

## BASIC PRINCIPLES FOR DEVELOPING CAPACITY BUILDING IN GEOMETRIC RECORDING OF CULTURAL HERITAGE

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## Cultural Heritage

Cultural Heritage **conservation** is extremely important and has been broadly emphasized by UNESCO

Yet not much attention is paid especially in developing countries, where monuments of great value exist, due to other priorities: poverty reduction, infrastructure improvement

*That approach has negative impact on Cultural Heritage!*

*Major importance for Greece with such a big number of monuments and sites of a variety of historical periods*



*Need for Geometric Recording of Monuments*

*In this field Surveyors have a leading role to play !!*

## Geometric Recording of Monuments

- The geometric recording of a monument is the procedure of **acquiring, processing, archiving** and **presenting** data for the determination of the position and the actual present form, shape and size of a monument in 3D space at a given moment in time
- The geometric recording **monitors** the present condition of the monuments, as it has been formed through time and it is a necessary document for those who would understand their past, as well as for those who provide for their future

## Geometric Recording of Cultural Heritage

- Necessity for Recording - Documentation (Venice Chart, 1964)
- International Rules
- Geometric Recording as part of the integrated Monument Documentation

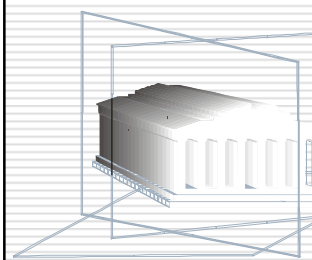
*Conservation, Development and Restitution of Architectural Heritage demands Multidisciplinary Approach*

*International Charta of ICOMOS*

## Basic Principles of Geometric Recording

- **Structural Interventions on the monument according to International Rules**  
Application of non contact methods and techniques  
Recoverability of interventions
- **Use of low cost methods and techniques appropriate for the Technical Specifications**  
Documentation of monument - Field data collection
- **Specialized needs according to the importance & shape of the monument and of the intervention that will be done.**  
Accuracy, Type & format of products

## Geometric Recording of Monuments



Scale - Accuracy

Methods of Geometric Recording:

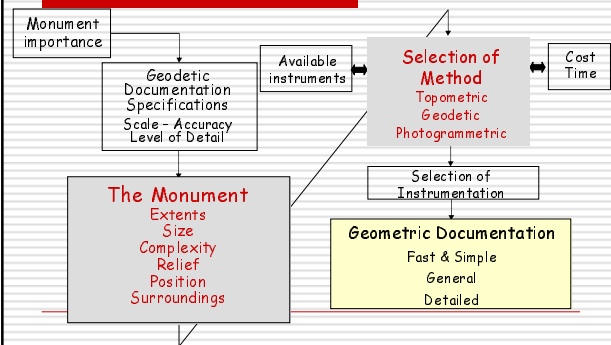
- Topometric
- Geodetic
- Photogrammetric
- Laser Scanning

## Geometric Recording of Monuments

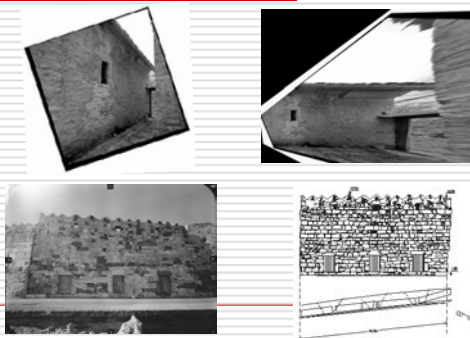
The geodetic and photogrammetric methods:

- Are based on direct measurements of lengths and angles either on the object itself or on images of it
- Determine 3D co-ordinates in a common reference system
- Ensure the specified and common accuracy
- Provide adaptability and flexibility, together with speed, security and efficiency
- Are cost effective, in the sense that they are the only ones capable of satisfying and meeting any specifications with the least possible cost and maximum possible benefit

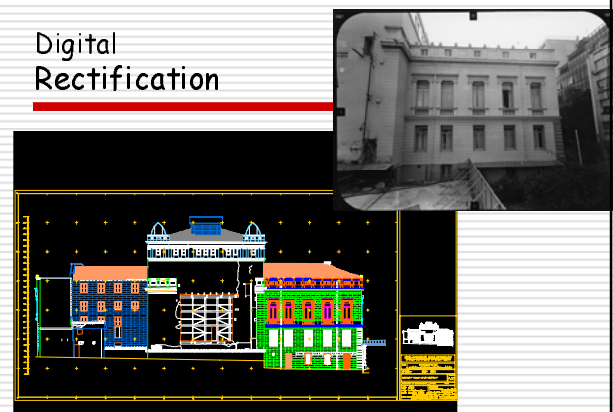
## Geometric Recording of Monuments



## Digital Rectification



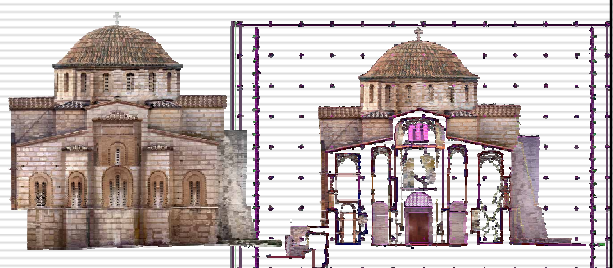
## Digital Rectification



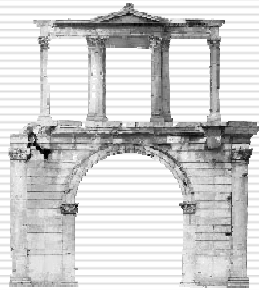
## Photomosaic



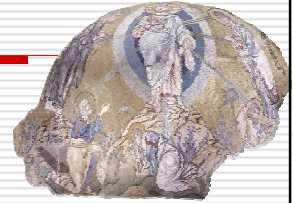
## Orthophotography



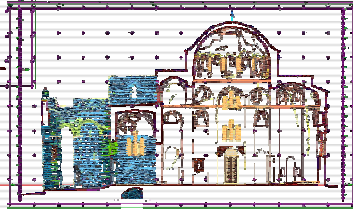
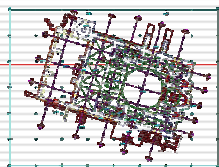
## Orthophotography



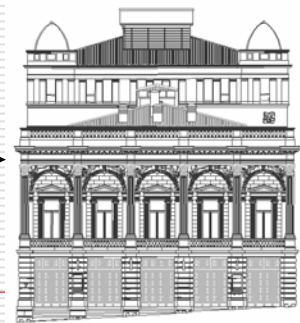
## Orthophotography



## Photogrammetric Stereo restitution



## Photogrammetric Stereo restitution



## 3D visualizations



## Capacity

**Capacity** can be defined as the ability of individuals and organizational units to perform functions effectively, efficiently and sustainably

UN publication on *Capacity Assessment and Development*

- Capacity is not a passive state but is part of a continuing process
- Human resources are central to Capacity development
- The overall context within which organizations undertake their functions will be a key consideration in strategies for Capacity Development

## Capacity Development

Capacity Development is the process by which individuals, groups, organisations, institutions, societies increase their abilities to:

- Perform core functions, solve problems, define and achieve objectives
- Understand and deal with their development needs in a sustainable manner

Capacity Development includes retaining & strengthening existing capacities of people & organisations to perform their tasks

## Capacity Building

Capacity Building encompasses the country's human, scientific, technological, organisational, institutional and resource capabilities.

It includes the ways and means by which the overall goals are achieved:

- Education & Training
- Human resource development
- Development of institutional infrastructures
- Adequate policy framework

## Capacity Building

Application levels of Capacity Building in society:

- ❑ **Societal level**  
policies, legal framework, management perspective, availability of resources
- ❑ **Organisational level**  
mission & strategy, processes, infrastructure, human / financial / information resources
- ❑ **Group of people / Individual level**  
educational & training courses, qualified staff to operate the systems

## Capacity Building in Cultural Heritage

Adjustment of the various aspects of Capacity Building in the field of Geometric Recording of Cultural Heritage:

- ✓ Education and Training of Surveyors and the other relevant disciplines
- ✓ Gaining experience - knowhow
- ✓ Development of infrastructure
- ✓ Use of specialized hardware & software by the Public & mainly the Private Sector
- ✓ ...

## Capacity Building in Cultural Heritage

1/3

Capacity Building should be improved at all fields:

- **Political level / Decision Makers**  
Awareness about the necessity for multi-disciplinary approach  
Adopting the necessary legislation  
Financing the compilation of studies
- **Administrative level**  
Institutional arrangements & Collaboration of Public Services  
Development of a system for the supervising projects, quality control tests & compilation of the works

## Capacity Building in Cultural Heritage

2/3

- **Scientific level**  
Increase of specialized technical knowledge  
Lifelong learning programs & Continuing education  
Experience through active participation in multi-disciplinary working groups
- **Financial level**  
Compilation of cost-benefit & technical studies for the geometric recording, using both purely financial and cultural criteria  
Purchase & Maintenance of Hardware & Software

## Capacity Building in Cultural Heritage

3/3

- **End-user level**  
Raising awareness about: What they can demand?  
What they can expect?  
What are the procedures & techniques for Recording  
Which are the levels of Documentation & Archiving
- **Citizen level**  
Developing public awareness about Cultural Heritage  
Historic knowledge - Aesthetic upgrading

## Education in Greece for the Recording of Cultural Heritage

Present situation in the Schools of Surveyors & Architects  
(NTU Athens)

- Under-graduate studies** 5 years
- Surveyors:** - Large number of courses in Geodesy, Photogrammetry, Laser Scanning  
- 1 specialized course at the final academic year  
- Optional Diploma thesis (1 full semester)
- Architects:** 1 course
- Post-graduate Programme** 1.5 year  
"Monument Protection"

## Decisions about Advanced Education in EU

**June 1999 (Bologna):**

Symposium on "Advanced Education in Europe"  
participation of 29 European Ministers of Education  
**Statement (among others):**  
Two-segment studies: 3 years for the 1<sup>st</sup> degree  
+2 years for a Master degree

**September 2003 (Berlin):**

Ministerial Decision of 33 Ministers of Education  
Commitment for validation by the end of 2005

## Changes in Advanced Education in EU

Decisions taken will:

- affect the Structure & Orientation of studies
- result to more specialization after the completion of the 2<sup>nd</sup> segment of studies, and to lack of fundamental knowledge to the graduates of the 1<sup>st</sup> segment



Standards and Structure of Advanced Technological Education in Greece will change, thus also changing the education in Geometric Recording of Cultural Heritage

## Universities & New European Challenges

Universities are facing an imperative need to adapt and adjust to a series of changes:

- Increased demand for higher education
- The internationalisation of education & research
- To develop effective & close cooperation with industry
- The proliferation of places where knowledge is produced
- The re-organisation of knowledge
- The emergence of new expectations

## Lifelong Learning

1/3

In addition to the change and the new challenges in University education, new trends for the Lifelong Learning in EU are established

- In **June 2000 Feira (Portugal)** European Council asked the EU Commission and the Member States to identify a coherent strategy to enable all Europeans to access LL
- LL focuses on apprenticeship from pre-school education to the approach to retirement
  - Covers all forms of education (formal / informal)

## Lifelong Learning

2/3

**Present situation in Greece**, in the field of Recording:  
Sporadic programmes in Continuing Education  
Financed (or not) by the State & EU  
are offered by the 2 Universities (NTUA, AUTH), the TGC  
and the Private Sector (at a level lower than the University  
degree)

### **Future situation:**

- A new semi-independent agency will be established within  
each University responsible for the LL **self-financed**
- Educational Institutes for LL in each Prefecture  
Authority optionally **doubtful quality of studies**

## Lifelong Learning

3/3

Conservation and Recording of Cultural Heritage is an  
attractive issue

It is expected to attract the interest of Public &  
Private Sector in Lifelong Learning

Rules and Specifications should be applied in order to  
achieve Control of Quality and Completeness of the  
offered education and specialized knowledge

**Educators, Infrastructure, Equipment, Academic  
knowledge, Field practice**

## Guidelines & Action Plan Framework

All the above mentioned show the need for "**Guidelines on  
Specialized Education and Study Compilation for the  
Documentation of Cultural Heritage**"

In the international literature only general Rules and  
Specifications exist, and some more are under compilation,  
such as from the **International Scientific Committee for  
Analysis and Restoration of Structure of the Architectural  
Heritage**

Producing Guidelines is not an easy task, due to the  
broad variety and the different type of monuments  
Each monument needs a special approach and different  
level of treatment