96	18	5.3
GT 182	241	45	5.4
GT 183	234	46	5.1
GT 184	56	13	4.3
GT 185	29	11	2.6
GT 186	44	11	4.0
GT 187	76	23	3.3
GT 188	221	45	4.9
GT 190	63	1	63.0
GT 191	148	30	4.9
GT 192	64	9	7.1
GT 193	0	0	0.0
GT 194	39	6	6.5
GT 195	88	13	6.8
GT 196	40	9	4.4
GT 197	7	3	2.3
GT 198	38	9	4.2

GT 199	0	0	0.0
GT 201	31	6	5.2
GT 202	34	4	8.5
GT 203	35	3	11.7
GT 204	156	30	5.2
GT 205	15	5	3.0
GT 206	15	4	3.8
GT 207	22	3	7.3
GT 208	5	2	2.5
GT 209	39	9	4.3
GT 210	0	0	0.0
GT 211	45	8	5.6
GT 212	11	3	3.7
GT 213	6	2	3.0
GT 214	0	0	0.0
GT 215	42	4	10.5
GT 216	52	11	4.7
GT 217	119	34	3.5
GT 218	45	5	9.0
GT 219	6	4	1.5
GT 220	48	14	3.4
GT 221	68	24	2.8
GT 222	153	30	5.1
GT 223	274	35	7.8
GT 224	235	58	4.1
GT 225	81	17	4.8
GT 226	251	50	5.0
GT 227	71	15	4.7
GT 228	80	17	4.7
GT 229	133	33	4.0
GT 230	121	38	3.2
GT 231	84	11	7.6
GT 232	195	42	4.6
GT 233	99	26	3.8
GT 234	97	13	7.5
GT 235	263	40	6.6
GT 236	275	26	10.6
GT 237	1118	240	4.7
GT 239	616	131	4.7
GT 240	260	109	2.4
GT 241	901	159	5.7
GT 243	2049	189	10.8
GT 244	34	10	3.4
GT 245	70	11	6.4
GT 246	117	28	4.2
GT 247	149	29	5.1
GT 248	149	15	9.9

GT 251	247	27	9.1
GT 252	68	11	6.2
GT 253	314	53	5.9
GT 254	110	28	3.9
GT 255	254	28	9.1
GT 256	86	11	7.8
GT 257	89	22	4.0
GT 258	1962	140	14.0
GT 259	78	9	8.7
GT 262	217	3	72.3
GT 263	368	18	20.4
GT 264	120	6	20.0
GT 265	69	11	6.3
GT 266	510	61	8.4