Looking at the painted plaster of Knossos: A visibility analysis on 2D and 3D representations of decorated space.

Georgiopoulou, Vasiliki

Universiteit Leiden

MSc thesis Computational Archaeology

Title: Looking at the painted plaster of Knossos: A visibility analysis on 2D and 3D representations of decorated space.

Author: Vasiliki Georgiopoulou (s3682781)

Supervisor: Tuna Kalayci

Leiden, 2024

Acknowledgements

This thesis would not have been completed without the help of a couple of people, to whom I wish to express my gratitude. Firstly, I wish to thank Dr. Karsten Lambers, who first encouraged me to aim for an internship at the 4D Research Lab in the University of Amsterdam, to familiarize myself with the 3D-reconstuction methods. Consequently, I thank my internship supervisor, Dr. Chiara Piccoli, for her patience during the process of teaching, and her useful remarks. I also wish to express my deep appreciation towards my supervisor, Dr. Tuna Kalayci, for his support, his immense amount of understanding and for our always fruitful conversations.

Finally, a big ‘efxaristo’ to all the people, friends and roommates, I had the chance to meet during my studies in Leiden. You made this year a truly unforgettable experience.

Table of Contents

1. Introduction

1.1 Painting the image of a palace

Situated on the northwest coast of Crete, an island in the southern part of the Aegean Sea (see Appendix A), the settlement of Knossos flourished during the prehistoric period, also known as the Bronze Age (3000 - 1100 BCE.), with the development of the cultural phenomenon of the Minoan civilisation (Evans, 1921; Mantzourani, 2002; MacDonald, 2005; Vavouranakis, 2015b, p. 61-62). Knossos has often been termed the epicentre of European civilisation, due to the existence of an intricate political, economic and ideological system that is represented by the remnants of the palatial complex built in the acropolis, from the 2nd millennium BCE to the 14th century BCE (see Figure 1.1.1 & Appendix B), (Hitchcock & Koudounaris, 2002, p. 42; Papadopoulos, 2005, p. 88; MacDonald, 2005, p.232; Hood & Taylor, 1981, p. 1-2).

Figure 1.1.1: View of the architectural complex of the Knossos palace taken by Prof. J. Wilson Myers in 1976 for the British School at Athens (Vavouranakis, 2013, p. 214, Figure 1).

The modern perception of the Minoans has been greatly defined by the rich material of images found in the palace of Knossos (Hood, 2005, p. 45-48; Cameron, 1976, p. 4).

The plastered paintings that decorated the walls and floors of the palatial structure have fascinated archaeologists, artists, and the broader public ever since their discovery at the beginning of the 20th century (Haysom, 2018, p. 253). Images of human figures in procession, of women with jewellery, of bulls and athletes, of dolphins and griffins, which were once part of the decoration of the Knossian building, were reconstructed within the first decades of the excavation by the artists Émile Gilliéron and Émile Gilliéron, father and son (Blakolmer, 2010, p. 302, 307).

Figure 1.1.2 Reconstruction of the painted plaster decoration of the 'Prince of the Lilies', Corridor of the South Wing, palace of Knossos, Middle Minoan IIIB - Late Minoan IA or II. (Chapin, 2016, p. 17, Fig. 3).

Respectively, the reconstructions of some of the most famous wall decorations like the 'Prince of the Lilies' (see Figure 1.1.2), greatly contributed to attracting the interest of researchers on the island of Crete, while also bringing forth a glimpse of the re-imagined in the 20th- century aesthetics of the Minoan civilisation (Galanakis et al., 2017, p. 50-51). Although fascinating and artistically unique, the painting

reconstructions were often criticised by later researchers due to their evident influence by the art nouveau movement (Vavouranakis, 2013, p. 213; Papadopoulos, 2005, p. 91).

In the same manner, the reconstruction of the palace and the surrounding area, forged by Evans's classicist and Edwardian evolutionism, is thought to have distorted the original archaeological evidence, to a considerable degree (Vavouranakis, 2015b, p. 63-64; Papadopoulos, 2005). However, Evans used this evidence, in addition to Gordon Childe's theory on the evolutionary progress of human civilisation, to argue for the sophisticated art and cultural 'superiority' of the Minoans, framing them as the predecessors of modern Europe (Chapin 2016, p.12; Vavouranakis, 2015a, p. 35-36; MacDonald, 2005, p.114; Childe, 1925, p. 29).

Figure 1.1.3 The North Entrance and part of the Northwest Propylon, as viewed from northeast, in their current reconstructed state, Knossos palatial complex. (Ephorate of Antiquities of Heraklion, (n.d.). https://knossospalace.gr/map?readPoiId=32).

Thus, the palatial landscape of Knossos, at its present state (see Figure 1.1.3), can be described as a historical assemblage formed by different perceptions; that of its original builders and users, of the Minoan archaeologists, of the Greek government that took advantage of the 'Childian' concept, to reinforce the newly founded Greek

identity, and lastly, that of local Cretans, and tourists that visit the monument yearly (Duke, 2010, p. 105, 112-6; Χαμηλάκης, 2010, p. 203, 217; Hitchcock & Koudounaris 2002, p. 42, 51).

Despite the various difficulties, the 'Minoan' scholars were not discouraged; further research produced a great amount of bibliography that discussed previous notions about the feature and the role of the painted plaster images (Chapin, 2016, p. 10; Marinatos, 1993; Immerwahr, 1990; Niemeier, 1988; Cameron, 1976). Research of the paintings during the 20th century mainly focused on the new reconstructions (see Figure 1.3), the interpretation of the scenes and their study in comparison to iconographical parallels (Niemeier, 1988, p. 242).

Although these studies contributed greatly to our knowledge of Minoan and Aegean iconography, they did not question Evans' perception of treating the paintings as a medium to reconstruct Minoan ideology (Evans, 1921, p. 4; Immerwahr, 1990, p. 40, 160; Cameron, 1976, p. 661). Studies of the next century did not fall far from the same scope, while only recently post-processual scholarship has tried to approach the decorations as active elements of space (Goodison, 2001, p. 78-79; Panagiotopoulos, 2020, p. 385; Blakolmer, 2020, p. 13).

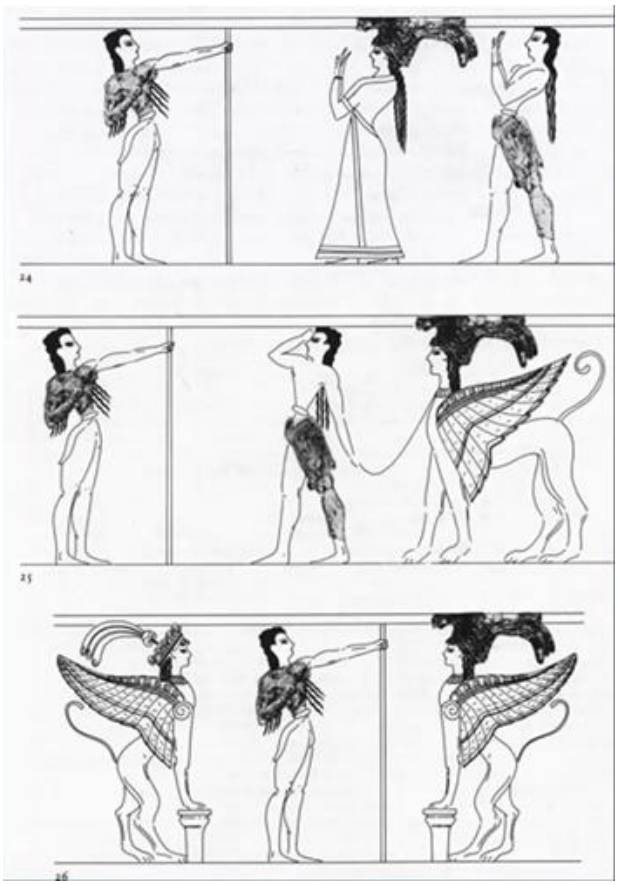

Figure 1.1.4 Sketch of three possible reconstructions of the composition with the fragments from the 'Prince of the Lilies', South Wing of the palatial complex of Knossos. (Niemeier, 1988, p. 244).

Even though approached by many notable archaeologists, the wall paintings have been a difficult subject

for new interpretations. The absence of explanatory text in the case of the painted plaster images, together with the effect of how similar images of the Egyptian pharaonic culture, found not many decades ago, were perceived and explained by archaeologists, contributed to a unidimensional understanding of the Knossian images (Immerwahr, 1990, p. 159-160; Panagiotopoulos, 2020, p. 389). The prevalent argument of Minoan scholarship is that the wall decorations of Knossos depicted ritualistic themes, which functioned as a means to reinforce the power of the elite and to retain inequalities within the Knossian society (Cameron, 1976, p. 670; Marinatos, 1993; Boulotis, 1995; Immerwahr, 1990).

However, this argument is based on two preconceptions; firstly, that the present reconstructions of the painted plaster images are close to the original ones, and secondly, that the images were positioned in visible spots in space, to propagandise the public (Brysbaert, 2008, p. 161). The iconographic studies of the decorations, although numerous, have proven that in most cases, a secure interpretation, which is close to the original image, is not realizable (Chapin 2016, p.11). Furthermore, the position of the paintings is also a matter of great controversy, due to the extent of architectural reconstruction that the monument has undergone (MacDonald, 2005, p.89). Under these conditions, Allan Klynne's query comes to mind; "Is the visual experience of the Knossian palace and its wall decorations forever lost?" and the following can be added, 'Are the various attempts to reconstruct human actions within the Knossos's landscape futile?' (Klynne, 1999, p. 207).

Within the scope of my research, I will argue that neither the visual experience of the wall paintings at Knossos, and consequently, nor the comprehension of the human agents within the palace are impossible to approach. The study of the paintings' relation to space and people is realised by conducting visibility analysis, which explores the visual connectivity of spatial elements, with the use of new computational tools developed in the 21st century (Paliou et al. 2011; 2013; 2014; Günkel-Maschek, 2020; Piccoli, 2018, p. 77). Rather than a fetishized view of the palatial decoration as a piece of ancient artwork, in this thesis, I aim to question

previous assumptions about painted decorations and showcase their active role in shaping people's daily activities and special routines (Vavouranakis, 2013, p.220, 226; Brysbaert, 2008, p. 19-23).

1.2 Research Questions

Therefore, this thesis aims at exploring the following query: What was the visual integration of the painted plaster images of the palatial complex of Knossos? To specify, my research focuses on answering both archaeological issues, regarding the visual experience of the Knossian wall decorations, and methodological ones, by investigating the existent methods of visibility analysis in archaeological inquiries and proposing a relevant workflow.

For the first part, the questions that are posed are the following: What was the degree of visual accessibility, or segregation of the decorated spaces? Which elements of the decorative compositions were favoured in matters of visual access, and which were not? And ultimately, how were the paintings affecting the use of space and the experience of the people who were active within the palatial complex?

For the methodological part, visibility analysis was conducted in two-dimensional (2D) and three-dimensional (3D) representations of the space under investigation. Both the 2D and the 3D versions of the complex were based on the plans by Sinclair Hood and William Taylor, in their work 'The Bronze Age Palace at Knossos. Plan and Sections.', due to their high reliability and reproducibility by Minoan scholars (Hood & Taylor, 1981; Galanakis et al., 2017).

For this part, the queries that were put under examination were: What are the analytical capabilities of the 2D and the 3D visibility analysis? What are the differences between the two methods and how are they reflected in their results? Ultimately this research aims to provide a transparent workflow for the conduction of visibility analysis both in the 2D and the 3D environment, stating explicitly the steps, software and tools that were used (Piccoli, 2018, p. 67; Katsianis et al., 2022, p. 538-539).

1.3 Criteria for selection of case studies

The visibility analysis of the decorated landscape of the palace of Knossos does not come without its problems; quite contrary there are many, obvious and less visible, restraints to accomplishing this project. The incompleteness of some spaces and the highly reconstructed state of some others pose a great difficulty in conducting the analysis (see Figure 1.3.1), (Hood & Taylor, 1981, p. 5-6). The reconstructions began early on, with Evans keeping track of the reconstructive phases in his diaries which dated from the beginning of the 20th century up to the 1950s (Hitchcock & Koudounaris 2002, p. 41).

However, a "cleaning" phase of the site also took place during Evans' supervision, even before the reconstruction process, to reveal the original Minoan ruins. During this phase many walls that dated to more recent periods, or were thought to be irrelevant to the monument, were removed, thus adding to the difficulty of a reapproach of the architectural phases of the site (MacDonald, 2005, p.89; Piccoli, 2018, p. 73-74).

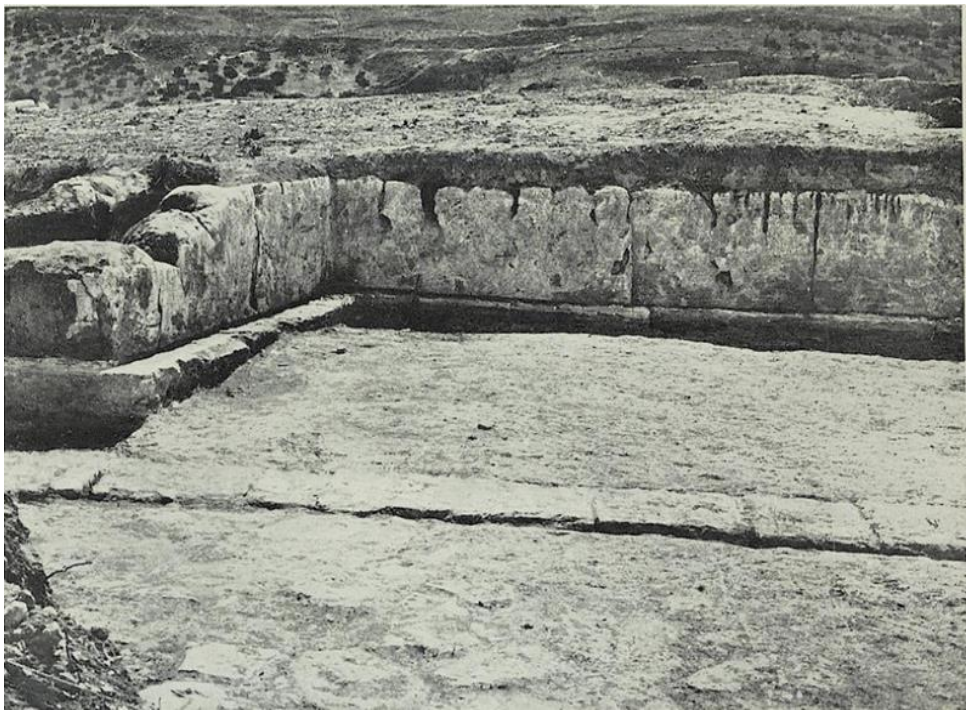

Figure 1.3.1 View of the orthostats of the West Façade from the west part of the West Porch in 1920, before the excavation of the West Wing and its restoration. (Evans, 1921, p. 722).

Although a plethora of plans of the Knossian structure has been produced over the years, the current state of the monument has been the main reason that Minoan

scholarship is still ambivalent in agreeing on the existence of some specific features, like in the case of a corridor on Southern Section of the palace that hypothetically connected the South Entrance directly to the Central Court (Niemeier, 1988, p. 237; MacDonald, 2005, p. 96-98).

As aforementioned, the study of wall decorations is also problematic (Smith, 1976, p. 65). According to the archaeological diaries and the photographic record of the excavation, only a small number of decorations were preserved in such a state that allows for their accurate reconstruction, and even fewer were found intact (Hood, 2005, p. 56; Günkel-Maschek, 2020, p. 156-157). These factors render the visibility analysis of the wall decorations of Knossos challenging, especially in the case of the recreation of the visual experience in a 3D environment, where specific information about the height of the decorations and the dimensions of the figures and features should be visualised. To overcome these difficulties, my research focuses on the only figurative paintings found still attached to the walls of the feature; the decoration of the Throne Room complex and that of the West Entrance, both located at the West Wing of the complex (see Figure 1.3.2) (Immerwahr, 1990, p. 85; Hood, 2005, p. 56; Günkel-Maschek, 2020, p. 156-157; Galanakis et al., 2017, p. 48).

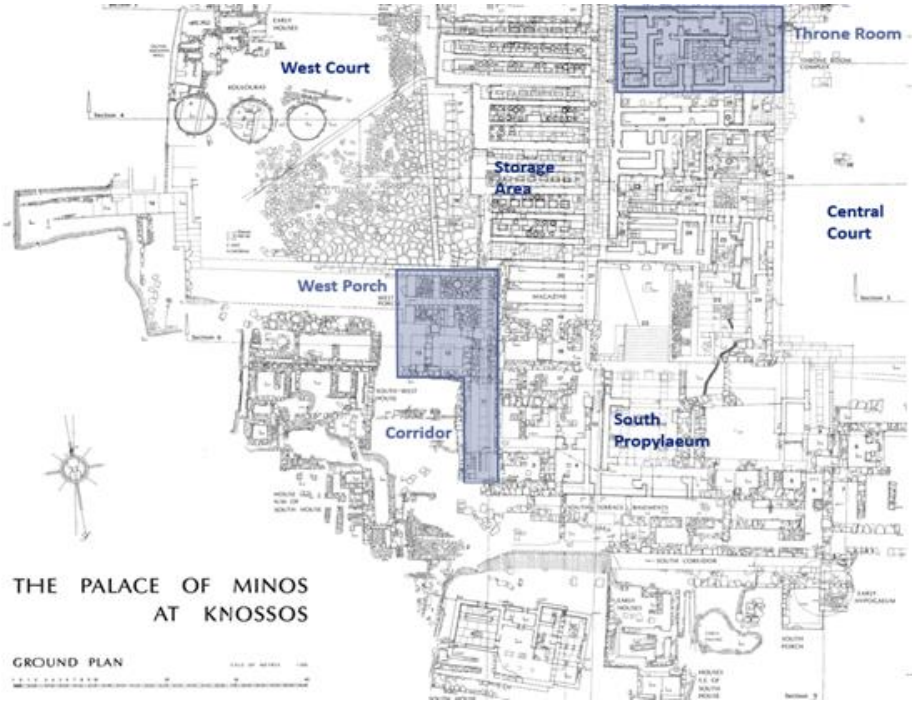

Figure 1.3.2 Detail of the architectural plan of the palace of Knossos with reference to the case studies under investigation and to the areas mentioned in the text, edited by the author. (Adapted from Hood & Taylor, 1981, Plan).

1.4 Thesis Overview

My thesis begins with the history of research of Minoan scholarship on the matter of the Knossian paintings and with insight on the theoretical background of the previous studies. Reference on the background of spatial syntax analysis and the use of visibility analysis in archaeological studies is also provided in this chapter. In the third chapter, the theoretical basis of visibility studies and the theoretical queries that sparked this study are further explained. The methodology I followed for the conduction of visibility analysis on the 2D and the 3D environment, together with reference to the software and tools, are described explicitly in the fourth chapter.

In the 5th chapter of the thesis, I begin with a short reference to the historical context of the two case studies, while in the following subchapters, I refer to each of the two case studies distinctly; starting with an introduction to the spatial elements and the wall decorations and followed by, firstly, the 2D visibility analysis and its results, and secondly, with the 3D viewshed analysis and its results, respectively. I focus on the interpretation of the results of the two methods in a separate chapter, the discussion, while implementing the theoretical background of my research. In this chapter I also comment on the advantages and drawbacks of the two analytical methods, outlining their use in investigating a reconstructively problematic monument. Ultimately, the conclusion chapter contains an overview of the thesis's archaeological results and main methodological points, while ideas for future research are discussed briefly.

2. History of Research

2.1 On the matter of the Knossian painted images

The palatial complex of Knossos is situated on the hill of Kefalas, in the heart of the Knossian settlement (Figure 2.1.1) (MacDonald, 2005, p. 92). The feature was first excavated by the Greek businessman, Minos Kalokairinos in 1878 and almost twenty years after, it underwent extensive excavation by the archaeologists Sir Arthur Evans, Duncan Mackenzie, and Stephanos Xanthoudides (Vavouranakis, 2013, p. 215; Papadopoulos, 2005, p. 94; Hood & Taylor, 1981, p. 1-2; Hitchcock & Koudounaris, 2002, p. 41).

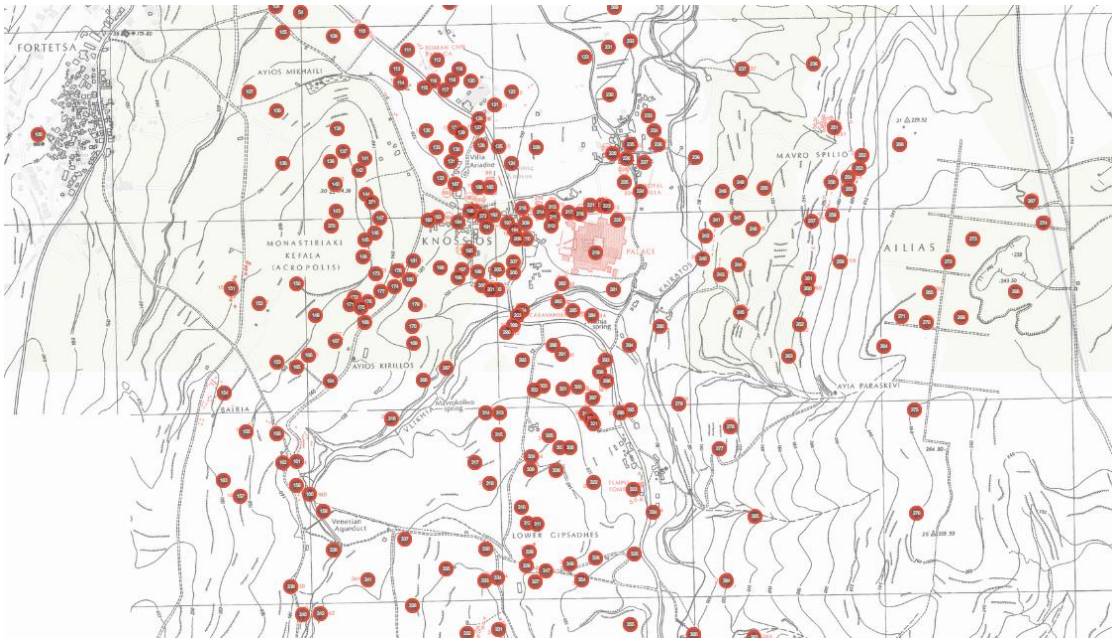

Figure 2.1.1 Detail from interactive digital map of the area around the Knossian palatial complex, with indications of archaeological sites. Indication of hypothetical limits of the Bronze Age settlement added by the author. Data were retrieved by Sinclair Hood and David Smyth, in the 1981 Archaeological Survey of the Knossos. (AreaBSA Digital Collections. (n.d.). https://digital.bsa.ac.uk/hood.php).

All four wings gave access to the interior of the complex, where areas of storage, rooms with ritualistic function, residential spaces and a drainage system have been identified (Evans, 1928; MacDonald, 2005). Although the function of the complex has been an ongoing debate since its discovery, its central role in the life of the prehistoric society of Knossos over the periods of its existence, and its influence on the island,

have never been questioned (Hägg & Marinatos, 1987; Marinatos, 1993, p. 40; Letesson, & Vansteenhuyse, 2006, p. 97).

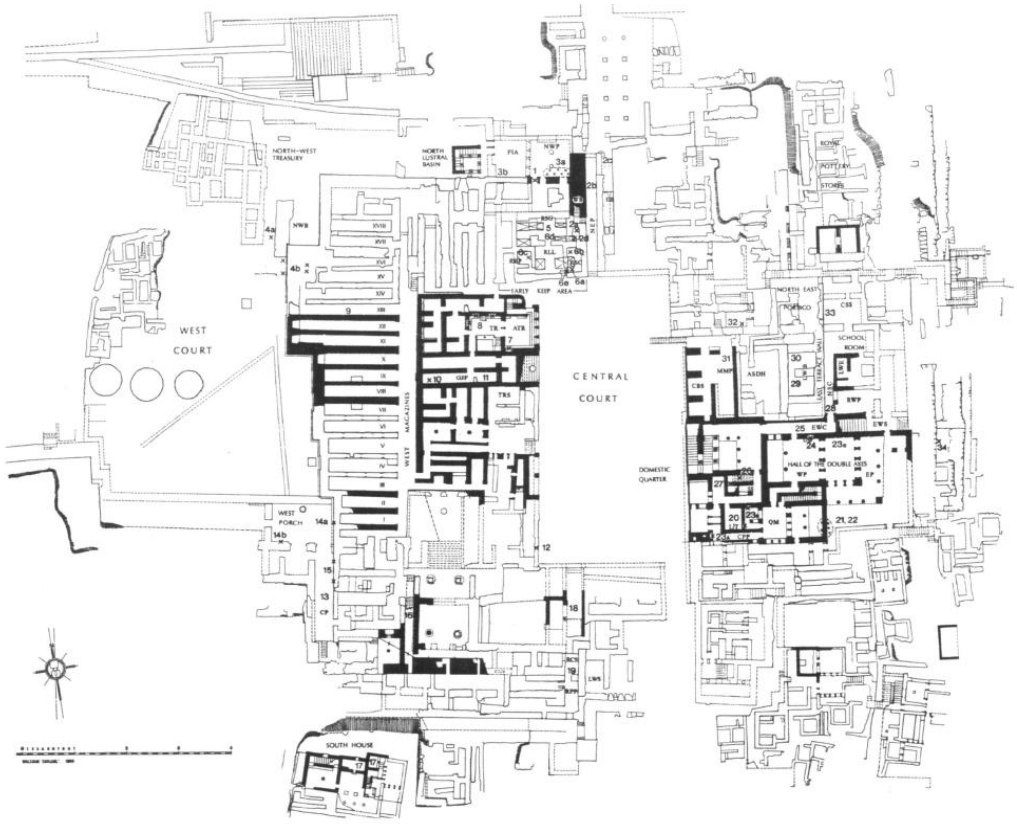

Figure 2.1.2 Plan of the Knossian palatial complex with numbers indicating the positions of painted plaster decorations. (Hood, 2005, p. 46, Fig. 2.1).

Fragments of plastered decorations were discovered in the first years of the excavation and with their publication in the volumes of 'The Palace of Minos', Evans introduced the scholars of Greek archaeology to the intricate matter of the Knossian paintings (Evans, 1928; Panagiotopoulos, 2020, p. 386; Hood & Taylor, 1981, p. 2). Evidence of the earliest painted plastered decorations of the complex is believed to date in the Middle Minoan IIB, (see Appendix B), while the structure was re-decorated multiple times in later years, up until the Late Minoan IIIA period (see Figure 2.1.2) (Hood, 2005, p. 48-49, 56; Immerwahr, 1990, p. 162, 166-167; Cameron, 1976, p. 656-657).

Evans regarded the painted plaster decorations as evidence of the highly ritualistic and political function of the Knossian palace, as he interpreted them either as images of the Minoan religion or as representations of the members of the elite and their

world (Evans, 1921, p. 3-4; Chapin, 2016, p. 12-13). Studies of the Minoan iconography in the second half of the 20th century focused on their chronological placement and the interpretation of their compositions (Smith, 1976; Hood, 2005; Cameron, 1976).

Notably, the researchers Hawke Smith (1976) and Sinclair Hood (2005), greatly contributed to the reviewing of the older chronologies suggested by Evans, especially regarding the dating of the earliest fragments of the Knossian complex and the layers dating to the end of the Late Minoan period (Smith, 1976, p. 75). These clarifications supported a better understanding of the relation of the plastered decorations to the several architectural phases of the monument and enabled the researcher Mark Cameron (1976) to argue for successive and organised decorative programs that defined the ritualistic use of different spaces in the Wings of the palace (Cameron, 1976, p. 654).

A series of excavations and research at the end of the 20th century and the first decades of the 21st century brought to light a vast variety of impressive artefacts, which further added to the puzzle of Minoan imagery (Morgan, 1990; Immerwahr, 1990; Boulotis, 1995). Comparative studies between the painted plaster images and other media emphasised the existence of a pictorial language, visible both in the form of the features depicted, but also in their syntax; the way that motifs are combined (Blakolmer, 2012; Immerwahr, 1990; Boulotis, 1995, p. 13). Although useful for understanding the development of the Minoan iconographic vocabulary, in most cases, the painted images were viewed merely as media to express the elite ideology.

Ultimately, scholarship has been contributing to the knowledge of the painted plastered images for over a century, by mainly trying to identify the actors and the events depicted, and thus, get a glimpse of Minoan ideology (Niemeier 1988, 242; Chapin, 2016, p. 10). However, the treatment of the Minoan images as art pieces, whose meaning must be deciphered, has been criticised as meaningless, given the absence of written sources (Chapin 2016, p.11-12, 16). Questions such as ‘How were the images attributing meaning?’ and ‘Who were the recipients of it?’, eluded the interest of most scholars (Panagiotopoulos, 2020, p. 390-391, 395).

A new series of studies touched upon these kinds of questions while focusing on the 'hard facts' of the pictorial creations, like the visual and material characteristics of the images, the size, scale, colours and lastly, the techniques and technology behind their creation, also known as 'chaînes-opératoires' (Jones & MacGregor, 2002; Brysbaert, 2008). In more detail, Ann Brysbaert conducted a thorough study on the techniques of the Aegean plastered painting and was one of the few researchers of the 21st century to question the 'fresco' technique as the attributed method of all Aegean paintings and to investigate the social position and the role of painters (Brysbaert, 2008, p. 38-39, 161, 166).

Post-processual theories of archaeology, like the concepts of material agency and phenomenology, which attribute agency to the elements of the human environment, initiated research that underlined the active role of paintings, viewing them as meaningful elements of architectural space, that contribute to the forging of peoples' lives and identities (Panagiotopoulos, 2020, p. 389; Johannsen, 2012, 305, 316-318). One of the first phenomenological studies referring to Knossian paintings can be attributed to Lucy Goodison (2001), who investigated how the tholos tombs of the Mesara plain and the Throne Room, were lighted by natural sunlight during the different periods of the year. Goodison's investigation was based on photographic media acquired from several visits to the sites in question (Goodison, 2001, p. 83, 87).

Recent research on Minoan paintings, still largely influenced by post-processual notions, is going forward by using the computational tools of the 21st century (Günkel-Maschek, 2020; Galanakis et al., 2017; Paliou, 2011, 2013). Both the studies of Galanakis, Tsitsa and Günkel Maschek, as well as the doctoral study of the latter, successfully touched upon the relation of specific iconographic themes with one another and with architectural elements of the palatial structure of Knossos. Eleutheria Paliou's research on the wall decorations of buildings in the settlement of Akrotiri, in Thera, has been groundbreaking, as it is one of the rare cases in which visibility analysis has been conducted in the field of Minoan art (Paliou et al., 2011; 2013). The results of the use of new media, such as graphs of pictorial elements (Günkel-Maschek, 2020, p. 197, 221), in combination with digital tools which enable

the recreation of decorated spaces (Paliou, 2013), emphasised that there are still many aspects of the paintings to be discussed.

Ultimately, a visibility analysis research similar to Paliou's, that explores the visual characteristics of the Knossian painted images and their role in defining the use of the palatial complex, has yet to be conducted. The current research aims to start filling this gap and to initiate a discussion around the painted decorations of Knossos as active elements of the built space (Letesson, 2014, p. 79). Re-contextualising the paintings in their original place, and studying them as 'built forms', unmovable and at the same time, modifiable, will enable us to represent the visual landscape of the users of the Knossian monument, rather than focusing on decoding the images and deciphering their meaning (Lawrence & Law, 1990, p. 454; Vavouranakis, 2013, p. 220, 226).

2.2 Visibility analysis: Theory and methods

Visibility is one of the most extensively explored concepts of Space Syntax, a corpus of theory and practices that analyses the relation of spatial configurations to humans and society (Hillier, 2014, p. 19; Wheatley, 2014, p. 119). Originally introduced in the 1970s by a team of architects at the University College of London (Hillier et al., 1976).

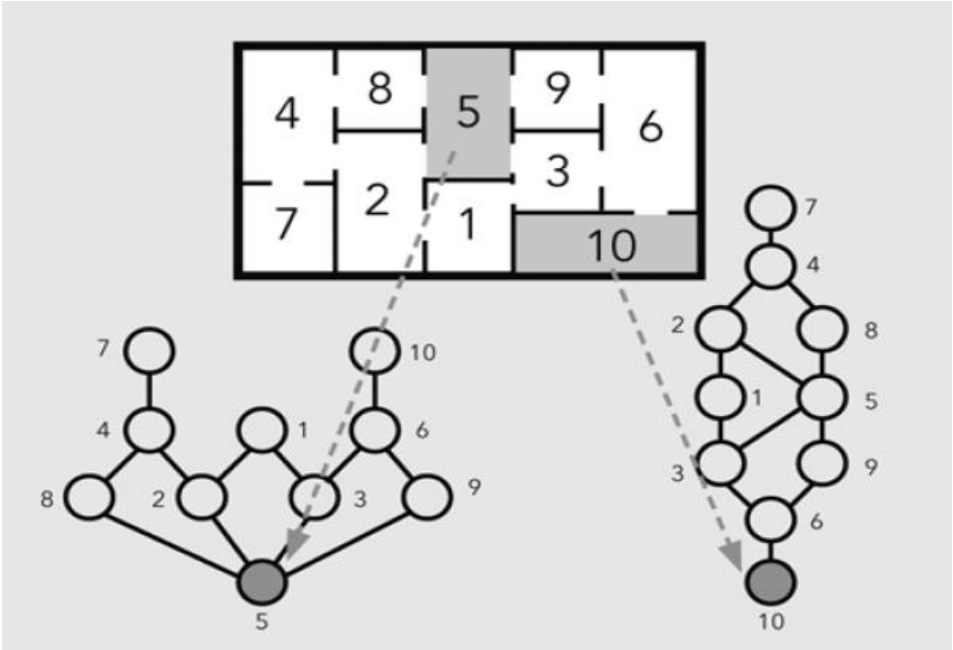

Figure 2.2.1 Plan of space and two distinct j-graphs representing the visual connections between rooms of the same space, from two different viewpoints, Room 5 and Room 10 (Hillier, 2014, p. 21, Figure 2).

Space Syntax theory has been pioneering in bridging the mathematical and physical dimensions of space, with patterns of human behaviour and interaction (Hillier et al., 1976, p. 149, 153). Matters of visual accessibility and segregation are essential in understanding the ways space enables or restricts human action. Therefore, visibility is considered central in quantifying the human perception of the attributes of space (Paliou, 2014, p. 92).

One of the first established methods for examining visibility is through isovist. The term 'isovist' was first introduced in the 1970s by the architect Tandy, and it is defined as the spatial area directly visible, from a set point within an environment (Turner et al., 2001, p. 103; Koutsolampros et al., 2019, p.3; van Nes & Yamu, 2021, p. 88). In isovist analysis, the components of space are visualised as polygons, known as grids, which are coloured according to whether they are visible or not from a set point of view in that space (Clark, 2007, p. 86).

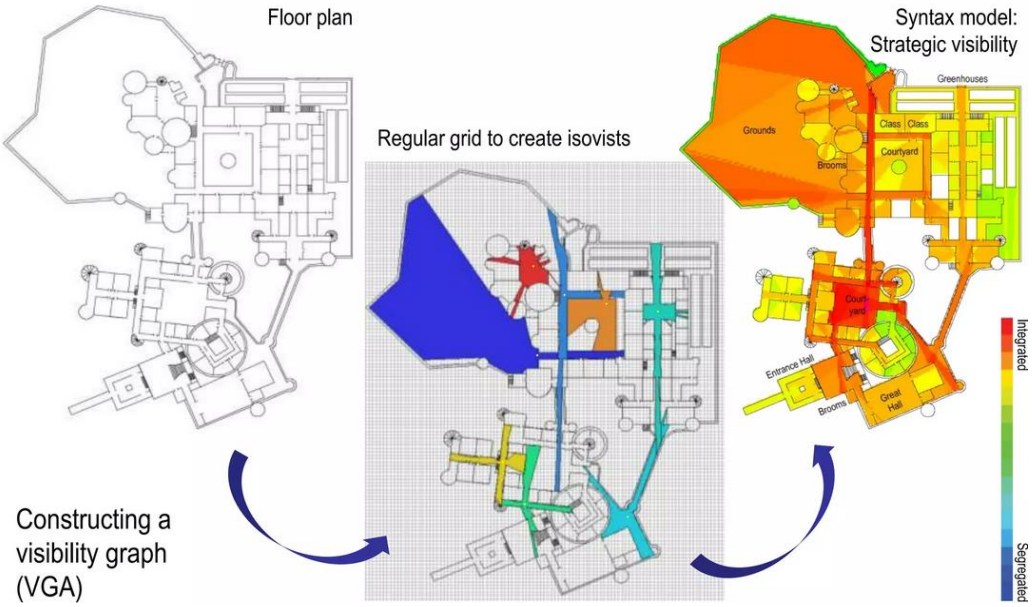

Figure 2.2.2 Representation of the different stages of visibility analysis in a 2-dimensional plan of a building (Sailer, 2016, Slide 13).

The methodology of using the isovist to create visibility graphs was developed by Michael Benedikt in 1979 (Turner et al., 2001, p. 103; Paliou, 2013, p. 1). In visibility graphs and moreover, in Visibility Graph Analysis (VGA), space is again represented in grids, but this time the visual connection of each grid to the others is visualised (Paliou

et al. 2011, p. 377). In the first years of research, the connections represented with VGA were initially defined in a justified graph (see Figure 2.2.1), also known as the j-graph; a tree-graph, with nodes that represent the spatial components and lines that signify their visual connection (Hillier, 2014, p.20-21, 25; Cho, 2022).

In more recent years, technological developments enabled the scientific community to design a tool that calculates and visualises the visual relationships described in the j-graph; 'Depthmap', and now known as 'depthmapX' (Koutsolampros et al., 2019). Initially established by Alasdair Turner, depthmapX was further developed by a team of researchers from the University of London and was rendered available as an open-source program in 2011 (depthmapX development team, 2017; UCL Space Syntax, n.d.). The software enables the user to perform a variety of analyses, both in built space and urban environments, through the spatial metrics that it incorporates (Koutsolampros et al., 2019, p. 3). The final product is a two-dimensional (2D) graph that visualises the outcome of the analysis in meaningful patterns using a scale of colours from red to blue (see Figure 2.2.2).

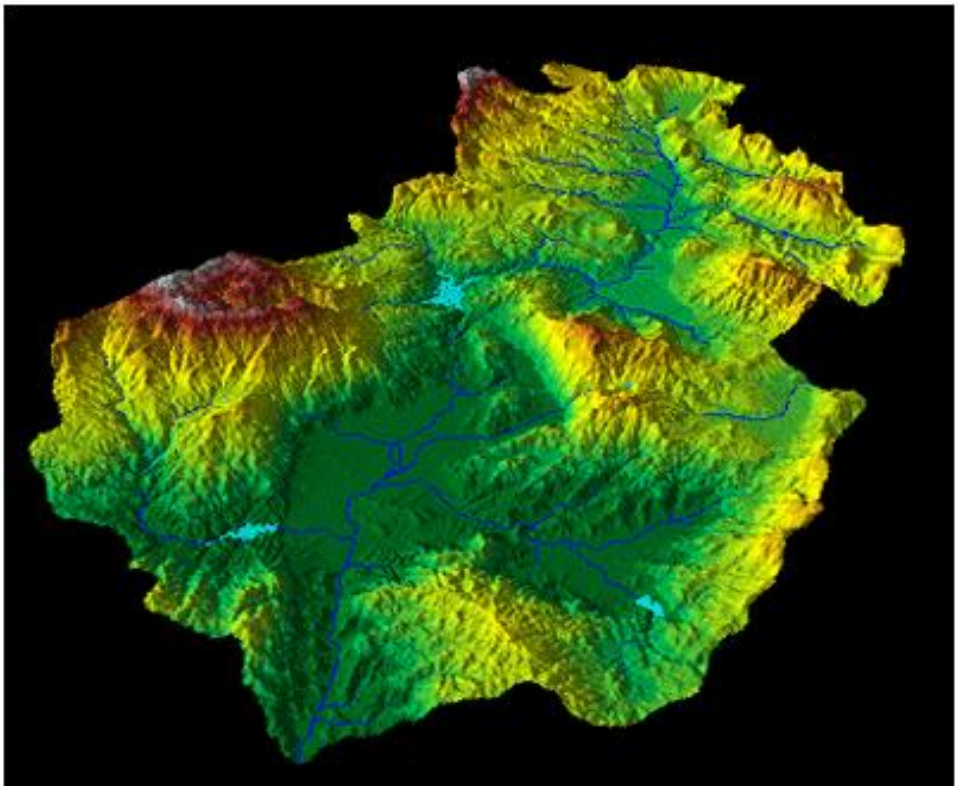

Figure 2.2.3 Visualization of the digital elevation model (DEM) of a geographical area. (ArcGIS, 2024, https://pro.arcgis.com/en/pro-app/latest/tool-reference/spatial-analyst/GUID-F7126CF0-5666-4C0C-976E-8F29FB7AE0AB-web.gif).

Recent advancements in the development of the Geographical Information System (GIS), a software that represents geographic information in a computational environment, enable the assessment of space both at a macro- and micro-scale level (Paliou et al., 2011, p.375; Gillings, 2017, p. 121; O'Sullivan & Turner, 2001, p. 221). The topographic characteristics of space are represented in a three-dimensional format, known as a digital elevation model (DEM) (see Figure 2.2.3). With the function 'lines-of-sight', (LOS) which calculates the visual integration through routes of connection, the visibility of built and natural elements of the environment can be assessed (European Environment Agency, 2024; Landeschi et al., 2016, p. 104). The analysis of the connection of multiple viewpoints in GIS is referred to as viewshed analysis and results in a colour-coded, three-dimensional (3D), interactive model that represents the visible and non-visible areas (see Figure 2.2.4) (ArcGIS Developers, 2024; O'Sullivan & Turner, 2001, p. 221).

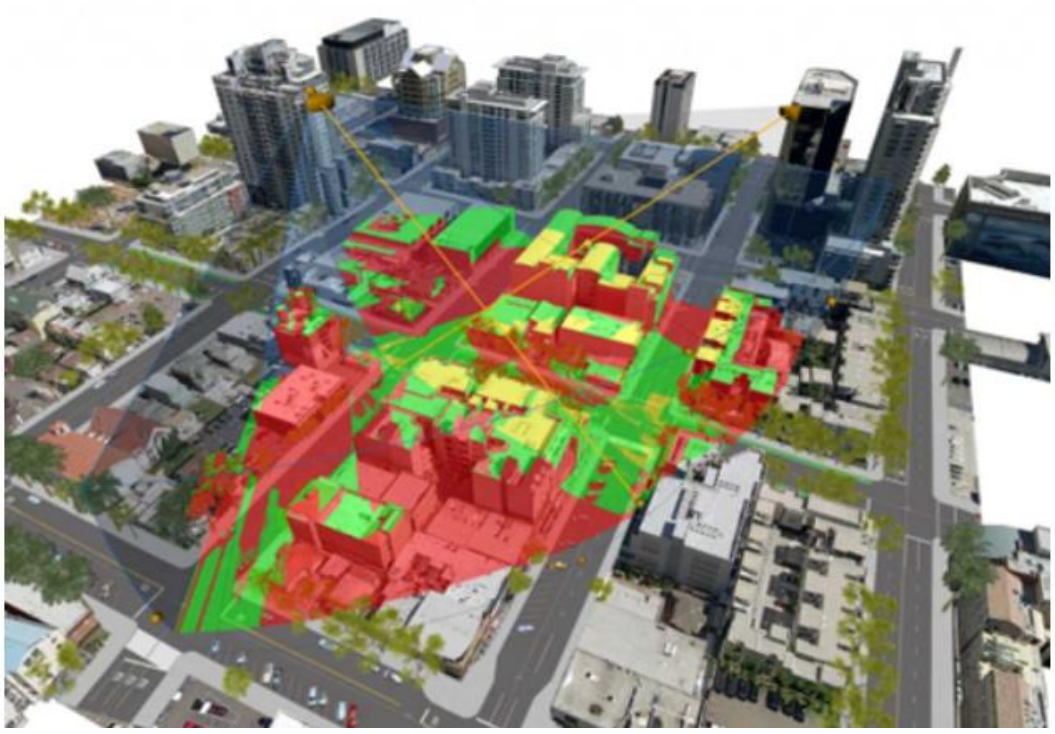

Figure 2.2.4 Example of viewshed analysis in a DEM model of an urban landscape, with LOS analysis from two different viewpoints in the environment of ArcGIS. (ArcGIS Developers, 2024).

2.3 Visibility analysis: Archaeological studies of interior space

In archaeology, visibility analysis studies flourished at the beginning of the 21st century (Turner et al., 2001, p. 105; Wheatley, 2014, p. 115; Paliou, 2013, p. 1). Aiming at understanding human perception and action within the past landscape, visibility studies have been put forward to answer questions about visual control, accessibility, connectivity, or segregation. Research was initiated both due to technological developments, like the introduction of GIS that enabled non-IT specialists to get involved with computational tools, and to the rise of phenomenological and experiential inquiries posed by modern archaeological theory (Gillings, 2017, p. 121-122; Katsianis et al., 2022, p. 540; Kalayci & Hacıgüzeller, 2023, p. 18-19; Wheatley, 2014, p. 116).

However, most of these studies focused on the exploration of the position of ancient monuments and sites on the macro-scale, within the larger frame of landscape and its components (Wheatley, 2014, p. 115). Only a few archaeological studies were concerned with visibility analysis on the micro-scale, in the context of a settlement, or the interior of a building (Landeschi et al., 2016; Paliou et al, 2011). In that matter, the work of David Clark on the visibility patterns of church buildings in Jordan, dating to the Byzantine period, has been pioneering (Clark, 2007; Paliou et al, 2011, p. 377). With the use of data from experimental research, Clarck was able to identify patterns of change in the visual accessibility of the spatial elements of churches (see Figure 2.3.1). Visual and spatial integration and/or segregation played a meaningful role in the conduction of Byzantine rituals, and the research of these patterns can highly contribute to the understanding of past societies (Clark, 2007, p. 88, 101-102).

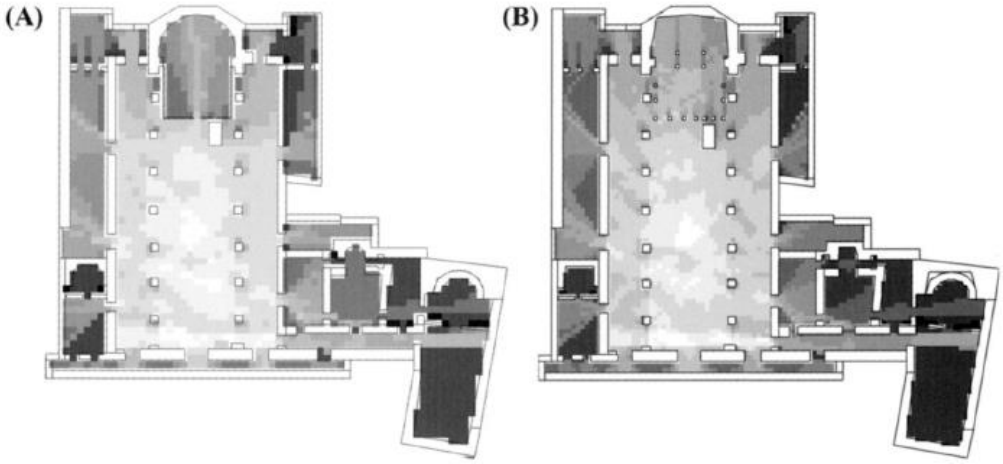

Figure 2.3.1 Visibility Graph Analysis of the. St Theodore church, in Jerash West, with and without chancel screen. (Clark, 2007, p. 98, Fig. 9).

Similarly, in the case of prehistoric Crete, the research of Quentin Letesson on the spatial characteristics of Minoan buildings, stresses both the challenges of using 2D models and the advantages of the method. Letesson explored the adoption of innovative architectural characteristics from the Early Minoan period, at the beginning of the Bronze Age, that soon developed into a norm during the Late Minoan period, also known as the Neopalatial (Letesson, 2014). The researcher used a variety of spatial analyses, like j-graphs, accessibility plans and VGA graphs to assess and compare the development of architectural elements of buildings through time (Letesson, 2014, p. 49, 56). This methodology enabled Letesson to study the 'Minoan architectural language', as he refers to it, while also underlying the restrictions of studying architecture as an unchanged 2D plan (Letesson, 2014, p. 78-79).

Therefore, early in the conduction of VGA in archaeological paradigms, scholars started to acknowledge the limits of the method to interpret the visual and even more, the multi-sensorial experience of human agents within a spatial environment (Turner et al. 2001, 108). Viewshed analysis in archaeology has often been limited to answering the 'in-view' or 'out-of-view' question, a practice criticised as the result of 'intellectual laziness' (Gillings, 2017, p. 122). Reaching a simple binary result of 'in' and 'out-of-view' should not be the end, but rather the starting point of the assessment of the archaeological space (Gillings, 2017, p. 127). As Gillings phrased it, and I quote: 'The challenge we face with viewshed analysis is to start doing something thought-provoking and stimulating with it…' (Gillings, 2017, p. 127).

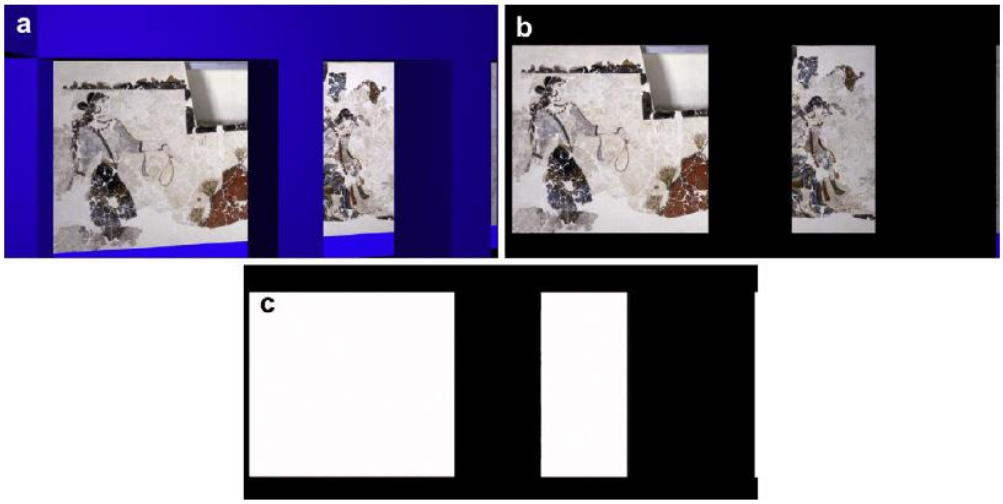

Figure 2.3.2 View of the reconstructed 3-d model of the Room 3 with the wall decoration of the 'Adorants' in the building of Xeste 3, settlement of Akrotiri, Thera. (Paliou et al., 2011, p. 380, fig. 7).

The transition from the 2D to a 3D environment, with the use of 3D GIS, has been considered as a way forward for archaeological visibility studies (Paliou et al., 2011, p. 377, 384; Piccoli, 2018, p. 77-80; Wheatley, 2014, p. 116, 119). Although the merging of GIS with 3D tools has been suggested early in the introduction of the first to the archaeological community, spatial studies and visibility analyses conducted on 3D maps are far rarer, than their 2D counterpart (Paliou, 2014, p. 94-95, 98; Landeschi, 2019, p. 18, 19; Landeschi et al., 2016). One of the main arguments of the supporters of 3D spatial studies is that important characteristics of the built environment like altitude and light, cannot be explored in the 2-dimension (Paliou, 2014, p. 91-93).

The research of Eleutheria Paliou on the 3D representation of vertical built elements indeed highlighted the many possibilities of this method (see Figure 2.3.2 & Figure 2.3.3) (Paliou et al., 2011). By illuminating the decorations in a 3D environment and extracting the lighter and darker areas of the images as textures, the researcher was able to identify which elements of the compositions were meant to be more, or less visible by the passersby (Paliou et al., 2011, p. 251; Piccoli, 2018, p. 79).

3D GIS has also been used by the University of Lund and the Institute for Technologies Applied to Cultural Heritage in Rome (ITABC) to investigate the visibility of two study cases of wall paintings from the house of Caecilius Iucundus in Pompeii (Landeschi et al., 2016; Piccoli, 2018, p. 78). The researchers investigated the spatial configuration of a graffiti with the Roman alphabet and a fresco with an erotic scene, represented in 3D, using ArcGIS and the function of lines-of-sight (LOS) (Landeschi et al., 2016, p. 104). By creating frequency maps that resulted from multiple observation points, the researchers were able not only to assess the degree of visibility of the two cases, but also to determine certain conditions of the visual experience of the images, like how the erotic fresco was meant to be experienced by the passersby (Landeschi et al., 2016, p. 108, 111).

Figure 2.3.3 View of the 'times-seen maps' calculated using the 3D model of the Room 3 with the wall decoration of the 'Adorants' in the building of Xeste 3, settlement of Akrotiri, Thera. (Paliou et al., 2011, p. 380, fig. 7).

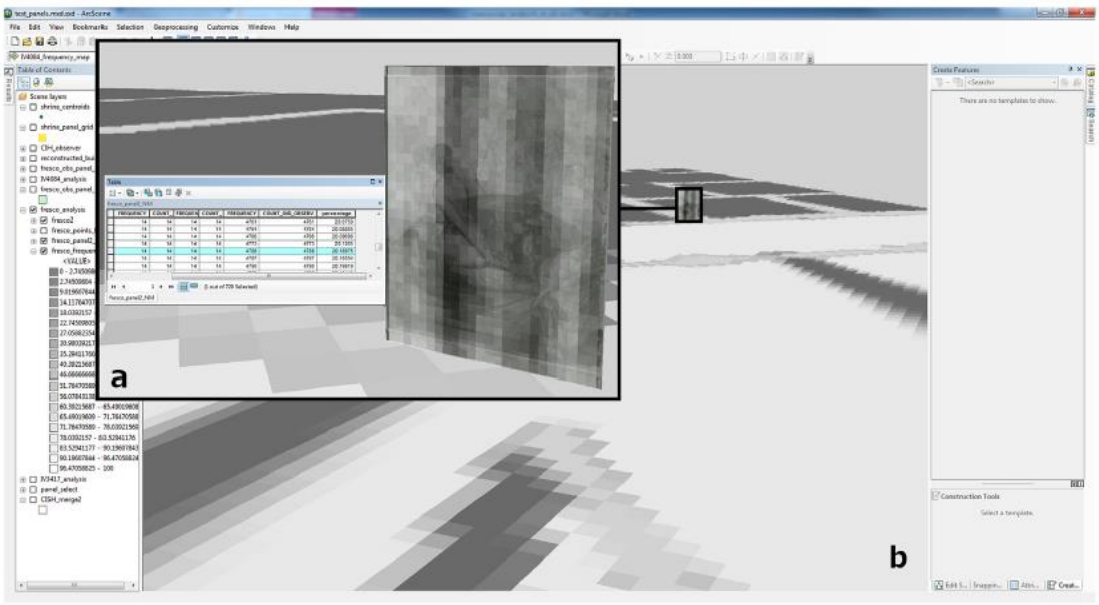

Figure 2.3.4 Result of the 'lines-of-sight' analysis performed on the wall decoration of the erotic fresco, north portico of the house of Caecilius Iucundus in Pompeii, ArcGIS. (Landeschi et al., 2016, p. 112, fig.13).

Previous research on 3D representations of the Knossian complex and the wall paintings has been conducted within the limits of academic studies, such as the post-doctoral dissertation of Ute Günkel-Maschek (2020) and are not available for further research. Other generic models of the complex have been reconstructed mainly for tourist purposes, as in the case of the DigiPast Knossos (KNOSSOS, n.d.). Therefore, the creation of a new 3D model of the complex was a vital step for the conduction of my research. Ultimately, both the 2D plans and the 3D models functioned as the main analytical tools to satisfy the scope of this thesis; the study of the painted plaster decorations as an integral part of the Knossos palatial landscape.

3. Theoretical background

3.1 The agency of the built environment and the 'artscape'

The past treatment of the prehistoric wall decorations of Knossos as passive elements of space has its roots in a deeper philosophical notion around society, built environment and its components, that views the latter solely as the materialised forms of the first (Hillier, 2008, p. 223; 2014, p. 20, 45; Lawrence & Law, 1990, p. 466). The term itself, 'built environment', implies the active involvement of humans with space that results in its modification with the creation of movable and immovable structures (Lawrence & Law, 1990, p.454). Notably, this notion culminated in viewing space as the plain outcome of economic, political and social dynamics, driven by human interest. Although this view of the environment has been contested, the discussion on the definition of the 'built environment' and its relation to humans has been a long one (Rapaport, 1990; Archer, 2005, p. 430).

The body of literature on the built environment in the 19th century underlined the material restraints and the social connotations behind the different architectural forms and designs. Built space was thought to have been moulded by the availability of material resources and by norms that defined social relations and politics. Therefore, human-made structures aim to cover the needs, practical and ideological, of the society that produced them, and ultimately, to retain the society itself (Lawrence & Law, 1990, p. 457-458). This functionalist explanation of space was criticised later, as it reduced humans' role in shaping their environment, to the plain act of reproducing societal dogmas imposed by existing architecture (Giddens, 1986, p. 2).

It was the psychologist and architect, Amos Rapaport, who argued that apart from technological and social factors, distinct cultural factors that attribute meaning, should also be considered when analysing built space (Rapaport, 1990, p.13-14). In particular, the researcher viewed architectural differences throughout human history, as the amalgamation of multiple factors, highlighting the importance of historical phenomena in the creation of built environments (Lawrence & Law, 1990, p. 460-461). By recognising the uniqueness of built forms due to the historical factors that

produced them, a less deterministic background was set that left space for human agency to explain changes through time (Lawrence & Law, 1990, p. 469).

Pierre Bourdieu's 'habitus', the internalised social rules and habits that constitute a person's identity and actions, and Antony Giddens's theory of 'structuration', which describes the environment as the outcome of repetitive social activities, greatly influenced the work of social scientists (Giddens, 1986, p. 25-26, 202; Bourdieu, 1977, p. 18, 82-83; Archer, 2005, p. 431). Reciprocally, Bill Hillier and Julienne Hanson (Hillier & Hanson, 1984; Hillier, 2014), claimed that structures are built to accommodate human actions and routines, but at the same time activity is shaped by the environment in which it takes place (Hillier, 2014, p. 45). They also underlined the importance of opposites, such as that of 'host-guest', and 'insider-outsider' established by the built environment, in shaping human relationships and identities (Lawrence & Law, 1990, p. 460, 471).

Ultimately, by highlighting the importance of repetitive actions in attributing meaning to space, these concepts contributed greatly to the theory of the built environment, by connecting space with the notion of time (Giddens, 1986, p. 202-203, 297-298). However, it is not only the everyday activities, one-time events and ritualistic performances that act as media of meaning, but also, the aftermath of these actions in human memory (Lawrence & Law, 1990, p. 474-475).

The effect of time and human experiences on the use of built space is discussed thoroughly by the anthropologist Tim Ingold (2000). Motivated by the principles of phenomenology on the agency of the environment, and of environmental psychology, which examines the ways that the spatial habitat furnishes human behaviour, Ingold introduced the term 'taskscape'; by this term, he referred to the actively and continuously forming environment that we humans not only live in but are part of (Sailer & Psathiti, 2017, p. 1-2; Ingold, 2000, p.173). Originating from the word 'landscape', the taskscape is the space where, and with which humans dwell in their daily lives (Ingold, 2000, p.189, 191). With this theory, the anthropologist managed to find an escape from the quarrel on who has the most 'agency' over the other, humans

or the environment, as he highlighted that both are constantly in a process of mutual interrelation, changing and recreation (Ingold, 2000, p.172, 191).

Seeing the built environment as a taskscape recognises its historicity and temporality; the fact that it is formed through periodical actions and events, taking place in specific spaces and acted by specific people (Ingold, 2000, p.194-195). Ultimately, viewing the built environment as a taskscape recognises its ability to house at the same time multiple actors, activities, and perceptions, and renders it not only temporal, but also multi-perspective. The significance of taking into account the existence of different perceptions of the same space has been underlined by Doreen Massey, a geographer and researcher of social space (Massey, 1994; Archer, 2005, p. 432). By describing a personal experience, a visit to an art gallery, Massey pinpoints that elements of space, in this case the art pieces, were perceived very differently by her and her then colleagues and had even a lasting effect on her that could surpass the walls of the gallery (Massey, 1994, p. 186).

Back to this thesis's study case, wall decorations can be considered a unique element of the built environment as they are both part of the three-dimensional, immobile space, while as two-dimensional objects, they can be easily modified (Lawrence & Law, 1990, p. 454, 468; Paliou et al., 2011, p. 379). Within the theory of the taskscape, as explored by Ingold, I would like to propose that the wall decorations should be viewed as another kind of 'scape', the 'artscape'. The term has also been employed in modern art and urban studies, describing how art pieces should be viewed as an active part of contemporary city landscapes (Hawkins, 2017; Hingley, 2023).

Accordingly, by deploying the 'artscape' in my research, I wish to explore wall decorations as active elements of space that played a significant role in the patterns of everyday life and the perception of the landscape of the Knossian complex. The artscape, just like the taskscape, is not a finished product of human agency, but rather a space where art, architectural elements, other objects, and animate things, contemplate and forge their meaning, role and identities. Within this scope, the perception of images, buildings, other humans and everyday life are rendered as constantly under formation.

4. Methodology

4.1 Visibility analysis in decorated space

Visibility analysis was conducted first in the 2D model of the rooms with the use of depthmapX, and then in the 3D models, with the use of Blender and ArcGIS. I decided to proceed first with the creation of the 2D model, in order to assess the floor plans by Sinclair Hood and William Taylor (Hood & Taylor, 1981), and to better grasp the architectural landscape that needs to be represented both for the analysis in depthmapX, and in the 3D computational environment. In both cases, the analysis focuses on whether the wall decorations of the West Entrance and the Throne Room were situated in visually accessible, or segregated places according to different viewpoints inside, and outside of the rooms. Moreover, both the decorative compositions as a whole, and their individual pictorial elements are examined to pinpoint whether there was a visual differentiation between them.

4.1.1 Two-dimensional Visibility Analysis: Steps and metrics

To conduct the 2D analysis and integrate the floor plans into depthmapX, I had to convert them from PDF format into DXF, a format that is recognizable by the software and better suited for the visibility analysis (SourceCAD, 2022). For that reason, I imported the PDF plan in Inkscape, an open access software that allows the editing of graphic designs, and I used the function of 'Trace bitmap' to convert into a DXF (see Figure 4.1.1).

Consequently, I decided to crop the plan into two distinct plans, to be able to focus on the two spaces of interest. The two floor plans were further edited in AutoCAD 2025, another graphic design software, that is available for free to students through the student licence version. In AutoCAD, elements like the outline of paved floors and dotted lines representing non surely identified structures, were removed, producing a more distinct image of the spatial characteristics of space (see Figure 4.1.2). The removal was necessary, because these elements would have been recognized as visual obstacles from the software of depthmapX.

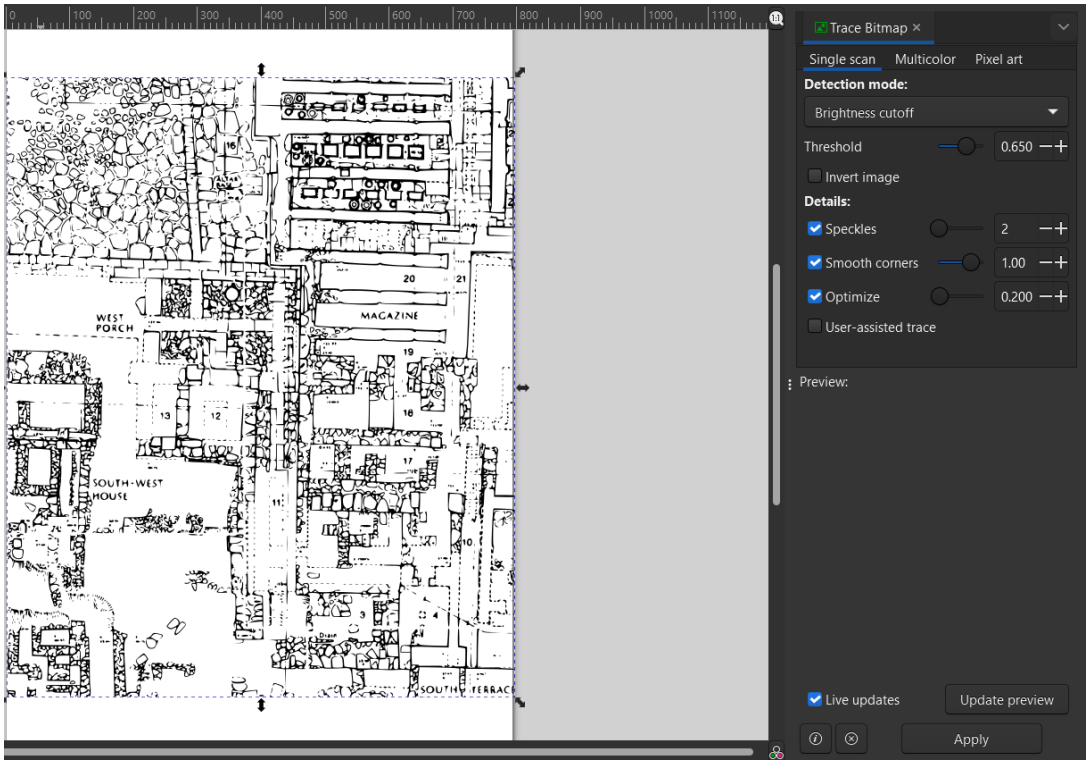

Figure 4.1.1 Processing of the pdf file of the West Entrance of Knossos, to convert it into a .dxf file using Inkscape. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

The plans were then imported into depthmapX, where firstly, the grid of the analysis had to be set. In both plans, I chose to follow the default 10,000 grid, which is adjusted automatically according to the size of the plan, to achieve a relatively fast analysis (Turner, 2004, p. 9). Analysis with a 0,02 grid, which represents approximately the human scale (Pinelo & Turner, 2010, p. 16), was also put to testing, but not chosen for two reasons; firstly, it was very time consuming (approx. 3 hours per plan), for the range of different analyses of the two study cases and most importantly, the final results were similar to the higher grid. Ultimately, the grid does not affect the visibility analysis itself, as the software calculates the connectivity between location points, and thus, the grid only determines the configuration of the 2D plan (Turner, 2004, p. 9).

Having set the grid, I filled in the areas to be analysed (see Figure 4.1.2) and proceeded with the conduction of the first basic metrics of visual analysis; the connectivity, point first moment, and point second moment (Turner, 2004, p. 27).

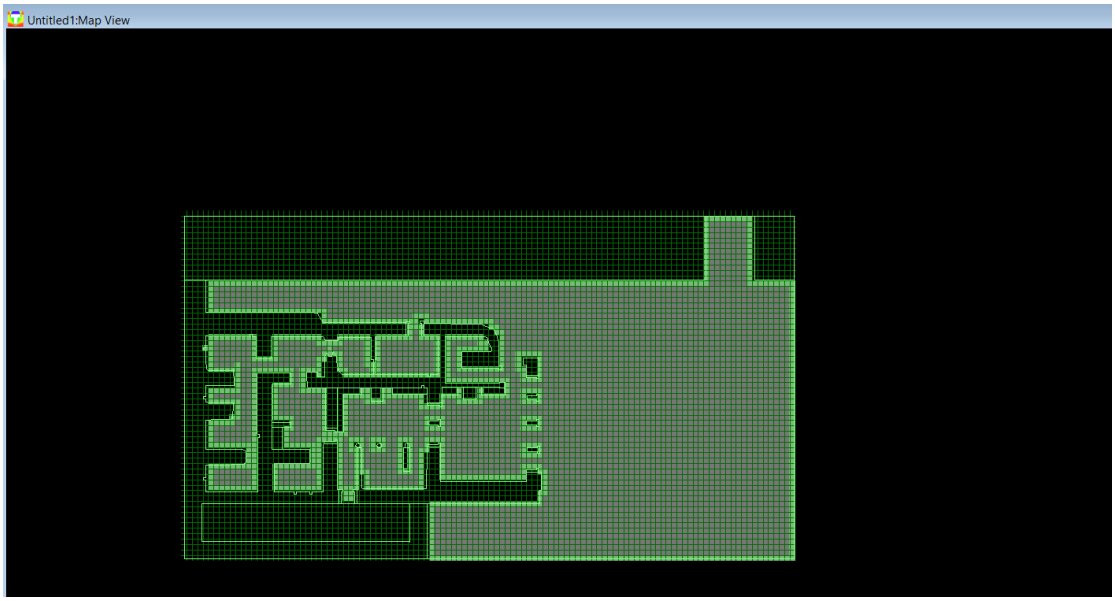

Figure 4.1.2 Processing of the dxf file of the plan of the Throne Room of Knossos, by setting and filling the grid to conduct the visibility analysis, in depthmapX (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Connectivity calculates the shortest distance between each grid, and therefore highlights which areas are more, or less easily accessible from the viewpoint of one person standing in the space (Koutsolampros et al., 2019, p. 5). The metrics of point first and point second moment visualise the first and the second area of each grid that is covered when trying to spin outwards from the centre of the grid (Koutsolampros et al., 2019, p. 6). These metrics are calculated by comparing the distance of the spin from each grid to all the others; this is useful in the case of elongated spaces and closed passageways, as the movement is restricted and therefore, the distance from each grid is smaller, resulting in higher visibility (Koutsolampros et al., 2019, p. 6).

To proceed with a more detailed analysis, I selected the function of 'Run Visibility graph analysis' from the Visibility Analysis tool, which conducts the analysis of visual integration and isovist area (Turner, 2004, p. 10). These two metrics were assessed on a global scale with 'n' number of radius, which enables the analysis of the effect of

each individual value to the others (see Figure 4.1.3) (Koutsolampros et al., 2019, p. 8; Turner, 2004, p. 11, 25). Subsequently, visual integration represents the degree of accessibility from all points to each other and is considered as the metric that quantifies the viewpoint of people within a space (Turner, 2004, p. 14). Spaces with high visual integration are the places where people can view and reach each other more easily, whereas low integration translates into places that are far away from the scope of most people.

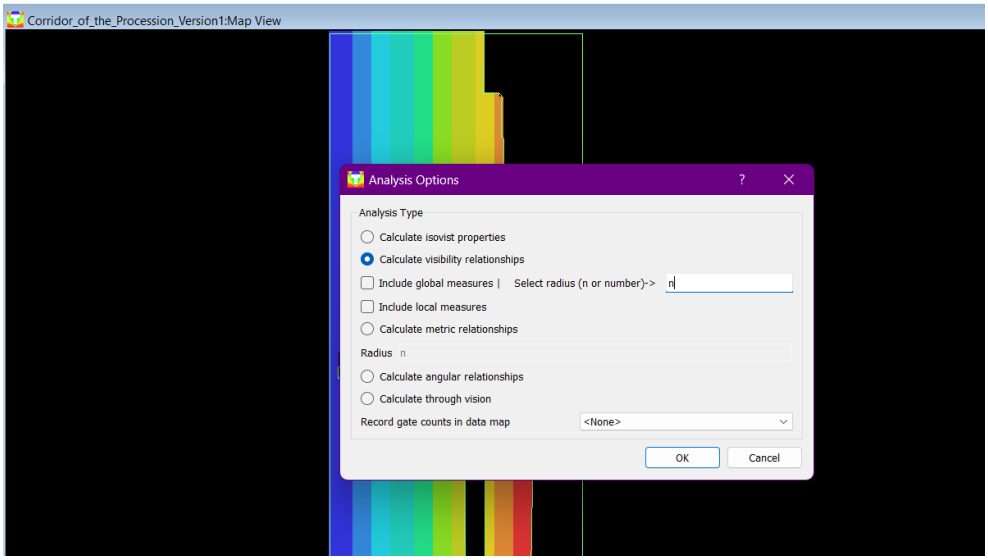

Figure 4.1.3 Conduction of the visibility graph analysis tool in a 2-dimensional plan of the West Entrance, palatial complex of Knossos, in depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

The metric of isovist area is similar to that of connectivity as it also focuses on the isovists and it produced identical results in both case studies (Koutsolampros et al., 2019, p. 5). More specifically, isovist area calculates the area of each grid that is visible from a specific point. If we consider visual integration as the 'viewpoint' of all the people in a set space towards each other, the isovist area represents the viewpoint of one person to all the others. Both metrics were tested as visual integration aids in determining the overall visual connectivity of the decorated space, while with isovist area, only the part of the decorated space visible from a single spot is expressed.

4.1.2 Three-dimensional Visibility Analysis: Steps and metrics

In the case of the 3D analysis, I designed schematic models representing the architectural elements of the two study cases within the palatial complex, using Blender (version 3.6), an open-access, 3D software tool (CG Fast Track, 2022). First, I imported the floor plan of the whole palatial structure as a PNG image into Blender, after enabling the Add-On 'Import-Export: Import Images as Planes' from the Edit Menu (see Figure 4.1.4), and then I proceeded to scale the image according to the scale of the plan, for my model to have the original dimensions of the Knossian complex (4D Research Lab, 2022).

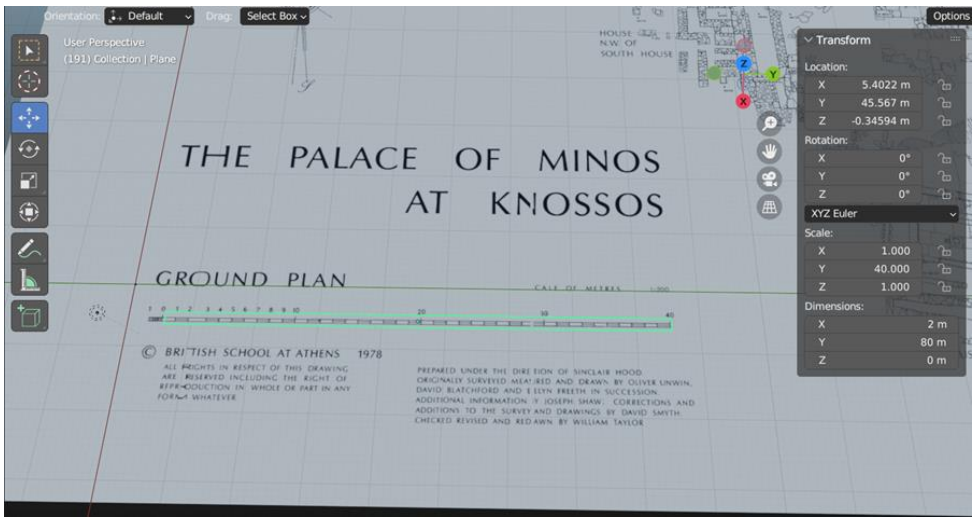

Figure 4.1.4 Importing and scaling the image of the plan of Knossos as a plane, in Blender 3.6. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

The next step was the modelling itself, which was conducted by using different types of meshes, mostly planes and cubes (see Figure 4.1.5). To specify, I chose to model each case study separately and create different reconstructions that represented the cases schematically, instead of realistically (Piccoli, 2018, p. 87). The end result was the creation of two 3D. blend files, under 2.000 KB, which were easier to load and assess in the GIS environment.

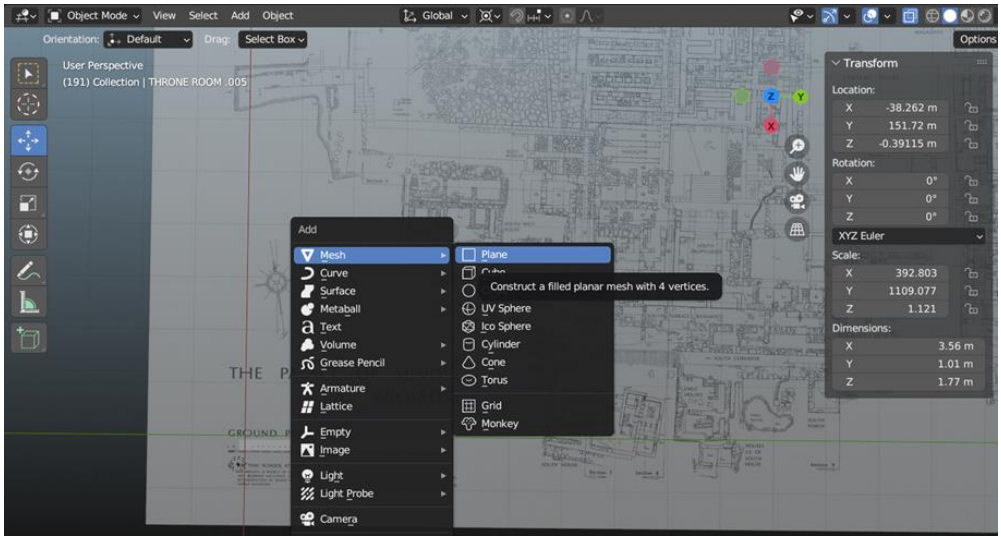

Figure 4.1.5 Adding meshes to create 3D models of study cases of the Knossian complex, in Blender 3.6. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

In order to achieve representational validity as much as possible, I made use of the available data of a plethora of resources (for full catalogue see Appendix D), mainly sketches (see Figure 4.1.6), and pictures from publications (Evans, 1920, 1928, 1930, 1935; Cameron, 1976; Hood, 2005; Galanakis et al., 2017; Günkel-Maschek, 2020). Due to the ambiguity of the monument's present state, one of the main principles of my 3D reconstructions was to represent the study cases closest to the state that they were found, by consulting the photographic record of the Knossos excavation available online in the Digital Collection of the British Library at Athens (BSA Digital Collections, 2024).

Figure 4.1.6 Use of sketch of the West Entrance indicating the position of the painted plaster decoration of the West Porch in the 3D reconstruction using Blender 3.6. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan, Cameron, 1976, Plate 80, Figure B.& Plate 145, Figure B).

Another important convention in my 3D models is that decoration with no surviving fragments or other visual documentation, was not represented. For example, Evans attests the existence of fallen painted fragments inside the West Porch (Evans, 1928, p. 675). However, these fragments remain unidentified, with no relevant photographs, or sketches (Cameron, 1976, p. 673-675). Where plain colour was attested, such as in the case of the floor of the main room of the Throne Room complex, it was also deliberately left out of the 3D models, due to lack of detailed documentation and my research's focus on figurative painted images (Evans, 1935, p. 903).

In general, to model the decoration, I used either pictures of the fragments of the painted plaster wall decorations, or in some cases, the sketches themselves. The decorations were added to the models under the category 'Image as plane' and were scaled to their original dimensions (see Figure 4.1.7).

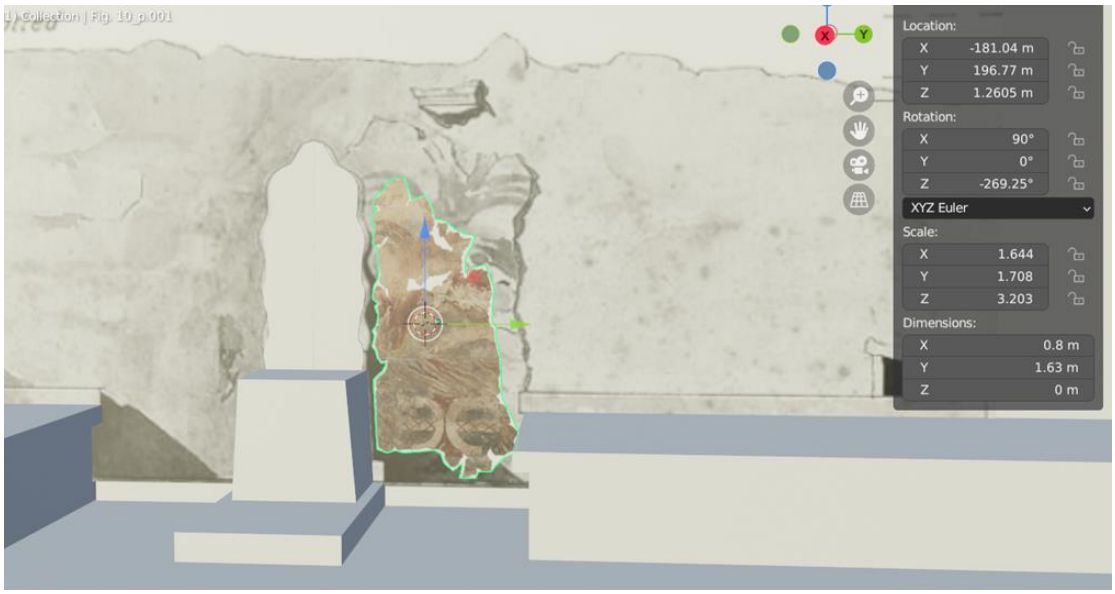

Figure 4.1.7 Adding the image of the painted plaster decoration of the north wall of the main room of the Throne room complex in the 3D reconstruction using Blender 3.6. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan, Galanakis et al., 2017, p. 54, Figure 8 & p. 55, Figure 10c).

To set the real coordinates of the representation of the two study cases as 3D models, I used a Blender add-on tool, Blender GIS (see Figure 4.1.8). This tool enabled me to load a basemap with the coordinates and imagery of Google Satellites in the environment of Blender (*How to Create 3D Buildings in Blender and Import into ArcGIS Pro—YouTube*, n.d).

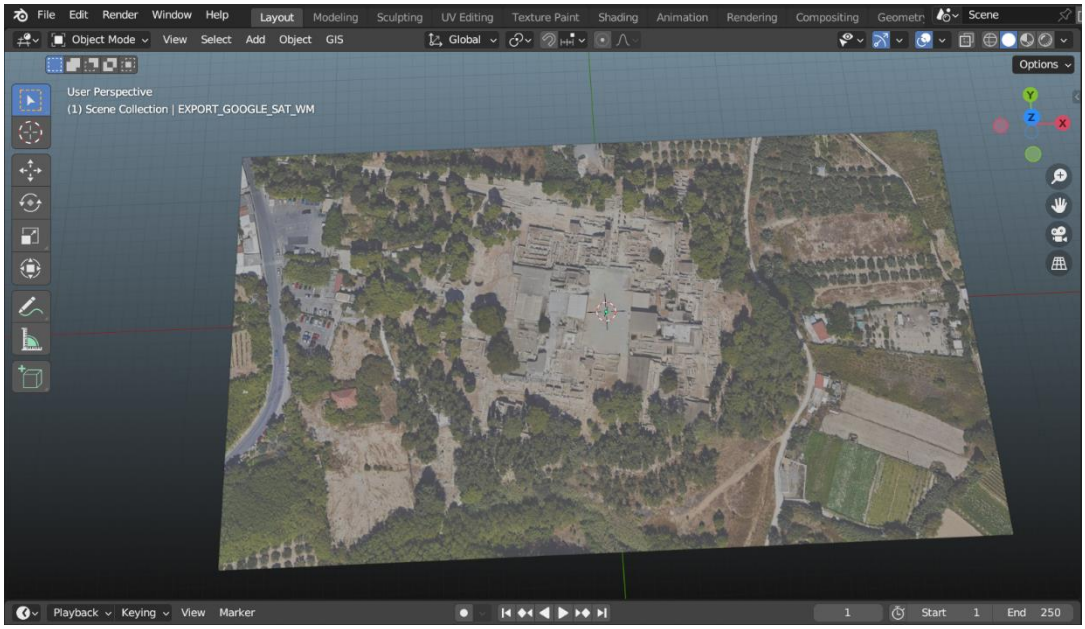

Figure 4.1.8 Detail of the basemap of Google Satellite, zoomed in the palatial complex of Knossos, from the GIS add-on tool in Blender 3.6. (Figure: V. Georgiopoulou).

After adding the Knossos basemap, I zoomed in to create a smaller map and adjusted the 3D models to align with the real building. For the next steps in ArcGIS Pro, I selected the 3D model, without the images of the decoration and exported it as Wavefront Object files (.obj), a file type recognisable in the 3D GIS environment (*Import 3D Files (3D Analyst)—ArcGIS Pro | Documentation*, n.d.).

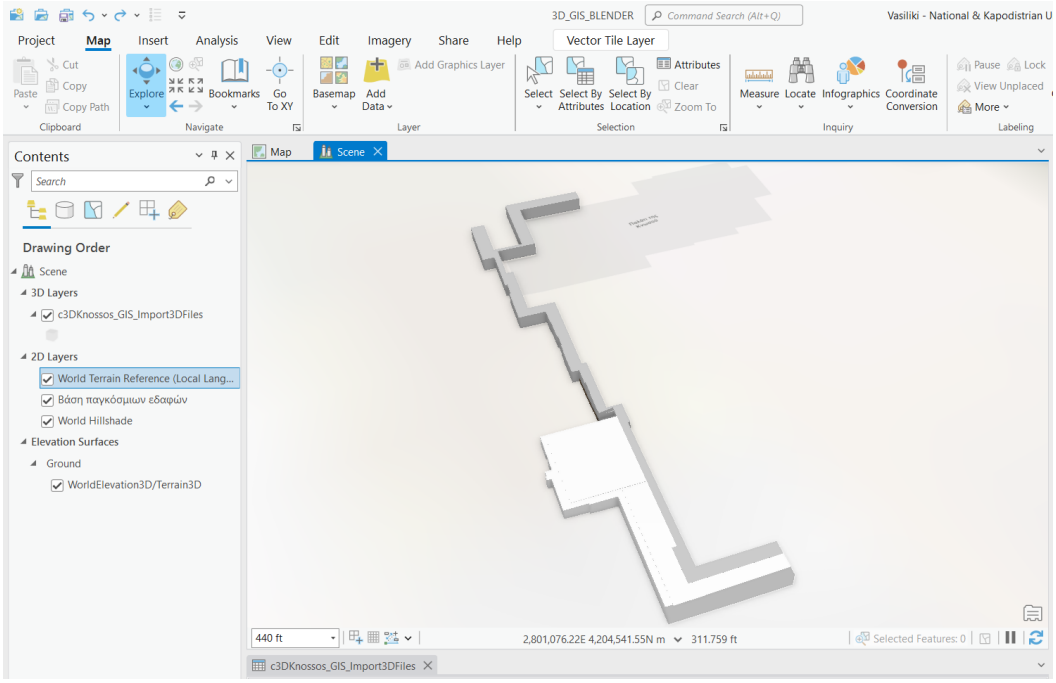

Figure 4.1.9 View of the 3D model reconstruction of the West Entrance complex imported as .obj in ArcGIS Local Scene. Adjusting the position of the model. (Figure: V. Georgiopoulou, ArcGIS Pro).

Subsequently, I used ArcGIS, a geographic information software, that although not open source, offers advanced tools for the conduction of visibility analysis in a 3D environment. ArcGIS enabled the recreation of the geographical anaglyph of the feature's location and could, therefore, analyse visibility under real-life conditions, like the elevation of the ground and the sunlight (Paliou, 2014, p. 94-95). Firstly, I opened a new project in ArcGIS Local Scene, and I imported the .obj files through the 'Import 3D Files (3D Analyst)' tool. The exact location of the model had to be adjusted accordingly to ensure its exact location (see Figure 4.1.9), while I also had to add the images of the decorations manually as textures with the 'Multipatch texture' tool (see Figure 4.1.10).

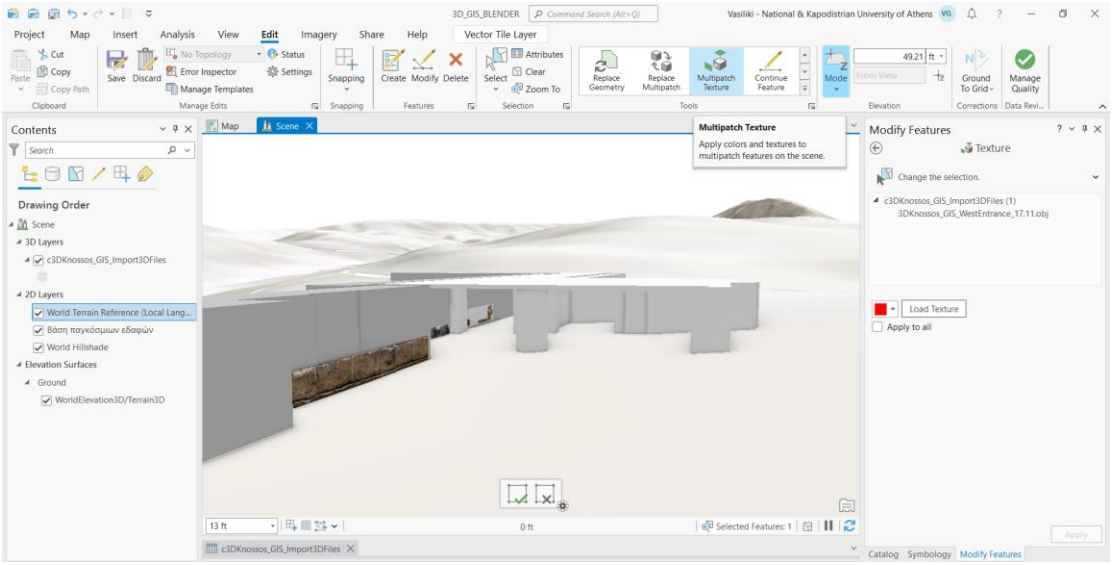

Figure 4.1.10 View of the 3D model reconstruction of the West Entrance complex imported as .obj in ArcGIS Local Scene. Adding the images of the painted plaster decoration as textures. (Figure: V. Georgiopoulou, ArcGIS Pro).

To conduct the visibility analysis in 3D GIS, I first tested the workflow developed from Lund University in collaboration with the Institute for Technologies Applied to Cultural Heritage (ITABC), with the Line-of-sight (LOS) function (Landeschi et al., 2016). LOS is available in the 3D Analyst Tools of ArcGIS Pro and examines the visual connection between an observer and a target point. I assembled two layers composed of points; the target layer, which represented the surface of the painted plaster decoration under investigation, and the observer layer, which stood for the points from where the visual accessibility is assessed. However, in that case the area of the observers'

layer had to be limited to a specific number of points, or else a very 'heavy', non-interoperable 3D GIS file was created (see Figure 4.1.11) (Landeschi et al., 2016, p. 105).

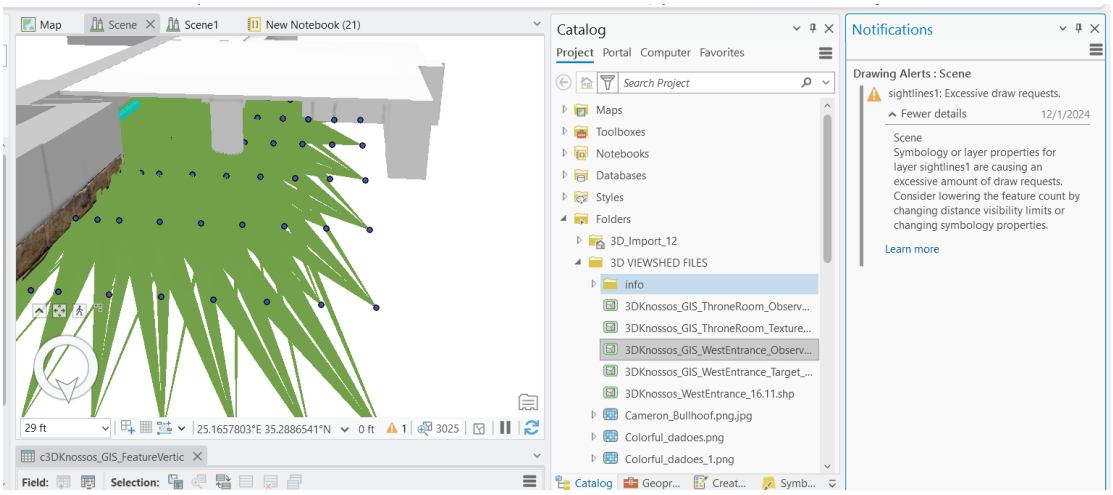

Figure 4.1.11 View of the conduction of Lines-of-sight in ArcGIS Local Scene, with point layers and scripted Arcpy code. The notification pane describes the problem raised from the number of points and information to be processed for the visual analysis. (Figure: V. Georgiopoulou, ArcGIS Pro).

Aiming for a detailed analysis of the decorations, each square of the grid of the target points measured 0.20 cm, while the observers' grid was made less dense, about 1 m. I formed the grids of the targets and observer points firstly in Blender, saving only the planes of the images as shapefiles of polygon layers, after I had subdivided them to the dimensions. The shapefiles were then imported into the ArcGIS project and were further assessed with the tool 'Feature Vertices to Points', which created a point layer from all the vertices of the grid. I manually adjusted the new point layer to the exact position of the painted wall decorations in the 3D models. I followed the same procedure for the grid of the observers' point layer and chose to place it at a height of 1.65 m. from the surface of the ground, as an average human height, also used in other visibility analysis research (Landeschi et al., 2016).

To conduct the Line-of-sight analysis, I first had to create a raster feature to use as the surface of the targets' layer, and the sightlines that extended from the observers' to the targets' layers. I used the 'Point to Raster' tool, with the targets' point layer as the input for the raster feature. For the sightlines, I decided to write a Python code to run

in the subsequent ArcGIS Notebook for Arcpy (see Appendix F). The code was composed with the aid and instructions of ChatGPT, by Open AI (Open AI, 2024). After the sightlines were in position, I used the LOS function, by filling the input fields respectively. The outcome of the LOS analysis, a set of lines connecting each observer point to the target, signifies the 'lines' of visibility using green for the visual accessibility, and red for no visibility.

To further assess the 3D models, I took advantage of the existing tools in ArcGIS Pro and performed the viewshed analysis using the 'Exploratory 3D Analysis'. This function is immediately accessible through the 'Analysis' menu and offers a variety of visibility analysis options. From the available tools, I used the 'Viewshed analysis', which is suitable for examining large areas of spatial information, without lacking the ability to visualise details of the analysis on an interior space. In particular, I first placed the observers' points according to the areas of interest, either using the 'Interactive placement' option, or with the 'Placement from Camera' option; four points were allowed per version, due to restrictions of the analysis (see Figure 4.1.12). I also took into consideration the existence of unmovable features, like the benches in the case of the Throne Room complex and set an observing target from a sitting position.

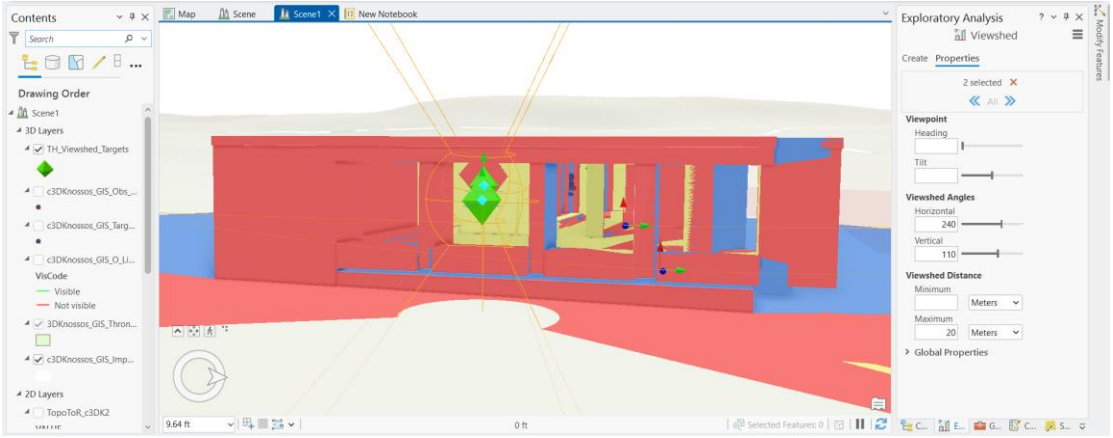

Figure 4.1.12 View of the conduction of Exploratory Viewshed Analysis in the 3D model of the Throne Room complex. Green points as observer targets, while the visible, multiple coverage and no visible areas are represented by the red, yellow and blue colours, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Both options allowed me to manipulate easily both the height of the observers' target; to be specific, I placed the targets to a range of 1.60 m to 1.80 m. from the surface of the ground, according to the average human height, while, regarding the direction and angle of the projected area, I set them according to the human peripheral vision limits, to 214° degrees horizontally and to 135° degrees vertically, respectively (Strasburger et al., 2024). For the final adjustments, I set the sightlines from 20 m, up to 40 m, since the limit of human vision reaches up to 4.800 m, based on the horizon limit (Rand et al., 2011). After the analysis was completed, I saved the viewshed points as a feature, to be able to reuse them, with the subsequent creation method, 'From a layer', to reapply the analysis (see Figure 4.1.13).

Figure 4.1.13 View of the observer points saved as a layer for the conduction of Exploratory Viewshed Analysis in the 3D model of the West Entrance complex. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Finally, to better understand the results of the viewshed analysis in the 3D environment of ArcGIS Pro, I decided to create attribute tables signifying the degree of visibility based on the colour assigned to each painted plaster decoration under examination (see Appendix E, Figure E86 & E87). For this reason, I conducted the analysis per version, from all the observer points, to analyse the percentage of visibility per decorated wall for each study case. Notably, I used a value of '2' for the areas represented in yellow, with multiple coverage, a value of '1.5' for the areas ½ red, ½ yellow, '1' for the areas in red, '0.5' for the decoration half in red and half in blue, '0.25' for the features which were covered ¾ by blue, and only a ¼ by red, and finally, a value of 0 for the areas fully in blue, with no visibility.

5.Analysis & results

5.1 Chronological and architectural placement

Traces of destruction and reconstruction point to the long history of the palatial complex of Knossos. A large part of the architecture and the wall decorations of the complex that survive in the present day are attributed to the series of renovations that took place in the 16th century, from the Late Minoan IA to IB (see Appendix B) (MacDonald, 2005, p. 89, 91; Poursat, 2022, p. 345). This period coincides with the seismic aftermath of the volcanic eruption at Thera, an island in the southern Aegean, north of Crete. Although the structure must have suffered serious damages, especially in the South Wing, the rebuilding works resulted in the most imposing structure of the long genealogy of the Knossian palace (MacDonald, 2005, p. 90-91, 192-193).

Figure 5.1.1 View of the West façade from the southwest corner of the West Court with the original foundations visible, Knossos palatial complex. (Ephorate of Antiquities of Heraklion. (n.d.) https://knossospalace.gr/map?readPoiId=12).

It is towards the end of this period, from the Late Minoan IB to the Late Minoan II, that the two study cases of the present analysis, the West Entrance and the Throne Room complex, were re-decorated in the West Wing (Hood, 2005, p. 55; Poursat, 2022, p. 345; Immerwahr, 1990, p. 164). The West Wing was housing the storage area of the complex, as well as spaces of ritualistic function and a substantial archive of written records on its upper floor (Evans, 1899; Driessen & Langohr, 2007, p. 179). Built on

top of the previous monumental foundations of gypsum blocks, the West facade (see Figure 5.1.1), which was facing the Knossian settlement, is believed to have been the most impressive one, acting as a visual benchmark for the whole monument (Palyvou, 2004, p. 215; MacDonald, 2005, p. 91-93; Letesson & Vansteenhuyse, 2007, p. 100).

5.2 Case Study: The West Entrance

5.2.1 Architectural space and decoration

Connecting the open space of the West Court with the western and southern part of the palatial complex (see Figure 5.2.1), the West Entrance acted as a gateway between the public and the palatial landscape (Smith, 1976, p. 70; Palyvou, 2004, p. 214; Günkel-Maschek, 2020, p. 156-157, 262). Dating back to the Middle Minoan III period (see Annex 1), the West Entrance is situated at the southeastern corner of the West Court, and it was originally accessed through a simple passageway that crossed the West Facade (Evans, 1928, p. 661-662; Günkel-Maschek, 2020, p. 156).

Figure 5.2.1 Detail of the architectural plan of the palace of Knossos with indication of the path from the West Court to the Central Court. Blue lines, made by author, indicating the position of the painted plaster decoration. (Adapted from Günkel-Maschek, 2020, p.157, Figure 4.1).

In the Late Minoan period the entrance was thoroughly rebuilt and rendered accessible through a rectangular space, that of the West Porch (MacDonald, 2004, p. 92). The West Porch consists of an open paved area and a closed, roofed area; the two connect through at least two entrances, as the three surviving pillars indicate (see Figure 5.2.2).

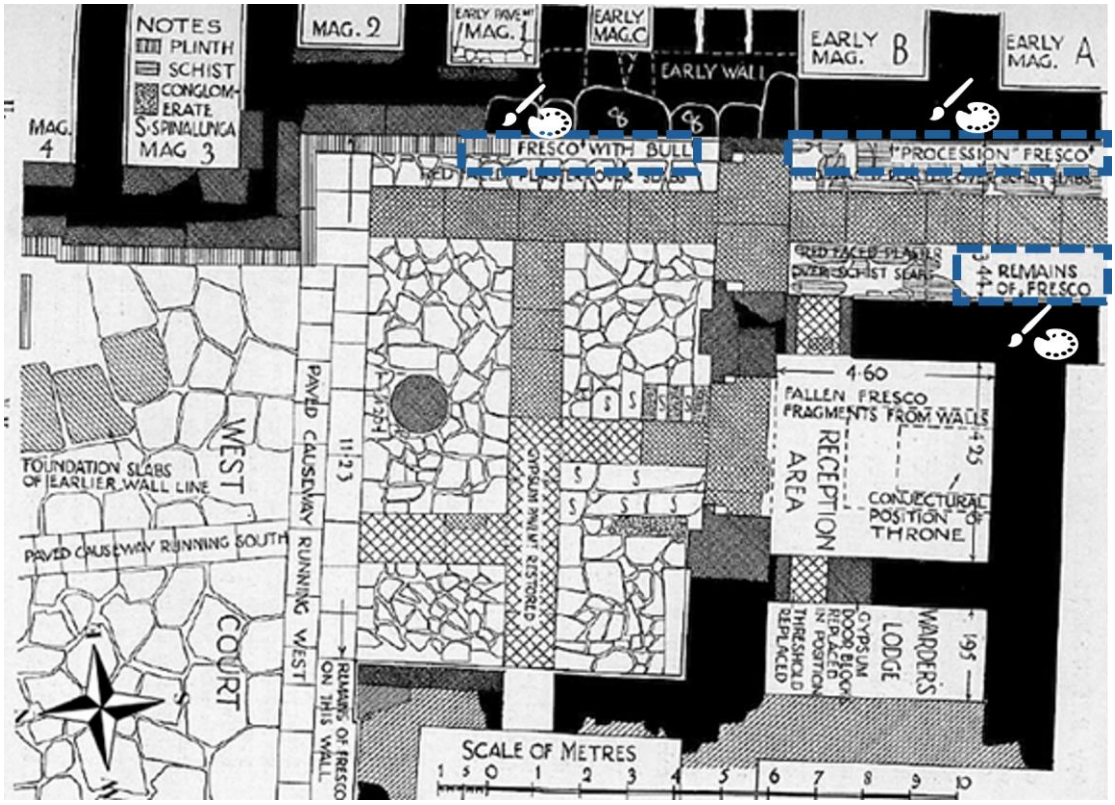

Figure 5.2.2 Detail of the plan of the West Porch and the Corridor of the Procession, in the southeast corner of the West Court, Knossos palatial complex. North arrow symbol and indications, added by the author, indicating the painted wall decorations under discussion. (Adapted from Evans, 1928a, p. 673, Figure 427).

This system is known in Minoan architecture of the Late Bronze Age as 'polythyron' and is thought to have been used to control the access and lighting in the interior of a space, by using wooden doors between two or more pillars (Shaw, 2011, p.142; Goodison, 2001, p. 83; MacDonald, 2005, p. 90). Distinct lines of gypsum paved causeways coming from the west and northwest and crossing the West Court, give

access to the polythyron of the West Porch (Figure 5.2.3) (Palyvou, 2004, p. 214; Evans, 1928a, p. 609; Günkel-Maschek, 2020, p.158).

Figure 5.2.3 View of the West Porch from northwest, with the pavement of the West Court and the causeways entering the Porch visible, Knossos, photographic record from the 1920s. (Evans, 1928a, p. 611, Figure 383).

Fragments of painted plaster were found adjacent to the walls of the West Porch; respectively, fragments of painted slabs with colourful veined motifs were located at the bottom part of the eastern and southern wall of the Porch (Figure 5.2.4) (Hood, 2005, p. 66). According to the surviving fragments, the slabs were of rectangular and oblong shape and most probably were running along all the walls of the Porch. Their decoration is thought of to have been an artistic convention, imitating the panel dadoes made of marble (Cameron, 1976, p. 672-674).

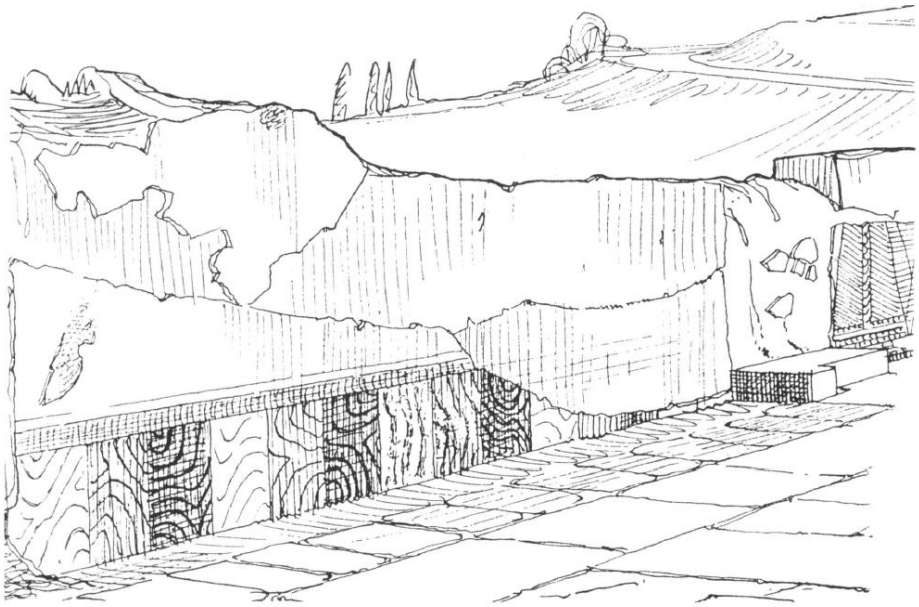

Figure 5.2.4 Sketch depicting the decoration of the eastern wall of the West Porch, according to the fragments found in situ, Knossos palatial complex. (Hood, 2005, p. 67, Figure 2.16).

Furthermore, also attached to the eastern wall were the red relief fragments of the hoof of an animal, usually interpreted as a bull, depicted above colourful dado panels (see Figure 5.2.4) (Evans, 1935, p. 894; Hood, 2005, p. 66-67). Inspired by the compositions of galloping bulls found in other parts of the decoration of the complex, such as in the case of the North Entrance (see Figure 5.2.5), archaeologists believe that a similar composition would have decorated the West Porch (Hood, 2005, p. 56-57, 79; Evans, 1899, p. 51-52).

Figure 5.2.5 Hypothetical restoration of the fragments found in the North Corridor, depicting a bull and an olive tree in low relief, North Wing, palatial complex of Knossos. Photographic record from 1939. (BSA Digital Collections, Reference No. 01/6796.C6805. https://digital.bsa.ac.uk/results.php?locality-irn=725&start=101&irn=146006).

Following the eastern paved causeway of the West Porch and entering the entrance of the polythyron, one had access

to the Corridor of the Procession. The Corridor's present name resulted from the fragments of painted plaster decoration of this period. Clusters of fragments, which depict several humans of life-size scale on a procession, were found both in situ on the east and west wall of the corridor and scattered on the pavement (see Figure 5.2.2) (Evans, 1899, p. 13; Günkel-Maschek, 2020, p. 165).

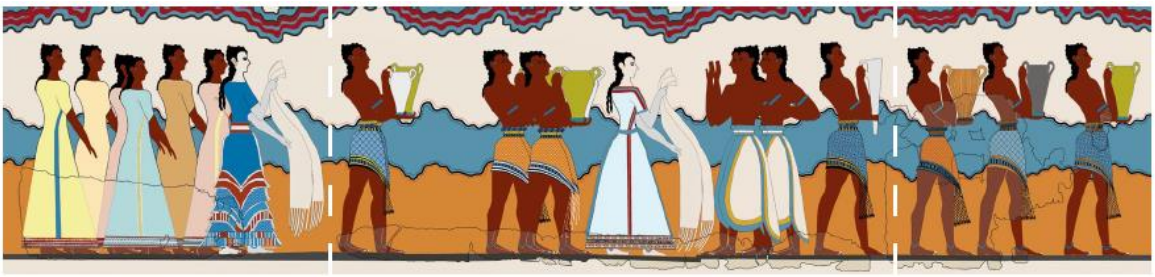

Figure 5.2.6 Hypothetical reconstruction of the composition decorating the walls of the Corridor of the Procession, Knossos palatial complex. (Günkel-Maschek, 2020, p. 259, Figure 4.16).

Most of the fragments preserve only the lower body of the figures and specifically part of their garments and their feet (see Figure 5.2.6); some of them were wearing long dresses, while others were dressed in a short skirt, known in the bibliography as the Minoan kilt (Günkel-Maschek, 2020, p. 165-167;). The colour of their skin, either dark red or white, has been interpreted as indication of their sex, male in the first case and female in the latter, based on a convention that also exists in Egyptian paintings (Evans, 1899, p. 13; Macdonald 2005, 93, 95-6· Cameron 1987, 1 p.2, 674· Hitchcock 2000, p. 70).

A few interconnecting fragments also save part of the upper body of three figures, identified as males wearing Minoan kilts, while one of them seems to be holding a jug. More fragmentary evidence points to the fact that the procession figures are displaying different types of pottery (see Figure 5.2.7). The composition was executed in a white/grey, yellow and blue background (Galanakis et al., 2017, p 59).

Fragments of colourful painted plaster, unearthed below the pavement, might point to the existence of an earlier decoration of the passageway, or the upper floor of the area (Hood, 2005, p. 52; 78; Günkel-Maschek, 2020, p. 158). The fragments are thought to depict the pattern of a garment and jewellery (see Figure 5.2.8), and have been interpreted as part of a composition of women dressed with the typical Minoan

bodice. These fragments were chronologically placed in the Middle Minoan IIIB, and were thought to have been part of the first composition that decorated the Corridor (Hood, 2005, p. 66; Evans 1928, p. 679-682; Günkel-Maschek, 2020, p. 156). However, their original position is not certain and given that the West Entrance was restructured in its final form in the Late Bronze Age, presumably in the Late Minoan IB, the composition should also date at that period (Günkel-Maschek, 2020, p. 158).

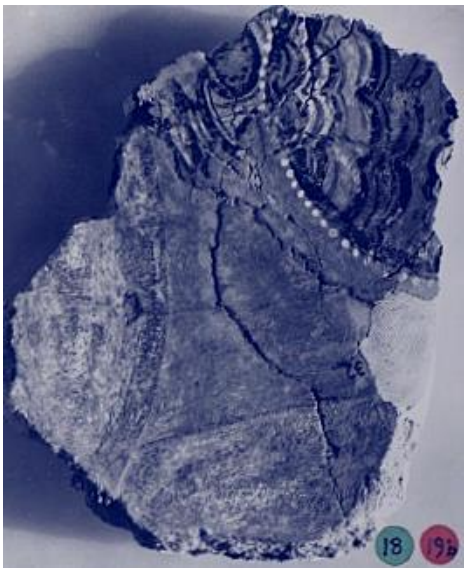

Figure 5.2.7 Fragment depicting part of a male arm and a colourful object, probably vase, Corridor of the Procession, palatial complex of Knossos. (Cameron, 1976, Plate 56, Figure A).

Signs of fire on these fragments are also evidence for destructive events of the 16th century that preceded the reformation of the West Wing (Smith, 1976, p. 70-71; MacDonald, 2005, p. 96). During the Late Minoan II, the Corridor was not only re-decorated with the new painted plaster image of the Procession, but also its width was extended to 3,38m., as evidence of the earliest pavement showcases that the passageway was previously narrower by 1 metre (Evans, 1928a, p. 669; MacDonald, 2005, p. 95; Hood, 2005, p. 66; Günkel-Maschek, 2020, p. 158).

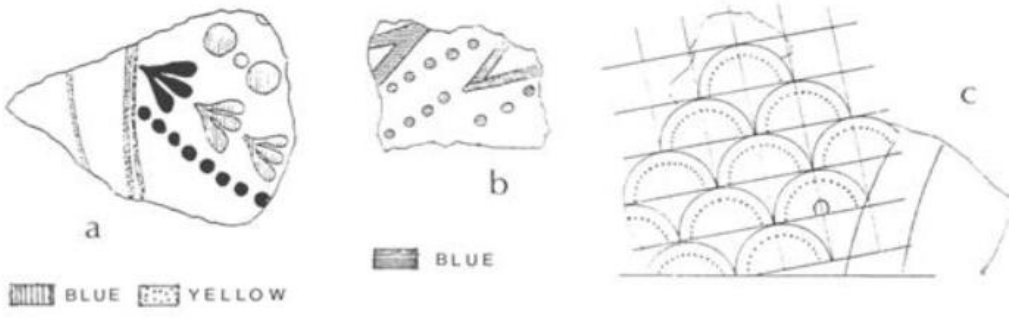

Figure 5.2.8 Sketch of three fragments found beneath the pavement of the Corridor of the Procession, Knossos palatial complex. (Hood, 2005, p. 67, Figure 2.15).

The rich and impressive decorative program of the West Entrance, with the galloping bull and the procession of people, in combination with the bent-axis of the passageway from the West Court to the Central Court of the palatial complex, have

been considered as evidence for the controlled use of the entrance by Minoan scholars (Günkel-Maschek, 2020, p. 160, 262). Ultimately, Evans considered the system of the West Entrance as the "*chosen avenues of royal and official approach*" (Evans, 1921, p. 424).

5.2.2 Aims of Visibility Analysis

To explore the visual integration of the decoration of the West Entrance, I chose to focus on two main perspectives; the perspective of the people standing in the West Court to the north of the entrance, and from the perspective of people that were inside the West Porch and the Corridor. By this analysis I aim to investigate what was the degree of visual accessibility or segregation of the painted images, and more explicitly, the visual experience of someone standing in the open area of the West Porch in comparison to the close space of the Corridor. Moreover, in both methods of analysis focus is also placed on how architectural elements, like the system of the pier-and-door partitions, were affecting the visual connection of people to the paintings. Finally, in the case of the 3D analysis, I also examine whether specific elements of the wall decorations were rendered more visible than others.

5.2.3 Visibility Analysis in 2D: Results

Visibility analysis is conducted, in total, in three distinct versions of the West Entrance complex. The first version represents the space with all entrances open. In the second version the east entrance to the West Porch is closed, and finally, in the third version the west entrance of the porch, that leads directly to the Corridor, is closed. I present the results below categorised by metrics (for full list of figures see Appendix C):

5.2.3.1 Isovist Area

- Version 1: All entrances open (see Figure 5.2.9 & Appendix C, Figure C1).

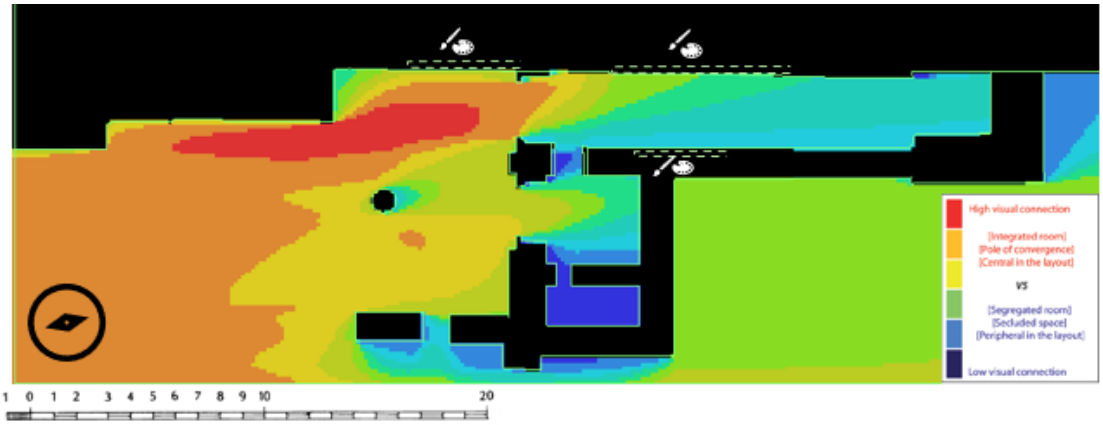

Figure 5.2.9 Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 1: Metric of Isovist Area, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

The areas of high visibility in the case of the isovist area, which considers the visibility from one point to the others, are concentrated at the north and northeastern part of the West Entrance complex, and mainly at the opening of the east partition of the West Porch that leads to the corridor. The isovist metric shows less visual accessibility in the interior of the porch and the corridor.

- Version 2: East entrance closed (see Appendix C, Figure C2).

In the case of the 2nd version where the east partition is closed, the area of highest visibility is situated in the northwest part and mainly to the entrance of the West Porch.

- Version 3: West entrance closed (see Appendix C, Figure C3).

Similarly to the 1st version, in the 3rd version the isovist metric pinpoints to the east partition and the entrance to the corridor as the areas with high visibility, whereas the closed west door completely blocks the visual accessibility to the West Porch.

5.2.3.2 Visual Integration (HH)

- Version 1: All entrances open (see Figure 5.2.10 & Appendix C, Figure C4).

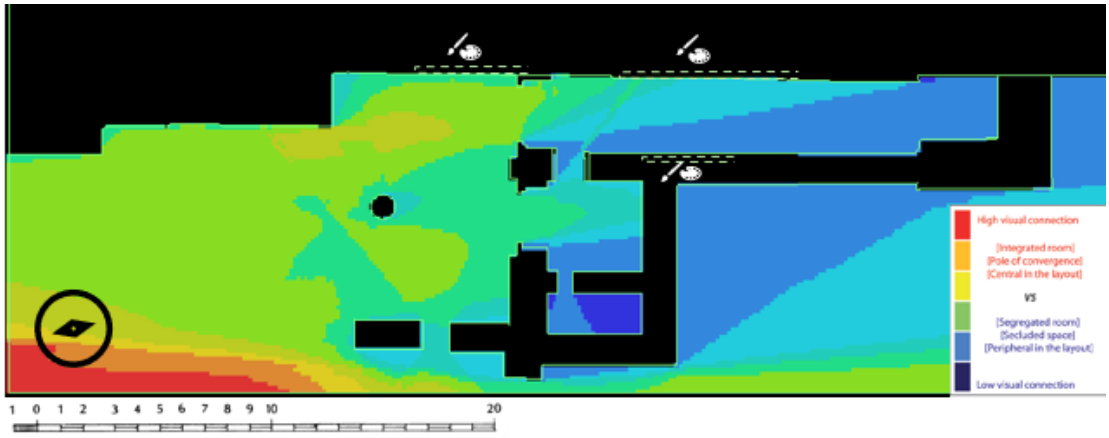

Figure 5.2.10 Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 1: Metric of Visual Integration (HH), depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

In the case of the visual integration, which calculates the visual connection between all the points of a spatial layout, the results show a different picture; the area of high visibility is situated in the northwest, where the West Court is located, while the areas of the entrances to the West Porch and the corridor appear as secluded, especially in their interior.

- Version 2: East entrance closed (see Appendix C, Figure C5).

The analysis of the 2nd version with the same metric revealed that when the east partition of the West Porch is closed, the visual connection of the corridor to the West Porch through the passage that connects the two, is slightly higher than in the 1st version.

- Version 3: West entrance closed (see Appendix C, Figure C6).

In the 3rd version, where the west entrance is blocked, the visibility is higher at the entrance of the corridor, and accordingly, the passage between the West Porch and the corridor attests again a medium degree of visibility.

5.2.3.3 Point First Moment & Point Second Moment

- Version 1: All entrances open (see Appendix C, Figure C7 & Figure C10).

In the case of the point first and point second moment metrics, that visualise the visual field of a centrifugal movement from each point in space to the other, both entrances to the West Porch and the corridor reveal a relatively high degree of visibility,

especially in the case of the east entrance which leads to the corridor. Moreover, a significant difference highlighted in this metric is that the area of the corridor is presented less segregated than in the previous metrics. Lines of visual connectivity that extend from the entrance of the corridor to its end, showcase that visibility within the passageway is concentrated to the east side.

- Version 2: East entrance closed (see Appendix C, Figure C8 & Figure C11) & Version 3: West entrance closed (see Appendix C, Figure C9 & Figure C12).

In the case of the 2nd and 3rd versions, the point first moment metric pointed out that the areas of space close to more than one entrances or passageways to other spaces tend to have a central role in the visual interconnection between these spaces.

5.2.4 Viewshed Analysis & LOS in 3D: Results

For the 3D visibility analysis results to be comparable to the 2D, I decided to recreate and conduct the analyses in three distinct versions of the West Entrance complex. Similarly to the 2D, the first version represents the space with all entrances open. In the second version, access to the east entrance to the West Porch is blocked, while in the third version the west entrance of the porch is closed. However, in the case of the LOS analysis, only the first version is put under investigation, as the integration of more sightlines was hindered by the tool's restrictions (see Figure 4.1.11). For the Viewshed Analysis function, I placed an observer point in the West Court, the other two in the area of the West Porch and the fourth one, inside the Corridor, as these were the main areas that satisfied my queries on the visual integration of the complex's decoration (see Appendix E, Figure E4).

Firstly, I present the results of the Line-of-sight analysis, where visibility is assessed from all the observer points of the grid to the target points of the painted plaster decoration. In the case of the viewshed analysis, I comment on each version of the feature, while conducting the analysis from the observer points procedurally, so as to unveil the different levels of visual accessibility to the decorations (for full list of figures see Appendix E). Finally, I include the visualized outcome of the viewshed assessment of the wall paintings in two graphs.

5.2.4.1 LOS Analysis

The analysis of Line-of-sight (LOS) in the West Entrance complex confirmed the results of the equivalent 2D analysis (see Figure 5.2.11). The area with the most green lines, indicating the visual connection from observer points to the decoration and specifically the target points, is located in the West Court. The degree of visibility decreases steadily as we move from the West Porch to the entrance of the Corridor, and within the feature itself (see Figure 5.2.12). This fact indicates that the painted plaster images of the West Porch were better visually integrated with the West Court, while in the case of the decoration of the Corridor, only the observer points inside the passageway show a certain grade of visual interconnection.

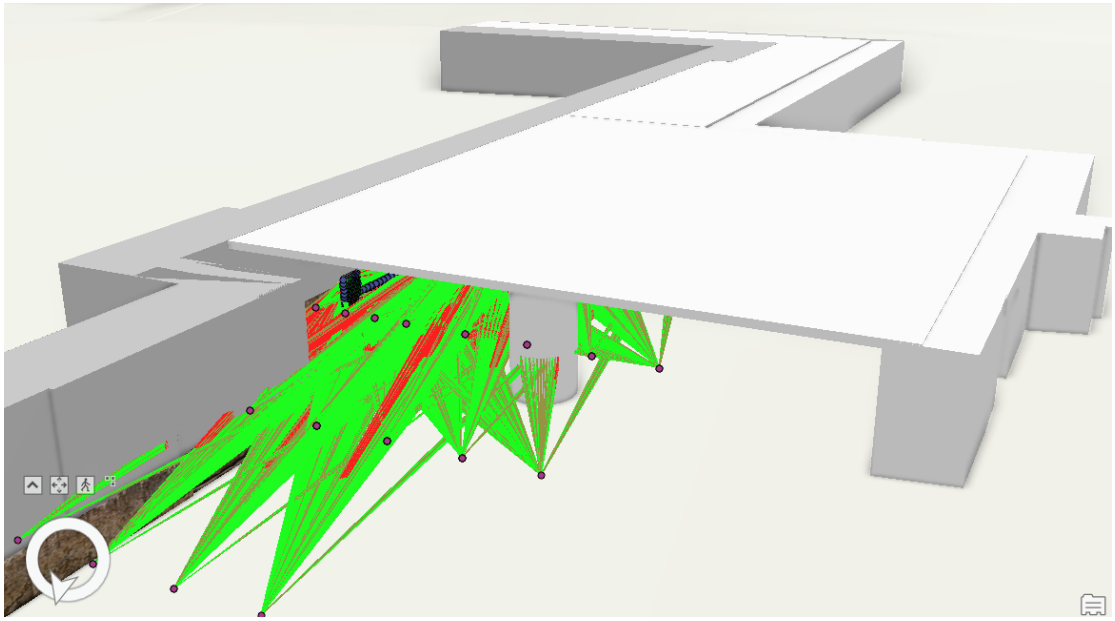

Figure 5.2.11 View of the conduction of LOS analysis in the 3D model of the West Entrance complex, with the grid of points representing the observes. Green lines indicate visible distance to target points, while red the no visible. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

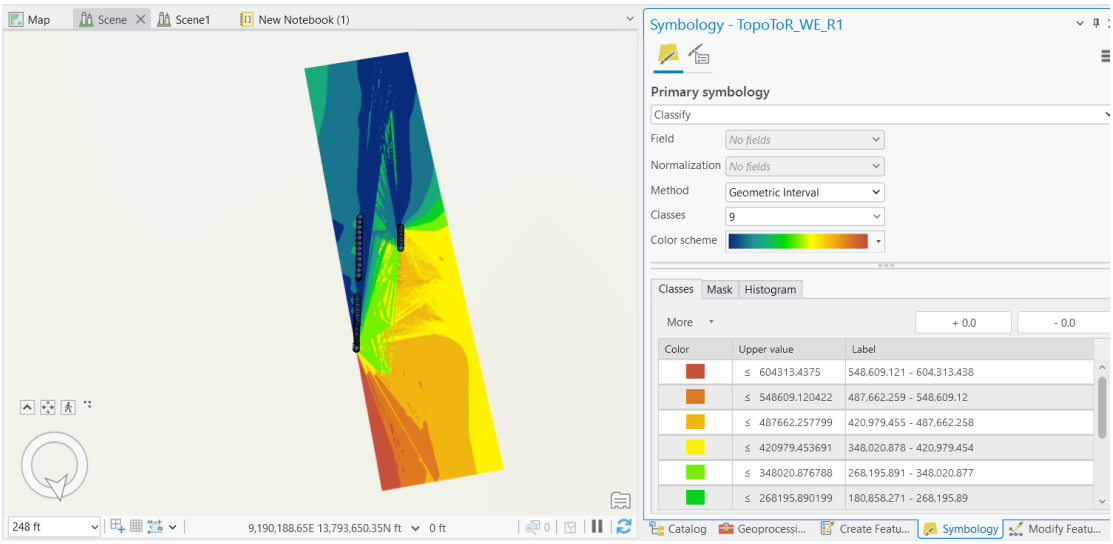

Figure 5.2.12 View of the raster created with the 'Topo to Raster' function, showcasing the results of the West Entrance complex. Red colour represents the areas with the highest degree of visual accessibility to the wall decorations, while blue represents the more segregated areas. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

5.2.4.2 Viewshed Analysis

- Observer point in the West Court

In the 3D viewshed analysis of the West Entrance complex, the observer point situated in the West Court aligns with previous interpretations regarding the visual integration of the feature's decoration. In the 1st version of the 3D representation of the complex, the decoration of the east wall of the West Porch, as well as part of the beginning of the painted image of the human procession, in the east wall of the Corridor, are discernible. Visibility is limited at the entrance of the Corridor, and therefore, the east side of the interior of the passageway was not visible from the viewpoint of the West Court (see Appendix E, Figure E5). In the 2nd version of the feature, the fact that the east entrance to the Corridor is closed, results in the visual segregation of its interior decoration, while only the decoration of the West Porch was visible (see Appendix E, Figure E8). The 3rd version, where the west entrance of the West Porch is blocked, presents the exact same results as the 1st version (see Appendix E, Figure E11).

- Observer points in the West Porch

In the 1st version of the feature, the observer points positioned in the east area and the west entrance of the West Porch had unobstructed visual access to the Porch's and the Corridor's decoration, with the west side of the passageway being the only exception (see Appendix E, Figure E6). The decoration of the West Porch is covered by multiple observer points in the case of the 2nd version, while the blocked door to the Corridor restricts the visual connection to its decoration (see Appendix E, Figure E9). In the 3rd version, again similarly to the 1st version, both decorations of the east wall of the Porch and the Corridor, are prominent to the viewers in the West Porch, while further access to the west side of the Corridor is again not possible by the set points (see Appendix E, Figure E12).

- Observer point in the entrance of the Corridor

Lastly, the observer point set at beginning of the Corridor, in the east part of the West Porch, highlights that the only area where the overall decoration of the Corridor was visible, was exactly that space (see Appendix E, Figure E7). As expected, the 2nd version has no visual connection to the Corridor's decoration, while the decoration of the West Porch is visible (see Appendix E, Figure E10). Regarding the 3rd version of the feature, both decorations of the West Porch and the Corridor are discernible to the set observer point.

- Viewshed analysis from all observer points

Finally, in the case where all observer points are set, the highest degree of visibility is concentrated once more in the area of the West Porch (see Appendix E, Figure E14-16). Therefore, the painted plaster image of the bull and the colourful dadoes in the east wall are covered by multiple observer points. That is also the case for the procession image of the east wall of the Corridor, while the west wall of the Corridor is also visible at least to one observer point (see Figure 5.2.13).

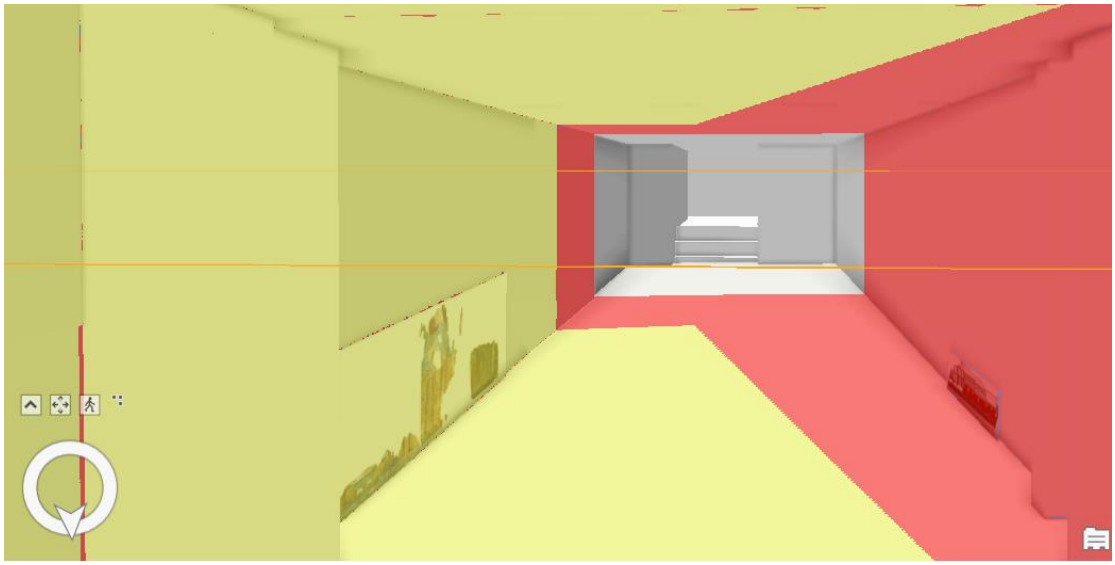

Figure 5.2.13 View of the beginning of the Corridor of the West Entrance complex, with all the viewshed points activated. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

In order to summarize the findings of the 3D viewshed analysis and make them more comprehensive, I categorized them in a table using as attributes the value of visibility per painted plaster decoration, by observer point and version of the 3D feature (see Appendix E, Figure E86). Furthermore, I visualized the information of the table in two graphs. The stacked column chart illustrates the degree of visual integration of each painted plaster image of the West Entrance complex, per version of the 3D representation. According to the chart, the 1st version of the 3D analysis displays the highest amount of visual integration for all the decorated spaces under examination (see Figure 5.2.14). In particular, the decoration of the West Porch in the east wall, followed by the east wall of the Corridor, have an evident advantage in comparison to the west wall of the Corridor, when it comes to their visual connection. The 2nd version of the feature illustrates the importance of the east door of the West Porch in controlling the visual access to the Corridor, while the 3rd version displayed a similar, but slightly lower degree of visibility to the 1st version.

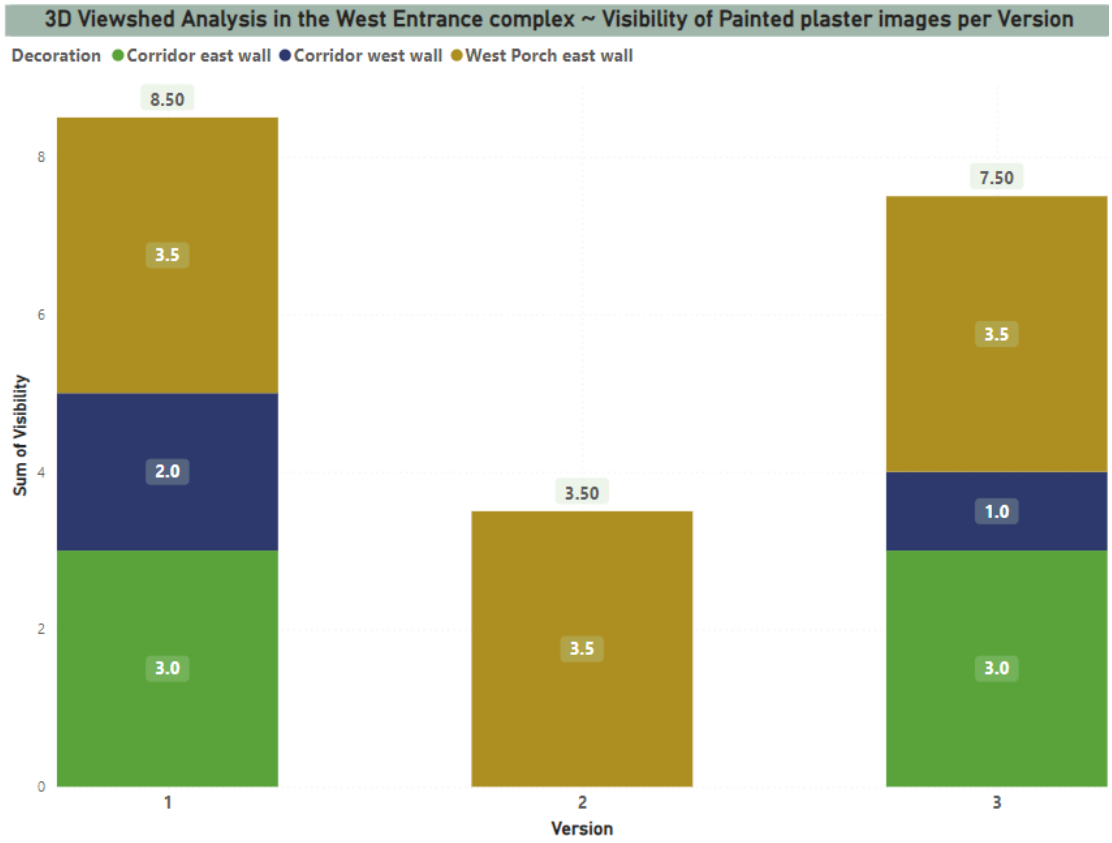

Figure 5.2.14 Stacked column chart visualizing the results of the 3D Exploratory Viewshed in the West Entrance complex. Percentage and sum of the degree of visibility per painted plaster decoration and per version. Graph created with Power BI (Figure: V. Georgiopoulou).

Alike the stacked column chart, the ribbon chart (see Figure 5.2.15), illustrating the degree visibility of each decoration according to the position of the observer points, confirms the speculations expressed in the commentary of the 3D viewshed results. To elaborate, the observer points that have had unobstructed visual connection to all the painted plaster elements of the feature, were the ones positioned in the West Porch, followed by the observers in the entrance to the Corridor and lastly, the viewpoint from the West Court. As expected, the decoration with the highest value of visibility from all the observer points is that of the West Porch's east wall.

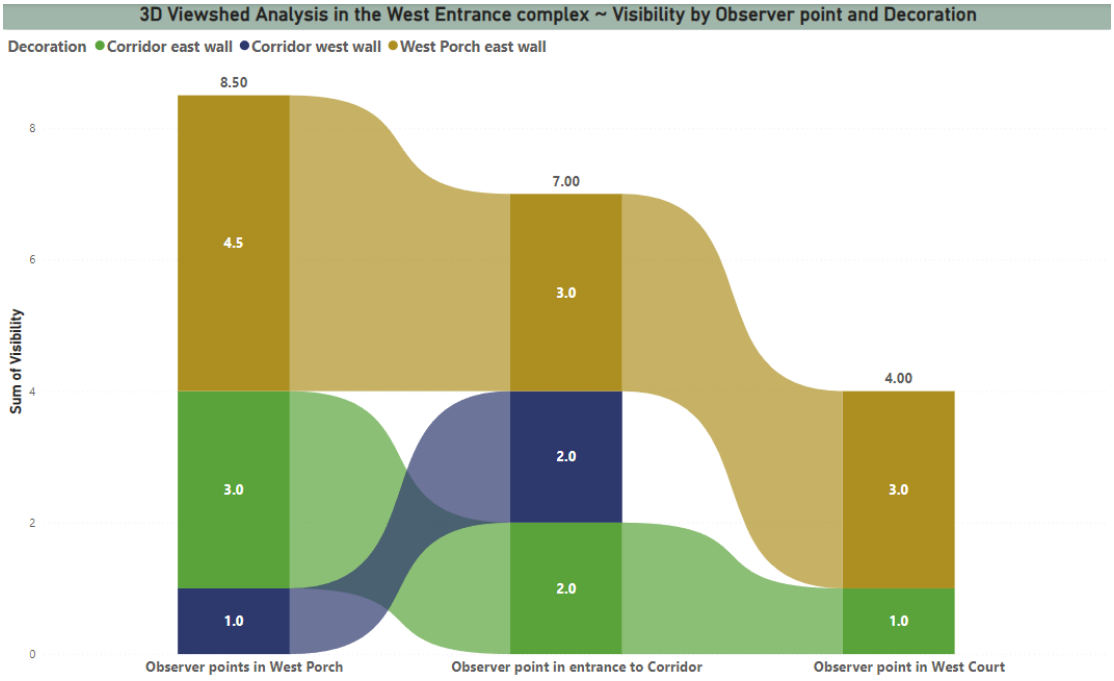

Figure 5.2.15 Ribbon chart visualizing the results of the 3D Exploratory Viewshed in the West Entrance complex. Sum of the degree of visibility of the painted plaster decoration per observer points by version. Graph created with Power BI (Figure: V. Georgiopoulou).

5.3 Case Study: The Throne Room complex

5.3.1 Architectural space and decoration

The complex of the Throne Room is located in the West Wing, and it is accessible from the northwest corner of the Central Court (MacDonald, 2005, p.113; Niemeier, 1987, p. 163). Part of the room was already visible before the excavation by Evans took place, and was first documented by Kalokairinos (Galanakis et al., 2017, p. 48). Initially referred to as the 'bathroom chamber', the discovery of a gypsum seat in the north wall of the main room, inspired the later name of the whole structure (Macdonald 2005, 115; Galanakis et al., 2017, p. 48; Niemeier, 1987, p. 163; Evans, 1935, p. 915-917).

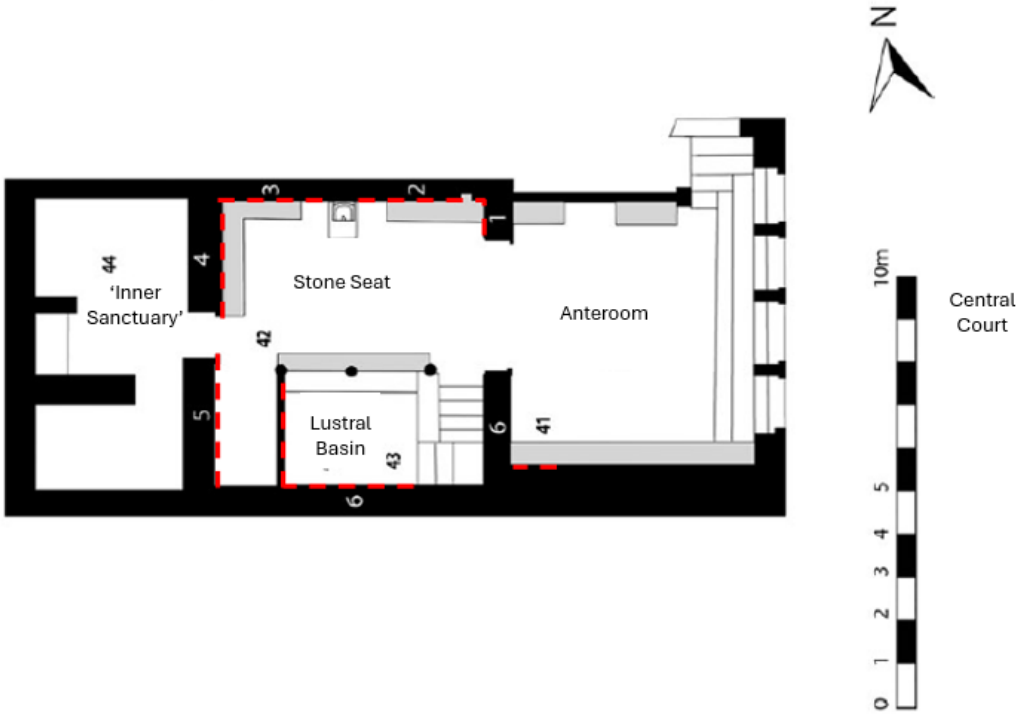

Figure 5.3.1: Plan of the Throne Room with depiction of its basic architectural elements, West Wing of the Knossos palatial complex. Red lines indicate the position of painted plaster wall decorations found in situ, added by the author. Minor changes in the orientation of the plan were also added by the author. (Adapted from Galanakis et al. 2017, p.50, Figure 3).

The orthogonal complex of the Throne Room is comprised of three rooms that connect horizontally; the entrance, or anteroom, the main room, with the base room of the 'lustral basin', and the inner room (see Figure 5.3.1) (Goodison, 2001, p. 81-82; Evans, 1935, p. 902-903; Niemeier, 1987, p. 163). The anteroom is either entered from the east, through a descending staircase with four pier-and-door partitions that create a

polythyron structure, or through another entrance at the north (Shaw, 2011, p.142; Evans, 1899, p. 35).

The floor of the anteroom is paved with rectangle and asymmetric stones (Evans, 1899, p. 36). In the north wall of the anteroom are located two gypsum benches, with a partition in between, in which Evans found remnants of charred wood; these were initially thought to belong to a wooden case or wardrobe, which was later reconstructed as a seat (Evans, 1935Hitchcock & Koudounaris, 2002, p. 48; Goodison, 2001, p. 81; Rehak, 1995, p. 99). The south part of the anteroom also preserved a gypsum bench that run along the length of the wall; in the southwest corner of the bench was found a fragment of painted plaster depicting the hoof of an animal, most probably a bull, above a frieze of colourful marble dado imitation (see Figure 5.3.2), while evidence for the decoration of the north wall survives only in photographic record (Evans, 1935, p. 892-893, 904; Cameron, 1976, p. 680; Hood, 2005, p. 65).

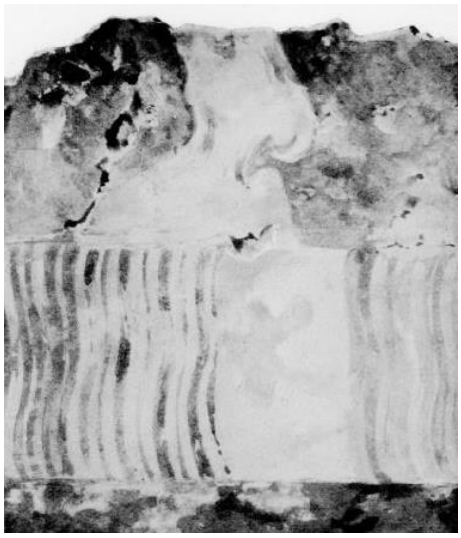

Figure 5.3.2 Fragment depicting hoof of a bull facing west, above frieze of dado imitation, southwest corner of the anteroom, Throne Room complex, palatial complex of Knossos. (Hood, 2005, Plate 27, Fig 4).

The anteroom was connecting to the main room of the complex either through a simple entrance, or through another pier-and-door partition, comprised of two doors (Galanakis et al. 2017, p. 50; Hood & Taylor, 1981). The main room has a paved floor of rectangular and asymmetric stones, and benches of gypsum at the north and northwest walls. The ‘throne’ is located in the middle of the two north benches; adjacent to the east of the seat, the largest surviving fragment of painted plaster was found (see Figure 5.3.3) (Evans, 1935, 904; Immerwahr, 1990, p. 85; Hood, 2005, p. 55-56; Galanakis et al., 2017, p. 48).

Figure 5.3.3 View of the gypsum seat and the fragment of painted plaster decoration found in situ, as found east of the seat, Throne Room complex, palatial complex of Knossos. From the Photographic record of the British School at Athens from the 1900 excavation of the monument. (Galanakis et al. 2017, p. 51, fig. 5).

This recently re-examined and re-conserved fragment depicts part of a palm tree and the legs of a seated animal, above a frieze of colourful dado and a schematic motif, regularly interpreted in Minoan iconography as an 'altar-base' of the incurved type (see Figure 5.3.4) (Evans, 1935, p. 919-920; Cameron, 1976, p. 679-680; Galanakis et al., 2017, p. 73). The palm tree has been rendered with great detail, as white dots and dark red lines and ochre have been used to highlight different parts of the tree, such as

Figure 5.3.4 Representation of the reconstruction of the painted plaster decoration of the palm tree and seated griffin, above a frieze of dado imitation, north wall of the main room of the Throne Room complex, palatial complex of Knossos. (Galanakis et al. 2017, p. 56, Fig 11).

Figure 5.3.5 Coloured sketch representing the position of the fragments of painted plaster decoration of the north wall of the main room of the Throne Room complex, palatial complex of Knossos. (Galanakis et al. 2017, p. 60, Fig 16).

its leaves and dates (Galanakis et al., 2017, p. 55-58, 68). The animal is identified as a wingless griffin according to the fragments of decoration found in the other walls of the room and has been depicted with red dots in its white fur, that again underline the artistic detail of the decoration (Cameron, 1976, p. 680; Galanakis et al., 2017, p. 58-59; Niemeier, 1987, p. 166). A set of wavy bands, painted white/grey and dark red alternatively, now lost, was also attested at the upper part of the palm tree fragment, according to recent spectroscopic analysis (Galanakis et al., 2017, p. 57).

In the northeast corner of the same wall, fragments of painted plaster decoration, depicting four papyrus-hybrid plants above a dado band, were found in situ (Galanakis et al., 2017, p. 52). However, the composition is now lost, and it is only known through

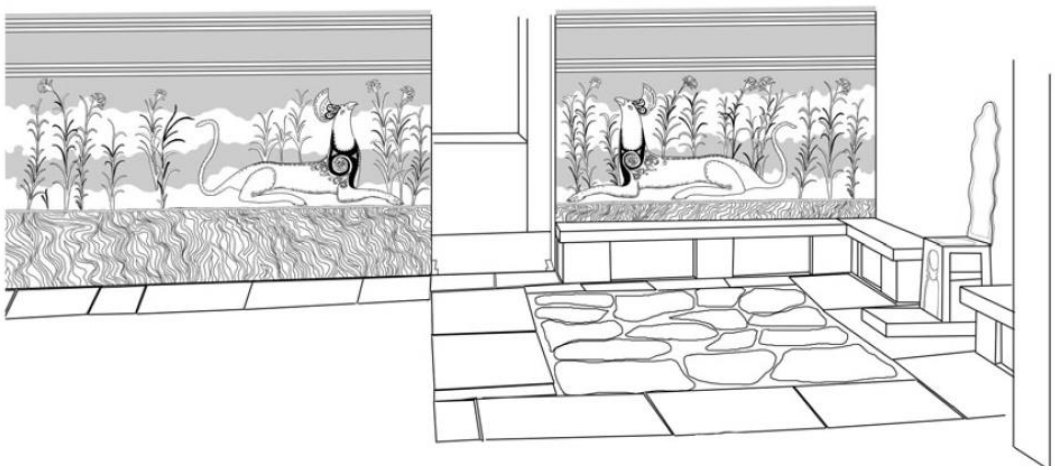

Figure 5.3.6 Representation of a hypothetical reconstruction of the decoration of the west wall of the main room in the Throne Room complex, palatial complex of Knossos. (Galanakis et al., 2017, p. 64, Fig. 21).

sketches. Similarly, a fragment with dado imitation is depicted in a sketch in the west lower part of the wall (see Figure 5.3.5) (Galanakis et al., 2017, p. 60).

Moving on to the west wall, fragments of painted plaster decoration were located in the north and the south part of the wall; in both cases a composition of a wingless griffin, seated among papyrus-reeds, in a red and white background, is attested (see Figure 5.3.6) (Evans, 1935, p. 910; Galanakis et al., 2017, p. 60-63).

Figure 5.3.7 Composition of interconnecting fragments depicting a seated griffin among papyrus-reeds, from the south part of the west wall of the main room in the Throne Room complex, palatial complex of Knossos. (Galanakis et al., 2017, p. 66, Fig. 25).

The griffin of the south wall (see Figure 5.3.7), is preserved in a better condition and saves more details such as the, decorated with a spiral motif, crest of the animal, the red and white horizontal bands from the upper part of the wall, and part of the colourful dado frieze from the lower part of the composition (Galanakis et al., 2017, p. 64). The fragments with wavy bands of white and red acting as the background, the frieze of dado imitation at lower part of the walls, and the white and red bands at the upper, indicate that the composition of the room was continuous in the north and west wall; that was not however, the case for the south wall.

The south part of the room, opposite to the gypsum seat, is occupied by another gypsum structure that worked as a base for three, probably wooden columns; this element created a smaller space within the main room of the Throne Room complex, known in the bibliography as 'lustral basin' (see Figure 5.3.8) (Evans 1899, p. 39; Galanakis et al., 2017, p. 50). The basin is accessible through six descending stairs, and its depth reaches about 1,20m; its small dimensions, its paved floor, and finally, its depth was considered by the excavator as evidence for the use of the space for rituals related to water (Evans 1899, p. 38-39; 1935, p. 907-908). The walls of this space were also decorated with painted plaster, but they lack a figurative scene. From the remaining fragments found in situ only four horizontal bands of white/grey and red colour against a red background, were decorating the south wall (Galanakis et al., 2017, p. 67). The lustral basin was found filled with rumble and is thought to have been rendered unusable during the period of the decoration of the complex (Macdonald 2005, 116-117).

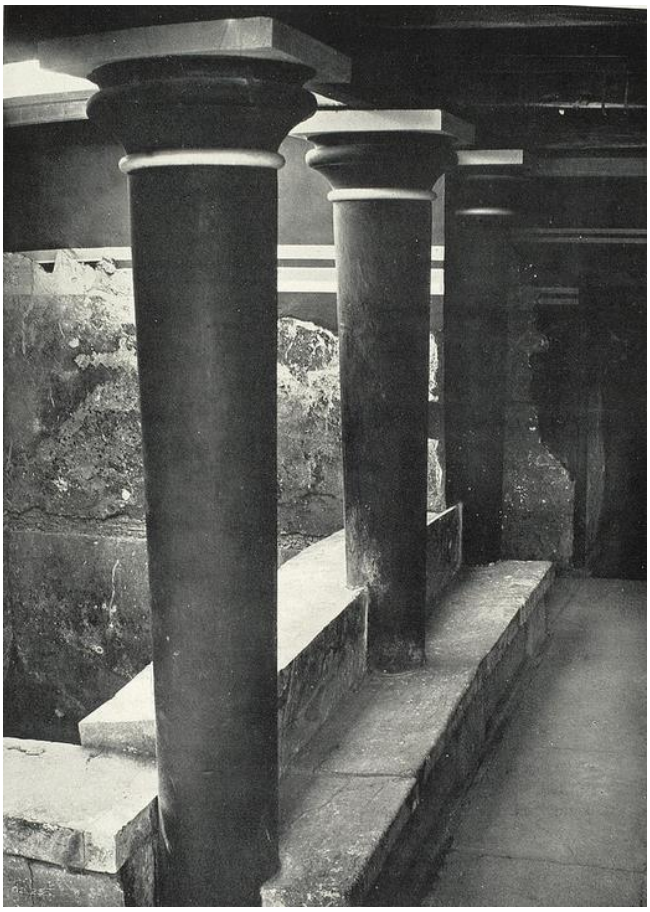

Figure 5.3.8 View of the lustral basin from northeast, with the restored columns and the decoration of the south wall visible. South space of the main room in the Throne Room complex, palatial complex of Knossos. (Evans, 1935, p. 909, Fig. 883).

Dating to the Late Minoan II, the preserved decoration of the complex of the Throne Room is thought to be part of the reconstruction program that took place after the fire destructions of the LM II (Smith, 1976, p. 75; Niemeier, 1987, p. 163). No signs of the earlier decoration were discovered, while the inner room of the complex was also undecorated. Most of the findings are thought to date to the final period of usage of

the complex; in particular, a large jar was found southeast of the gypsum seat in the main room, while four smaller alabastra were surrounding the jar (Galanakis et al., 2017, p. 85; Cameron, 1976, p. 681; Evans, 1935, p. 903).

North of the lustral basin, inlays of faience were attested, while inside the basin were found the remains of a small, crystal rectangular plate, with the depiction of a bull in blue background (Dimopoulou - Rethemiotaki, 2005, p. 328-329). The lustral basin was found filled with rumble and is thought to have been rendered unusable during the period of the decoration of the complex (Macdonald 2005, 116-117). Therefore, the plate is thought to belong to an earlier treasure that was buried in the basin (Evans 1930, 108-9).

Ultimately, the findings of the complex together with the gypsum seat and the decoration convinced Evans and later researchers for the ritualistic and propagandistic function of the room (Evans, 1935, p. 992; Niemeier, 1987, p. 166-167); the throne together with the decoration, was thought to have been used by a 'priest-king' and officials of the Minoan elite, as a scenery that reinforced the elites' identity and political power (MacDonald, 2005, p.114-115; Dimopoulou - Rethemiotaki, 2005, p. 80; Galanakis et al., 2017, p. 85).

5.3.2 Aims of Visibility Analysis

In the case of the Throne Room complex the visibility analysis of its decoration is assessed from two main viewpoints, the open space of the central Court to the east, and within the closed space of the complex itself. Consequently, I explore the visual integration or segregation of the painted decorations of the complex as viewed both from the outsiders of the Throne Room complex, and from those who had access to it.

My aim is to locate differences in the visual accessibility to the decorations according to the spatial location of the observers, and to test the role of the pier-and-door partitions on that matter, while also experimenting with different potential reconstructions of the space, as suggested for example in the case of the one entrance connecting the anteroom to the main room (Galanakis et al., 2017, p.50). Similarly to

the analysis of the West Entrance, in the 3D, I also investigate whether specific elements of the painted compositions exhibit a higher or lower degree of visibility.

5.3.3 Visibility Analysis in 2D: Results

In that scope, I built six distinct versions of the Throne Room complex to conduct the visibility analysis in the 2D. The first version represents the space with all entrances open, the second version represents the space with the two southern pier-and-door partitions of the anteroom closed and the south partition between the anteroom and the main room closed, while in the third version the north pier-and-door partitions of the anteroom and the north partition to the main room are closed. In the fourth version, the southern partitions of the anteroom are closed, while the north door to the main room is open, and the fifth version represents tests visibility in the opposite case, when the northern partitions of the anteroom are closed, while the south door to the main room is open. Finally, with the sixth version I examine the case where a simple entrance, instead of a pier-and-door partition, connects the anteroom to the main room.

I present below the results of the visibility analysis of the six versions with four metrics, the isovist area, which is similar to the metric of connectivity, the visual integration, point first moment and point second moment, categorised per metric. However, we have to keep in mind that the two latter metrics, the point first and point second moment, display more meaningful results in the case of close elongated spaces, and therefore the results on the visual integration of the Central Court should be considered under this parameter (Koutsolampros et al., 2019, p. 6).

5.3.3.1 Isovist Area

- Version 1: All entrances open (see Figure 5.3.9 & Appendix C, Figure C13).

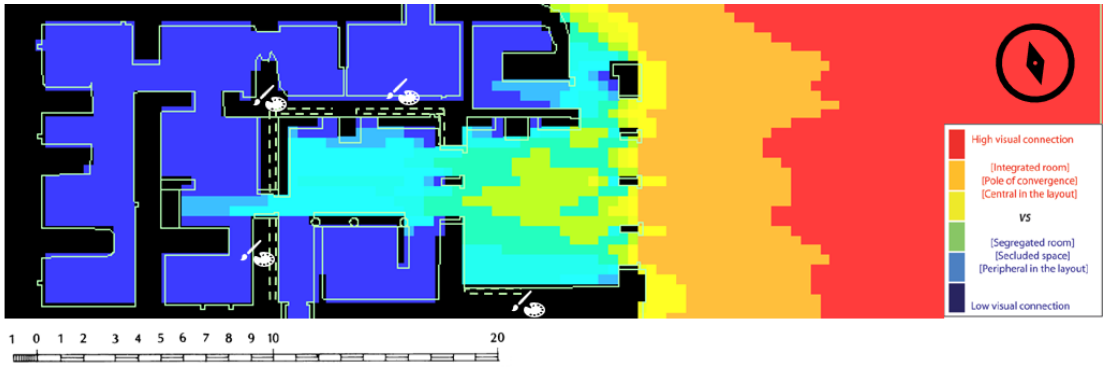

Figure 5.3.9 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 1: Metric of Isovist Area, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

The isovist area calculates the visual integration of one point of space to all the others; therefore, the result of the isovist area analysis in the 1st version of the Throne Room complex, draws attention to the fact that the decoration was visible to the peripheral vision, regardless of the exact viewpoint. As expected, the entrance to the anteroom and the anteroom itself have a slightly higher visual integration, as they are in close proximity with the open area of the Central Court, which displays the highest degree of visibility in all versions of this metric.

- Version 2: Southern doors of the anteroom & main room closed (see Appendix C, Figure C14).

In the 2nd version, the metric of isovist area calculates the degree of visibility in the case where the southern partitions of both the main entrance to the complex and the entrance from the anteroom to the main room are closed. Following the path of access from the main entrance to the main room, the visibility of the isovist area is rendered gradually lower. In the case of the decoration of the main room, only the west wall displays poor visual connectivity. The anteroom is visually integrated in the west wall where the entrance to the main room is, and only partially in its north wall. Visibility calculated by the isovist area metric is higher in the entrances to the complex and to the Central court.

- Version 3: Northern doors of the anteroom closed & main room closed (see Appendix C, Figure C15).

The 3rd version, which represent the opposite case of the 2nd version, again a line of vision passes through the southern partitions of the main entrance and the entrance from the anteroom to the main room; surprisingly, the decoration of the west wall is the most visible one among the other walls of the main room. A noticeable difference is that the west and south walls of the anteroom are better visually integrated in this version.

- Version 4: Southern partitions of the anteroom closed & north door to the main room closed north door to the main room open (see Appendix C, Figure C16) & Version 5: Northern partitions of the anteroom closed & south door to the main room closed (see Appendix C, Figure C17).

The 4th version and 5th version showcase that when the opposite partitions of the main entrance and the entrance to the main room are closed, visibility as calculated by the isovist area, is concentrated only on the path left accessible; from the north part of the anteroom to the south end and the pillar crypt of the main room in the case of the 4th version, and from the south of the anteroom to the north of the main room and to gypsum bench in the case of the 5th version.

- Version 6: No pier-and-door partition from the anteroom to the main room (see Figure 5.3.10 & Appendix C, Figure C18).

The isovist area metric in the case of the 6th version of the Throne Room complex displayed similar results to the 1st version, highlighting the fact that the existence of a pier-and-door partition between the anteroom and the main room did not dramatically affect the visual connectivity between the two rooms.

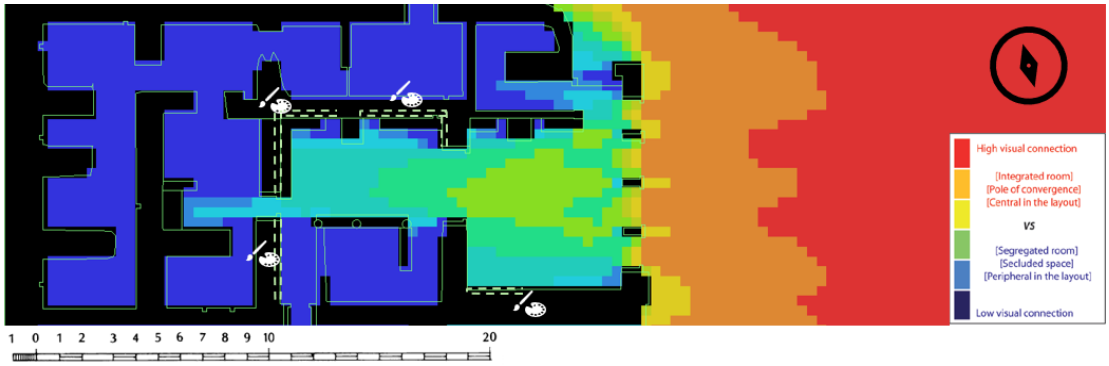

Figure 5.3.10 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 6: Metric of Isovist Area, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

5.3.3.2 Visual Integration (HH)

- Version 1: All entrances open (see Figure 5.3.11 & Appendix C, Figure C19).

Regarding the 1st version, the anteroom and main room of the Throne Room complex appear to be more visually integrated, in comparison to the isovist area analysis, however, the rooms still appear in general secluded. The visibility is also higher in the entrance to the complex, as well as in all the passages that lead from one space of the complex to another. Surprisingly, even the inner room of the complex, and more explicitly, the west-southwest wall of the room, are visually connected to the main room and the anteroom. In the case of the visibility from and to the Central Court, distinguishable lines of higher visibility are formed between the court and the pier-and-door partitions of the main entrance, reaching the interior of the complex; however, the degree of visibility is progressively decreasing as we move from the open space of the court to the interior.

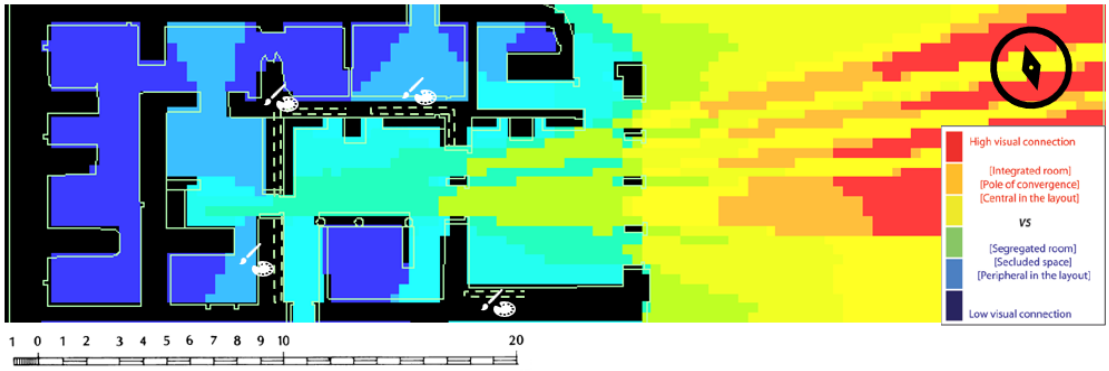

Figure 5.3.11 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 1: Metric of Visual Integration, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

- Version 2: Southern doors of anteroom closed & main room closed (see Appendix C, Figure C20).

In the case of the 2nd version, the visual integration analysis results are similar to the 1st version; visual connection is in general low within the complex, but better represented than in the isovist metric. The closing of the southern pier-and-door partitions of the main entrance and from the anteroom to the main room, do not affect that much the visibility inside the main room or the anteroom. However, the alignments of sight from and to the Central Court are now secluded to the north part of the court.

- Version 3: Northern doors of the anteroom closed & main room closed (see Figure 5.3.12 & Appendix C, Figure C21).

The analysis of the 3rd potential architectural layout of the complex showcases an interesting result. Firstly, similarly to the previous layouts, the integration within the complex is higher than in the isovist metric. Despite the closed northern pier-and-door partitions, a less segregated area is formed in the southern front of the complex, highlighting the fact that the northern doors did not affect the visual connection between this area and the complex.

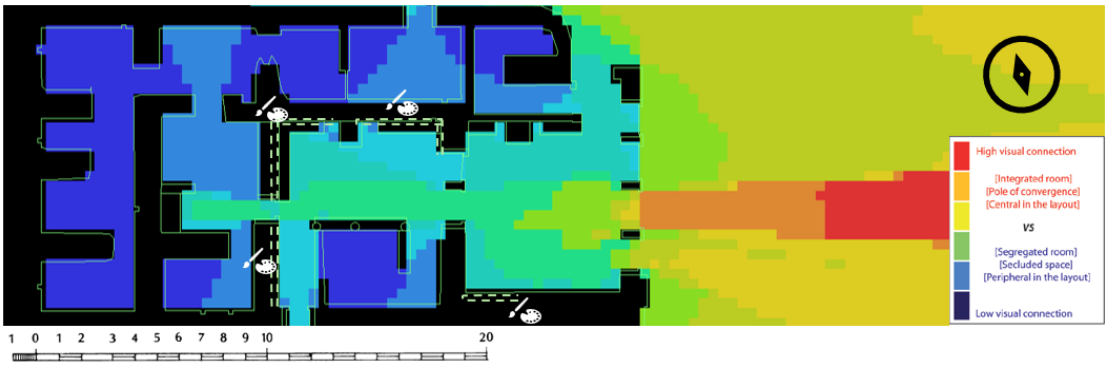

Figure 5.3.12 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 3: Metric of Visual Integration, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

- Version 4: Southern partitions of the anteroom closed north door to the main room open (see Appendix C, Figure C22).

The 4th version of the complex does not present significant changes to the visual integration of the space; one noticeable difference is that because the southern partitions of the main entrance are blocked, the visibility from and toward the Central Court is restricted to a small line of sight, mainly concentrated close to the north entrance of the complex.

- Version 5: Northern partitions of the anteroom closed south door to the main room open (see Appendix C, Figure C23).

Regarding the 5th version, the blocking of the northern partitions of the main entrance creates an area of high visibility near the southern entrances that extends to the Central Court, just as in the case of the 3rd version. The visual integrity is also relatively higher in the interior of the anteroom, and in the north entrance to the main room.

- Version 6: No pier-and-door partition from anteroom to main room (see Appendix C, Figure C24).

Finally, in the case of the 6th layout, the visual integration appears similar to the 1st version, with the exception that the visual accessibility from the anteroom to the main room of the complex appears less segregated, due to the existence of a simple opening between them rather than a pier-and-door system.

5.3.3.3 Point First Moment & Point Second Moment.

- Version 1: All entrances open (see Figure 5.3.13 & Appendix C, Figure C25 & Figure C31).

In the case of the 1st potential architectural layout of the Throne Room complex, the metrics of point first and point second moment display that the interior of the complex is less easily trespassed, and that the visual connectivity is generally segregated; however, still existent, reaching all the way to the entrance of the inner room. The entrance to the complex is slightly more central, visually, but the Central Court, as an open space, exhibits a higher degree of visibility only at its edges due to the nature of the metrics.

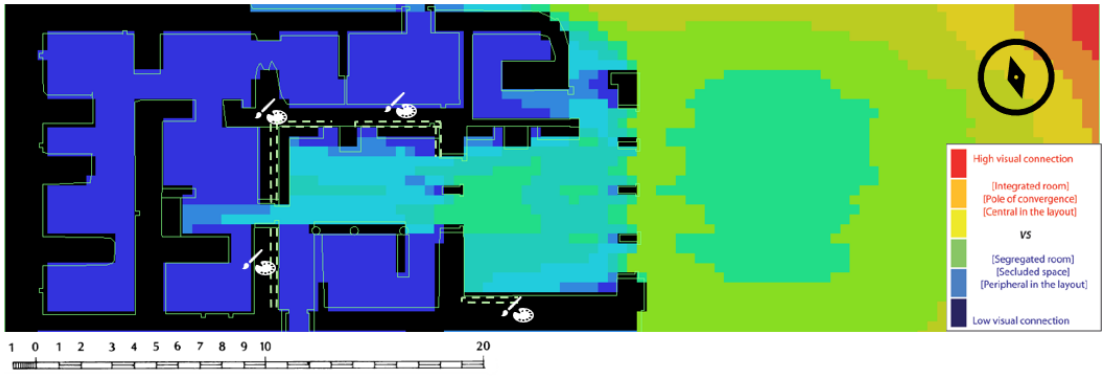

Figure 5.3.13 2D Visibility Analysis of the Throne Room complex with indications of original position of known painted plaster fragments, Version 1: Metric of Point First Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

- Version 2: Southern doors of anteroom closed & main room closed (see Appendix C, Figure C26 & Figure C32).

The testing of the metrics on the 2nd version of the complex, revealed once again that the blocking of the southern partitions affects remarkably the degree of visual connection between the interior of the complex and the Central Court; only an alignment of visibility from the north reaches part of the north and west walls of the anteroom and the west wall of the main room partially.

- Version 3: Northern doors of anteroom closed & main room closed (see Appendix C, Figure C27 & Figure C33).

In the 3rd version of the complex, the southern partitions of the main entrance enable the visual, limited, connection of the Central Court to a large part of the anteroom, and part of the west wall of the main room, mainly the south end. A line of vision also reaches the inner room of the complex.

- Version 4: Southern partitions of the anteroom closed & north door to the main room closed north door to the main room open (see Appendix C, Figure C28 & Figure C34).

In the 4th version, both metrics display the excessive segregation of the complex, due to the southern partitions of the anteroom being closed. Only an alignment of sight from the northern partitions passes through the north section of the anteroom and barely reaches the pillar crypt of the main room.

- Version 5: Northern partitions of the anteroom closed & south door to the main room closed (see Appendix C, Figure C29 & Figure C35).

In the case of the 5th version, the metrics showcase that the space of the anteroom, mostly, its south and central part, are slightly less segregated due to the southern partitions being open. The gypsum bench and part of the north wall of the main room are also visible to a smaller degree.

- Version 6: No pier-and-door partition from the anteroom to the main room (see Appendix C, Figure C30 & Figure C36).

Finally, in the 6th architectural layout of the complex, the metrics of point first and point second moment unveil the relatively high visual connection of the interior of the complex, and especially, the connection of the anteroom to the main room and to part of the west wall of the inner room.

5.3.4 Viewshed Analysis & LOS in 3D: Results

Regarding the 3D analysis, analogously to the assessment of the West Entrance complex, I recreated the same versions of the feature as in the 2D analysis. Consequently, I conducted the LOS analysis with a dense grid of observer points in the first version of the Throne Room complex, while in the case of the viewshed, I

positioned the four observer points accordingly; one point in the entrance to the complex, two points in the area of the anteroom and one in the main room (see Appendix E20). I present the results of the line-of-sight analysis below, and I comment on the viewshed analysis, by focusing on the different degrees of visual connection to the painted images according to the position of the observer points and the version of the feature (also see Appendix E). Similarly to the West Entrance, my analysis ends with the visualisations of the 3D results in two graphs.

5.3.4.1 LOS Analysis

The Line-of-sight analysis on the Throne Room complex (Version 1) highlights the areas of higher and lower visibility, similarly to the 2D analysis. At the same time, per contra to the 2D, the results of LOS, a set of visibility lines, are focused on the visual integration of the painted images on the walls of the complex (see Figure 5.3.14). Most of the green lines are assembled mainly in centre of the anteroom and slightly towards the northern part of the main room (see Figure 5.3.15 & Appendix E, Figures E17-19). Therefore, this can be considered as the area of the Throne Room complex, which has the highest degree of undisturbed visual access to all the painted surfaces. The 2D results of the metrics of isovist area and visual integration also pinpoint to this part of the complex (see Appendix C).

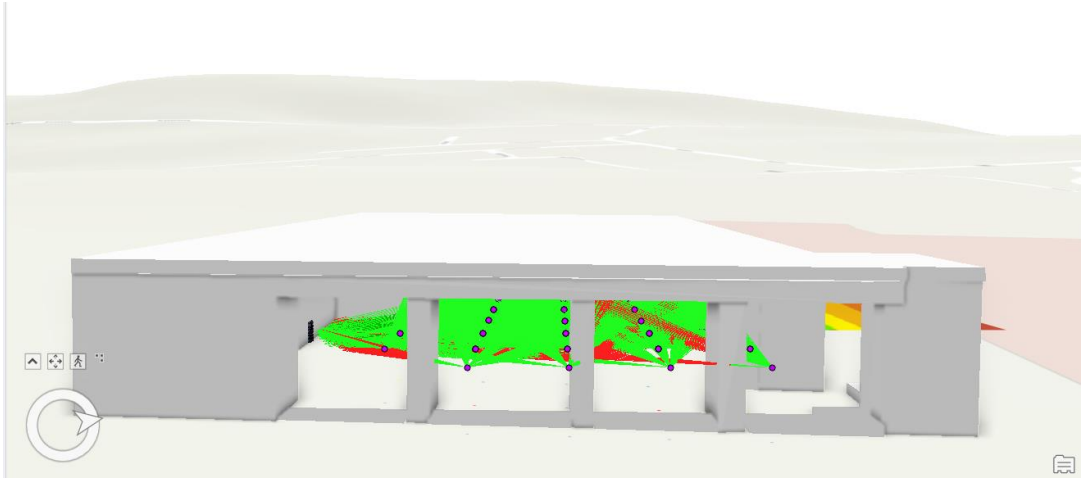

Figure 5.3.14 View of the conduction of LOS analysis in the 3D model of the Throne Room complex (Version 1: All doors open), with the grid of points representing the observers. Green lines indicate visible distance to target points, while red the no visible. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

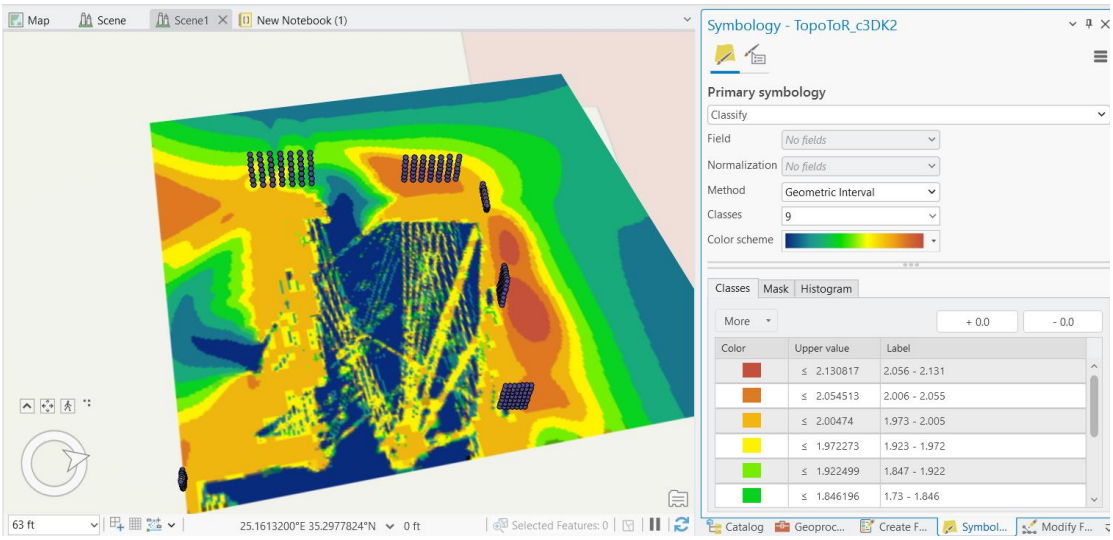

Figure 5.3.15 View of the raster created with the 'Topo to Raster' function, showcasing the results of the conduction of LOS analysis in the 3D model of the Throne Room complex. Red colour represents the areas with the highest degree of visual accessibility to the wall decorations, while blue represents the more segregated areas. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

5.3.4.2 Viewshed Analysis

- Observer Point: Central Court (see Appendix E)

Regarding the 3D viewshed assessment of the decoration of the Throne room complex, the analysis from the point view of the Central Court resulted in relatively expected results. In the 1st version of the 3D representation of the Throne room complex, the observing point set in the Central Court has no visual access to the palm painted plaster next to the gypsum seat of the north wall and to the southwest wall, and limited access to the griffin of the northwest wall, whose front body must have been easily discernible (see Appendix E, Figure E21&E22). Even without the use of the pier-and-door partitions, the visual connection of the people standing in the Central Court to the main room, was hindered verily by the unmoveable features of the complex. On the other hand, the decoration of the anteroom with the bull, was easily recognizable by the passersby of the Central Court (see Appendix E, Figure E20).

In the case of the 2nd version of the feature, where the southern partitions of the entrance to the anteroom are closed, neither the decoration of the main room, nor that of the anteroom seems to have been visually accessible to the viewpoint of the Central Court (see Appendix E, Figure E27 & 28). In the 3rd version, the northern

partitions are once again blocking the view of the main room, but the decoration of the anteroom is again visible (see Appendix E, Figure E34-36). The 4th version, in which the southern partitions of the anteroom and the north door to the main room are represented as blocked, renders once again obvious the importance of the southern pier-and-door of the as there is no visual access to the decoration from the Central Court (see Appendix E, Figure E43).

In the 5th version of the complex, where the northern partitions of the anteroom and the south door to the main room are closed, again only part of the griffin images of the northwest wall is visible, as well as the anteroom bull decoration (see Appendix E, Figure E50-52). Finally, in the 6th version, where the passage from the anteroom to the main room is represented without a pier-and-door partition, the northwest image is fully visible from the Central Court, while the same applies for the anteroom's decoration (see Appendix E, Figure E58-60).

- Observer Points: In the anteroom (see Appendix E)

The 3D viewshed analysis with the observer points set in the anteroom pinpointed to the overall high visual accessibility of the people who were sitting or standing in the anteroom. In the 1st version of the feature, the visual access is mainly concentrated on the on west walls with the decoration of the griffins, while the north wall's palm image is almost fully hidden by the pillars of the pier-and-door partition from the anteroom to the main room (see Appendix E, Figure E24). On the other hand, the decoration of the anteroom itself is covered by both viewpoints, and therefore, represented in yellow (see Appendix E, Figure E25). That also seems to be the case in all versions of the 3D analysis of the Throne room complex with the observers set inside the anteroom.

In the 2nd version, the visual connection of the anteroom to the west walls is once again visible. However, the blocking of the southern door to the main room does not enable visual access to the lustral basin and the southwest decoration of the main room, while the same applies for the north wall and the gypsum bench (see Appendix

E, Figure E30-32). In the 3rd version, where the northern doors of the anteroom and the main room are blocked, the visibility of the west walls is extremely restricted, as only the north part of the southwest griffin decoration is visible and part of the west part of the north wall decoration (see Appendix E, Figure E38-40). The decoration of the anteroom is once again visible to both viewpoints. Surprisingly, the 4th version where the southern doors of the entrance to the anteroom and the north to the main room were blocked, had similar outcomes to the 3rd one (see Appendix E, Figure E45-47).

Regarding the 5th version, the northwest part and the northwest corner of the main room were the only discernible ones, with the usual high visual coverage of the anteroom's south wall (see Appendix E, Figure E54&55). Finally, the 6th version, presents once more, that with the absence of the pillars of the pier-and-door from the anteroom to the main room, the visual accessibility to the north and northwest walls of the main room is unhindered, while the same applies to the anteroom's decoration (see Appendix E, Figure E61&63).

- Observer Point: In the main room (see Appendix E)

The assessment of the visual integration of the Throne room complex with the observer point set in the east corner of the lustral basin, inside the main room, brought into my attention the altogether limited visual interconnection of the people inside the main room with the rest of the complex. In the 1st, the 2nd and 3rd versions of the complex, the visual accessibility is limited to the north and northwest walls of the main room, while only the southwest corner of the anteroom is visible (see Appendix E, Figure E26&27, Figure E33-34, Figure E41-43). Similarly to the previous versions, in the 4th version, the north and northwest walls were visually accessible (see Appendix E, Figure E47-49). In the 5th version the visual connection of the viewpoint of the main room is restricted only to the north and northwest walls (see Appendix E, Figure E56&57). Finally, in the 6th version, the northwest and north walls are visible, while the southwest is not, and only the southwest corner of the anteroom is seen from the main room (see Appendix E, Figure E64-66).

- Viewshed from all observer points (see Appendix E)

With all the observer points set, the outcome of the viewshed analysis was tested on the 1st version of the Throne room complex. This analysis visualized the areas of multiple visual coverage from the distinct observers inside and outside the complex. In particular, the decoration of the anteroom displayed a high degree of visibility, while the north, and northwest wall of the main room were also visible, but by less observers. The lustral basin and the decoration of the southwest wall presented poor visual access, just as in the case of most of the other versions (see Figure 5.3.16).

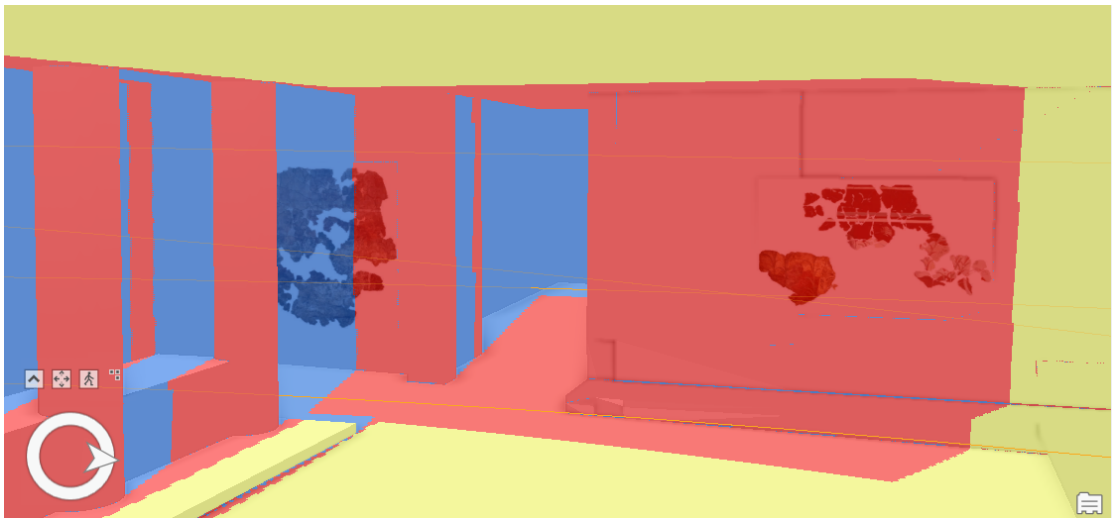

Figure 5.3.16 View of the main room of the Throne Room complex from the northeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Ultimately, to take a more holistic look of the outcome of the 3D viewshed analysis discussed above, I created a table with the degree of visual integration of each decoration, categorized by the set of observer points, and per version of the 3D feature (see Appendix E, Figure E86). From this table I was able to further analyse my results of, by visualizing them in two distinct graphs; the stacked column chart depicts the degree of visual access of the painted plaster images per version (see Figure 5.3.17), while the ribbon chart illustrates the change of the degree of visibility of each painting per observer point (see Figure 5.3.18).

In the stacked column chart, it is evident that the 6th version of the Throne room complex, displayed the optimal visual access to all the decorated spaces of the feature. Moreover, the most visually accessible painted image both in this version, as well as in all the other, seems to have been that of the southwestern wall of the anteroom, with the depiction of a bull's hoof. The decoration of the northwest wall of the main room, is equally or slightly less high, in four out of the six versions. The north wall of the same room, with the palm and griffin painting comes third, while finally, the lustral basin and the northeast wall seem to have been the less visually integrated areas of the complex.

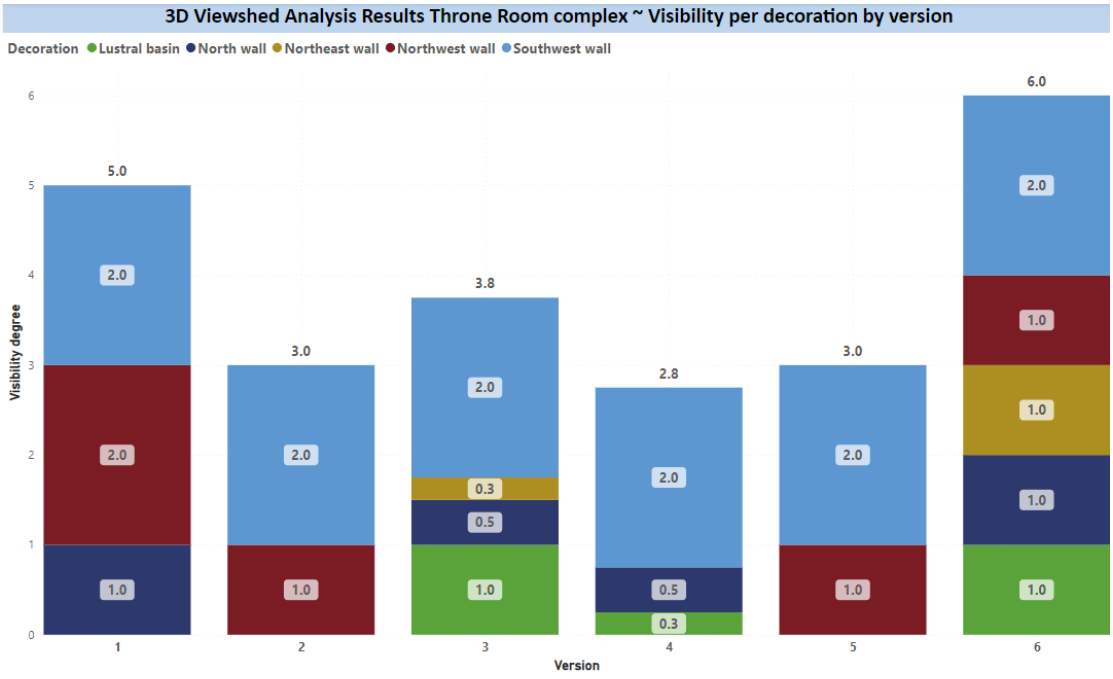

Figure 5.3.17 Stacked column chart visualizing the results of the 3D Exploratory Viewshed in the Throne Room complex. Percentage and sum of the degree of visibility per painted plaster decoration and per version. Graph created with Power BI (Figure: V. Georgiopoulou).

The ribbon chart illustrates that among the sample of observer points set in the different areas of the Throne room complex, the ones positioned in the anteroom had unobstructed visual connection to all the decorations, with the decoration of the anteroom itself presenting the highest degree of visibility. The observer point in the main room, displays less variety in the number of visually accessible wall paintings, as only the decoration of the northwest and north wall of the main room, as well as the southwest wall of the anteroom are discernible. Lastly, the observer points from the

Central Court, have naturally the lowest degree of visual connection to the decoration, but they could still discern all the decorated walls of the complex.

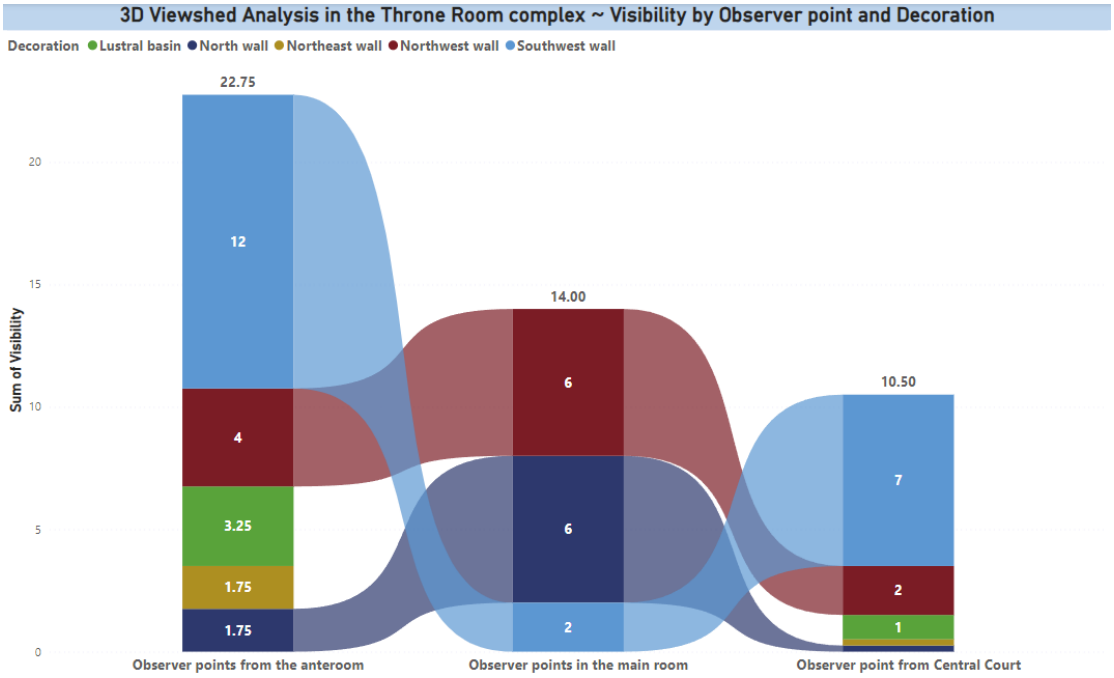

Figure 5.3.18 Ribbon chart visualizing the results of the 3D Exploratory Viewshed in the Throne Room complex. Sum of the degree of visibility of the painted plaster decoration per observer points by version. Graph created with Power BI (Figure: V. Georgiopoulou).

6. Discussion

6.1 Reapproaching the Knossian 'artscape'

Prior to interpreting the results from the visibility analysis of the two study cases of the Knossian feature, it's crucial to revisit the theoretical notion that underlines this research, the treatment of the wall decorations as part of an artscape. The artscape, inspired by the taskscape of Tim Ingold, describes the relationship of art and human-made environment, as dynamic and interactive, since both elements are mutually influenced by one another (Ingold, 2000, p.173; Sailer & Psathiti, 2017, p. 1-2). This conclusion is not new to archaeological research, as many material and phenomenological studies have made use of it to reach new interpretations (Wheatley, 2014 p. 115-119; Paliou et al., 2011, p. 379).

The main factor that renders artscape the niche of my research lies in the fact that it recognises art and its manifestations as living entities within the landscape that nests human action. The material properties of art decorations render them indeed modifiable and changeable, but at the same time as part of unmovable features, they play a key role in defining the use of space. Within this framework, I will assess the decorations of the two study cases by investigating their position within the palatial landscape, and their visual integration according to the visibility analysis results. Ultimately, by reconstructing the artscape, I aim to approach part of the Knossian landscape and the patterns of human activity that developed within it.

6.1.1 The '- scape': Spatial characteristics

To begin with, architectural affordances render the two case studies more similar than they might seem at first sight. To explain, both the Corridor of the Procession and the Throne Room act as interconnecting spaces between a closed and an open area, the West and South Wings and the West Court in the case of the Corridor, and the West Wing and the Central Court, in the case of the Throne Room. Furthermore, to enter both spaces you need to cross an intermediate space, the West Porch for the Corridor and the anteroom for the Throne Room, which consist of a hall accessible by pier-and-door partitions (Galanakis et al., 2017, p. 50).

These conditions render both study cases mediators from an area with more freedom of movement, to areas where behaviour and action are limited by the architectural features. The West Entrance complex, through the elongated Corridor, imposes its users to specific movement, while the system of the pier-and-door partitions of the Throne Room Complex pinpoint to the ability of its users to determine the patterns of motion.

Other unmovable features that define the use of both spaces are the gypsum seats built attached to the wall and floor; in the case of the West Entrance complex, in the south wall of the West Porch survives only what has been interpreted as a base for a seat, while in the Throne Room the whole structure is preserved. Moreover, in the case of the latter, part of the anteroom and main room also host seating benches that run across the walls, showcasing that the areas might have been used for a substantial amount of time, rather than just a passing by area, as in the case of the Corridor.

From the assessment of the spatial characteristics of the two cases, the phrase of Ian Driessen and Quentin Letesson on the architecture of the Neopalatial period comes to mind, '*…architecture betrays a strong concern for standardized behaviour, and a development to more structured sequences of actions and encounters.'* (Driessen & Letesson, 2008, p. 212). Ultimately, both cases exhibit features which could potentially be used to control access, while the existence of stable seating points, highlight at least one pattern of the human behaviour in the use of the space.

6.1.2 The 'art- ': Visual characteristics

Following their spatial similarities, the two study cases also seem to follow a specific iconographic language when it comes to the decoration of the entrance areas; bands of painted plaster with imitation of colourful marble dadoes and compositions with animals, most probably bulls, are attested both in the West Entrance complex and in the Throne Room complex, in the West Porch and the anteroom, respectively (Evans, 1928a, p. 676; Hood, 2005, p.65-66). The more detailed compositions that decorated the interior of the Corridor of the West Entrance, and the main room of the Throne Room complex, also presumably shared a similar dark red background, with red and

white bands in the upper part of the wall and a frieze of dadoes imitation in the lower (Evans, 1933, p. 908-910; Poursat, 2022, p. 346).

Ute Günkel-Maschek (2020), referred to this phenomenon of using certain iconographic motifs and compositions to decorate specific areas of the palatial complex of Knossos as the 'bild-räume', the spatial vocabulary of Minoan iconography. The purpose of the 'bild- räume' in my study case, the dadoes' imitations and the bull's scene, might have been to inform the people of the importance of the space they were entering, by referring to a myth from the Minoan oral lore, or to a specific symbol, not fully decipherable in the present. In any case, the repetition of the same visual scene in two similar built spaces creates an undeniable link between the two cases, as it communicates to their users, information about their position within the Knossian complex; they were about to move from an open space to the first room of a close complex.

6.1.2.1 West Entrance complex: People on the move

Moving from the West Court inside the feature of my first study case, the West Entrance complex, the assessment of the decorations helped me reach important conclusions on the use of the space. To begin with, both the 2D and the 3D analysis of the decoration of the West Entrance complex pinpoint to the fact that the degree of visual access varied considerably, according to the position of the viewers and the use of the pier-and-door partitions. The fact that the visual access to the overall decorations of the feature, was unobstructed to the observers standing in the area of the West Porch and the entrance to the Corridor (see Figure 5.2.15), showcases that there were higher chances for people who were moving from one space to the other to catch a glimpse of the decorations of both spaces. Subsequently, regarding my query on the details of the painted images that might prevail over the others, the only conclusion that can be drawn is that the part of the images closer to the entrances, had also higher chances to be observed more frequently.

On the other hand, the decoration of the people in procession in the interior of the Corridor was more segregated in comparison to the decoration of the West Porch, as it was only visible when someone was standing exactly in front of the entrance to the

passageway. This contradicts with previous interpretations that the procession images of the Corridor were meant to act as a feature of social differentiation and propaganda (Evans, 1921, p. 424), as the only people that could be intimidated by it where the ones who could actually cross it. People in the West Court, or the open area of the West Porch, could fully admire the bull decoration and the colourful dadoes of the West Porch, while also catching a glimpse of the procession.

In a sense, the overall decoration of the West Porch complex was meant to be seen while people were on the move. Specifically in the case of the Corridor, both the architectural format, which leaves not much room for other activities than moving from one direction to the other, and the decorative theme with its large dimensions and details, promote movement. This might be considered as a rather logical argument, given that corridors even today are considered elements of trespassing space, that control the access from one point to the other. However, the fact that the fragments of the Procession image attest such a detailed and complex decoration, meant to be experienced only on the move and in artificial, dim light, lead us to two important observations; first, that indeed the decoration was an integral part of the imposing atmosphere of the route to the palatial complex, and/or secondly, that the great detail of the composition was the result of the will of the painters themselves who might have wanted to show off their artistic skills.

6.1.2.2 Throne Room complex: A throne for a few kings?

The visibility analysis of the Throne room complex also pinpointed to the area in-between the open space of Central Court and the interior of the complex, as the place with the optimal visual access to the decorations. At the same time, the painted image of the anteroom's southwest wall with the bull above the marble imitation, showed a considerably large degree of visibility in all the versions of the 3D representation of the feature, and from all observer points (see Figures 5.3.17 & 5.3.18). The decoration of the north and northwest wall of the main room of the complex, also displayed a high degree of visual integration. Even with the pier-and-door partitions in use, the interior of the main room, and especially the north area where the gypsum seat was positioned, were visible to the observers of the anteroom. This comes into contrast

with the arguments on the segregation of the space due to its ritualistic function (Evans, 1935, p. 992; Niemeier, 1987, p. 166-167), while it is further supported by the fact that the very existence of the partitions from the anteroom to the main room, is contemplated by recent research (Galanakis et al., 2017, p.50). Furthermore, according to both the 2D and the 3D analysis, the pier-and-door partitions were mainly affecting the view of the people outside the complex. More specifically, the southern partitions played a more significant role in controlling the visual connection between the complex and the Central Court.

The only space of the Throne Room complex that appeared segregated in all the distinct versions, and in all the metrics, is the 'lustral basin'. This coincides with the fact that it is the only feature of the main room with no figurative decoration, possibly indicating the different use of this room in comparison to the rest of the complex (Galanakis et al. 2017, p. 48). On the other hand, the painted plaster decoration of the southwest wall of the main room was also segregated in most versions of the feature. Notably, in the 3D analysis, it was not visible even by the viewpoint inside the main room. Nevertheless, the fact that this wall's decoration repeats the motif of the griffin, similarly to the northwest and north walls, illustrates that the creation of a symmetrical decorative composition was important to the commissioners, even if it was not fully visible.

Regarding my other query, whether a specific part of the compositions had a higher visual integration due to their spatial position in the walls, from the 3D viewshed analysis it became clear no such pattern could be discerned securely. In some cases, the front body of the griffins from the west wall of the main room was favoured, but in the reconstructed versions where the southern pier-and-door partition to the main room was shut, the back was visible (see Appendix E, Figure E53). Naturally, when it comes to the decoration of the southwest wall, which was in most of the versions hidden by the lustral basin, the head of the griffin situated close to the existing door, had a higher degree of visual connectivity. Respectively, in the case of the palm and griffin painting east of the gypsum 'throne', when the northern door to the main room was closed, only the palm must have been visible to the people in the anteroom (see Appendix E, Figure E46). Consequently, the pier-and-door partitions, the lustral basin

and the other architectural elements, in combination with the position of the observers, played an important role in drawing attention to parts of the decorations, without a set of specific ones prevailing over the others.

6.2 Methodological assessment: Visibility analysis in 2D vs 3D

Regarding the assessment of the visibility analysis both the 2D and the 3D methods came with their own challenges and highlights. In the case of the 2D visibility analysis, the preparation of the different versions of the 2D plans of the study cases was quite time consuming and resulted in several different types of files. For the representation in 2D, I decided to exclude specific architectural elements of the spaces under investigation in order to examine the visibility of the wall decoration. To clarify, I did not include the benches in the representation of the Throne room complex, as the 2D software could not consider their height, and the fact that they would not in reality affect the visibility of the wall decorations and treated them as extensions of the walls.

This issue, of the incapability of 2D representation to consider the Y-value, or else the height of spatial elements, also resulted in analytical biases, as I could not represent the exact location of the wall decoration on the 2D plans, and consequently, my analysis was based on the visual accessibility of the walls where the paintings were positioned, and not the paintings themselves. Without the recreation of the original height of the decorations, optical barriers that might have affected their visibility were, therefore, not taken into account. Moreover, to test the plethora of hypotheses regarding the visual accessibility of the study cases, I had to create 36 different plans of the features under examination which although feasible, resulted in many files that had to be assessed (see Appendix C).

Nonetheless, the conduction of the 2D visibility analysis in the depthmapX environment was made possible within a very short amount of time per plan, and by following only a few steps. The results were also easy to interpret thanks to the colour coding raster signifying the areas of higher or lower visibility. The fact that the whole process was made possible through open-source tools granted my research a fair amount of documentation, that aided me both on the methodological part, and the interpretation.

Similarly, the 3D viewshed analysis conducted with ArcGIS Pro allowed me to test several versions of my study areas and visualize the results in a comprehensive way. Since the first archaeological research that dealt with visibility analysis of decorative elements (Landeschi et al., 2016; Paliou, 2013, fortunately, the computational resources have made considerable progress. ArcGIS Pro rendered the visual analysis of the 3D features very sophisticated and detailed, yet realizable even by a non-IT specialist.

Not surprisingly, it was the representational process of the two study cases within the 3D environment that mostly hindered my research. The fact that the 3D environment enables the detailed representation of architectural features also led to many scientific dilemmas, especially due to the fragmentary state of the Knossian monument. For that reason, the detailed documentation of the plans and images I used to build the two models is attested explicitly in Appendix D.

Another, rather defining characteristic of the 3D methodology was the interconnectivity of the software and tools I used. The GIS add-on tool in Blender allowed me to easily set the real coordinates of the 3D models I have created, while extracting them as an .obj file and importing them in ArcGIS Pro, was also completed effortlessly. Moreover, the 3D elements represented as multipatch geometries in ArcGIS 3D Scene, could be edited and modified within the GIS environment, making the process of testing multiple accessibility options realizable.

The LOS method worked well for the in-depth analysis of the decorations under investigation, but as aforementioned, the analysis had to be limited to a specific area of viewpoints and to a specific number of versions, as the layers created caused the 3D project to overload with information. A solution to this would be to create multiple projects to test the other 3D versions, which would subsequently result in a vast number of layers, not easily manageable by an ordinary computer. Nevertheless, even if this was possible, the results of this method fall under the category of the more ‘stern’ visibility analysis studies, as it discerns only the visible and the non-visible relationship between the observer and target layers.

Within the Viewshed Analysis tool, I could place manually the observation points, while having full control of the other conditions of the analysis, such as the angle, distance and height of the area of testing. At the same time, the colour coded results of the analysis highlighted the areas of higher and lower visual connectivity, not only within the space of the feature, but also, specifically on the decorated walls, the initial subject of my study. Moreover, instead of creating multiple 3D models to represent the different versions of the pier-and-door partitions, I used rectangular multipatch features created in Blender, to position them as obstacles.

On the other hand, the Viewshed Analysis tool, also posed certain restrictions, such as the number of observer points that could be analysed. This certainly affected the results on the perception of the visual integration of the wall decorations. To partially overcome this flaw, I used the horizontal and vertical degrees of angle of the human peripheral vision, which enabled me to analyse a larger area of space. However, one bias of my analysis was that I positioned the manipulation of the observer points towards the decorated walls (see Appendix E). Due to the restriction of the analysis's points, I chose not to include points looking in other directions or moving towards other areas within the rooms. Subsequently, the results displayed in the two tables (see Appendix E, Figure E86&E87), are the outcome of a specific set of parameters, and might not reflect entirely the degree of visual accessibility of each decoration. Further research, and the development of the existing visibility analysis software could greatly contribute to ensuring the integrity of future similar studies.

Overall, the two methodologies acted complementary to each other. The 2D visibility graph analyses provided me with a general idea of the areas of higher and lower visual connectivity of the two study cases, while with the 3D analyses, I was able to gauge the visual integration of the wall decorations in depth. Even though there is still space for improvement, ultimately, both methods greatly contributed to grasping the representational and analytical difficulties of assessing the study cases of the Knossos monument.

7. Conclusions

7.1 On the visual integration of the painted plaster images

Revisiting the main research question of my thesis, it is vital to explicitly state that by the current research I did not aspire to give a definite answer to this initial query. Since my analysis focused on two specific areas of the Knossian complex, I would like to rephrase my original question, from 'What was the visual integration of the painted plaster images of the palatial complex of Knossos?', to 'What was the visual integration of the painted plaster images of the Throne Room and the West Entrance areas of the palatial complex of Knossos?'. To try and understand the role of the whole painted plaster decoration of the feature based on the results of two very specific, spatially and temporally, study cases would be unscientific, if not irrational. Ultimately, I wish to draw my conclusions as an argument for the necessity of reassessing the study of the painted plaster images of Knossos.

Thus, 'what was the visual integration of the painted plaster images of the Throne Room and the West Entrance areas of the palatial complex of Knossos?'. The analysis of the two complexes using 2D and 3D visibility tools revealed significant insights into the answer of this query. By the assessment of the two cases, it became clear that it was not necessary for people to be inside the complexes to enjoy the view of the decorations, as the areas in-between the open space of the courts and the interior, displayed the highest degree of visual accessibility to the overall decoration of the features. Moreover, the fact that both in the case of the West Porch and the anteroom, the same theme, a bull walking above a frieze of a colourful dado, was selected, indicates that the choice might have been deliberate. The repetition of a similar composition would have created a sense of familiarity for those having access both to the West Entrance and the Throne room complex.

Therefore, even though both the Throne room complex and the West Entrance complex, display architectural characteristics, like the elongated corridor and the pier-and-door partitions, that left little room for appropriation by its users, the visual accessibility to their decoration and the recreation of similar compositional themes, indicate that both spaces might not have been that mystical, or daunting to the

Knossian public that had access to the palatial complex. As the theory of the artscape dictates, it's not only the perception of the people that changes due to the visual integration of the painted images, but the images themselves can take on a different meaning. For example, the representation of a mythical animal like the griffins, might have been initially a way to illustrate the ritualistic use of the space, but since it was visible to whoever had access to the anteroom, it could have turned into a more artistic symbol. This is even more supported by the fact that the decorations were visible even from the open spaces of the Courts. Therefore, even if the details of the compositions were not discernible from afar, the size of the figures suggests that the painters had taken this parameter into account, and still ensured that the images were recognisable.

Similarly to the change of the images' perception by the people, the high connectivity of the figurative compositions possibly signifies a change to the perception and use of space as well. The two study cases underwent renovations during the Late Minoan IB to the Late Minoan II period, just as the whole palatial complex. Regardless of the cause of these architectural modifications, the fact that they were accompanied by these specific decorative choices, further attests the possible change of the use of the Throne room and the West Entrance complex; from spaces with fully controlled activities and regulations, to spaces with more flexible functionality. The fact that both the procession composition and the palm and griffin decorations are rendered with such artistic detail, enhances this argument as it signifies that the painters knew that their works were going to be seen by more people, or more frequently.

Ultimately, the analysis of the visual integration of the painted plaster decoration enables us to get a glimpse of the complexity of relations that results from the interconnection of architecture, art and people, within the limits of such a 'living' feature such as the Knossos palace.

7.2 Future Research and final thoughts

As I hope to have rendered 'visible' with my thesis, even after almost a century of research, the study of the Knossian wall decorations still holds unexplored areas of focus. The implementation of existing and new computational tools to answer

archaeological queries can greatly expand the variety of analyses and knowledge on certain fields. The integration of 3D modelling technologies with the environment and tools of GIS, Agent Based Modelling, and other kinds of software surely holds a lot of potential.

One area for further research would be the recreation of many diverse and possibly interactive representations of archaeological features, and their analysis under real-life conditions. As aforementioned, the present state of the Knossos palatial complex allows for many different representational interpretations, regarding its architecture and decoration. Although I designed specific versions of the two study cases for the purpose of my research, in order to stay within the limits of a master's thesis, I only tested different ways of accessing the features, by changing the system of the pier-and-door partitions. Other reconstructions could interpret differently architectural elements, like the size of the columns, the size of the entrance that could be abstracted by movable items, or even the existence of openings to other spaces (Paliou et al., 2011, p. 382).

Regarding the study of painted plaster images specifically, another important parameter that influences their visual perception, and was not included in my research, is the lighting conditions. Whether the source is natural or artificial, the change of the light's hue or volume according to the hour of the day and/or the season, would have undoubtedly affected the images' appearance and therefore, their perception. Ultimately, the creation of a number of diverse reconstructions of the same feature, and its analysis under different conditions could question existing theories, by showcasing the subjectivity of the interpretating method, while possibly discerning previously unknown patterns of human behaviour in the past.

Finally, the future development of 3D archaeological documentation to include diverse types of data could enable the investigation of the represented space as a multisensorial platform. This multisensorial 3D environment could represent many lost 'scapes', like land, art, sound, taste, smell and other kinds of 'scapes'.

On that scope, the implementation of other new technologies like Agent Based Modelling (ABM), in 3D, could help archaeologists represent not only the

multisensorial, but also the multiperceptional nature of human-made features. To elucidate, the integration of ABM in these kinds of multisensorial digital platforms, could highlight previously hidden patterns of human activities, and showcase a variety of distinct perceptions of space, where sound, or smell would be the fundamental, interconnecting factors, instead of visibility.

To conclude, the analysis of archaeological features by using a variety of diverse computational tools can be a very demanding, but at the same time fruitful process. In spite of that, I believe that it is mainly in the representational process that archaeologists conversing with tools like 3D, GIS and ABM, can benefit from. As Chiara Piccoli has stated, '...the time that is invested in evaluating and interpreting the sources in most cases exceeds the time that is employed for its actual creation.' (Piccoli, 2018, p. 68). However, it is exactly through that process that archaeologists can question previous perceptions and reassess the meaning of the remnants of human-made landscapes. Similarly, I hope that in my research I have managed to showcase that 3D models can be more than just 'pretty pictures' (Piccoli, 2018, p. 75). 3D viewshed analysis, especially in contested reconstructed monuments, like in the case of the Knossian complex, can help us reach new conclusions and new queries that would have otherwise remained untouched.

Abstract

My thesis, titled "Looking at the Painted Plaster of Knossos: A Visibility Analysis on 2D and 3D Representations of Decorated Space", explores the interplay between architectural space and the visual perception of the painted plaster images of two selected study cases from the Bronze Age site of Knossos. Among the plethora of painted plaster decoration of the Knossian palatial complex, I chose to focus on the only figurative decorations found in situ, that of the West Entrance and the Throne room complex, dating back to the mid-15th century BC. To provide a comprehensive evaluation of my two study cases, I approach them as part of the Knossian 'artscape', a new theoretical framework inspired by Tim Ingold's 'taskscape', which views art decoration as part of the, constantly under construction, human environment. To reconstruct the visual integration of the paintings, I utilized new computational tools and conducted two-dimensional (2D) and three-dimensional (3D) visibility analysis.

My research begins with the investigation of the Knossian palace as both an archaeological and a visual entity, offering insights into how its painted plaster decoration contributes to interpretations of its spatial organisation and cultural significance. I provide the historical overview of prior studies on the Knossian painted images and discuss the evolution of approaches to understanding the interplay between visual perception and interior architectural space in archaeological contexts. In the theoretical background, I introduce the concept of the 'artscape' and the agency of built environments, focusing on how architectural space and decorative elements interact to shape human experience and perception. Consequently, I refer explicitly to the metrics and processes involved in the 2D and 3D analyses, detailing the respective strengths and applications of each method. This approach allowed me to examine both transparently and systematically, how were the painted plaster images integrated into the Knossian palatial landscape.

In the detailed analysis of case studies, I examine the architectural context, decorative schemes, and the results of visibility analysis. The discussion and comparison of the outcomes of both the 2D and the 3D analyses showcases that the two methods act complementary to each other, while the assessment of my findings reveals significant

insights into how visual accessibility and engagement with painted plaster were mediated by the architectural layout and spatial features.

My study reaches its conclusions, by reapproaching the notion of the ‘artscape’ and critically evaluating its contribution to the visibility analysis methodologies. My attempt of reconstructing the ‘artscape’, leads to the discussion of the interconnecting relationship between the architecture, the painted images and the humans that acted within the complex. The evaluation of the methodologies used, and decisions made during the interpretational phase of the Knossian features, offers a useful basis for future assessment.

Ultimately, by combining theoretical perspectives with innovative analytical methods, my thesis sheds new light on the decorated spaces of Knossos, while highlighting the significance of integrating archaeological approaches with cutting-edge digital technologies to explore the interplay of art, architecture, and human perception in ancient contexts. Possible avenues for future research, including the application of advanced digital tools and comparative studies of other archaeological sites, are also briefly discussed.

List of References

ArcGIS Developers. (2024, April) *3D viewshed | Documentation*. https://developers.arcgis.com/documentation/mapping-apis-and-services/spatial-analysis/3d-visual/3d-viewshed/

ArcGIS Help 10.1—Line Of Sight (3D Analyst). (n.d.). *Retrieved 1 December 2024, from* https://resources.arcgis.com/en/help/main/10.1/index.html#/Line_Of_Sight/00q900000005s000000/

ArchaiOptix. (2019). *English: - Object type: wall painting (fresco)* [Graphic]. Own work. https://commons.wikimedia.org/wiki/File:Wall_painting_of_cult_procession_from_Knossos_(Corridor_of_Procession)_-_Heraklion_AM_-_01.jpg

Archer, J. (2005). Social Theory of Space: Architecture and the Production of Self, Culture, and Society. *Journal of the Society of Architectural Historians*, *64*(4), 430–433. https://doi.org/10.2307/25068197

Blakolmer, F. (2020). The "Brilliant Child Prodigy" of the Eastern Mediterranean. An Introduction. In *Current Approaches and New Perspectives in Aegean Iconography.* (pp. 9–18). Presses Universitaires de Louvain.

Blakolmer, F. (2012). Image and Architecture: Reflections of Mural Iconography in Seal Images and Other Art Forms of Minoan Crete. In D. Panagiotopoulos & U. Günkel-Maschek (Eds.), *Minoan Realities,* 83-114. Presses Universitaires de Louvain. https://books.openedition.org/pucl/2839

Blakolmer, F. (2010). Οι τέχνες της Κρήτης την Εποχή του Χαλκού και το Ευρωπαϊκό μοντέρνο στυλ: Απεικάσματα και διαμόρφωση διαφορετικών ταυτοτήτων. In Γ.Χαμηλάκης and N.Momigliano (Eds.), *Αρχαιολογία και ευρωπαϊκή νεωτερικότητα. Παράγοντας και καταναλώνοντας τους «Μινωίτες»*, 301-29. Εκδόσεις του Πρώτου Εικοστού Αιώνα.

Bourdieu, P. (1977). *Outline of a Theory of Practice*. (R. Nice, Trans.). Cambridge University Press.

Boulotis, C. (1995). Αιγαιακές Τοιχογραφίες: Ένας πολύχρωμος αφηγηματικός λόγος. *Αρχαιολογία και Τέχνες, 55*, 13-32.

Brysbaert, A. (2008). *The Power of Technology in the Bronze Age Eastern Mediterranean. The Case of the Painted Plaster Monographs in Mediterranean Archaeology.* Equinox.

BSA Digital Collections. (n.d.). Retrieved June 15, 2024, from https://digital.bsa.ac.uk/results.php?department=Archive&collection=BSA+SPHS+Image+Collection&locality=Knossos&order=numasc&results=200

Cameron, M. (1976). *A general study of minoan frescoes with particular reference to unpublished wall paintings from Knossos* [doctoral dissertation, University of Newcastle]. Newcastle University. http://theses.ncl.ac.uk/jspui/handle/10443/302

CG Fast Track (Director). (2022, October 14). *Blender 3.6 Beginner Tutorial—Part 1* [Video recording]. https://www.youtube.com/watch?v=3QAGpxV36wM

Chapin, A. (2016). Into the Labyrinth: Research Methods and the Study of Minoan Iconography. *Pharos. Greek Iconographies: Identities and Media in Context Volume 22, Issue 1, 9-26*. https://doi.org/10.2143/PHA.22.1.3284999

Childe, G. (1925). *The Dawn of European Civilisation*. Routledge & Kegan Paul LTD.

Cho, Y. (2022). *Chapter 4. Depthmap X – Data visualisation*. https://iastate.pressbooks.pub/visualgraphiccomm2/chapter/chapter-5-data-visualization-depthmap/

depthmapX development team. (2017). depthmapX (Version 0.6.0) [Computer software]. Retrieved from https://github.com/SpaceGroupUCL/depthmapX/

Dimopoulou-Rethemiotaki, N. (2005). *Το Αρχαιολογικό Μουσείο Ηρακλείου.* Εκδόσεις Ιδρύματος Ι. Σ. Λάτση.

Driessen, J. & Langohr, C. (2007). Rallying around a “minoan” past: the legitimation of power at Knossos during the late bronze age. In M. L. Galaty & W. A. Parkinson (Eds.), *Rethinking the Mycenaean Palaces* (pp. 178-189). Cotsen Institute of Archaeology Press, UCLA.

Duke, P. (2010). Η Κνωσός ως μνημείο, τελετουργικό και μεταφορά. In *Αρχαιολογία και ευρωπαϊκή νεωτερικότητα. Παράγοντας και καταναλώνοντας τους «Μινωίτες».* In Γ. Χαμηλάκης & L. Momigliano (Eds.), *Αρχαιολογία και ευρωπαϊκή νεωτερικότητα. Παράγοντας και καταναλώνοντας τους «Μινωίτες»* (pp. 105–119). Εκδόσεις του Πρώτου Εικοστού Αιώνα.

Eforia of Antiquities Iraklio. (n.d.). Retrieved 18 May 2024, from https://knossospalace.gr/map?readPoiId=12

European Environment Agency. (2024, April) *digital terrain model*. https://www.eea.europa.eu/help/glossary/eea-glossary/digital-terrain-model

Evans, A. (1935). Camp-stool Fresco, long-robed priests and beneficent genii [...]. *Palace of Minos: A Comparative account of the successive stages of the early Cretan civilisation as illustrated by the discoveries at Knossos.* Band 4,2. Macmillan. https://doi.org/10.11588/diglit.1118

Evans, A. (1930). The great transitional age in the northern and eastern sections of the Palace. *Palace of Minos: A Comparative account of the successive stages of the early Cretan civilisation as illustrated by the discoveries at Knossos.* Band 2,2. Macmillan.https://doi.org/10.11588/diglit.811

Evans, A. (1928). Town houses in Knossos of the new era and restored West Palace Section. *Palace of Minos: A Comparative account of the successive stages of the early*

Cretan civilisation as illustrated by the discoveries at Knossos. Band 2,2. Macmillan.https://doi.org/10.11588/diglit.810

Evans, A. (1921). The Neolithic and Early and Middle Minoan Ages. *Palace of Minos: A Comparative account of the successive stages of the early Cretan civilisation as illustrated by the discoveries at Knossos.* Band 1. Macmillan. https://doi.org/10.11588/diglit.807

Evans, A. J. (1899). Knossos. Summary Report of the Excavations in 1900: I. The Palace. *The Annual of the British School at Athens*, *6*, 3–70. http://www.jstor.org/stable/30096250

Galanakis, Y., Tsitsa, E., & Günkel-Maschek, U. (2017). The Power of Images: Re-Examining the Wall Paintings from the Throne Room at Knossos. In *The Annual of the British School at Athens.* (Vol. 112, pp. 47–98). https://www.jstor.org/stable/26573011

Giddens, A. (1986). *The Constitution of Society: Outline of the Theory of Structuration.* Polity Press.

Gillings, M. (2017). Mapping liminality: Critical frameworks for the GIS-based modelling of visibility. *Journal of Archaeological Science, 84,* 121-128. https://doi.org/10.1016/j.jas.2017.05.004.

Goodison, L. (2001). From Tholos Tomb to Throne Room: Perceptions of the Sun in Minoan Ritual. In R. Laffineur & R. Hagg (Eds.), *Aegaeum 22. Potnia, Deities and Religion in the Aegean Bronze Age, Proceedings of the 8th International Aegean Conference Göteborg*, 77-88, Göteborg University.

Günkel-Maschek, U. (2020). *Minoische Bild-Räume. Neue Untersuchungen zu den Wandbildern des spätbronzezeitlichen Palastes von Knossos.* Heidelberg University Publishing.

Hägg, R., & Marinatos, N. (1987). The function of the Minoan palaces: Proceedings of the 4th International Symposium at the Swedish Institute in Athens, 10-16 June, 1984. *Skrifter Utgivna Av Svenska Institutet i Athen = Acta Instituti Atheniensis Regni Sueciae*.

Hamilakis, Y. (2015). *Η Αρχαιολογία και οι αισθήσεις: Βίωμα, Μνήμη και Συν-κίνηση*. Εκδόσεις του Εικοστού Πρώτου.

Hamilakis, Y. (2010). Αποικιακό, Εθνικό και Τοπικό: Κληρονομιές του "μινωικού" παρελθόντος. In Γ. Χαμηλάκης & L. Momigliano (Eds.), *Αρχαιολογία και ευρωπαϊκή νεωτερικότητα. Παράγοντας και καταναλώνοντας τους «Μινωίτες»* (pp. 197–222). Εκδόσεις του Πρώτου Εικοστού Αιώνα.

Hawkins, H. (2017). Arts Works: Art Worlds—Scales, Spaces, Scapes. In J. Luger, and J. Ren (Eds.), *Art and the City: Worlding the Discussion Through a Critical Artscape*, Xvi–xix. Routledge.

Hillier, B. (2014). Spatial analysis and cultural information: the need for theory as well as method in space syntax analysis. In U. Lieberwirth, S. Polla & E. Paliou (Eds.), *Spatial analysis and social spaces: Interdisciplinary approaches to the interpretation of prehistoric and historic built environments* (pp. 19-47). De Gruyter. https://doi.org/10.1515/9783110266436.

Hillier, B. (2008). Space and spatiality: what the built environment needs from social theory. *Building Research and Information: the International Journal of Research, Development and Demonstration, 36(3)*, 216–230. https://doi.org/10.1080/09613210801928073

Hillier, B., & Hanson, J. (1984). *The Social Logic of Space*. Cambridge University Press.

Hillier, B., Leaman, A., Stansall, P., & Bedford, M. (1976). Space Syntax. *Environment and Planning B: Planning and Design, 3(2)*, 147-185. https://doi.org/10.1068/b030147.

Hingley, R. (2023). Hadrian's Wall as Artscape. *Journal of Borderlands Studies.* Taylor & Francis. doi: 10.1080/08865655.2023.2292117.

Hitchcock, L.A. (2000). Engendering Ambiguity in Minoan Crete: It's a Drag to be a King. In M. Donald & L. Hurcombe, (Eds.), *Representations of Gender from Prehistory to the Present. Studies in Gender and Material Culture,* 69-86. Palgrave Macmillan. https://doi.org/10.1007/978-1-349-62331-0_5

Hitchcock, L. A., & Koudounaris, P. (2002). Virtual discourse: Arthur Evans and the reconstructions of the Minoan palace at Knossos. In Y. Hamilakis (Ed.), *Labyrinth Revisited: Rethinking 'Minoan' Archaeology.* (pp. 40–58). Oxford and Oakville.

Hood, S. (2005). Dating the Knossos frescoes. In *British School at Athens Studies, Aegean wall painting: A tribute to Mark Cameron.* (Vol. 13, pp. 45–81).

Hood, S., & Taylor, W. (1981). The Bronze Age Palace at Knossos. Plan and Sections. *British School at Athens Supplement 13*.

Hood, S., & Smyth, D. (1981). *Archaeological survey of the knossos area* (2nd ed., rev.expanded). British School at Athens.

How To Create 3D Buildings in Blender and Import into ArcGIS Pro—YouTube. (n.d.). Retrieved 15 September 2024, from https://www.youtube.com/watch?v=n_TbwtJnhAw

Immerwahr, S. (1990). *Aegean Painting in the Bronze Age.* Pennsylvania State University Press.

Import 3D Files (3D Analyst)—ArcGIS Pro | Documentation. (n.d.). Retrieved 18 August 2024, from https://pro.arcgis.com/en/pro-app/latest/tool-reference/3d-analyst/import-3d-files.htm

Ingold, T. (2000). *The Perception of the Environment Essays on Livelihood, Dwelling and Skill.* Routledge.

Johannsen, N. (2012). Archaeology and the Inanimate Agency Proposition: a critique and a suggestion. In N. Johannsen, M. Jessen & H.J. Jensen (Eds.), *Excavating the Mind: Cross-sections through culture, cognition and materiality* (pp. 305-47). Aarhus University Press.

Jones, A., & MacGregor, G. (Eds.). (2002). *Colouring the past: The significance of colour in archaeological research.* Oxford.

Kalayci T. & Hacıgüzeller, P. (2023). Metaphors, Myths, and Transformations in Digital Archaeology. In K. Lambers & V. Klinkenberg (Eds.), Digital Archaeology: Promises and Impasses. *Analecta Praehistorica Leidensia no. 51*, 538-545. Sidestone Press.

Katsianis, M.; Kalayci, T.; Sarris, A. (2022). Bridging Digital Approaches and Legacy in Archaeology. *Digital 2022, 2, 538–545*. https://doi.org/ 10.3390/digital2040029.

KNOSSOS. (n.d.). *DIGI-PAST*. Retrieved 7 December 2023, from https://digi-past.com/apps/knossos/

Koutsolampros, P., Sailer, K., Varoudis, T., & Haslem, R. (2019). Dissecting Visibility Graph Analysis: The metrics and their role in understanding workplace human behaviour. In *Proceedings of the 12th International Space Syntax Symposium (12 SSS), International Space Syntax Symposium: Beijing, China: Vol. 12., Article Number 191.* Curran Associates.

Landeschi, G. (2019) Rethinking GIS, three-dimensionality and space perception in archaeology. *World Archaeology*, 51(1), 17-32, 10.1080/00438243.2018.1463171.

Landeschi, G., N. Dell'Unto, K. Lundqvist, D. Ferdani, D. M. Campanaro, and A.-M. Leander Touati. (2016). 3DGIS as a Platform for Visual Analysis: Investigating a

Pompeian House. *Journal of Archaeological Science 65*, pp. 103–113. Academic Press. 10.1016/j.jas.2015.11.002

Lawrence, D. L. & Law, S. (1990). The built environment and spatial form. *Annual Reviews in Anthropology,19*, 453-505.

Letesson, Q. (2014). From building to architecture. The rise of configurational thinking in Bronze Age Crete. In U. Lieberwirth, S. Polla & E. Paliou (Eds.), *Spatial analysis and social spaces: Interdisciplinary approaches to the interpretation of prehistoric and historic built environments* (pp. 49-90). De Gruyter. https://doi.org/10.1515/9783110266436.

Letesson, Q. (2012). 'Open Day Gallery' or 'Private Collections'? An Insight on Neopalatial Wall Paintings in their Spatial Context. In D. Panagiotopoulos & U. Günkel-Maschek (Eds.), *Minoan Realities. Approaches to Images, Architecture, and Society in the Aegean Bronze Age* (pp. 27-62). AEGIS 05. Presses Universitaires de Louvain, Louvain-la-Neuve.

Letesson, Q., & Vansteenhuyse, K. (2007). Towards an Archaeology of Perception: 'Looking' at the Minoan Palaces. *Journal of Mediterranean Archaeology*, *19*(1), 91-119. https://doi.org/10.1558/jmea.v19i1.91

Macdonald, C. F. (2005). *Knossos.* Folio Society.

Massey, D. (1994). *Space, Place, and Gender* (NED-New edition). University of Minnesota Press. http://www.jstor.org/stable/10.5749/j.cttttw2z

Mantzourani, E. 2002. *Προϊστορική Κρήτη, Τοπογραφία και Αρχιτεκτονική: Από τη νεολιθική εποχή έως και τους νεοανακτορικούς χρόνους.* Institut Du Livre - Kardamitsa Publications.

Marinatos, N. (1993). *Minoan Religion. Ritual, Image and Symbol*. University of South Carolina Press.

Morgan, L. (1990). Island Iconography: Thera, Kea, Milos. Lyvia Morgan. In D.H. Hardy (Ed.). *THERA AND THE AEGEAN WORLD III Vol I: Proceedings of the third International Congress,* 252-266. The Thera Foundation.

Niemeier, W. D. (1988). The “Priest king” fresco from Knossos: A new reconstruction and interpretation. In E. B. French & K. A. Wardle (Eds.), *Problems in Greek prehistory: Papers presented at the Centenary Conference of the British School of Archaeology at Athens* (pp. 235–244). Bristol Classical Press.

Niemeier, W. D. (1987). On the Function of the Throne Room in the Palace at Knossos. In R. Hägg & N. Marinatos (Eds.), *The Function of the Minoan palaces: proceedings of the Fourth International Symposium at the Swedish Institute in Athens.* (pp. 163-168). Göteborg.

OpenAI. (2024). *ChatGPT* (Mar 14 version) [Large language model]. https://chat.openai.com/chat

O'Sullivan, D. & Turner, A; (2001) Visibility graphs and landscape visibility analysis. *International Journal of Geographical Information Science , 15 (3),* 221-237. 10.1080/13658810151072859.

Papadopoulos, J. K. (2005). Inventing the Minoans: Archaeology, Modernity and the Quest for European Identity. *Journal of Mediterranean Archaeology 18(1)*, 87-149. 10.1558/jmea.2005.18.1.87

Paliou, E. (2011). *The communicative potential of Theran murals in Late Bronze Age Akrotiri: Applying viewshed analysis in 3D townscapes. 30*(3), 247–272.

Paliou, E., Wheatley, D., & Earl, G. (2011). Three-dimensional visibility analysis of architectural spaces: iconography and visibility of the wall paintings of Xeste 3 (Late Bronze Age Akrotiri). *Journal of Archaeological Science, 38,* 375-386.

Paliou, E. (2013). Reconsidering the concept of visualscapes: Recent advances in three-dimensional visibility analysis. In A. Bevan & M. Lake (Eds.), *Computational Approaches to Archaeological Spaces* (pp. 1–19). Left Coast Press.

Paliou, E. (2014). Visibility analysis in 3D built spaces: A new dimension to the understanding of social space. In U. Lieberwirth, S. Polla, & E. Paliou (Eds.), *Spatial analysis and social spaces: Interdisciplinary approaches to the interpretation of prehistoric and historic built environments* (pp. 91–114). De Gruyter. https://doi.org/10.1515/9783110266436.

Panagiotopoulos, D. (2020). The 'Death of the Painter' Towards a Radical Archaeology of (Minoan) Images. In F. Blakolmer (Ed)., *Current Approaches and New Perspectives in Aegean Iconography* (pp. 369-384). AEGIS 18. Presses Universitaires de Louvain.

Piccoli, C. (2018). *Visualizing cityscapes of classical antiquity: From early modern reconstruction drawings to digital 3D models: With a case study from the ancient town of Koroneia in Boeotia, Greece*. Archaeopress.

Pinelo, J. & Turner, A. (2010). *Introduction to UCL Depthmap 10 Version 10.08.00r.* University College London.

Poursat, J. (2022). The Frescoes. In C. Knappett (Trans.), *The Art and Archaeology of the Aegean Bronze Age: A History* (pp. 345-355). Cambridge University Press.

Rand, K. M., Tarampi, M. R., Creem-Regehr, S. H., & Thompson, W. B. (2011). The importance of a visual horizon for distance judgments under severely degraded vision. *Perception*, *40*(2), 143–154. https://doi.org/10.1068/p6843

Rehak, P. (Ed.) (1995). Enthroned Figures and the Function of the Mycenaean Megaron. In *Aegaeum 11, The Role of the Ruler in the Prehistoric Aegean: Proceedings*

of a Panel Discussion Presented at the Annual Meeting of the Archaeological Institute of America, 95-117. Universite de Liege.

Sailer, K. & Psathiti, C. (2017) A Prospect-Refuge Approach to Seat Preference: Environmental psychology and spatial layout. In T. Heitor, and M. Serra, J. P. Silva, M. Bacharel, and L.C. da Silva (Eds.), *Proceedings of the 11th International Space Syntax Symposium* (pp. 137.1-137.16). Instituto Superior Tecnico, Departamento De Engenharia Civil, Arquitetura e Georrecursos.

Sailer, K. (2016) *Understanding Complex Buildings.* (2016, April 29). SlideShare. https://www.slideshare.net/kerstinsailer/understanding-complex-buildings

Shaw, J. W. (2011). Tracing the ancestry of the Minoan Hall system. *The Annual of the British School at Athens, 106*, 141–165. https://doi.org/10.1017/S0068245411000049

Smith, H.C. F. (1976). The Knossos Frescoes: A Revised Chronology. *The Annual of the British School at Athens, 71,* 65–76.

Stavroulaki, G., & Peponis, J. (2003). Seen in a different light: Icons in byzantine museums and churches. In A. van Nes (Ed.), *Fifth International Space Syntax Symposium, Vol. 2* (pp. 251–263). Delft University of Technology.

Strasburger, H., Rentschler, I., & Jüttner, M. (2024). Corrections to: Peripheral vision and pattern recognition: A review. *Journal of Vision April 2024, Vol.24, 15*, 1-2. https://doi.org/10.1167/jov.24.4.15

SourceCAD (Director). (2022, August 29). *Convert scanned PDF and Image into DWG* [Video recording]. https://www.youtube.com/watch?v=q4QIuR8T9Js

Tausch, O. (2018). *Deutsch: Drei nach rechts gehende Männer des Prozessionsfreskos aus dem Palast von Knossos (um 1400 v. Chr.), ausgestellt im Archäologischen Museum Iraklio, Kreta, Griechenland* [Graphic]. Own work. https://commons.wikimedia.org/wiki/File:Knossos_Prozessionsfresko_Gehende_M%C3%A4nner_01.jpg

Turner, A. (2004). *Depthmap 4, A Researcher's Handbook.* Bartlett School of Graduate Studies, University College London.

Turner, A., Doxa, M., O'Sullivan, D., & Penn, A. (2001). From Isovists to Visibility Graphs: A Methodology for the Analysis of Architectural Space. *Environment and Planning B: Planning and Design, 28(1)*, 103–121. https://doi.org/10.1068/b2684

UCL Space Syntax. (n.d.). *DepthMapX*. Space Syntax. Retrieved November 23, 2023, from https://www.spacesyntax.online/software-and-manuals/depthmap/

Van Nes, A. & Yamu, C. (2021). *Introduction to space syntax in urban studies*. Springer Nature, https://www.springer.com/gp/book/9783030591397

Vavouranakis, G. (2015a). Time past and time present. In Z. Theodoropoulou Polychroniadis and D. Evely (Eds.), *AEGIS, Essays in Mediterranean Archaeology* (pp. 35–44). https://doi.org/10.2307/J.CTVR43K1P.7

Vavouranakis, G. (2015b). Ανάκτορο και κράτος στη μινωική Κρήτη: η σημασία της κοινωνικής αναπαραγωγής. In Κ. Αθανασίου, Ε. Βασδέκη, Ε. Καπετανάκη, Μ. Καραγιάννη, Μ. Καψάλη, Β. Μακρυγιάννη, Φ. Μάμαλη, Ο. Πάγκαλος, Χ. Τσαβδάρογλου, *Urban Conflicts* (pp. 61-72). Εργαστήριο συναντήσεις και συγκρούσεις στην πόλη.

Vavouranakis, G. (2013). Working on a dream: The 'Palace of Minos' at Knossos in archaeological research, heritage protection and daily life. *Cultural History 2, no. 2*, 213-231.

Wheatley, D. (2014). Connecting landscapes with built environments: visibility analysis, scale and the senses. In E. Paliou, U. Lieberwirth & S. Polla (Ed.), *Spatial analysis and social spaces: Interdisciplinary approaches to the interpretation of*

prehistoric and historic built environments (pp. 115-134). De Gruyter. https://doi.org/10.1515/9783110266436.115

3D viewshed | Documentation | ArcGIS Developers. (n.d.). Documentation. Retrieved April 8, 2024, from https://developers.arcgis.com/documentation/mapping-apis-and-services/spatial-analysis/3d-visual/3d-viewshed/

4D Research Lab (Director). (2022, November 6). *Importing 2D reference images in Blender: Two methods* [Video recording]. https://www.youtube.com/watch?v=qwFepcMiE18

List of Figures

Chapter 1

Chapter 2

Figure 2.1.1 Detail from interactive digital map of the area around the Knossian palatial complex, with indications of archaeological sites. Indication of hypothetical limits of the Bronze Age settlement added by the author. Data were retrieved by Sinclair Hood and David Smyth, in the 1981 Archaeological Survey of the Knossos. (AreaBSA Digital Collections. (n.d.). https://digital.bsa.ac.uk/hood.php).

Figure 2.1.2 Plan of the Knossian palatial complex with numbers indicating the positions of painted plaster decorations. (Hood, 2005, p. 46, Fig. 2.1).

Figure 2.2.1 Plan of space and two distinct j-graphs representing the visual connections between rooms of the same space, from two different viewpoints, Room 5 and Room 10 (Hillier, 2014, p. 21, Figure 2).

Figure 2.2.2 Representation of the different stages of visibility analysis in a 2-dimensional plan of a building (Sailer, 2016, Slide 13).

Figure 2.2.3 Visualization of the digital elevation model (DEM) of a geographical area. (ArcGIS, 2024, https://pro.arcgis.com/en/pro-app/latest/tool-reference/spatial-analyst/GUID-F7126CF0-5666-4C0C-976E-8F29FB7AE0AB-web.gif).

Figure 2.2.4 Example of viewshed analysis in a DEM model of an urban landscape, with LOS analysis from two different viewpoints in the environment of ArcGIS. (ArcGIS Developers, 2024).

Figure 2.3.1 Visibility Graph Analysis of the. St Theodore church, in Jerash West, with and without chancel screen. (Clark, 2007, p. 98, Fig. 9).

Figure 2.3.2 View of the reconstructed 3-d model of the Room 3 with the wall decoration of the ‘Adorants’ in the building of Xeste 3, settlement of Akrotiri, Thera. (Paliou et al., 2011, p. 380, fig. 7).

Figure 2.3.3 View of the ‘times-seen maps’ calculated using the 3D model of the Room 3 with the wall decoration of the ‘Adorants’ in the building of Xeste 3, settlement of Akrotiri, Thera. (Paliou et al., 2011, p. 380, fig. 7).

Figure 2.3.4 Result of the ‘lines-of-sight’ analysis performed on the wall decoration of the erotic fresco, north portico of the house of Caecilius Iucundus in Pompeii, ArcGIS. (Landeschi et al., 2016, p. 112, fig.13).

Chapter 4

Figure 4.1.1 Processing of the pdf file of the West Entrance of Knossos, to convert it into a .dxf file using Inkscape. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure 4.1.2 Processing of the dxf file of the plan of the Throne Room of Knossos, by setting and filling the grid to conduct the visibility analysis, in depthmapX (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure 4.1.3 Conduction of the visibility graph analysis tool in a 2-dimensional plan of the West Entrance, palatial complex of Knossos, in depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure 4.1.4 Importing and scaling the image of the plan of Knossos as a plane, in Blender 3.6. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure 4.1.5 Adding meshes to create 3D models of study cases of the Knossian complex, in Blender 3.6. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure 4.1.6 Use of sketch of the West Entrance indicating the position of the painted plaster decoration of the West Porch in the 3D reconstruction using Blender 3.6. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan, Cameron, 1976, Plate 80, Figure B.& Plate 145, Figure B).

Figure 4.1.7 Adding the image of the painted plaster decoration of the north wall of the main room of the Throne room complex in the 3D reconstruction using Blender 3.6. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan, Galanakis et al., 2017, p. 54, Figure 8 & p. 55, Figure 10c).

Figure 4.1.8 Detail of the basemap of Google Satellite, zoomed in the palatial complex of Knossos, from the GIS add-on tool in Blender 3.6. (Figure: V. Georgiopoulou).

Figure 4.1.9 View of the 3D model reconstruction of the West Entrance complex imported as .obj in ArcGIS Local Scene. Adjusting the position of the model. (Figure: V. Georgiopoulou, ArcGIS Pro).

Figure 4.1.10 View of the 3D model reconstruction of the West Entrance complex imported as .obj in ArcGIS Local Scene. Adding the images of the painted plaster decoration as textures. (Figure: V. Georgiopoulou, ArcGIS Pro).

Figure 4.1.11 View of the conduction of Lines-of-sight in ArcGIS Local Scene, with point layers and scripted arcpy code. The notification pane describes the problem raised from the number of points and information to be processed for the visual analysis. (Figure: V. Georgiopoulou, ArcGIS Pro).

Figure 4.1.12 View of the conduction of Exploratory Viewshed Analysis in the 3D model of the Throne Room complex. Green points as observer targets, while the visible, multiple coverage and no visible areas are represented by the red, yellow and blue colours, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure 4.1.13 View of the observer points saved as a layer for the conduction of Exploratory Viewshed Analysis in the 3D model of the West Entrance complex. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Chapter 5

Figure 5.1.1 View of the West façade from the southwest corner of the West Court with the original foundations visible, Knossos palatial complex. (Ephorate of Antiquities of Heraklion. (n.d.) https://knossospalace.gr/map?readPoiId=12).

Figure 5.2.1 Detail of the architectural plan of the palace of Knossos with indication of the path from the West Court to the Central Court. Blue lines, made by author, indicating the position of the painted plaster decoration. (Adapted from Günkel-Maschek, 2020, p.157, Figure 4.1).

Figure 5.2.2 Detail of the plan of the West Porch and the Corridor of the Procession, in the southeast corner of the West Court, Knossos palatial complex. North arrow symbol and indications, added by the author, indicating the painted wall decorations under discussion. (Adapted from Evans, 1928a, p. 673, Figure 427).

Figure 5.2.3 View of the West Porch from northwest, with the pavement of the West Court and the causeways entering the Porch visible, Knossos, photographic record from the 1920s. (Evans, 1928a, p. 611, Figure 383).

Figure 5.2.4 Sketch depicting the decoration of the eastern wall of the West Porch, according to the fragments found in situ, Knossos palatial complex. (Hood, 2005, p. 67, Figure 2.16).

Figure 5.2.5 Hypothetical restoration of the fragments found in the North Corridor, depicting a bull and an olive tree in low relief, North Wing, palatial complex of Knossos. Photographic record from 1939. (BSA Digital Collections, Reference No. 01/6796.C6805. https://digital.bsa.ac.uk/results.php?locality-irn=725&start=101&irn=146006).

Figure 5.2.6 Hypothetical reconstruction of the composition decorating the walls of the Corridor of the Procession, Knossos palatial complex. (Günkel-Maschek, 2020, p. 259, Figure 4.16).

Figure 5.2.7 Fragment depicting part of a male arm and a colourful object, probably vase, Corridor of the Procession, palatial complex of Knossos. (Cameron, 1976, Plate 56, Figure A).

Figure 5.2.8 Sketch of three fragments found beneath the pavement of the Corridor of the Procession, Knossos palatial complex. (Hood, 2005, p. 67, Figure 2.15).

Figure 5.2.9 Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 1: Metric of Isovist Area, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure 5.2.10 Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 1: Metric of Visual Integration (HH), depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure 5.2.11 View of the conduction of LOS analysis in the 3D model of the West Entrance complex, with the grid of points representing the observes. Green lines indicate visible distance to target points, while red the no visible. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure 5.2.12 View of the raster created with the 'Topo to Raster' function, showcasing the results of the West Entrance complex. Red colour represents the areas with the highest degree of visual accessibility to the wall decorations, while blue represents the more segregated areas. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure 5.2.13 View of the beginning of the Corridor of the West Entrance complex, with all the viewshed points activated. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure 5.2.14 Stacked column chart visualizing the results of the 3D Exploratory Viewshed in the West Entrance complex. Percentage and sum of the degree of visibility per painted plaster decoration and per version. Graph created with Power BI (Figure: V. Georgiopoulou).

Figure 5.2.15 Ribbon chart visualizing the results of the 3D Exploratory Viewshed in the West Entrance complex. Sum of the degree of visibility of the painted plaster decoration per observer points by version. Graph created with Power BI (Figure: V. Georgiopoulou).

Figure 5.3.1: Plan of the Throne Room with depiction of its basic architectural elements, West Wing of the Knossos palatial complex. Red lines indicate the position of painted plaster wall decorations found in situ, added by the author. Minor changes in the orientation of the plan were also added by the author. (Adapted from Galanakis et al. 2017, p.50, Figure 3).

Figure 5.3.2 Fragment depicting hoof of a bull facing west, above frieze of dado imitation, southwest corner of the anteroom, Throne Room complex, palatial complex of Knossos. (Hood, 2005, Plate 27, Fig 4).

Figure 5.3.3 View of the gypsum seat and the fragment of painted plaster decoration found in situ, as found east of the seat, Throne Room complex, palatial complex of Knossos. From the Photographic record of the British School at Athens from the 1900 excavation of the monument. (Galanakis et al. 2017, p. 51, fig. 5).

Figure 5.3.4 Representation of the reconstruction of the painted plaster decoration of the palm tree and seated griffin, above a frieze of dado imitation, north wall of the main room of the Throne Room complex, palatial complex of Knossos. (Galanakis et al. 2017, p. 56, Fig 11).

Figure 5.3.5 Coloured sketch representing the position of the fragments of painted plaster decoration of the north wall of the main room of the Throne Room complex, palatial complex of Knossos. (Galanakis et al. 2017, p. 60, Fig 16).

Figure 5.3.6 Representation of a hypothetical reconstruction of the decoration of the west wall of the main room in the Throne Room complex, palatial complex of Knossos. (Galanakis et al., 2017, p. 64, Fig. 21).

Figure 5.3.7 Composition of interconnecting fragments depicting a seated griffin among papyrus-reeds, from the south part of the west wall of the main room in the Throne Room complex, palatial complex of Knossos. (Galanakis et al., 2017, p. 66, Fig. 25).

Figure 5.3.8 View of the lustral basin from northeast, with the restored columns and the decoration of the south wall visible. South space of the main room in the Throne Room complex, palatial complex of Knossos. (Evans, 1935, p. 909, Fig. 883).

Figure 5.3.9 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 1: Metric of Isovist Area, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure 5.3.10 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 6: Metric of Isovist Area, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure 5.3.11 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 1: Metric of Visual Integration, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure 5.3.12 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 3: Metric of Visual Integration, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure 5.3.13 2D Visibility Analysis of the Throne Room complex with indications of original position of known painted plaster fragments, Version 1: Metric of Point First Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure 5.3.14 View of the conduction of LOS analysis in the 3D model of the Throne Room complex (Version 1: All doors open), with the grid of points representing the observers. Green lines indicate visible distance to target points, while red the no visible. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure 5.3.15 View of the raster created with the 'Topo to Raster' function, showcasing the results of the conduction of LOS analysis in the 3D model of the Throne Room complex. Red colour represents the areas with the highest degree of visual accessibility to the wall decorations, while blue represents the more segregated areas. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure 5.3.16 View of the main room of the Throne Room complex from the northeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure 5.3.17 Stacked column chart visualizing the results of the 3D Exploratory Viewshed in the Throne Room complex. Percentage and sum of the degree of visibility

per painted plaster decoration and per version. Graph created with Power BI (Figure: V. Georgiopoulou).

Figure 5.3.18 Ribbon chart visualizing the results of the 3D Exploratory Viewshed in the Throne Room complex. Sum of the degree of visibility of the painted plaster decoration per observer points by version. Graph created with Power BI (Figure: V. Georgiopoulou).

Appendix A

Figure A1 Map of Crete with indication of the position of the palatial complex of Knossos, made in QGIS 3.28.7. (Figure: V. Georgiopoulou).

Appendix B

Table B1 Chronological table with the relative and the absolute dates, as well as the palatial periods of the archaeology of Prehistoric Crete. (Μαντζουράνη, 2002, Chronological Table & Macdonald, 2005, Chronological Table).

Appendix C

Figure C1. 2D Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 1: All entrances open, Metric of Isovist Area, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C2. 2D Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 2: East entrance blocked, Metric of Isovist Area, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C3. 2D Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 3: West entrance blocked, Metric of Isovist Area, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C4. 2D Visibility Analysis of the West Entrance complex, Version 1: All entrances open, Metric of Visual Integration with indications of original found place of known painted plaster fragments, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C5. 2D Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 2: East entrance blocked, Metric of Visual Integration, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C6. 2D Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 3: West entrance blocked, Metric of Visual Integration, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C7. 2D Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 1: All entrances open, Metric of Point First Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C8. 2D Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 2: East entrance blocked, Metric of Point First Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C9. 2D Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 3: West entrance blocked, Metric of Point First Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C10. 2D Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 1: All entrances open, Metric of Point Second Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C11. 2D Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 2: East entrance blocked, Metric of Point Second Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C12. 2D Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 3: West entrance blocked, Metric of Point Second Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C13. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 1: Metric of Isovist Area, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C14. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 2: Metric of Isovist Area, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C15. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 3: Metric of Isovist Area, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C16. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 4: Metric of Isovist Area, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C17. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 5: Metric of Isovist Area, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C18. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 6: Metric of Isovist Area, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C19. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 1: Metric of Visual Integration, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C20. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 2: Metric of Visual Integration, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C21. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 3: Metric of Visual Integration, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C22. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 4: Metric of Visual Integration, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C23. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 5: Metric of Visual Integration, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C24. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 6: Metric of Visual Integration, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C25. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 1: Metric of Point First Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C26. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 2: Metric of Point First Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C27. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 3: Metric of Point First Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C28. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 4: Metric of Point First Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C29. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 5: Metric of Point First Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C30. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 6: Metric of Point First Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C31. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 1: Metric of Point Second Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C32. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 2: Metric of Point Second Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C33. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 3: Metric of Point Second Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C34. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 4: Metric of Point Second Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C35. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 5: Metric of Point Second Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure C36. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 6: Metric of Point Second Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Appendix D

Figure D1 View of the outer facade of the West Wing, from the area of the West Courrt, Knossos palatial complex. Images from the dado slabs were used by author to reconstruct the West Entrance complex. *(Eforia of Antiquities Iraklio*. (n.d.). https://knossospalace.gr/map?readPoiId=12).

Figure D2 Part of painted plaster decoration depicting the huff of a bull, from east wall of the West Porch, palatial complex of Knossos. Image cropped by the author. (Adapted from Cameron, 1976, Plate 80, Figure B).

Figure D3 Part of painted plaster decoration depicting the huff of a bull, from east wall of the West Porch, palatial complex of Knossos. Image cropped by the author. (Adapted from Cameron, 1976, Plate 145, Figure B).

Figure D4 Part of painted plaster decoration depicting the lower part of figures walking, from east wall of the Corridor of the West Entrance complex, palatial complex of Knossos. Image cropped by the author. (Adapted from ArchaiOptix, 2019, https://commons.wikimedia.org/wiki/File:Wall_painting_of_cult_procession_from_Knossos_(Corridor_of_Procession)_-_Heraklion_AM_-_01.jpg).

Figure D5 Part of painted plaster decoration depicting the lower part of figures walking, from east wall of the Corridor of the West Entrance complex, palatial complex of Knossos. Image cropped by the author. (Adapted from ArchaiOptix, 2020, https://commons.wikimedia.org/wiki/File:Wall_painting_of_cult_procession_from_Knossos_(Corridor_of_Procession)_-_Heraklion_AM_-_06.jpg

Figure D6 Part of painted plaster decoration depicting the lower part of figures walking, from east wall of the Corridor of the West Entrance complex, palatial complex of Knossos. Image cropped by the author. (Adapted from Tausch, 2018, https://commons.wikimedia.org/wiki/File:Knossos_Prozessionsfresko_Fragment_(F%C3%BC%C3%9Fe)_01.jpg

Figure D7 Part of painted plaster decoration depicting the lower part of figures walking, from east wall of the Corridor of the West Entrance complex, palatial complex of Knossos. Image cropped by the author. (Adapted from Tausch, 2018,

https://commons.wikimedia.org/wiki/File:Knossos_Prozessionsfresko_Gehende_M%C3%A4nner_01.jpg).

Figure D8 Part coloured digital sketch of painted plaster decoration depicting the huff of a bull, from west wall of the Corridor of the West Entrance complex, palatial complex of Knossos. Image cropped by the author. (Adapted from Günkel-Maschek, 2020, p.168, Figure 4.3).

Figure D9 View of the west wall from the 3D model of the West Entrance complex, with indications of the numbering of the images used to reconstruct the wall decoration, as seen in Appendix D. Made in Blender 3.6. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure D10 View of the west wall from the 3D model of the West Entrance complex, with indications of the numbering of the images used to reconstruct the wall decoration, as seen in Appendix D. Made in Blender 3.6. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure D11 View of the east wall from the 3D model of the West Entrance complex, with indications of the numbering of the images used to reconstruct the wall decoration, as seen in Appendix D. Made in Blender 3.6. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure D12 Fragment depicting hoof of a bull facing west, above frieze of dado imitation, southwest corner of the anteroom, Throne Room complex, palatial complex of Knossos. Image cropped by the author. (Adapted from Hood, 2005, Plate 27, Fig 4).

Figure D13 View of the lustral basin from northeast, with the restored columns and the decoration of the south wall visible. South space of the main room in the Throne Room complex, palatial complex of Knossos. Detail of the image used for the reconstruction of the wall decoration in 3D by the author. (Figure: V. Georgiopoulou).

Figure D14 Composition of interconnecting fragments depicting a seated griffin among papyrus-reeds, from the south part of the west wall of the main room in the Throne

Room complex, palatial complex of Knossos. Image cropped by the author. (Galanakis et al., 2017, p. 66, Fig. 25).

Figure D15 Detail of colored sketch of the fragments of painted plaster decoration with the seated griffin of the north wall of the main room of the Throne Room complex, palatial complex of Knossos. Images cropped and joint by author. (Adapted from Galanakis et al. 2017, p. 60, Figure 16 & p.62, Figure 19).

Figure D16 Colored sketch representing the fragments of painted plaster decoration of the north wall of the main room of the Throne Room complex, palatial complex of Knossos. Detail of the image cropped by author. (Galanakis et al. 2017, p. 60, Fig 16).

Figure D17 Painted plaster decoration of the palm tree and seated griffin, above a frieze of dado imitation, north wall of the main room of the Throne Room complex, palatial complex of Knossos. Image cropped by author (Adapted from Galanakis et al., 2017, p.55, Figure 10c).

Figure D18 Coloured sketch made by Theodore Fyfe, depicting the painted wall plaster found in the east part of the north wall of the main room in the Throne Room complex, palatial complex of Knossos. Image cropped by author (Adapted from Galanakis et al., 2017, p.53, Figure 7).

Figure D19 View of the south and southwest wall from the 3D model of the Throne Room complex, with indications of the numbering of the images used to reconstruct the wall decoration, as seen in Appendix D. Made in Blender 3.6. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure D20 View of the northwest and north wall from the 3D model of the Throne Room complex, with indications of the numbering of the images used to reconstruct the wall decoration, as seen in Appendix D. Made in Blender 3.6. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Appendix E

Figure E1 View of the conduction of LOS analysis in the 3D model of the West Entrance complex, with the grid of points representing the observes. Green lines indicate visible

distance to target points, while red the no visible. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E2 View of the conduction of LOS analysis in the 3D model of the West Entrance complex, with the grid of points representing the observes. Green lines indicate visible distance to target points, while red the no visible. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E3 View of the raster created with the 'Topo to Raster' function, showcasing the results of the West Entrance complex. Red colour represents the areas with the highest degree of visual accessibility to the wall decorations, while blue represents the more segregated areas. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E4 View of the West Entrance complex from above, with indication of positioned observer points outside, and inside the feature. The same locations were used in all the versions of the conduction of Exploratory Viewshed Analysis. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E5 View of the West Entrance from the northwest, observer point in West Court. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E6 View of the West Entrance from the northwest, observer points in entrance of West Porch. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E7 View of the West Entrance from the north, observer point in the beginning of the Corridor. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E8 View of the West Entrance from the northwest, observer point in West Court. Results of Exploratory Viewshed Analysis in Version 2: East entrance closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E9 View of the West Entrance from the north, observer points in the entrance of the West Porch. Results of Exploratory Viewshed Analysis in Version 2: East entrance closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E10 View of the West Entrance from the north, observer point in the beginning of the Corridor. Results of Exploratory Viewshed Analysis in Version 2: East entrance closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E11 View of the West Entrance from the northwest, observer point in West Court. Results of Exploratory Viewshed Analysis in Version 3: West entrance closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E12 View of the West Entrance from the northwest, observer points in entrance of West Porch. Results of Exploratory Viewshed Analysis in Version 3: West entrance closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E13 View of the West Entrance from the northwest, observer point in entrance of Corridor. Results of Exploratory Viewshed Analysis in Version 3: West entrance closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E14 View of the West Entrance from the north, with all the viewshed points activated. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E15 View of the West Entrance from the north looking inside the Corridor, with all the viewshed points activated. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E16 View of the east wall of the West Porch and the Corridor, West Entrance complex, with all the viewshed points activated. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E17 View of the conduction of LOS analysis in the 3D model of the Throne Room complex, with the grid of points representing the observes. Green lines indicate visible distance to target points, while red the no visible. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E18 View of the conduction of LOS analysis in the 3D model of the Throne Room complex, with the 3d feature hidden. Green lines indicate visible distance to target points, while red the no visible. Symbology pane on the right indicates the values of the lines of sight. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E19 View of the raster created with the 'Topo to Raster' function, showcasing the results of the conduction of LOS analysis in the 3D model of the Throne Room complex. Red colour represents the areas with the highest degree of visual accessibility to the wall decorations, while blue represents the more segregated areas. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E20 View of the Throne Room complex from northeast. Observer point from the Central Court. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E21 View of the north and northeast walls of the main room of the Throne Room complex from southeast. Observer point from the Central Court. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E22 View of the northwest and southwest walls of the main room of the Throne Room complex from southeast. Observer point from the Central Court. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E23 View of the north and west walls of the main room of the Throne Room complex from south. Observer points set in the anteroom. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E24 View of the west walls of the main room and of the anteroom of the Throne Room complex from northeast. Observer points set in the anteroom. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E25 View of the north and west walls of the main room of the Throne Room complex from east. Observer points set in the main room of the complex. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E26 View of the south wall of the anteroom of the Throne Room complex from northeast. Observer points set in the main room of the complex. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E27 View of the Throne Room complex from east. Observer point from the Central Court. Results of Exploratory Viewshed Analysis in Version 2: Southern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E28 View of the south wall of the anteroom of the Throne Room complex, from northeast. Observer point from the Central Court. Results of Exploratory Viewshed Analysis in Version 2: Southern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E29 View of the of the north and northwest wall of the Throne Room complex from east. Observer point set in the anteroom of the complex. Results of Exploratory Viewshed Analysis in in Version 2: Southern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E30 View of the of the northeast and northwest wall of the Throne Room complex from the northeast. Observer point set in the anteroom of the complex. Results of Exploratory Viewshed Analysis in in Version 2: Southern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E31 View of the of the south wall of the anteroom of the Throne Room complex from northeast. Observer point set in the anteroom of the complex. Results of

Exploratory Viewshed Analysis in in Version 2: Southern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E32 View of the of the north and northwest wall of the Throne Room complex from the east. Observer point set in the main room of the complex. Results of Exploratory Viewshed Analysis in in Version 2: Southern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E33 View of the of the south wall of the anteroom of the Throne Room complex from the north. Observer point set in the main room of the complex. Results of Exploratory Viewshed Analysis in in Version 2: Southern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E34 View of the north and northwest walls of the main room of the Throne Room complex from northeast. Observer point from the Central Court. Results of Exploratory Viewshed Analysis in Version 3: Northern doors of the anteroom closed & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E35 View of the southwest walls of the main room of the Throne Room complex from northeast. Observer point from the Central Court. Results of Exploratory Viewshed Analysis in Version 3: Northern doors of the anteroom closed & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E36 View of the south wall of the anteroom of the Throne Room complex from northeast. Observer point from the Central Court. Results of Exploratory Viewshed

Analysis in Version 3: Northern doors of the anteroom closed & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E37 View of the north and northwest walls of the main room of the Throne Room complex from southeast. Observer points from the anteroom. Results of Exploratory Viewshed Analysis in Version 3: Northern doors of the anteroom closed & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E38 View of the southwest and northwest walls of the main room of the Throne Room complex from southeast. Observer points from the anteroom. Results of Exploratory Viewshed Analysis in Version 3: Northern doors of the anteroom closed & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E39 View of the south wall of the anteroom of the Throne Room complex from northeast. Observer points from the anteroom. Results of Exploratory Viewshed Analysis in Version 3: Northern doors of the anteroom closed & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E40 View of the north and northwest walls of the main room of the Throne Room complex from the east. Observer point in the main room. Results of Exploratory Viewshed Analysis in Version 3: Northern doors of the anteroom closed & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E41 View of the southwest and northwest walls of the main room of the Throne Room complex from the east. Observer point in the main room. Results of Exploratory

Viewshed Analysis in Version 3: Northern doors of the anteroom closed & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E42 View of the south wall of the anteroom of the Throne Room complex from northeast. Observer point in the main room. Results of Exploratory Viewshed Analysis in Version 3: Northern doors of the anteroom closed & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E43 View of the Throne Room complex from the northeast. Observer point in the Central Court. Results of Exploratory Viewshed Analysis in Version 4: Southern partitions of the anteroom closed & north door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E44 View of the north and the northwest wall of the main room of the Throne Room complex from the northeast. Observer points in the anteroom. Results of Exploratory Viewshed Analysis in Version 4: Southern partitions of the anteroom closed & north door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E45 View of the southwest and the northwest wall of the main room of the Throne Room complex from the northeast. Observer points in the anteroom. Results of Exploratory Viewshed Analysis in Version 4: Southern partitions of the anteroom closed & north door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E46 View of the south wall of the anteroom and the southwest wall of the main room of the Throne Room complex from the northeast. Observer points in the anteroom. Results of Exploratory Viewshed Analysis in Version 4: Southern partitions of the anteroom closed & north door to the main room closed, with colours indicating

the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E47 View of the north and the northwest wall of the main room of the Throne Room complex from the northeast. Observer point in the main room. Results of Exploratory Viewshed Analysis in Version 4: Southern partitions of the anteroom closed & north door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E48 View of the southwest and the northwest wall of the main room of the Throne Room complex from the northeast. Observer point in the main room. Results of Exploratory Viewshed Analysis in Version 4: Southern partitions of the anteroom closed & north door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E49 View of the south wall of the anteroom of the Throne Room complex from the north. Observer point in the main room. Results of Exploratory Viewshed Analysis in Version 4: Southern partitions of the anteroom closed & north door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E50 View of the north and northwest walls of the main room of the Throne Room complex from the east. Observer point in the Central Court. Results of Exploratory Viewshed Analysis in Version 5: Northern partitions of the anteroom closed & south door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E51 View of the southwest and northwest walls of the main room of the Throne Room complex from the northeast. Observer points in the Central Court. Results of Exploratory Viewshed Analysis in Version 5: Northern partitions of the anteroom closed & south door to the main room closed, with colours indicating the visible,

multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E52 View of the south wall of the anteroom and northwest wall of the main room of the Throne Room complex from the northeast. Observer points in the Central Court. Results of Exploratory Viewshed Analysis in Version 5: Northern partitions of the anteroom closed & south door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E53 View of the north and northwest walls of the main room of the Throne Room complex from the east. Observer points in the anteroom. Results of Exploratory Viewshed Analysis in Version 5: Northern partitions of the anteroom closed & south door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E54 View of the north and northwest walls of the main room of the Throne Room complex from the east. Observer points in the anteroom. Results of Exploratory Viewshed Analysis in Version 5: Northern partitions of the anteroom closed & south door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E55 View of the north and northwest walls of the main room of the Throne Room complex from the east. Observer point in the main room. Results of Exploratory Viewshed Analysis in Version 5: Northern partitions of the anteroom closed & south door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E56 View of the south wall of the anteroom of the Throne Room complex from the northeast. Observer point in the main room. Results of Exploratory Viewshed Analysis in Version 4: Southern partitions of the anteroom closed & north door to the main room closed, with colours indicating the visible, multiple coverage and no visible

areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E57 View of the north and northwest walls of the main room of the Throne Room complex from the east. Observer point in the Central Court. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E58 View of the southwest and northwest walls of the main room of the Throne Room complex from the east. Observer point in the Central Court. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E59 View of the south wall of the anteroom and southwest walls of the main room of the Throne Room complex from the east. Observer point in the Central Court. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E60 View of the north and northwest walls of the main room of the Throne Room complex from the east. Observer points in the anteroom. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E61 View of the southwest and northwest walls of the main room of the Throne Room complex from the east. Observer points in the anteroom. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E62 View of the south wall of the anteroom and west walls of the main room of the Throne Room complex from the east. Observer points in the anteroom. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E63 View of the north and northwest walls of the main room of the Throne Room complex from the east. Observer point in the main room. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E64 View of the southwest and northwest walls of the main room of the Throne Room complex from the east. Observer point in the main room. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E65 View of the south wall of the anteroom of the Throne Room complex from the northeast. Observer point in the main room. Results of Exploratory Viewshed

Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E66 View of the main room of the Throne Room complex from the east. All observer points activated. Version 1: All doors open. Results of Exploratory Viewshed Analysis with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E67 View of the main room of the Throne Room complex from the southeast. All observer points activated. Results of Exploratory Viewshed Analysis with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E68 View of the anteroom of the Throne Room complex from northeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E69 View of the main room of the Throne Room complex from the east. All observer points activated. Results of Exploratory Viewshed Analysis in Version 2: Southern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E70 View of the main room of the Throne Room complex from the northeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 2: Southern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E71 View of the anteroom of the Throne Room complex from the northeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 2: Southern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E72 General view of the Throne Room complex from the southeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 3: Northern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E73 View of the main room of the Throne Room complex from the east. All observer points activated. Results of Exploratory Viewshed Analysis in Version 3: Northern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E74 View of the main room of the Throne Room complex from the northeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 3: Northern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E75 View of the anteroom of the Throne Room complex from the northeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 3: Northern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E76 View of the main room of the Throne Room complex from the east. All observer points activated. Results of Exploratory Viewshed Analysis in Version 4: Southern partitions of the anteroom closed & north door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented

by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E77 View of the main room of the Throne Room complex from the northeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 4: Southern partitions of the anteroom closed & north door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E78 View of the anteroom of the Throne Room complex from the northeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 4: Southern partitions of the anteroom closed & north door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E79 View of the main room of the Throne Room complex from the east. All observer points activated. Results of Exploratory Viewshed Analysis in Version 5: Northern partitions of the anteroom closed & south door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E80 View of the main room of the Throne Room complex from the northeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 5: Northern partitions of the anteroom closed & south door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E81 View of the anteroom of the Throne Room complex from the northeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 5: Northern partitions of the anteroom closed & south door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented

by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E82 View of the main room of the Throne Room complex from the east. All observer points activated. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E83 View of the main room of the Throne Room complex from the northeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E84 View of the main room of the Throne Room complex from the northeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E85 View of the anteroom and the main room of the Throne Room complex from the northeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E86 Table presenting the values of visual integration of each decoration, by observer point and per representational version of West Entrance complex. Values set by the author according to the results of the Exploratory Viewshed in the. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Figure E87 Table presenting the values of visual integration of each decoration, by observer point and per representational version of Throne Room complex. Values set

by the author according to the results of the Exploratory Viewshed in the. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Appendix F

Figure F1 Python code for the creation of sightlines with ArcPy (Source: Open AI, 2024 & V.Georgiopoulou).

Appendix A

Map of Crete

Figure A1 Map of Crete with indication of the position of the palatial complex of Knossos, made in QGIS 3.28.7. (Figure: V. Georgiopoulou).

Appendix B
Chronological Table

Relative Chronology	Absolute Chronology	Palatial periods
Early Minoan I	3300-2900 BCE	**Prepalatial period**
Early Minoan IIA	2900-2600 BCE	
Early Minoan IIA	2600-2400 BCE	
Early Minoan III	2400-2200 BCE	
Middle Minoan IA	2200-1950 BCE	
Middle Minoan IB	1950-1900 BCE	**Protopalatial period**
Middle Minoan IIA	1900-1800 BCE	
Middle Minoan IIB	1800-1750 BCE	
Middle Minoan IIIA	1750-1700 BCE	
Middle Minoan IIIB	1700-1600 BCE	**Neopalatial period**
Late Minoan IA	1600-1525 BCE	
Late Minoan IB	1525-1450 BCE	
Late Minoan II	1450-1425 BCE	**Final palatial period**
Late Minoan IIIA	1425-1325/1300 BCE	
Late Minoan IIIB	1325/1300-1250 BCE	

Table B1 Chronological table with the relative and the absolute dates, as well as the palatial periods of the archaeology of Prehistoric Crete. (Μαντζουράνη, 2002, Chronological Table & Macdonald, 2005, Chronological Table).

Appendix C

2D Visibility Analysis Graphs

- West Entrance complex

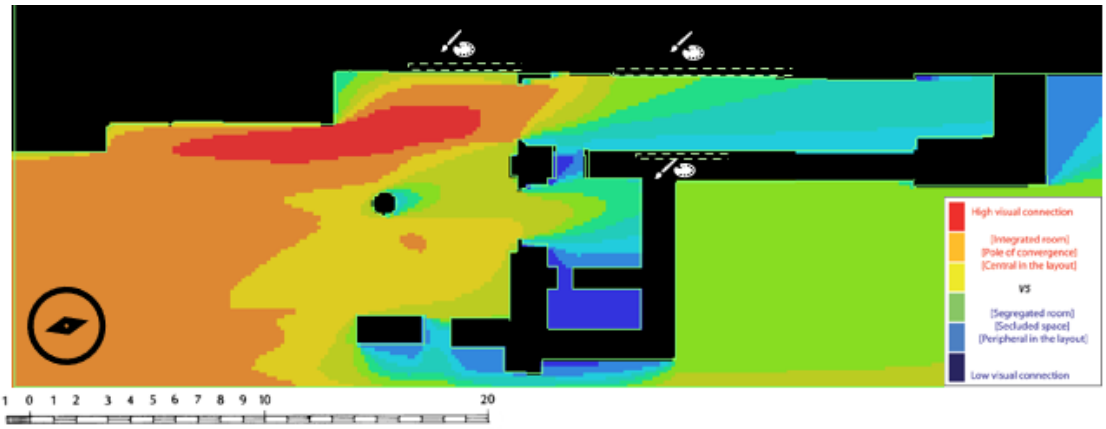

Figure C1. 2D Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 1: All entrances open, Metric of Isovist Area, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

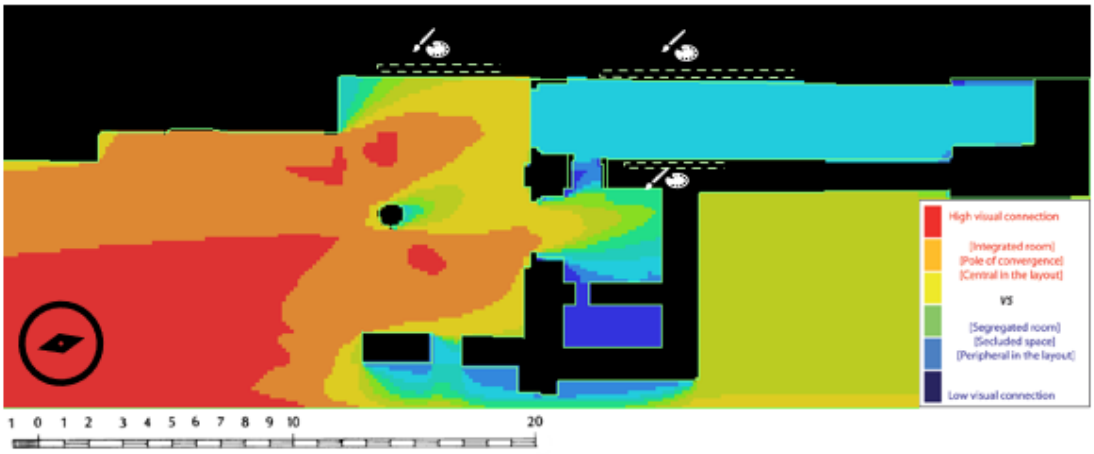

Figure C2. 2D Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 2: East entrance blocked, Metric of Isovist Area, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

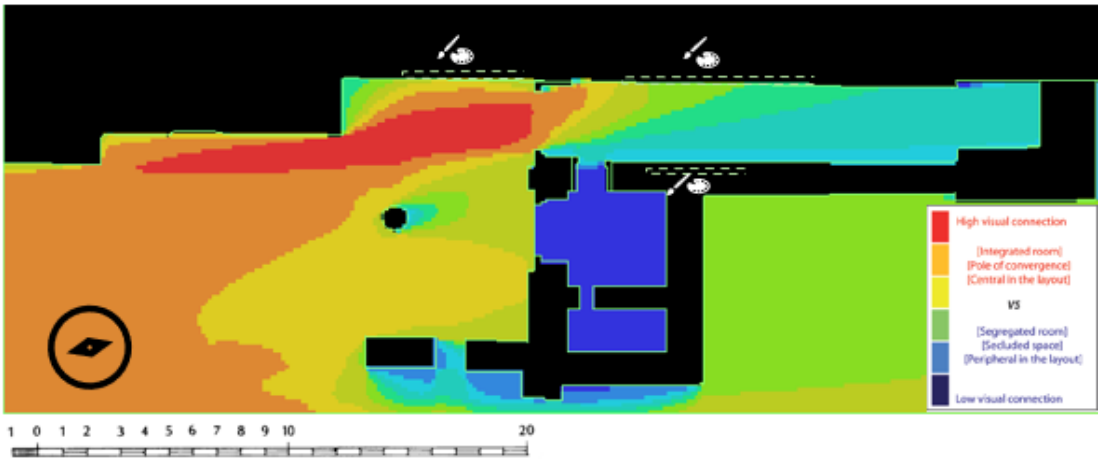

Figure C3. 2D Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 3: West entrance blocked, Metric of Isovist Area, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

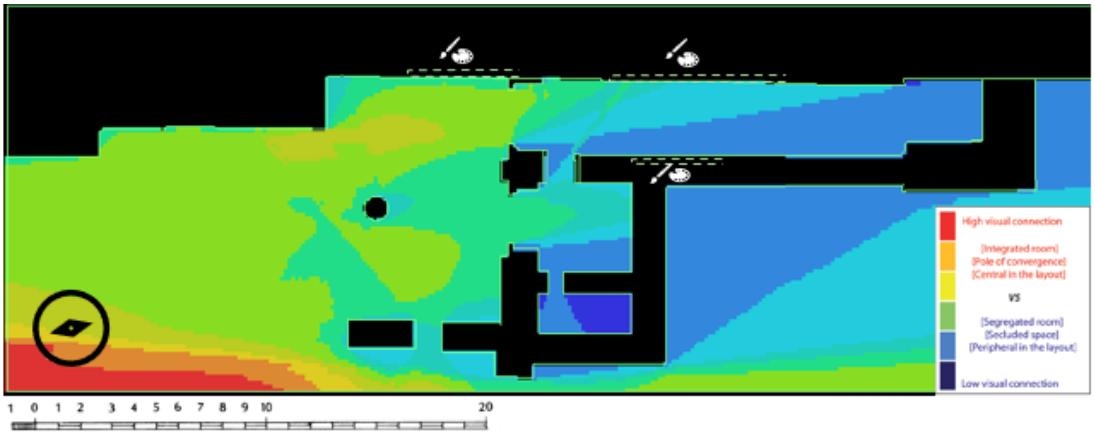

Figure C4. 2D Visibility Analysis of the West Entrance complex, Version 1: All entrances open, Metric of Visual Integration with indications of original found place of known painted plaster fragments, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

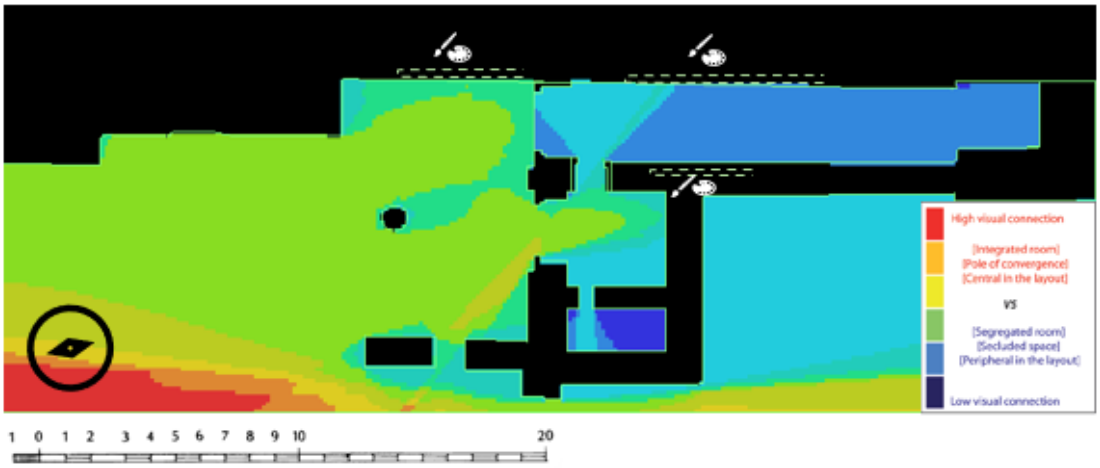

Figure C5. 2D Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 2: East entrance blocked, Metric of Visual Integration, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

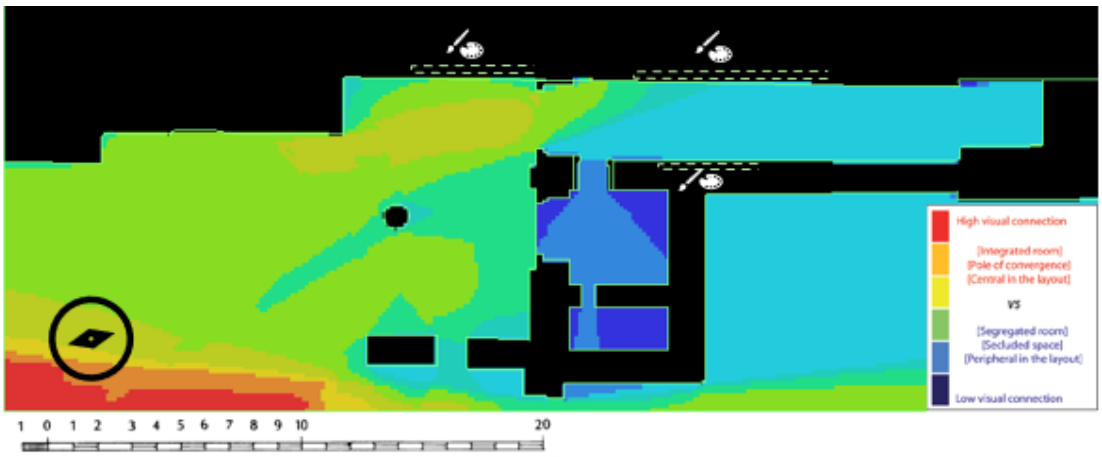

Figure C6. 2D Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 3: West entrance blocked, Metric of Visual Integration, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

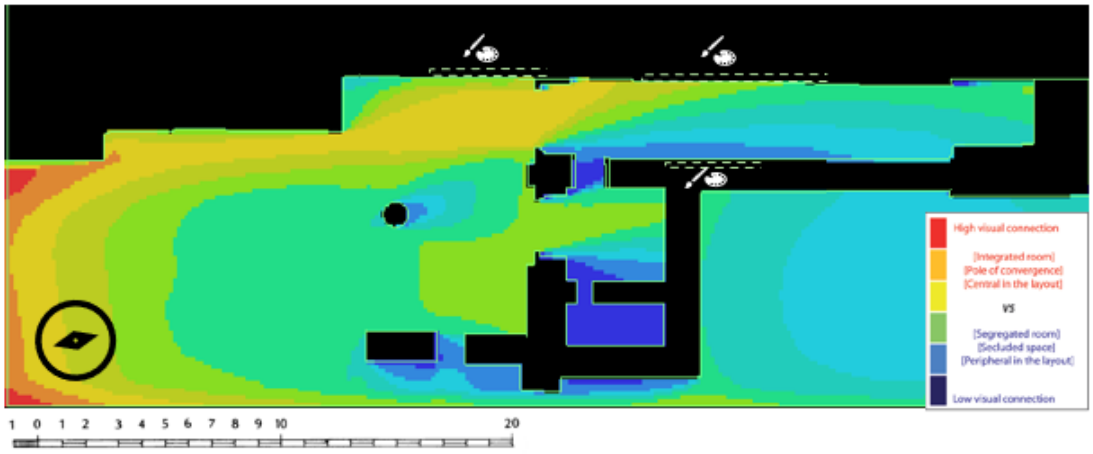

Figure C7. 2D Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 1: All entrances open, Metric of Point First Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

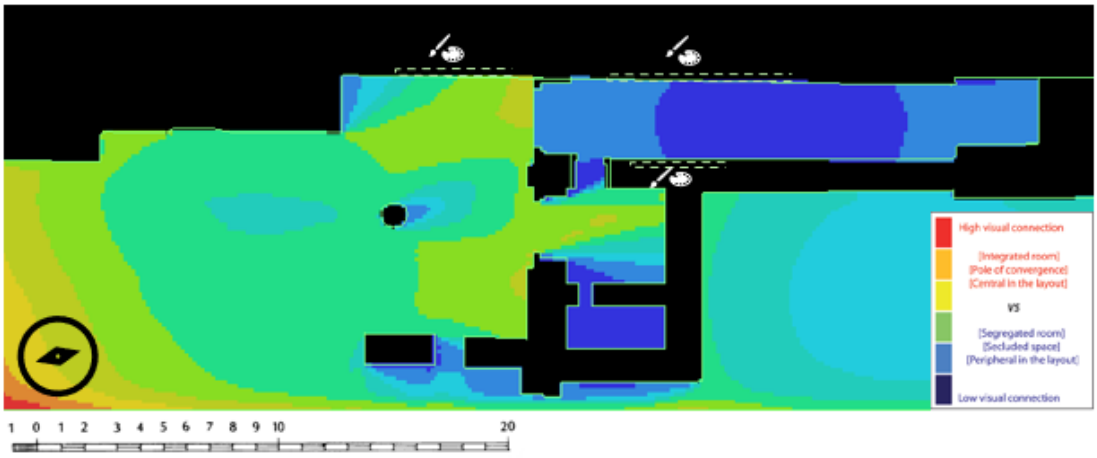

Figure C8. 2D Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 2: East entrance blocked, Metric of Point First Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

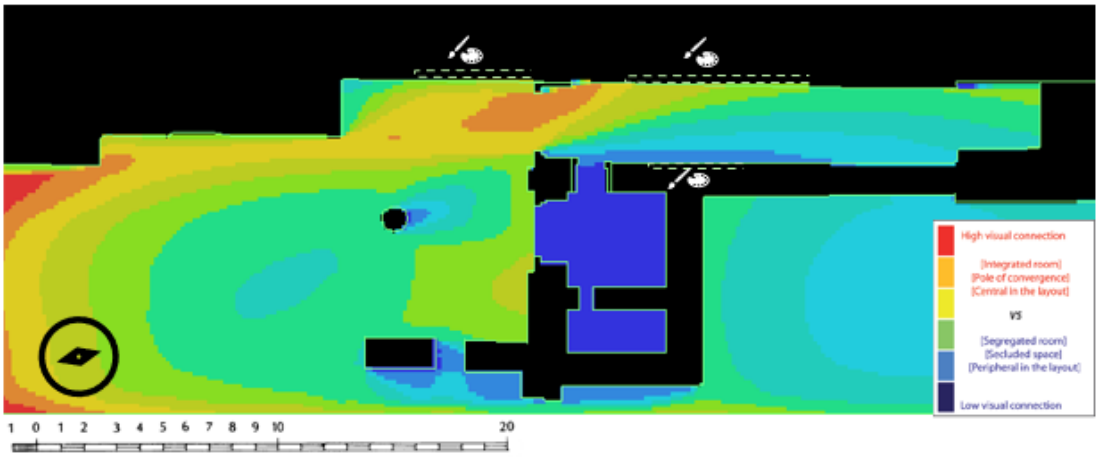

Figure C9. 2D Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 3: West entrance blocked, Metric of Point First Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

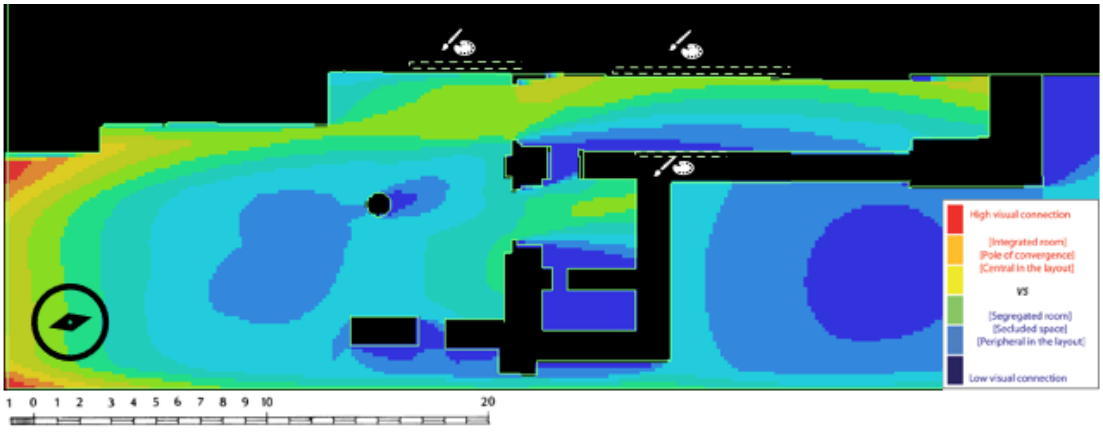

Figure C10. 2D Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 1: All entrances open, Metric of Point Second Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

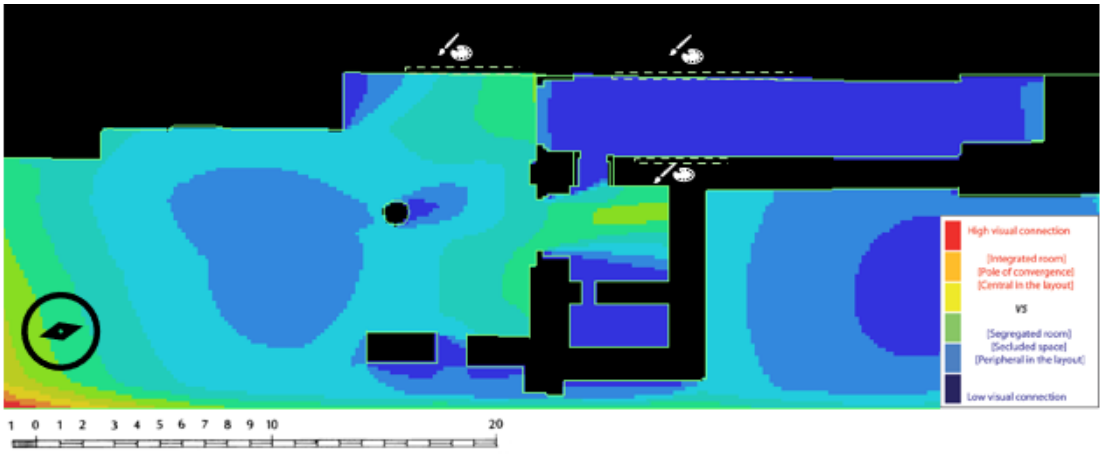

Figure C11. 2D Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 2: East entrance blocked, Metric of Point Second Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

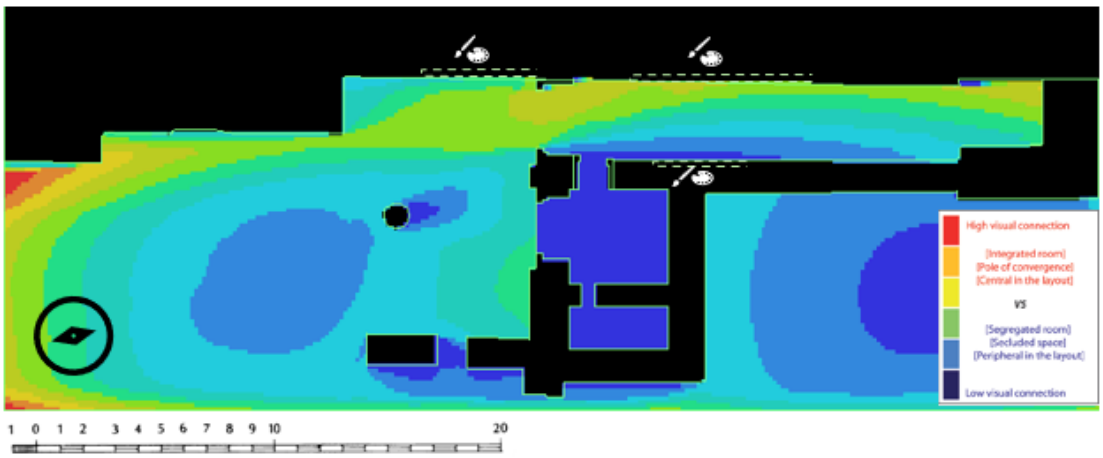

Figure C12. 2D Visibility Analysis of the West Entrance complex with indications of original found place of known painted plaster fragments, Version 3: West entrance blocked, Metric of Point Second Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

- Throne Room complex

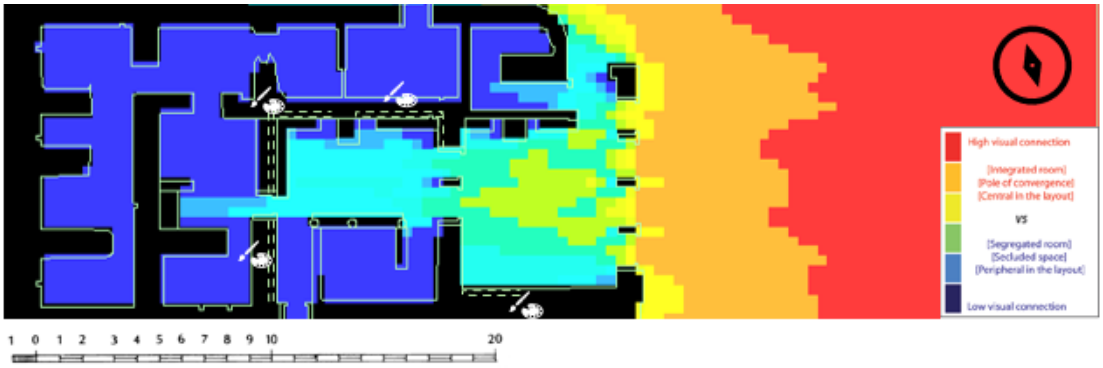

Figure C13. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 1: Metric of Isovist Area, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

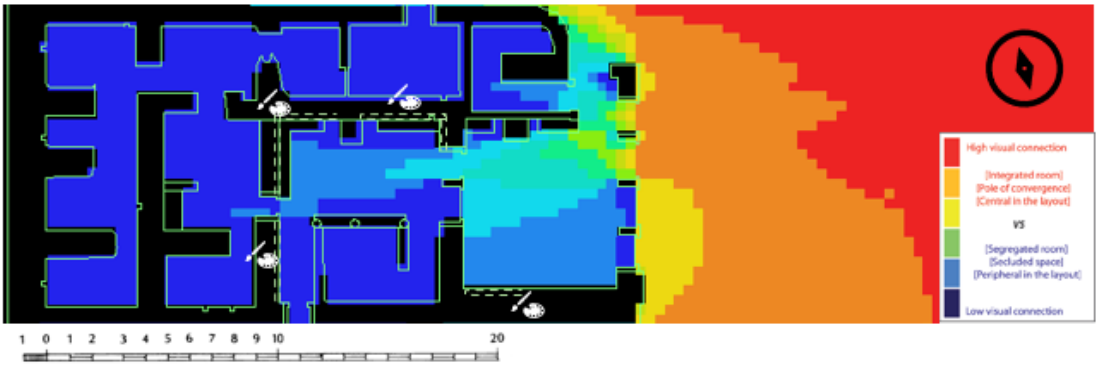

Figure C14. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 2: Metric of Isovist Area, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

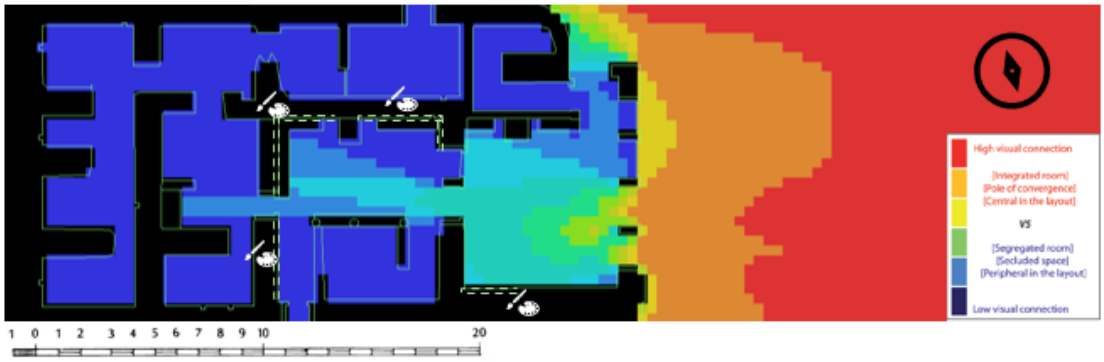

Figure C15. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 3: Metric of Isovist Area, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

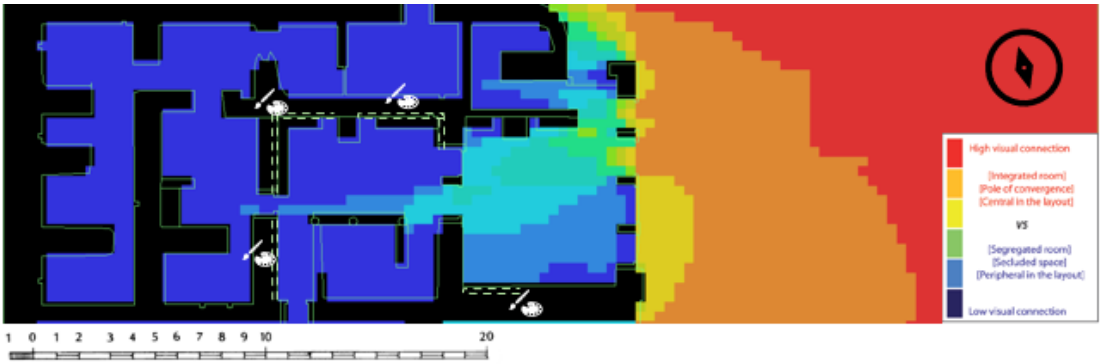

Figure C16. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 4: Metric of Isovist Area, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

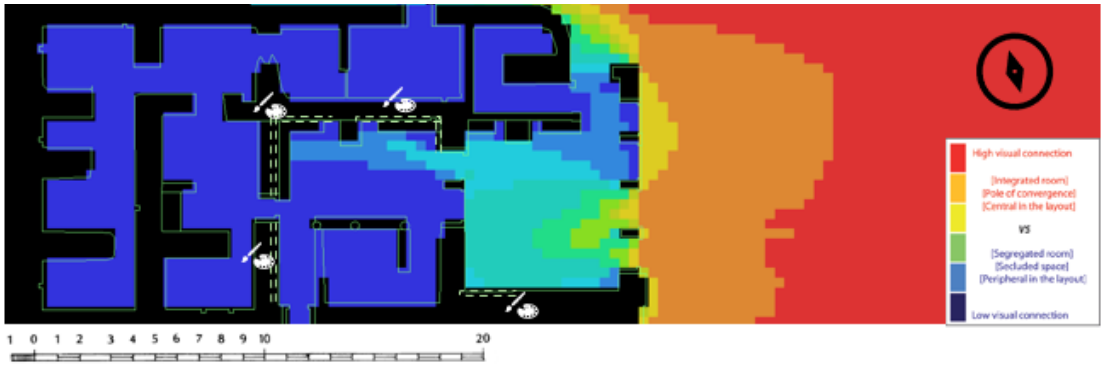

Figure C17. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 5: Metric of Isovist Area, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

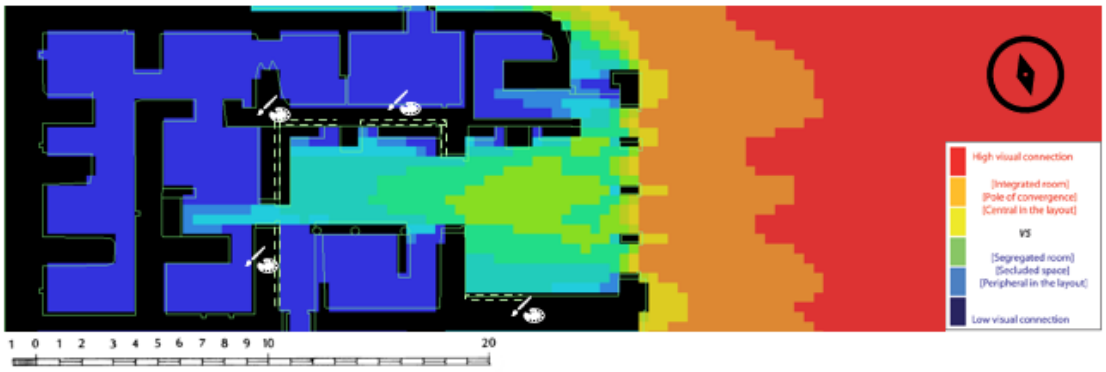

Figure C18. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 6: Metric of Isovist Area, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

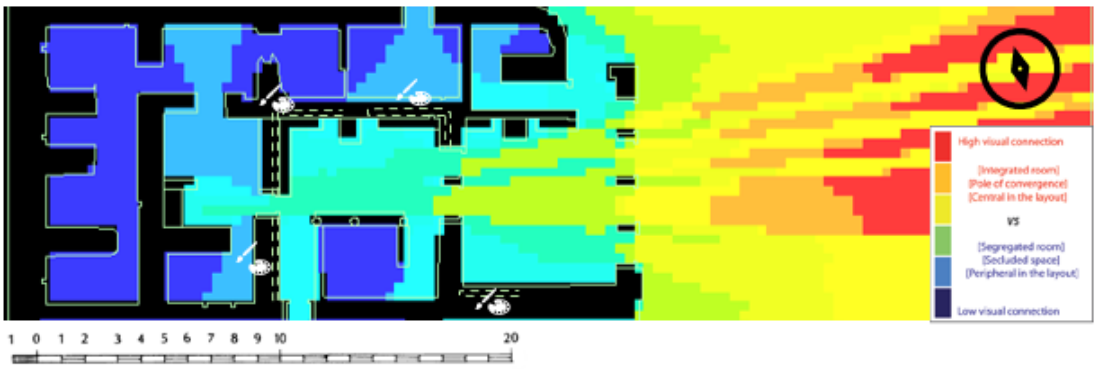

Figure C19. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 1: Metric of Visual Integration, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

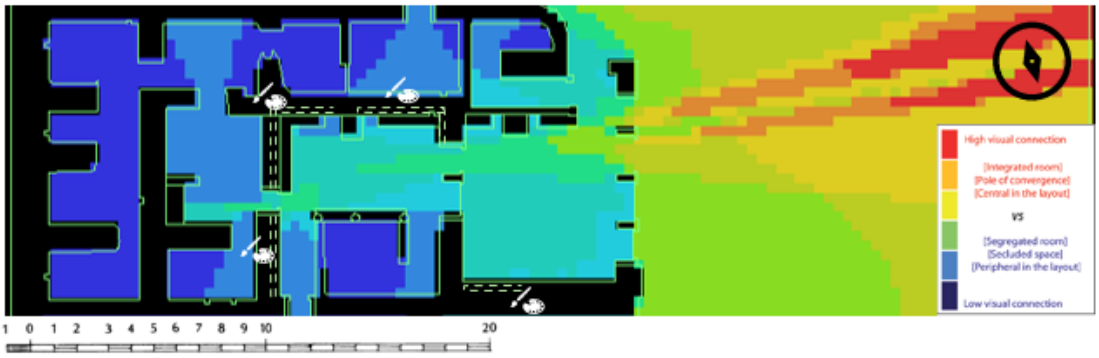

Figure C20. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 2: Metric of Visual Integration, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

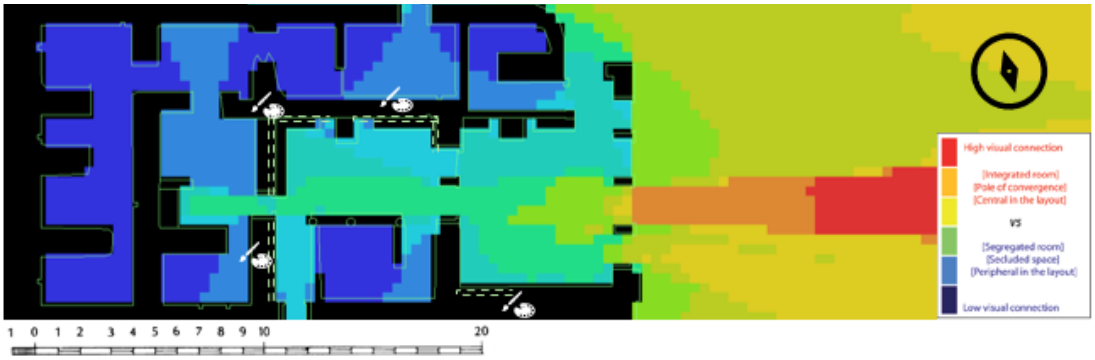

Figure C21. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 3: Metric of Visual Integration, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

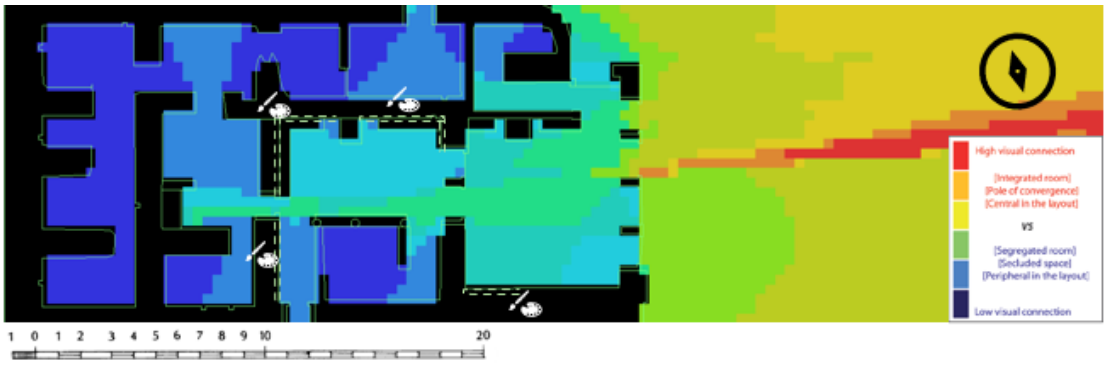

Figure C22. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 4: Metric of Visual Integration, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

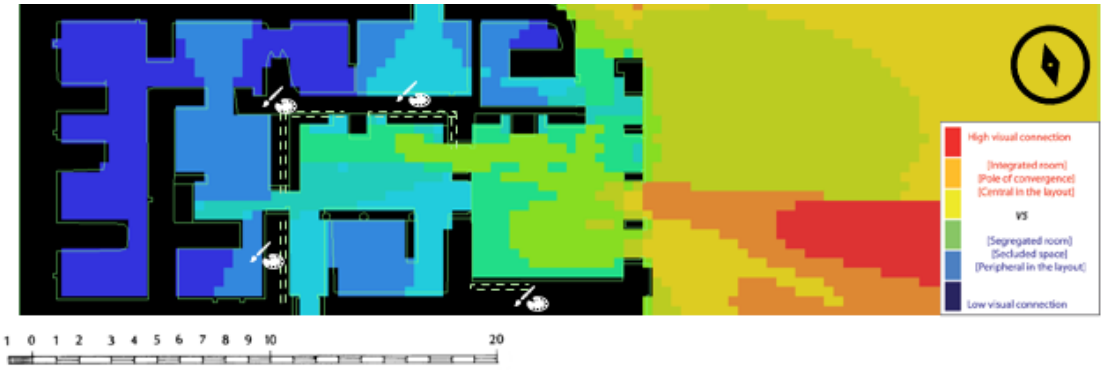

Figure C23. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 5: Metric of Visual Integration, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

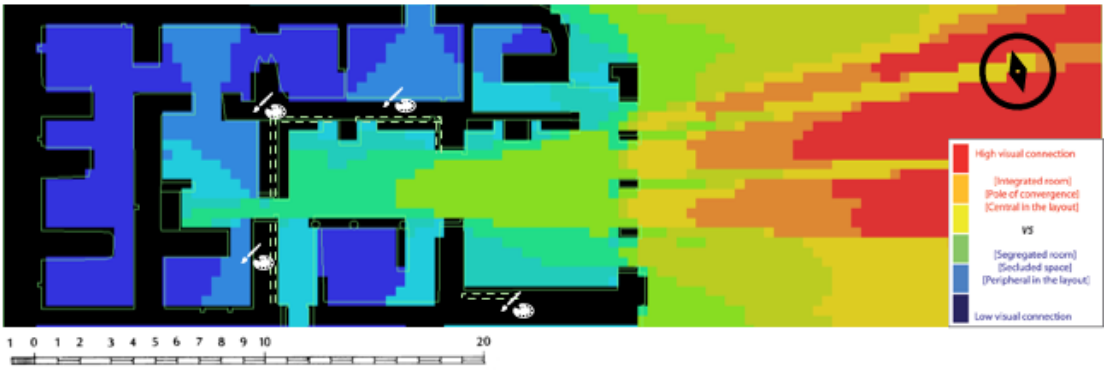

Figure C24. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 6: Metric of Visual Integration, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

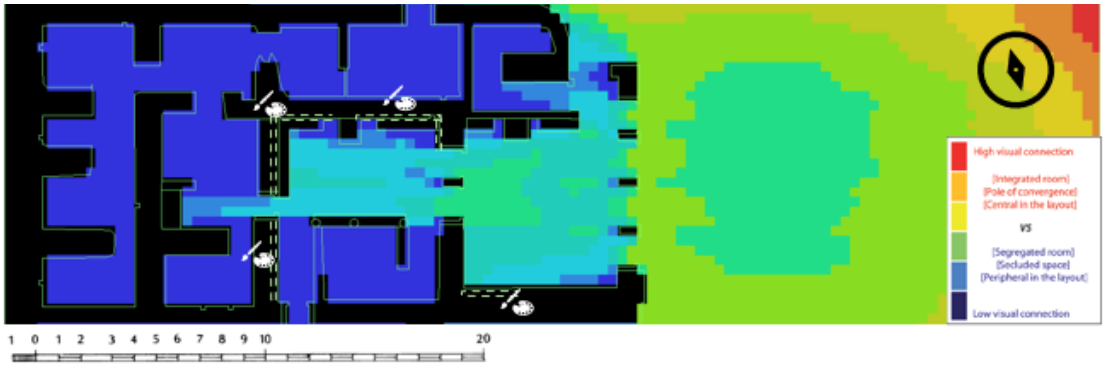

Figure C25. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 1: Metric of Point First Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

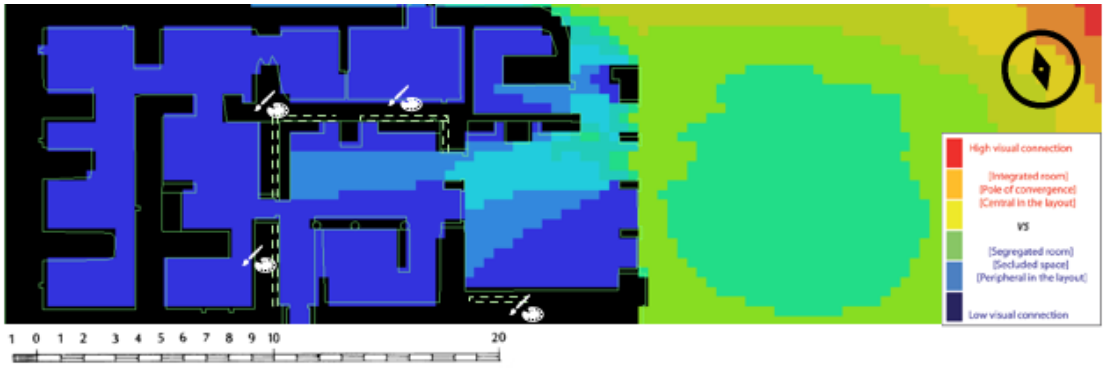

Figure C26. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 2: Metric of Point First Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

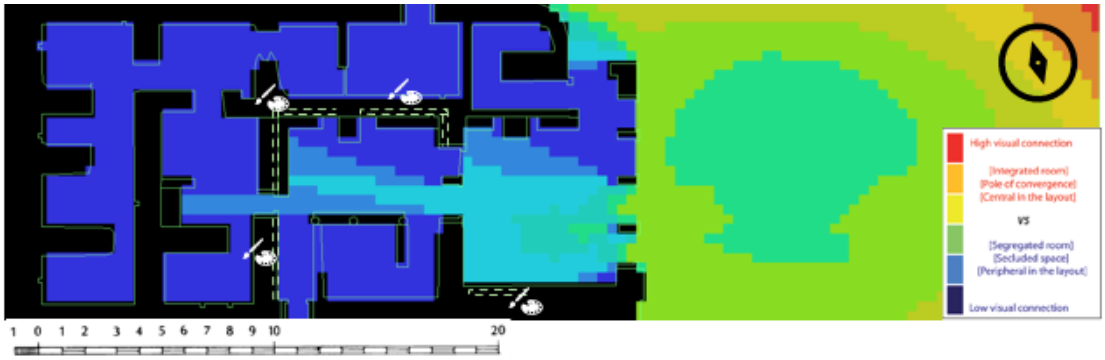

Figure C27. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 3: Metric of Point First Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

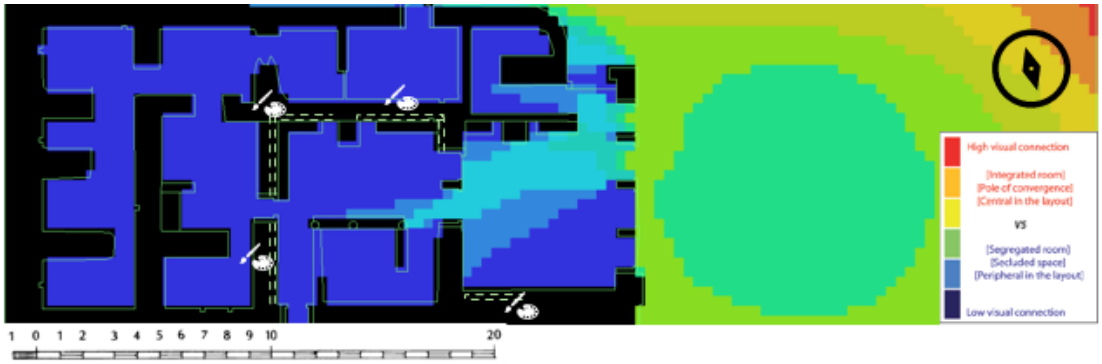

Figure C28. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 4: Metric of Point First Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

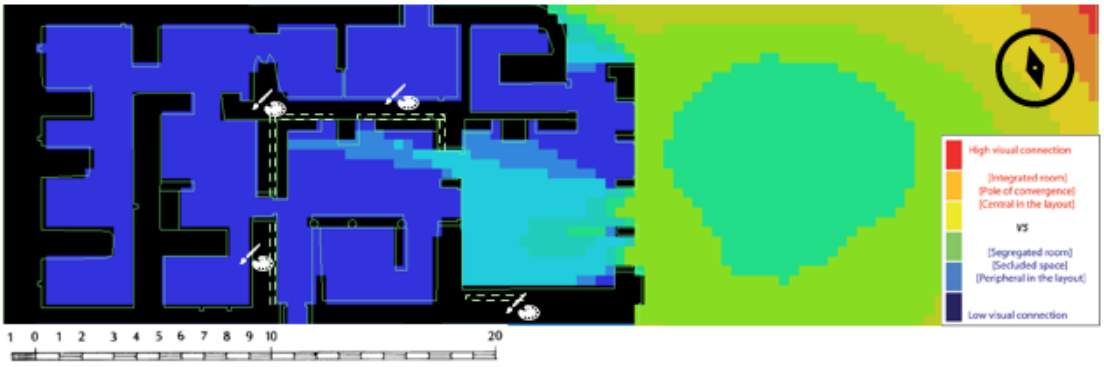

Figure C29. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 5: Metric of Point First Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

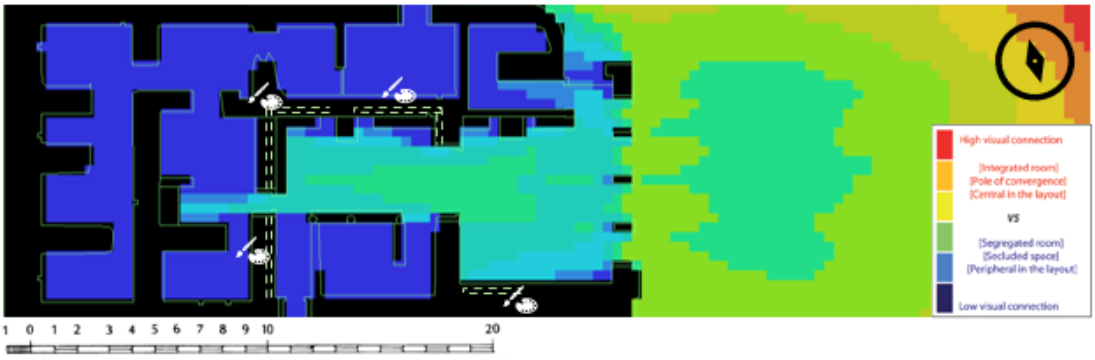

Figure C30. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 6: Metric of Point First Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

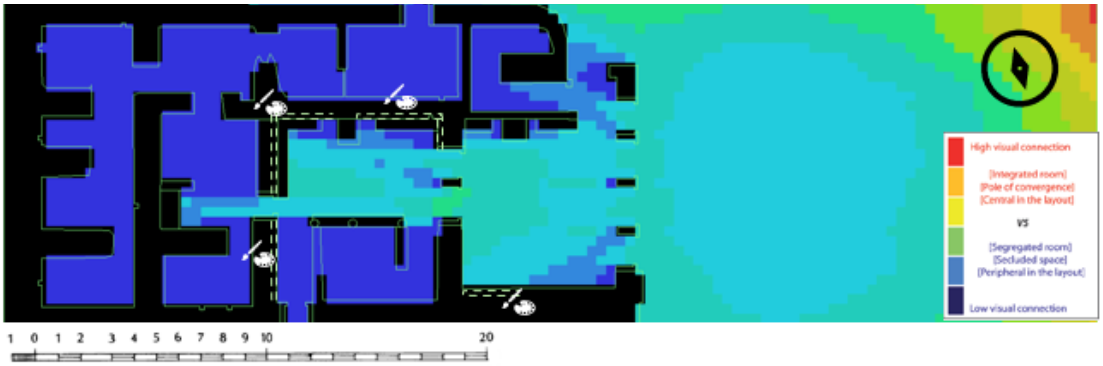

Figure C31. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 1: Metric of Point Second Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

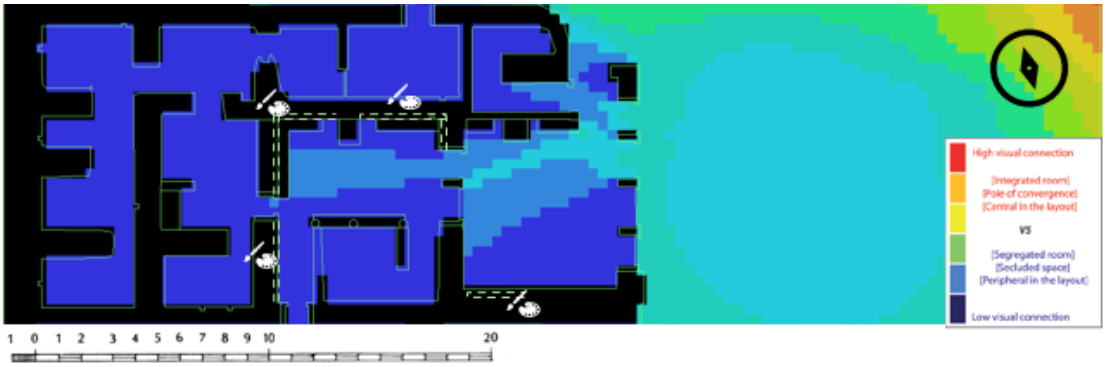

Figure C32. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 2: Metric of Point Second Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

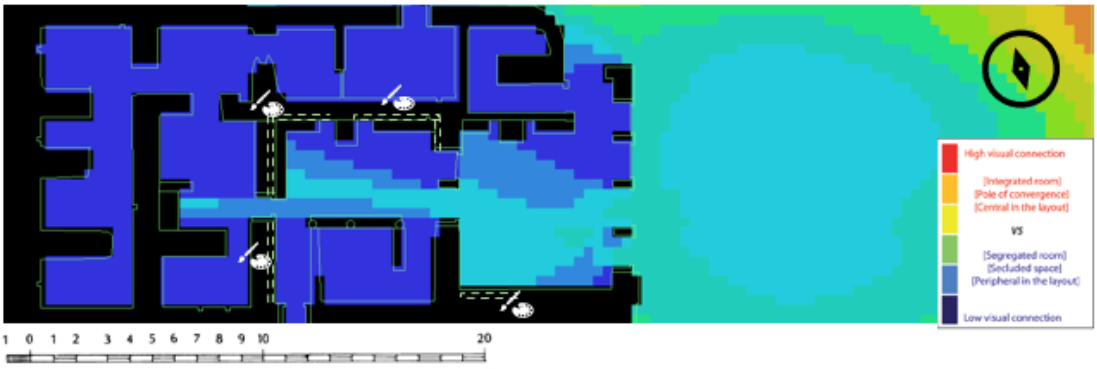

Figure C33. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 3: Metric of Point Second Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

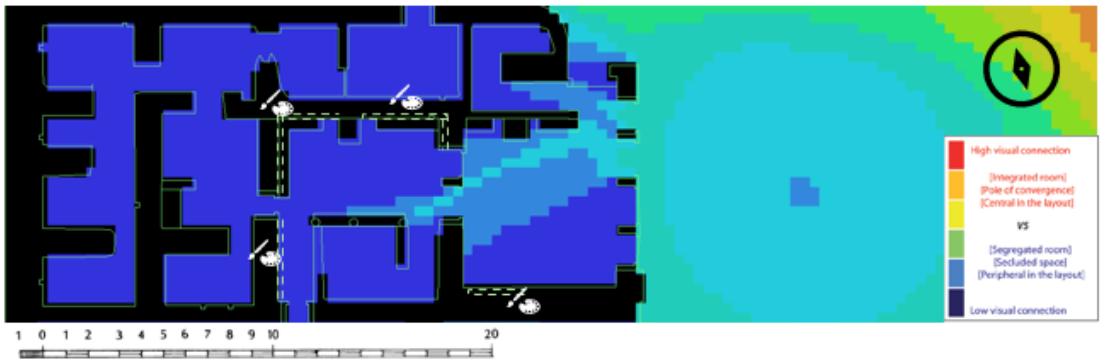

Figure C34. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 4: Metric of Point Second Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

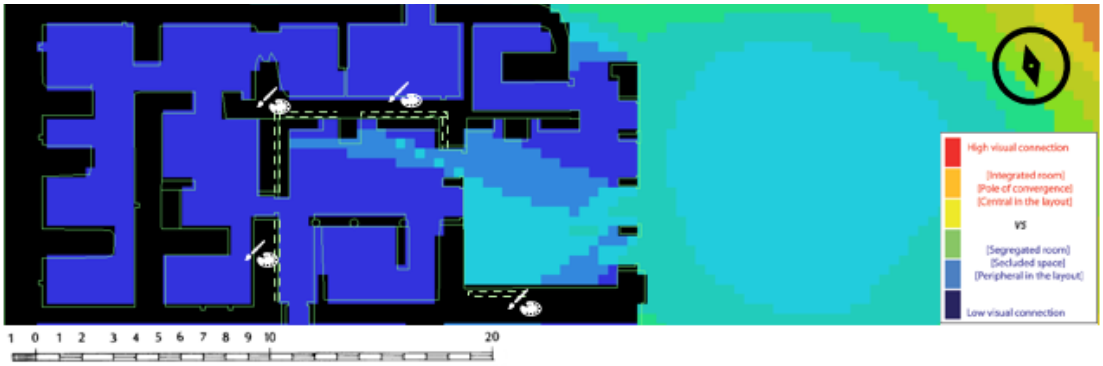

Figure C35. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 5: Metric of Point Second Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

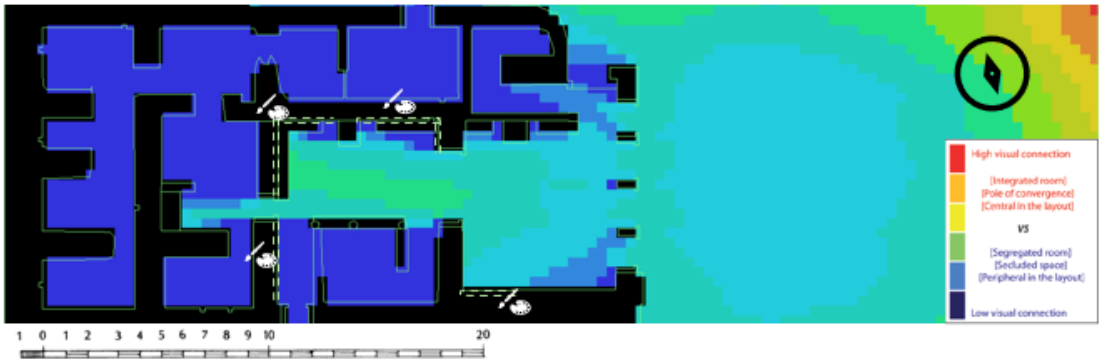

Figure C36. 2D Visibility Analysis of the Throne Room complex with indications of original found place of known painted plaster fragments, Version 6: Metric of Point Second Moment, depthmapX. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Appendix D

3D Models References & Visibility Analysis Results

- West Entrance complex

Figure D1 View of the outer facade of the West Wing, from the area of the West Courrt, Knossos palatial complex. Images from the dado slabs were used by author to reconstruct the West Entrance complex. *(Eforia of Antiquities Iraklio*. (n.d.). https://knossospalace.gr/map?readPoiId=12).

Figure D2 Part of painted plaster decoration depicting the huff of a bull, from east wall of the West Porch, palatial complex of Knossos. Image cropped by the author. (Adapted from Cameron, 1976, Plate 80, Figure B).

Figure D3 Part of painted plaster decoration depicting the huff of a bull, from east wall of the West Porch, palatial complex of Knossos. Image cropped by the author. (Adapted from Cameron, 1976, Plate 145, Figure B).

Figure D4 Part of painted plaster decoration depicting the lower part of figures walking, from east wall of the Corridor of the West Entrance complex, palatial complex of Knossos. Image cropped by the author. (Adapted from ArchaiOptix, 2019, https://commons.wikimedia.org/wiki/File:Wall_painting_of_cult_procession_from_Knossos_(Corridor_of_Procession)_-_Heraklion_AM_-_01.jpg).

Figure D5 Part of painted plaster decoration depicting the lower part of figures walking, from east wall of the Corridor of the West Entrance complex, palatial complex of Knossos. Image cropped by the author. (Adapted from ArchaiOptix, 2020, https://commons.wikimedia.org/wiki/File:Wall_painting_of_cult_procession_from_Knossos_(Corridor_of_Procession)_-_Heraklion_AM_-_06.jpg

Figure D6 Part of painted plaster decoration depicting the lower part of figures walking, from east wall of the Corridor of the West Entrance complex, palatial complex of Knossos. Image cropped by the author. (Adapted from Tausch, 2018, https://commons.wikimedia.org/wiki/File:Knossos_Prozessionsfresko_Fragment_(F%C3%BC%C3%9Fe)_01.jpg

Figure D7 Part of painted plaster decoration depicting the lower part of figures walking, from east wall of the Corridor of the West Entrance complex, palatial complex of Knossos. Image cropped by the author. (Adapted from Tausch, 2018, https://commons.wikimedia.org/wiki/File:Knossos_Prozessionsfresko_Gehende_M%C3%A4nner_01.jpg).

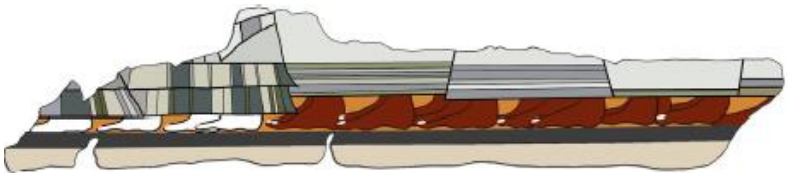

Figure D8 Part coloured digital sketch of painted plaster decoration depicting the huff of a bull, from west wall of the Corridor of the West Entrance complex, palatial complex of Knossos. Image cropped by the author. (Adapted from Günkel-Maschek, 2020, p.168, Figure 4.3).

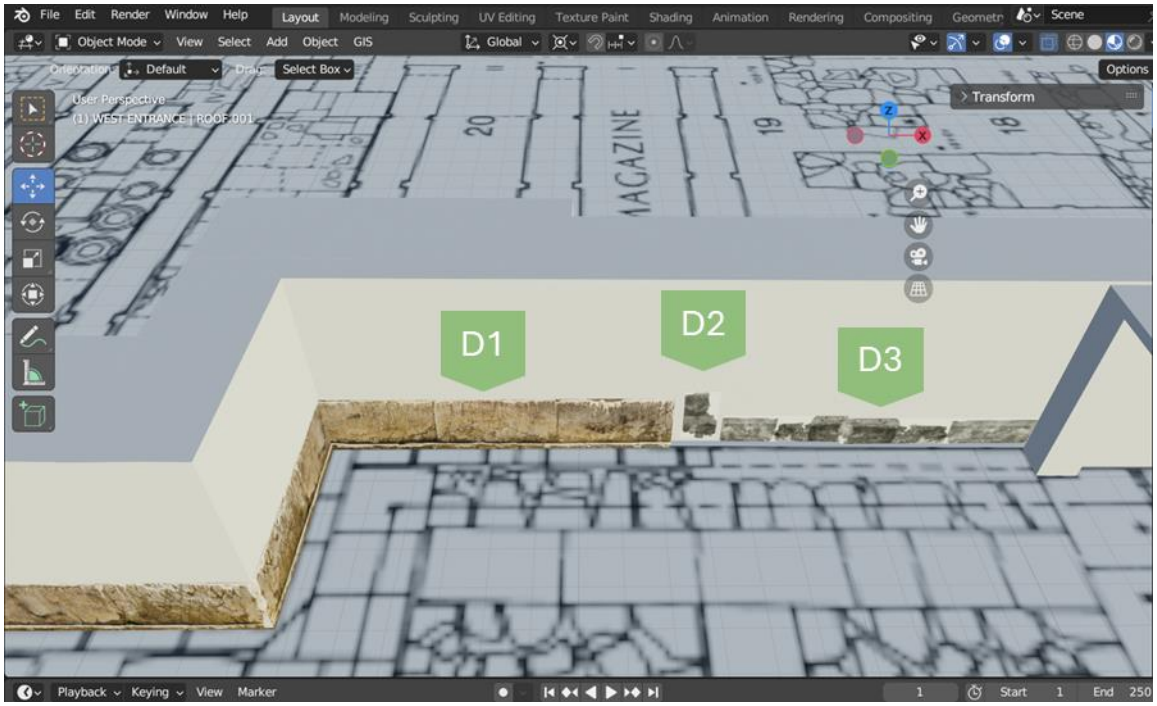

Figure D9 View of the west wall from the 3D model of the West Entrance complex, with indications of the numbering of the images used to reconstruct the wall decoration, as seen in Appendix D. Made in Blender 3.6. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

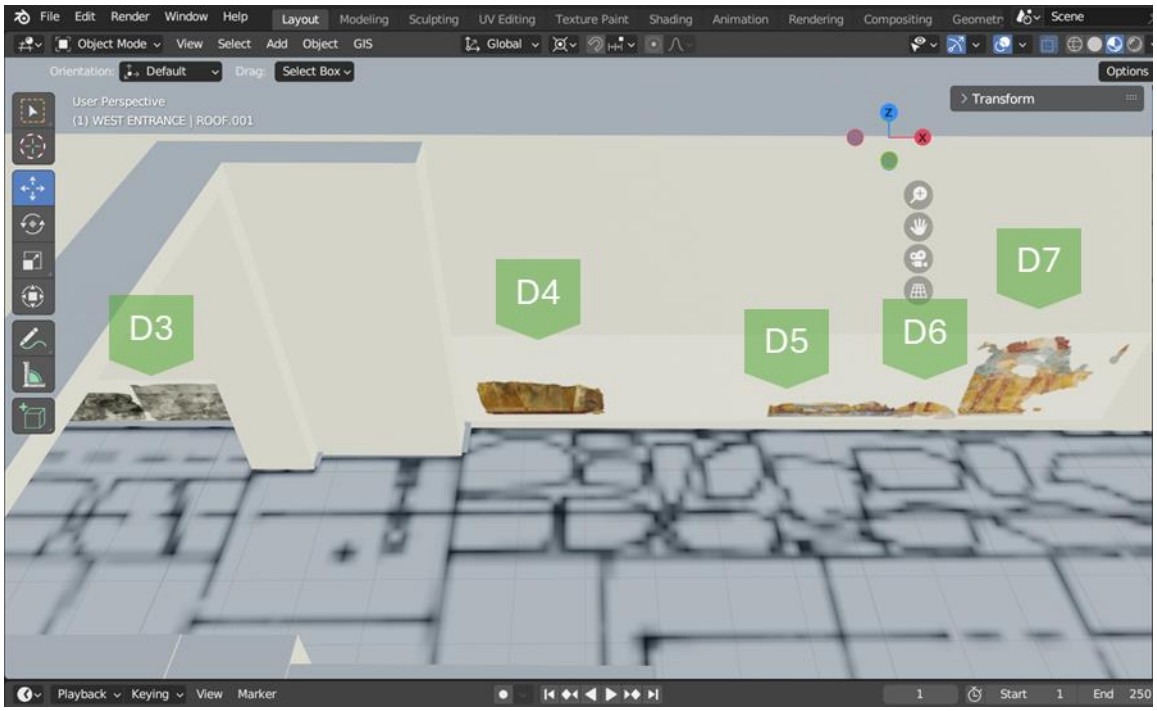

Figure D10 View of the west wall from the 3D model of the West Entrance complex, with indications of the numbering of the images used to reconstruct the wall decoration, as seen in Appendix D. Made in Blender 3.6. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

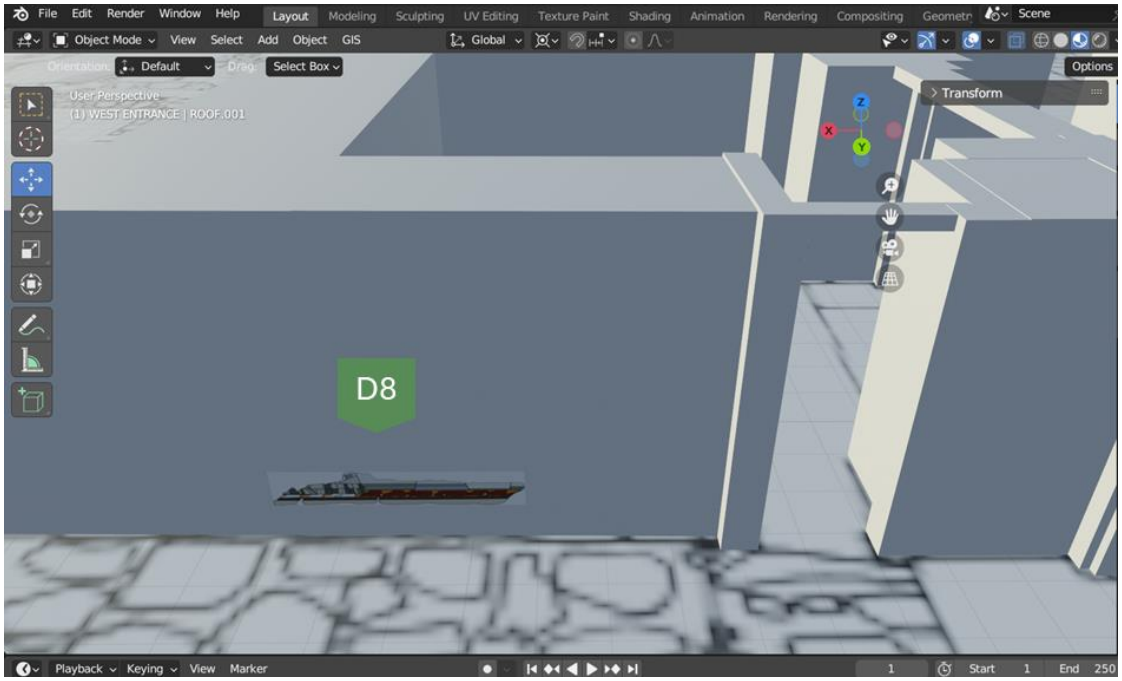

Figure D11 View of the east wall from the 3D model of the West Entrance complex, with indications of the numbering of the images used to reconstruct the wall decoration, as seen in Appendix D. Made in Blender 3.6. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

- Throne Room complex

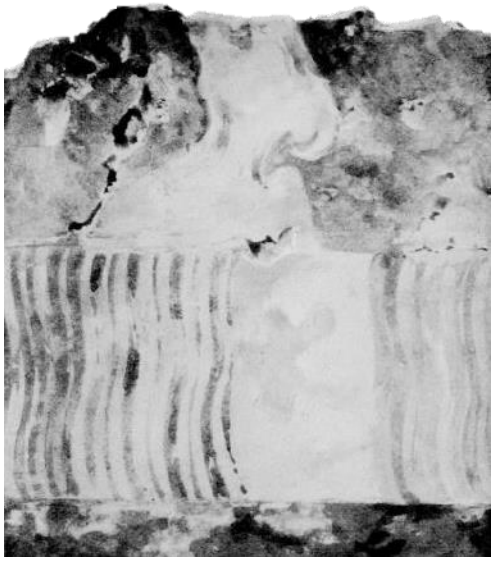

Figure D12 Fragment depicting hoof of a bull facing west, above frieze of dado imitation, southwest corner of the anteroom, Throne Room complex, palatial complex of Knossos. Image cropped by the author. (Adapted from Hood, 2005, Plate 27, Fig 4).

Figure D13 View of the lustral basin from northeast, with the restored columns and the decoration of the south wall visible. South space of the main room in the Throne Room complex, palatial complex of Knossos. Detail of the image used for the reconstruction of the wall decoration in 3D by the author. (Figure: V. Georgiopoulou).

Figure D14 Composition of interconnecting fragments depicting a seated griffin among papyrus-reeds, from the south part of the west wall of the main room in the Throne Room complex, palatial complex of Knossos. Image cropped by the author. (Galanakis et al., 2017, p. 66, Fig. 25).

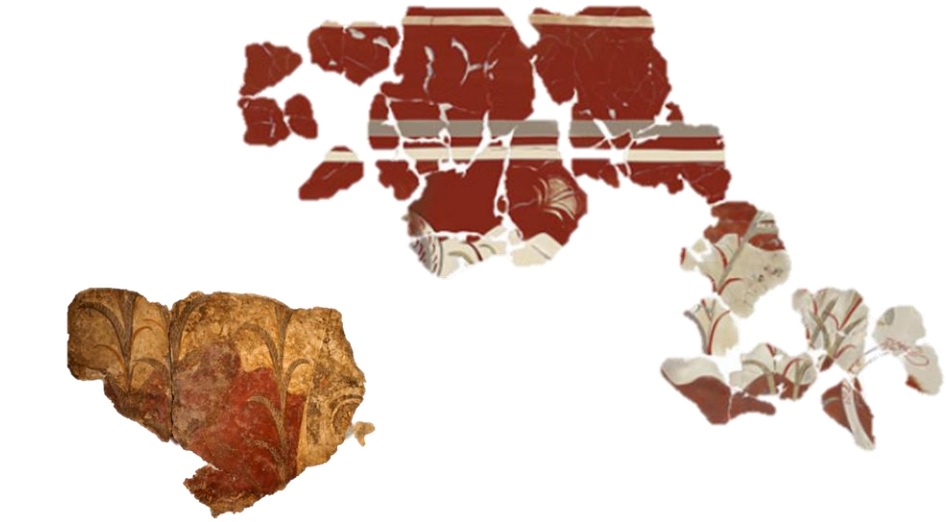

Figure D15 Detail of colored sketch of the fragments of painted plaster decoration with the seated griffin of the north wall of the main room of the Throne Room complex, palatial complex of Knossos. Images cropped and joint by author. (Adapted from Galanakis et al. 2017, p. 60, Figure 16 & p.62, Figure 19).

Figure D16 Colored sketch representing the fragments of painted plaster decoration of the north wall of the main room of the Throne Room complex, palatial complex of Knossos. Detail of the image cropped by author. (Galanakis et al. 2017, p. 60, Fig 16).

Figure D17 Painted plaster decoration of the palm tree and seated griffin, above a frieze of dado imitation, north wall of the main room of the Throne Room complex, palatial complex of Knossos. Image cropped by author (Adapted from Galanakis et al., 2017, p.55, Figure 10c).

Figure D18 Coloured sketch made by Theodore Fyfe, depicting the painted wall plaster found in the east part of the north wall of the main room in the Throne Room complex, palatial complex of Knossos. Image cropped by author (Adapted from Galanakis et al., 2017, p.53, Figure 7).

Figure D19 View of the south and southwest wall from the 3D model of the Throne Room complex, with indications of the numbering of the images used to reconstruct the wall decoration, as seen in Appendix D. Made in Blender 3.6. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Figure D20 View of the northwest and north wall from the 3D model of the Throne Room complex, with indications of the numbering of the images used to reconstruct the wall decoration, as seen in Appendix D. Made in Blender 3.6. (Figure: V. Georgiopoulou, Hood & Taylor, 1981, Plan).

Appendix E

LOS & Viewshed Analysis in 3D: Results

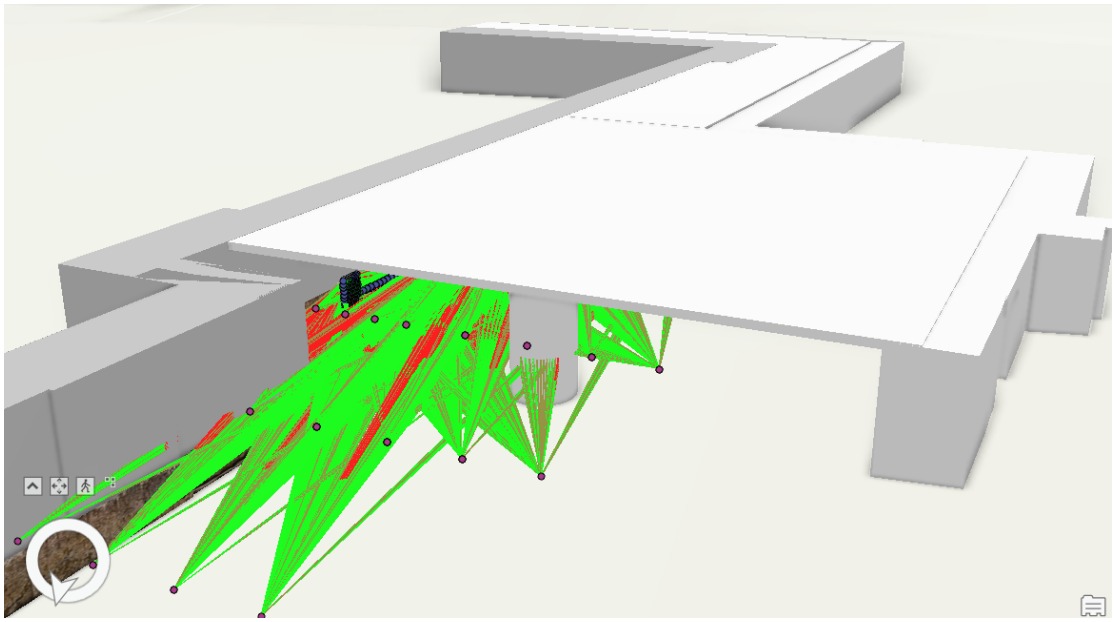

Figure E1 View of the conduction of LOS analysis in the 3D model of the West Entrance complex, with the grid of points representing the observes. Green lines indicate visible distance to target points, while red the no visible. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

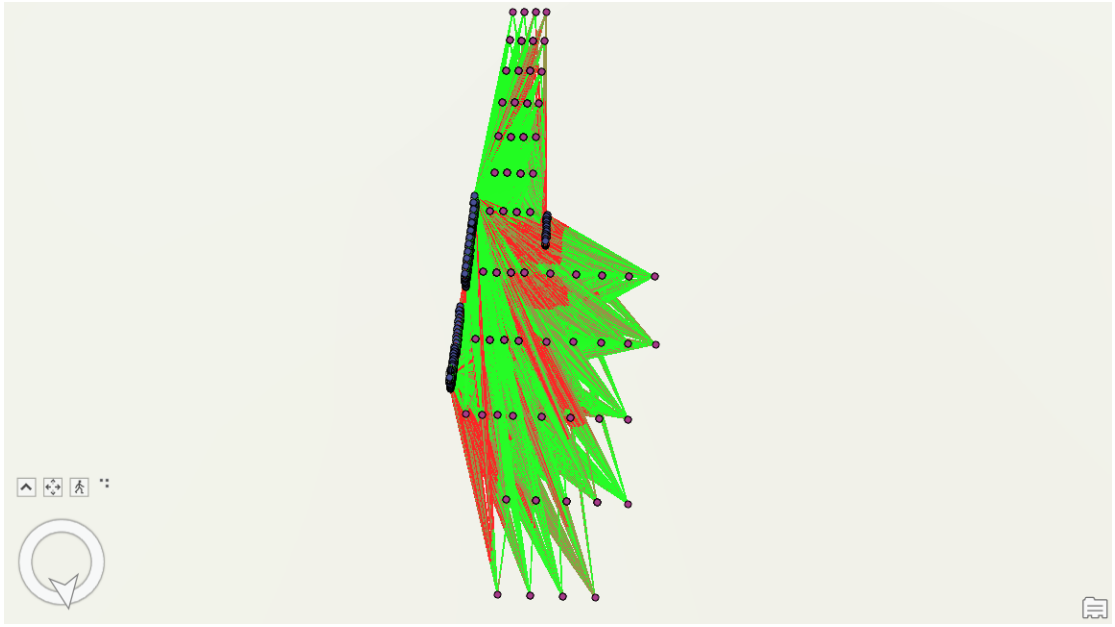

Figure E2 View of the conduction of LOS analysis in the 3D model of the West Entrance complex, with the grid of points representing the observes. Green lines indicate visible distance to target points, while red the no visible. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

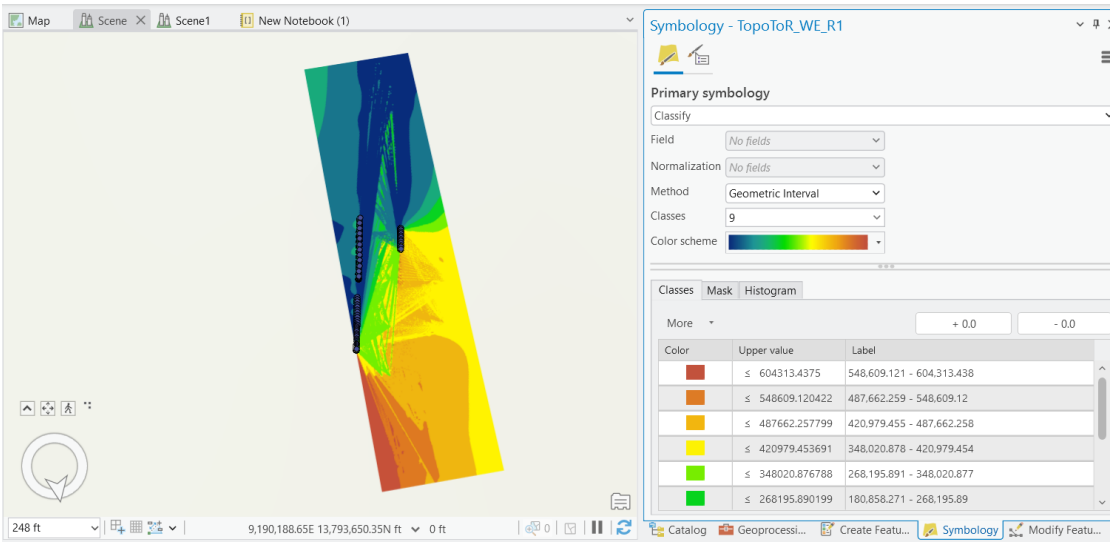

Figure E3 View of the raster created with the 'Topo to Raster' function, showcasing the results of the West Entrance complex. Red colour represents the areas with the highest degree of visual accessibility to the wall decorations, while blue represents the more segregated areas. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

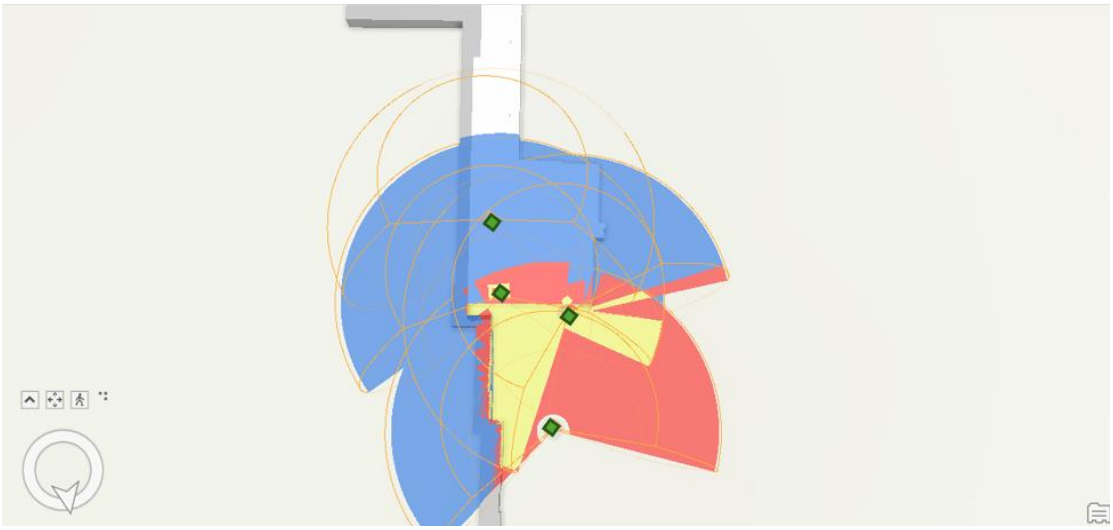

Figure E4 View of the West Entrance complex from above, with indication of positioned observer points outside, and inside the feature. The same locations were used in all the versions of the conduction of Exploratory Viewshed Analysis. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

-Version 1

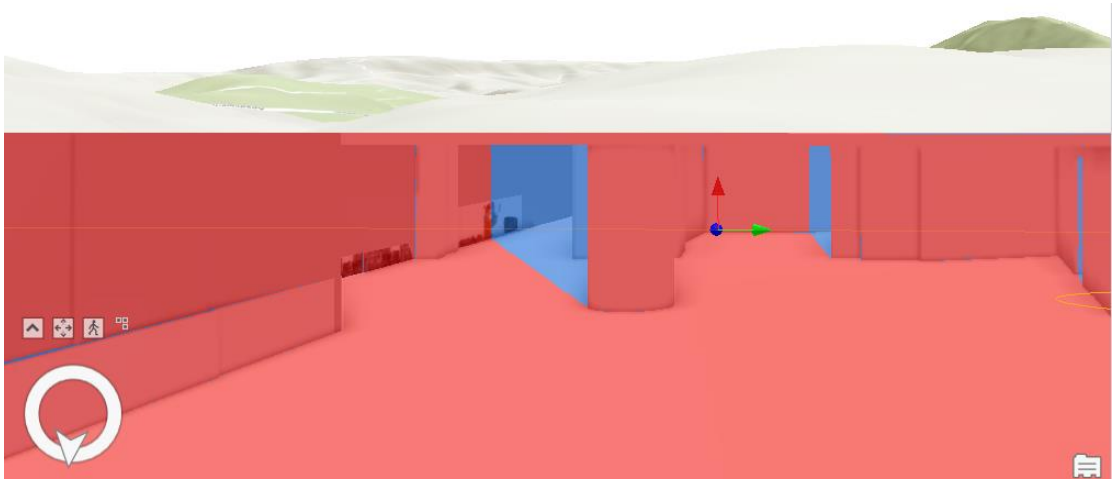

Figure E5 View of the West Entrance from the northwest, observer point in West Court. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

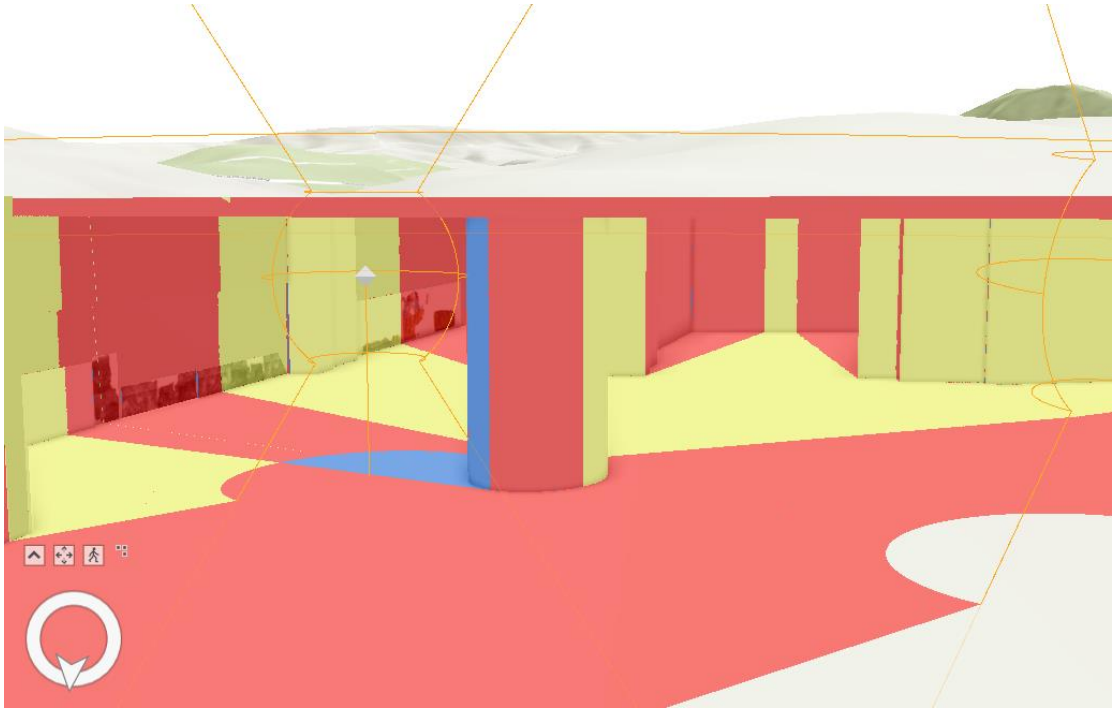

Figure E6 View of the West Entrance from the northwest, observer points in entrance of West Porch. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

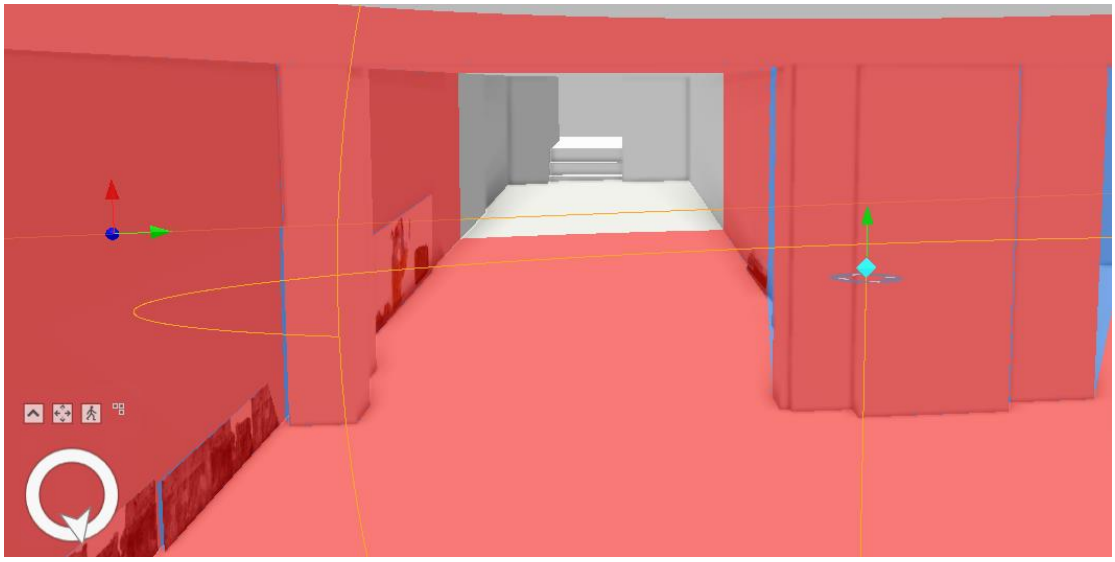

Figure E7 View of the West Entrance from the north, observer point in the beginning of the Corridor. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

-Version 2

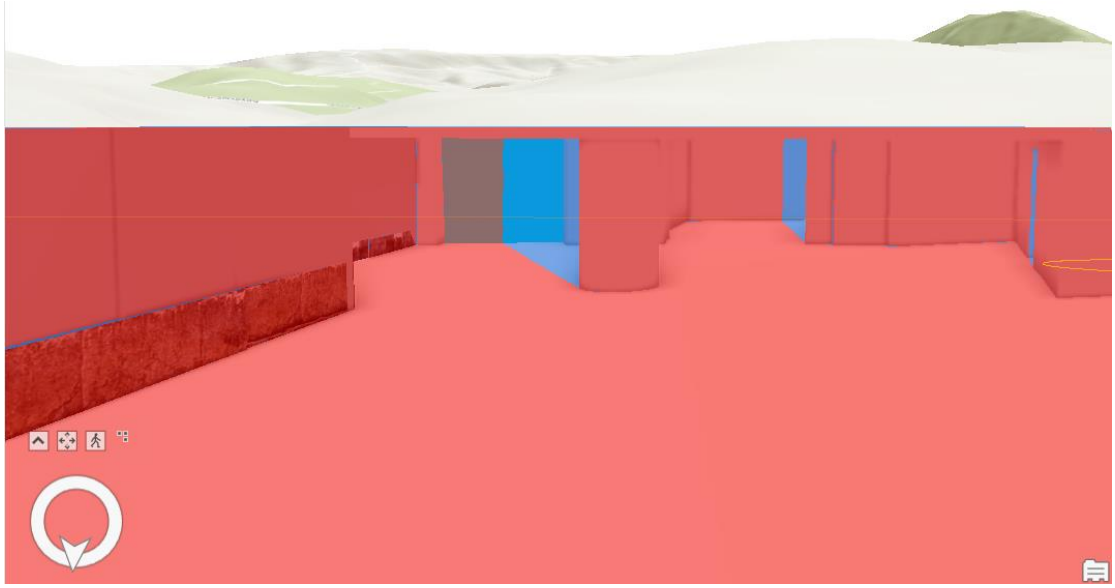

Figure E8 View of the West Entrance from the northwest, observer point in West Court. Results of Exploratory Viewshed Analysis in Version 2: East entrance closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

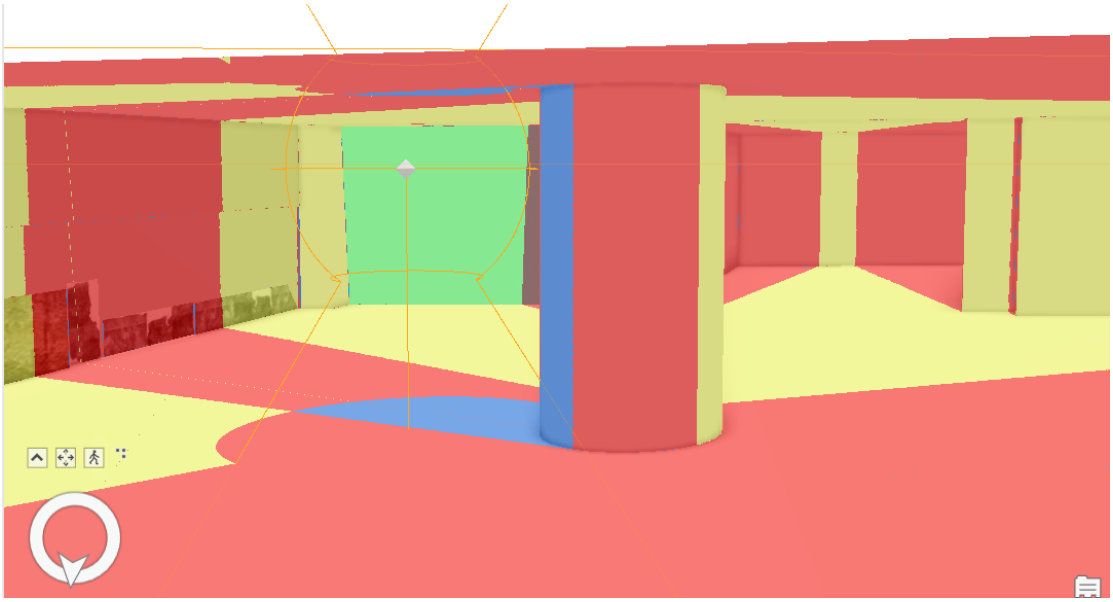

Figure E9 View of the West Entrance from the north, observer points in the entrance of the West Porch. Results of Exploratory Viewshed Analysis in Version 2: East entrance closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

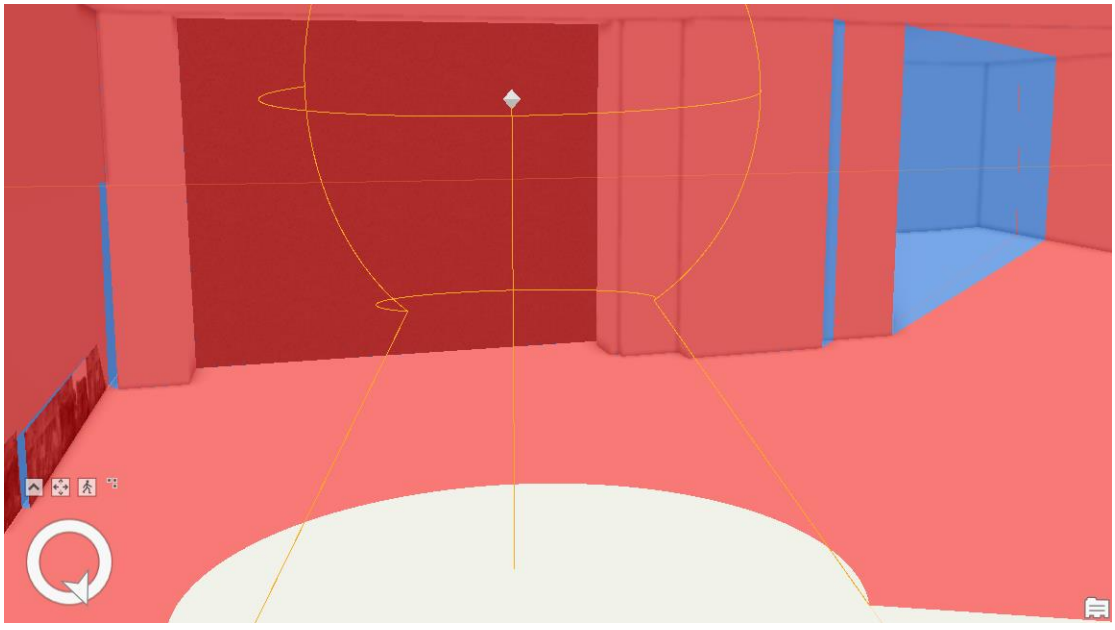

Figure E10 View of the West Entrance from the north, observer point in the beginning of the Corridor. Results of Exploratory Viewshed Analysis in Version 2: East entrance closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

-Version 3

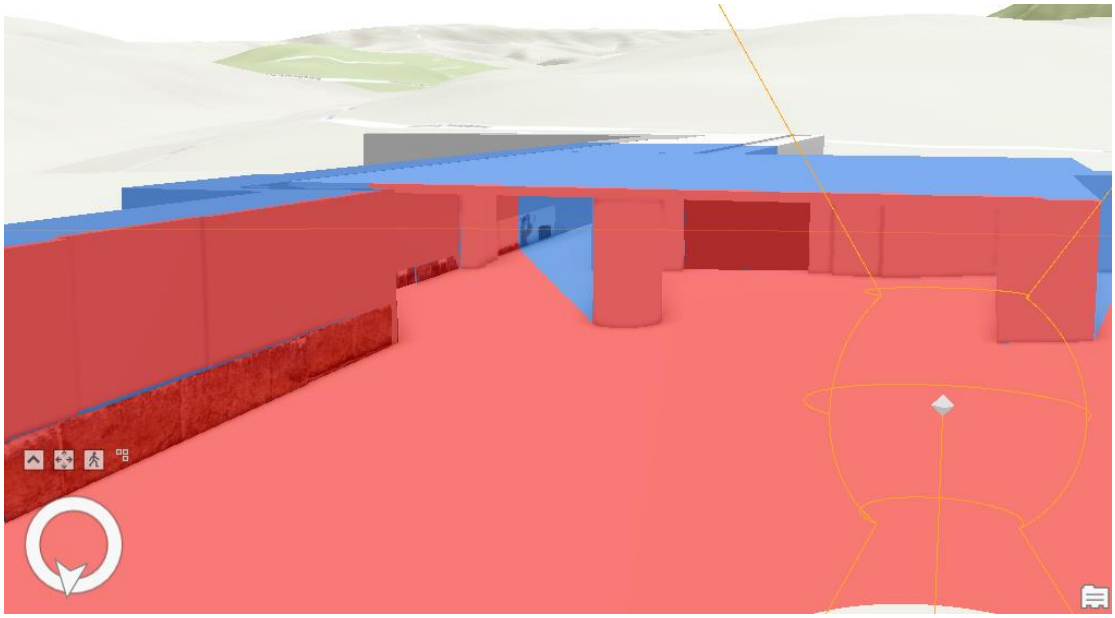

Figure E11 View of the West Entrance from the northwest, observer point in West Court. Results of Exploratory Viewshed Analysis in Version 3: West entrance closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

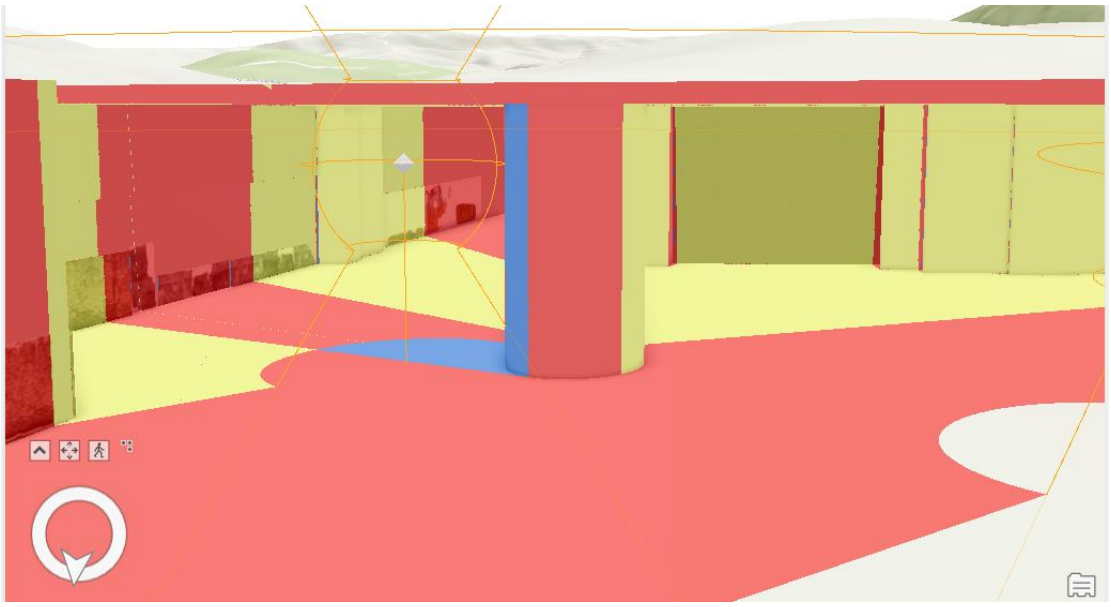

Figure E12 View of the West Entrance from the northwest, observer points in entrance of West Porch. Results of Exploratory Viewshed Analysis in Version 3: West entrance closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

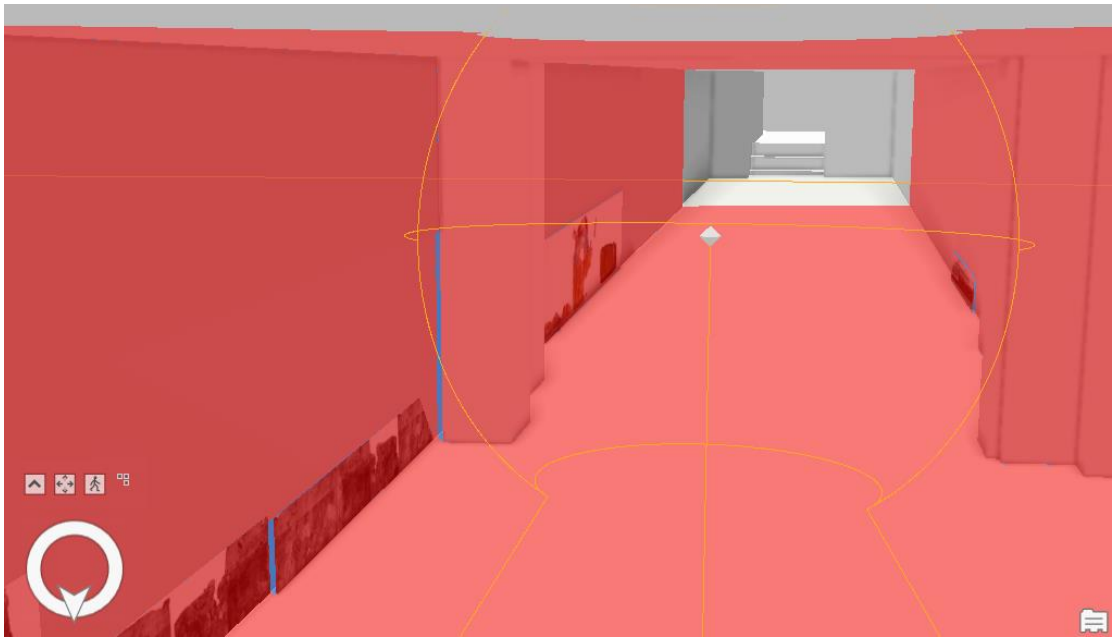

Figure E13 View of the West Entrance from the northwest, observer point in entrance of Corridor. Results of Exploratory Viewshed Analysis in Version 3: West entrance closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

-Viewshed from all observer points (Version 1)

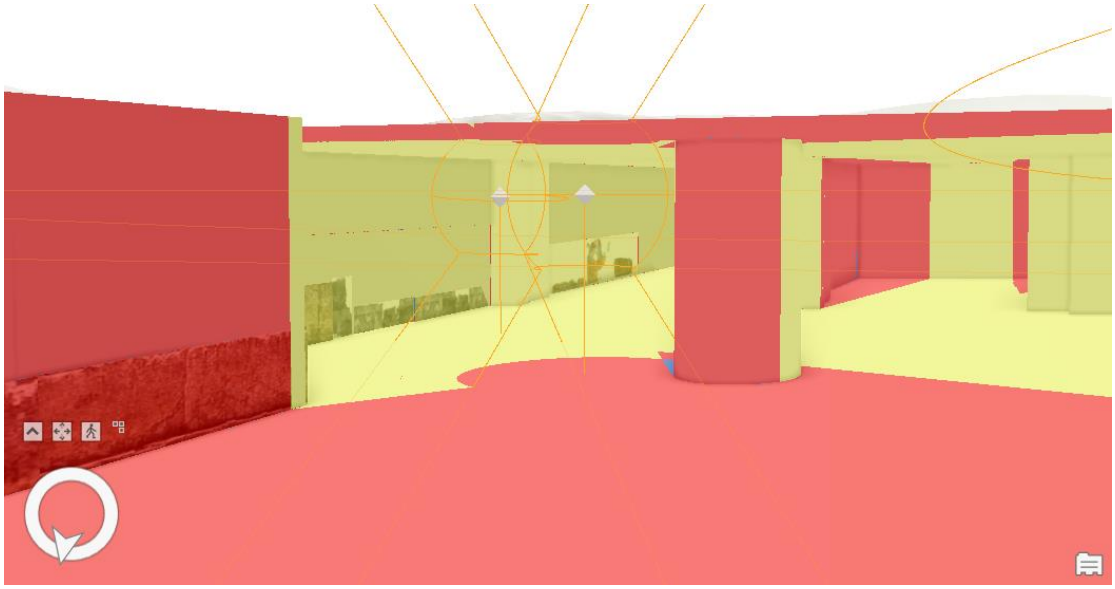

Figure E14 View of the West Entrance from the north, with all the viewshed points activated. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

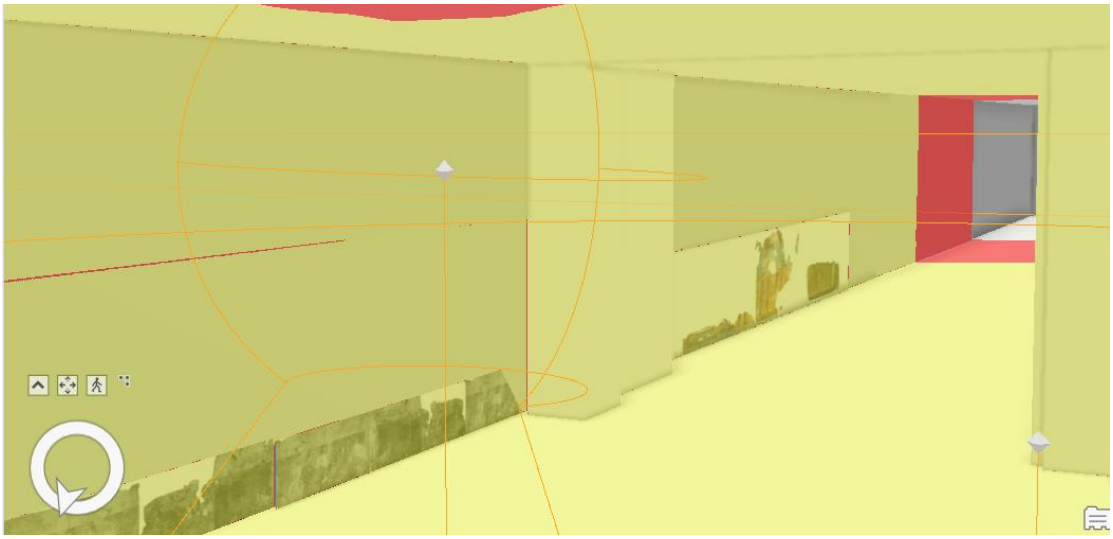

Figure E15 View of the east wall of the West Porch and the Corridor, West Entrance complex, with all the viewshed points activated. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

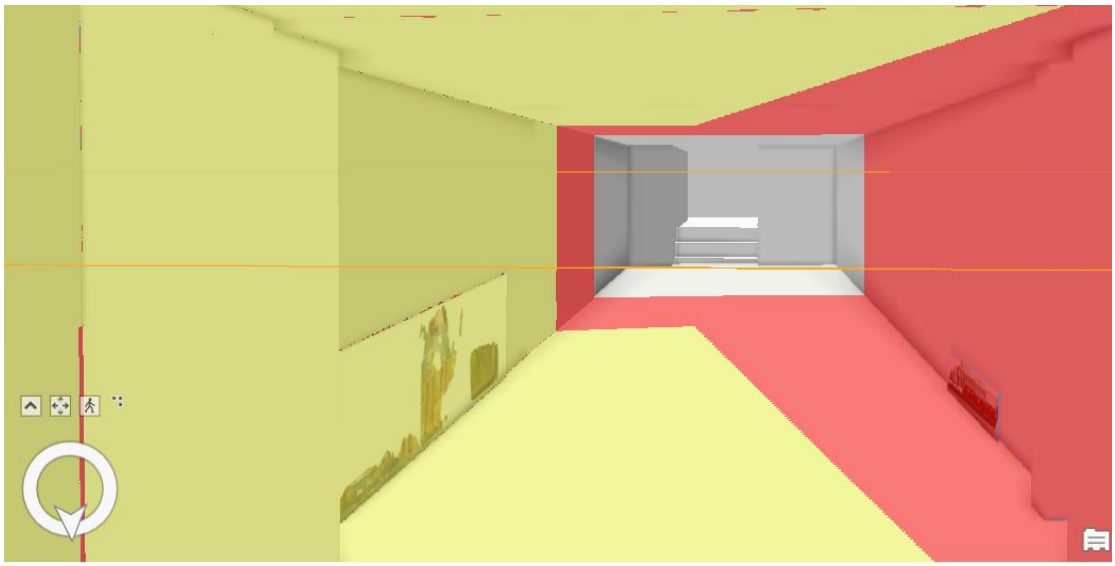

Figure E16 View of the beginning of the Corridor of the West Entrance complex, with all the viewshed points activated. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

-Throne Room (LOS)

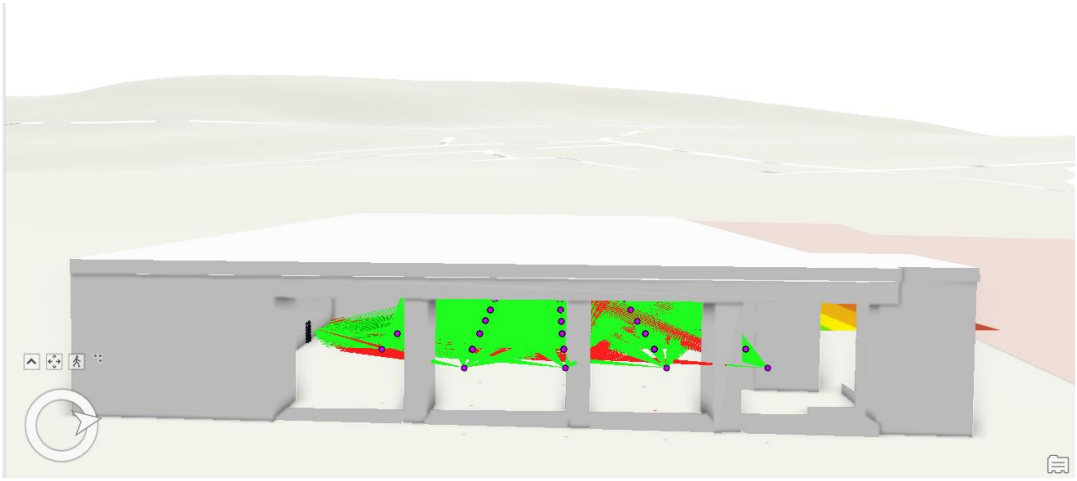

Figure E17 View of the conduction of LOS analysis in the 3D model of the Throne Room complex, with the grid of points representing the observes. Green lines indicate visible distance to target points, while red the no visible. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

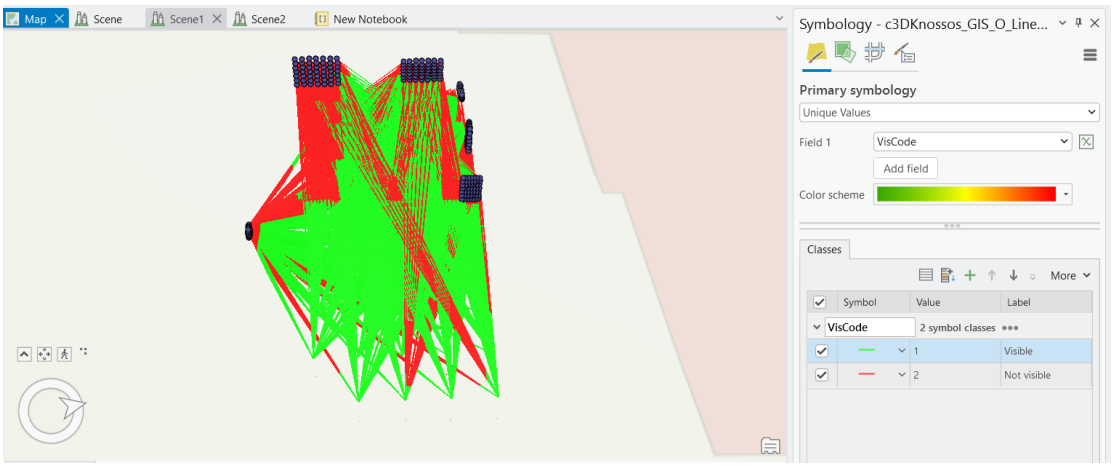

Figure E18 View of the conduction of LOS analysis in the 3D model of the Throne Room complex, with the 3d feature hidden. Green lines indicate visible distance to target points, while red the no visible. Symbology pane on the right indicates the values of the lines of sight. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

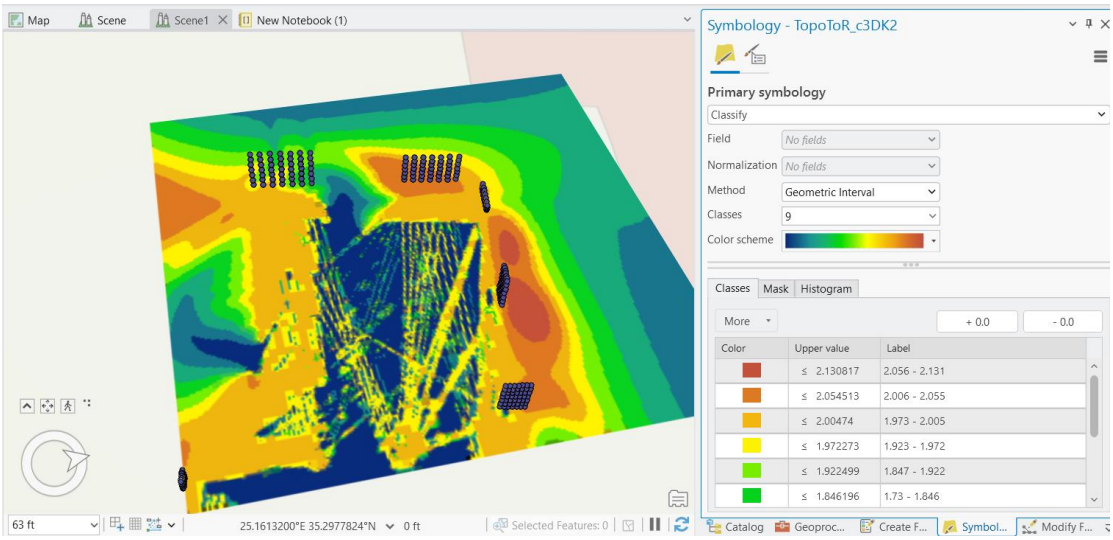

Figure E19 View of the raster created with the 'Topo to Raster' function, showcasing the results of the conduction of LOS analysis in the 3D model of the Throne Room complex. Red colour represents the areas with the highest degree of visual accessibility to the wall decorations, while blue represents the more segregated areas. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

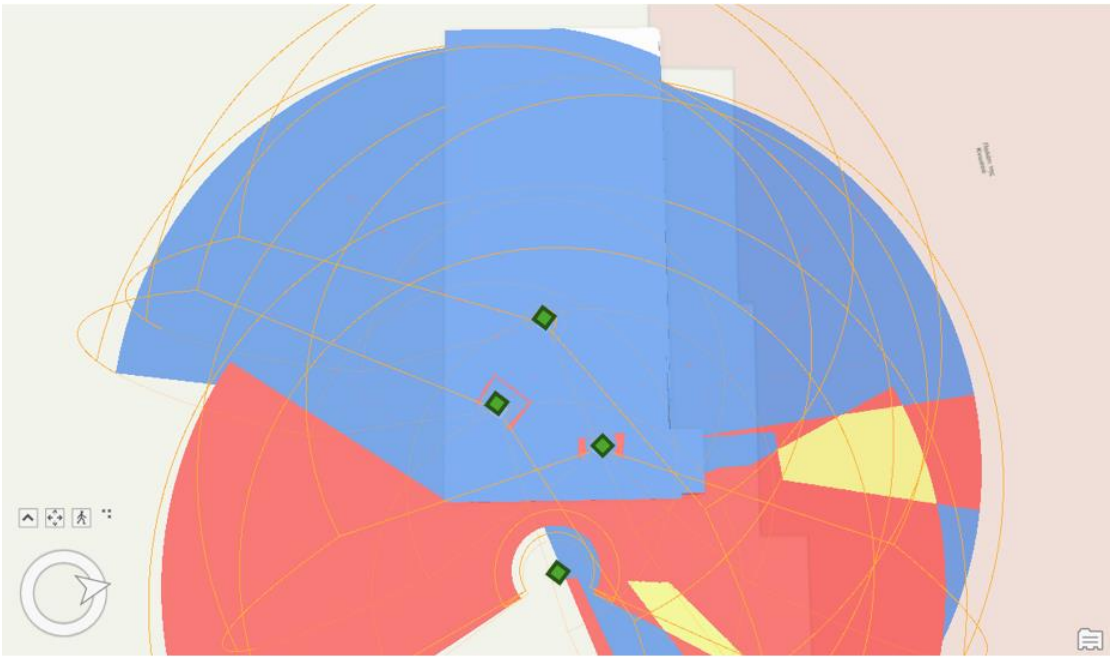

Figure E20 View of the Throne room complex from above, with indication of positioned observer points outside, and inside the feature. The same locations were used in all the versions of the conduction of Exploratory Viewshed Analysis. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

- **Version 1: All entrances open**

- **Observer point from Central Court**

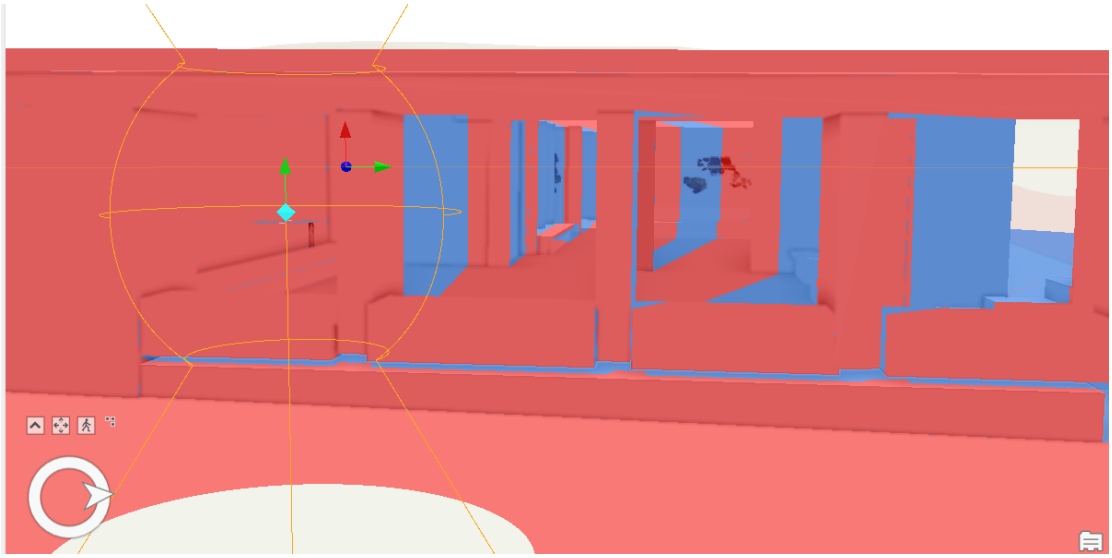

Figure E21 View of the Throne Room complex from northeast. Observer point from the Central Court. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

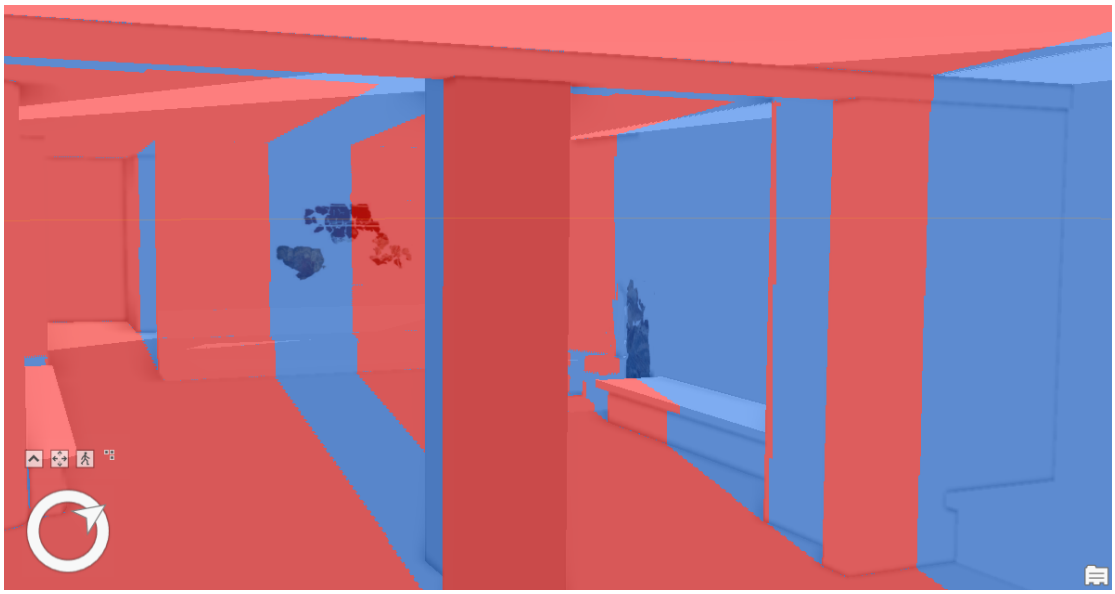

Figure E22 View of the north and northeast walls of the main room of the Throne Room complex from southeast. Observer point from the Central Court. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

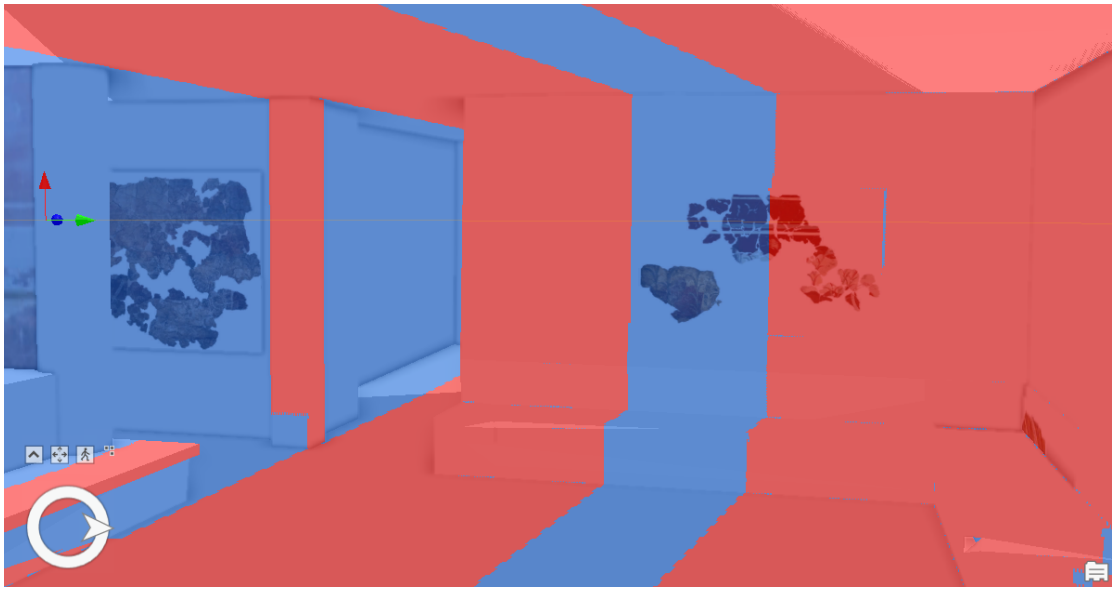

Figure E23 View of the northwest and southwest walls of the main room of the Throne Room complex from southeast. Observer point from the Central Court. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

- **Observer points from the anteroom**

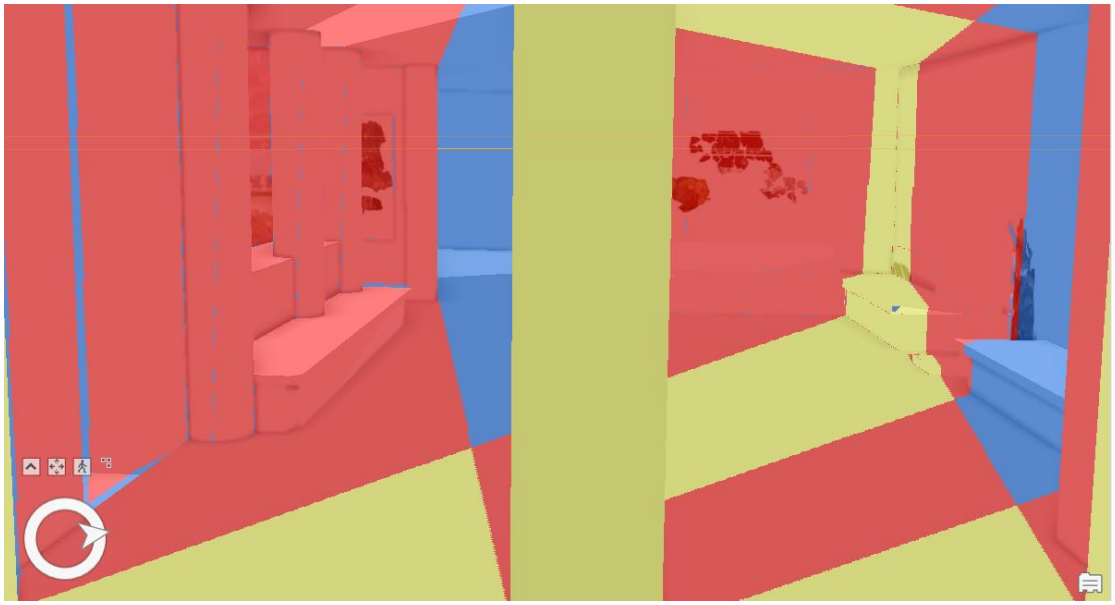

Figure E24 View of the north and west walls of the main room of the Throne Room complex from south. Observer points set in the anteroom. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

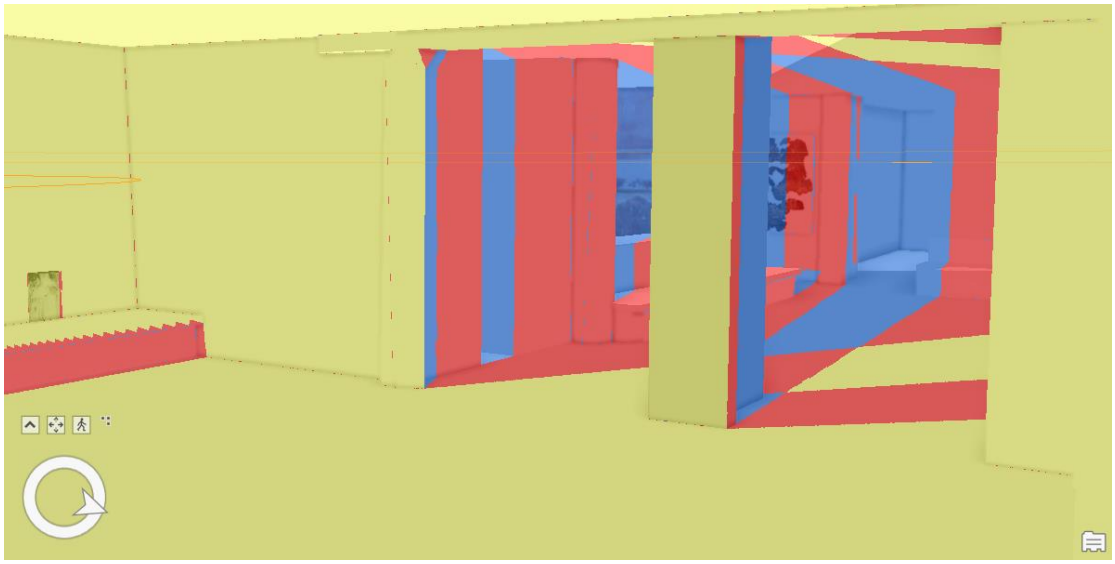

Figure E25 View of the west walls of the main room and of the anteroom of the Throne Room complex from northeast. Observer points set in the anteroom. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

- **Observer point in the main room**

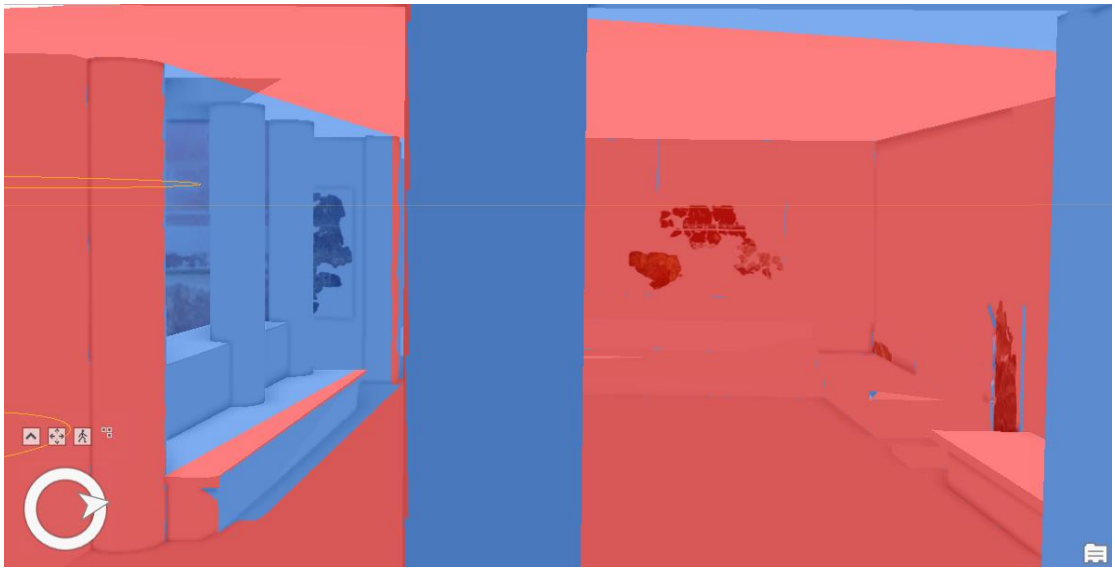

Figure E26 View of the north and west walls of the main room of the Throne Room complex from east. Observer points set in the main room of the complex. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

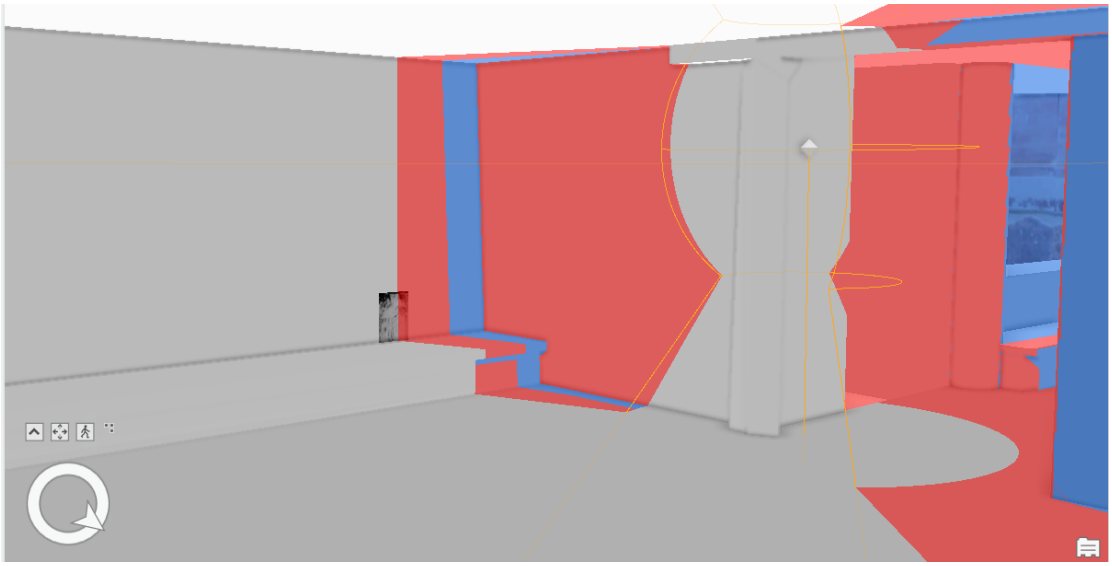

Figure E27 View of the south wall of the anteroom of the Throne Room complex from northeast. Observer points set in the main room of the complex. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

- **Version 2: Southern doors of the anteroom & main room closed**
- **Observer point from Central Court**

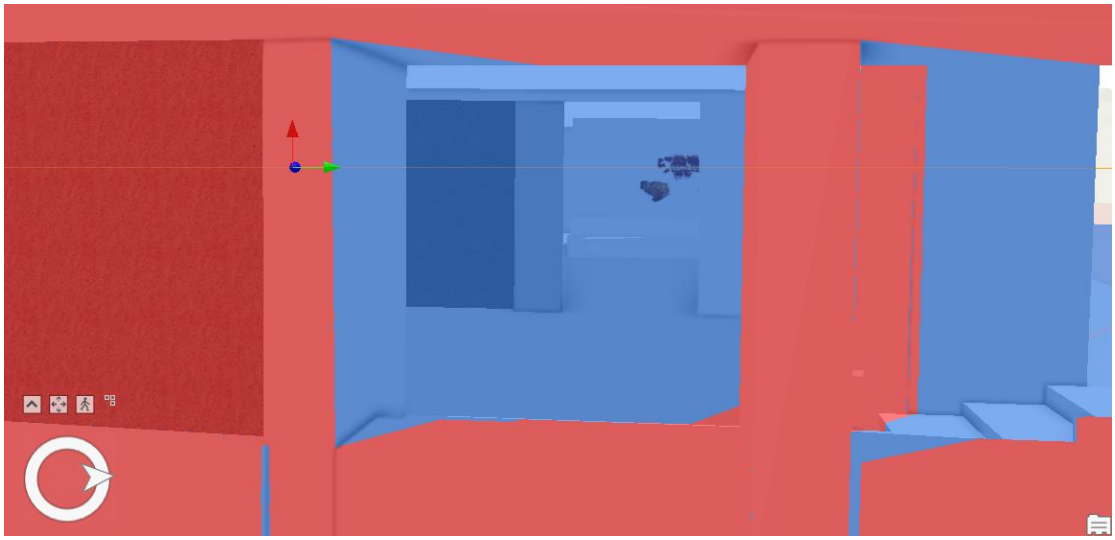

Figure E28 View of the Throne Room complex from east. Observer point from the Central Court. Results of Exploratory Viewshed Analysis in Version 2: Southern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

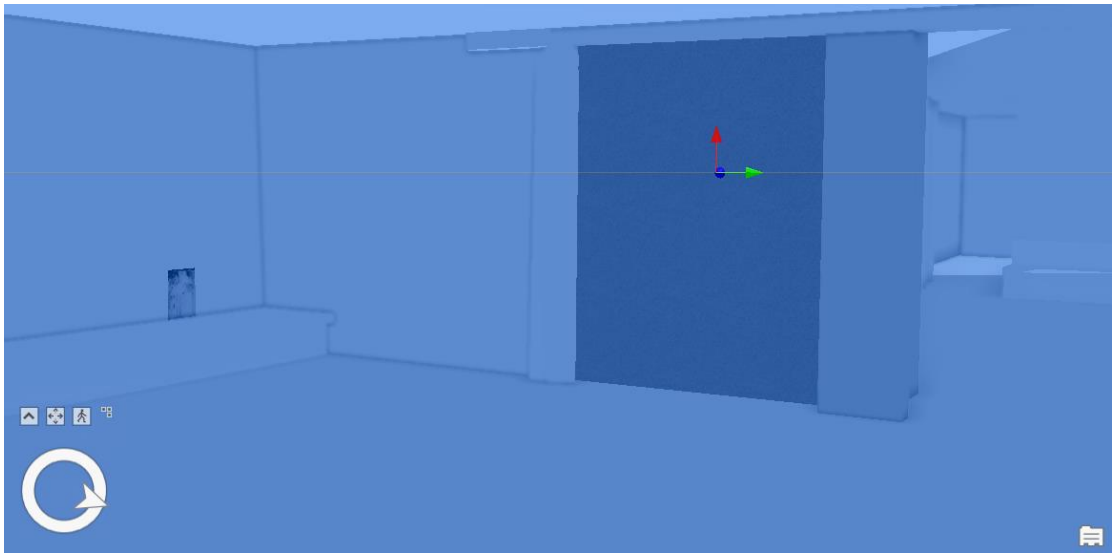

Figure E29 View of the south wall of the anteroom of the Throne Room complex, from northeast. Observer point from the Central Court. Results of Exploratory Viewshed Analysis in Version 2: Southern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

- **Observer points from the anteroom**

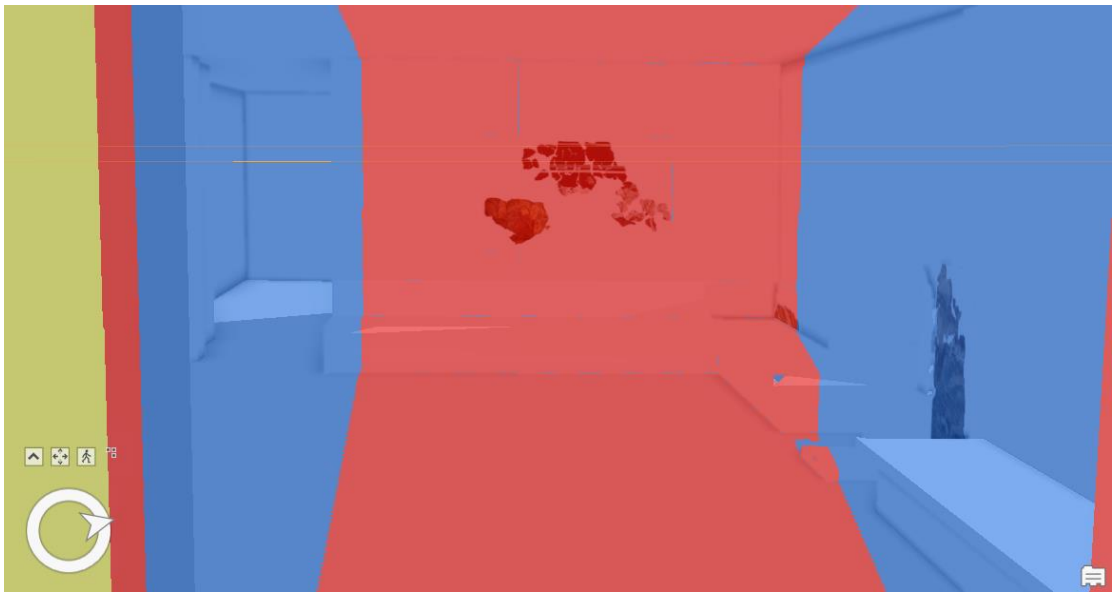

Figure E30 View of the of the north and northwest wall of the Throne Room complex from east. Observer point set in the anteroom of the complex. Results of Exploratory Viewshed Analysis in in Version 2: Southern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

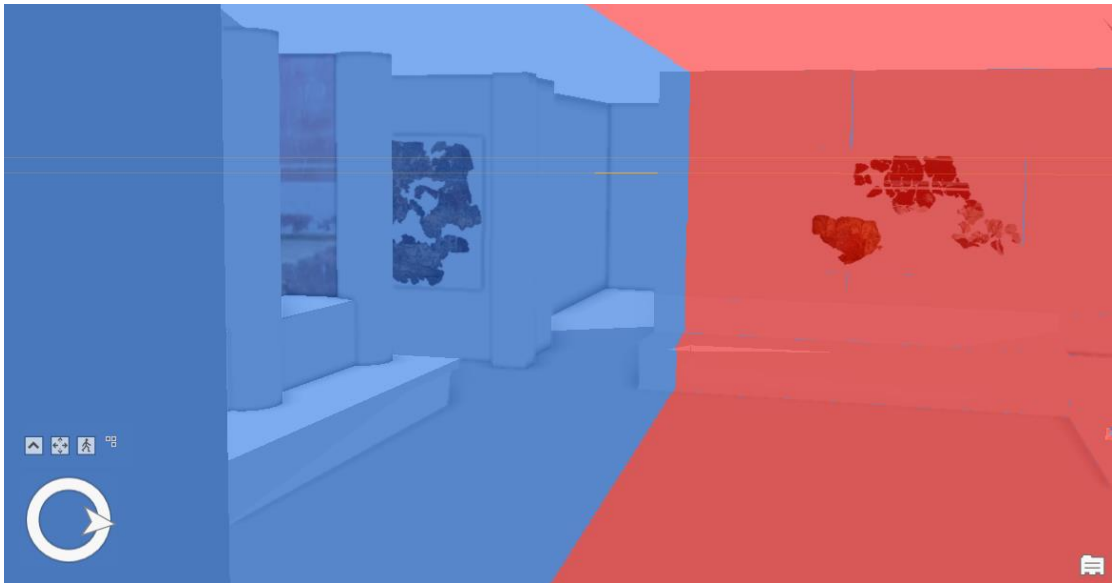

Figure E31 View of the of the northeast and northwest wall of the Throne Room complex from the northeast. Observer point set in the anteroom of the complex. Results of Exploratory Viewshed Analysis in in Version 2: Southern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

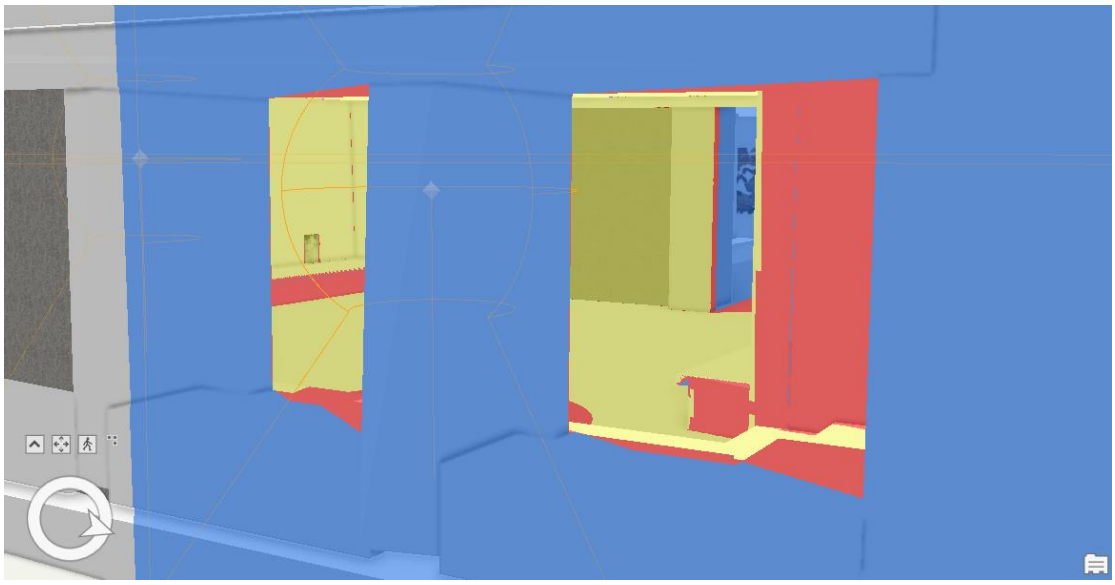

Figure E32 View of the of the south wall of the anteroom of the Throne Room complex from northeast. Observer point set in the anteroom of the complex. Results of Exploratory Viewshed Analysis in in Version 2: Southern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

- **Observer point in the main room**

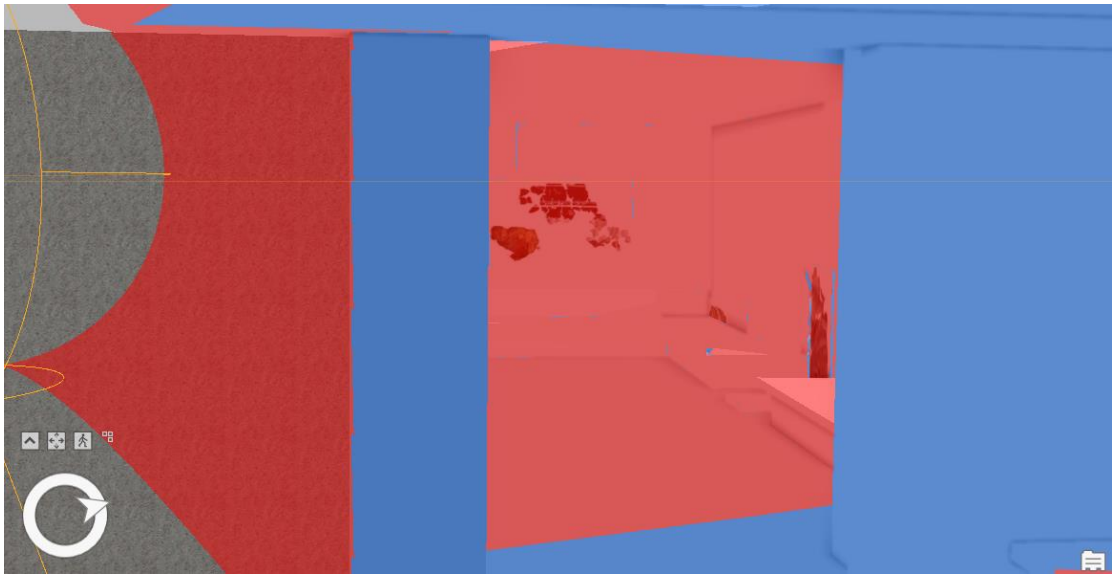

Figure E33 View of the of the north and northwest wall of the Throne Room complex from the east. Observer point set in the main room of the complex. Results of Exploratory Viewshed Analysis in in Version 2: Southern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

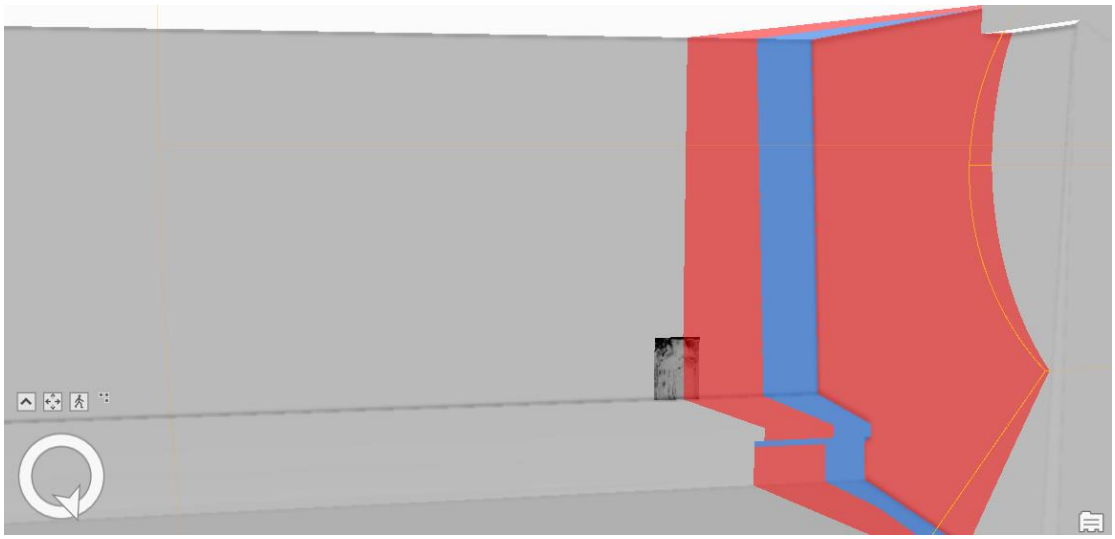

Figure E34 View of the of the south wall of the anteroom of the Throne Room complex from the north. Observer point set in the main room of the complex. Results of Exploratory Viewshed Analysis in in Version 2: Southern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

- **Version 3: Northern doors of the anteroom closed & main room closed**
- **Observer point from Central Court**

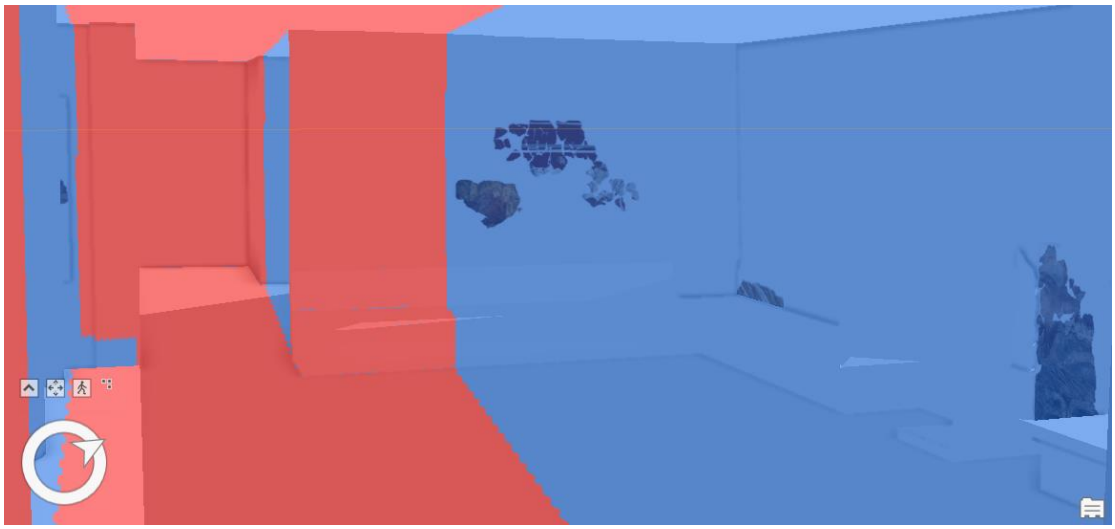

Figure E35 View of the north and northwest walls of the main room of the Throne Room complex from northeast. Observer point from the Central Court. Results of Exploratory Viewshed Analysis in Version 3: Northern doors of the anteroom closed & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

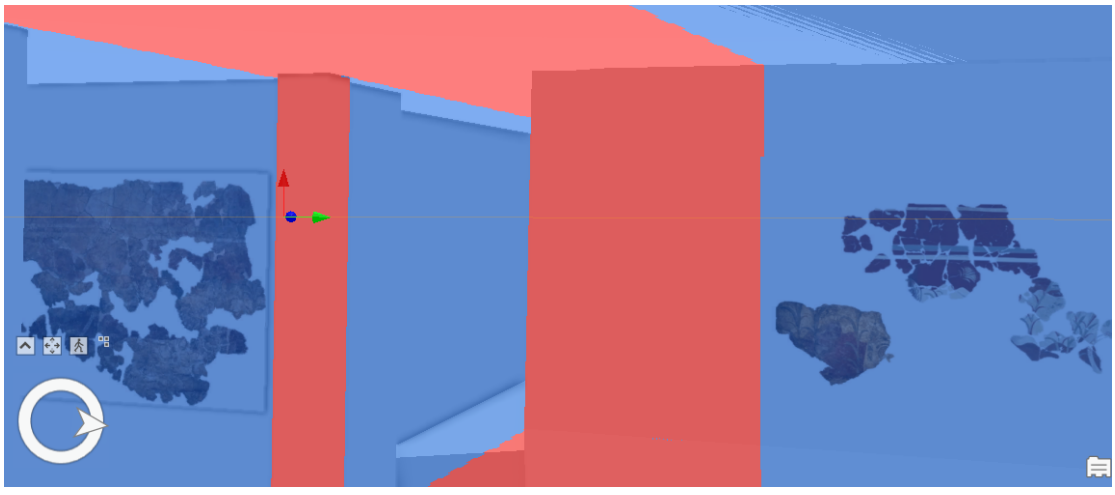

Figure E36 View of the southwest walls of the main room of the Throne Room complex from northeast. Observer point from the Central Court. Results of Exploratory Viewshed Analysis in Version 3: Northern doors of the anteroom closed & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

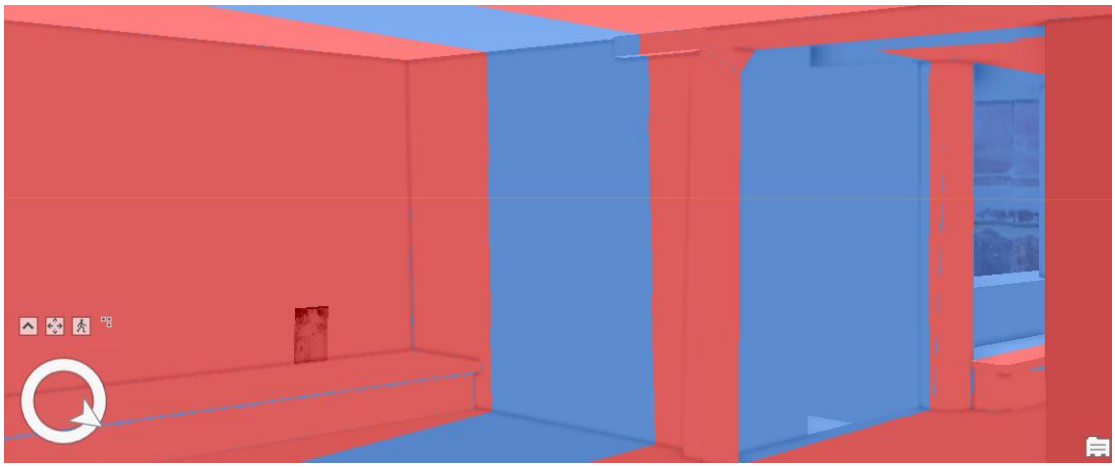

Figure E37 View of the south wall of the anteroom of the Throne Room complex from northeast. Observer point from the Central Court. Results of Exploratory Viewshed Analysis in Version 3: Northern doors of the anteroom closed & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

- **Observer points from the anteroom**

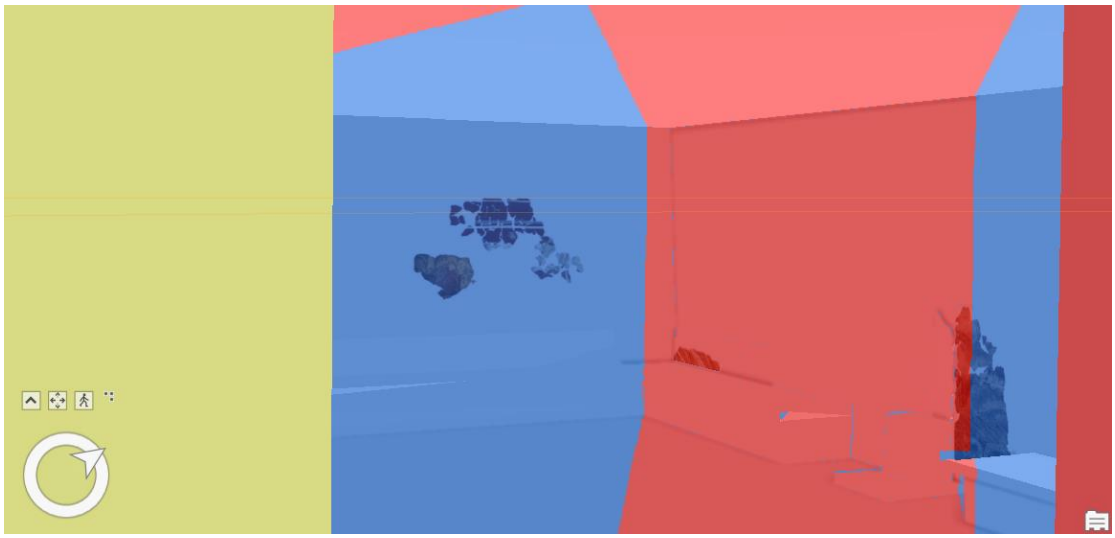

Figure E38 View of the north and northwest walls of the main room of the Throne Room complex from southeast. Observer points from the anteroom. Results of Exploratory Viewshed Analysis in Version 3: Northern doors of the anteroom closed & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

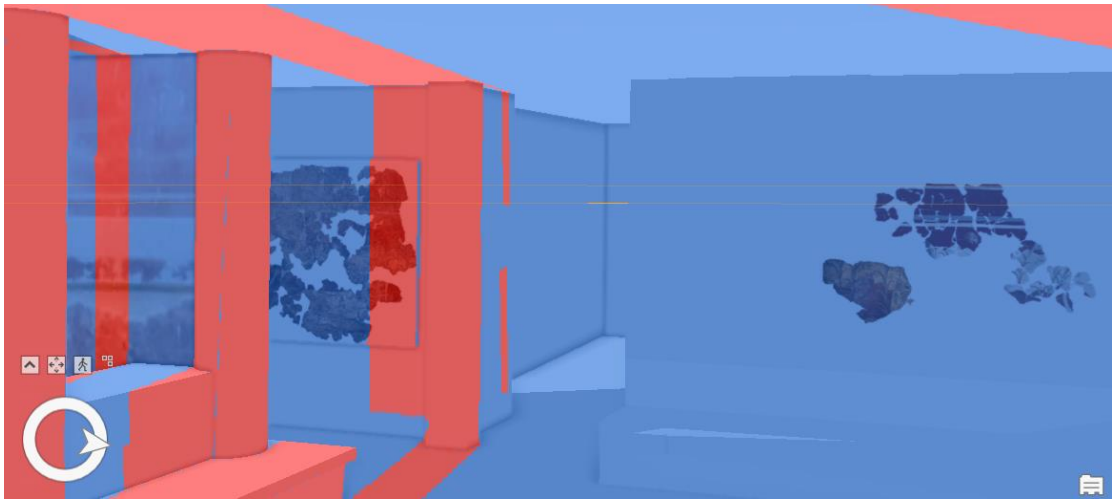

Figure E39 View of the southwest and northwest walls of the main room of the Throne Room complex from southeast. Observer points from the anteroom. Results of Exploratory Viewshed Analysis in Version 3: Northern doors of the anteroom closed & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

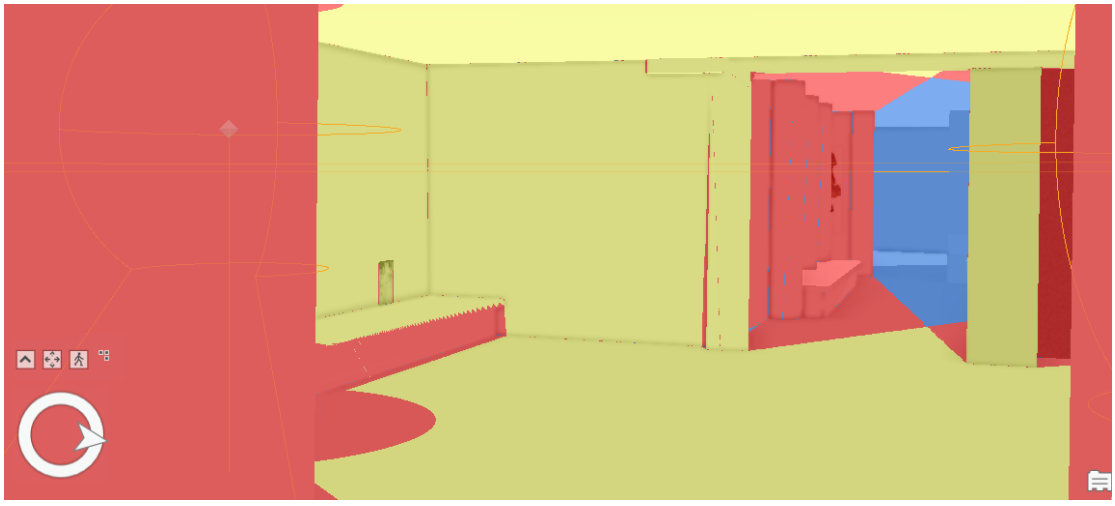

Figure E40 View of the south wall of the anteroom of the Throne Room complex from northeast. Observer points from the anteroom. Results of Exploratory Viewshed Analysis in Version 3: Northern doors of the anteroom closed & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

- **Observer point in the main room**

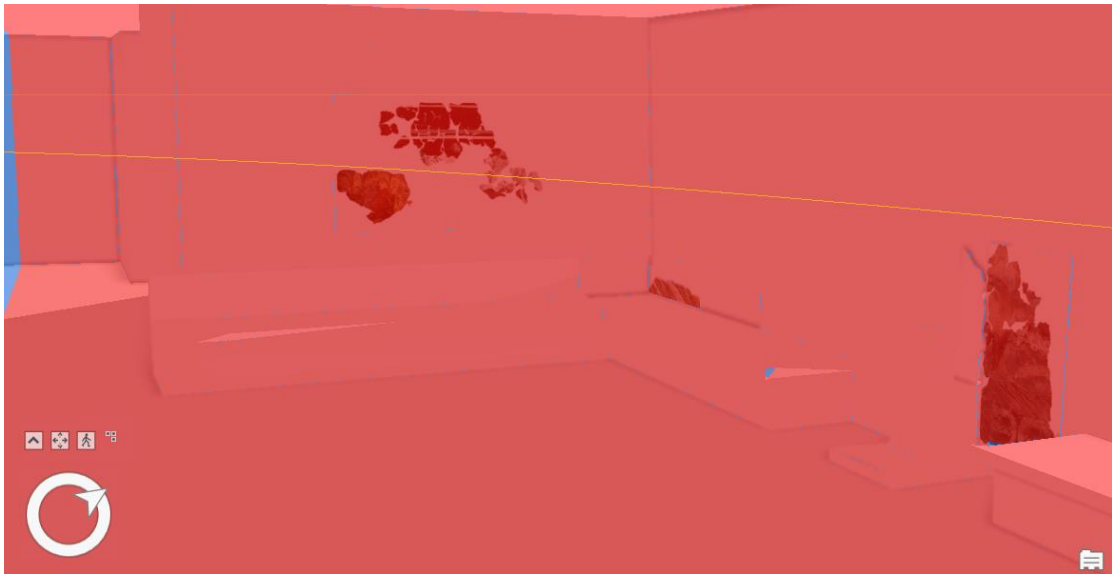

Figure E41 View of the north and northwest walls of the main room of the Throne Room complex from the east. Observer point in the main room. Results of Exploratory Viewshed Analysis in Version 3: Northern doors of the anteroom closed & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

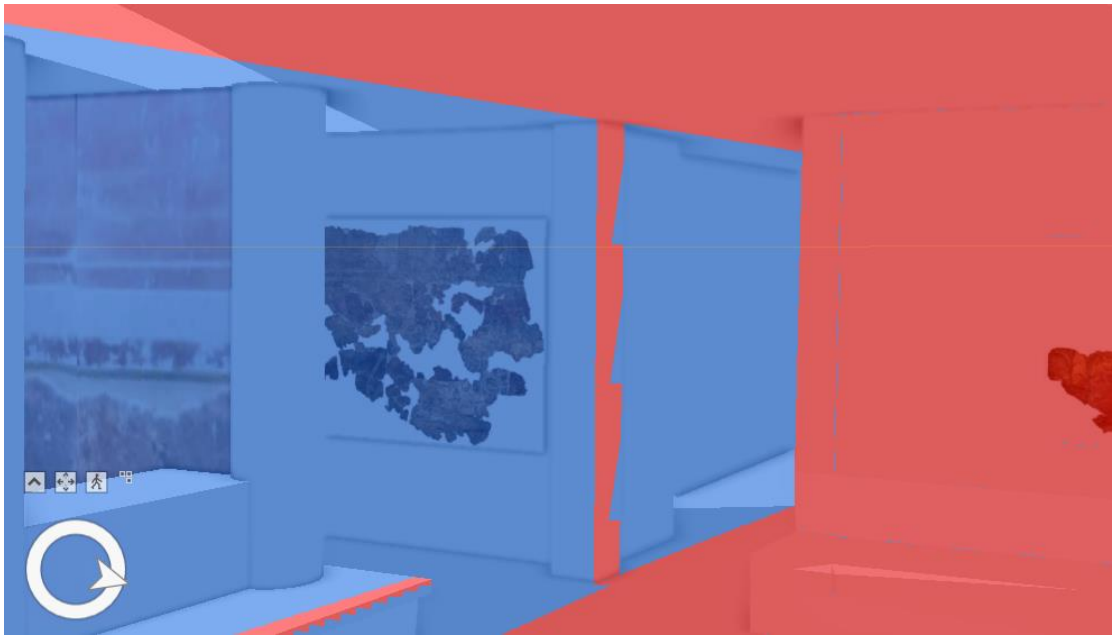

Figure E42 View of the southwest and northwest walls of the main room of the Throne Room complex from the east. Observer point in the main room. Results of Exploratory Viewshed Analysis in Version 3: Northern doors of the anteroom closed & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

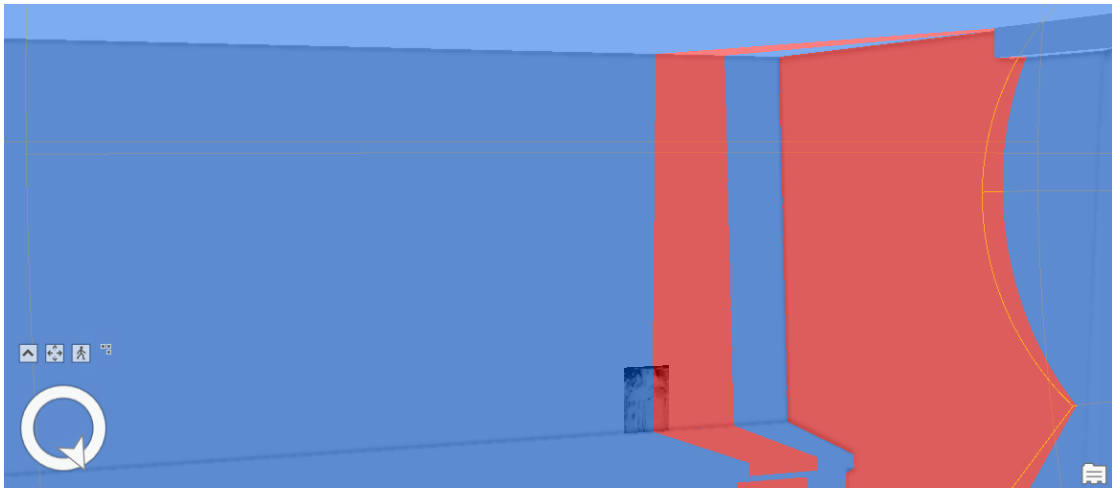

Figure E43 View of the south wall of the anteroom of the Throne Room complex from northeast. Observer point in the main room. Results of Exploratory Viewshed Analysis in Version 3: Northern doors of the anteroom closed & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

- **Version 4: Southern partitions of the anteroom closed & north door to the main room closed**
- **Observer point in the Central Court**

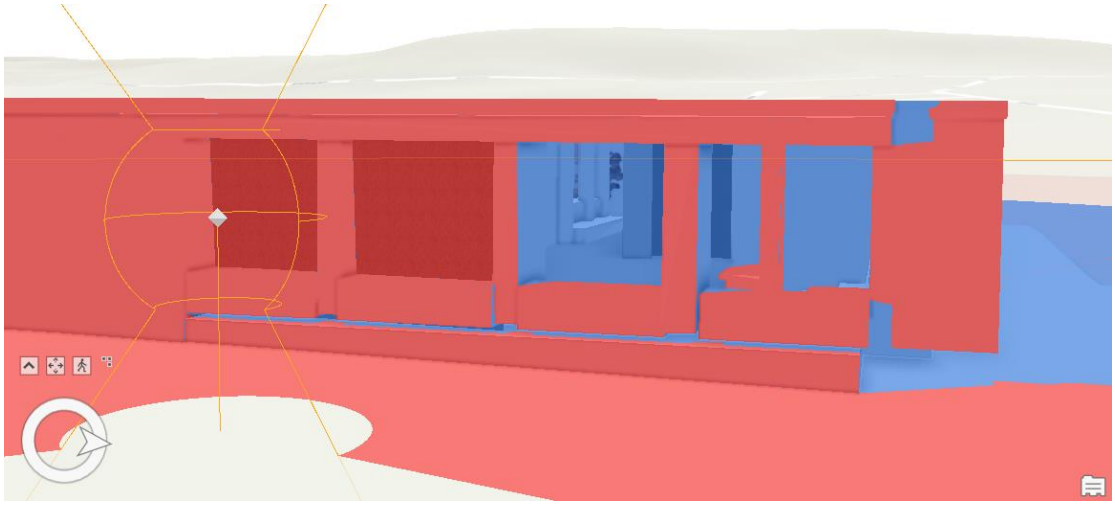

Figure E44 View of the Throne Room complex from the northeast. Observer point in the Central Court. Results of Exploratory Viewshed Analysis in Version 4: Southern partitions of the anteroom closed & north door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

- **Observer points in the anteroom**

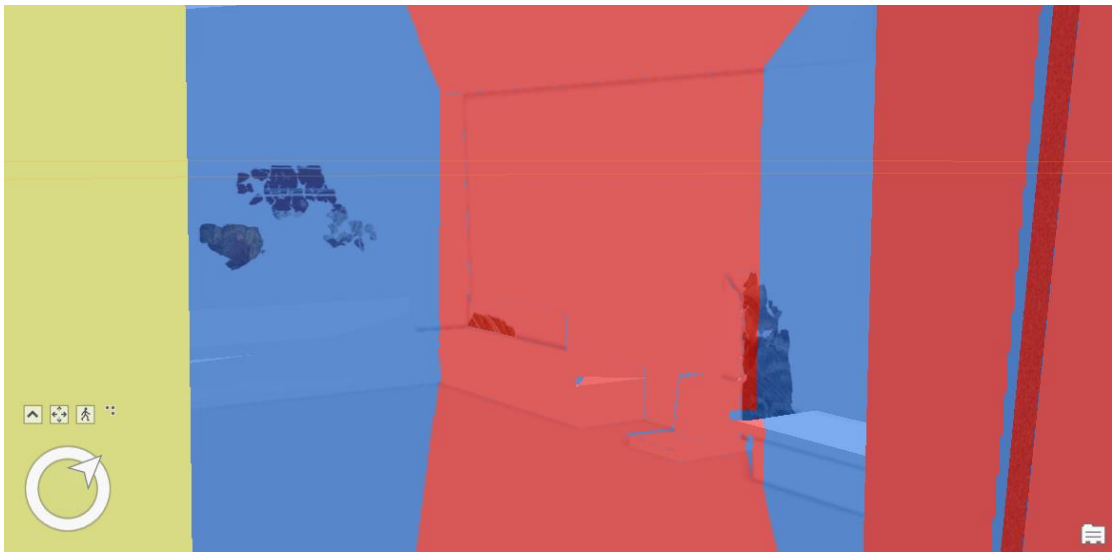

Figure E45 View of the north and the northwest wall of the main room of the Throne Room complex from the northeast. Observer points in the anteroom. Results of Exploratory Viewshed Analysis in Version 4: Southern partitions of the anteroom closed & north door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

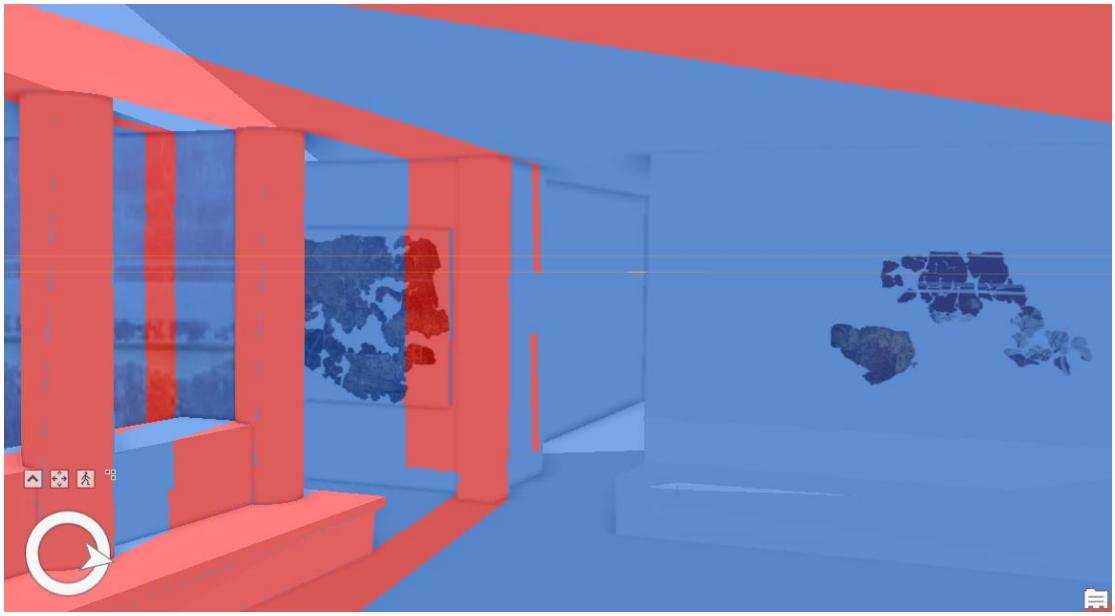

Figure E46 View of the southwest and the northwest wall of the main room of the Throne Room complex from the northeast. Observer points in the anteroom. Results of Exploratory Viewshed Analysis in Version 4: Southern partitions of the anteroom closed & north door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

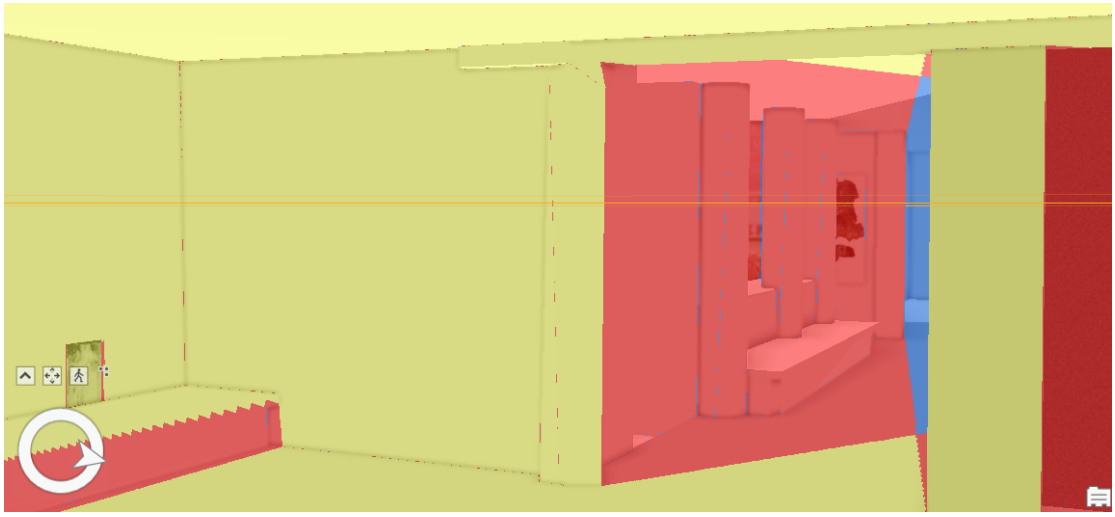

Figure E47 View of the south wall of the anteroom and the southwest wall of the main room of the Throne Room complex from the northeast. Observer points in the anteroom. Results of Exploratory Viewshed Analysis in Version 4: Southern partitions of the anteroom closed & north door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

- **Observer point in the main room**

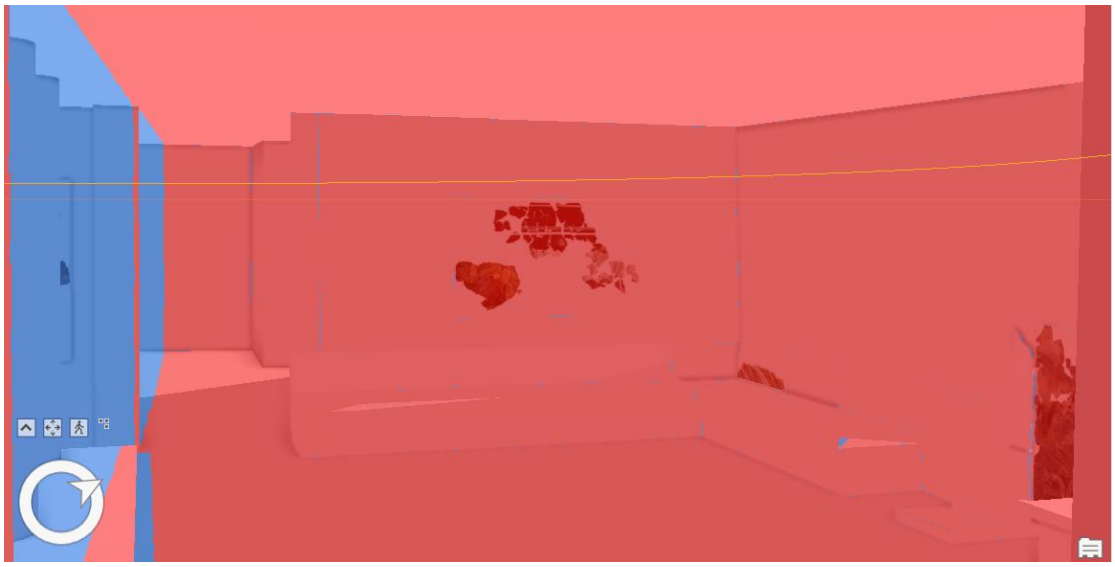

Figure E48 View of the north and the northwest wall of the main room of the Throne Room complex from the northeast. Observer point in the main room. Results of Exploratory Viewshed Analysis in Version 4: Southern partitions of the anteroom closed & north door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

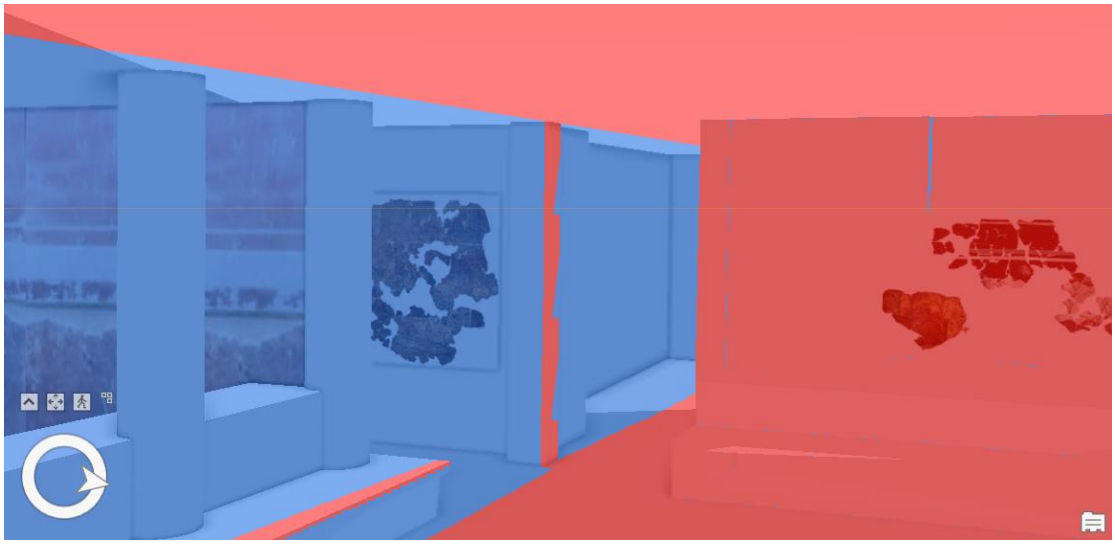

Figure E49 View of the southwest and the northwest wall of the main room of the Throne Room complex from the northeast. Observer point in the main room. Results of Exploratory Viewshed Analysis in Version 4: Southern partitions of the anteroom closed & north door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

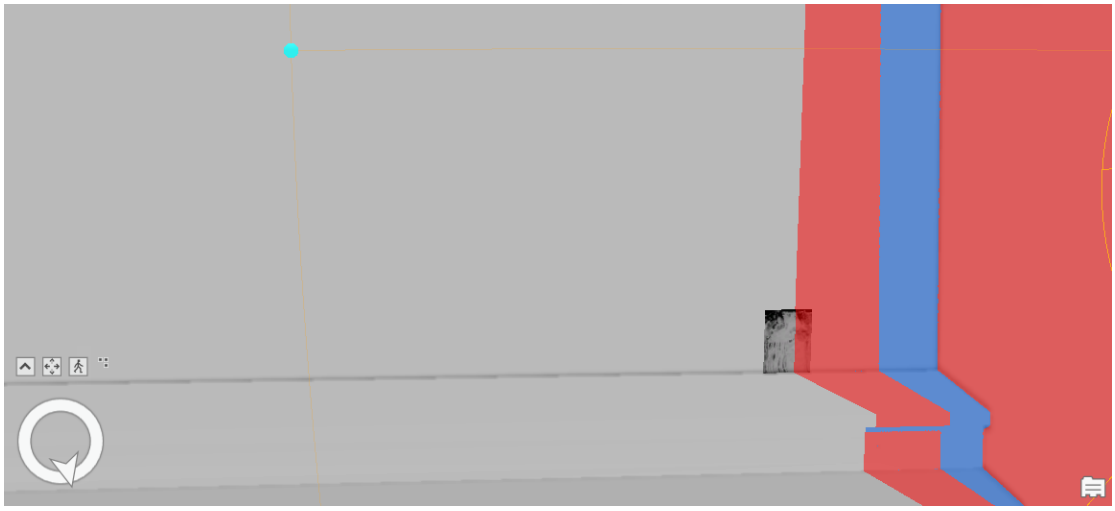

Figure E50 View of the south wall of the anteroom of the Throne Room complex from the north. Observer point in the main room. Results of Exploratory Viewshed Analysis in Version 4: Southern partitions of the anteroom closed & north door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

- **Version 5: Northern partitions of the anteroom closed & south door to the main room closed**
- **Observer point in the Central Court**

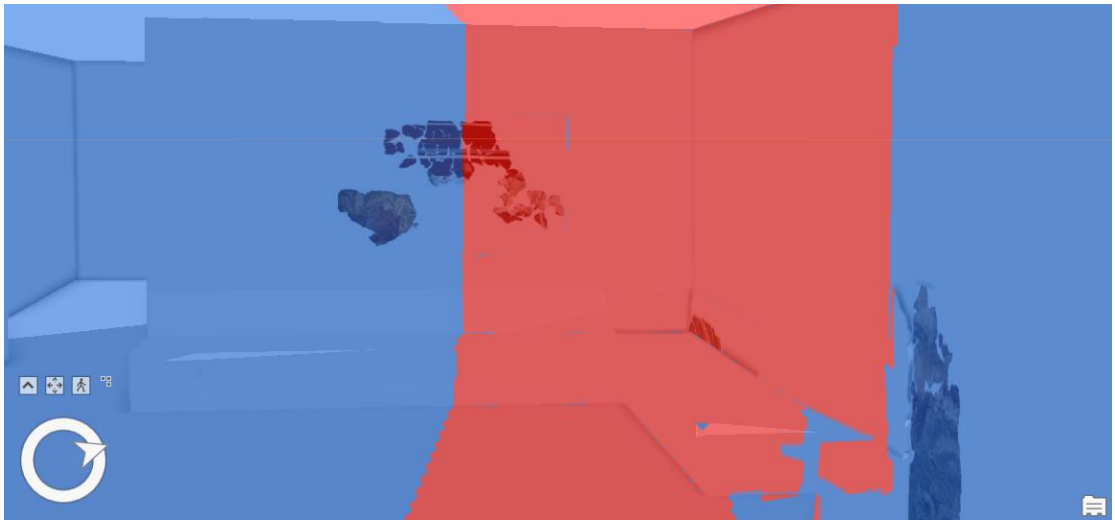

Figure E51 View of the north and northwest walls of the main room of the Throne Room complex from the east. Observer point in the Central Court. Results of Exploratory Viewshed Analysis in Version 5: Northern partitions of the anteroom closed & south door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

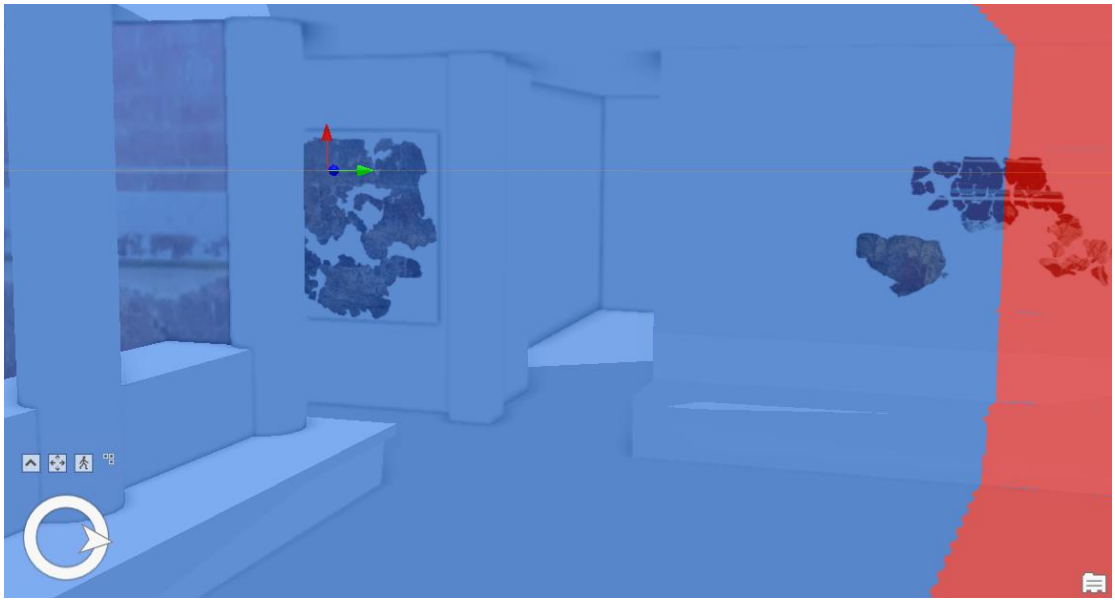

Figure E52 View of the southwest and northwest walls of the main room of the Throne Room complex from the northeast. Observer points in the Central Court. Results of Exploratory Viewshed Analysis in Version 5: Northern partitions of the anteroom closed & south door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

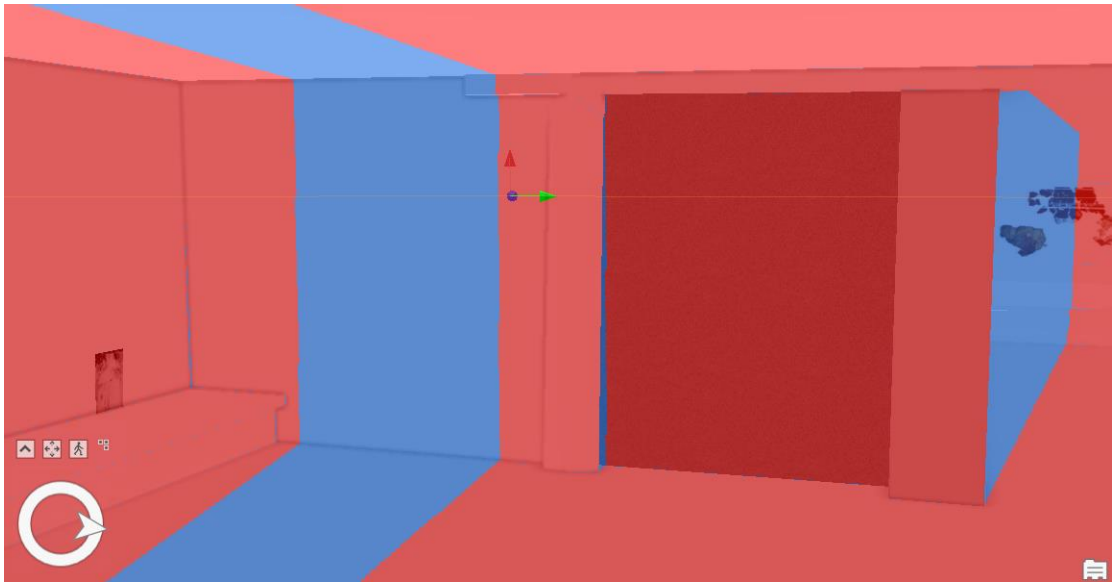

Figure E53 View of the south wall of the anteroom and northwest wall of the main room of the Throne Room complex from the northeast. Observer points in the Central Court. Results of Exploratory Viewshed Analysis in Version 5: Northern partitions of the anteroom closed & south door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

- **Observer points in the anteroom**

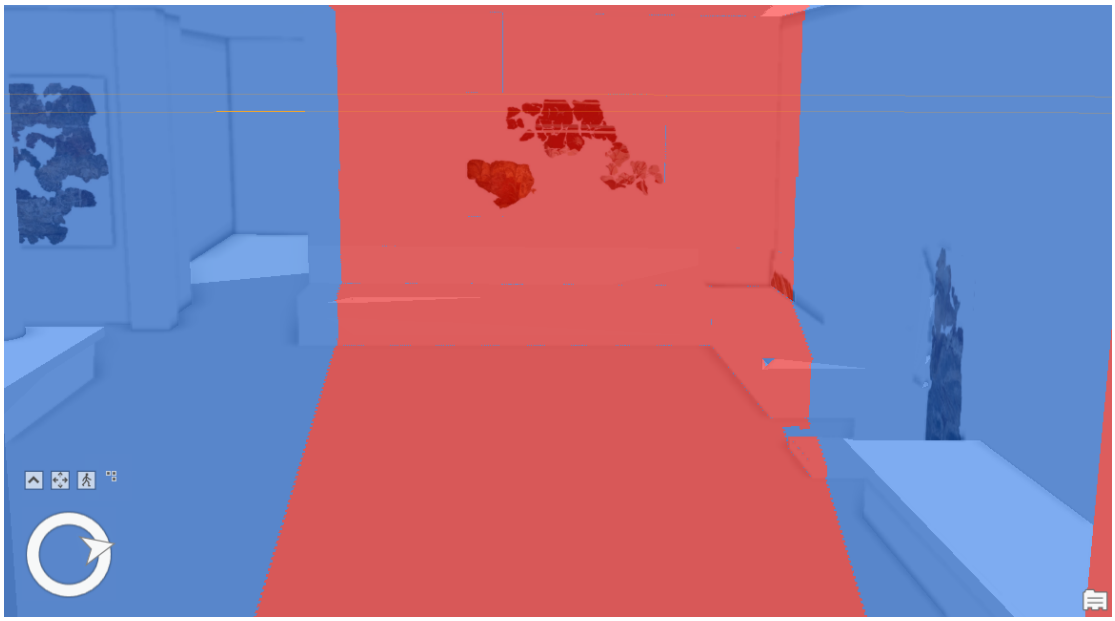

Figure E54 View of the north and northwest walls of the main room of the Throne Room complex from the east. Observer points in the anteroom. Results of Exploratory Viewshed Analysis in Version 5: Northern partitions of the anteroom closed & south door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

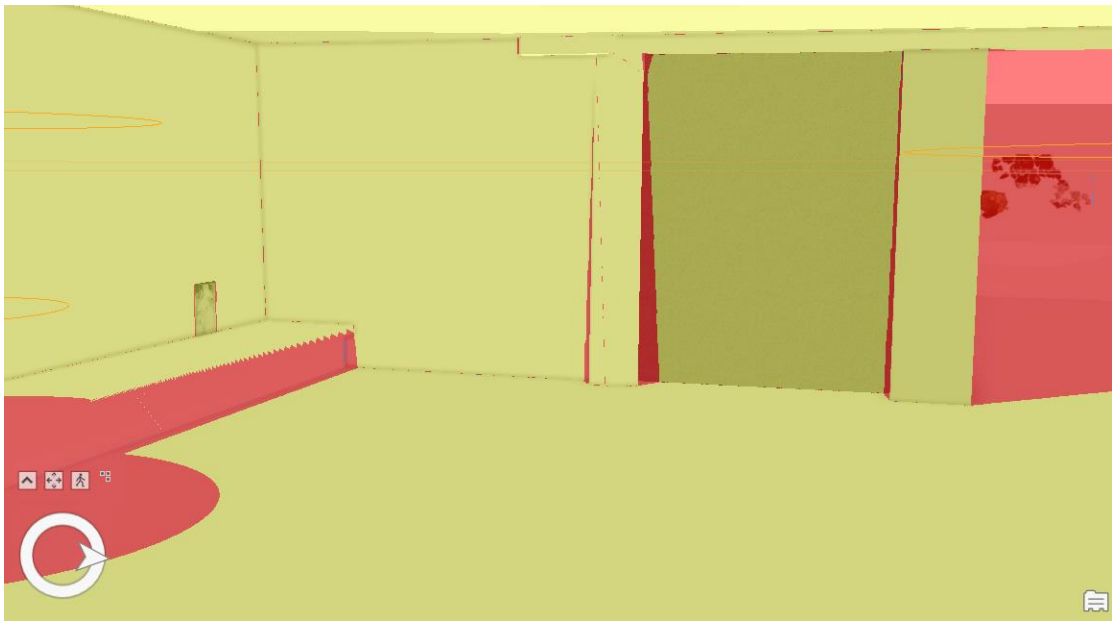

Figure E55 View of the north and northwest walls of the main room of the Throne Room complex from the east. Observer points in the anteroom. Results of Exploratory Viewshed Analysis in Version 5: Northern partitions of the anteroom closed & south door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

- **Observer point in the main room**

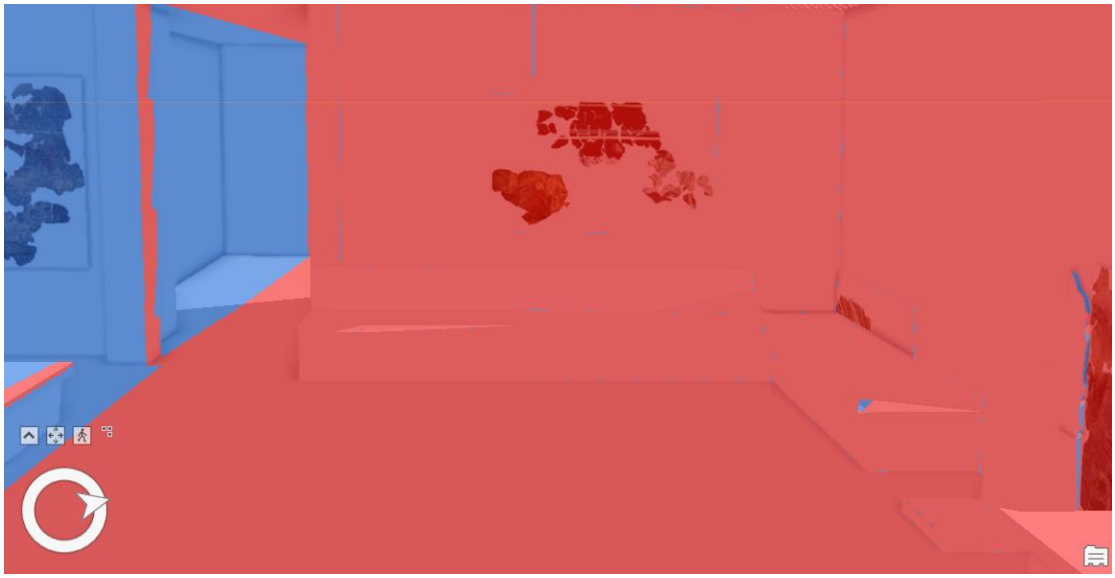

Figure E56 View of the north and northwest walls of the main room of the Throne Room complex from the east. Observer point in the main room. Results of Exploratory Viewshed Analysis in Version 5: Northern partitions of the anteroom closed & south door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

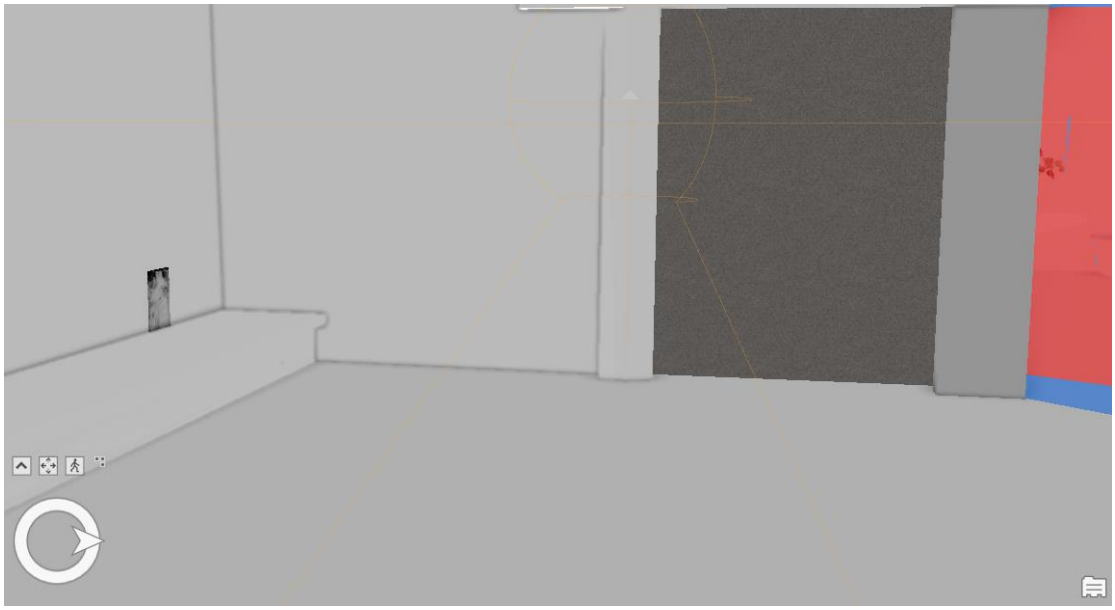

Figure E57 View of the south wall of the anteroom of the Throne Room complex from the northeast. Observer point in the main room. Results of Exploratory Viewshed Analysis in Version 4: Southern partitions of the anteroom closed & north door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

- **Version 6: No pier-and-door partition from the anteroom to the main room**
- **Observer point in the Central Court**

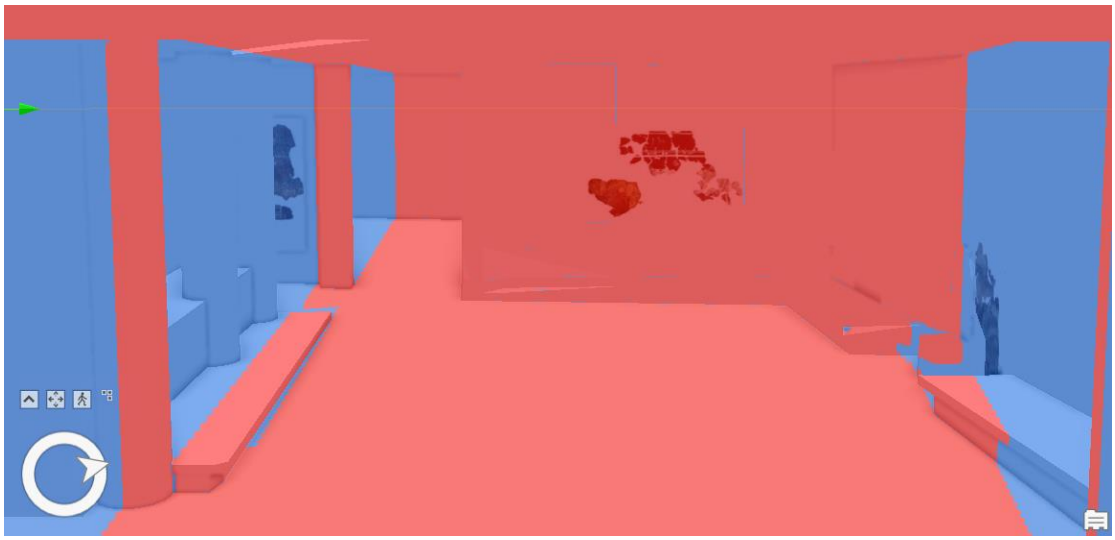

Figure E58 View of the north and northwest walls of the main room of the Throne Room complex from the east. Observer point in the Central Court. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

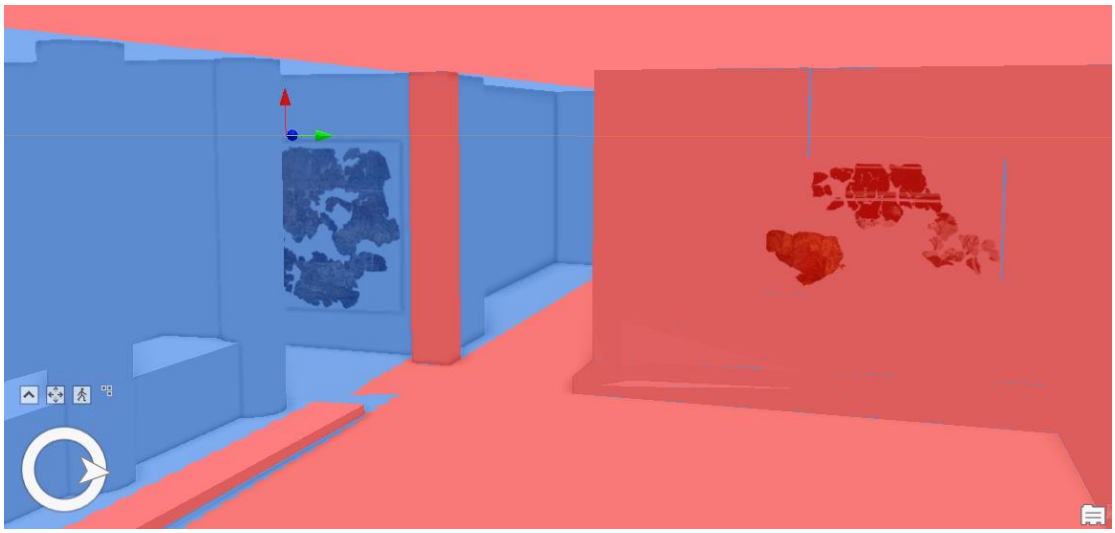

Figure 59 View of the southwest and northwest walls of the main room of the Throne Room complex from the east. Observer point in the Central Court. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

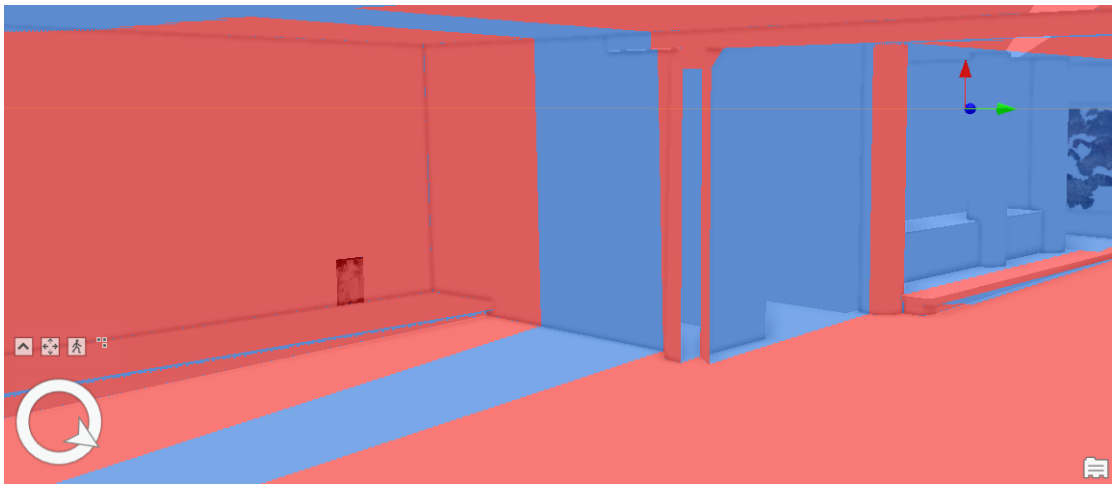

Figure E60 View of the south wall of the anteroom and southwest walls of the main room of the Throne Room complex from the east. Observer point in the Central Court. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

- **Observer points in the anteroom**

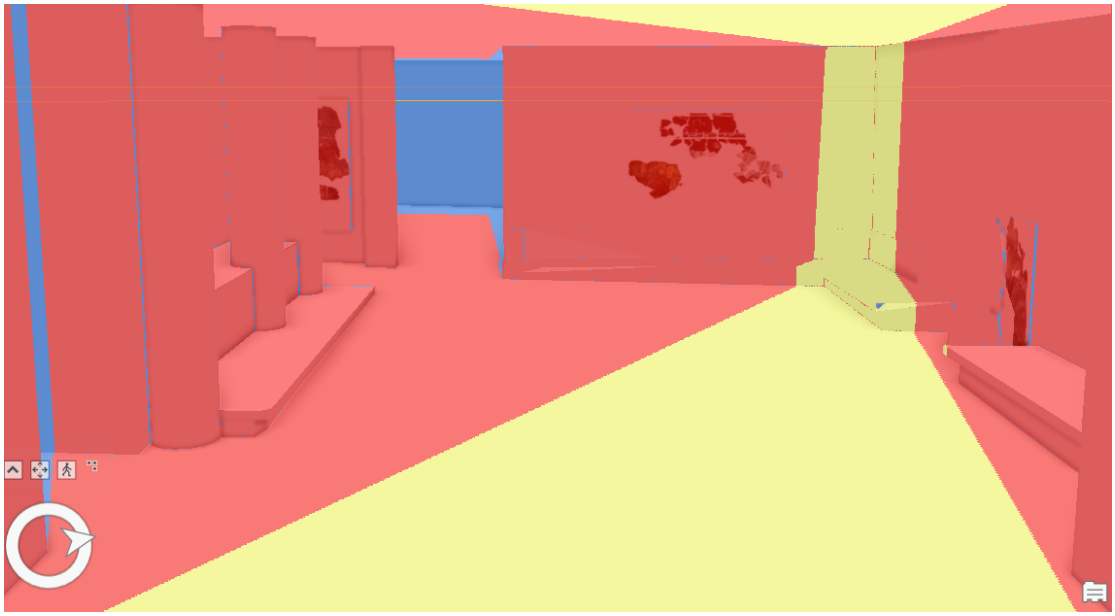

Figure E61 View of the north and northwest walls of the main room of the Throne Room complex from the east. Observer points in the anteroom. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

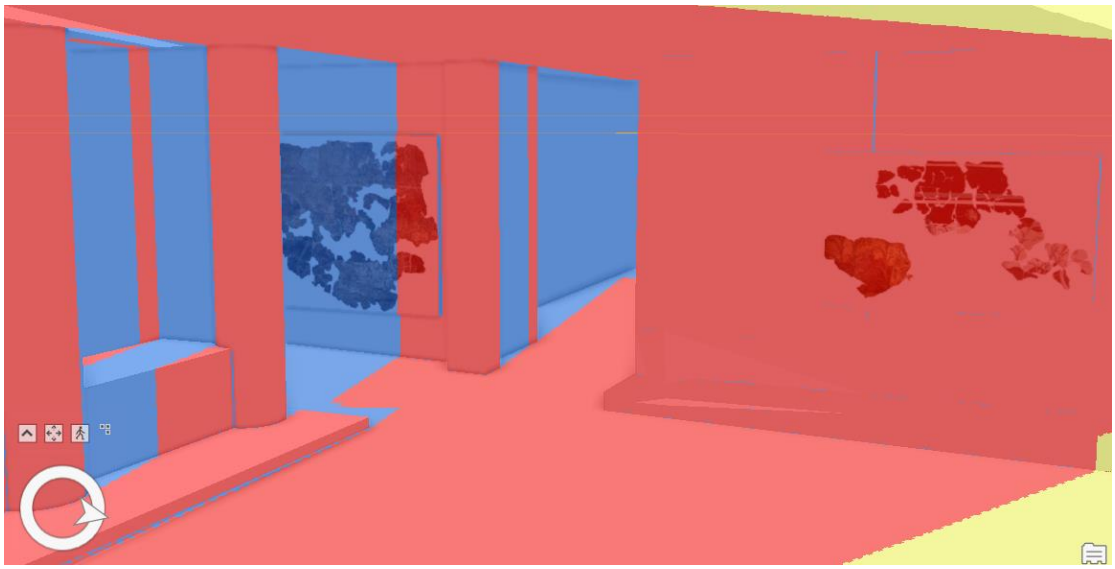

Figure E62 View of the southwest and northwest walls of the main room of the Throne Room complex from the east. Observer points in the anteroom. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

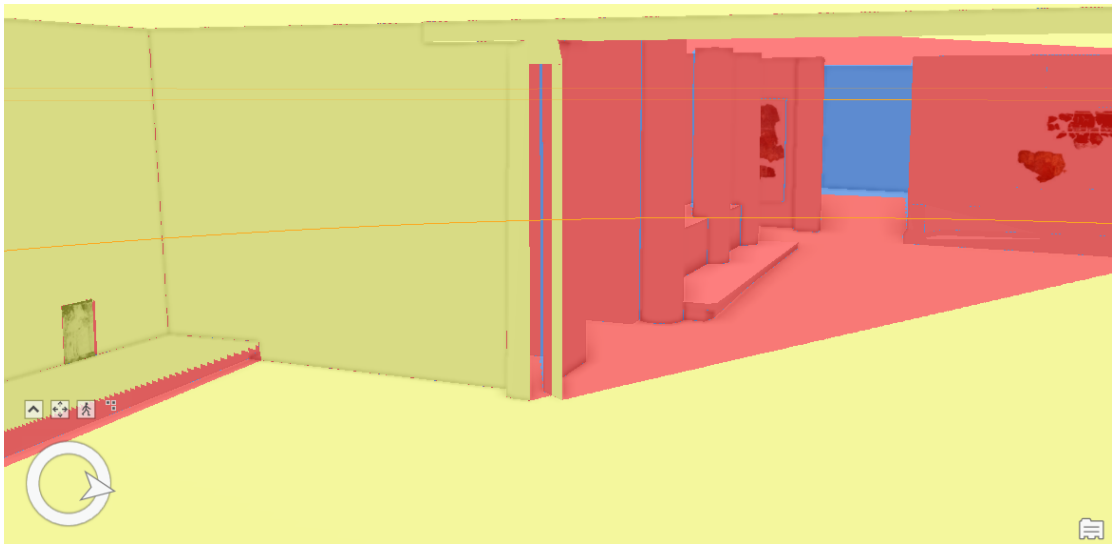

Figure E63 View of the south wall of the anteroom and west walls of the main room of the Throne Room complex from the east. Observer points in the anteroom. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

- **Observer points in the main room**

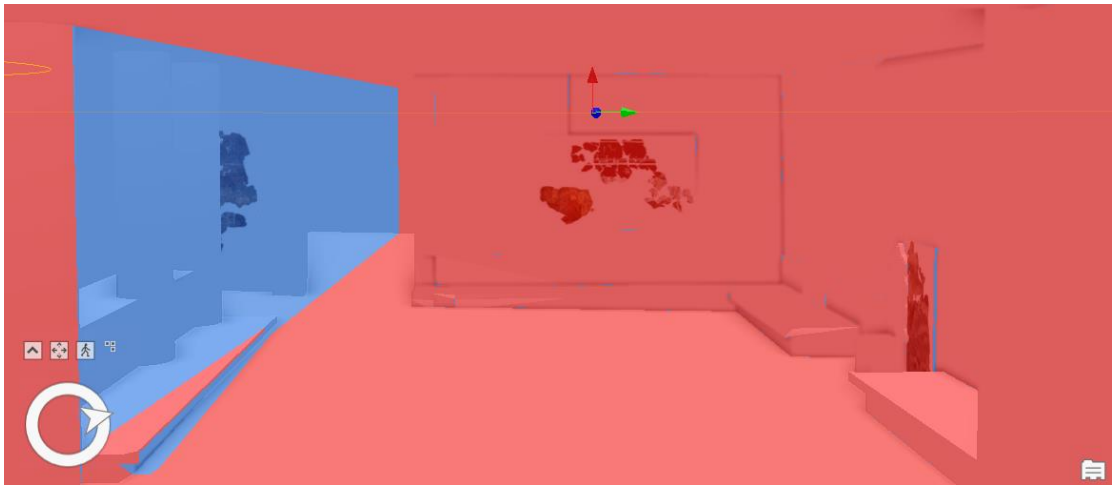

Figure E64 View of the north and northwest walls of the main room of the Throne Room complex from the east. Observer point in the main room. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

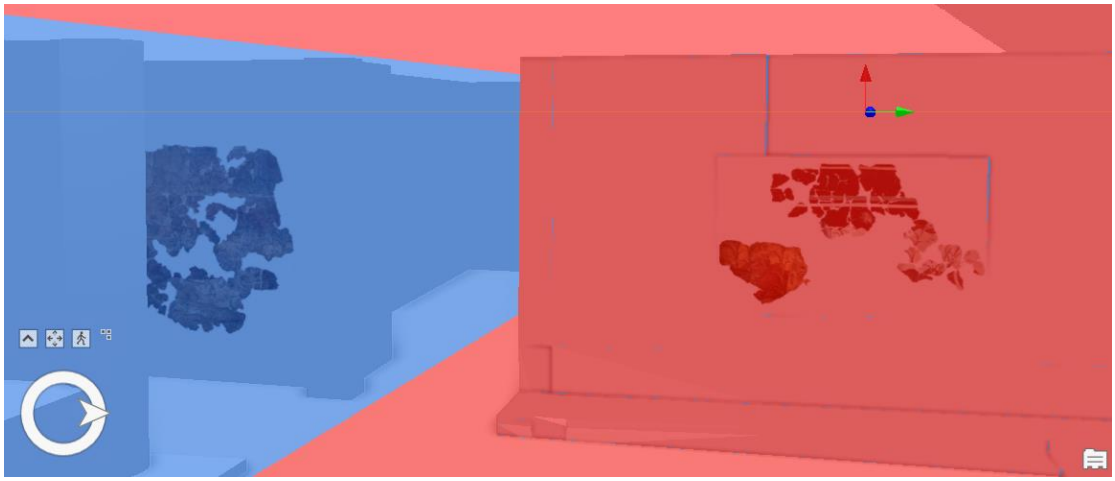

Figure E65 View of the southwest and northwest walls of the main room of the Throne Room complex from the east. Observer point in the main room. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

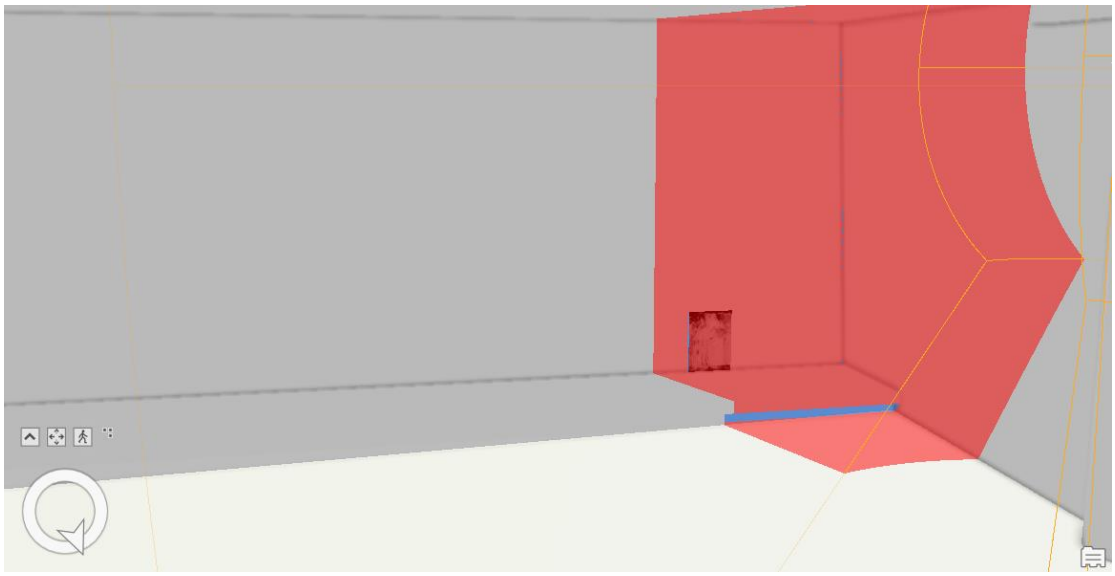

Figure E66 View of the south wall of the anteroom of the Throne Room complex from the northeast. Observer point in the main room. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

- Viewshed from all observer points

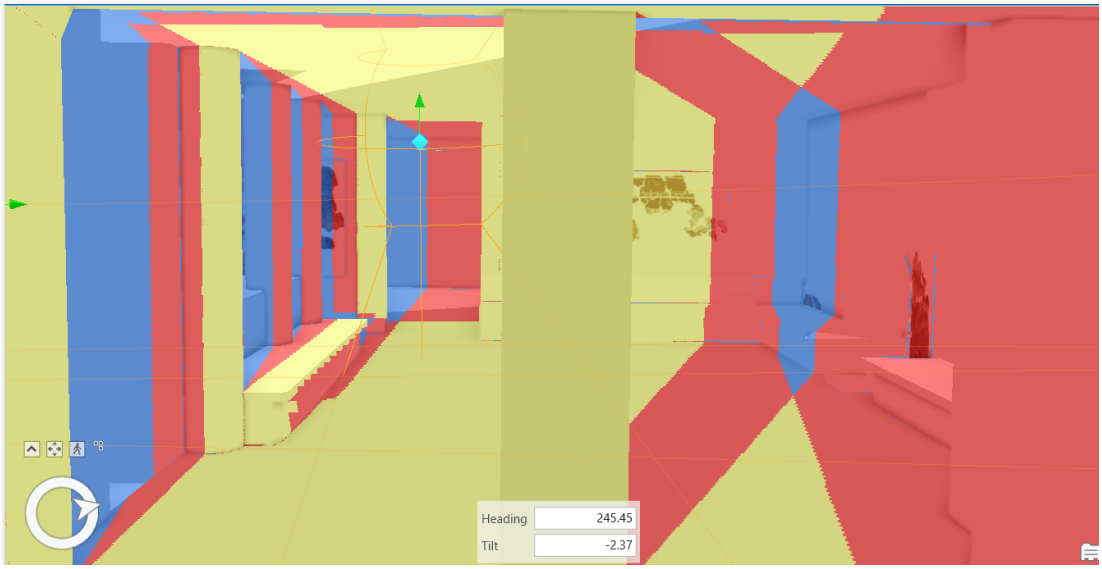

Figure E67 View of the main room of the Throne Room complex from the east. All observer points activated. Version 1: All doors open. Results of Exploratory Viewshed Analysis with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

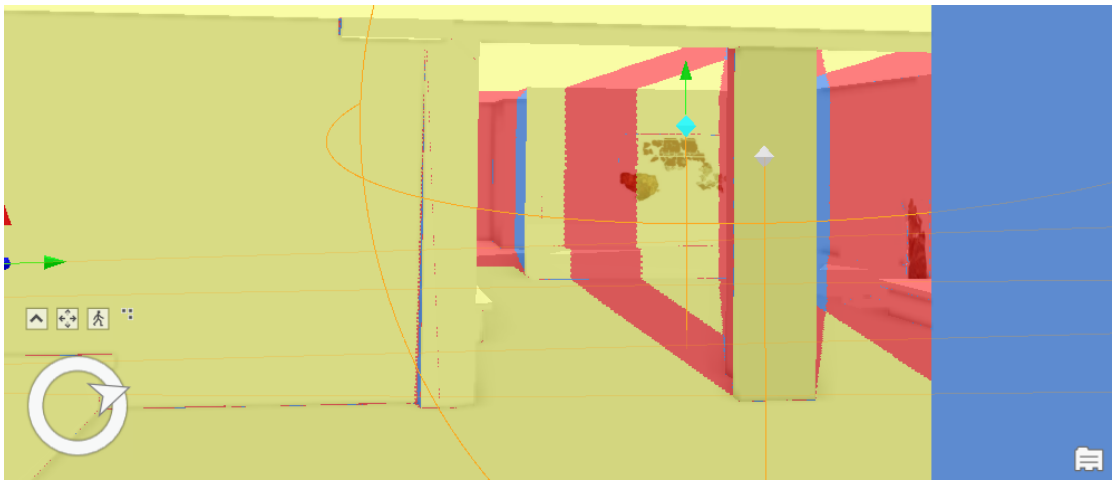

Figure E68 View of the main room of the Throne Room complex from the southeast. All observer points activated. Results of Exploratory Viewshed Analysis with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

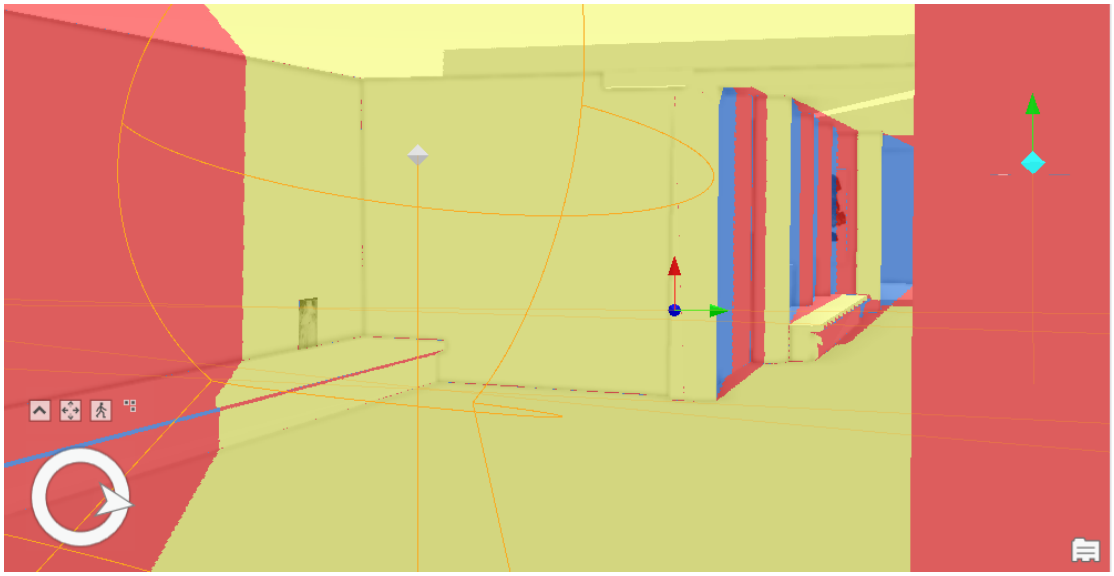

Figure E69 View of the anteroom of the Throne Room complex from northeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 1: All doors open, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

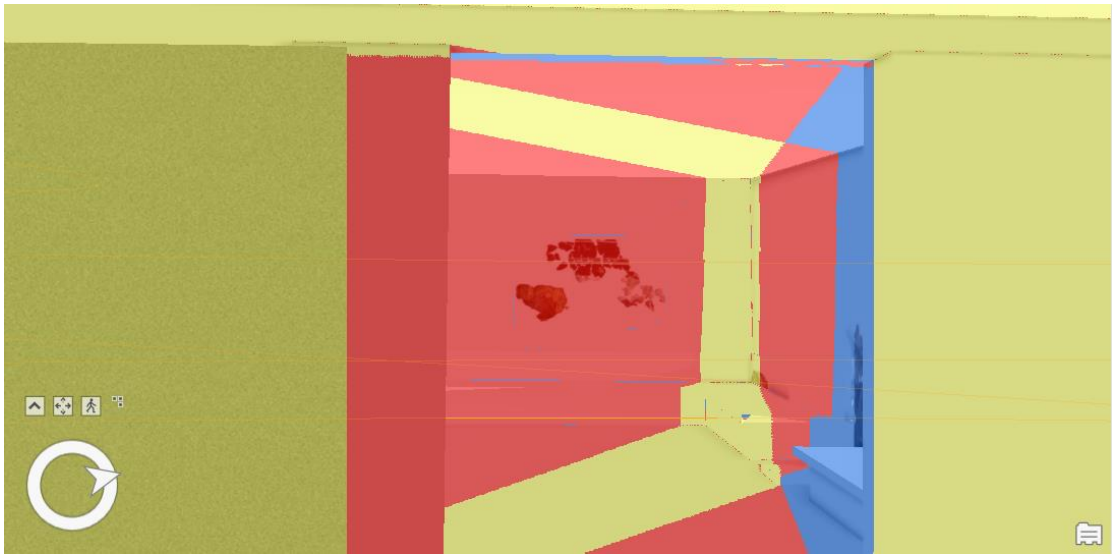

Figure E70 View of the main room of the Throne Room complex from the east. All observer points activated. Results of Exploratory Viewshed Analysis in Version 2: Southern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

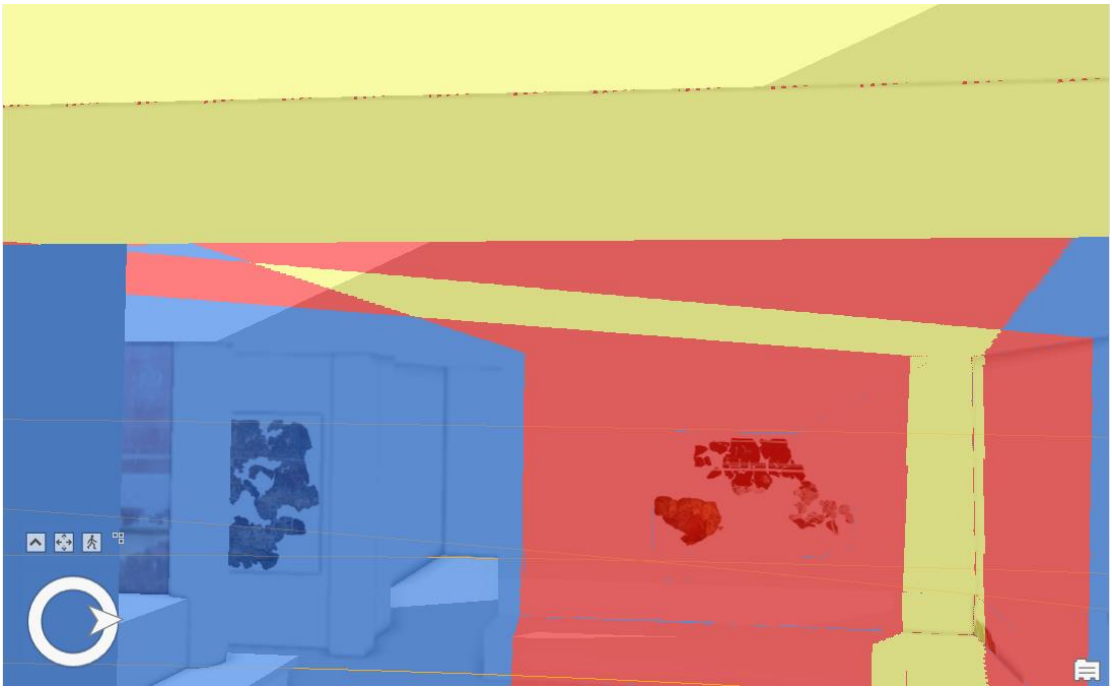

Figure E71 View of the main room of the Throne Room complex from the northeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 2: Southern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

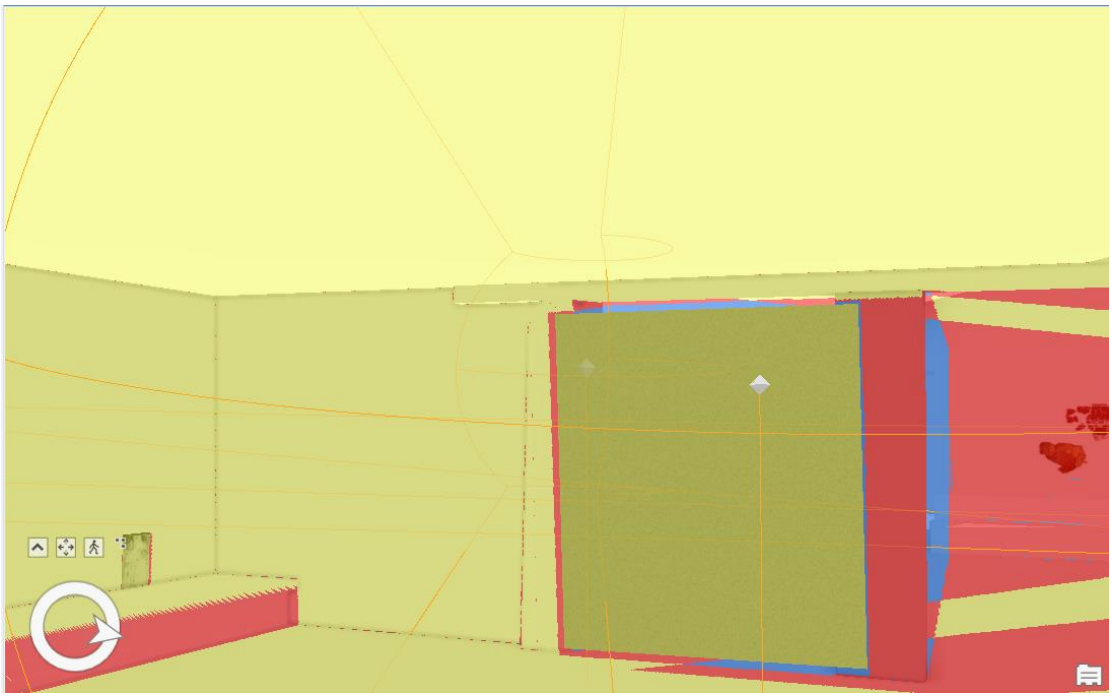

Figure E72 View of the anteroom of the Throne Room complex from the northeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 2: Southern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

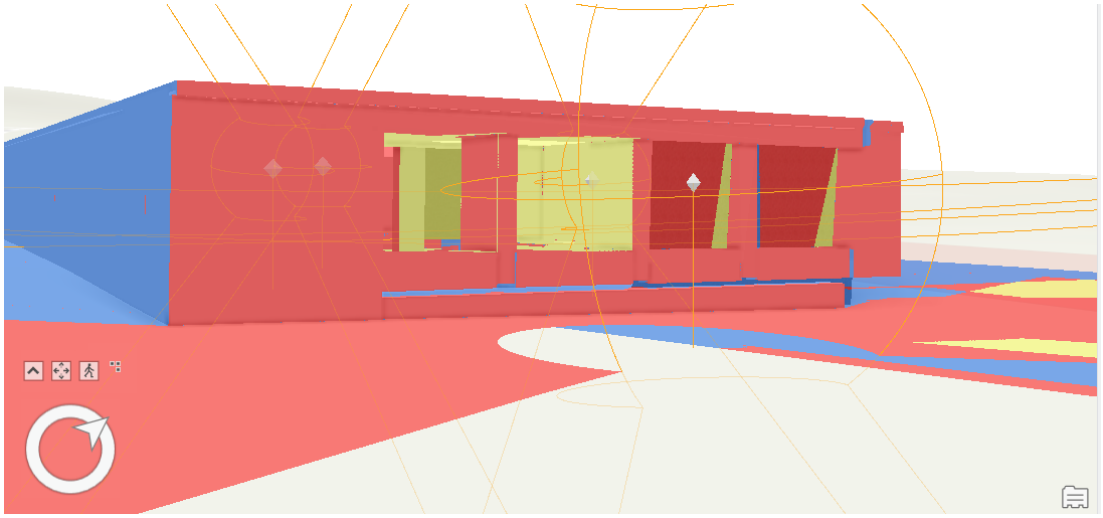

Figure E73 General view of the Throne Room complex from the southeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 3: Northern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

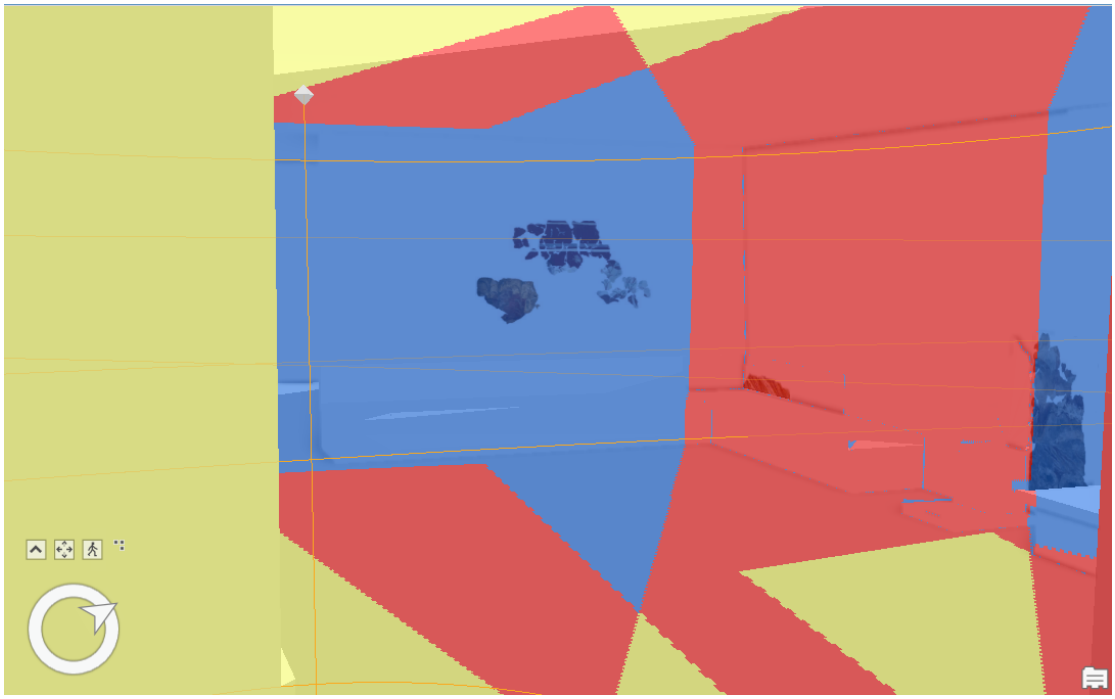

Figure E74 View of the main room of the Throne Room complex from the east. All observer points activated. Results of Exploratory Viewshed Analysis in Version 3: Northern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

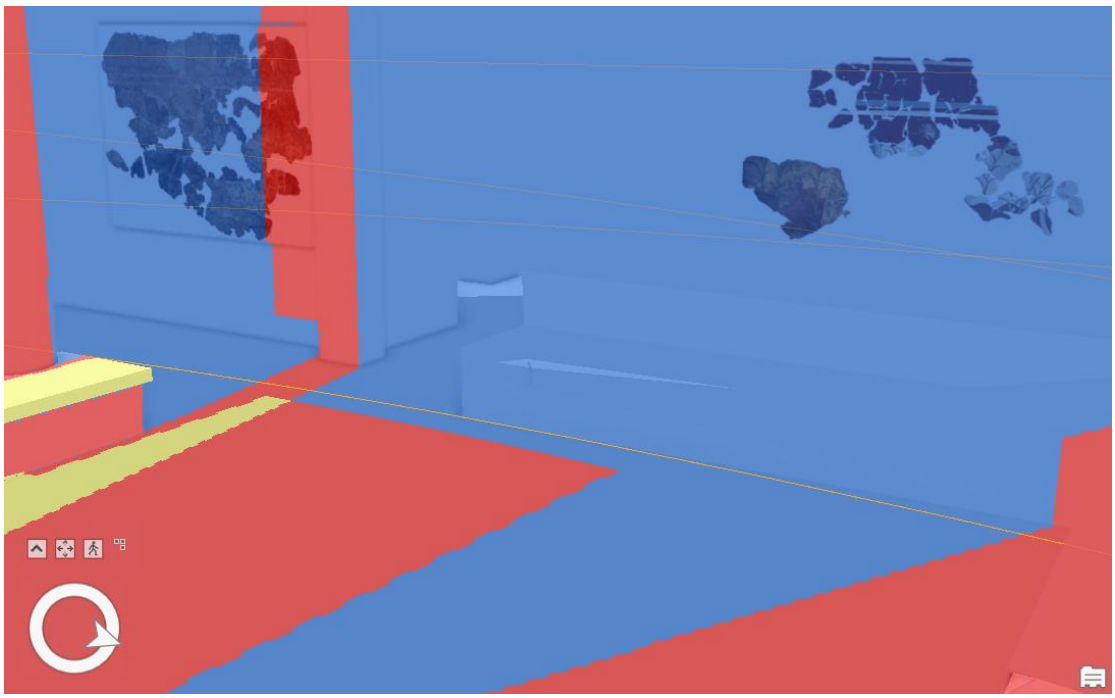

Figure E75 View of the main room of the Throne Room complex from the northeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 3: Northern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

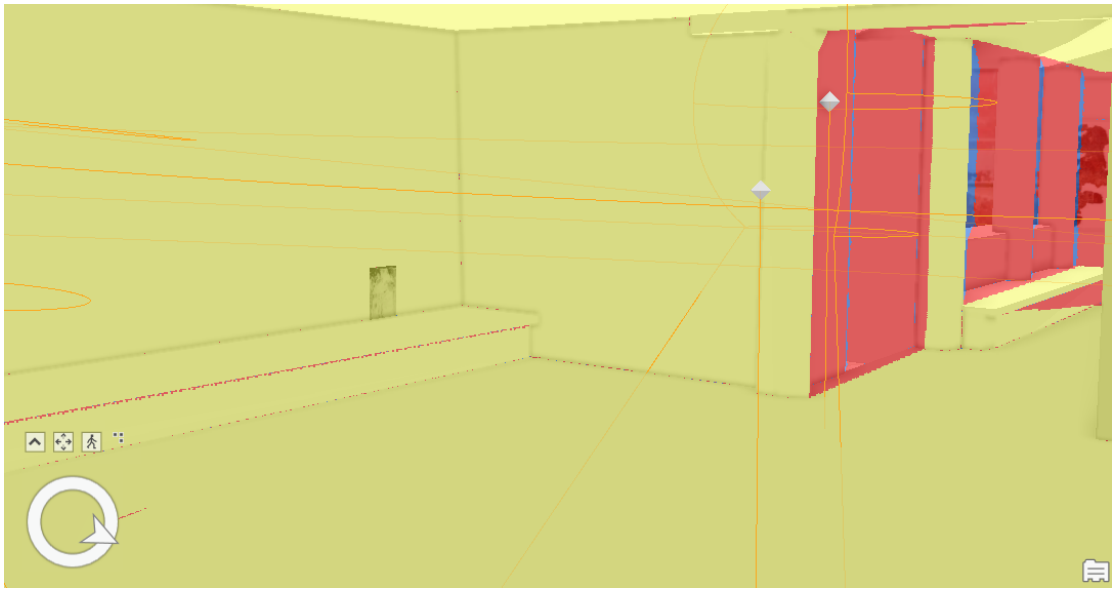

Figure E76 View of the anteroom of the Throne Room complex from the northeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 3: Northern doors of the anteroom & main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

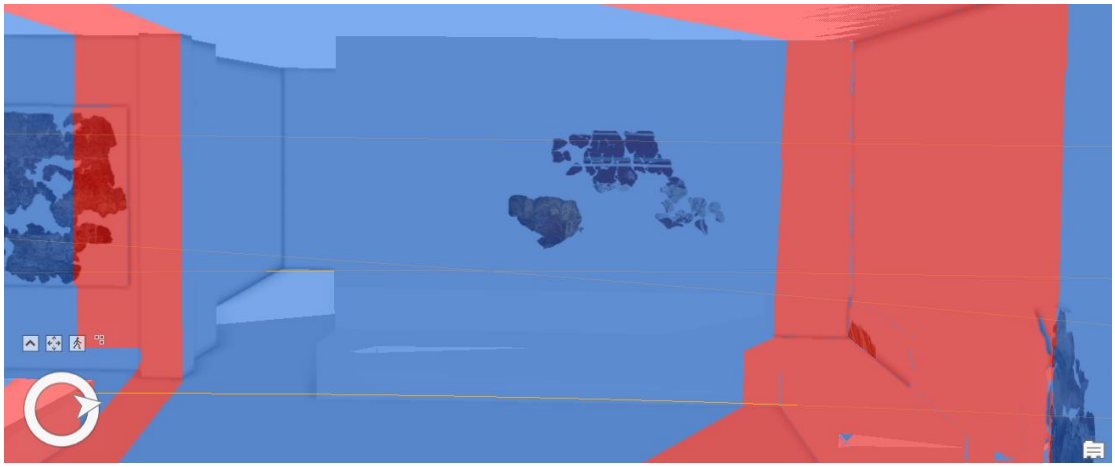

Figure E77 View of the main room of the Throne Room complex from the east. All observer points activated. Results of Exploratory Viewshed Analysis in Version 4: Southern partitions of the anteroom closed & north door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

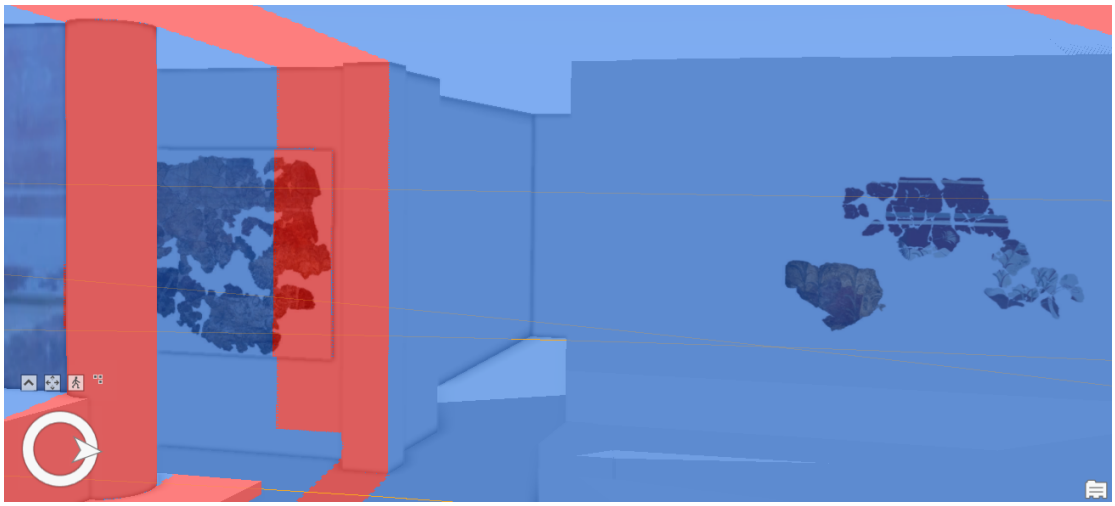

Figure E78 View of the main room of the Throne Room complex from the northeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 4: Southern partitions of the anteroom closed & north door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

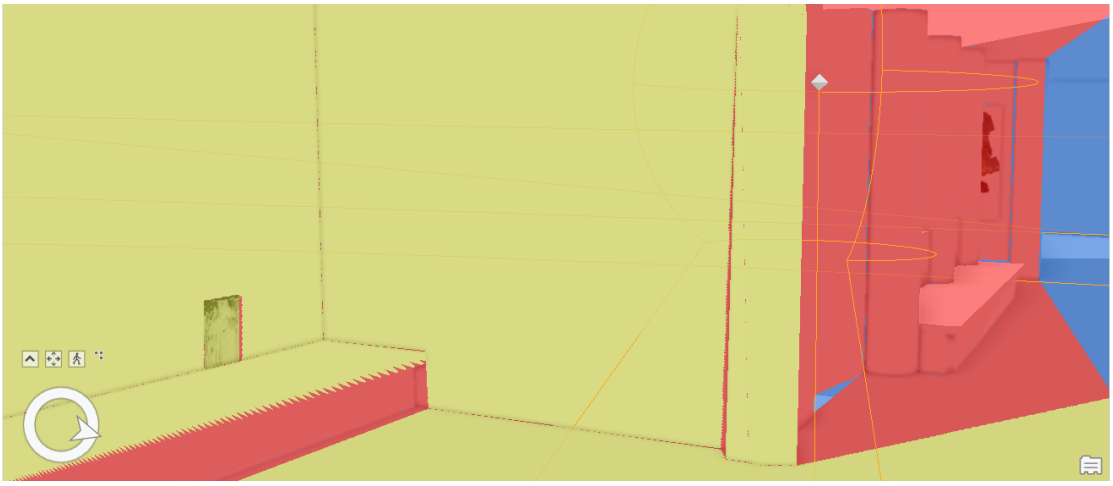

Figure E79 View of the anteroom of the Throne Room complex from the northeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 4: Southern partitions of the anteroom closed & north door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

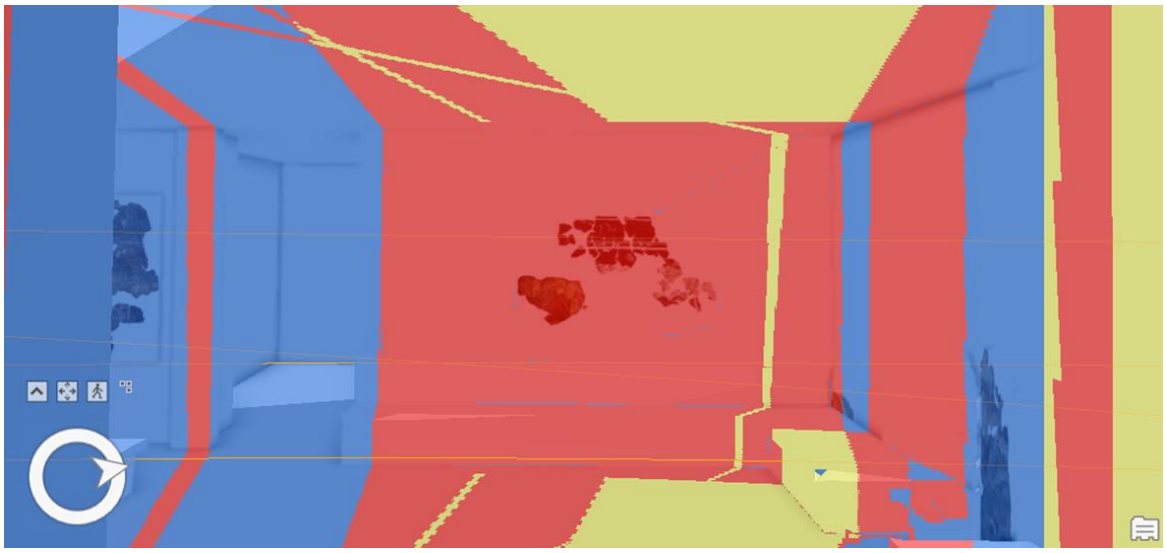

Figure E80 View of the main room of the Throne Room complex from the east. All observer points activated. Results of Exploratory Viewshed Analysis in Version 5: Northern partitions of the anteroom closed & south door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

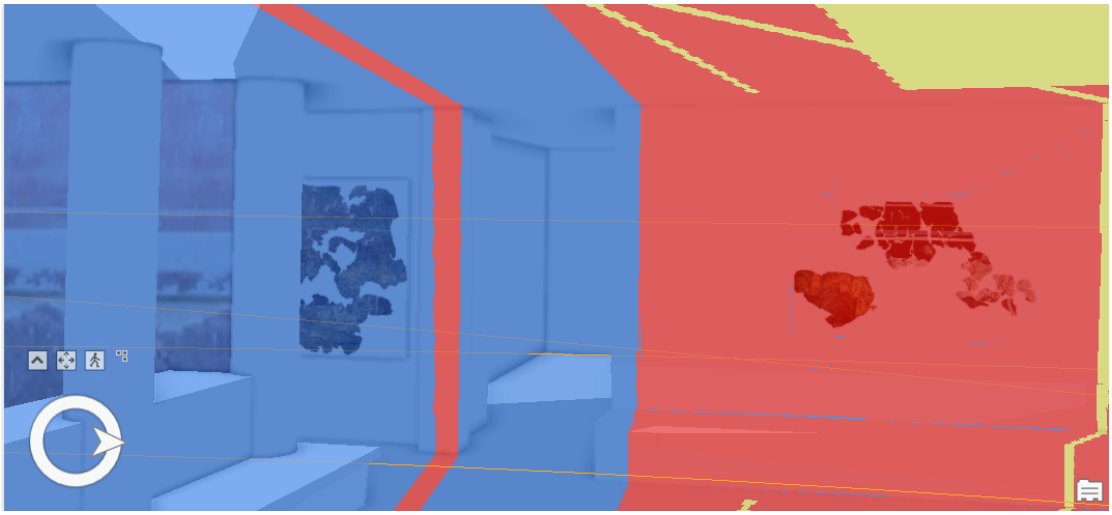

Figure E81 View of the main room of the Throne Room complex from the northeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 5: Northern partitions of the anteroom closed & south door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

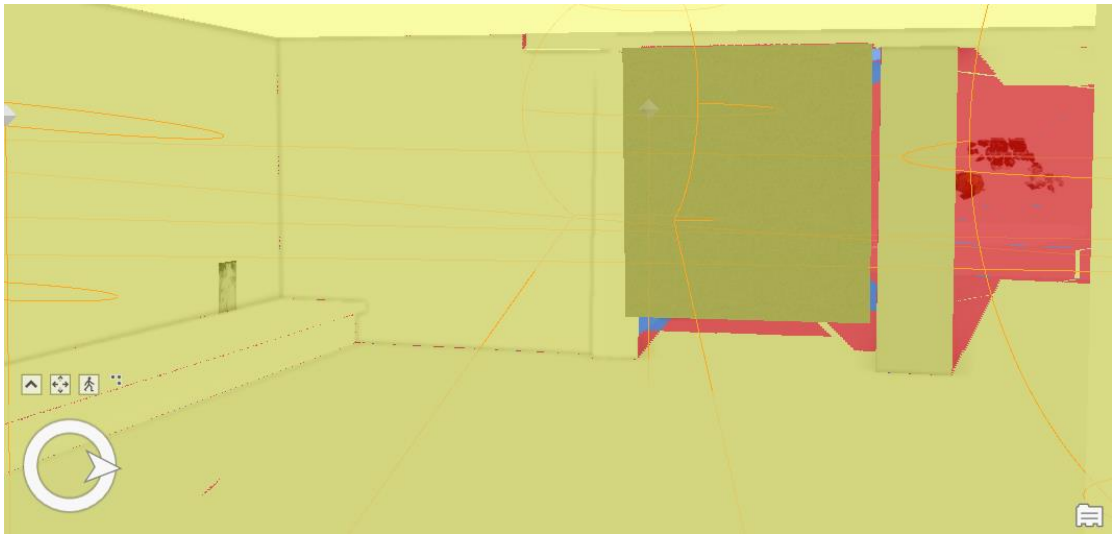

Figure E82 View of the anteroom of the Throne Room complex from the northeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 5: Northern partitions of the anteroom closed & south door to the main room closed, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

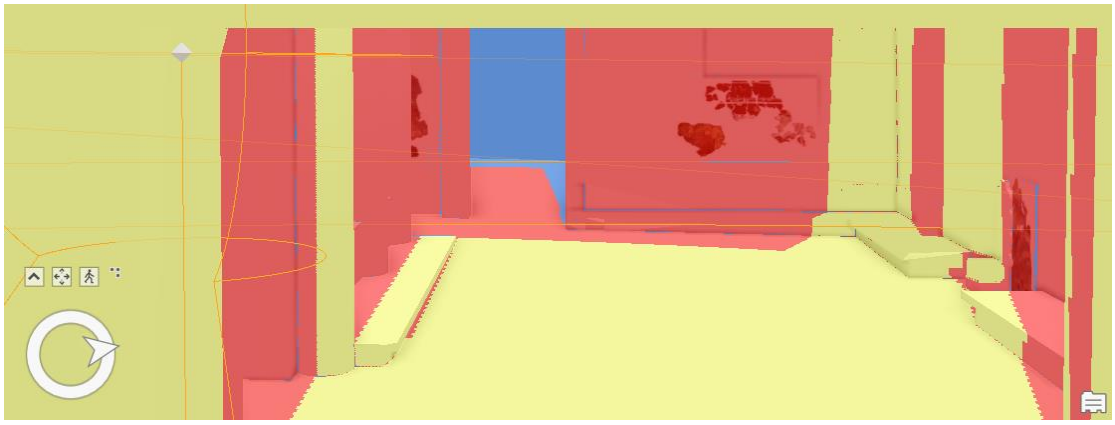

Figure E83 View of the main room of the Throne Room complex from the east. All observer points activated. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

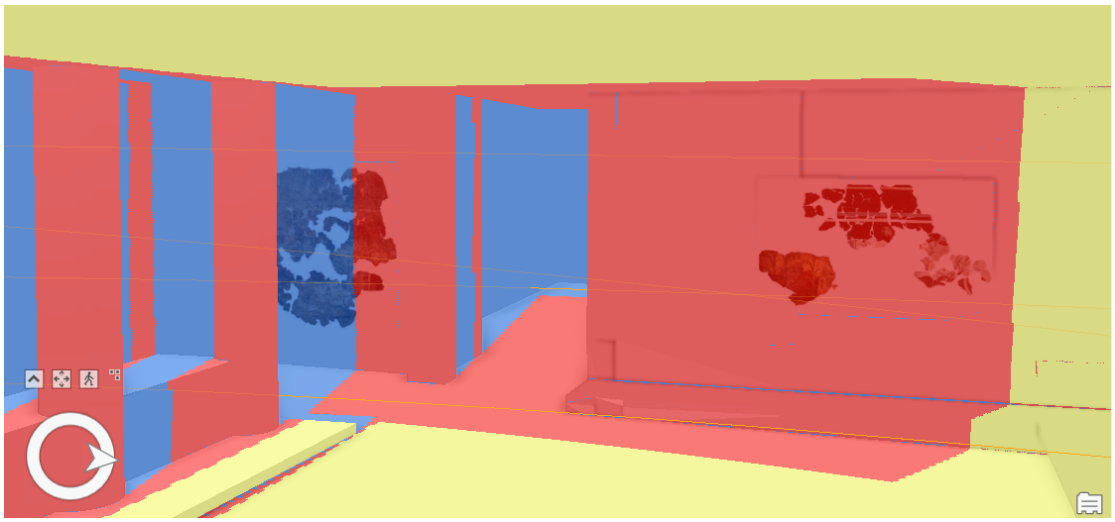

Figure E84 View of the main room of the Throne Room complex from the northeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

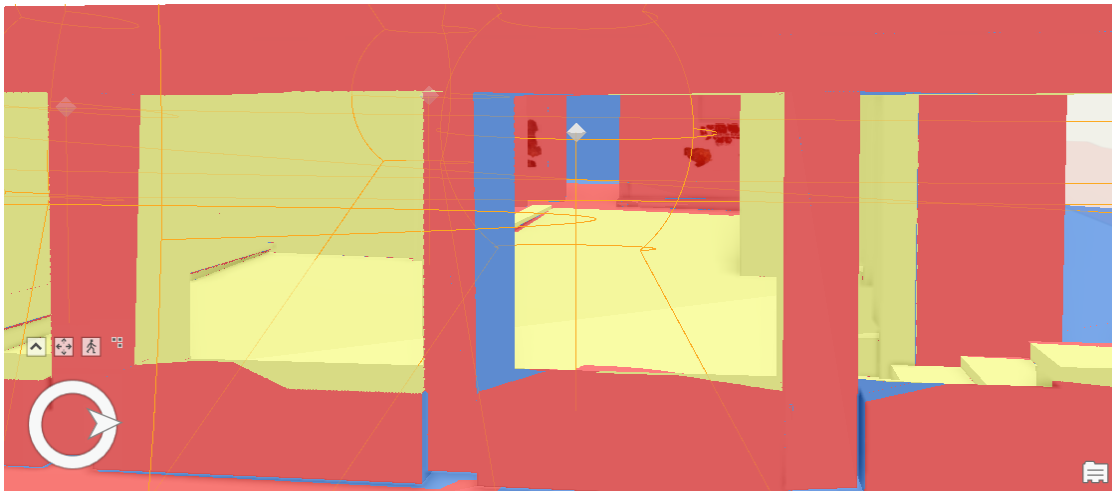

Figure E85 View of the anteroom and the main room of the Throne Room complex from the northeast. All observer points activated. Results of Exploratory Viewshed Analysis in Version 6: No pier-and-door partition from the anteroom to the main room, with colours indicating the visible, multiple coverage and no visible areas, represented by the red, yellow and blue, respectively. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

- **Tables of 3D Viewshed analysis results**

Sum of Visibility		Observation			
Decoration	Version	Observer points in West Porch	Observer point in entrance to Corridor	Observer point in West Court	Grand Total
Corridor east wall	1	1.5	1	0.5	3
	2	0	0	0	0
	3	1.5	1	0.5	3
Corridor east wall Total		3	2	1	6
Corridor west wall	1	1	1	0	2
	2	0	0	0	0
	3	0	1	0	1
Corridor west wall Total		1	2	0	3
West Porch east wall	1	1.5	1	1	3.5
	2	1.5	1	1	3.5
	3	1.5	1	1	3.5
West Porch east wall Total		4.5	3	3	10.5
Grand Total		8.5	7	4	19.5

Figure E86 Table presenting the values of visual integration of each decoration, by observer point and per representational version of West Entrance complex. Values set by the author according to the results of the Exploratory Viewshed in the. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Sum of Visibility		Observer point			
Decoration	Version	Observer point from Central Court	Observer points from the anteroom	Observer points in the main room	Grand Total
Lustral basin	1	0	0.25	0	0.25
	2	0	0	0	0
	3	0	1	0	1
	4	1	1	0	2
	5	0	0	0	0
	6	0	1	0	1
Lustral basin Total		1	3.25	0	4.25
North wall	1	0	0.25	1	1.25
	2	0	0	1	1
	3	0	0.25	1	1.25
	4	0.25	0.25	1	1.5
	5	0	0	1	1
	6	0	1	1	2
North wall Total		0.25	1.75	6	8
Northeast wall	1	0	1	0	1
	2	0	0	0	0
	3	0	0.25	0	0.25
	4	0.25	0.25	0	0.5
	5	0	0	0	0
	6	0	0.25	0	0.25
Northeast wall Total		0.25	1.75	0	2
Northwest wall	1	0.5	1	1	2.5
	2	0	1	1	2
	3	0	0	1	1
	4	0	0	1	1
	5	0.5	1	1	2.5
	6	1	1	1	3
Northwest wall Total		2	4	6	12
Southwest wall	1	1	2	0.25	3.25
	2	1	2	0.25	3.25
	3	1	2	0.25	3.25
	4	2	2	0.25	4.25
	5	1	2	0	3
	6	1	2	1	4
Southwest wall Total		7	12	2	21
Grand Total		10.5	22.75	14	47.25

Figure E87 Table presenting the values of visual integration of each decoration, by observer point and per representational version of Throne Room complex. Values set by the author according to the results of the Exploratory Viewshed in the. ArcGIS Pro, Local Scene. (Figure: V. Georgiopoulou).

Appendix F

Python code for ArcPy

```
# First, we import required modules

import arcpy

from arcpy import env

try:

# We enable the 3D Analyst extension to process the multipatch features aka 3D
#models

   arcpy.CheckOutExtension("3D")

   # Here we set the workspace using the project's  geodatabase file

   env.workspace = r"C:\Users\nairovi\Desktop\MA
Thesis\PLANS\3D_Import_12\3D_Import_12.gdb"

   arcpy.env.overwriteOutput = True

   # Next we set the observer and target layers by copying the names of our two
point    # layers. We also set the surface where the analysis is conducted and finally,
the #multipatch feature

   obs_pts = "c3DKnossos_GIS_Observers_TH"  # Observer points

   target = "c3DKnossos_GIS_Target_TH"  # Target points

   surface = "WorldElevation3D/Terrain3D"  # Surface raster (optional)

   multipatch_buildings = "c3DKnossos_GIS_Import3DFiles4"  # Multipatch feature
class for obstructions

   # With the following lines we set the destination of the new, output layers

   sight_lines = r"C:\Users\nairovi\Desktop\MA
Thesis\PLANS\3D_Import_12\3D_Import_12.gdb\sightlines_TH"

   outLOS = "Line_of_Sight"

   # Finally, we call the arcpy function to construct the sight lines

   arcpy.AddMessage("Constructing sight lines...")

   arcpy.ddd.ConstructSightLines(obs_pts, target, sight_lines)

except arcpy.ExecuteError:

   # To manage possible errors with the ArcPy

   print(arcpy.GetMessages(2))

except Exception as e:

   # Handle general Python errors

   import traceback

   traceback.print_exc()
```

Figure F1 Python code for the creation of sightlines with ArcPy (Source: Open AI, 2024 & V.Georgiopoulou).