

EDICULA

Educational Digital Innovative Cultural heritage related Learning Activities

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NATIONAL TECHNICAL
UNIVERSITY OF ATHENS
[GREECE]



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DI ROMA
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HELLENIC RESEARCH INSTITUTE OF
THE ALEXANDRIAN CIVILIZATION
[GREECE]

MULTIPLIER 1 [E1]: The Historic City of Jerusalem, The Holy Sepulchre: A Hands-on Experience

Hands-on education in protection of monuments, and innovative practices in a digital era

3 - 6 April 2022

Non-destructive prospection of the Holy Aedicule's structural history within the Holy Sepulchre environment

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A STRUCTURE FULL OF LIFE

Crucifixion & Resurrection

135AD

335AD

1009AD

11th & 12th c.

1555AD

1810AD

2017

A

B

C

D

E

F

G

Original Tomb hewn from the rock at an area formerly used as a stone quarry

Tomb buried under Hadrian's Temple

Constantine the Great & St. Helena revealed the Tomb, built the **Aedicule**, Church of the Holy Sepulchre

Fatimid Caliph al-Ḥākīm bi-Amr Allah **destroyed (?)** the **Aedicule**

Modified Aedicule: Constantine Monomachus & Crusaders

Rebuilt (?) Aedicule by Fra Bonifacio da Ragusa

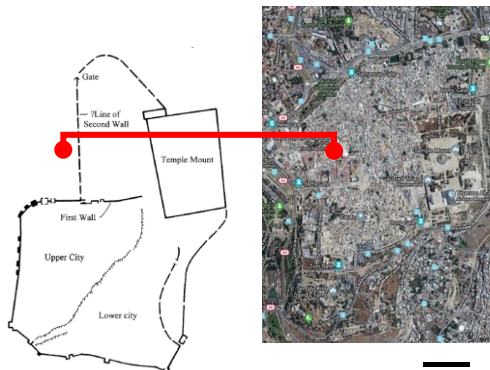
Rebuilt Aedicule by Kalfas Komnenos

Holy Aedicule rehabilitation project

THE AEDICULE THROUGHOUT THE AGES

FROM CRUCIFIXION & RESURRECTION TO THE CONTEMPORARY RESTORATION

According to the Gospels, the place of Crucifixion and the Tomb of Christ were situated outside the city wall

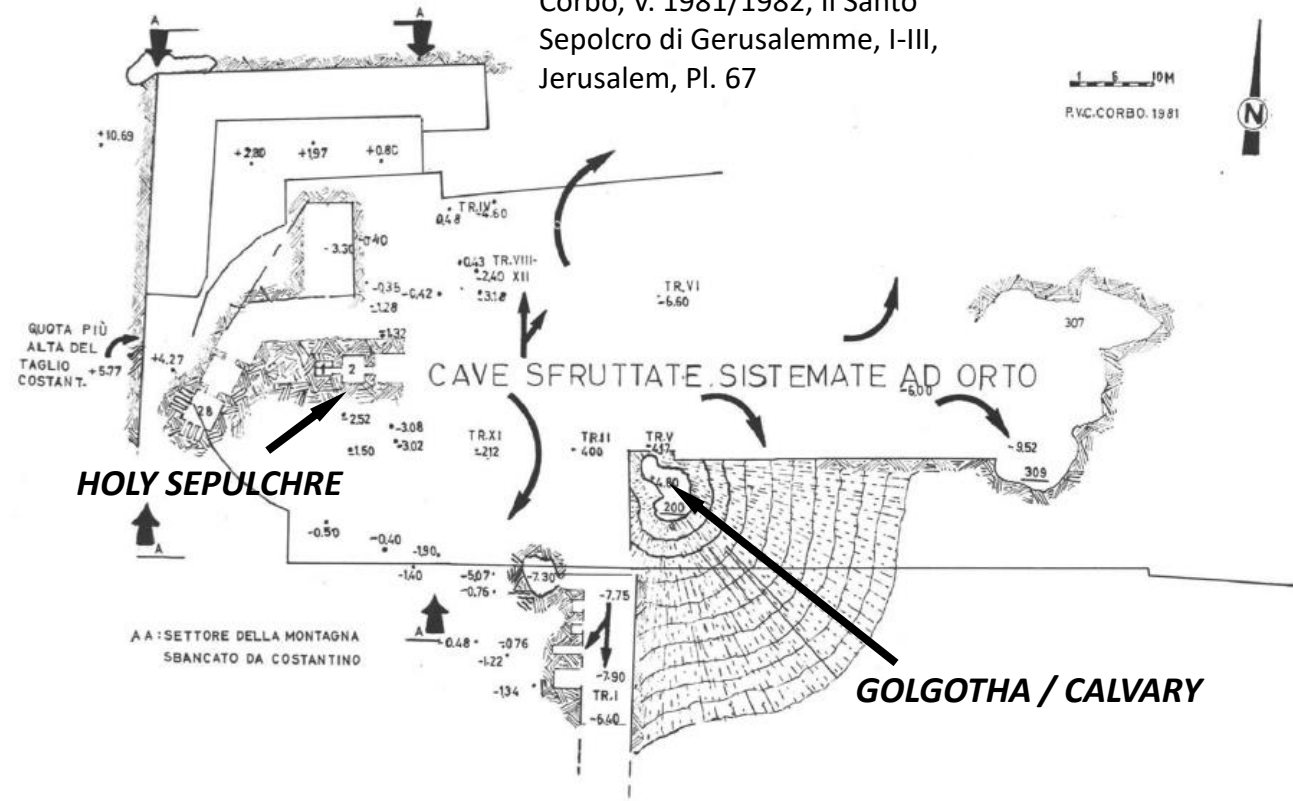


After Stern ed. 1993, ii, maps on pp. 718, 758, and 769, with modifications. (Drawn by Steven Ashley), Biddle, 1999 Fig. 60

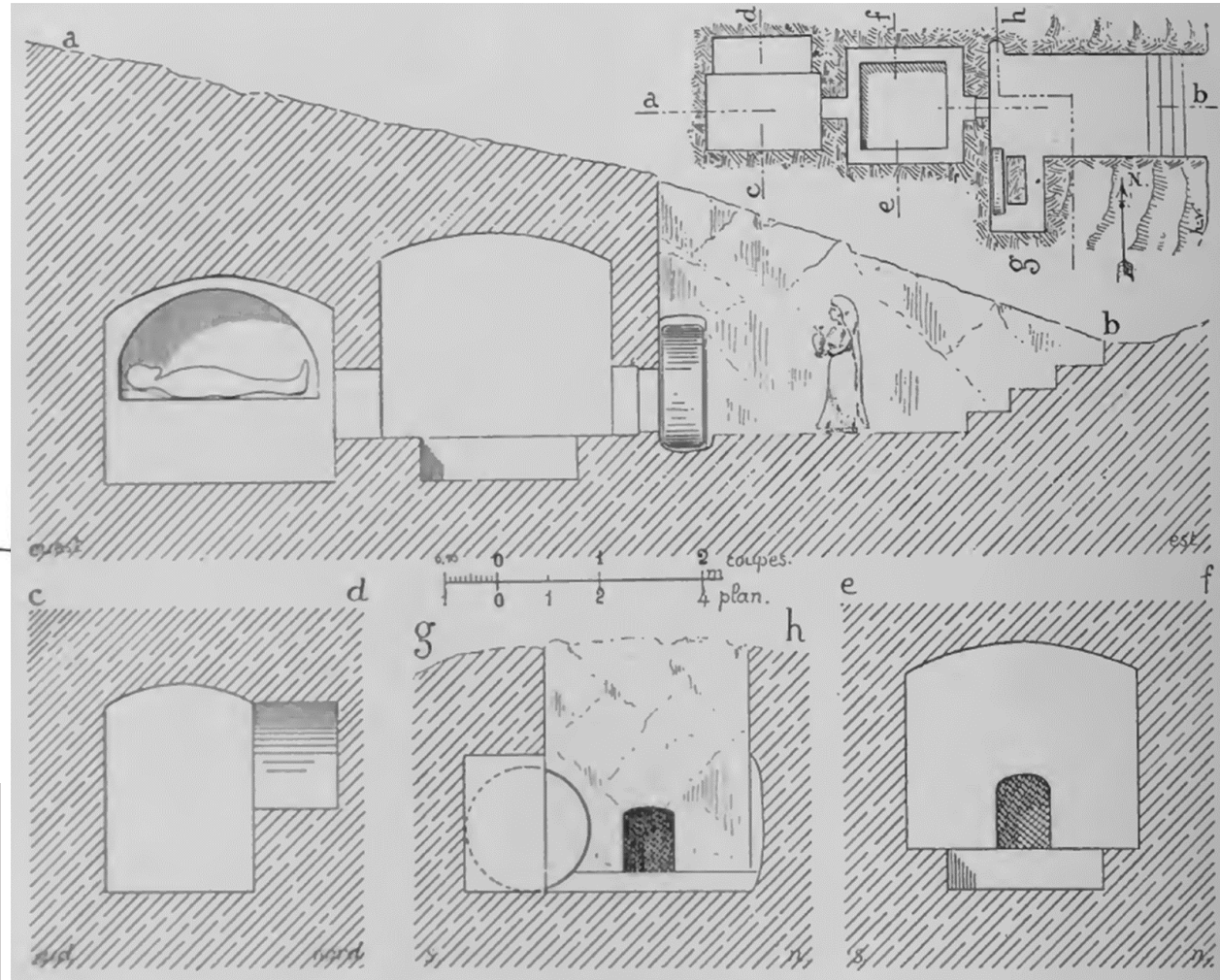


3D Model of the Holy Aedicule after the 2017 NTUA restoration (Prof. A. Georgopoulos NTUA)

Corbo, V. 1981/1982, Il Santo Sepolcro di Gerusalemme, I-III, Jerusalem, Pl. 67



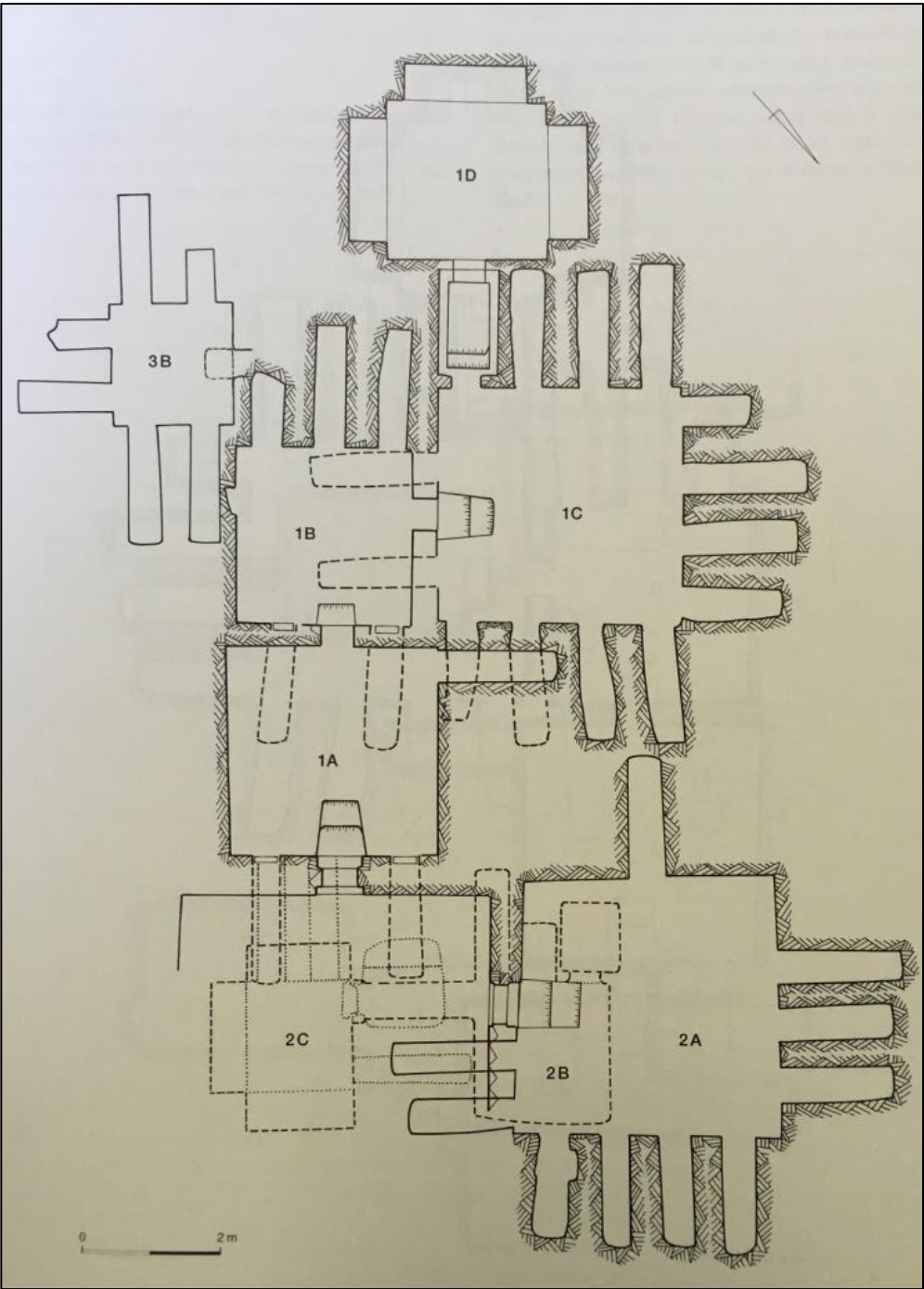
EARLY 1st CENTURY
THE ABANDONED QUARRY
OUTSIDE THE OLD WALLS OF JERUSALEM



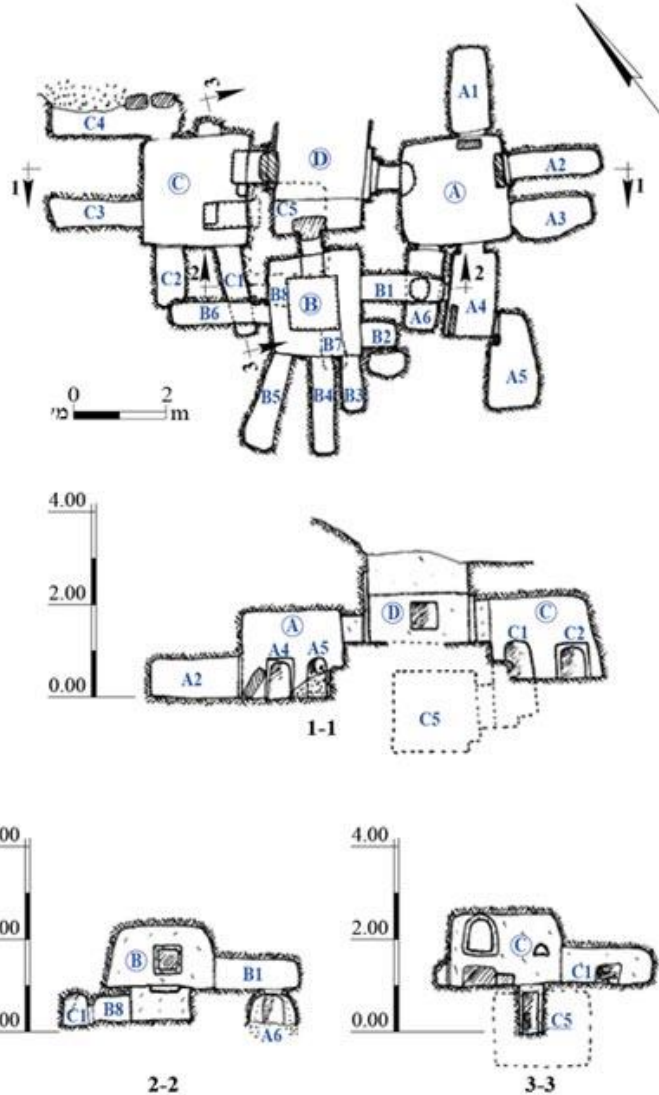
After the **quarry** was abandoned, it was partially filled with soil and became a **garden** (the garden mentioned in the Gospels), and several **tombs** have been discovered cut **in the walls of the quarry**

Vincent, L.-H. & Abel, F.-M.
 Jerusalem: Recherches de topographie, d'archeologie et d'histoire, Vol II. Jerusalem Nouvelle, Paris 1914-1926

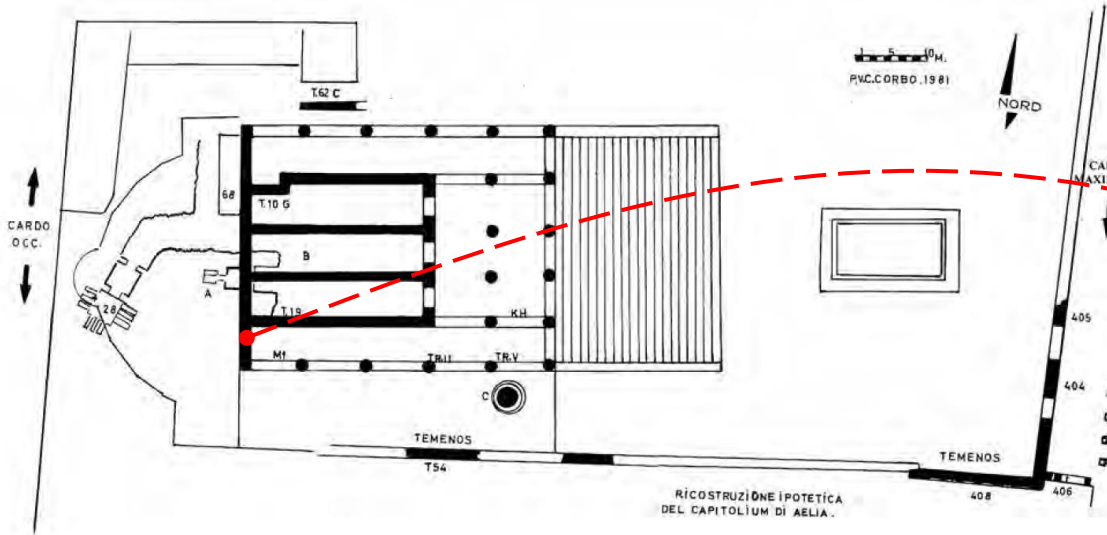
Akeldama Tombs complex, G. Avni, Z. Greenhut. Ch. 1 Architecture, burial customs and chronology. In: *The Akeldama Tombs*. IAA Reports, pp. 1-41 (1996) [Plan 1.1]



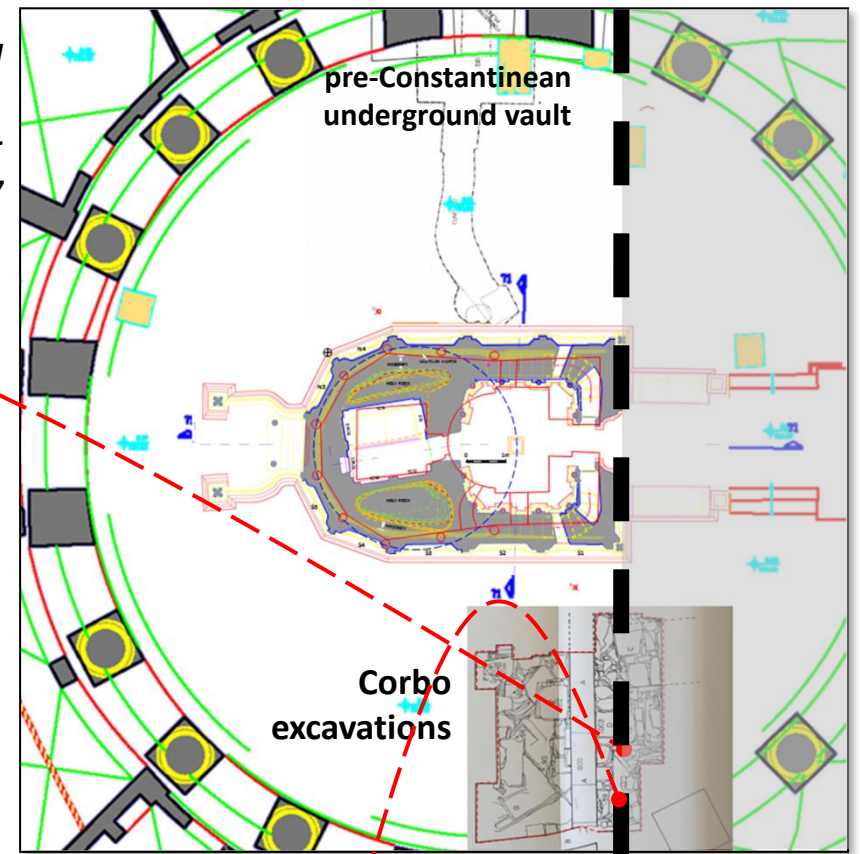
E. Klein, N. Sapir, G. Goldenberg and A. Wiegmann. Jerusalem, Akeldama: Final Report. *Hadashot Arkheologiyot: Excavations and Surveys in Israel*, Publ. IAA, Vol. 129 (2017)



<https://www.jstor.org/stable/26693753>



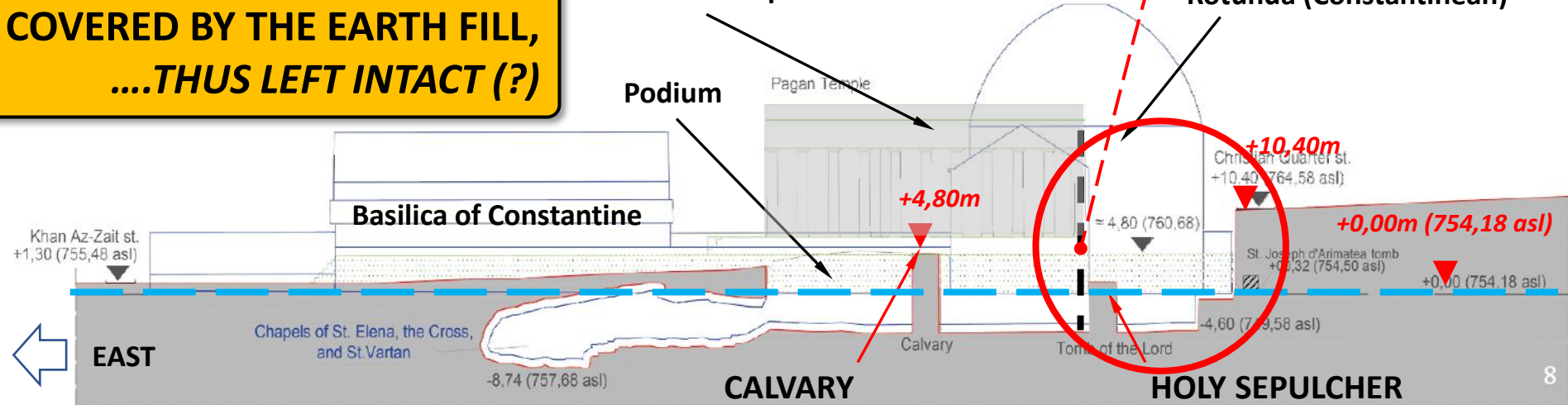
National Technical University of Athens. Rehabilitation Project 2016-2017



**HADRIAN ERA
PERIOD OF AELIA CAPITOLINA
TEMPLE OF APHRODITE**

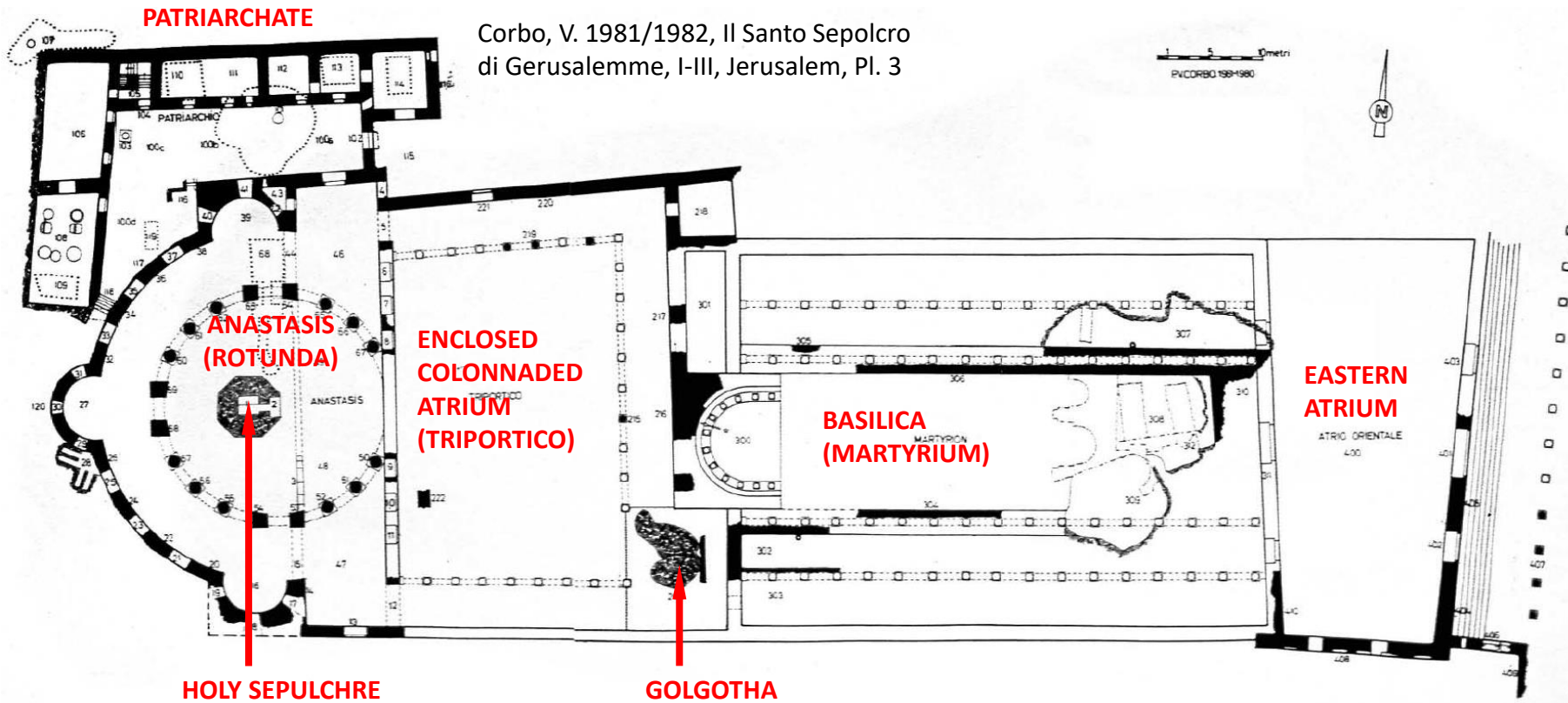
**The Temple was built on a raised platform (podium):
THE TOMB WAS COVERED BY THE EARTH FILL,
...THUS LEFT INTACT (?)**

Hadrian Temple, Basilica of Costantine, Rotunda (Constantinean)



[HYPOTHESIS: Sabelli, R., 2015]

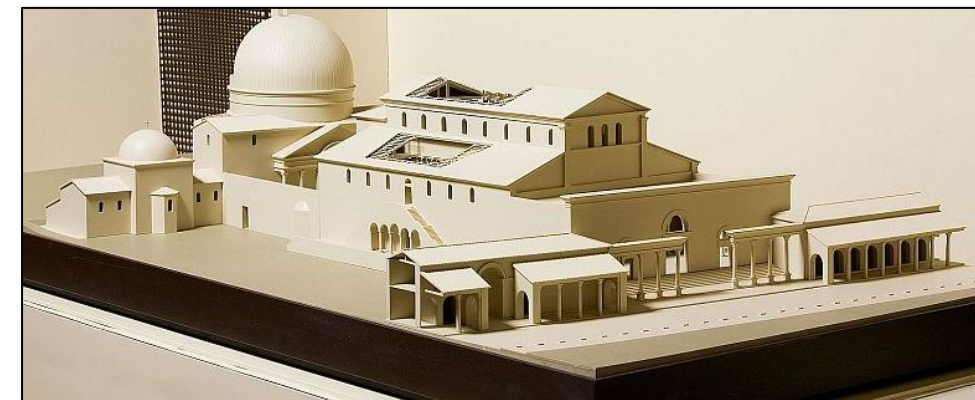
Cross-section: R. Sabelli "Roman changes to the hill of Gareb in "Aelia Capitolina", Restauro Arcaelogico, Firenze University Press, 1.2015 88-111



The Church complex, consecrated on 13 Sept. 335, consisted of:

- a) the **eastern atrium**,
- b) a large **basilica-type church** (Martyrium),
- c) An enclosed colonnaded atrium (**Triportico**) which included at its SE corner the site of Golgotha
- d) the **Rotunda** (Anastasis) which at the centre included the Holy Aedicule that contained the Holy Tomb,
- e) The **Patriarchate**

Model of the Constantinean Church Complex, The Tower of David, Museum of the History of Jerusalem



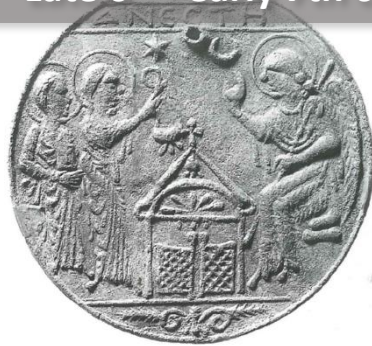
335AD
ERA OF CONSTANTINE THE GREAT & SAINT HELENA
CHURCH OF THE HOLY SEPULCHRE



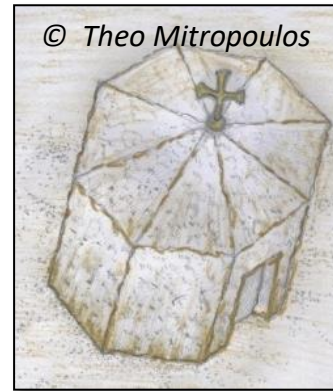
early 7th c.

Painted wooden casket lid, Biblioteca Apostolica Vaticana, Museo Sacra, Inv. nr. 1883 A-8

Late 6th - early 7th c.



Medallion, Wurttembergisches Landesmuseum, Stuttgart, Inv. nr. 1981-165

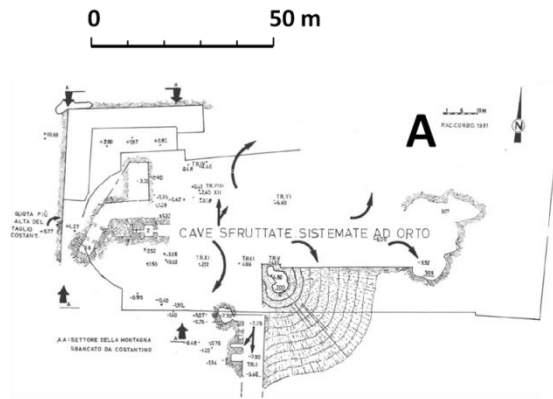


© Theo Mitropoulos

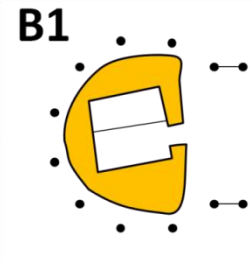
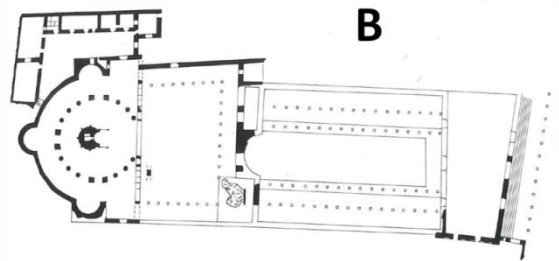
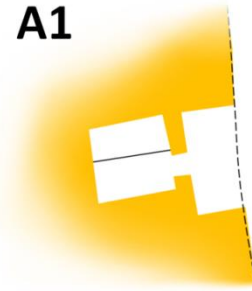
The removal of rock material from the surrounding rock-hill, left the Holy Sepulchre in the form of a relatively simple polygonal/circular mausoleum

• Was it **COMPLETELY MONOLITHIC?**
Including a conical (?) **ROCK ROOF**....

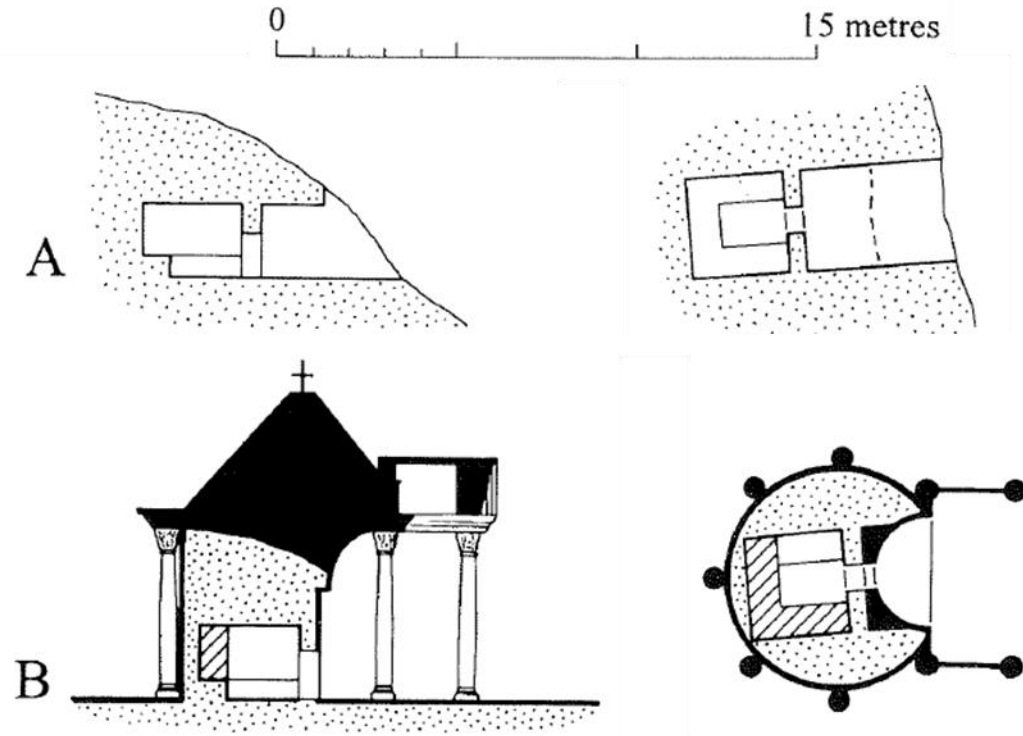
• Was it **POLYGONAL?** (8 OR 12 SIDES)



0 5 m



or

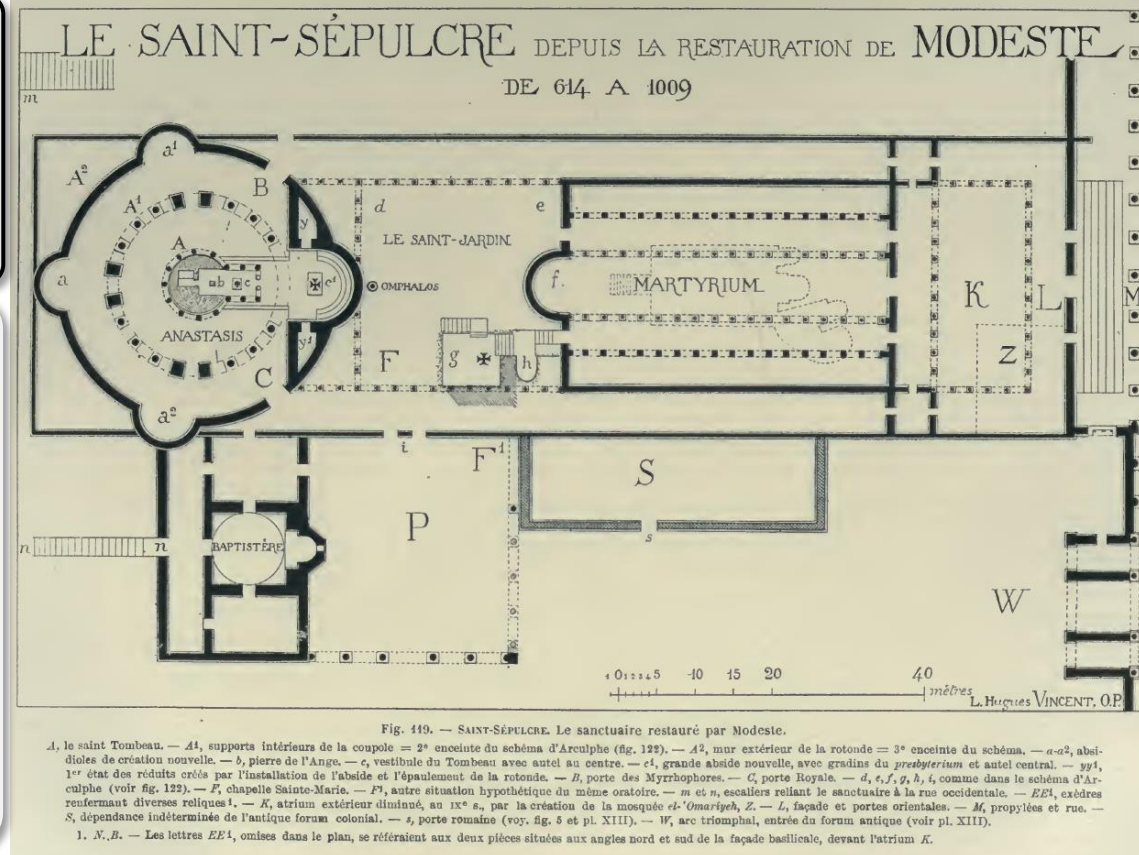


[A1 & B1 HYPOTHESIS: Lampropoulos, K.C., Moropoulou, A., 2018]
Corbo, V. 1981/1982, *Il Santo Sepolcro di Gerusalemme, I-III, Jerusalem*,
A: Pl. 67; B: Pl. 3

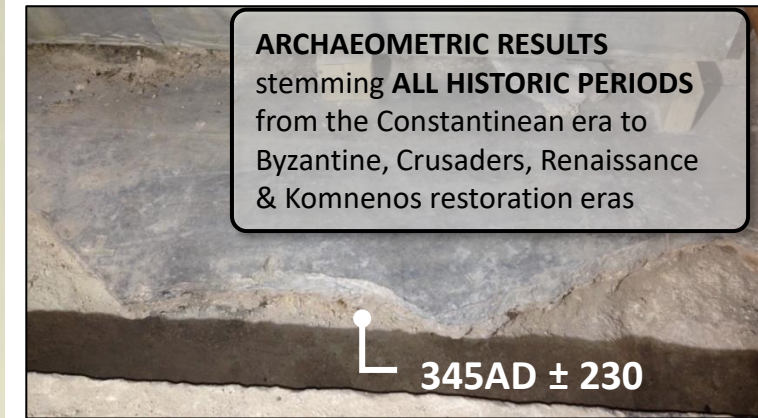
[HYPOTHESIS: Biddle, M.: *The Tomb of Christ*. Gloucestershire England, Sutton (1999), p. 68, Fig. 64]

During the **Persian Conquest of Jerusalem in 614 CE** the Church of the Holy Sepulchre was damaged (e.g. Rotunda roof burnt).

In **622**, a decree by Khosrau II, allowed the **rebuilding of the church, which was entrusted to Modestus**, abbot of St. Theodosius' Monastery, and subsequently Patriarch of Jerusalem:
Reinforced the structures and replaced the wooden roofs consumed in fire.



Vincent, L.,-H. & Abel, F.-M. Jerusalem: Recherches de topographie, d'archéologie et d'histoire, Vol II. Jerusalem Nouvelle, Paris 1914-1926



Moropoulou, A., Zacharias, N., Delegou, E. T., Apostolopoulou, M., Palamara, E., & Kolaiti, A. (2018). OSL mortar dating to elucidate the construction history of the Tomb Chamber of the Holy Aedicule of the Holy Sepulchre in Jerusalem. *J. Archaeol. Sci.: Reports*, 19, 80-91.

335AD - 1009AD

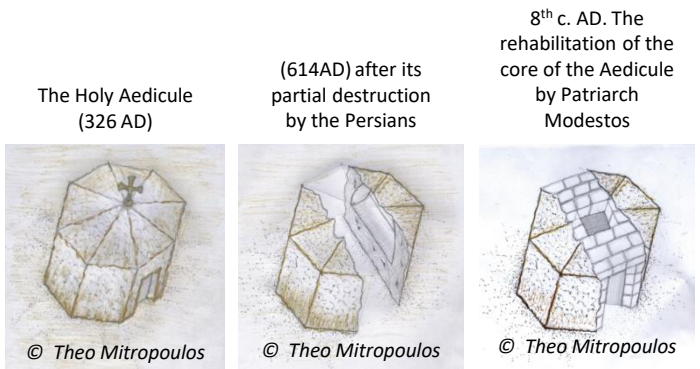
THE PERSIAN CONQUEST AND THE RESTORATION OF MODESTUS

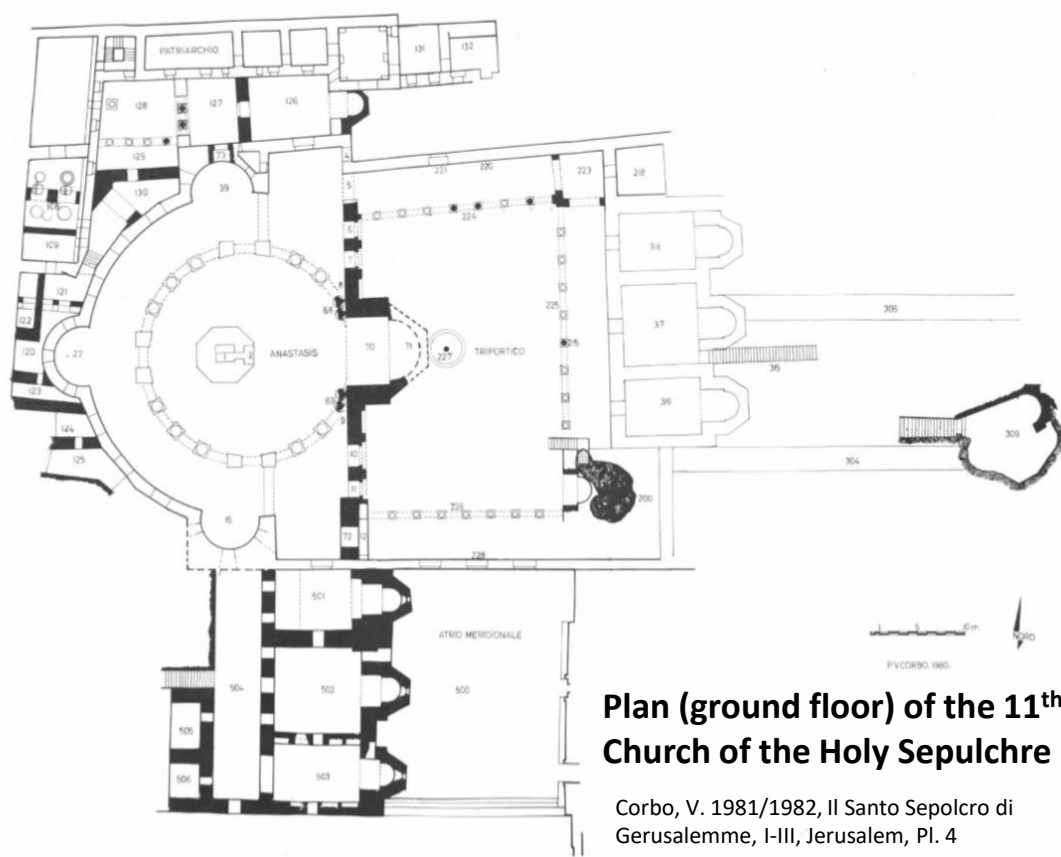
DESTRUCTION (?) & REPAIRS ON THE CONSTANTINEAN AEDICULE

According to Biddle:

“ There is thus **NO NEED TO ASSUME A CHANGE IN THE BASIC SHAPE OF THE EDICULE** between the late seventh and the late ninth centuries, and no need to suppose that the form of the Edicule built by Constantine did not survive unchanged until 1009”

Hypothesis of a partial east-west axis destruction

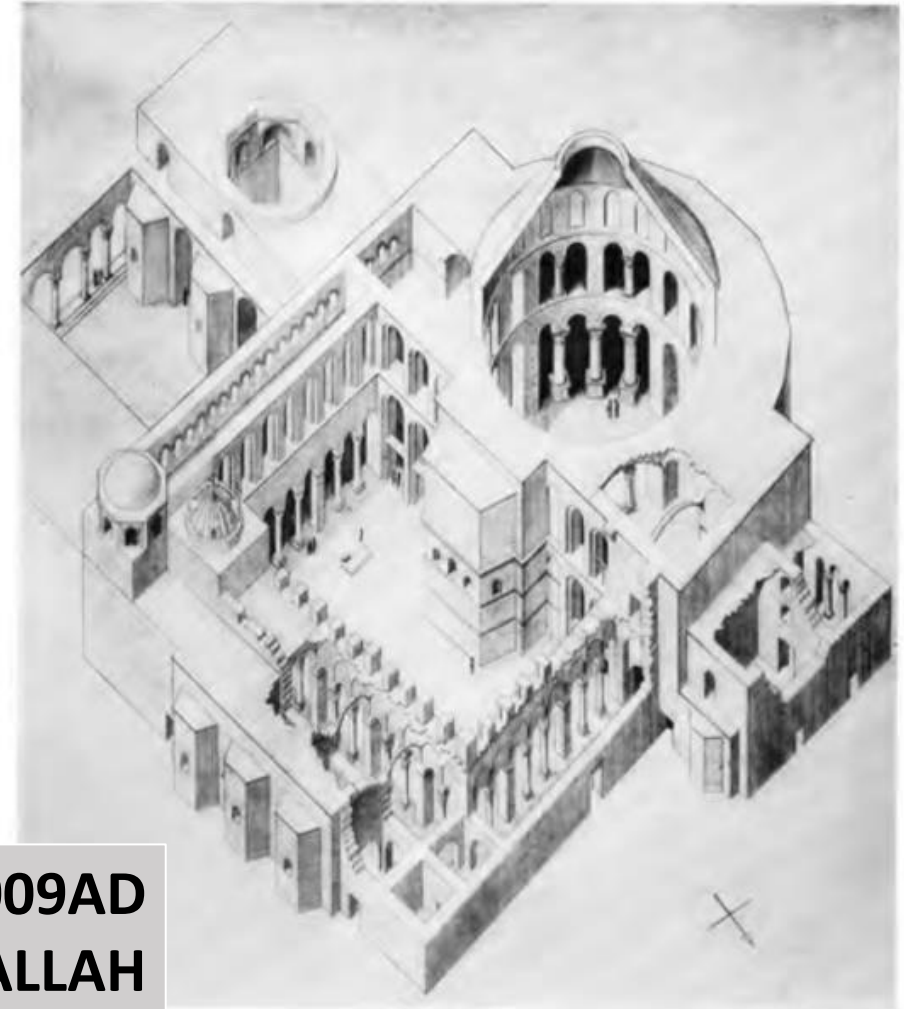




**Plan (ground floor) of the 11th c.
Church of the Holy Sepulchre**

Corbo, V. 1981/1982, *Il Santo Sepolcro di Gerusalemme*, I-III, Jerusalem, Pl. 4

The Church of the Holy Sepulchre:
Reconstruction of the structure rebuilt in the eleventh century:
Coüasnon 1974, Pl. XXV



1009AD

DESTRUCTION BY FATIMID CALIPH AL-ḤĀKIM BI-AMR ALLAH

11th CENTURY CHURCH OF THE HOLY SEPULCHRE

The Constantinian Basilica was destroyed by the Fatimid Caliph al-Ḥākīm bi-Amr Allah in 1009

There is limited information regarding the extent of damage to the Aedicule, it is often referred as significant, but recent findings indicate contradicting evidence....

(e.g. remnants of Constantinian phase within the Tomb Chamber)



335AD ± 235

345AD ± 230



11th
cent.???

REPAIR (?) WORKS BY AL-ḤĀKIM'S MOTHER MARIA

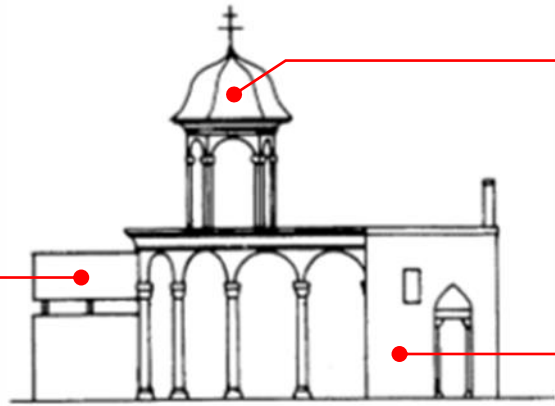
REPAIRING THE HOLY AEDICULE

1014AD

In 1014, five years after the destruction of the church **al-Ḥākīm's mother Maria, a Christian** whose brother Orestes had been Patriarch of Jerusalem, began '**to rebuild with well-dressed squared stones the Temple of Christ** destroyed by her son's order' (*reedificare Christi templum, iussu eius filii eversum, politis et quadris lapidibus*). Glaber, History, 3.25

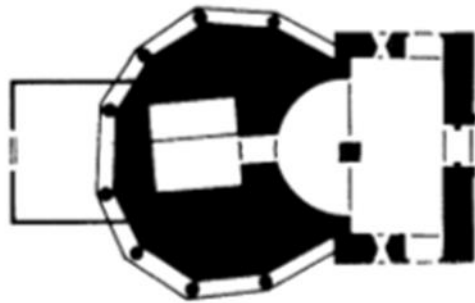
BUT WHAT DID AL-ḤĀKIM'S MOTHER MARIA REBUILD?...

CHAPEL ATTACHED TO THE WEST END of the Aedicule (now the Coptic Chapel)



CUPOLA CARRIED ON PILLARS and set on top of the western structure, over the burial chamber

ENCLOSED EASTERN COMPARTMENT (now the Chapel of the Angel), **with 3 doors**, fully integrated with the **POLYGONAL WESTERN STRUCTURE**



HYPOTHESIS:

Biddle, M.: The Tomb of Christ. Gloucestershire England, Sutton (1999), p. 68, Fig. 64

Some time before 1106, most possibly during the reigns of either **Michael IV Paphlagonian (1037-41)** or **Constantine Monomachos (1042-55)**, the Church was rebuilt

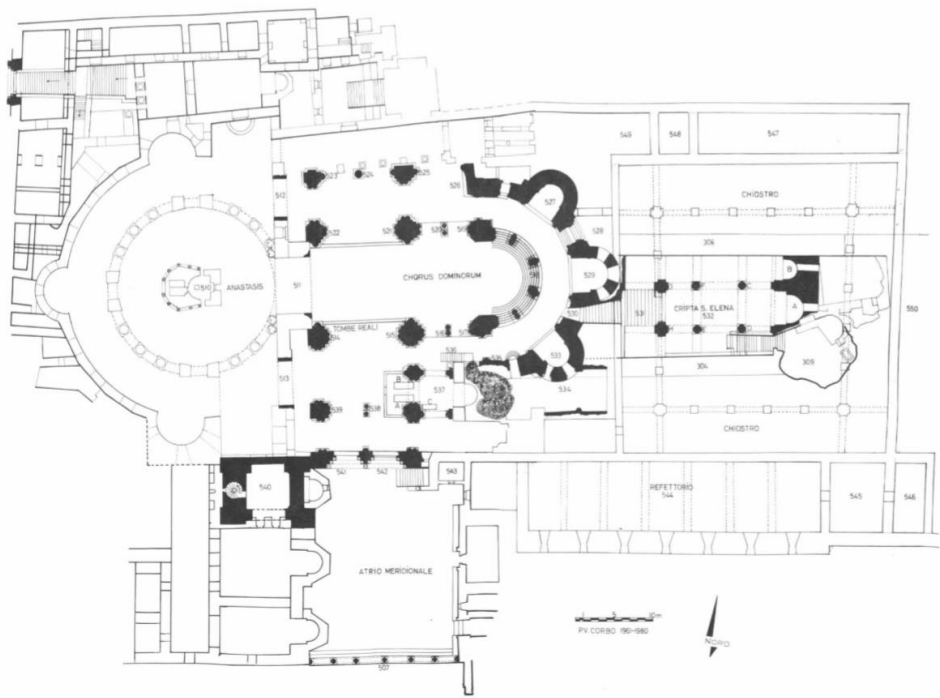
The **HOLY AEDICULE WAS REBUILT** as verified by the archaeometric results from mortar samples taken from the masonry area at the entrance of the Tomb Chamber, which are dated as 1040±40.

1037AD

THE BYZANTINE AEDICULE

REBUILDING THE HOLY AEDICULE

- The **AEDICULE** ceased to be a monolith with a tomb hewn into it, and became **A STRUCTURE** of which **UPPER, EAST AND WESTERN PARTS** were henceforth **BUILT**.

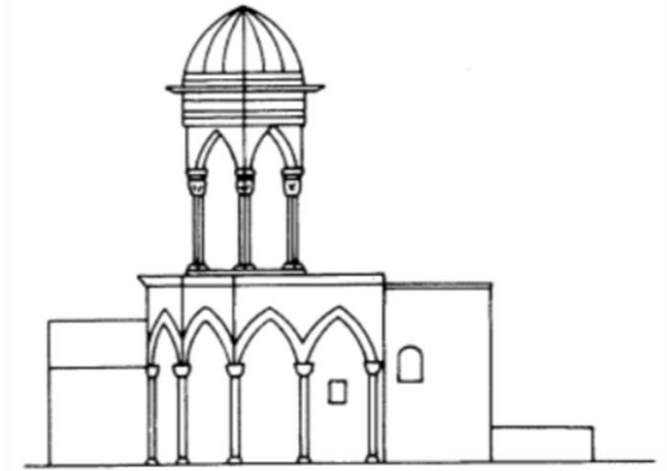


Jerusalem was conquered by the Crusaders in 1099. The Church was rebuilt in Romanesque style bringing together, for the first time, the Holy Sepulchre, the Rock of Golgotha, the Chorus Dominorum, and various chapels under one roof. The structure was inaugurated on the 50th anniversary of the Crusader conquest, July 15, 1149

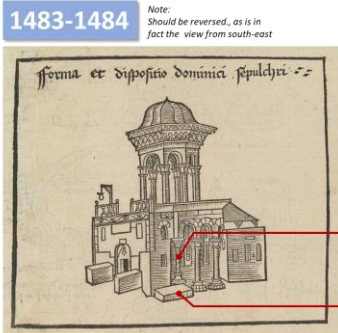
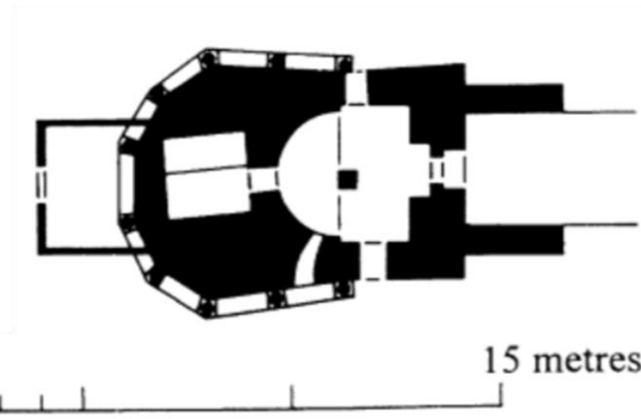
Plan (ground floor) of the 12th c. Church of the Holy Sepulchre

Corbo, V. 1981/1982, Il Santo Sepolcro di Gerusalemme, I-III, Jerusalem, Pl. 6

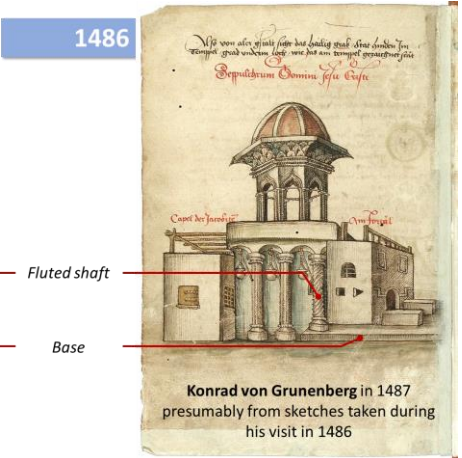
HYPOTHESIS:
Biddle, M.: The Tomb of Christ.
 Gloucestershire England,
 Sutton (1999), p. 68, Fig. 64



1149AD
THE AEDICULE OF THE CRUSADERS
 12th CENTURY AEDICULE MODIFICATIONS



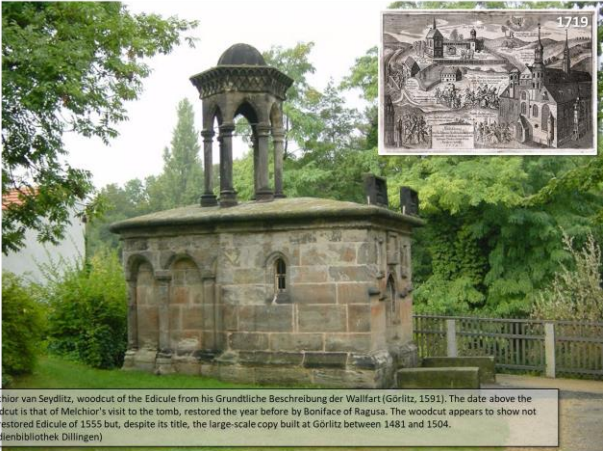
Erhard Reuwich 1486, in Bernhard von Breydenbach, Peregrinatio in terram sanctam



Konrad von Grunenberg in 1487 presumably from sketches taken during his visit in 1486



Copy of the Holy Aedicule Heiliges Grab, Görlitz, Germany between 1481 and 1504. (Studienbibliothek Dillingen)

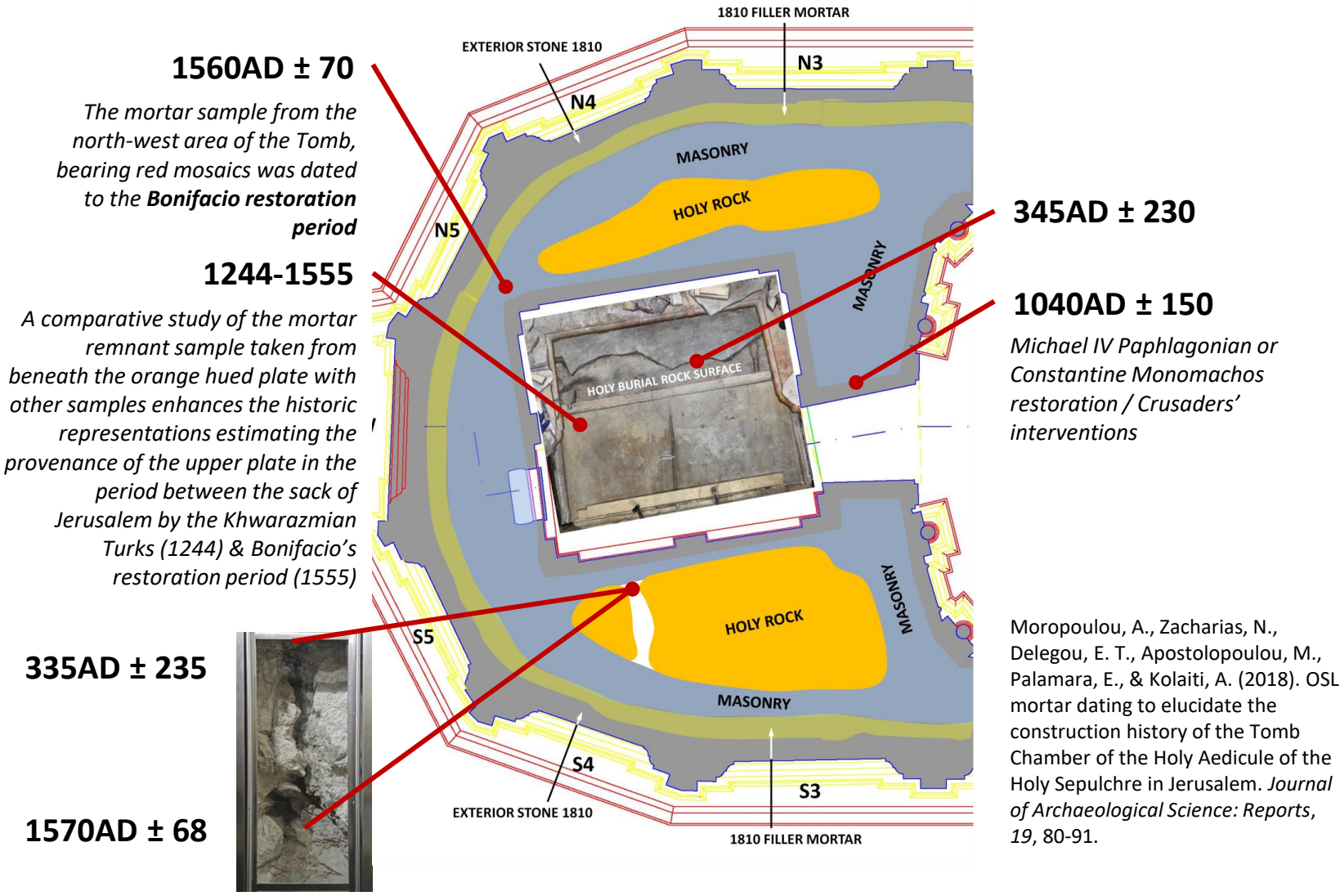


Melchior van Seydlitz, woodcut of the Edicule from his Grundtliche Beschreibung der Wallfahrt (Görlitz, 1591). The date above the woodcut is that of Melchior's visit to the tomb, restored the year before by Boniface of Ragusa. The woodcut appears to show not the restored Edicule of 1555 but, despite its title, the large-scale copy built at Görlitz between 1481 and 1504. (Studienbibliothek Dillingen)

1555AD

THE BONIFACIO RESTORATION

THE RENAISSANCE AEDICULE



Boniface of Ragusa was appointed Custos of the Holy Land in 1551

He opened the Tomb on 27 August 1555

- **DID BONIFACIO MODIFY SIGNIFICANTLY THE HOLY AEDICULE?**
- *If yes, why are there remnants of the previous construction phases?*

Moropoulou, A., Zacharias, N., Delegou, E. T., Apostolopoulou, M., Palamara, E., & Kolaiti, A. (2018). OSL mortar dating to elucidate the construction history of the Tomb Chamber of the Holy Aedicule of the Holy Sepulchre in Jerusalem. *Journal of Archaeological Science: Reports*, 19, 80-91.



1586

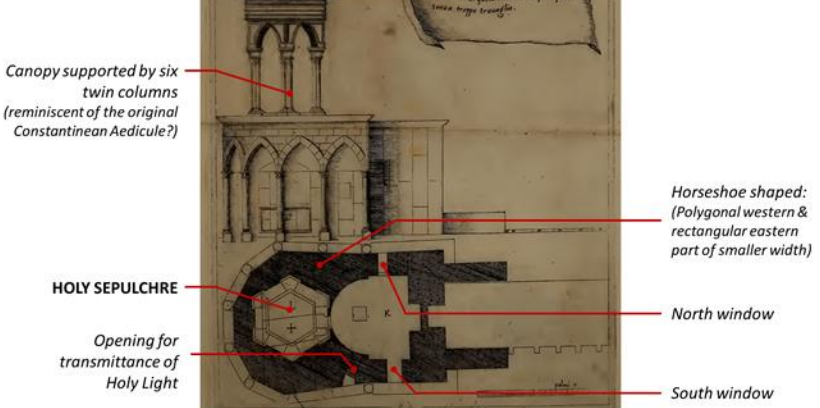
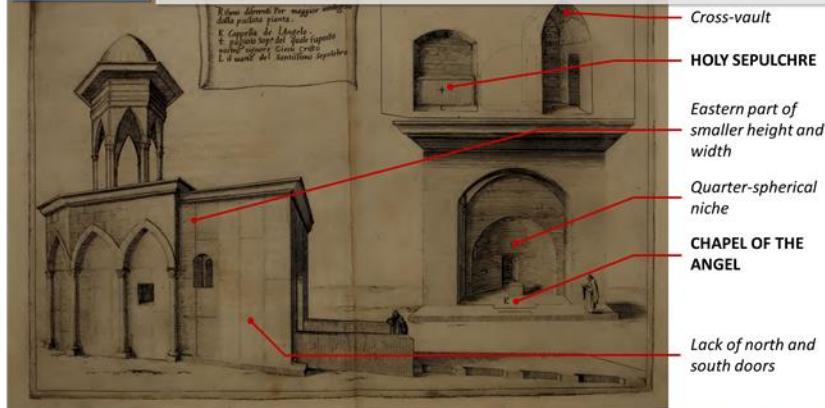
GIOVANNI ZUALLARDO

Il devotissimo viaggio di Gerusalemme, Rome 1595



- A. Cuppola.
- B. Il ss. Sepolcro.
- C. Antico capellotto.
- D. L'altare per di destra.
- E. Il vacuo dell'anticapellotto.
- F. La prima porta.
- G. Bocca dell'ss. Sepolcro.
- H. Pietra sopra la quale scodon l'Angelo.

1593-1597 BERNARDINO AMICO DA CALLIPOLI



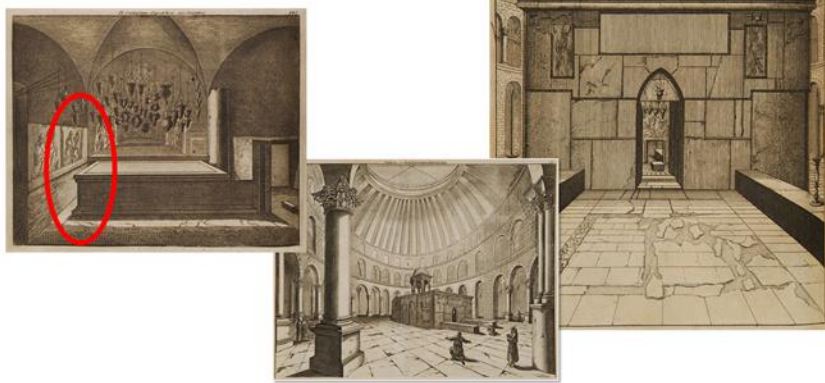
- Cross-vault
- HOLY SEPULCHRE
- Eastern part of smaller height and width
- Quarter-spherical niche
- CHAPEL OF THE ANGEL
- Lack of north and south doors

- Canopy supported by six twin columns (reminiscent of the original Constantinian Aedicule?)
- Horseshoe shaped: (Polygonal western & rectangular eastern part of smaller width)
- North window
- South window
- HOLY SEPULCHRE
- Opening for transmittance of Holy Light

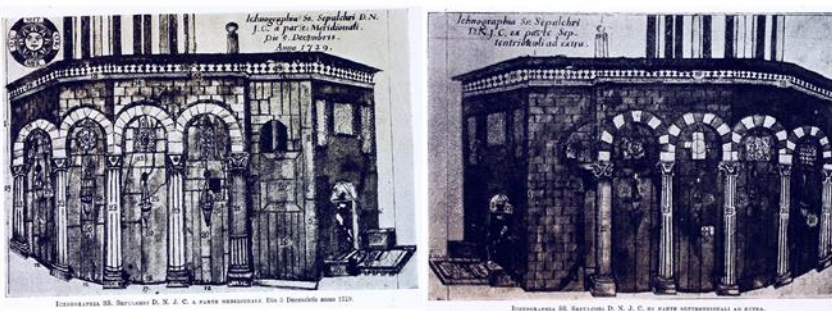
1703-1705 PAUL LUCAS

Voyage du Sieur Paul Lucas, fait par ordre du roy dans la Grece, l'Asie Mineure, la Macedoine et l'Afrique, vol. II, Paris, Nicolas Simart, MDCCXV

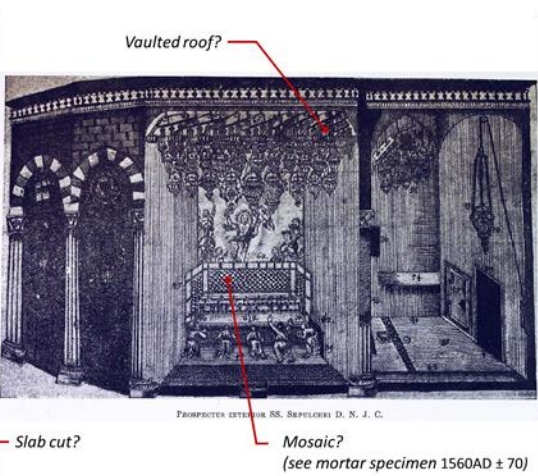
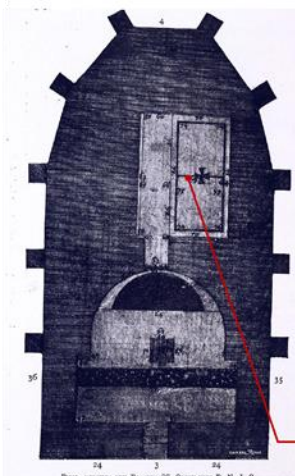
1681 CORNELIS de BRUYN



1724-1742 FR. ELLZEAR HORN

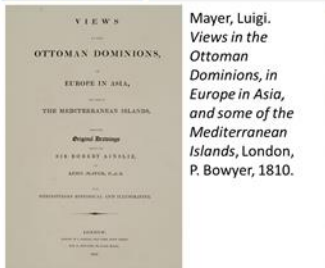


Ichnographia Locorum et Monumentorum Veterum TERRAE SANCTAE, accurate delineatae et descriptae a P. ELZEARIO HORN Ordinis Minorum Provinciae Thuringiae (1725-44) Editor P. HIERONYMUS GOLUBOVICH. Studium Biblicum Franciscanum, 1902

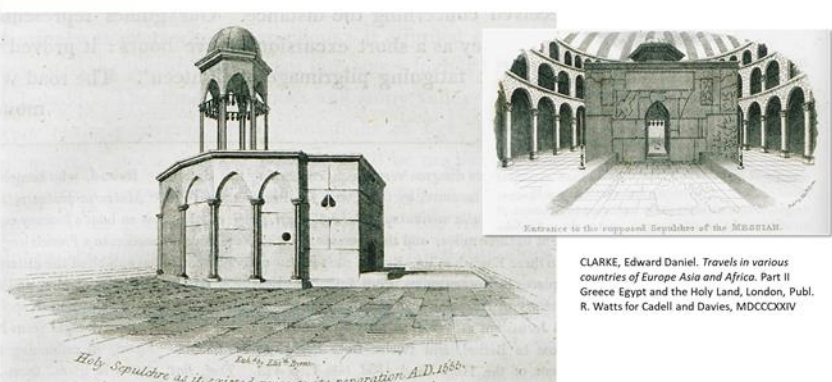


- Vaulted roof?
- Slab cut?
- Mosaic? (see mortar specimen 1560AD ± 70)

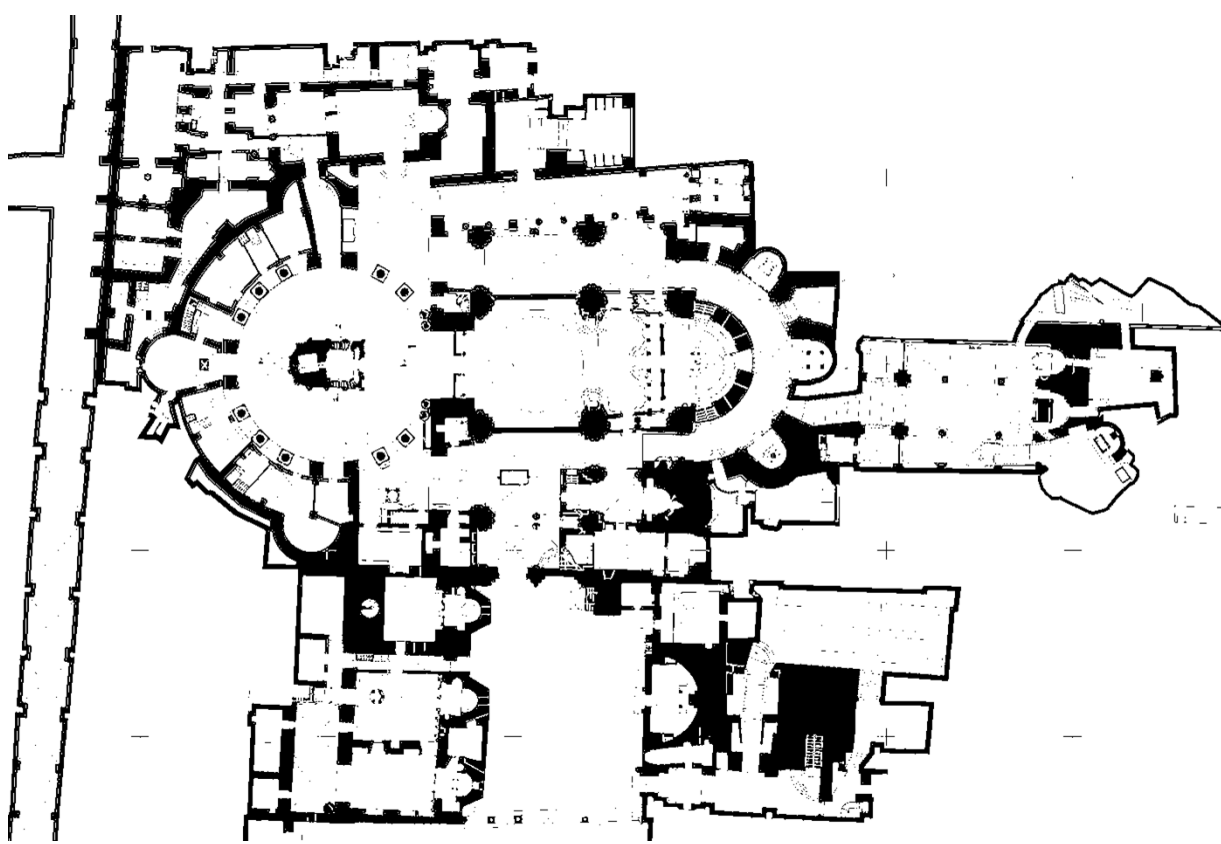
prior 1801 LUIGI MAYER



1799-1804 EDWARD DANIEL CLARKE



Clarke, Edward Daniel. Travels in various countries of Europe Asia and Africa. Part II Greece Egypt and the Holy Land. London, Publ. R. Watts for Cadell and Davies, MDCCCXIV



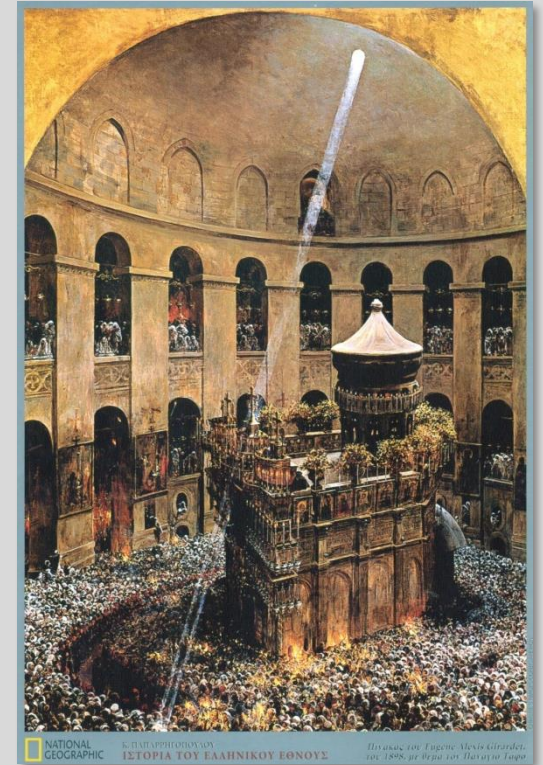
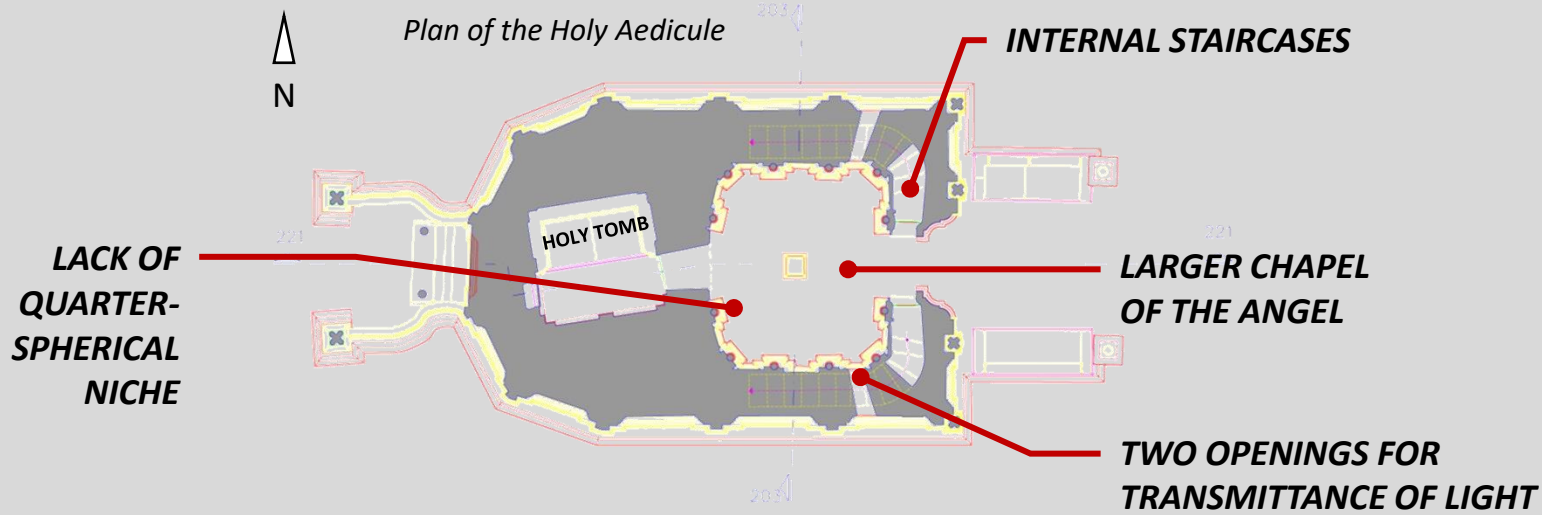
Serious damage was caused in 1808, when an accidental fire became uncontrolled and caused the dome of the Rotunda to collapse over the Aedicule. After a special edict (firman) was obtained by the Greeks from the Sultan Mahmud II, the Greek architect “Kalfas” Komnenos rebuilt the Church of the Holy Sepulchre and the Holy Aedicule.

Komnenos rebuilt the Aedicule in the contemporary Ottoman Baroque style, effectively embedding the remaining core of the Tomb chamber within the new, larger, Aedicule structure. The restored Church was inaugurated on 13th September 1810

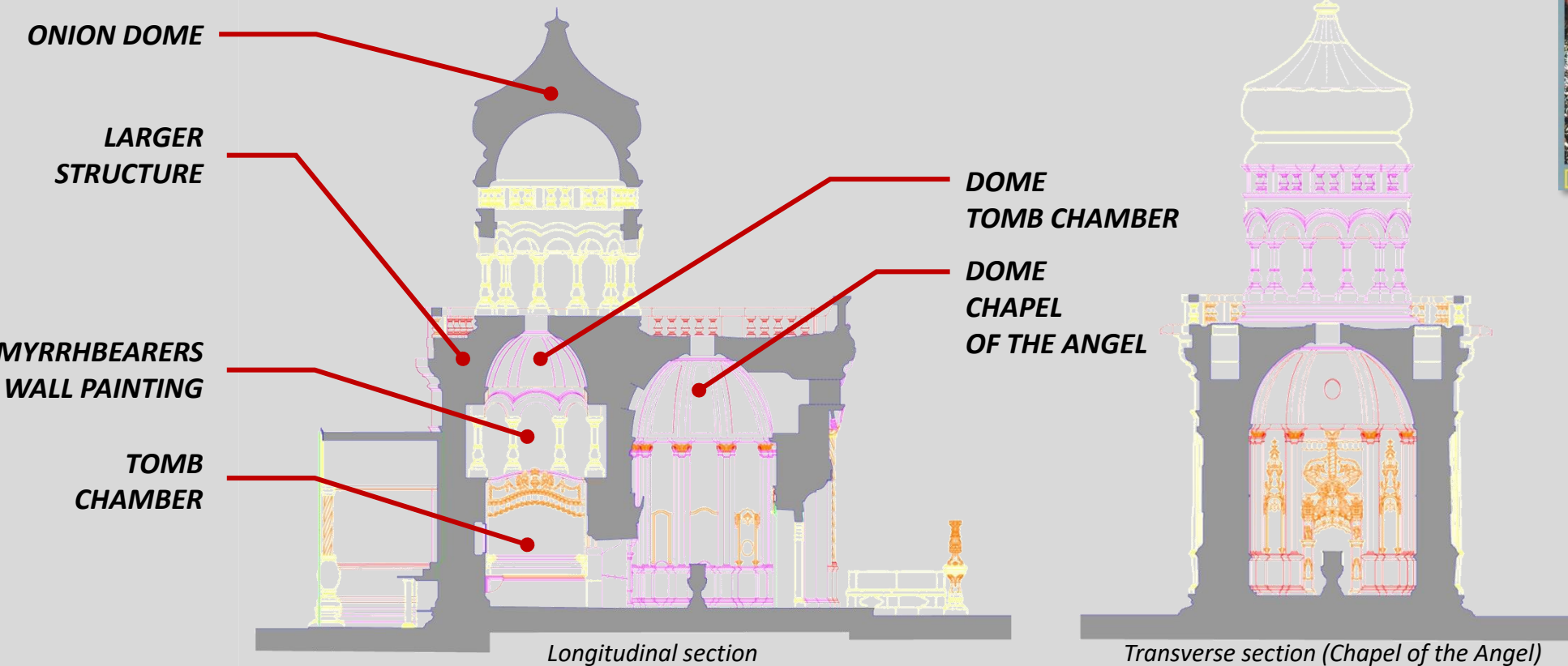
1810AD

THE REBUILT AEDICULE OF KALFAS KOMNENOS

THE CONTEMPORARY HOLY AEDICULE



Painting (1898)
Eugène Alexis Girardet

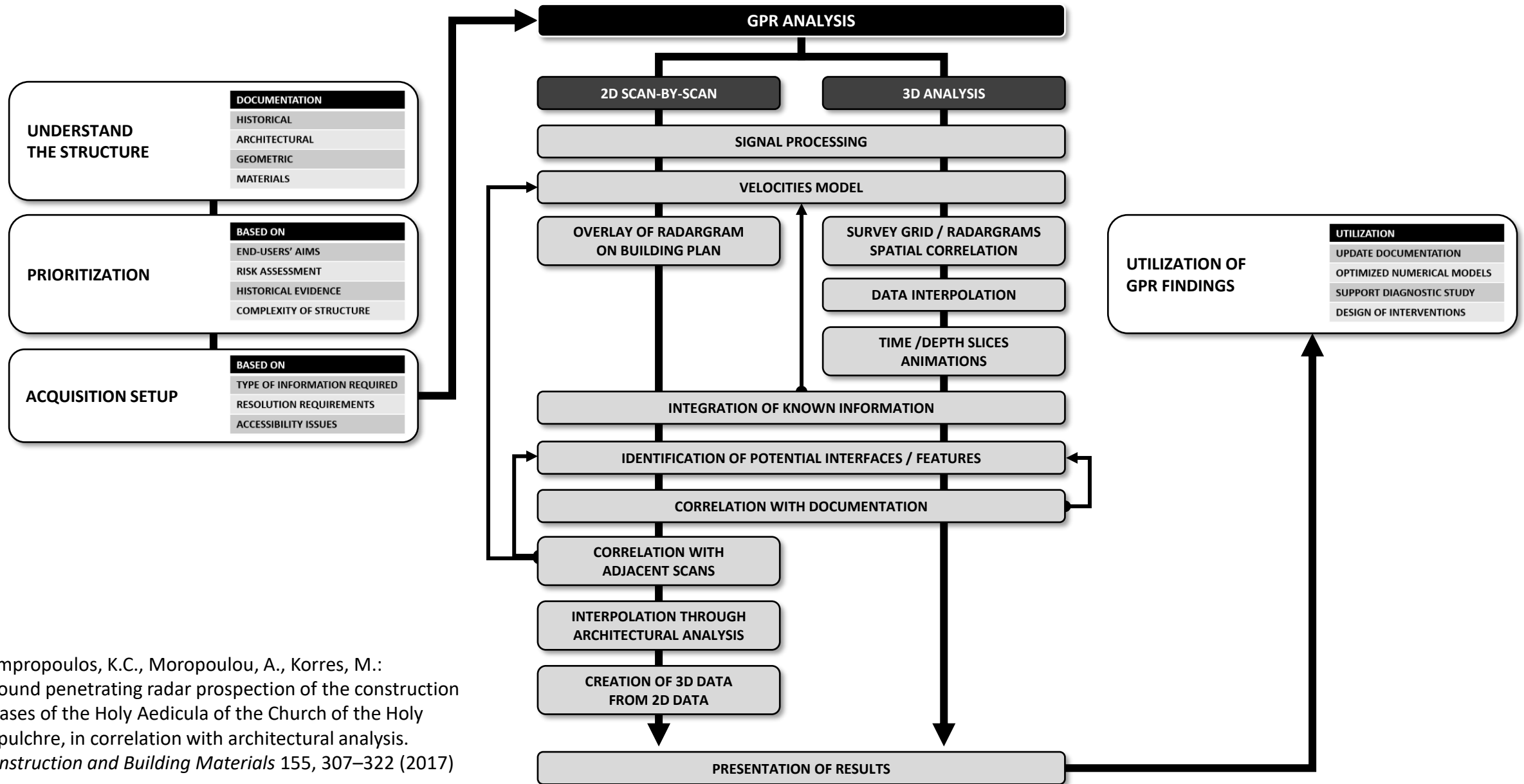


Plans (2003) by
Prof. G. Lavas (NKUA),
Prof. D.D. Mpalodimos (NTUA)

Thus, with all this largely unknown history and contradicting information regarding the structural evolution of the Holy Aedicule, how do we proceed with its non-destructive prospection?

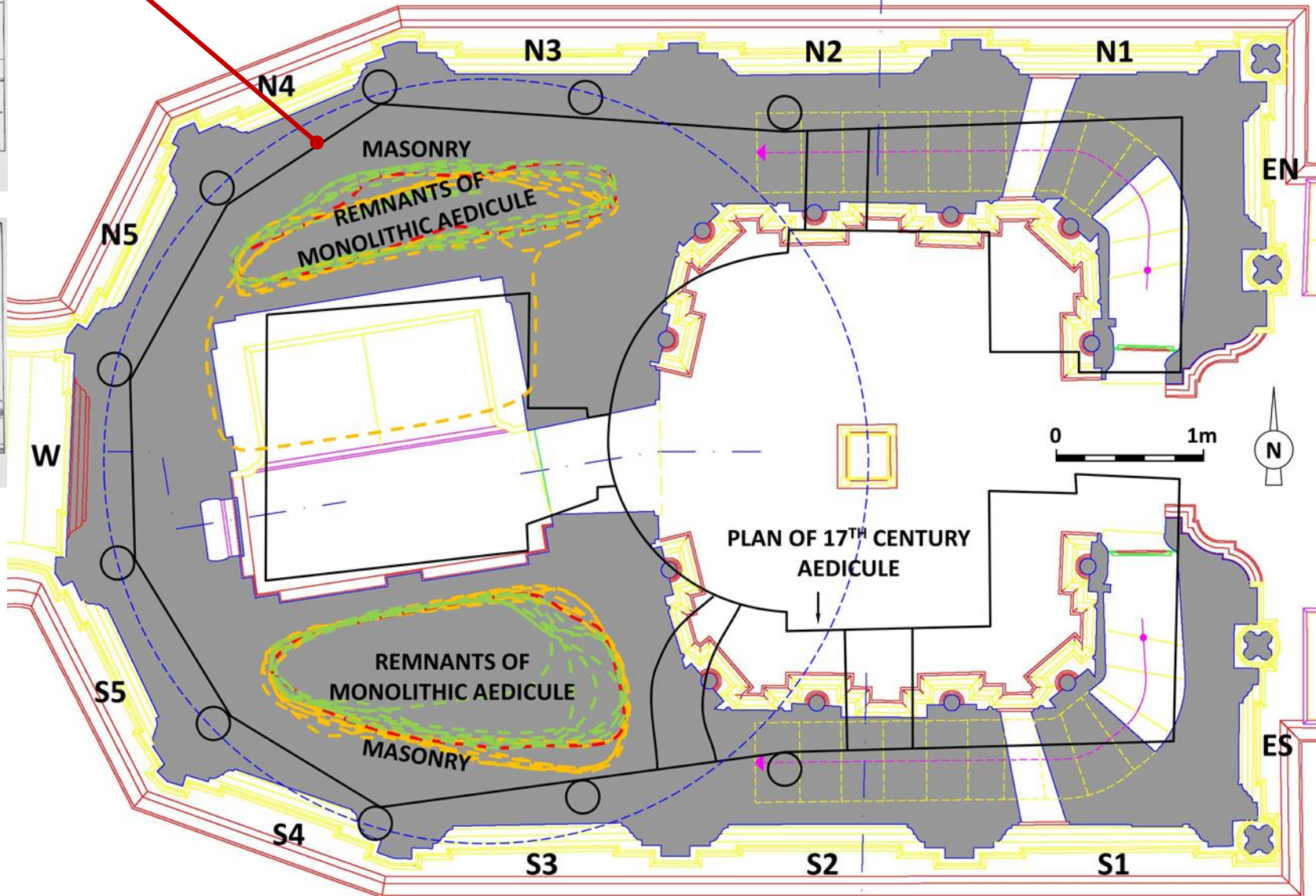
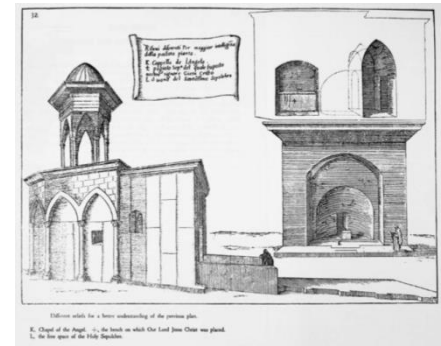
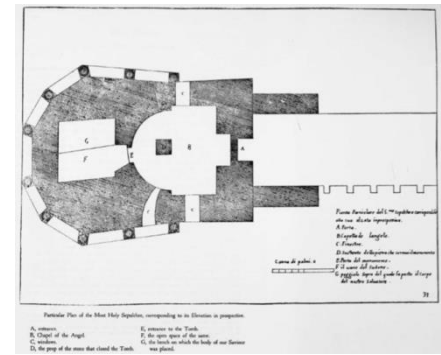


General experimental procedure for the use of GPR in built cultural heritage applications



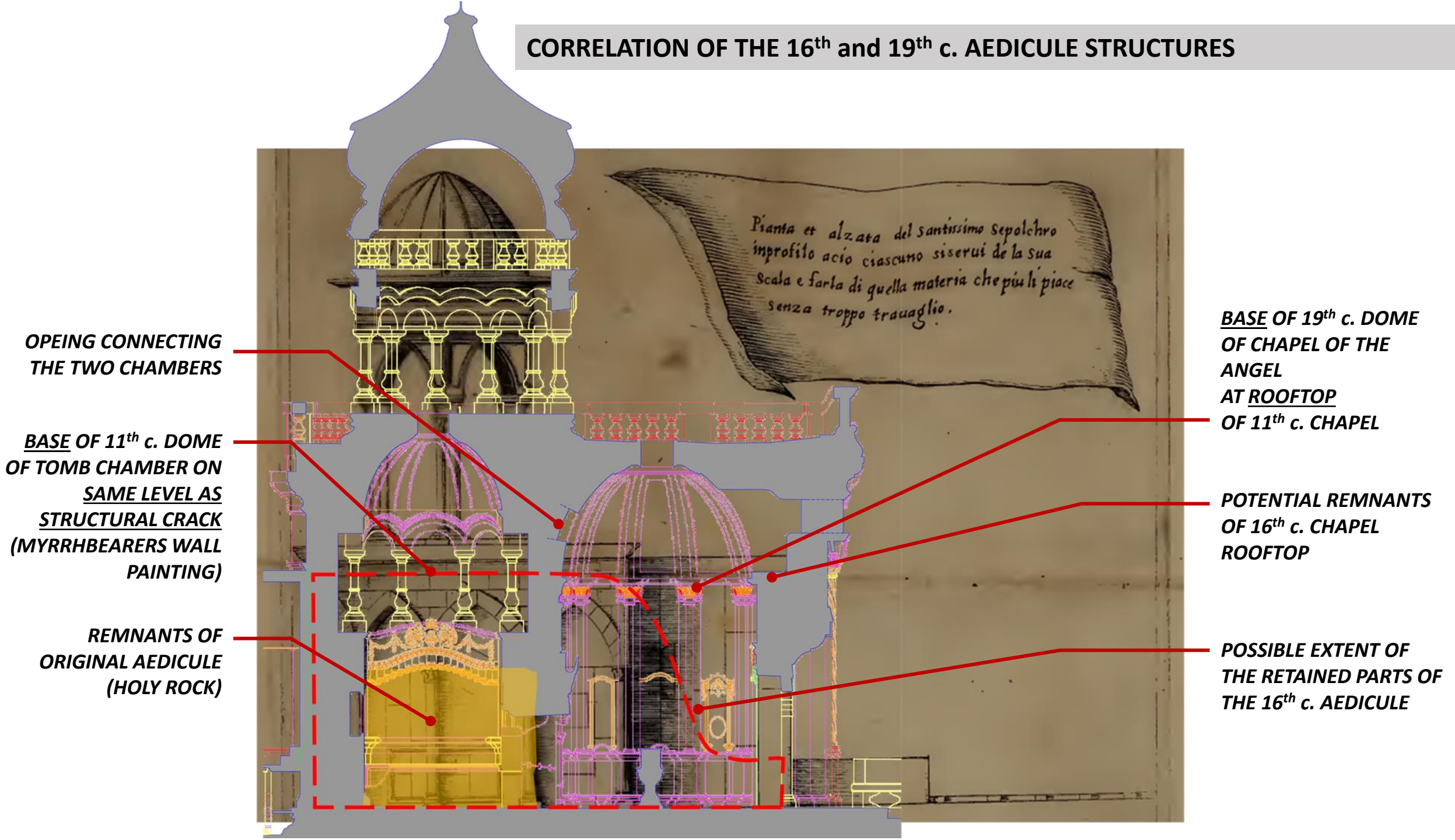
Lampropoulos, K.C., Moropoulou, A., Korres, M.:
 Ground penetrating radar prospection of the construction
 phases of the Holy Aedicula of the Church of the Holy
 Sepulchre, in correlation with architectural analysis.
Construction and Building Materials 155, 307–322 (2017)

CORRELATION OF THE 16th and 19th c. AEDICULE STRUCTURES

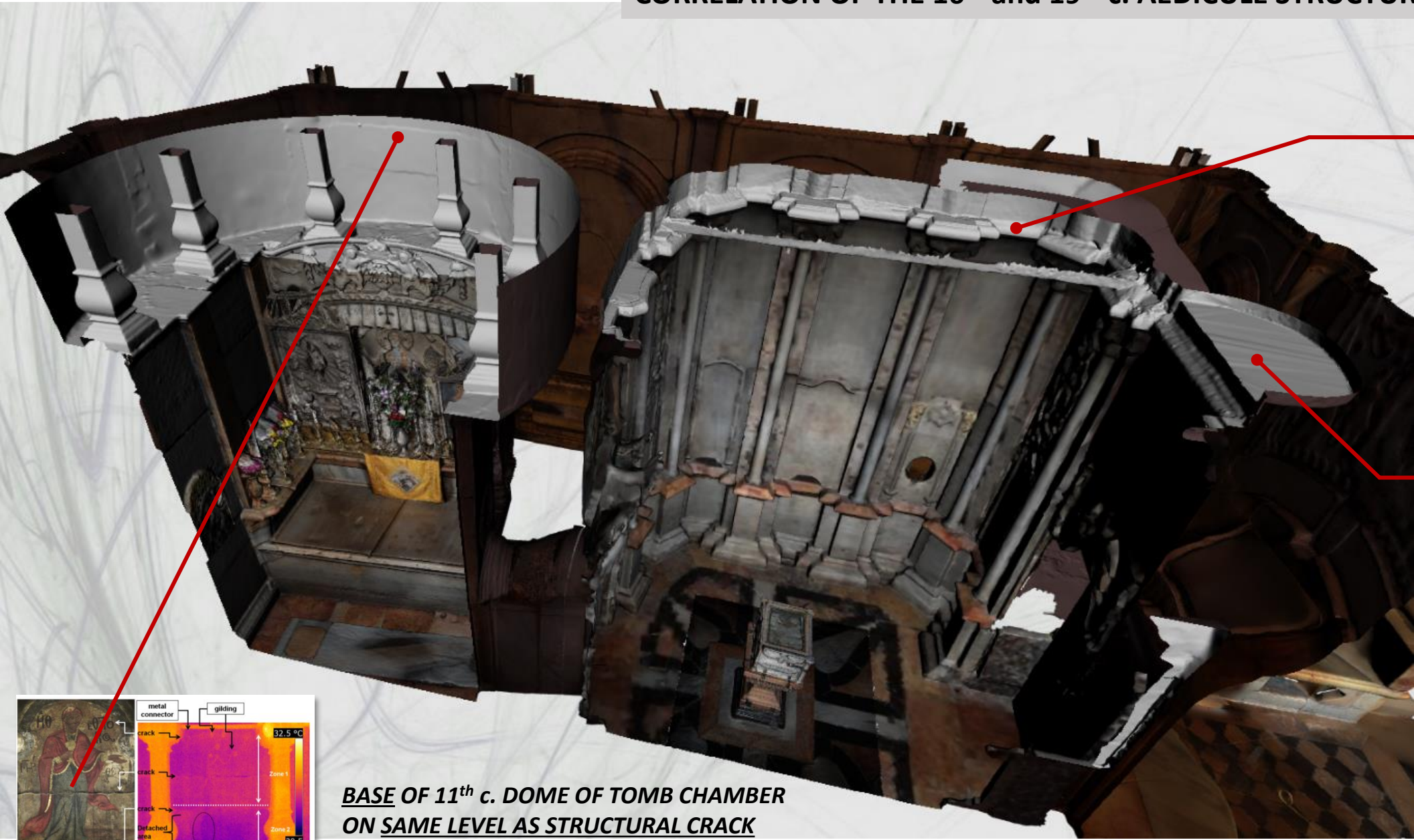


Lampropoulos, K.C., Moropoulou, A., Korres, M.: Ground penetrating radar prospection of the construction phases of the Holy Aedicula of the Church of the Holy Sepulchre, in correlation with architectural analysis. *Construction and Building Materials* 155, 307–322 (2017)

CORRELATION OF THE 16th and 19th c. AEDICULE STRUCTURES



CORRELATION OF THE 16th and 19th c. AEDICULE STRUCTURES

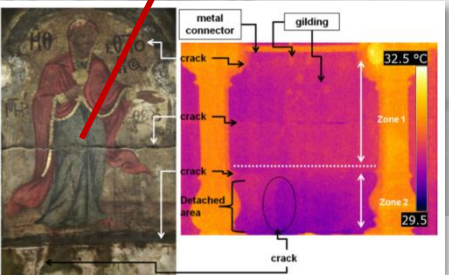


BASE OF 19th c. DOME OF CHAPEL OF THE ANGEL AT ROOFTOP OF 11th c. CHAPEL

POTENTIAL REMNANTS OF 16th c. CHAPEL OF THE ANGEL ROOFTOP

Alexakis, Emm. Delegou, E.T., Lampropoulos, K.C., Apostolopoulou, M., Ntoutsis, I., Moropoulou, A.: NDT as a Monitoring tool of the works progress and assessment of materials and rehabilitation interventions at the Holy Aedicule of the Holy Sepulchre. Construction and Building Materials. Construction and Building Materials 189 512-526 (2018)

BASE OF 11th c. DOME OF TOMB CHAMBER ON SAME LEVEL AS STRUCTURAL CRACK (MYRRHBEARERS WALL PAINTING)



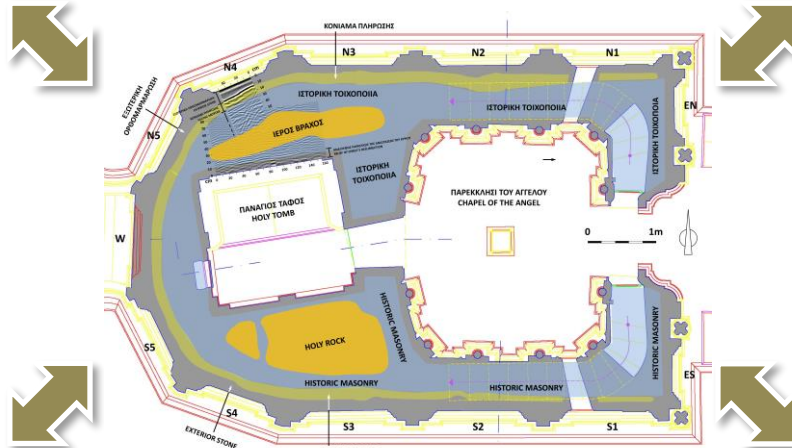
GEOMETRIC DOCUMENTATION



NATIONAL TECHNICAL UNIVERSITY OF ATHENS

Interaction with Rural, Survey and Geoinformatics Engineers

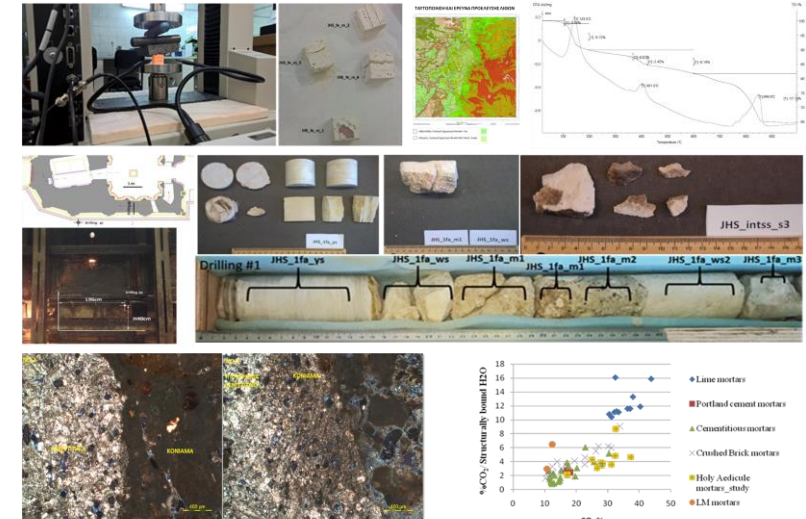
Interaction with Chemical Engineers



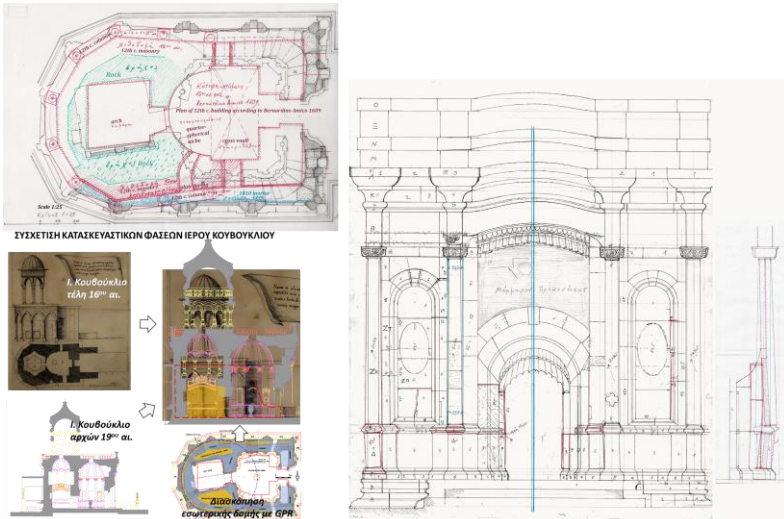
Interaction with Architects

Interaction with Civil Engineers

MATERIALS ANALYSIS

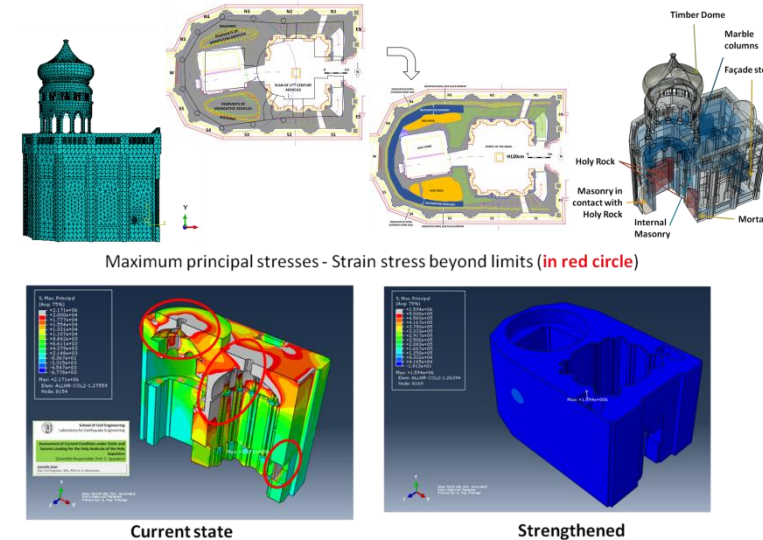


ARCHITECTURAL ANALYSIS



The characterization of materials, the architectural, historic, geometric documentation and the structural assessment of the monument function as **knowledge based digital infrastructure** to support the design of the **rehabilitation**

STRUCTURAL ANALYSIS



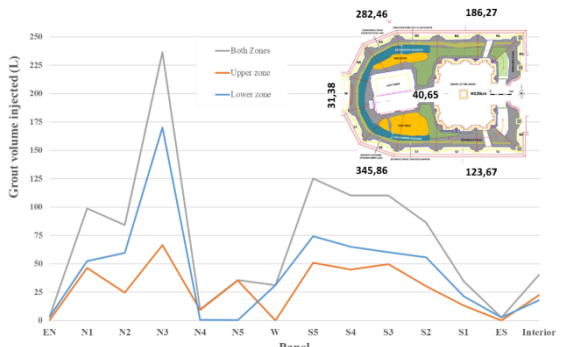
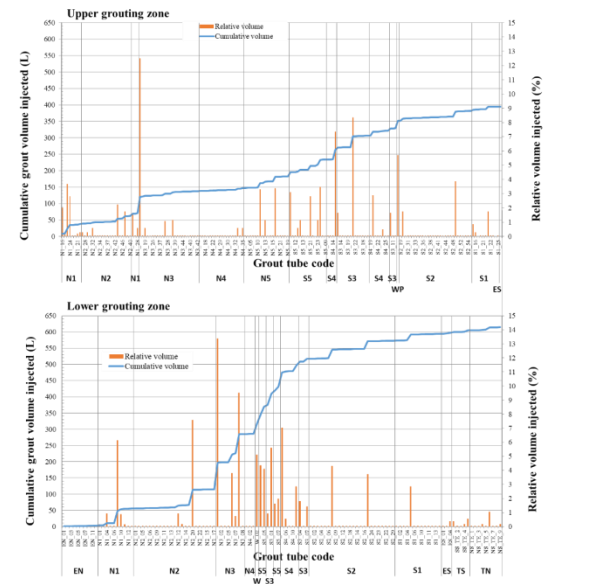
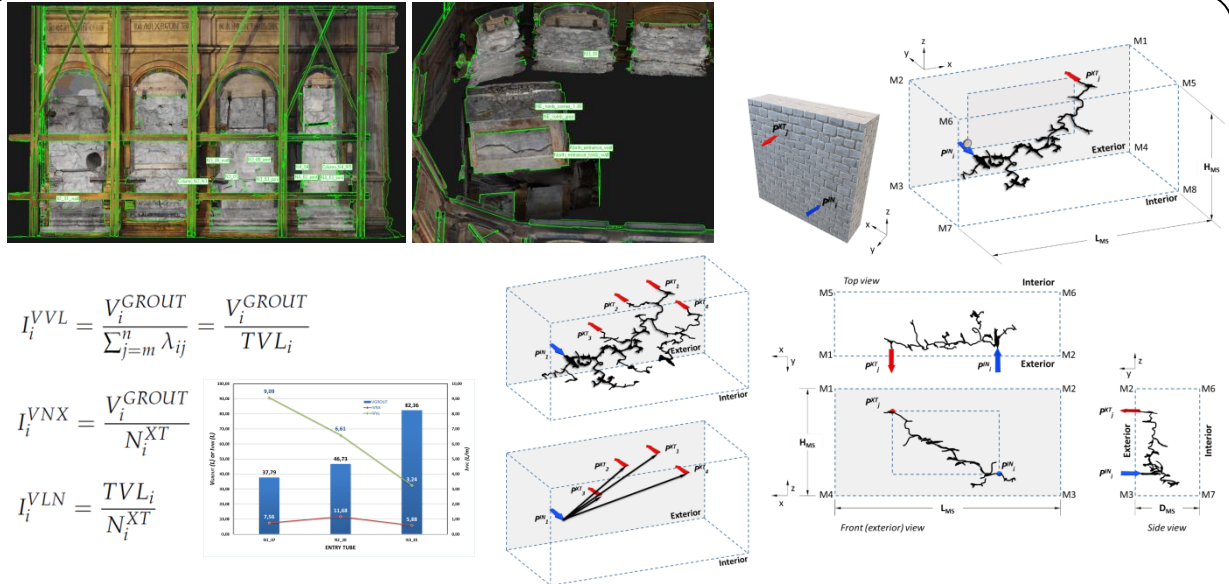


Table 1. Relationship between grout entry and grout exit tubes per panel.

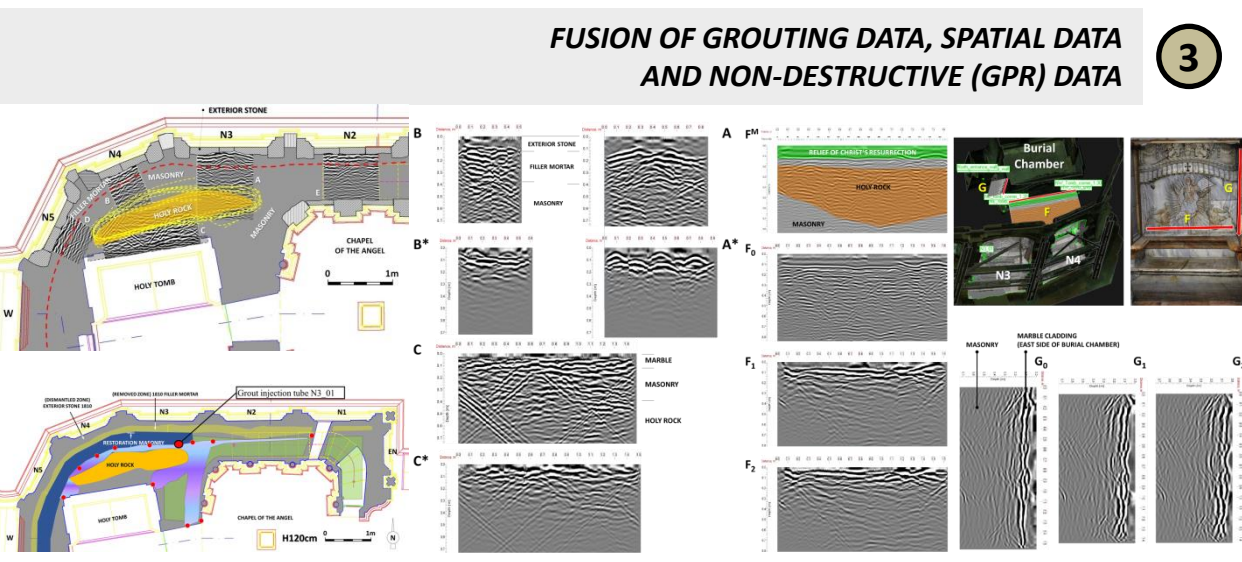
No. of Grout Entry Tubes	Lower Zone (Grouting 0-1.5 m)												
	EN	N1	N2	N3	N4	N5	W	S5	S4	S3	S2	S1	ES
0													
1													
2													
3													
4													
5													
6													
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GROUTING DATA ANALYSIS 1



CORRELATION OF SPATIAL DATA & GROUTING DATA 2



K.C. Lampropoulos, M. Apostolopoulou, E. Tsilimantou, A. Moropoulou. The Grouting Process as an Innovative Tool for the Assessment of the State of Preservation and Internal Features of the Holy Aedicule of the Holy Sepulchre. *Heritage*, 5, 61–87, 2022

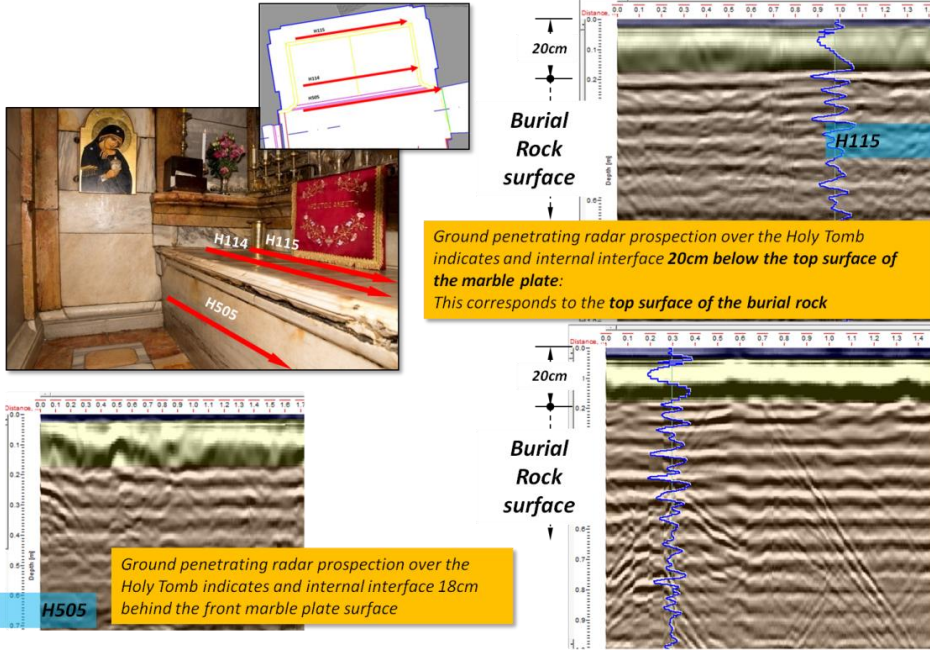
Evolution of the strengthening/homogenization, though co-analysis of spatial data and NDT data, as a tool for the assessment of the Holy Aedicule structure



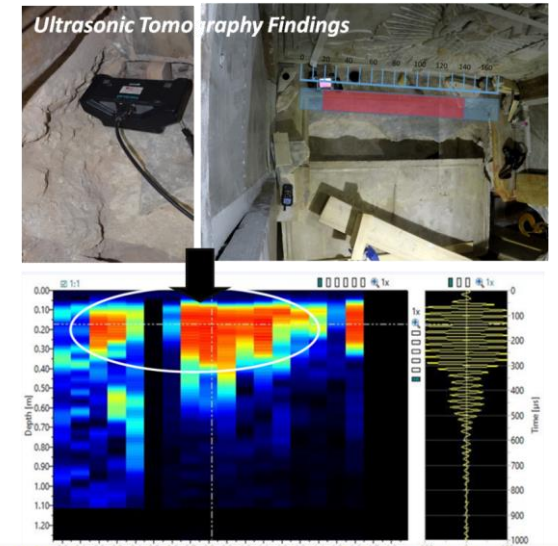
Next Step: ARTIFICIAL INTELLIGENCE

REVEALING AND PRESERVING THE VALUES: INNOVATIVE NDT INSPECTION TO REVEAL THE BURIAL MONUMENT'S MORPHOLOGY

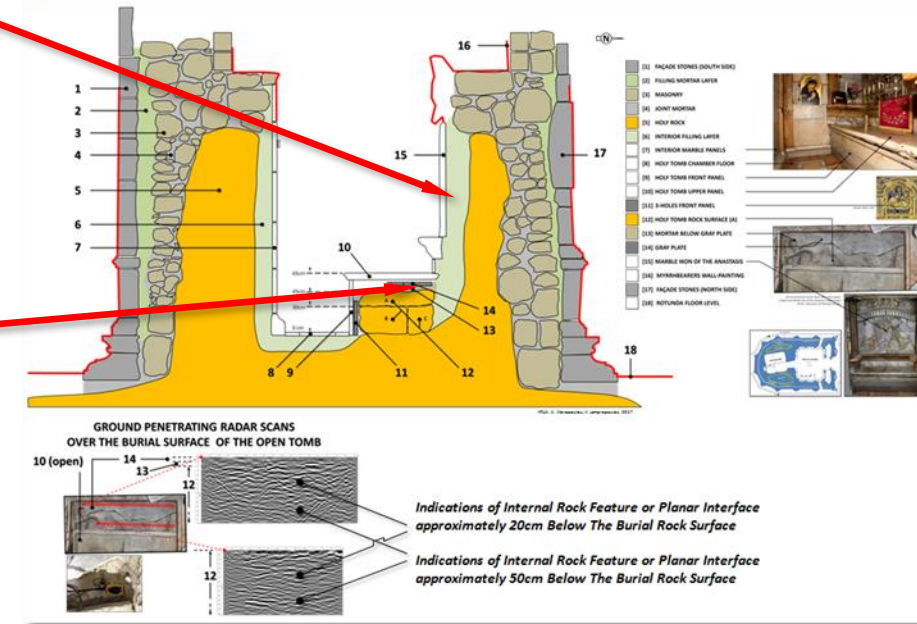
Georadar prospection over the closed tomb



Ground penetrating radar prospection of the opened Tomb

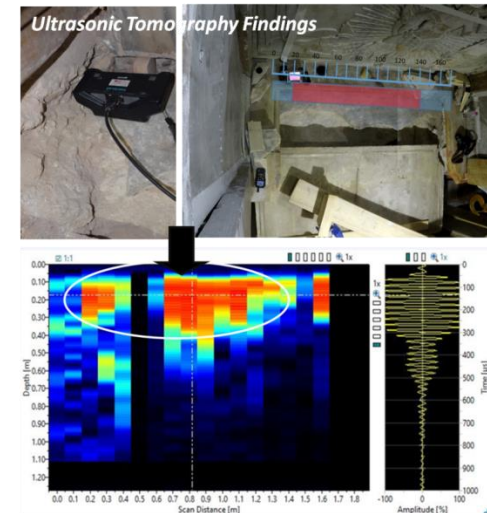
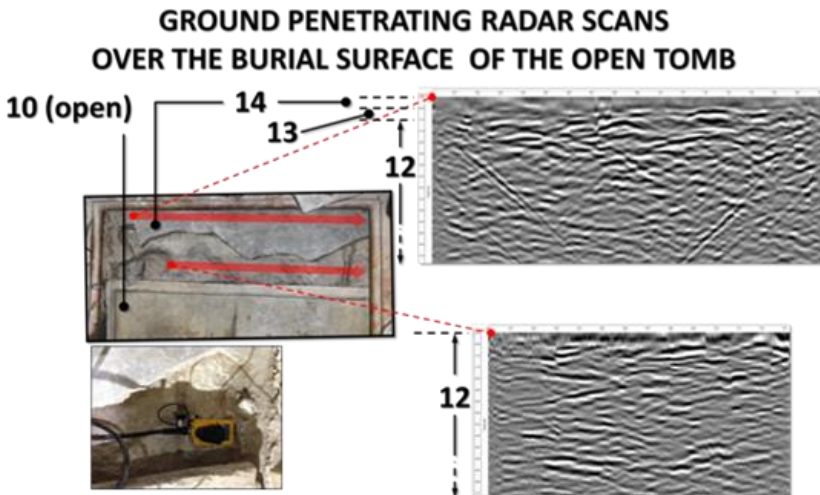


CONCEPTUAL DESCRIPTION OF HOLY TOMB BASED ON GEORADAR FINDINGS

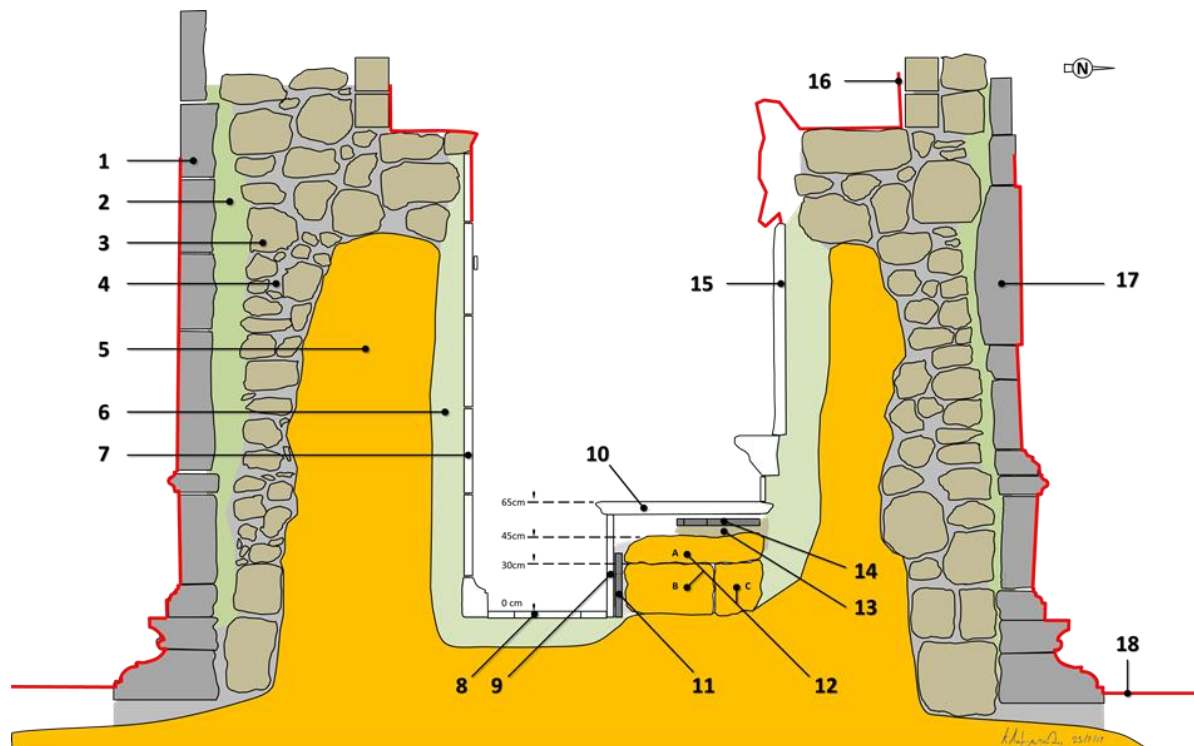


Digital portable microscopy over the burial surface





Μη-καταστρεπτικός έλεγχος για την λεπτομερή τεκμηρίωση της εσωτερικής δομής του ταφικού θαλάμου



LEGEND

- [1] FAÇADE STONES (SOUTH SIDE)
- [2] FILLING MORTAR LAYER
- [3] MASONRY
- [4] JOINT MORTAR
- [5] HOLY ROCK
- [6] INTERIOR FILLING LAYER
- [7] INTERIOR MARBLE PANELS
- [8] HOLY TOMB CHAMBER FLOOR
- [9] HOLY TOMB FRONT PANEL
- [10] HOLY TOMB UPPER PANEL
- [11] 3-HOLES FRONT PANEL
- [12] HOLY TOMB ROCK SURFACE (A)
- [13] MORTAR BELOW GRAY PLATE
- [14] GRAY PLATE
- [15] MARBLE IKON OF THE ANASTASIS
- [16] MYRRHBEARERS WALL-PAINTING
- [17] FAÇADE STONES (NORTH SIDE)
- [18] ROTUNDA FLOOR LEVEL



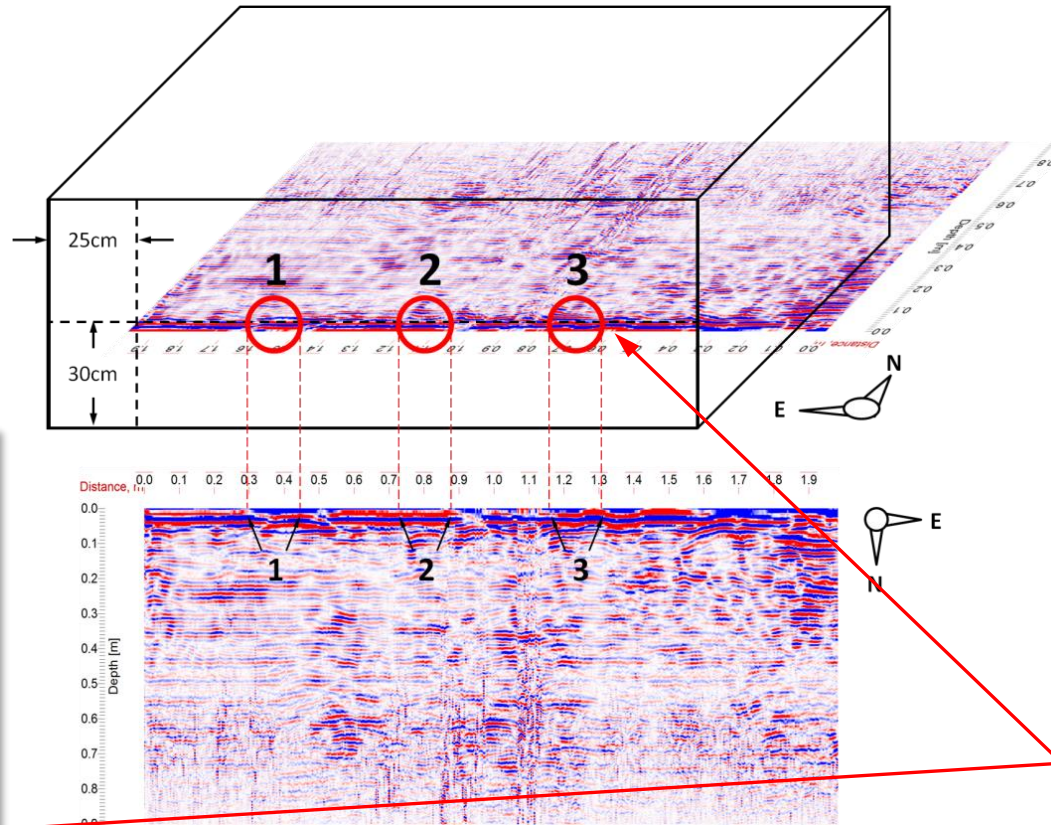


REVEALING AND PRESERVING THE VALUES: GROUND PENETRATION RADAR REVEALS THE THREE HISTORICAL PORTHOLES

(A. Moropoulou, K. Lampropoulos, M. Apostolopoulou 2017) based on recent findings and GPR survey



Verdun Altar, 1181
Nikolaus von Verdun



Battistero di San Giovanni in Tumba
Tomba di Rotari

THREE LARGE ROUNDELS REPRESENTING THE 'PORT-HOLES' which were a key feature of the burial couch in the Aedicule from c. 1100 or before until the 14th century

Ground penetrating radar indicates the presence of remnants of the **earlier front marble panel of the Holy Tomb**, between the current one and the Tomb.

REFLECTIONS CORRESPOND TO THE EDGES OF THE THREE HISTORICAL PORTHOLES.



NATIONAL TECHNICAL UNIVERSITY OF ATHENS

Interdisciplinary Research Group for the Monuments Protection

**UNDERGROUND INTERVENTIONS AT THE HOLY SEPULCHER ROTUNDA AREA
TO ASSURE SAFETY AND SUSTAINABILITY OF THE HOLY AEDICULE REHABILITATION**

***Non-destructive prospection of the underground structures and
water and humidity sources (canals, cisterns and voids)***

Chief Scientific Supervisor: Prof. A. Moropoulou

Prof. A. Moropoulou, Dr. K. C. Lampropoulos, PhD Cand. Em. Alexakis*, P. Sotiropoulos***

**School of Chemical Engineering, National Technical University of Athens, ** Terra Marine, Greece*

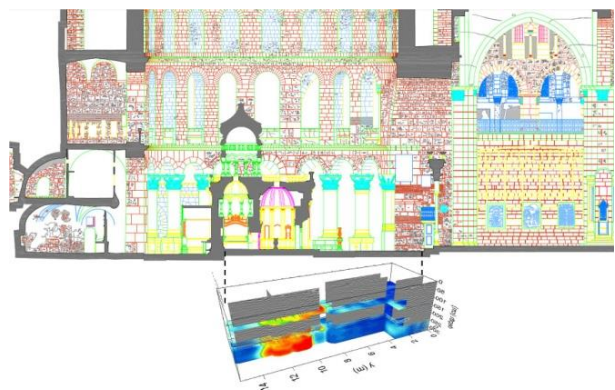
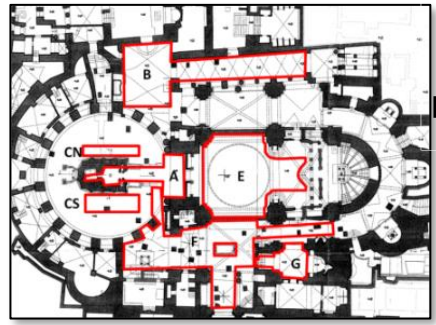
In cooperation with Athens Water Supply and Sewerage Company (EYDAP S.A.):

A. Aggelopoulos, E. Karampelas and D. Tamvakeras

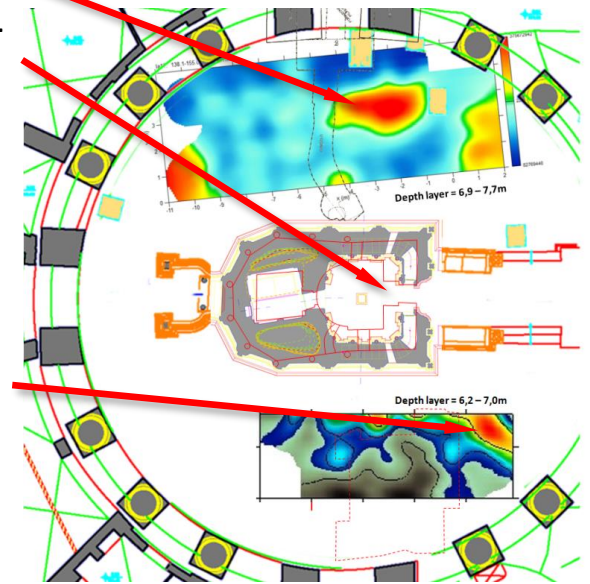
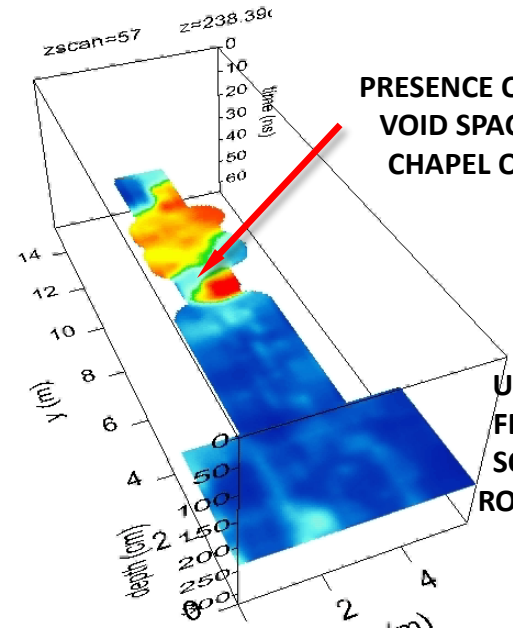
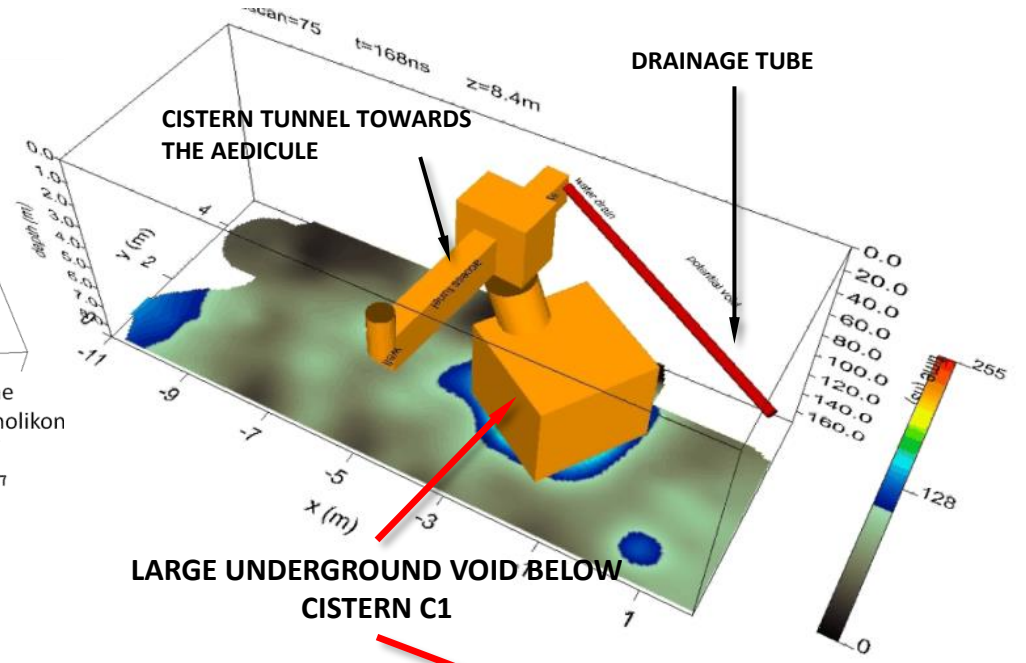
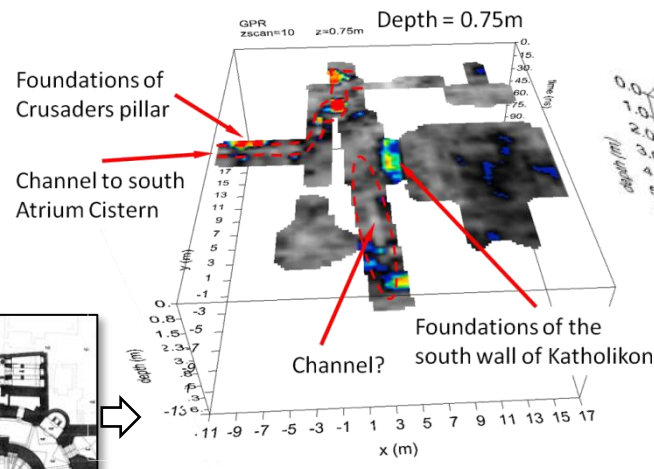
SUSTAINABILITY AT RISK:

3D DIGITAL NON-DESTRUCTIVE PROSPECTION OF UNDERGROUNDS RISKS

Ground penetrating radar (GPR), Electrical Resistence Tomography (ERT), Electromagnetic Probe Systems, and Robotic Cameras identified and documented the nature and state of all underground features related to water and humidity transport phenomena below and around the Holy Aedicule and neighboring areas

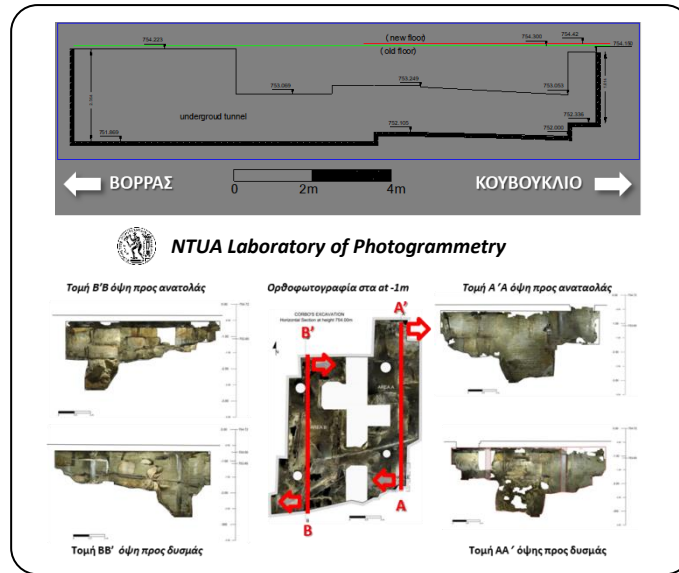
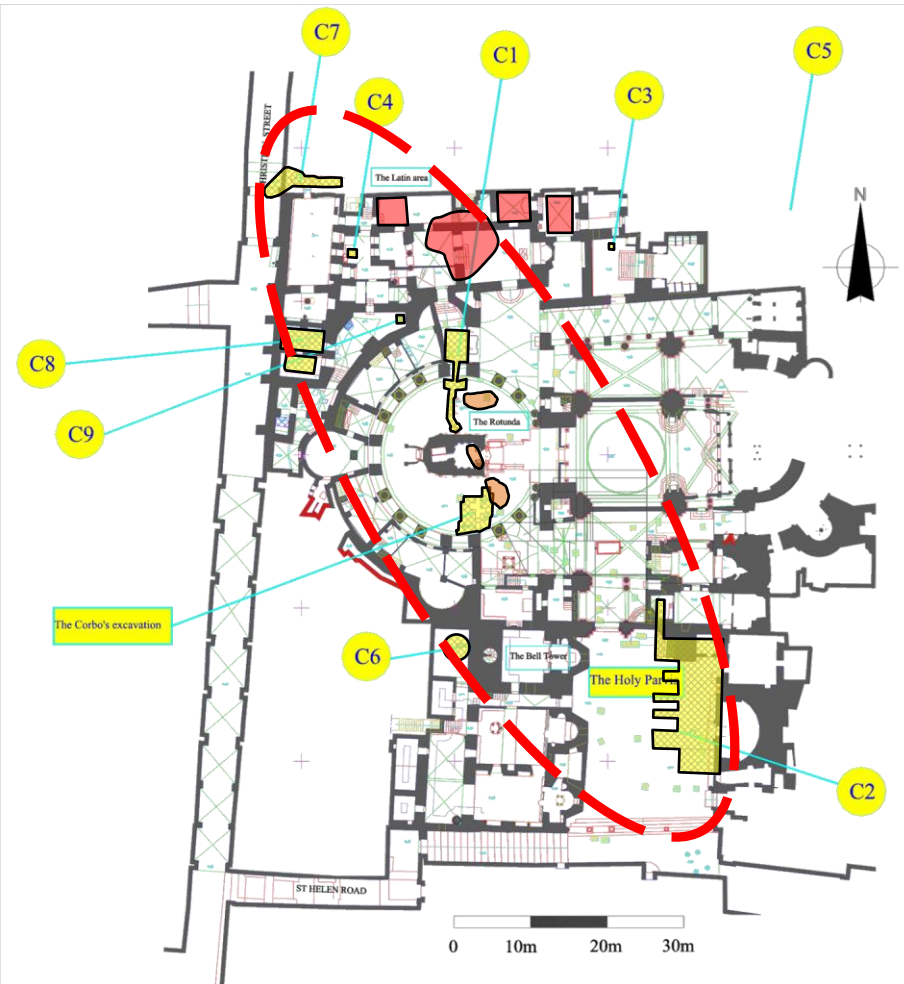


Relative location of the GPR prospection inside and in front of the Holy Aedicule

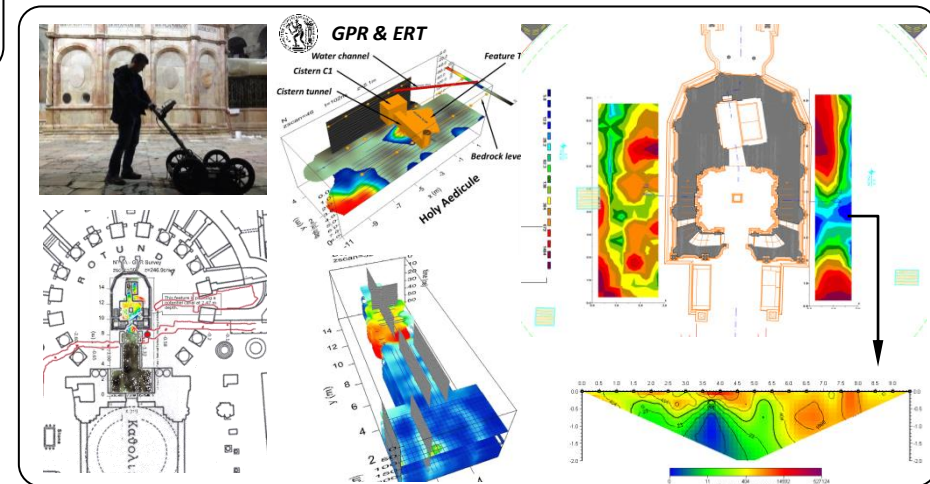
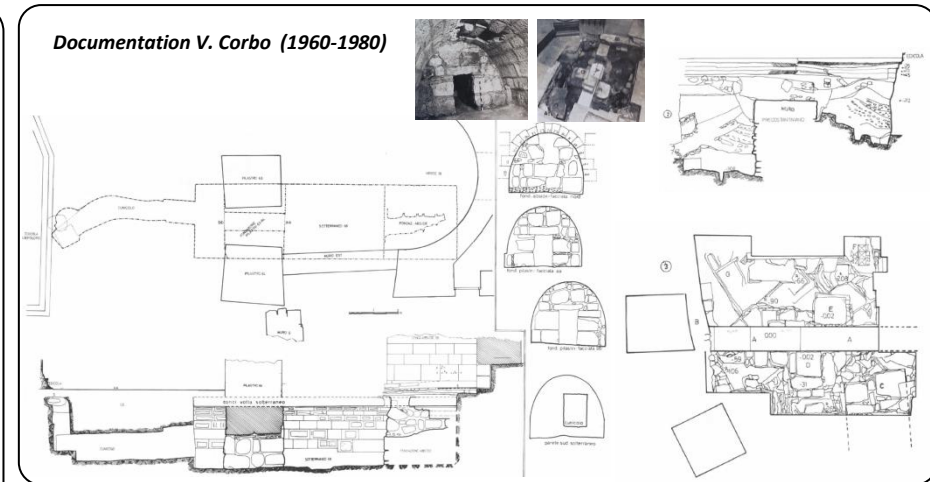


ARCHAEOLOGICAL SEMANTICS OF THE UNDERGROUND AREA OF THE CHURCH OF THE HOLY SEPULCHRE

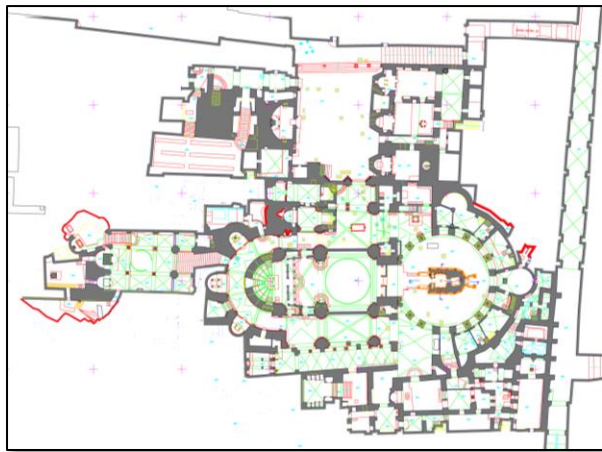
Correlation of findings from **non-destructive prospection** of underground features with data from **geometric and architectural documentation** at the scale of the Church of the Holy Sepulchre



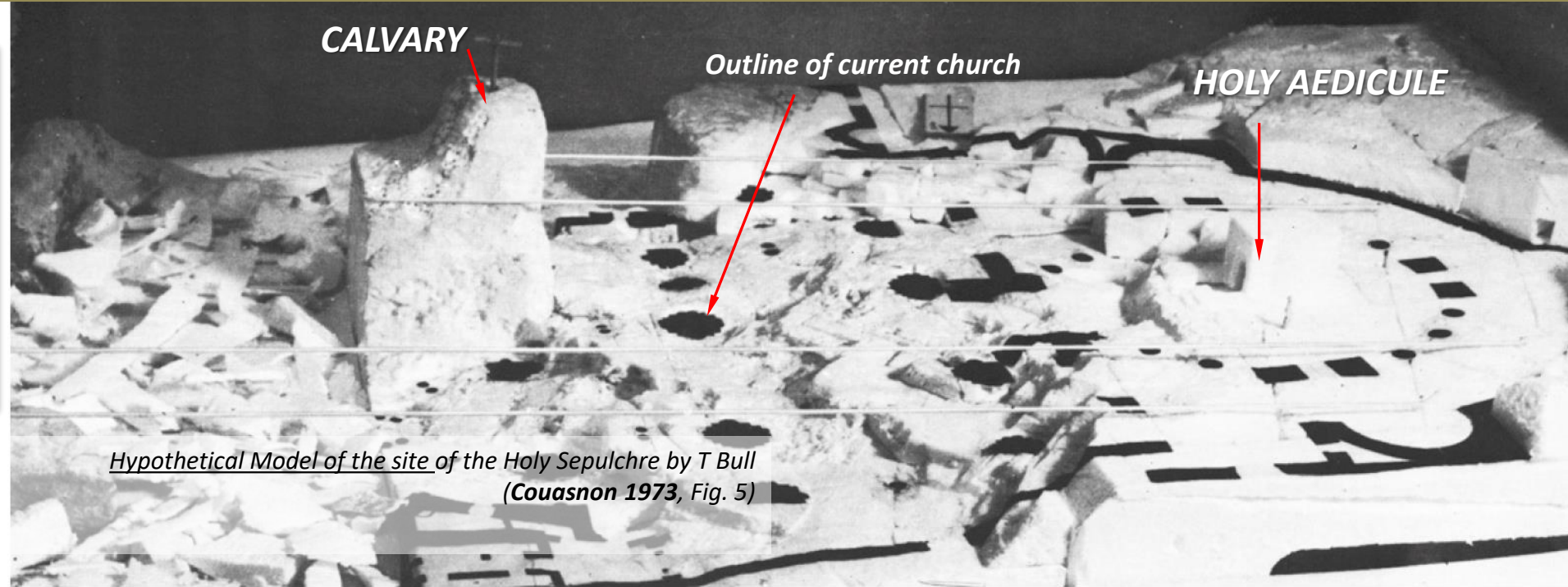
- NTUA GEOMETRIC SURVEY
- NTUA GPR SURVEY
- CORBO DOCUMENTATION



ARCHAEOLOGICAL SEMANTICS OF THE UNDERGROUND AREA OF THE CHURCH OF THE HOLY SEPULCHRE

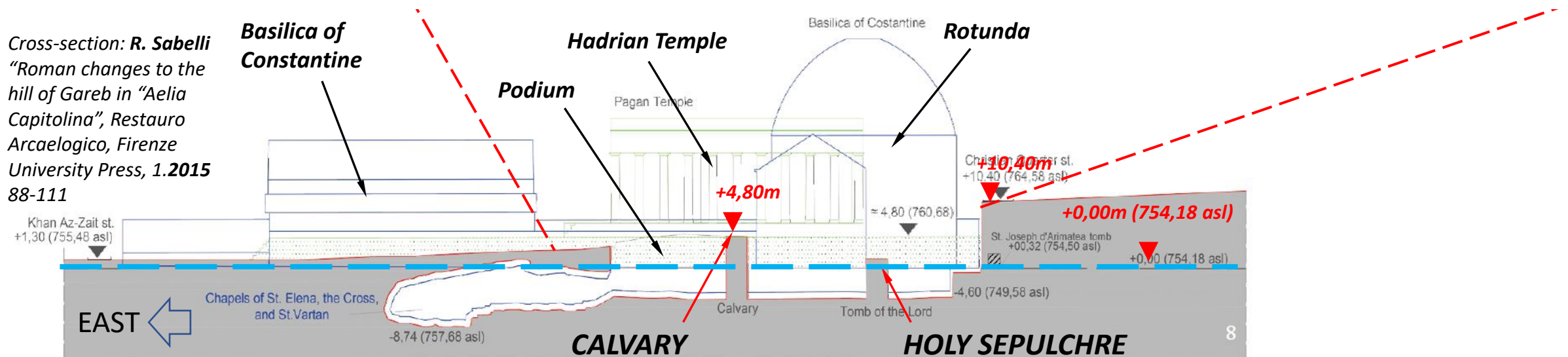


General ground plan of the Holy Sepulchre, courtesy of **D.-D. Balodimos, A. Georgopoulos and G. Lavvas, 2003**



Hypothetical Model of the site of the Holy Sepulchre by T Bull (Couasnon 1973, Fig. 5)

Cross-section: **R. Sabelli** "Roman changes to the hill of Gareb in "Aelia Capitolina", *Restauro Arcaelogico, Firenze University Press, 1.2015* 88-111



HYPOTHESIS FOR CONFIGURATION OF THE WESTERN BOUNDARY OF THE ABANDONED QUARRY

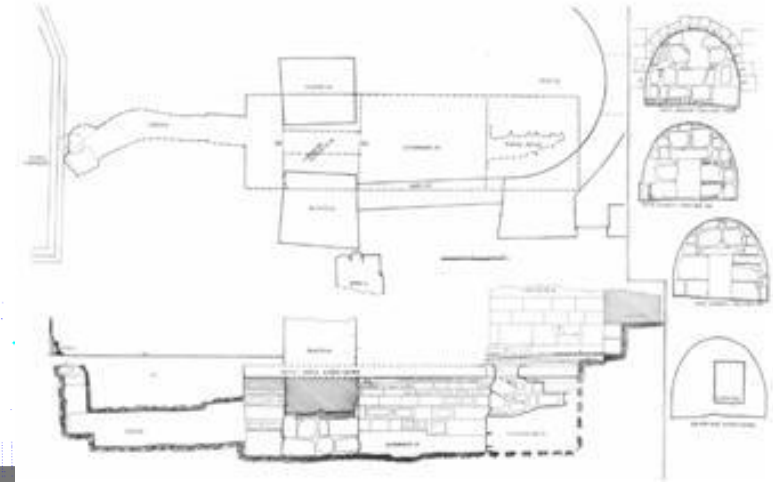
A. Moropoulou, K. Lampropoulos (2017)

The Cistern may be the **remnants of a Tomb**, its roof cut-off during the leveling of the area by Constantine.

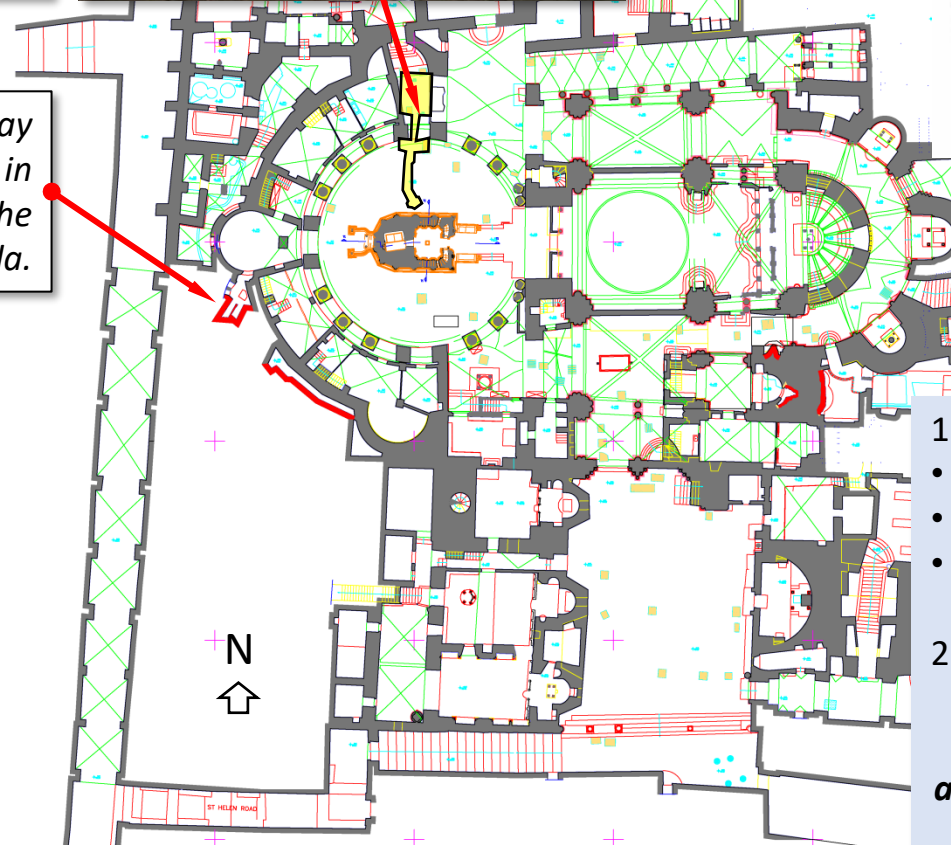
- The tunnel towards the Aedicule could be a southward extension of one of the burial openings of the Tombs
- The other openings may have been blocked by the stone lining



⇨ N



The Tomb of Joseph of Arimathea (+0.30m level) may be the **remnants of a multilevel cluster of Tombs**, as in the case of the Alkedama Tombs, Jerusalem, after the construction of the Constantine Rotunda.

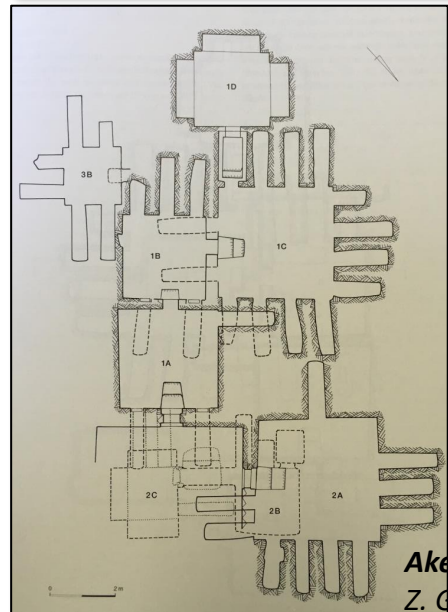


1. The facts that:

- "Cistern" is at -2.37m level
- Tomb of Joseph of Arimathea is at +0.3m level
- Tomb of Christ is a +0.9m level with an eastern entrance

2. Taking into account Corbo's excavations and recent GPR findings on the Rotunda floor

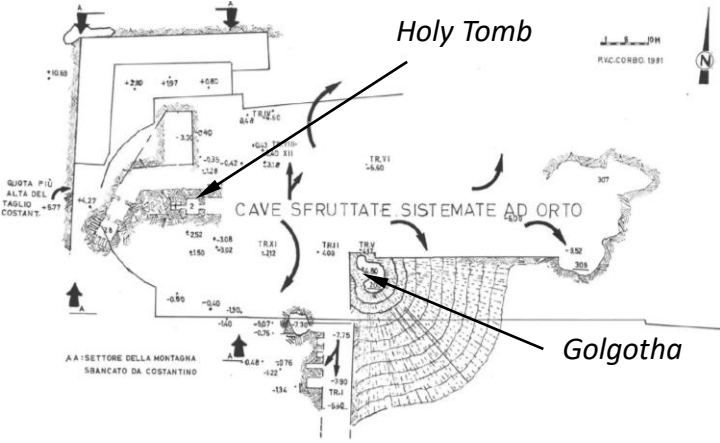
are indications that the western boundary of the quarry may have had a north-south direction during the Hadrian era



Akeldama Tombs complex, Plan 1.1 from G. Avni, Z. Greenhut, The Akeldama Tombs, IAA 1996

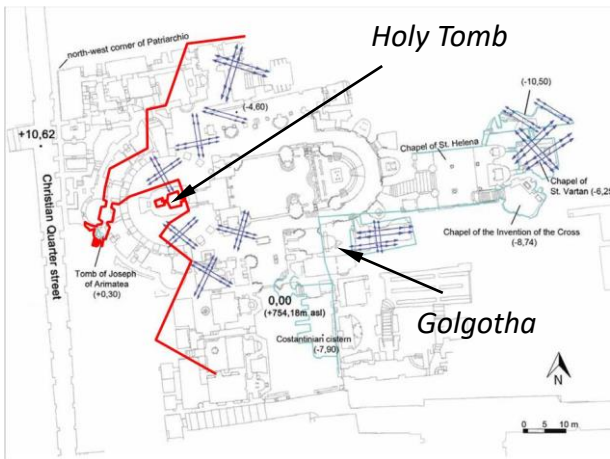
HYPOTHESIS FOR CONFIGURATION OF THE WESTERN BOUNDARY OF THE ABANDONED QUARRY

A. Moropoulou, K. Lampropoulos (2017)



The abandoned quarries partially used as a garden
V. Corbo 1981/1982, III, Pl. 67

Outline of western boundary of the quarry according to R. Sabelli (2014), based on directions of quarrying according to Corbo's indications



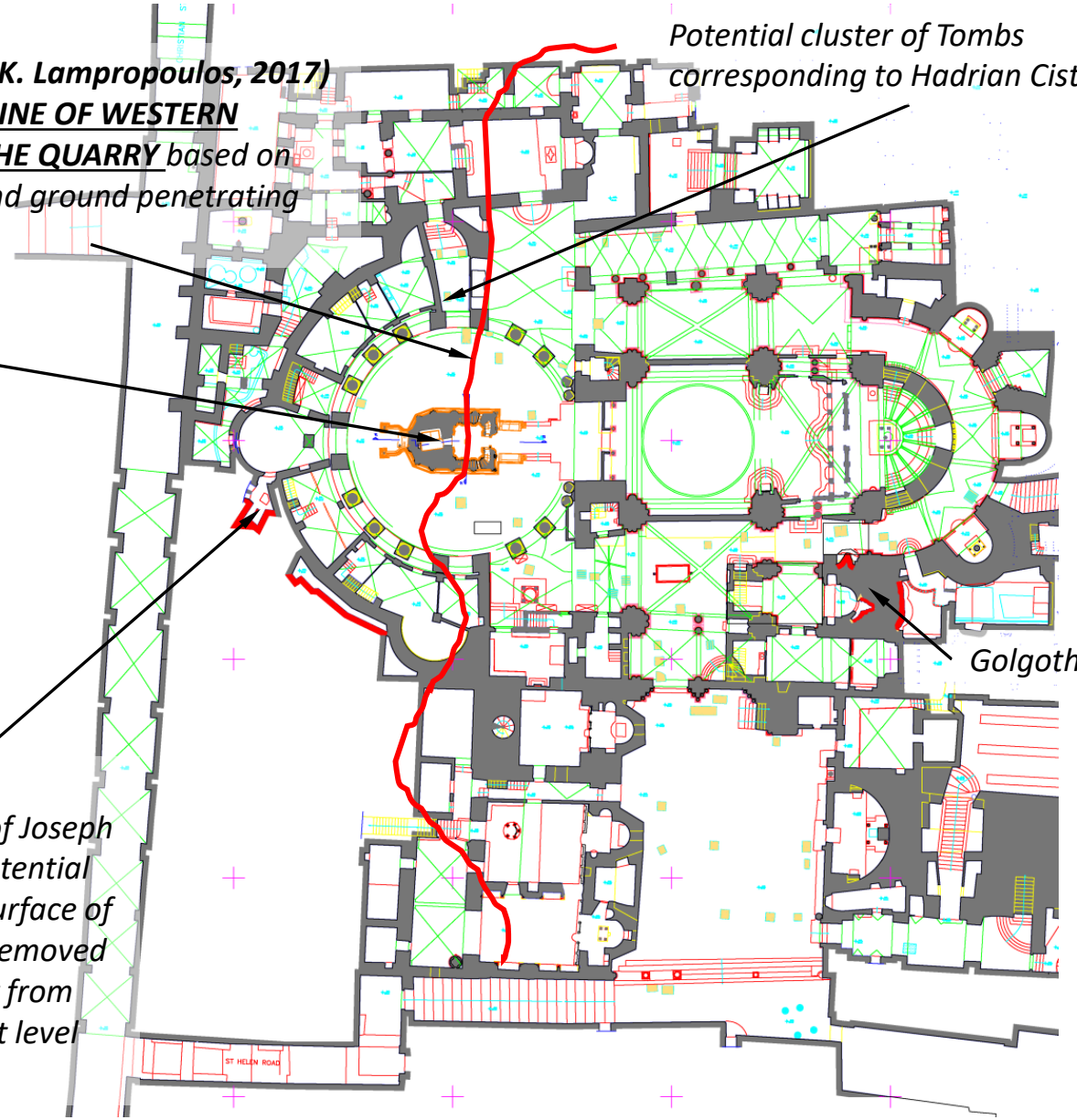
(A. Moropoulou, K. Lampropoulos, 2017)
POTENTIAL OUTLINE OF WESTERN BOUNDARY OF THE QUARRY based on recent findings and ground penetrating radar survey

Holy Sepulchre

Potential cluster of Tombs corresponding to Hadrian Cistern

Golgotha

Cluster of Tombs (including Tomb of Joseph of Arimathea). Potential entrance at the surface of the rock volume removed by Constantine or from the western street level (also removed)



HYPOTHESIS FOR CONFIGURATION OF THE WESTERN BOUNDARY OF THE ABANDONED QUARRY

A. Moropoulou, K. Lampropoulos (2017)

HYPOTHESIS:
HADRIAN BUILT THE TEMPLE WITH ITS WESTERN SIDE RIGHT UP TO THE HILL VERTICAL SURFACE TO AVOID EXCAVATING FURTHER TO THE WEST



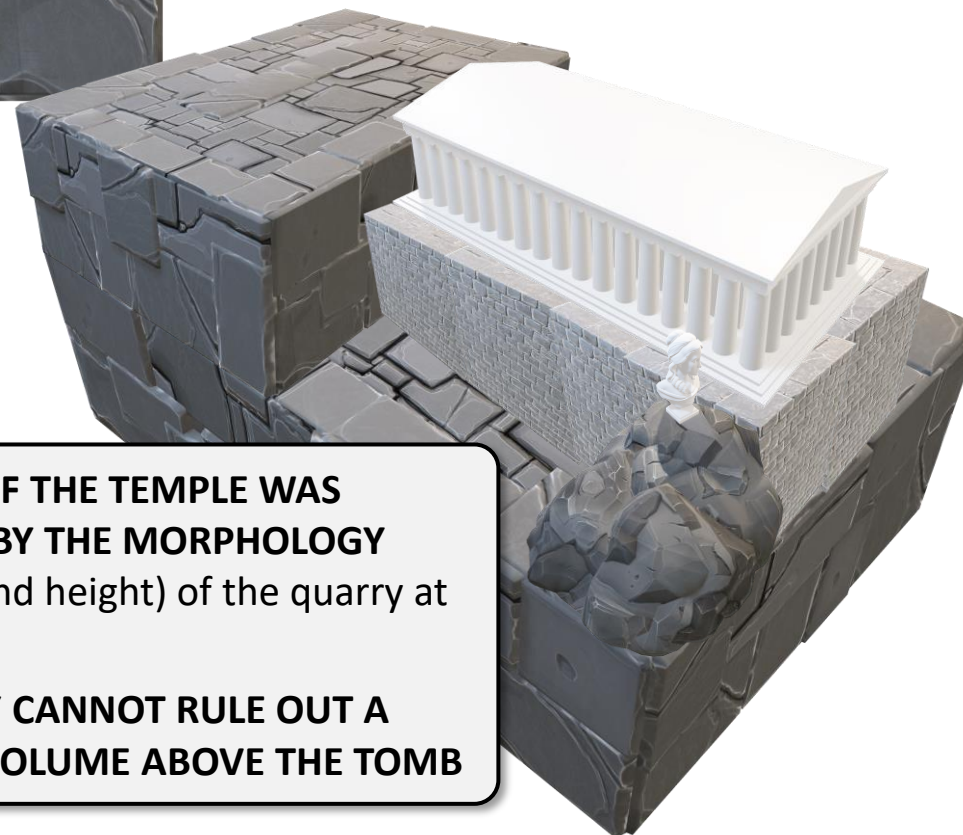
135AD

CONCEPTUAL MODEL



33AD

- The **WESTERN END OF THE TEMPLE WAS PROBABLY DEFINED BY THE MORPHOLOGY** (western boundary and height) of the quarry at that position
- **LOCAL TOPOGRAPHY CANNOT RULE OUT A SIGNIFICANT ROCK VOLUME ABOVE THE TOMB**



Acknowledgments:

The authors wish to acknowledge the leaders of the Christian communities: **His Beatitude the Greek Orthodox Patriarch of Jerusalem Theophilos III**; **His Paternity Archbishop Pierbattista Pizzaballa**, who was the Custos of the Holy Land until May 2016 and is now the Latin Patriarch of Jerusalem; **Rev. Fra Francesco Patton**, who has been Custos of the Holy Land since June 2016; and **His Beatitude the Armenian Patriarch of Jerusalem Nourhan Manougian**.

Contributions from all over the world secured the project's funding. Worth noting **Mica Ertegun's and Jack Shear's** donations through **World Monuments Fund, Aegean Airlines** et al. The **interdisciplinary NTUA team for the Protection of Monuments, Em. Korres, A. Georgopoulos, A. Moropoulou, C. Spyrakos, Ch. Mouzakis**, were responsible for the rehabilitation project and **A. Moropoulou, as Chief Scientific Supervisor** of the project, was responsible for its scientific supervision.

Acknowledgements are also attributed to the members of the **Holy Sepulchre Common Technical Bureau**: **Th. Mitropoulos**, Ph.D., the director of the Common Technical Bureau and construction site manager; **O. Hamdan; C. Benelli; and I. Badalian**

Additionally, acknowledgments are attributed to **P. Sotiropoulos**, Technical Director of **Terra-Marine**, Greece, for his support in the 3D GPR analysis.