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# Spatial Representation of Heavy Fraction Collection and Analysis from Tell eš-Šâfi/Gath, Israel

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## Introduction

Tell eš-Šâfi/Gath is a large multi-period tell site with a long and rich cultural history. This site is located in central Israel atop a large crescent shaped hill. During the Early Bronze Age (EB) III (2800-2500 BCE), it is a large urban centre (c. 24 hectares in size) and was probably a regional central polity. At the eastern end of the tell (Area E), a large domestic EB non-elite quarter was excavation 2004-2017.

Micro-debris were systematically recovered and analysed from the late Early Bronze III (Stratum E5c) during the later 3 years of excavation. Within this micro-debris, we find small pieces of human activity, such as pottery, lithics, animal bones and teeth, and pieces of jewelry and luxury (beads). A data analysis of this data was carried out to illustrate the different use areas within buildings.

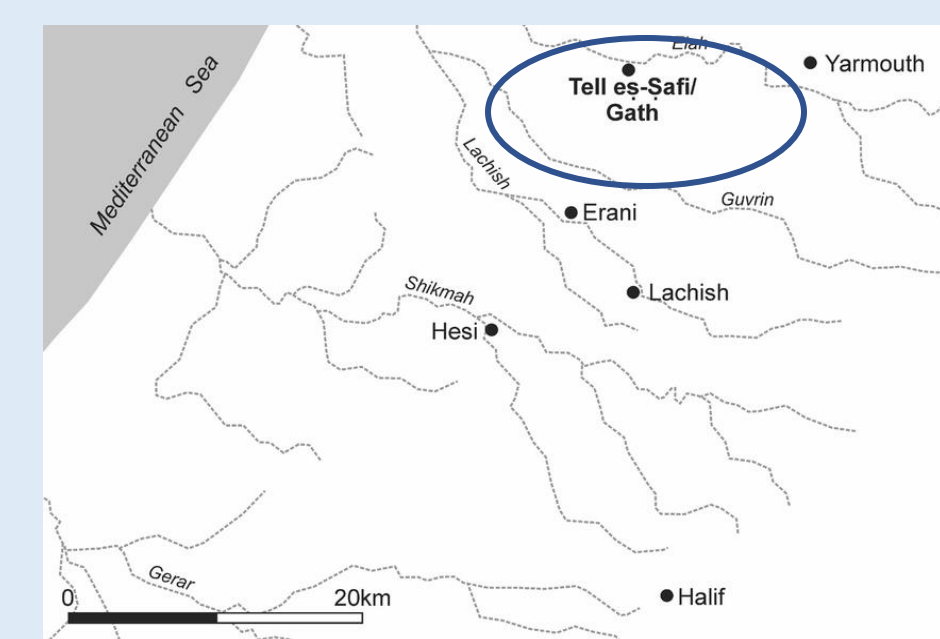


Figure 1. Map of the southern Coastal Plain and Shephelah with the location of Tell eš-Šâfi/Gath (Greenfield et al. 2016)



Figure 2. An aerial photo of Area E, North is right



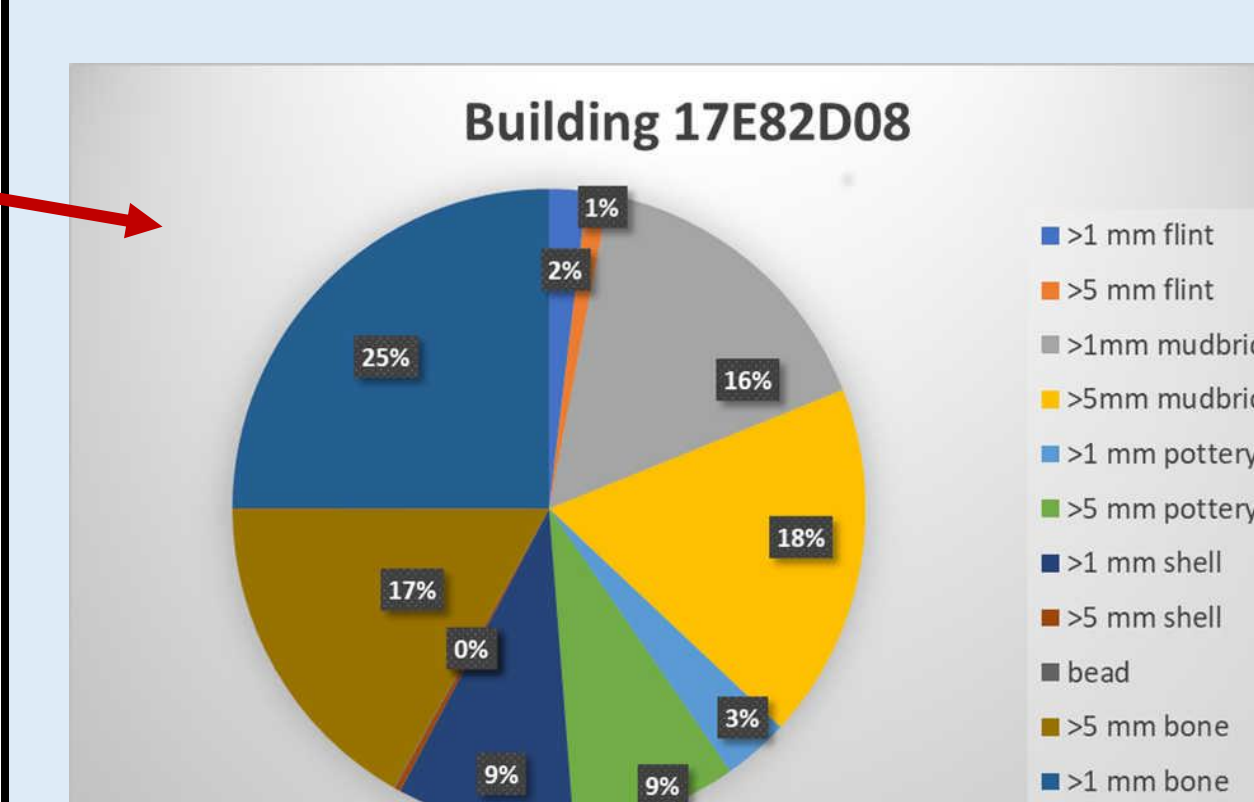
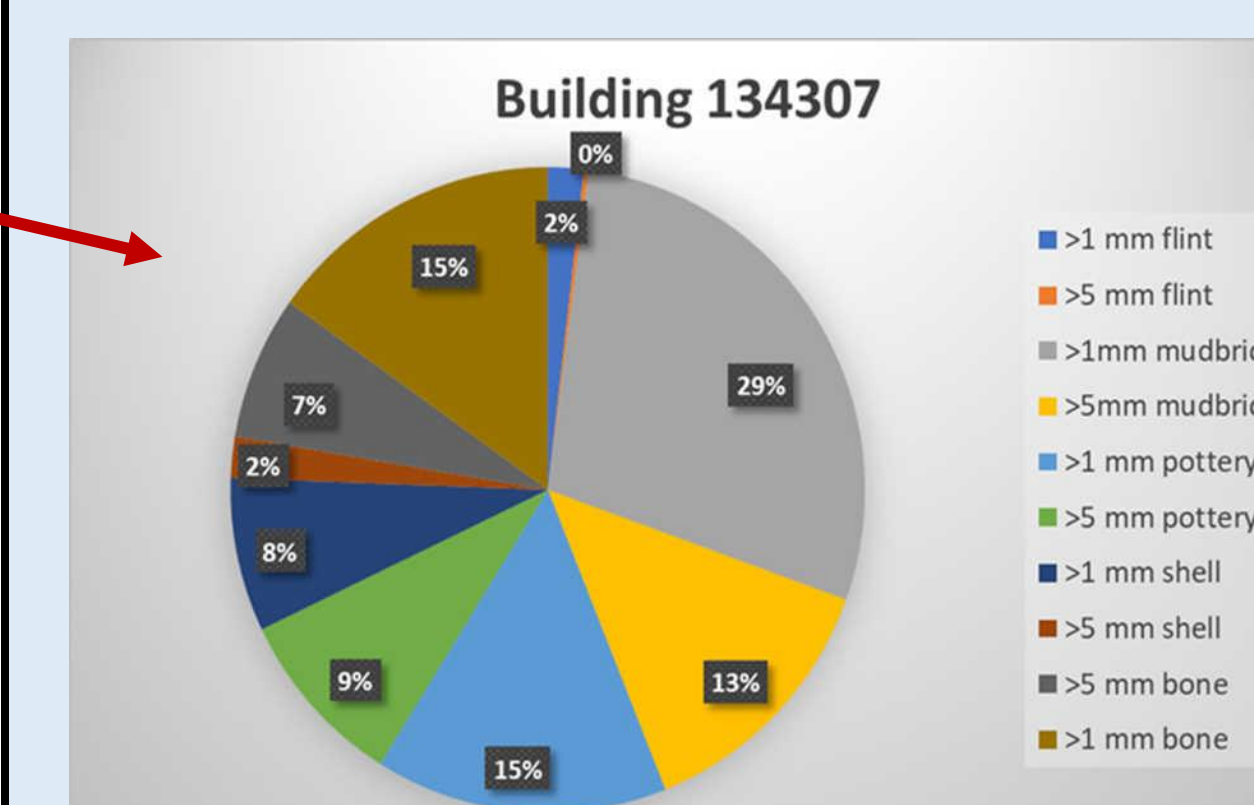
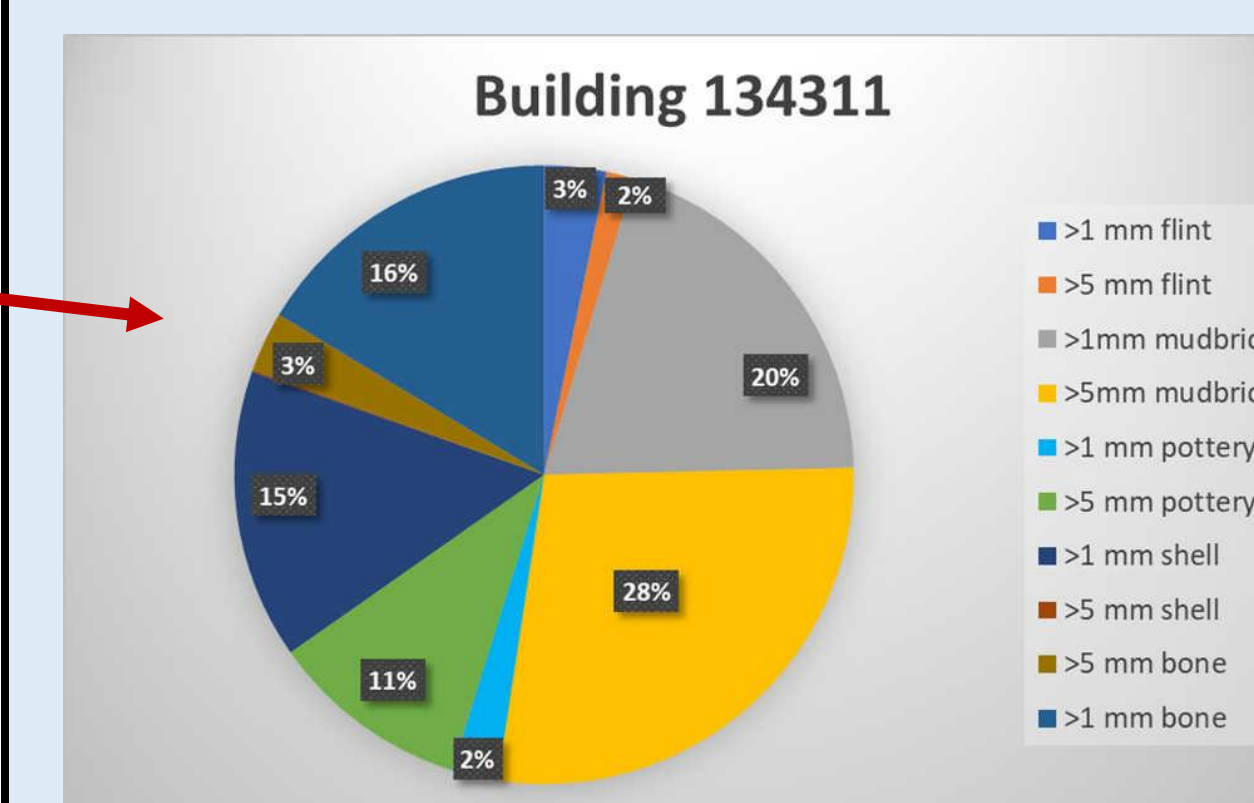
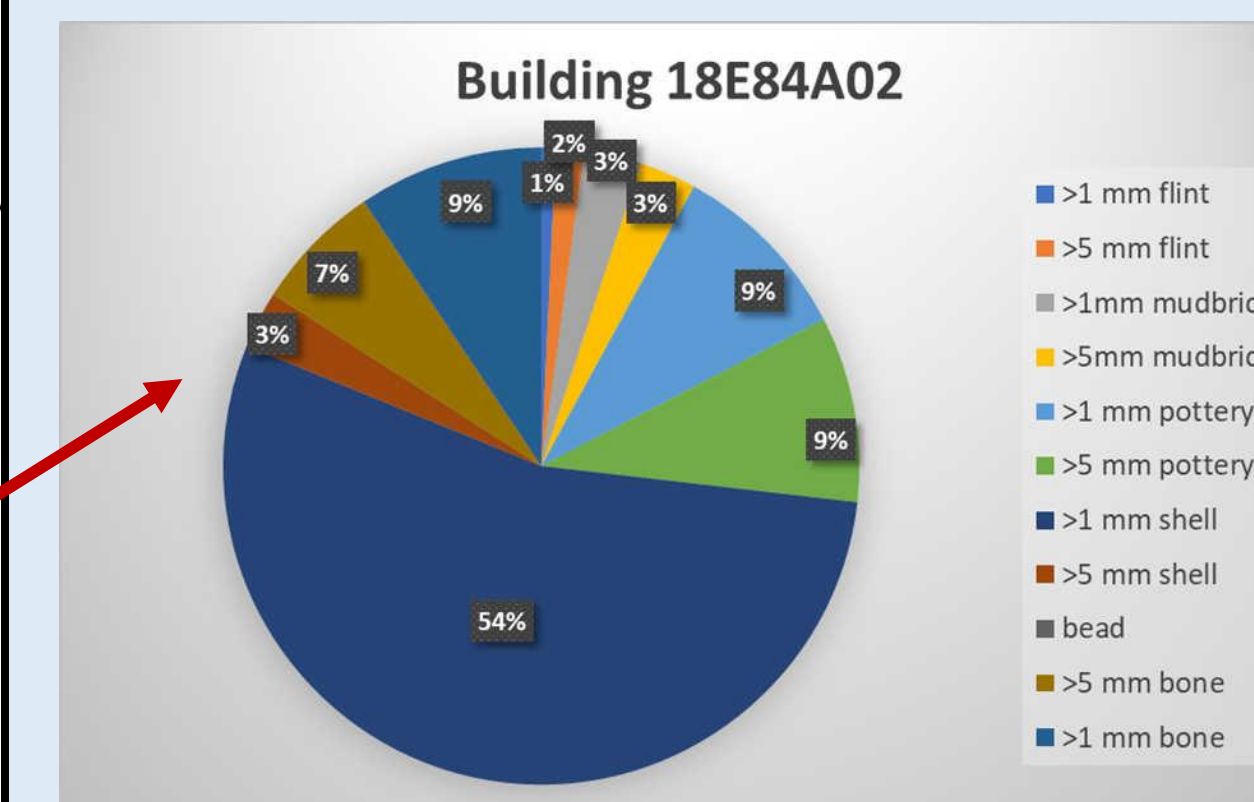
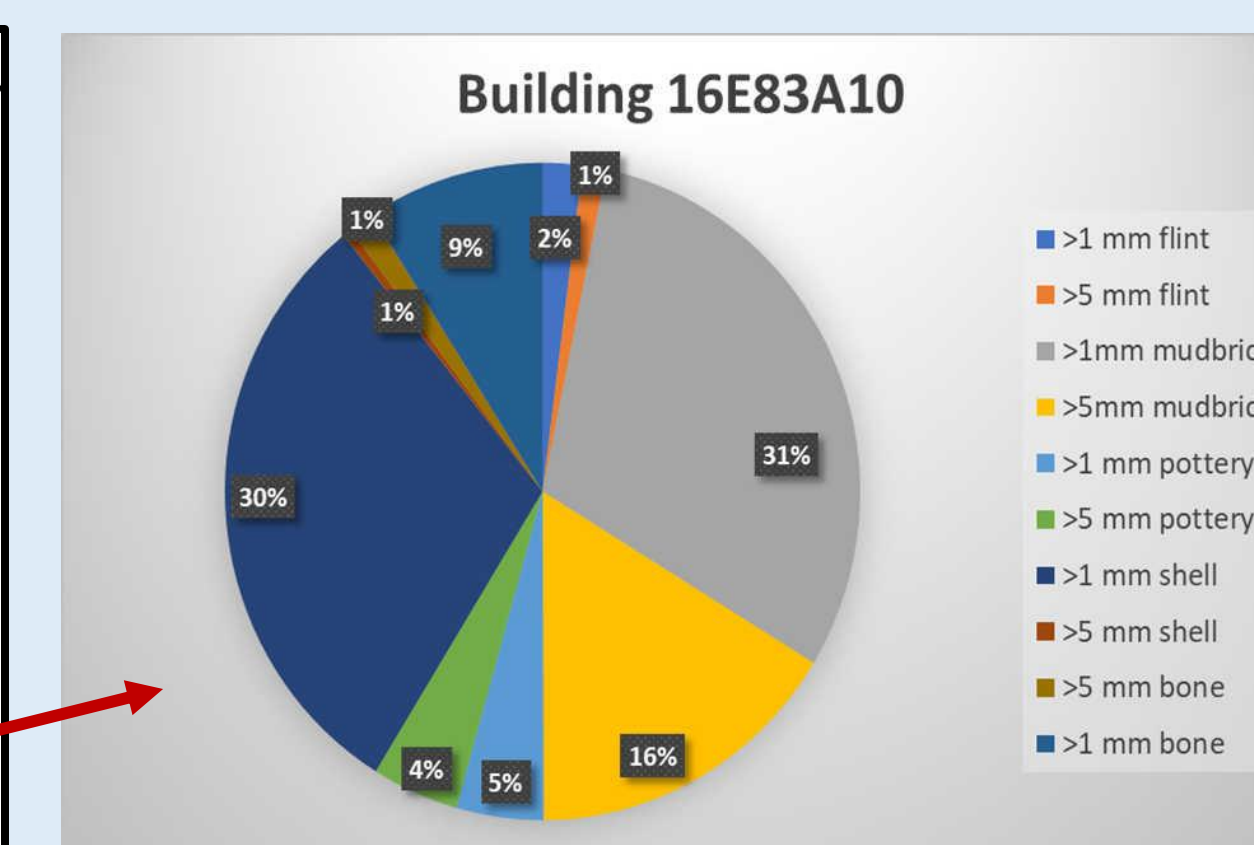
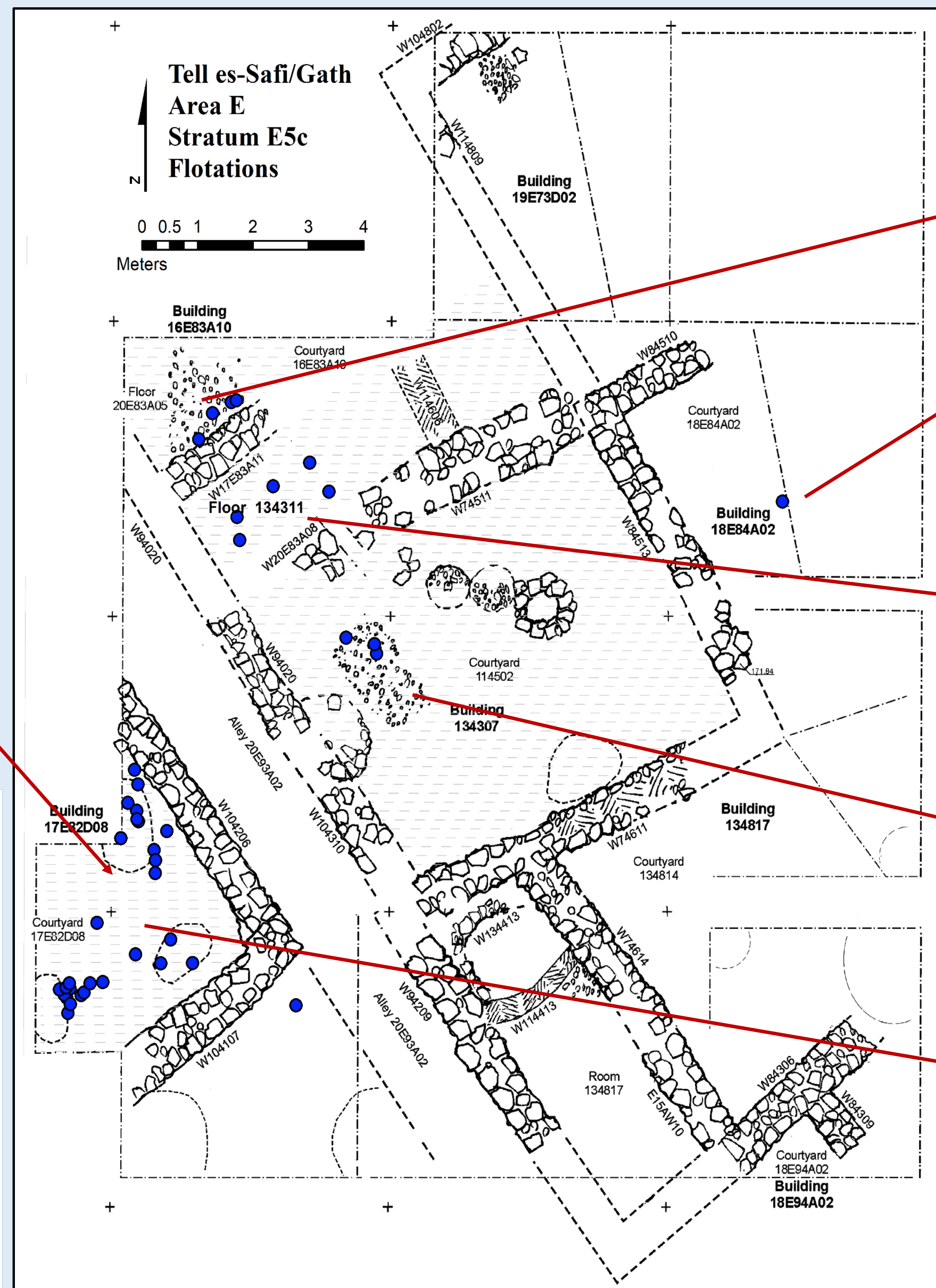
Figure 3: Example of a room within house 17E82D08 which was heavily sampled

## Heavy Fraction

**Data**  
The data used for this analysis consists of a total of 51 samples of heavy fraction taken from different houses at the site. These samples were hand sorted in the field laboratory and consist of c. 20,000 individual specimens.

**Method**  
During excavation, 10L samples from accumulations above floors were collected from 1m by 1m squares and spatial location data were recorded. These accumulations would be the items that were dropped, left or built up on the floor surface, but not trampled into the floor to become part of the floor makeup.

For the purposes of this poster, a simple data analysis based was carried out based four buildings and one room. A map was generated in ArcGIS showing all of the sample points and corresponding charts were then generated for each building.



## Results

The data analysis shows interesting patterns between each of the sampled buildings. Building 17E82D08 has a high number of bone samples. The high number of bone specimens from this building is from the many fragments of the 3 articulated donkey skeletons found in the room. It is indicative of the use of the space for ritual burial activities.

Samples from Building 16E83A10 and 18E84A02 have abnormally high percentages of shells (31% and 57% respectively). Both sea and land shells (snails) have been found across the site. However, in these rooms, mostly undamaged snail shells have been found. This may indicate that the building was abandoned for a period of time since snails are attracted to rich calcium and other organic deposits on dirt floors.

Room 134311 (associated with Building 16E83A10) and Building 134307 have a fairly even distribution of all types of specimens, aside from mudbricks (collapse material). The exact activity that occurred within these buildings is unclear. It is possible that these two areas may have been courtyards where activities were carried out differently than inside houses, allowing for a different pattern in the heavy fraction samples recovered.

Finally, within all of the buildings and rooms, flint was the least represented sample overall. This indicates that flint processing probably did not occur in these areas, despite the fact that it was the major household implement. The pieces that were found were either from retouching, were broken off the blades when in use, or discarded blades.



Figure 4: Heavy fraction was collected in 10L bucket samples



Figure 5: Heavy fraction samples ready for floatation



Figure 6: Heavy fraction in floatation machine

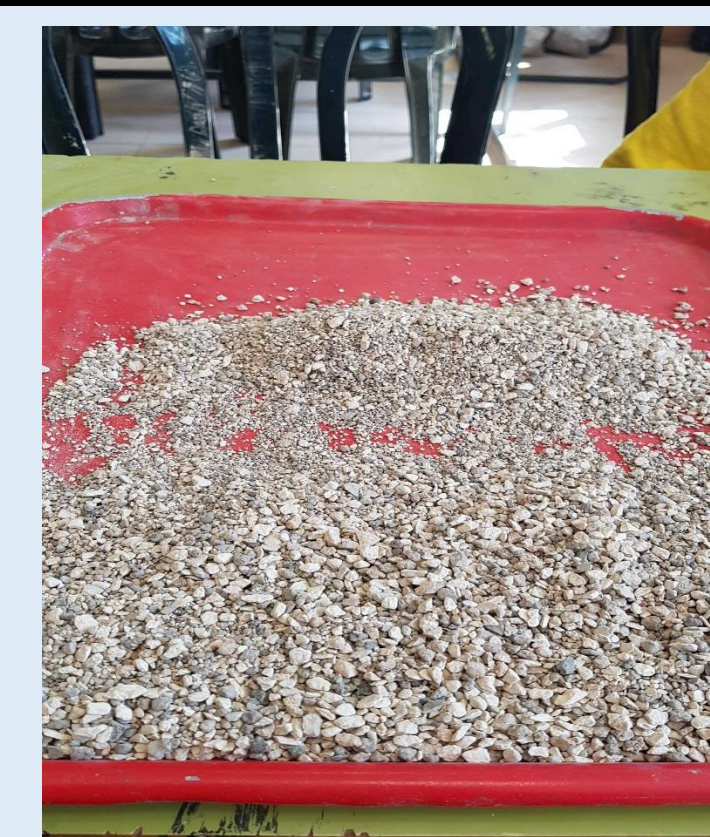


Figure 7: Heavy fraction ready for sorting in field lab



Figure 8 : up close image of heavy fraction

## Conclusion

We know that the rooms in 18E82D08 were used for burials of at least 3 donkeys during the E5c phase of the site, and the graphs presented above agree with the macro finds. The other buildings 16E83A10 and 18E84A04 with shells, and 134311 and 134307 with their matching distribution, show that there are specific areas of interest that deserve further analysis into their use. In addition the results presented here show that there are ways in which we can use heavy fraction collection and analysis to locate rooms and buildings which have been abandoned (16E83A10 and 18E84A04). With more analysis and eventual integration of this data with a special analysis with ArcGIS it will be possible to further answer more questions about the use of space in this Early Bronze neighborhood.

**References**  
Greenfield, Haskel J., Itzhaq Shai, and Aren M. Maeir. 2016. Understanding Early Bronze Urban Patterns from the Perspective of an EB III Commoner Neighbourhood: The Excavations at Tell eš-Šâfi/Gath, Israel. Pp. 1537–51 in *Proceedings of 9th International Congress on the Archaeology of the Ancient Near East (June 9–13, 2014, Basel)*, Vol. 3. Edited by Rolf A. Stucky, Oskar Kaelin, and Hans-Peter Mathys. Wiesbaden: Harrassowitz.  
Shai, Itzhaq, Haskel J. Greenfield, Adi Eliyahu-Behar, Johanna Regev, Elisabetta Boaretto, and Aren M. Maeir. 2014. The Early Bronze Age Remains at Tell eš-Šâfi/Gath, Israel: An Interim Report. *Tel Aviv* 41: 20–49.



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