Dr. Maria Andreadaki – Vlazaki
Secretary General
Ministry of Culture and Sports


FRIDAYS FOR
FUTURE

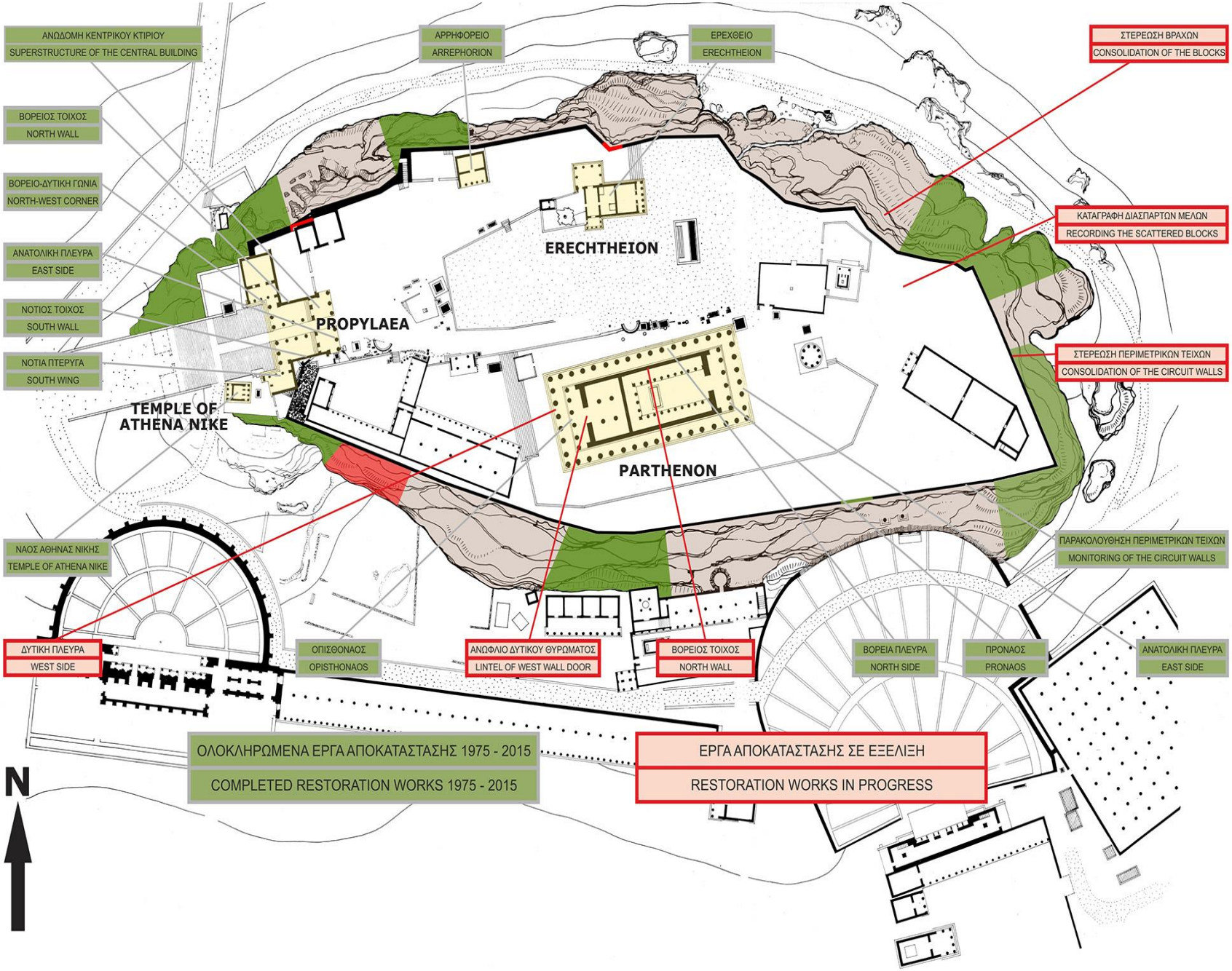

WE NEED THE
GREEN
NEW
DEAL
BACK
THE
DEAL

Human overrules the Environment

- Wonders are many, and none is more wonderful than man. ***(Sophocles, Antigone, 332-335, transl. sir Richard Jebb)***

- Possessing resourceful skill, a subtlety beyond expectation he moves now to evil, now to good. ***(Sophocles, Antigone, 365, transl. sir Richard Jebb)***

Pikionis intervention (late 50s) and the unification of the archaeological sites of Athens (2000‘s)


ΑΝΩΔΟΜΗ ΚΕΝΤΡΙΚΟΥ ΚΤΙΡΙΟΥ
SUPERSTRUCTURE OF THE CENTRAL BUILDING
ΑΡΡΗΦΟΡΕΙΟ
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ERECHTHEION
ΣΤΕΡΕΩΣΗ ΒΡΑΧΩΝ
CONSOLIDATION OF THE BLOCKS
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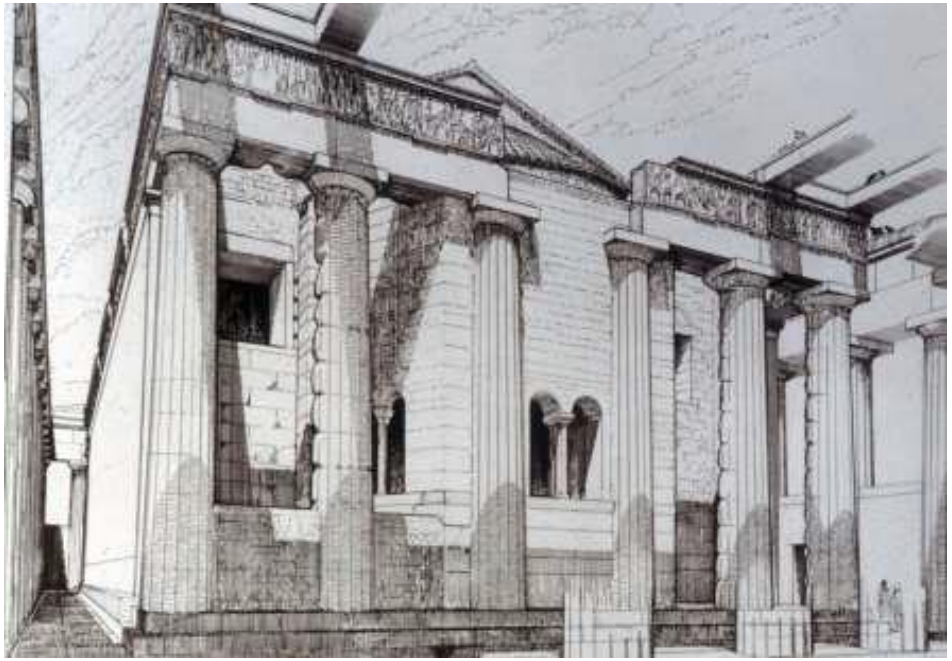
RESTORATION WORKS IN PROGRESS
N

Parthenon as symbolic capital: A Coca Cola advertisment and Nazi‘s officers in front of the ancient temple

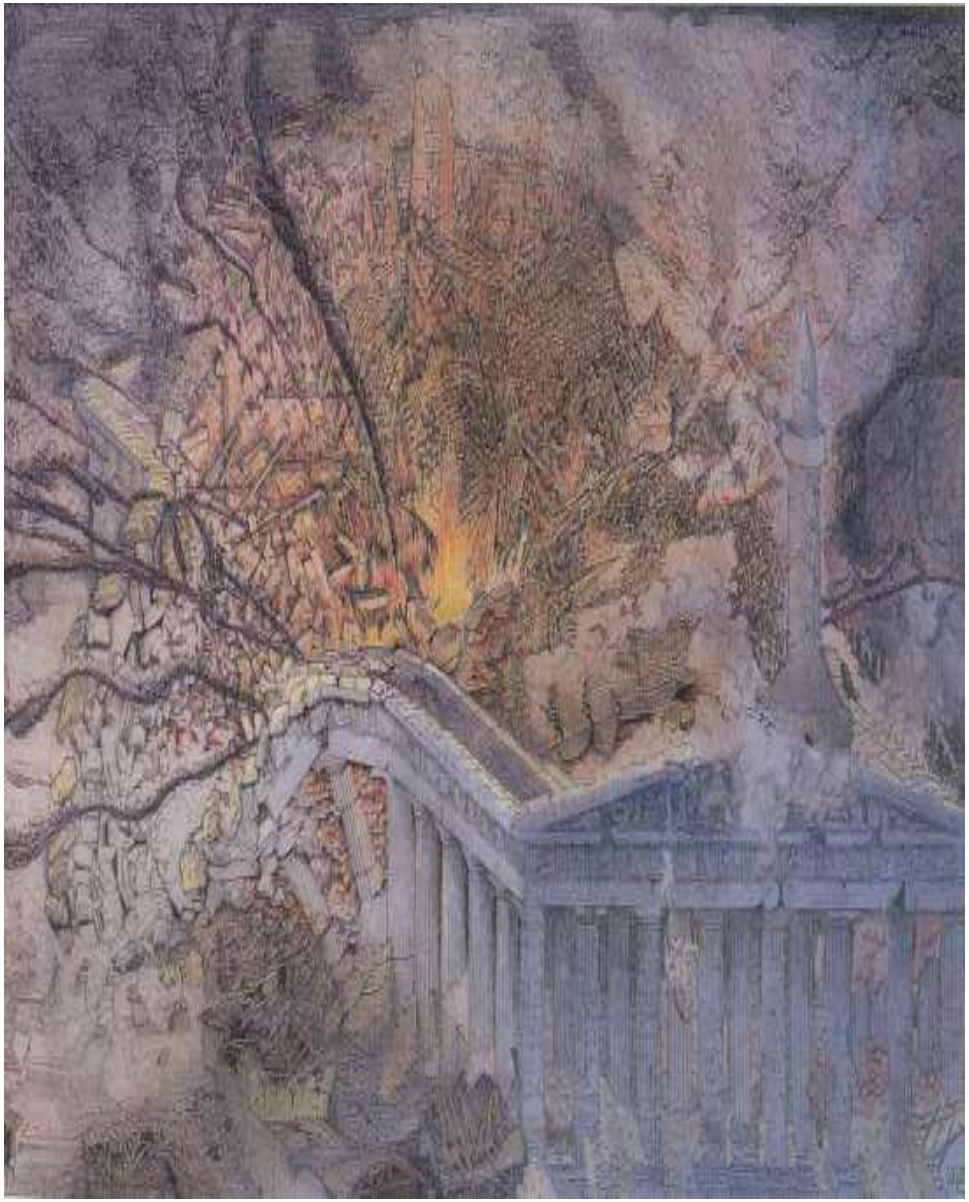
- **The faces of human figures, depicted on the metopes of Parthenon, were systematically erased by the fanatic early Christians (here metope, nr. 10 from the east side of the Parthenon Temple)**

Parthenon through History



Parthenon as a Christian church and afterwards as an Islamic mosque, during the Ottoman occupation

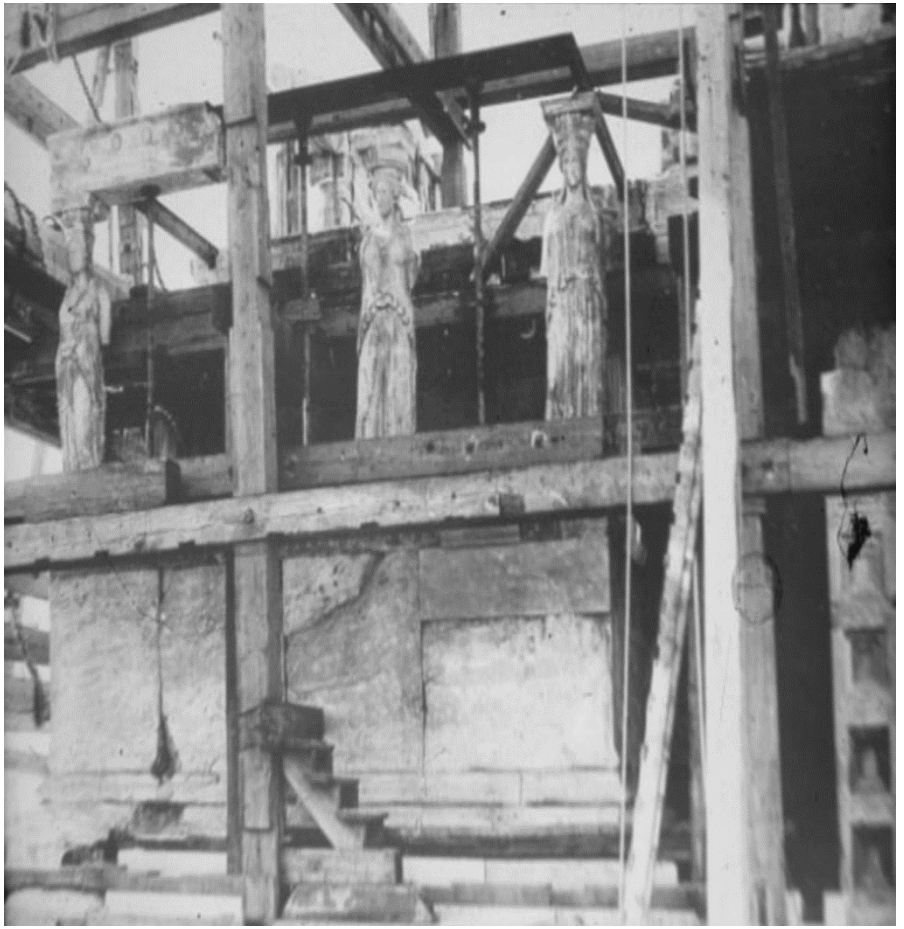
Parthenon through History II



- **The destruction of Parthenon in 1687.**
- **In 1656, the Propylaia, were also exploded, after they were hit by thunderstorm**.

The violent and illegal removal of the Sculptures from the Parthenon by Lord Elgin's Men, (3.7.1801), watercolor by Edward Dodwell

Restauration of the Acropolis Monuments after the Greek War of Independence and before Second World War

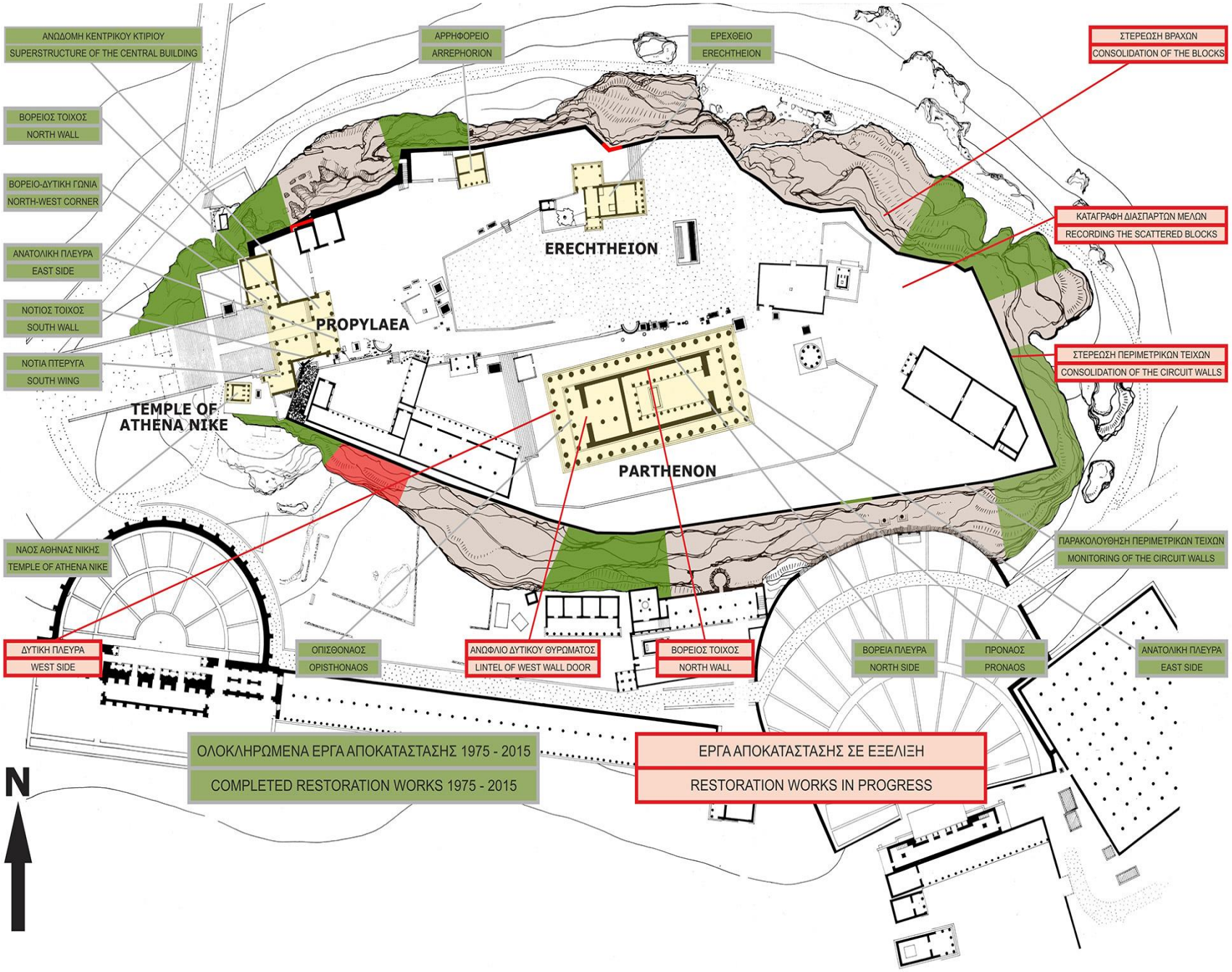


Failure of earlier conservation interventions

The type of failure appears in the form of fractures, cracks or in the form of delamination, which is the splintering - breaking off of large pieces from the surface of the marble. Most of the cracks have been caused by the rusting and swelling of the iron reinforcements, mainly from the Balanos restoration (1890-1937)

Failure of earlier conservation interventions

There are problems resulting from the mortars used in the past to join fragments and to point cracks. Most are constructed with Sorrel or Meyer cement, which was used extensively on monuments for more than 80 years. It is a white plaster with two basic components, magnesium oxide and magnesium chloride. Today, most of the mortars of this type are flaking or powdering, producing soluble salts and the adjoining marble crumbles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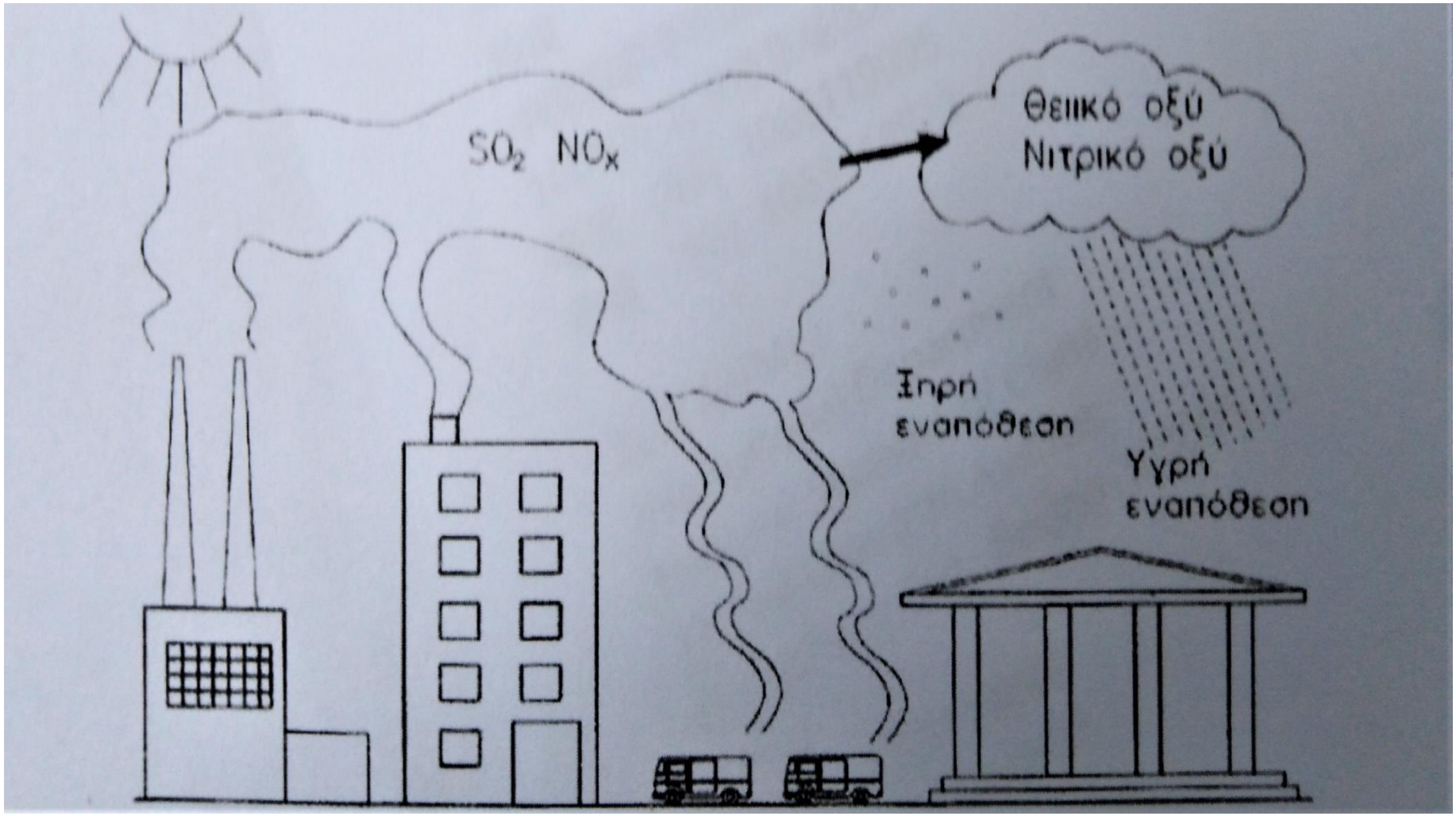
Surface erosion of the marble from

- **the atmospheric pollution and**
- **biological reasons**

How does the air pollution damage the monuments?



DETACHMENT

Appears on surface areas directly exposed to rain fall. The rainwater acidified by carbon dioxide, sulphur dioxide and nitrogen oxides from the air pollution slowly dissolves the marble. This damage is evident in the effect on the marble crystals, leading to the loss of their cohesion and ultimately in their falling off

- **Disintegartion**:
  Detachment
  of single grains
  or aggregates of grains.

Granular disintegration

Sugaring:
due mainly
to thermal stresses
and the atmospheric
action

Parthenon,
North Colonnade

The impact of acid rain on monuments

DISCOLORATION & DEPOSIT

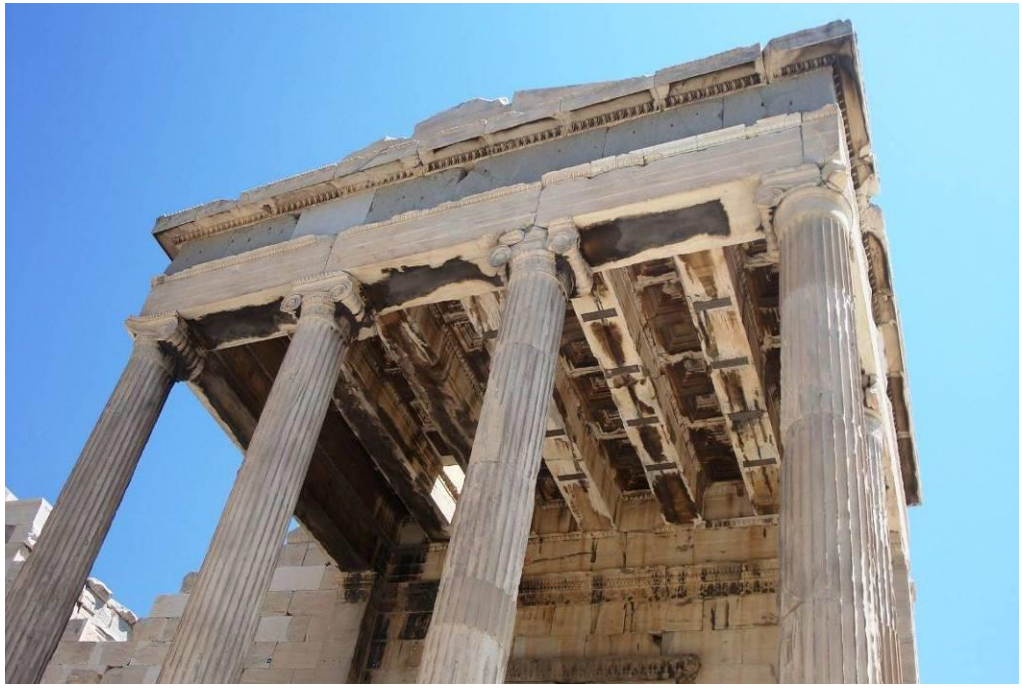
Crust: Generally coherent accumulation of materials on the surface.

Black Crust: Kind of crust developing generally on areas protected against direct rainfall or water runoff in urban environment. They are usually adhere firmly to the substrate and composed mainly of particles from the atmosphere, trapped into a gypsum ($CaSO_4.2H_2O$) matrix.

Black Crusts of Parthenon

- >200μm thick
- Gypsum, Calcite
- Si, Al, Fe, Pb, Ti, Zn, Mn

(from atmospheric pollutants)



Erechtheion
North Porch

Biodeterioration factors

Research by microbiologists has revealed the presence of a variety of microbial colonies, consisted of bacteria, algae, fungi and lichens. The biological factor in the physico-chemical damage to the marble has been shown to be significant. Both epilithic and hasmolithic microflora alter the colour of the monuments' surface, the secretion of erosive compounds from various micro-organisms causes the dissolution of the calcium carbonate and a large part of the microflora exerts micro-pressures resulting in surface decay.

- The Committee for the Conservation of the Acropolis Monuments (ESMA) is an interdisciplinary committee of the Ministry of Culture that was established in 1975
- The responsibilities of the Committee comprise programming, directing and supervising the works being carried out on the Acropolis rock.

- **M. Korres, Architect, Professor of the NTUA, Chairman of the ESMA**
- **F. Mallouchou - Tufano, Archaeologist, Professor Emeritus of the University of Crete, Deputy Chairman**
- **P. Themelis, Archaeologist, Professor Emeritus of the University of Crete**
- **V. Kaselouri - Regopoulou, Chemical Engineer, Professor Emeritus of the NTUA**
- **E. Kountouri, Archaeologist, Director of Prehistorical and Classical Antiquities of the Ministry of Culture and Sports**
- **P. Koufopoulos, Architect, Professor of the University of Patras**
- **V. Lamprinoudakis, Professor Emeritus of the University of Athens**
- **M. Mertzani, Director of Conservation of Ancient and Modern Monuments of the Ministry of Culture and Sports**
- **E. Banou, Archaeologist, Director of the Ephorate of Antiquities of Athens**
- **D. Svolopoulos, Architect, Director of Restoration of Ancient Monuments of the Ministry of Culture and Sports**
- **M. Chronopoulos, Civil Engineer, Scientific Associate of the NTUA**
- **A. Choremi, Archaeologist, Ephor Emeritus of Antiquities**

- **The Acropolis Restoration Service (YSMA) is a special peripheral service of the Ministry of Culture. It was established by the Presidential Edict 97/1999 (Φ.Ε.Κ. 104/Α/26.5.99) in order to organize and carry out the works of conservation and restoration on the Acropolis. Academic responsibility for carrying out the works has, since 1975, been held by the Committee for the Conservation of the Acropolis Monuments (ESMA)**

- **The Director of the YSMA is responsible for the coordination and unhindered function of the works, for its adherence to the time-frame and for introducing to the ESMA matters for which the Committee is responsible. The YSMA is divided into sections, such as:**
- **Technical office and work-site for the conservation and restoration of the Parthenon, the Propylaia, the temple of Athena Nike.**
- **Office and workshop for inventory, documentation and cataloguing of the scattered architectural members**

Facing the problem

Since 1970's concrete measurements have been gradually implemented, such as:

- Use of better quality diesel
- Replacement of the old technology cars
- Restricted for the vehicles areas of the Athens historical center of Unification of the archaeological sites
- Reduce of the emissions of sulfur dioxide

SYSTEMATIC CONSERVATION INTERVENTIONS
Cleaning

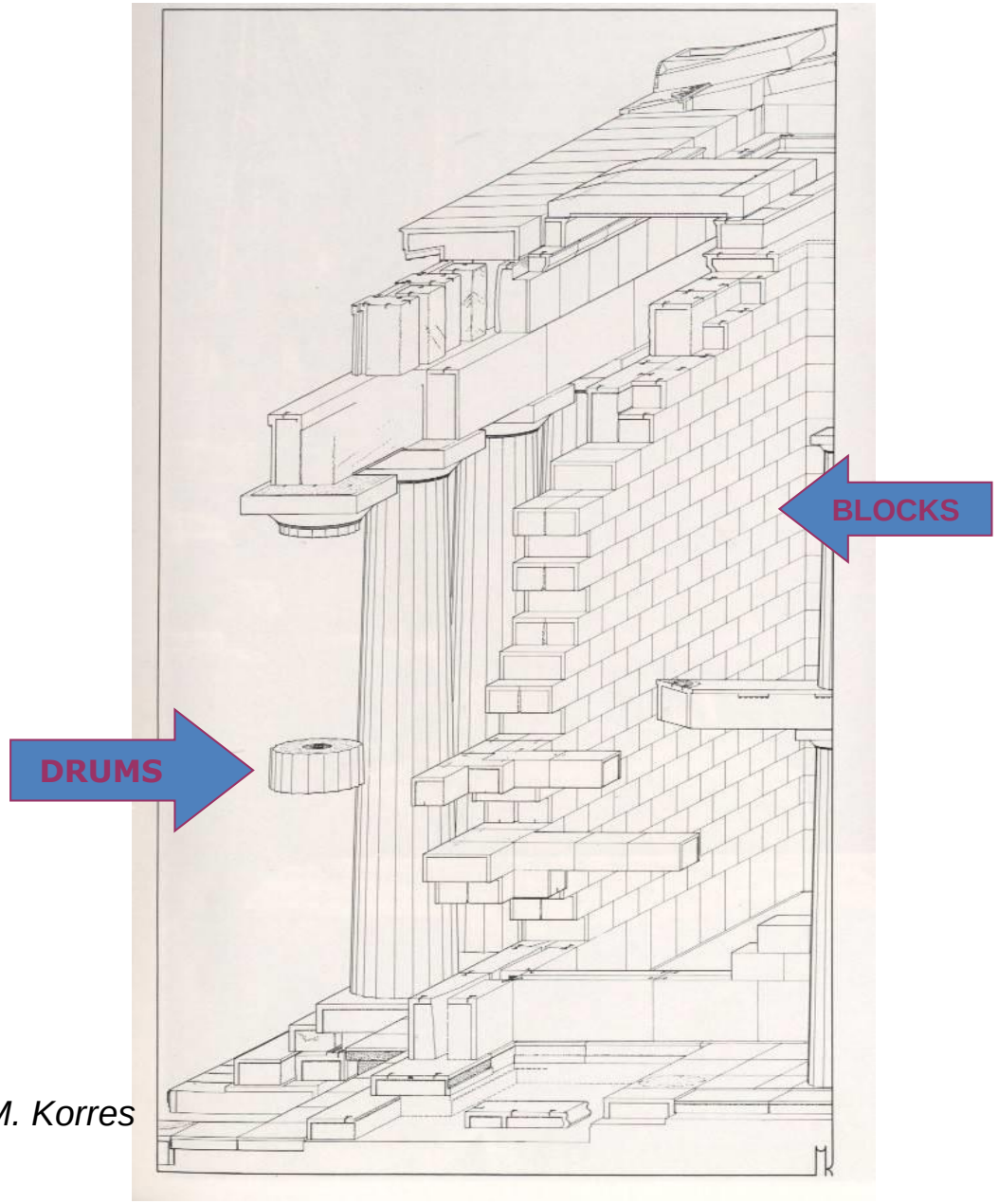
- **Biological Colonization,** especially the microbes that acts behind the surface of the stone and inside the cracks, gaps, etc.
- By using **Hydrogen Peroxide (H_2O_2) (5-7%).**

Laser Cleaning - The case of Parthenon west frieze

Laser Cleaning - The case of Parthenon west frieze

Monuments' Structure

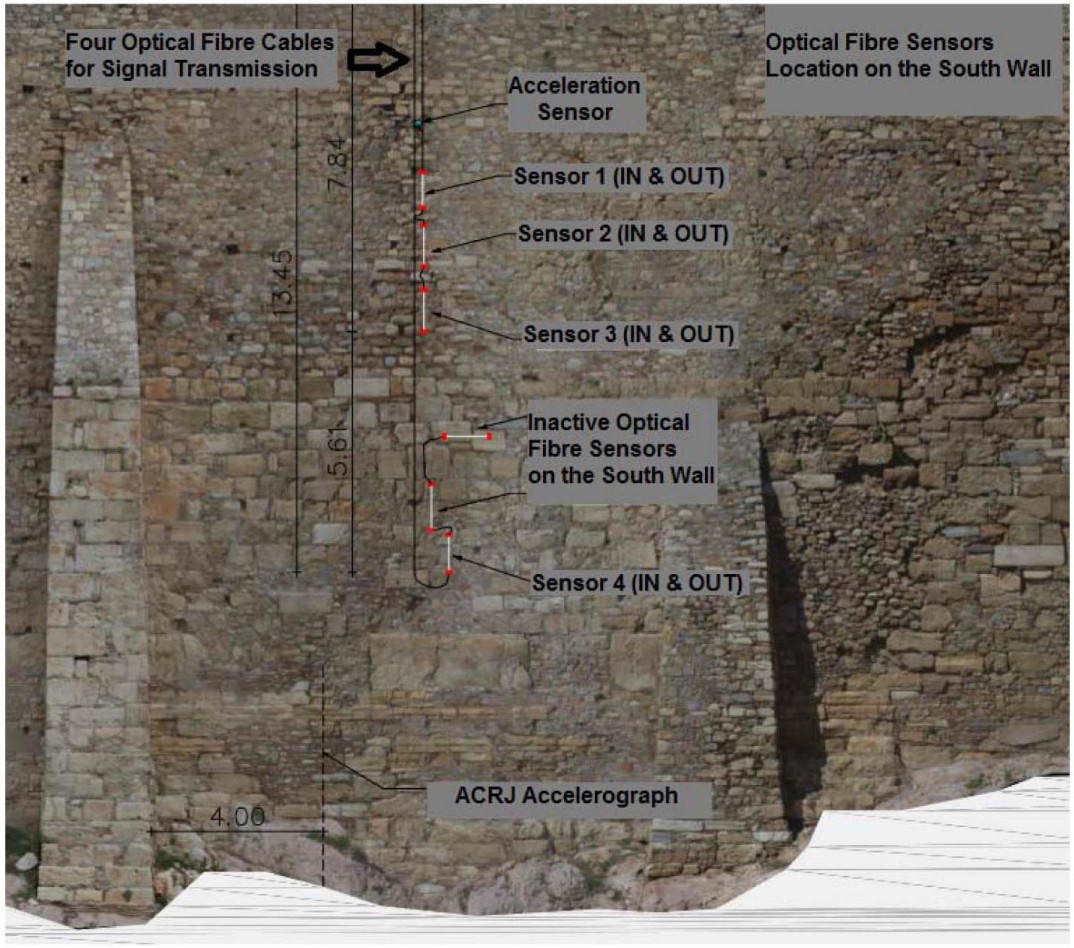
- Worked stones without mortars
- Metal joining elements



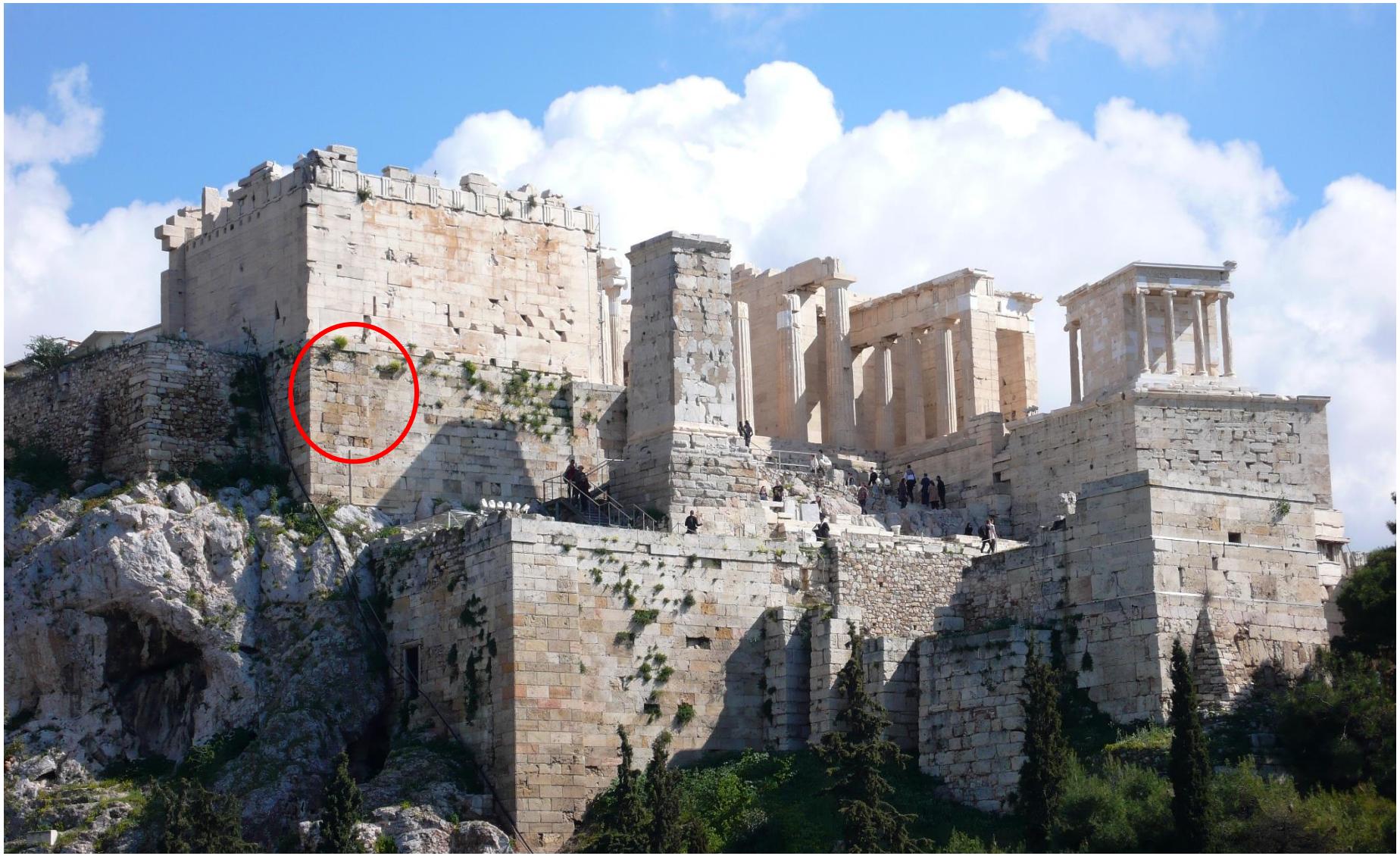
Drawing: M. Korres

Location of the accelerometers on the Acropolis

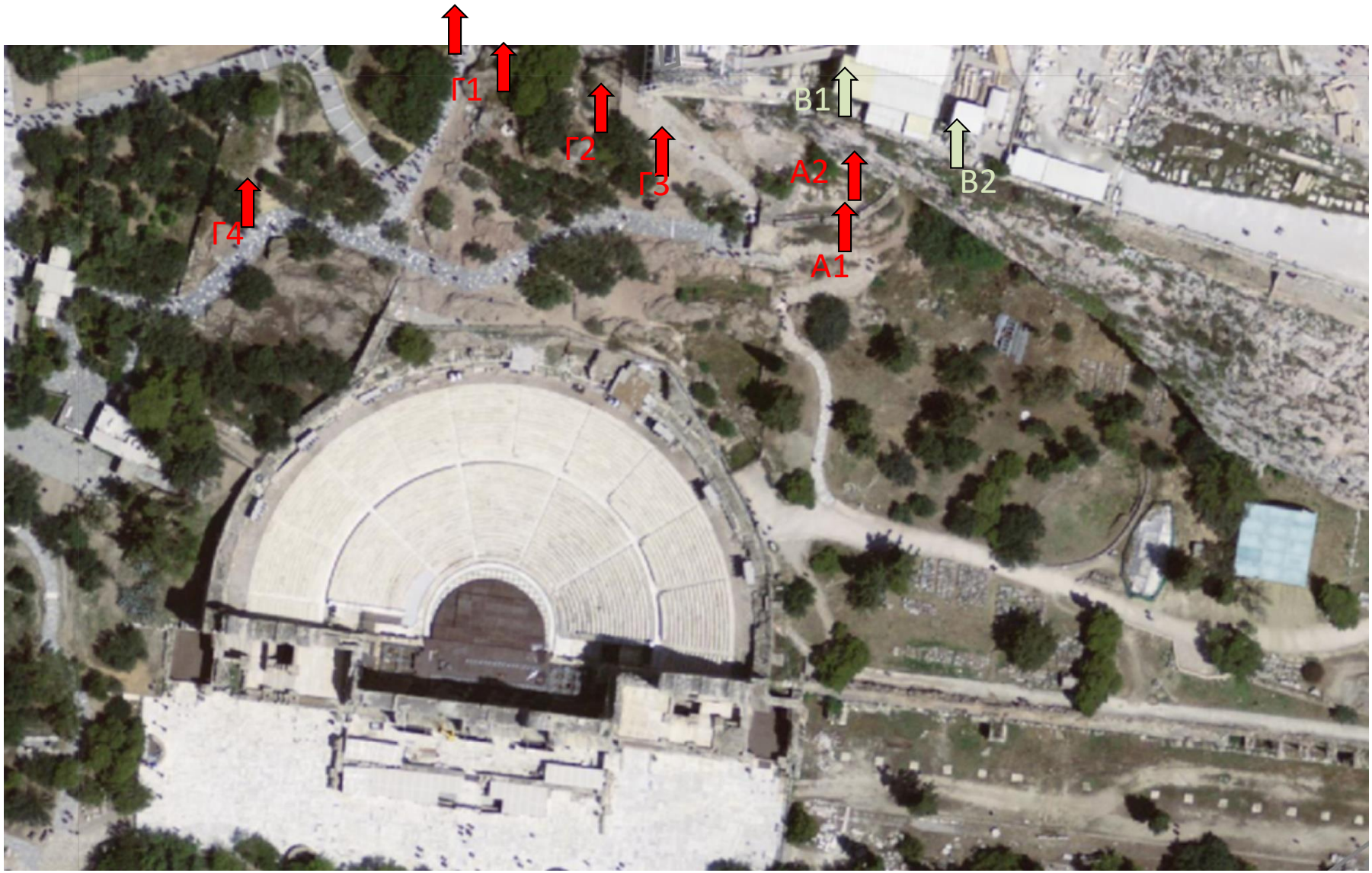
Monotoring with the combined use of accelerometers and fiber optic sensors

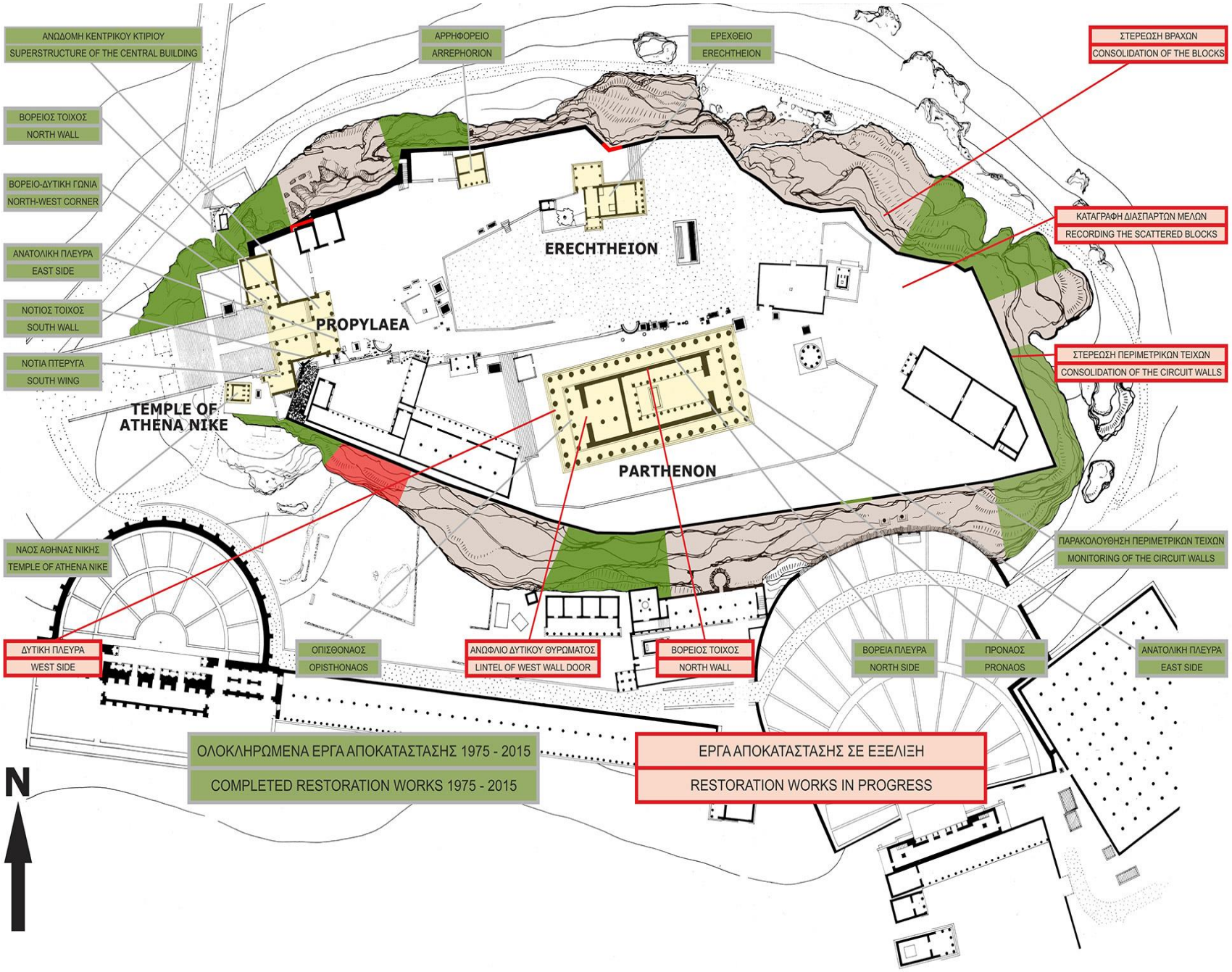


Monitoring with the use of micro fiber sensor at the base of the so called Pinakothiki (Gallery) of Propylaia.



Unstable schistolithic rocks (southwestern slope)

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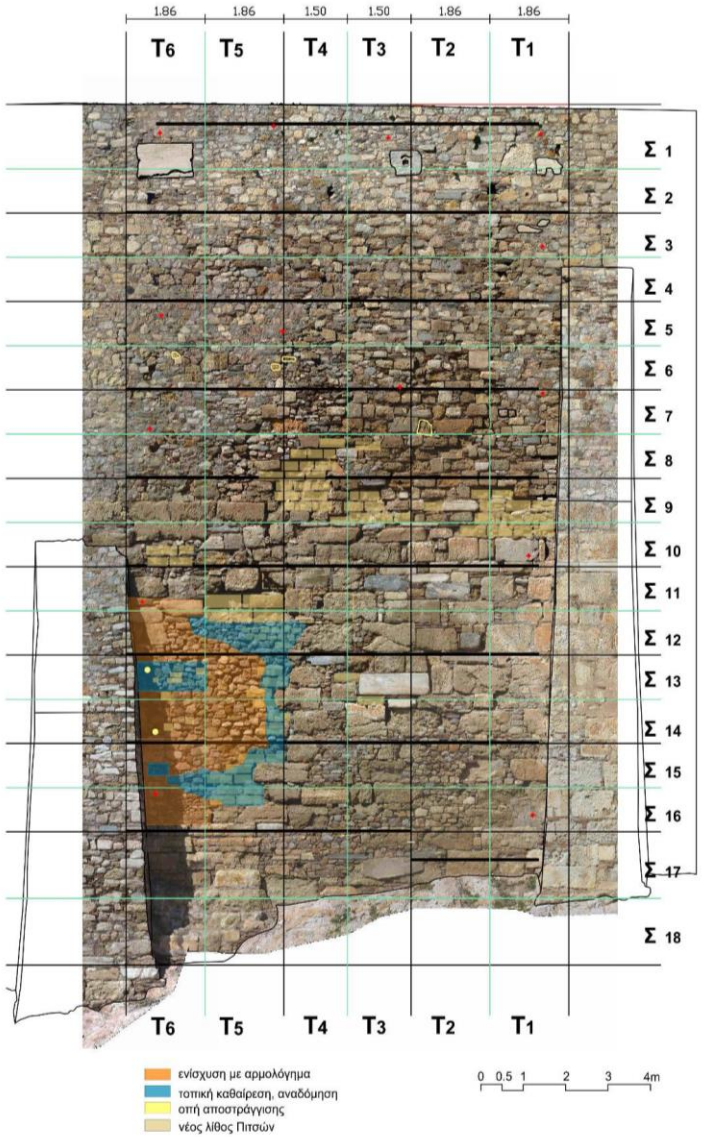
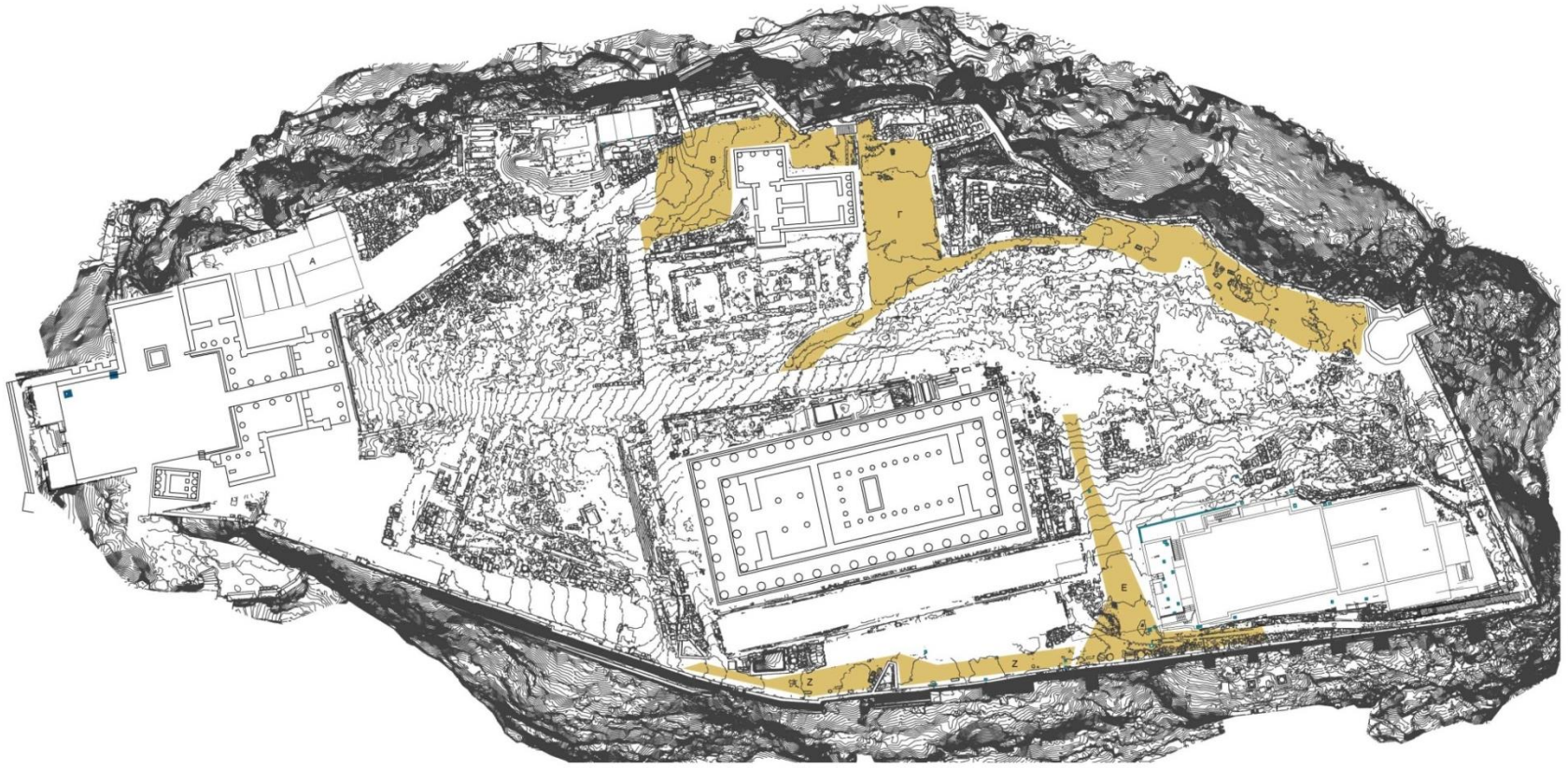
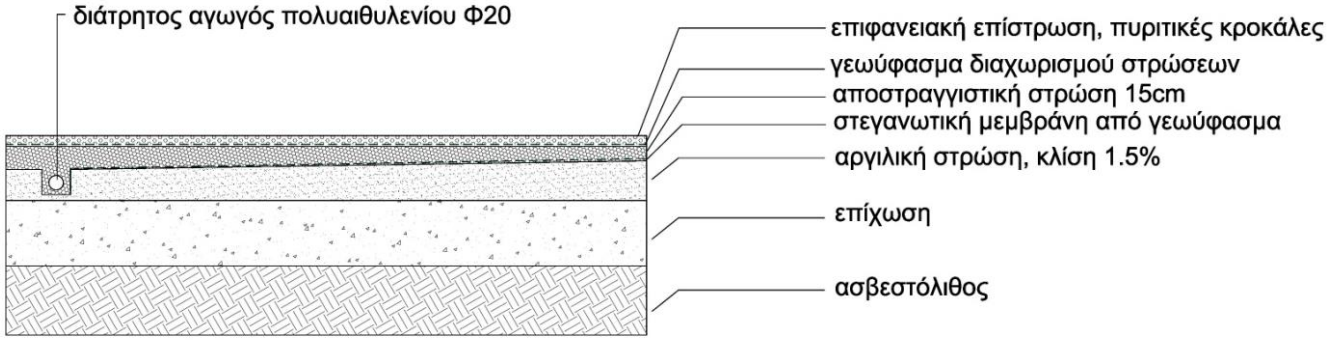
South Wall, area among 6th and 7th retaining wall



Study for the restoration of the south fortification wall of the Acropolis in the area between the 6th-7th retaining wall

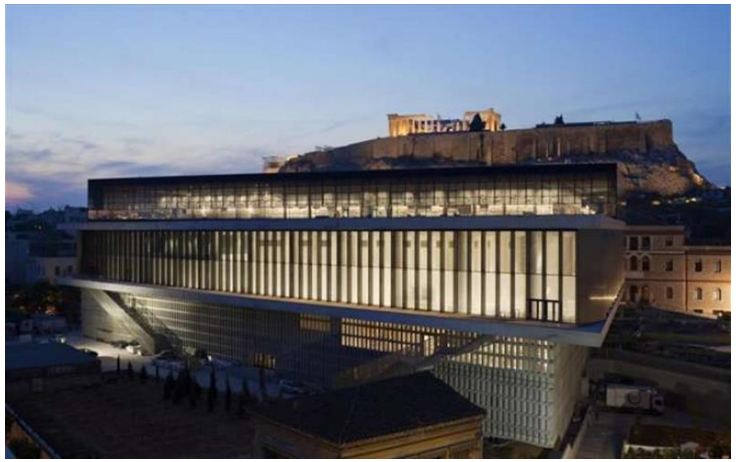
Preliminary study on the treatment of rainwater





Before and after the works of stabilization of the schistolithic SW slope of Acropolis

The reunification of the Parthenon Sculptures



The Acropolis Museum

Thank you for your attention

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