

MODELING A PREHISTORIC EXCAVATION PROCESS WITH SURVIVING ARCHITECTURAL REMAINS

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* Original Presentation: Christaki, E., Doerr, M., Bekiari, C., Bruseker, G. 2016. Μεθοδολογία μοντελοποίησης ανασκαφικής διαδικασίας με σωζόμενα αρχιτεκτονικά λείψανα. In *2nd CAA-GR Conference*, Athens 20-21 December 2016, National and Kapodistrian University of Athens (under review for the proceedings). Website: <http://www.caa-gr.org/2016/>

The Challenge

Complexity of the Archaeological Building Excavation Documentation



Fig.1 The Zominthos Archaeological Excavation

Topographer
Architect
Archaeologist
Craftsmen
Restorer
Draftsman



Excavation
Photos

Architectural
Plans

Excavation
Diaries

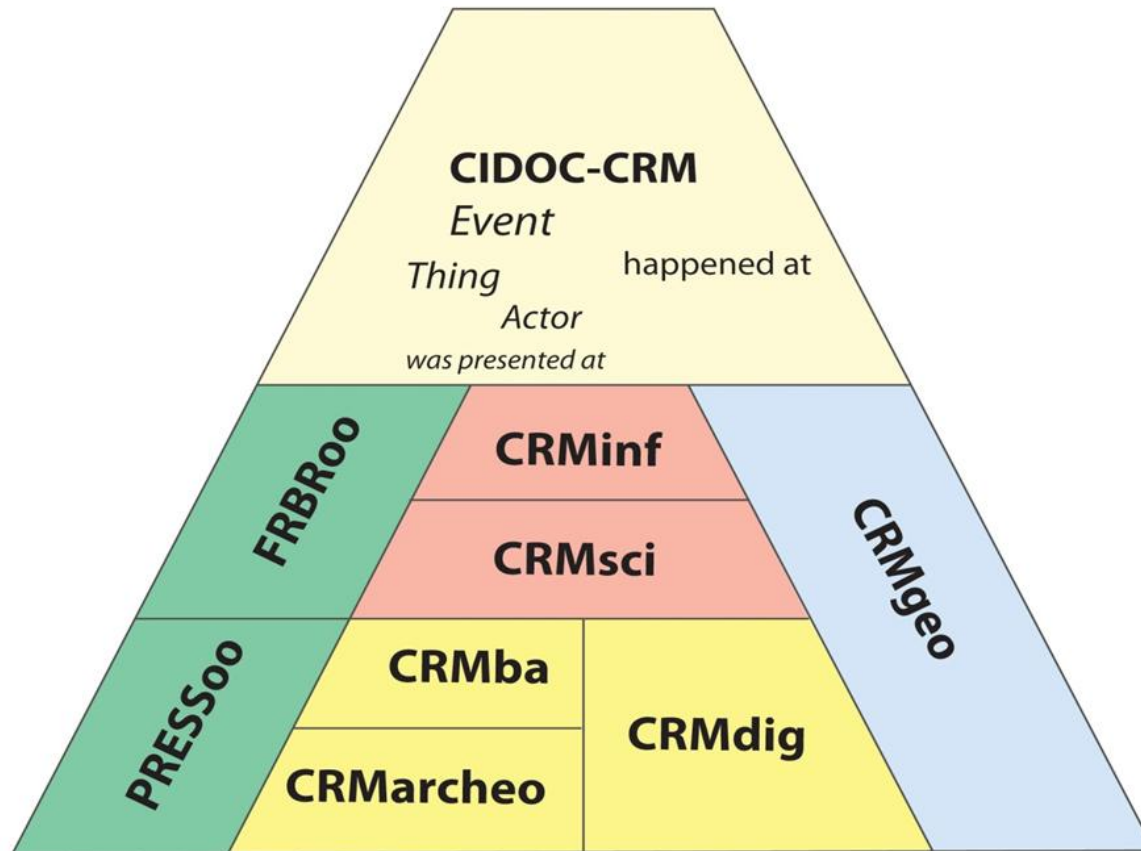
Catalogue
Findings



Fig.2 Archaeologists in charge for the post-processing elaboration of the data

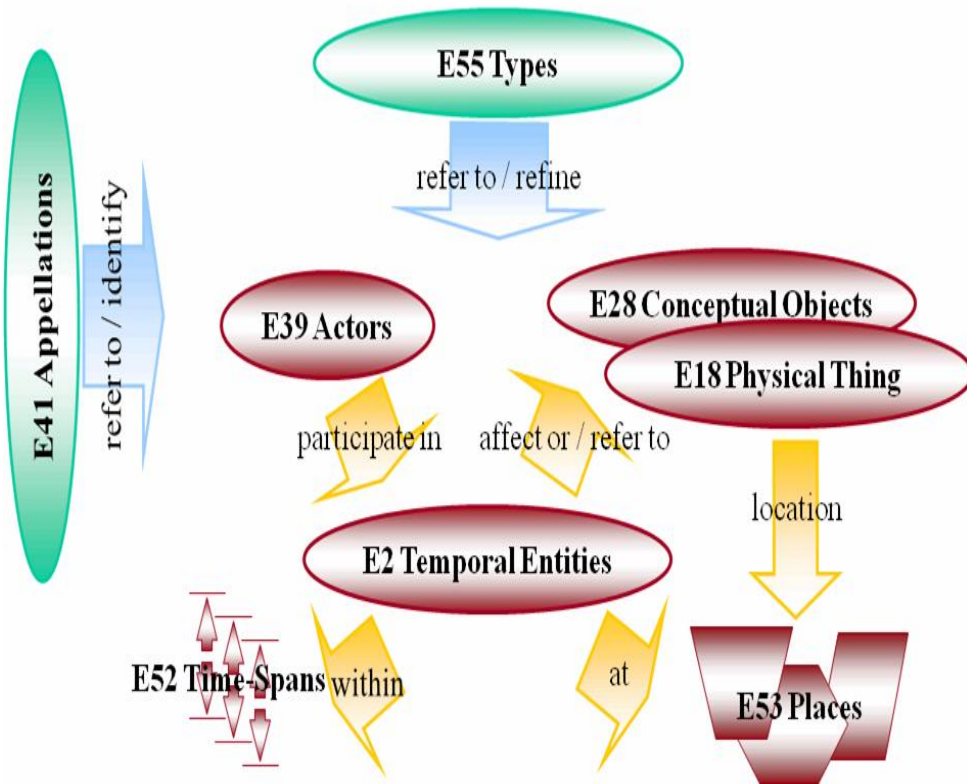
Archaeology's Interactive Dig Crete: Zominthos Project: <http://interactive.archaeology.org/zominthos/>
Σαπουνά-Σακελλαράκη, Ε. 2016. Προσκύνημα στη Ζώμινθο-Ο μινωικός πλούτος του Ψηλορείτη. *Αρχαιολογία και Τέχνες* 120: 22-43
Photos by: Yiagkos Chairetis, Eleni Christaki and Yiannis Theodosiou

Methodology-CIDOC CRM



CRM and its extensions

Event Modeling



CRM and top level classes

- Excavation Data
- Architectural Remains

- Observation Events
- Interpretation Events

Bekiari, C., Charami, L., Doerr, M., Georgis, Ch., Kritsotaki, A. 2008. 'Documenting Cultural Heritage in Small Museums', In *Proceedings of the Annual Conference of CIDOC Athens, Greece, 15-18 September 2008*.

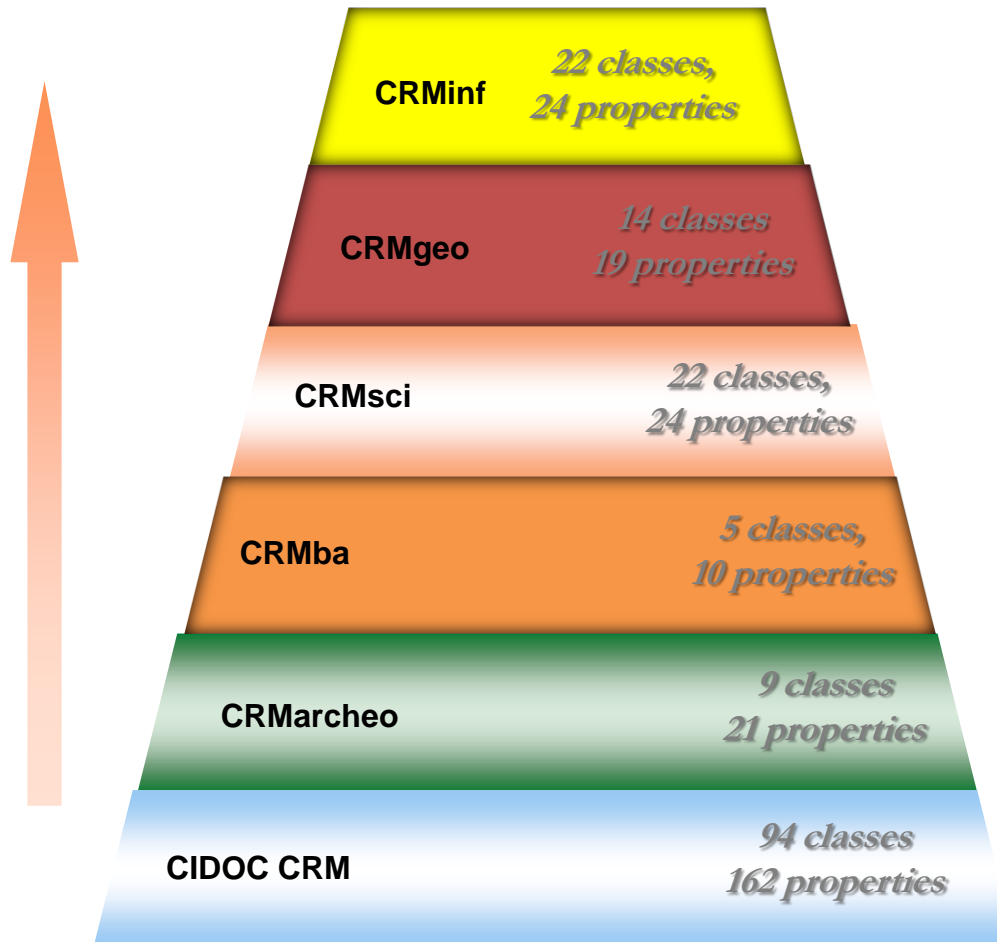
Main Questions-Outcome

- *What kind of archaeological datasets are required for the extraction of scientific inferences?*
- *What kind of relations must be modeled?*
- *Why is so important the linking between the excavation procedure data and the data on the preserved architectural remains?*



Knowledge Representation Model Schema

Model Construction

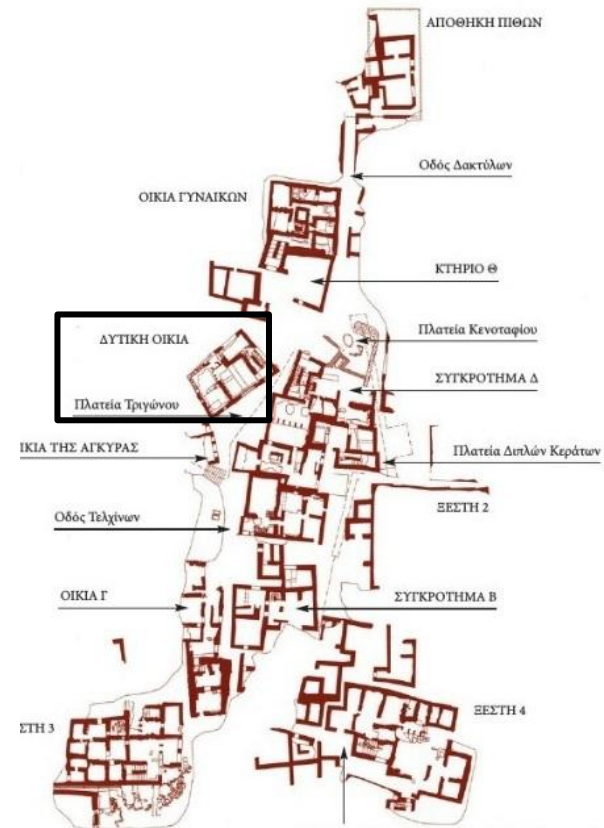


Case Study – West House of Prehistoric Akrotiri, Thera



Δυτική Οικία. Νότια όψη στην Πλατεία Τριγώνου.

**Fig.3 West House.
Triangle Square**



**Fig.4 Topographic plan of the
excavated part of the city**

Ντούμας, Χ. 2016. *Προϊστορική Θήρα*. Αθήνα: Κοινοφελές Ίδρυμα Ιωάννη Λάτση: <http://www.latsis-foundation.org/ell/electronic-library/the-museum-cycle/proistoriki-thira>

Palynou, C. 2005. *Akrotiri Thera. An Architecture of Affluence 3,500 Years Old*. Prehistory Monographs 15. Philadelphia: INSTAP Academic Press

Case Study-Observation Events

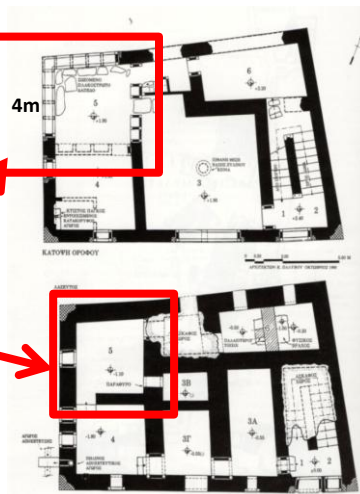
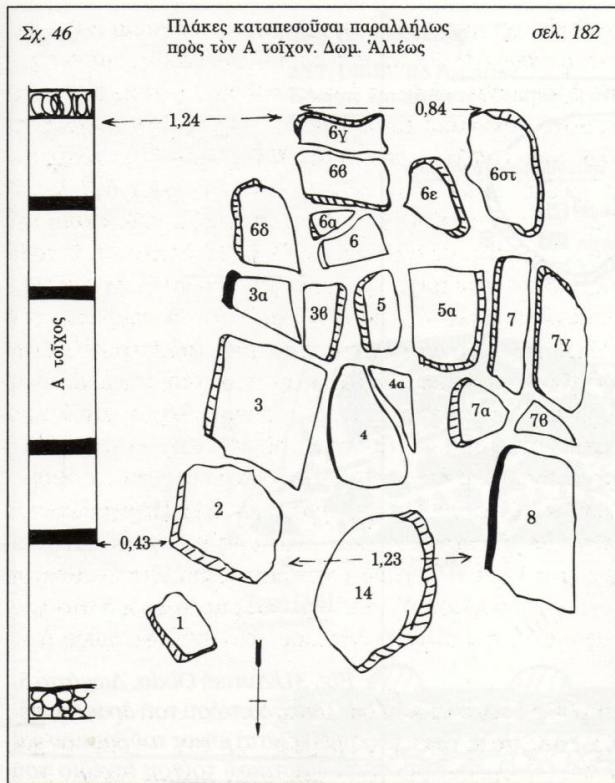


Fig.6 West House, Room 5. In situ part of the paved floor at the NW corner on the first floor

Fig.7 West House, Room 5. Architectural plan on the ground floor and the upper storey

Fig.5 West House, Room 5. Archaeological diary. Section of the fallen schists slabs on the deposit of the ground floor.

Μαρινάτος, Σ. 1974 (1972). *Ανασκαφαί Θήρας VI*. ΒΑΕ 64. Αθήνα: Η Εν Αθήναις Αρχαιολογική Εταιρεία.
 Μιχαηλίδου, Α. 2001. *Ακρωτήρι Θήρας. Η μελέτη των ορόφων στα κτήρια του οικισμού*. ΒΑΕ 212. Αθήνα: Η Εν Αθήναις Αρχαιολογική Εταιρεία.

Case Study-Interpretation Events

According to the excavators:

- the Room 5 on the upper storey was luxurious, decorated with wall paintings.
- the Room 5 on the upper storey was used as “veranda” with eight windows
- the schist slabs surface, which is preserved in the North-West (NW) corner of the upper storey, is part of the original paved floor.
- the slabs found on the deposit of the ground floor are fallen parts of the original paved floor on the upper storey, before the collapse of the room.

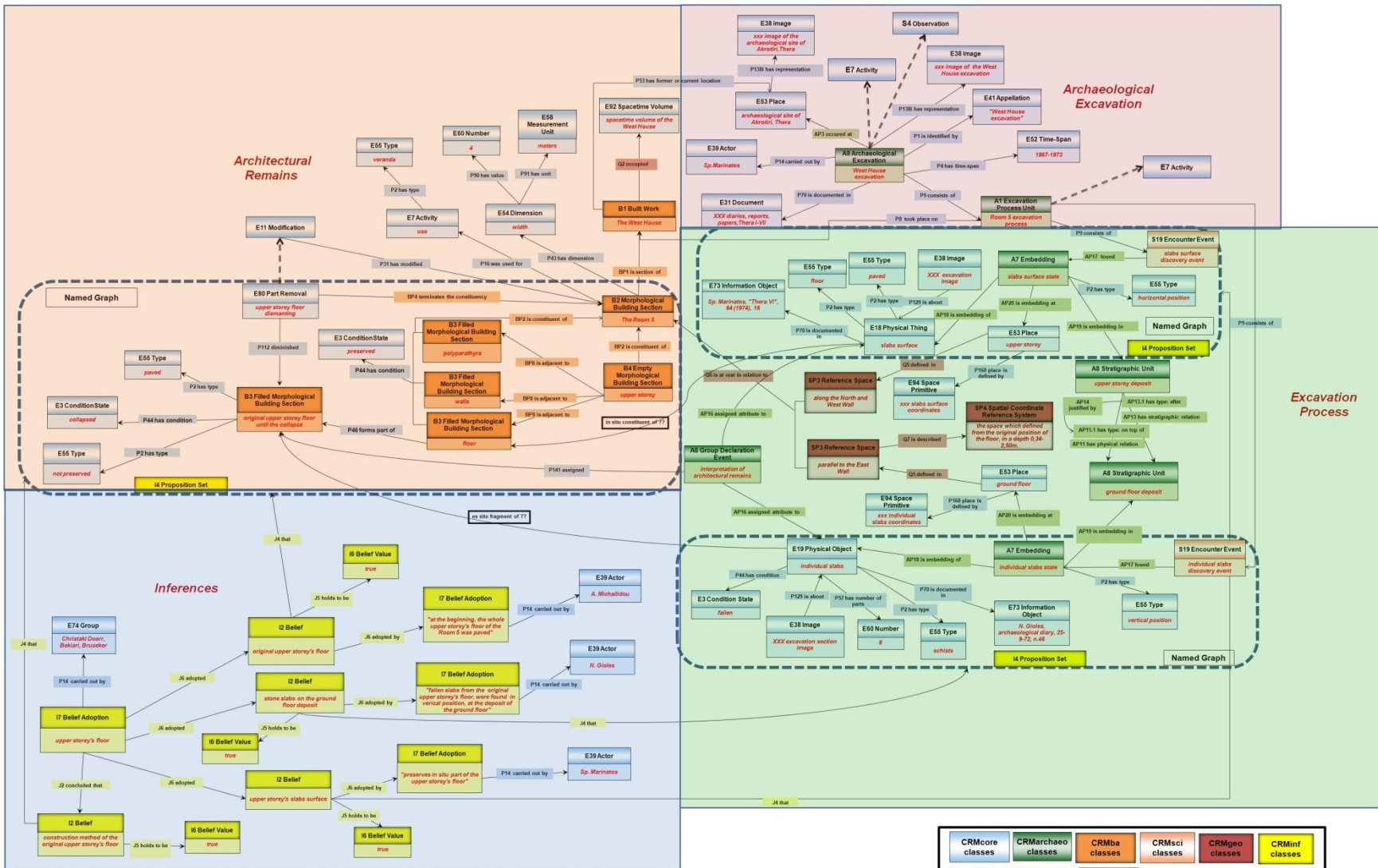
Μαρινάτος, Σ. 1974 (1972). *Ανασκαφαί Θήρας VI*. BAE 64. Αθήνα: Η Εν Αθήναις Αρχαιολογική Εταιρεία.

Μιχαηλίδου, Α. 2001. *Ακρωτήρι Θήρας. Η μελέτη των ορόφων στα κτήρια του οικισμού*. BAE 212. Αθήνα: Η Εν Αθήναις Αρχαιολογική Εταιρεία.

Ντούμας, Χ. 2016. *Προϊστορική Θήρα*. Αθήνα: Κοινωνοφελές Ίδρυμα Ιωάννη Λάτση: <http://www.latsis-foundation.org/ell/electronic-library/the-museum-cycle/proistoriki-thira>

Palyvou, C. 2005. *Akrotiri Thera. An Architecture of Affluence 3,500 Years Old*. Prehistory Monographs 15. Philadelphia: INSTAP Academic Press

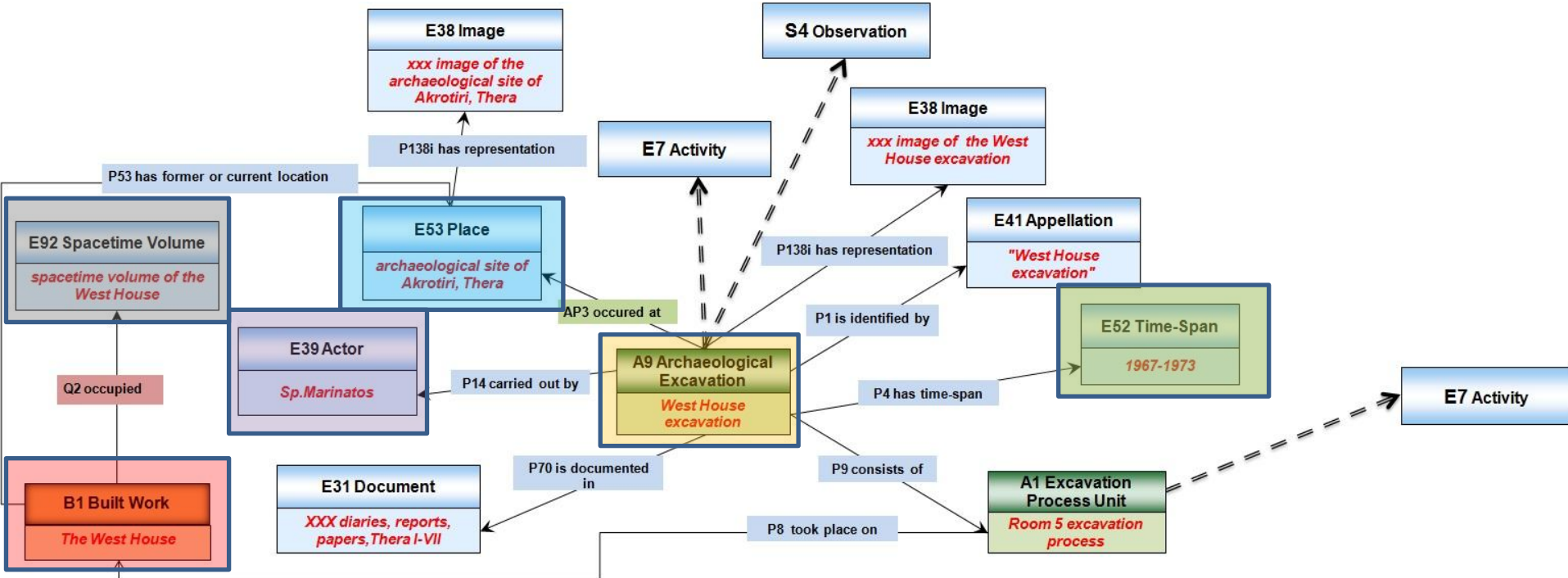
Model Schema Sections



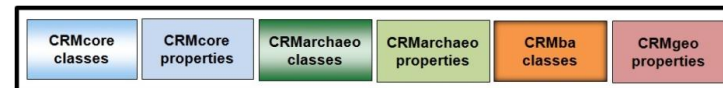
1. Archaeological Excavation

"Το καλοκαίρι του 1967 ο καθηγητής Σπ. Μαρινάτος άρχισε την ανασκαφή του στη Θήρα, στην περιοχή του Ακρωτηρίου... Δυτική Οικία ονόμασε ο Μαρινάτος το κτήριο που αποκαλύφθηκε δυτικά του Συγκροτήματος Δ" **Μιχαηλίδου Α., 2001**

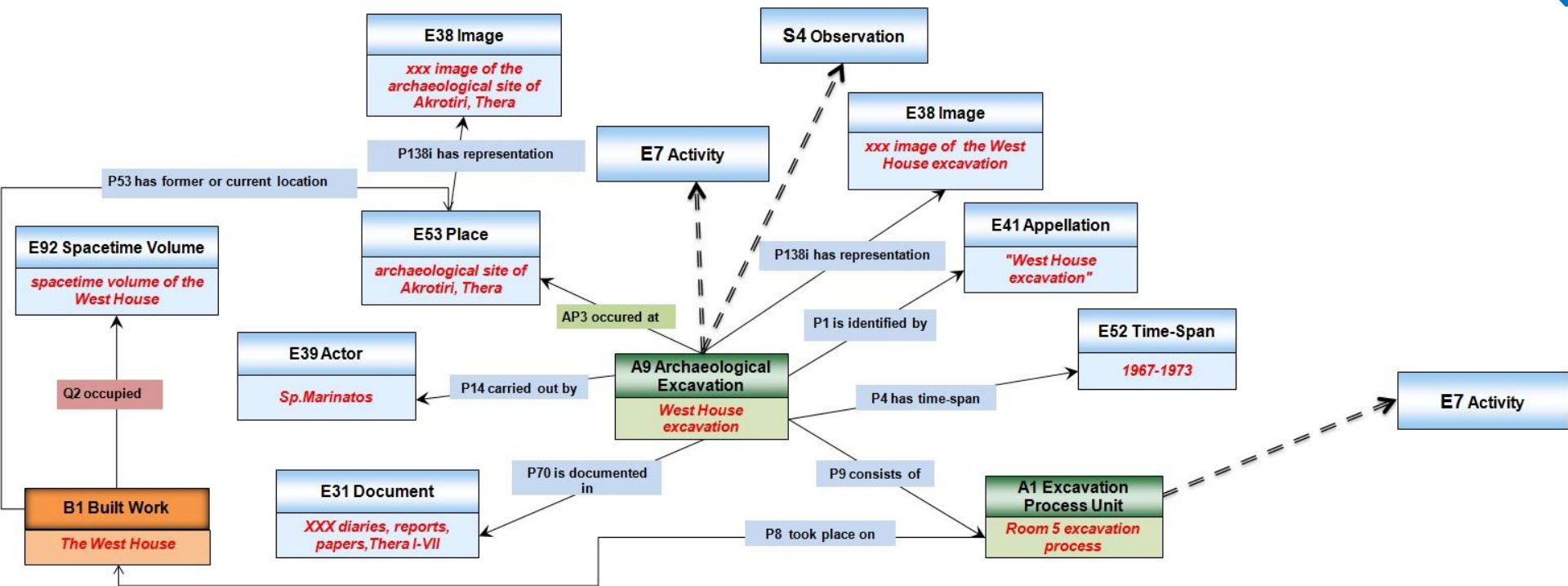
".....το καλύτερα μελετημένο και διατηρημένο είναι η Δυτική Οικία που οφείλει την ονομασία της στη θέση της μέσα στον οικισμό κατά την στιγμή της αποκάλυψής της....οικοδόμημα της προηγούμενης περιόδου, φαίνεται πως επισκευάστηκε μετά τον σεισμό στα μέσα του 17ου αι. π.Χ " **Ντούμας Χ., 2016**



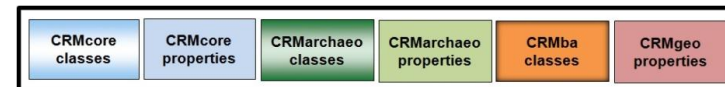
Μαρινάτος, Σ. 1974 (1972). Ανασκαφάι Θήρας VI. ΒΑΕ 64. Αθήνα: Η Εν Αθήναις Αρχαιολογική Εταιρεία.
 Μιχαηλίδου, Α. 2001. Ακρωτήρι Θήρας. Η μελέτη των ορόφων στα κτήρια του οικισμού. ΒΑΕ 212. Αθήνα: Η Εν Αθήναις Αρχαιολογική Εταιρεία.



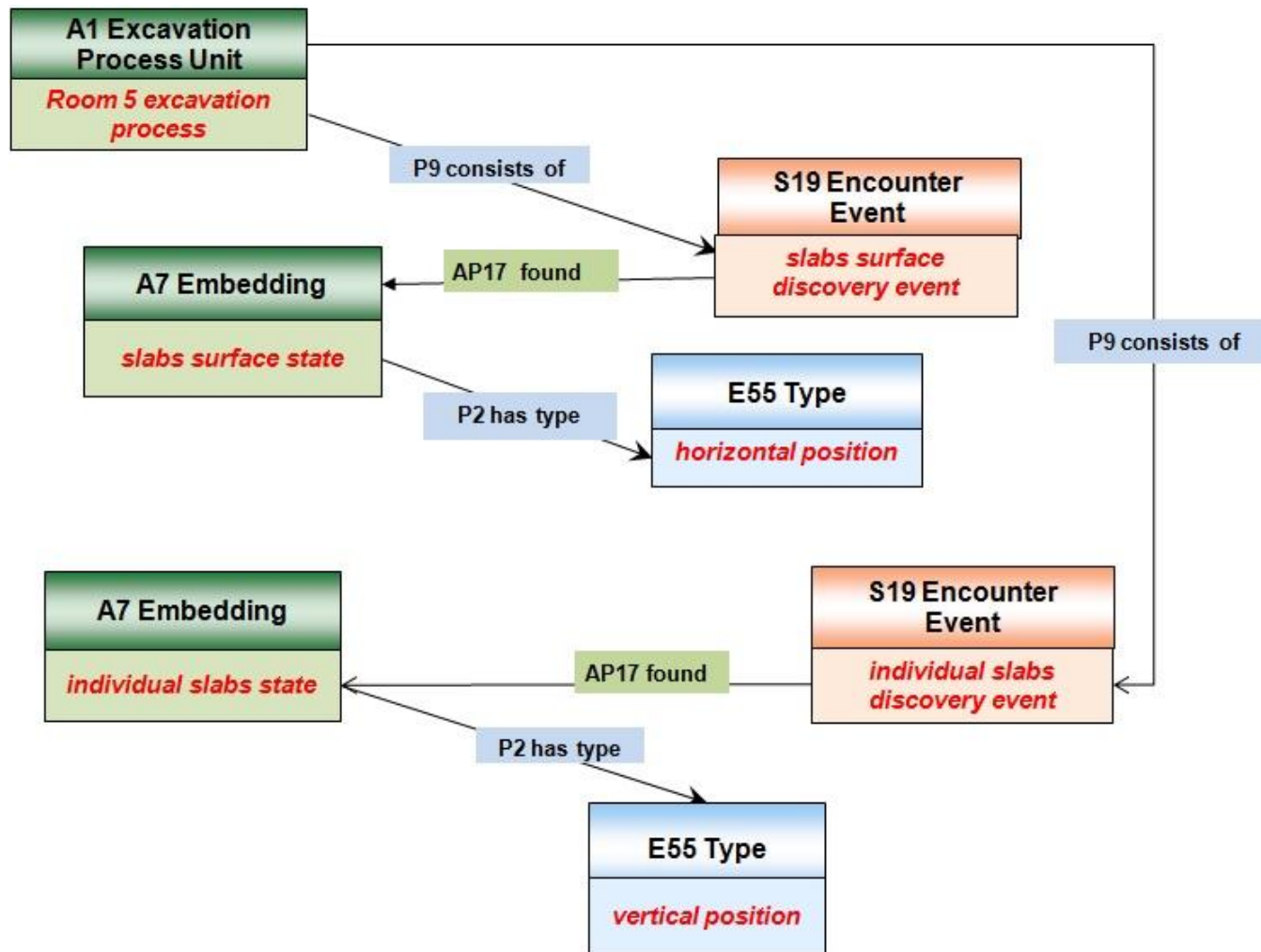
1. Archaeological Excavation



CIDOC CRM. 2017. *Definition of the CIDOC Conceptual Reference Model*. Version 6.2.2
 CRMarchaeo. 2016. CRMarchaeo An extension of CIDOC CRM to support the archaeological excavation process. Version 1.4



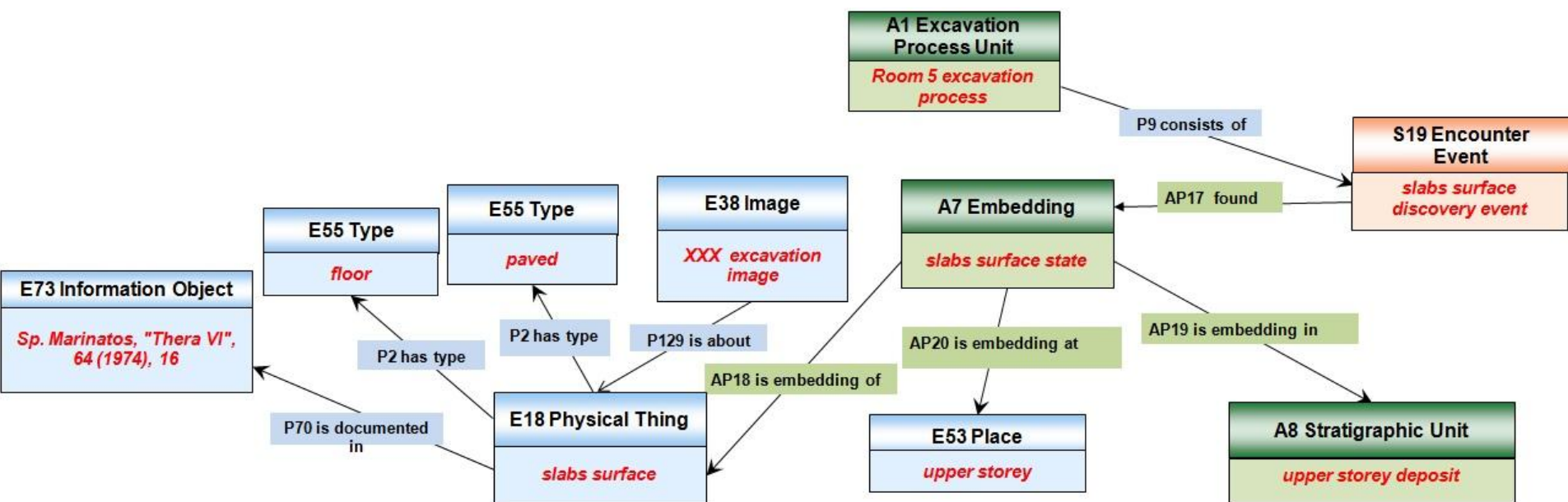
2. Excavation Process-Encounter Events



Doerr, M., Theodoridou, M., Aspöck, E., Masur, A. 2016. 'Mapping archaeological databases to cidoc-crm', In *Keep the Revolution Going. Proceedings of the 43rd Annual Conference on Computer Applications and Quantitative Methods in Archaeology (CAA 2015), Siena, Italy, April 2015*. Edited by S. Campana, R. Scopigno, G. Carpentiero and M. Cirillo, pp. 443-452. Oxford: Archaeopress.

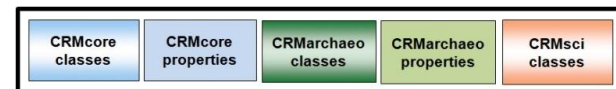


2. Excavation Process-Embedding 1

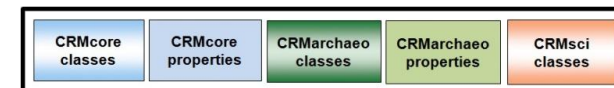
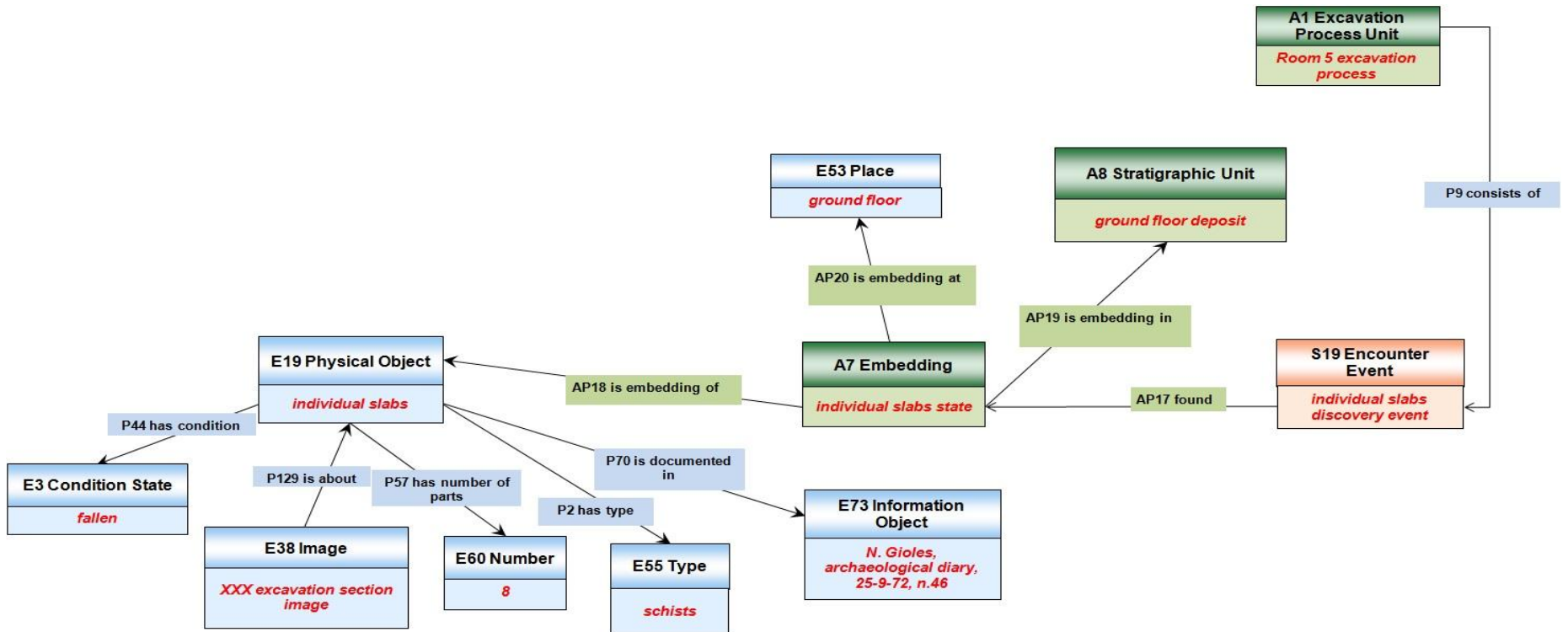


CRMarchaeo. 2016. CRMarchaeo An extension of CIDOC CRM to support the archaeological excavation process. Version 1.4.

CRMsci. 2015. CRMsci An Extension of CIDOC-CRM to support scientific observation. Version 1.2.3

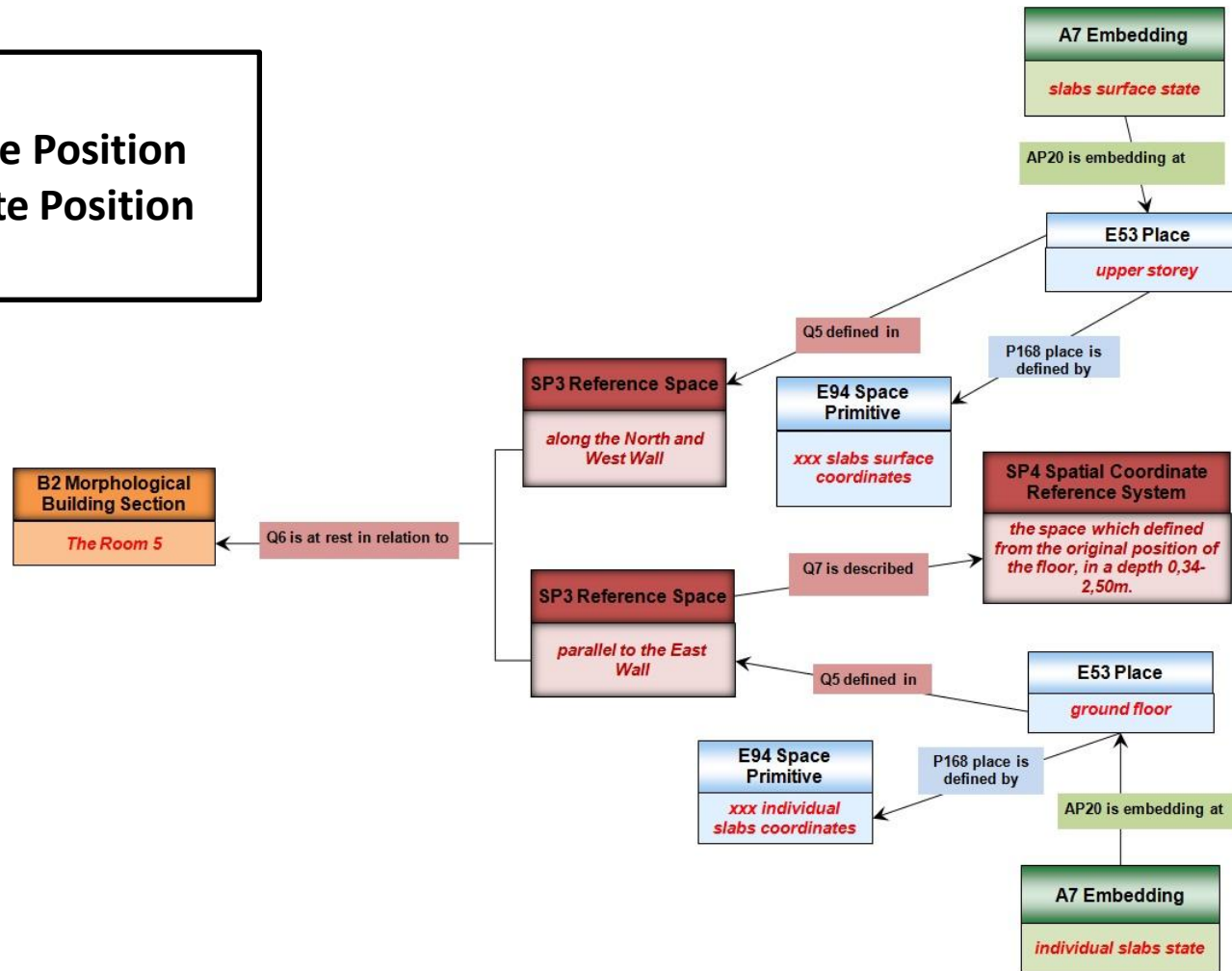


2. Excavation Process-Embedding 2

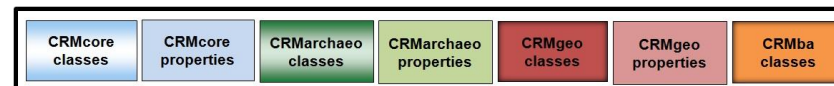


2. Excavation Process-Place

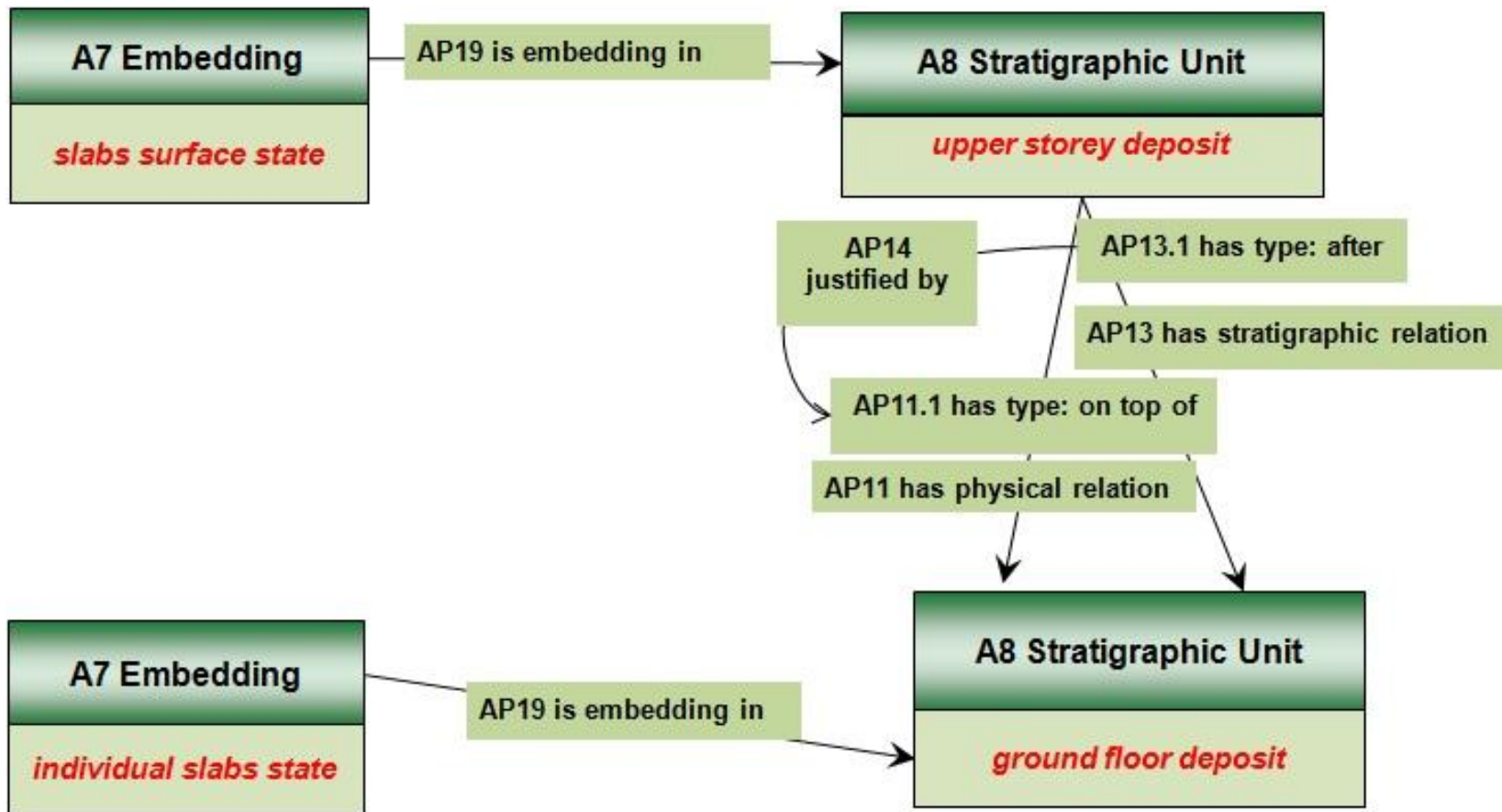
- Relative Position
- Absolute Position



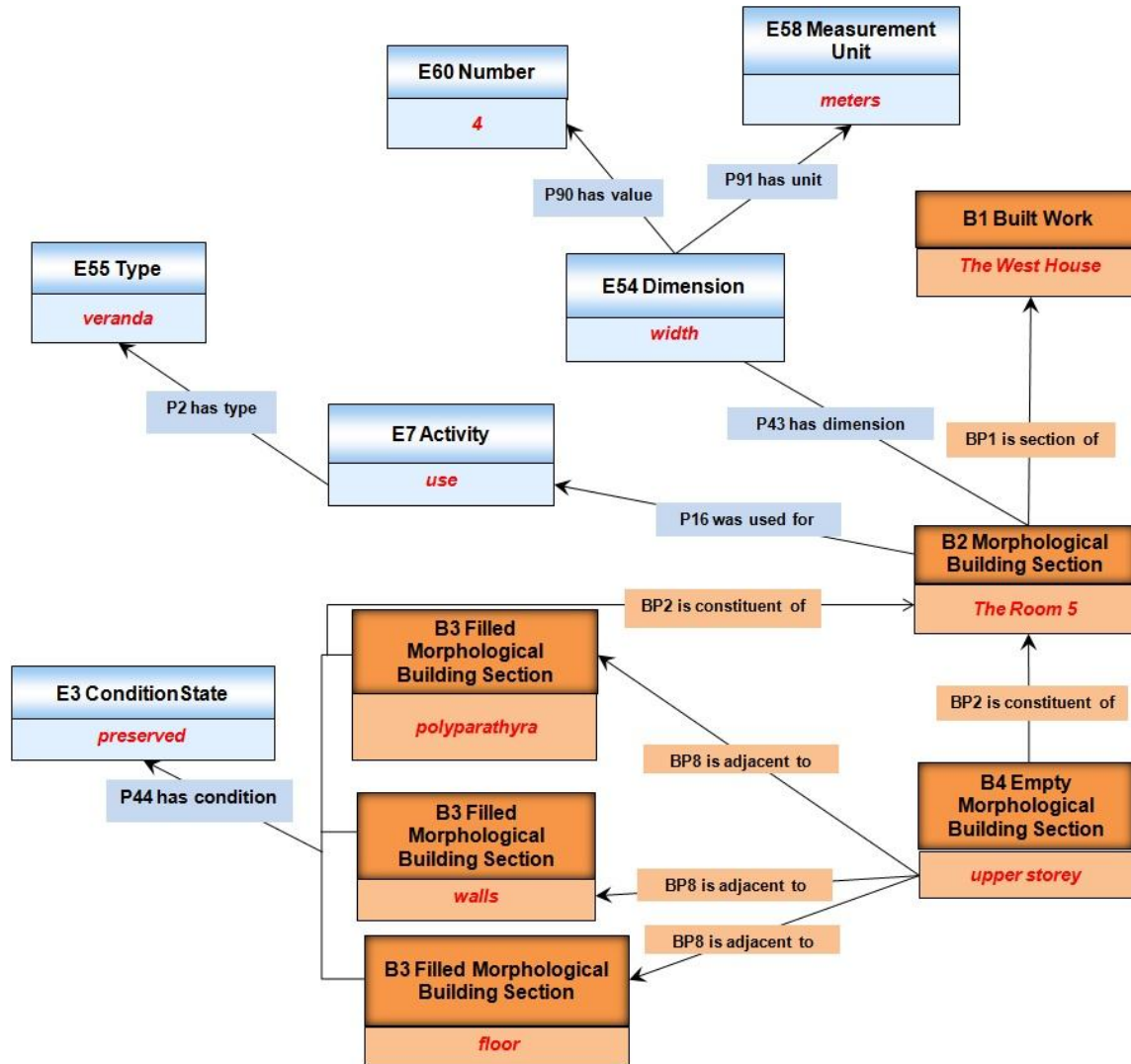
CRMgeo. 2015. CRMgeo An Extension of CIDOC-CRM to link the CIDOC CRM to GeoSPARQL through a Spatiotemporal Refinement. Version 1.2.



2. Excavation Process-Stratigraphic Unit



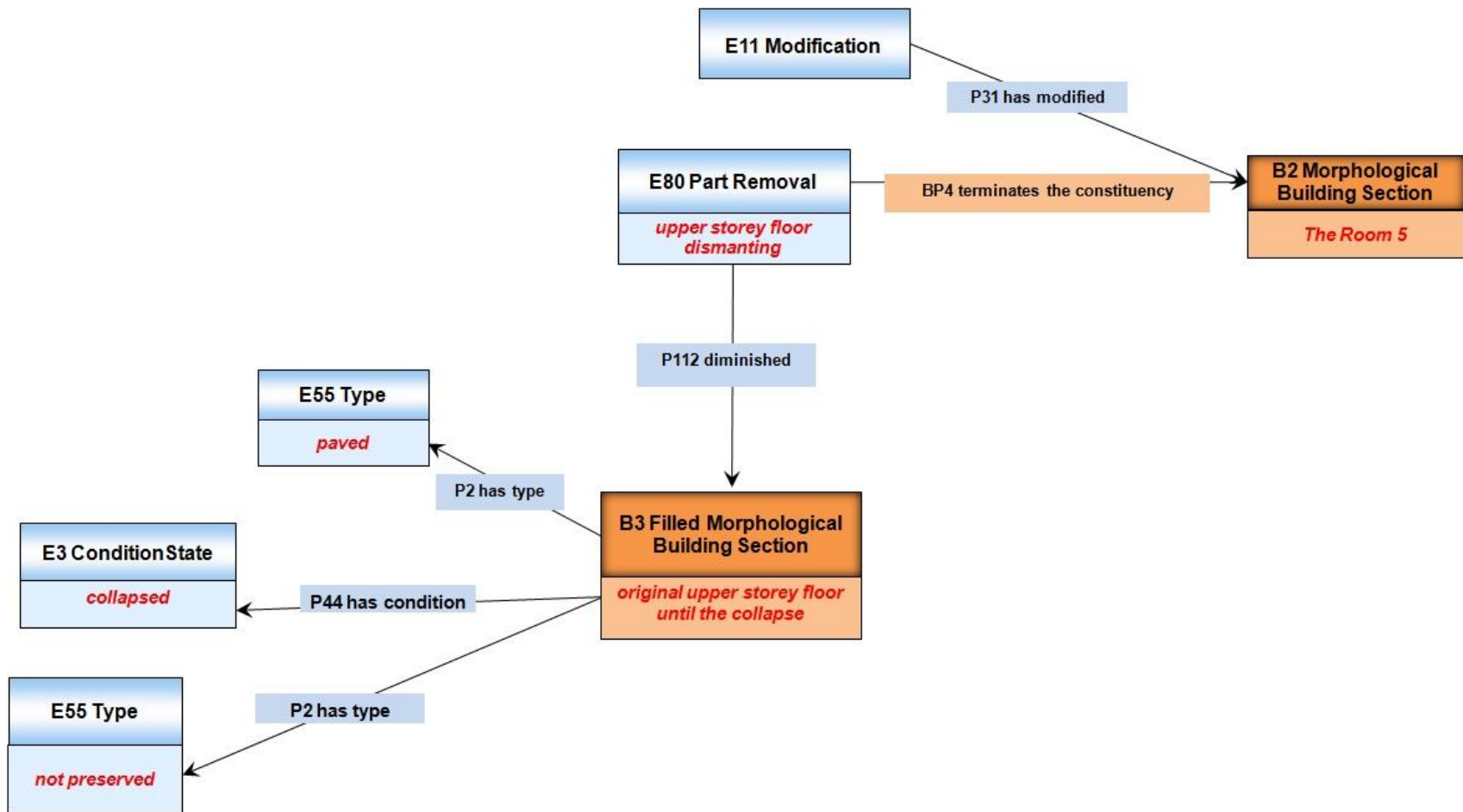
3. Architectural Remains-Morphological Building Sections



CRMba. 2016. CRMba An extension of CIDOC CRM to support buildings archaeology documentation. Version.1.4.

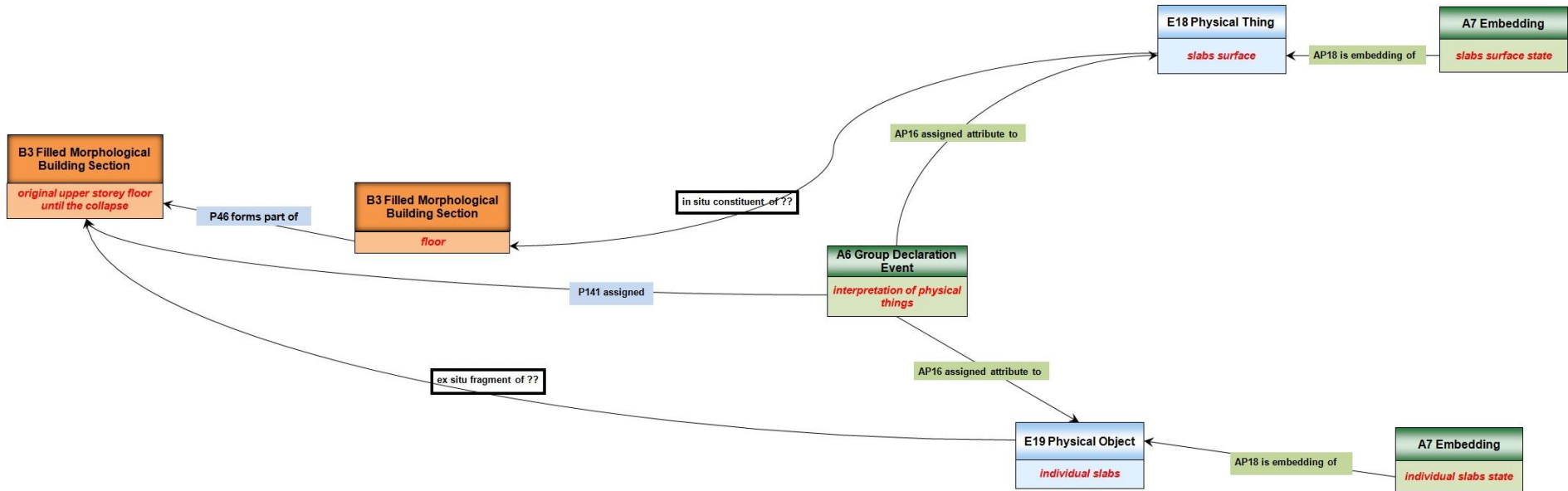


3. Architectural Remains-Modification Event

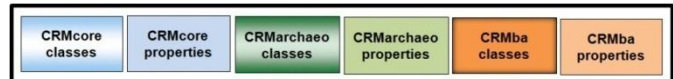


3. Architectural Remains-Group Declaration Event

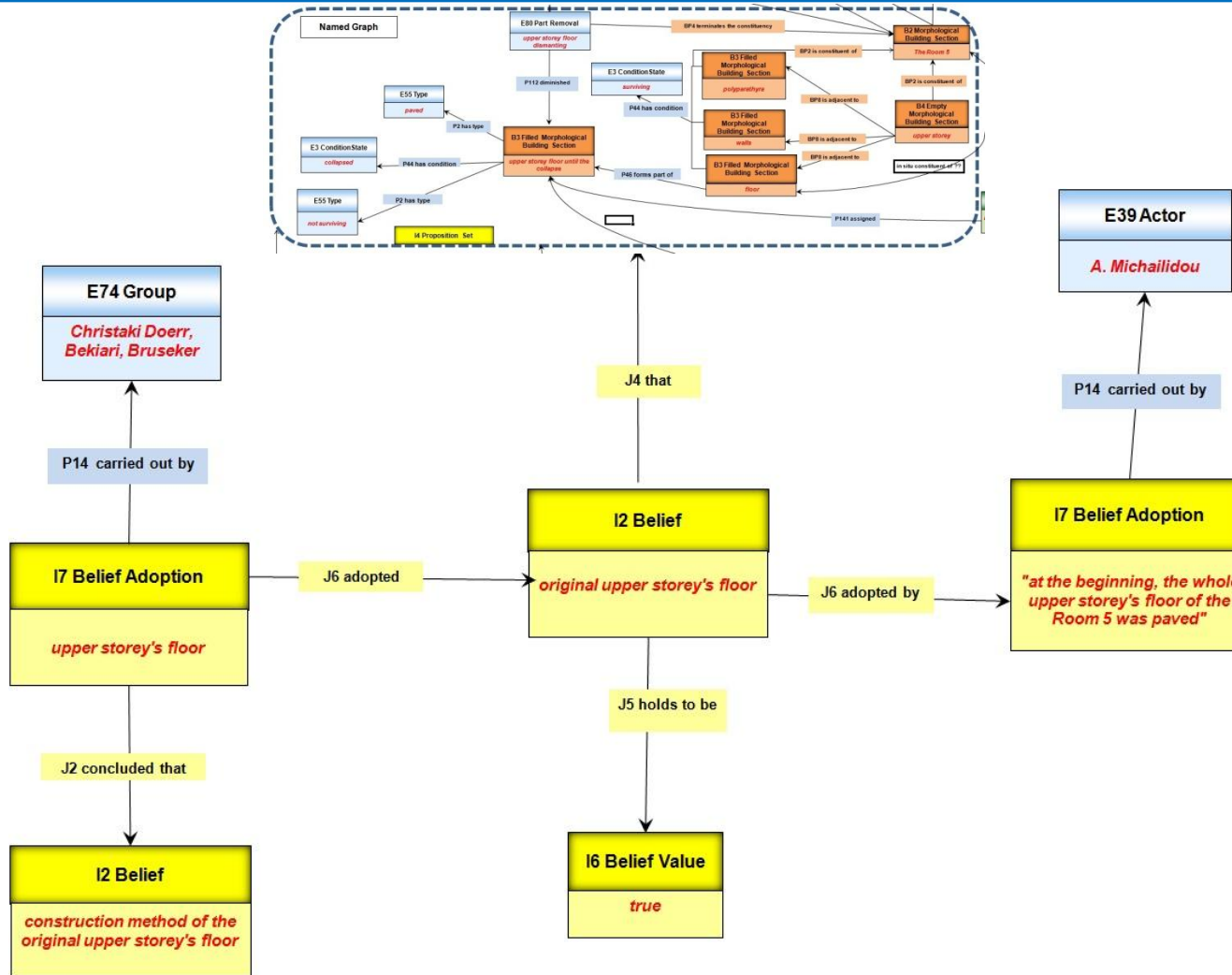
- Excavation data
- Architectural remains data



Ronzino, P. 2016. Harmonizing the CRMba and the CRMarchaeo models. *Int J Digit Libr*



4. Inference Making Event



CRMInf. 2015. CRMInf An Extension of CIDOC CRM to support argumentation. Version. 0.7

Μιχαηλίδου, Α. 2001. Ακρωτήρι Θήρας. Η μελέτη των ορόφων στα κτήρια του οικισμού. ΒΑΕ 212. Αθήνα: Η Εν Αθήναις Αρχαιολογική Εταιρεία.

Conclusions

The Knowledge Representation Model ensures and supports:

- the semantic interoperability of the data and the consistent knowledge representation for all the excavation process activities.
- the data integration with archaeological objects, buildings and interpretations that have been assigned
- the consistent representation of the past and the link to the information objects
- the overview of the data from multiple sections or prospects as for example: excavation, archaeological/historical, interpretive and others.

Implementation Proposals-Next Steps

The proposed Knowledge Representation Model can be implemented in:

- data systems based on XML technology
- knowledge networks based on graph repositories technologies whose data are in the form of interconnected RDF data

Next Steps:

- development of an electronic repository which will provide the opportunity to archaeologists to organize, manage and store all the information of an archaeological excavation from the stage of a survey to the publication of the final results
- modification of the *Synthesis* Information System which has been developed by the CCI for the documentation of the construction methods of the Zominthos Central Building, within the framework of my PhD research

Synthesis Information System: http://www.ics.forth.gr/isl/index_main.php?l=e&c=271

THANK YOU



Martin Doerr
Chrysoula Bekiari
George Bruseker

