- Methodologies for cataloguing cultural heritage
- Computerized cataloguing and multimedia documentation

Emergency measures and storage management

Experience gained: 2009, 2012, 2016 earthquakes

Ministry for Cultural Heritage and Activities Directive 23/04/2015,
published in Official Gazette no.169, 23-7-2015, as updating of Directive 12/12/2013,
on management of planning and operational stages for safeguard, reconstruction, consolidation and restoration of damaged properties

The Directive provides for:

1. Activation of management and communication procedures;
2. Coordination with civil protection agencies;
3. Recording damages to cultural properties;
4. Safeguarding operations for movable and immovable properties;
5. **Management of temporary deposits and laboratories for emergency intervention on movable properties;**
6. Information management.

The Directive regulates :

1. "preventive" actions to be carried out in the affected area, from the issue date of the ministerial decree;
2. "Emergency" and "full operation" actions;
3. Standardised cataloguing records.

Temporary storage areas

Following the 2009 and 2012 earthquakes, MiBAC agencies set up a central management and storage areas. These were highly effective for:

- **Avoiding dispersion of rescued properties;**
- **Optimising the use of human and financial resources;**
- **Setting up preservation-restoration laboratories for emergency interventions and properties safeguard.**

Temporary storage areas

However, in some scenarios the responsible agencies should consider distribution of works in multiple locations, to avoid concentrations at risk of attacks, ransom, etc.

Temporary storage areas: features

Temporary storage areas must meet basic requirements:

1. **Suitability for management and control of properties;**
2. **Structural environmental and patrimonial safety;**
3. **Sufficient capacity;**
4. **Easy access to the building and interior spaces for all types and sizes of properties;**
5. ***(Ideally* - suitability for environmental monitoring and control*).***

Temporary storage areas: features

We have to point out that some level of EARTHQUAKE

AND HUMAN-INDUCED RISKS WILL ALWAYS REMAIN.

Temporary storage areas: features

•Operations in the first days of the emergency will inevitably be confused.

Fire departments, Civil Protection, and ministry employees are all in action, resulting in large numbers of properties arriving at the storage area at all hours of day and night.

•The works can **remain in storage for the short, medium or long term**.

Often they cannot return to their original place.

Temporary storage areas: logistics

Temporary storage areas: logistics

Temporary storage areas: *dealing with properties of all kinds*

Operators will be confronted with a vast variety of movable properties arriving from different locations. This requires design of low-cost, easily-constructed modular structures, which can keep collections together in safe conditions, potentially for long periods of time.

Temporary storage areas

2009: Celano (Province of L'Aquila)

2012: Sassuolo (Modena)

Temporary storage areas:
dealing with properties of all kinds

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Temporary storage areas:
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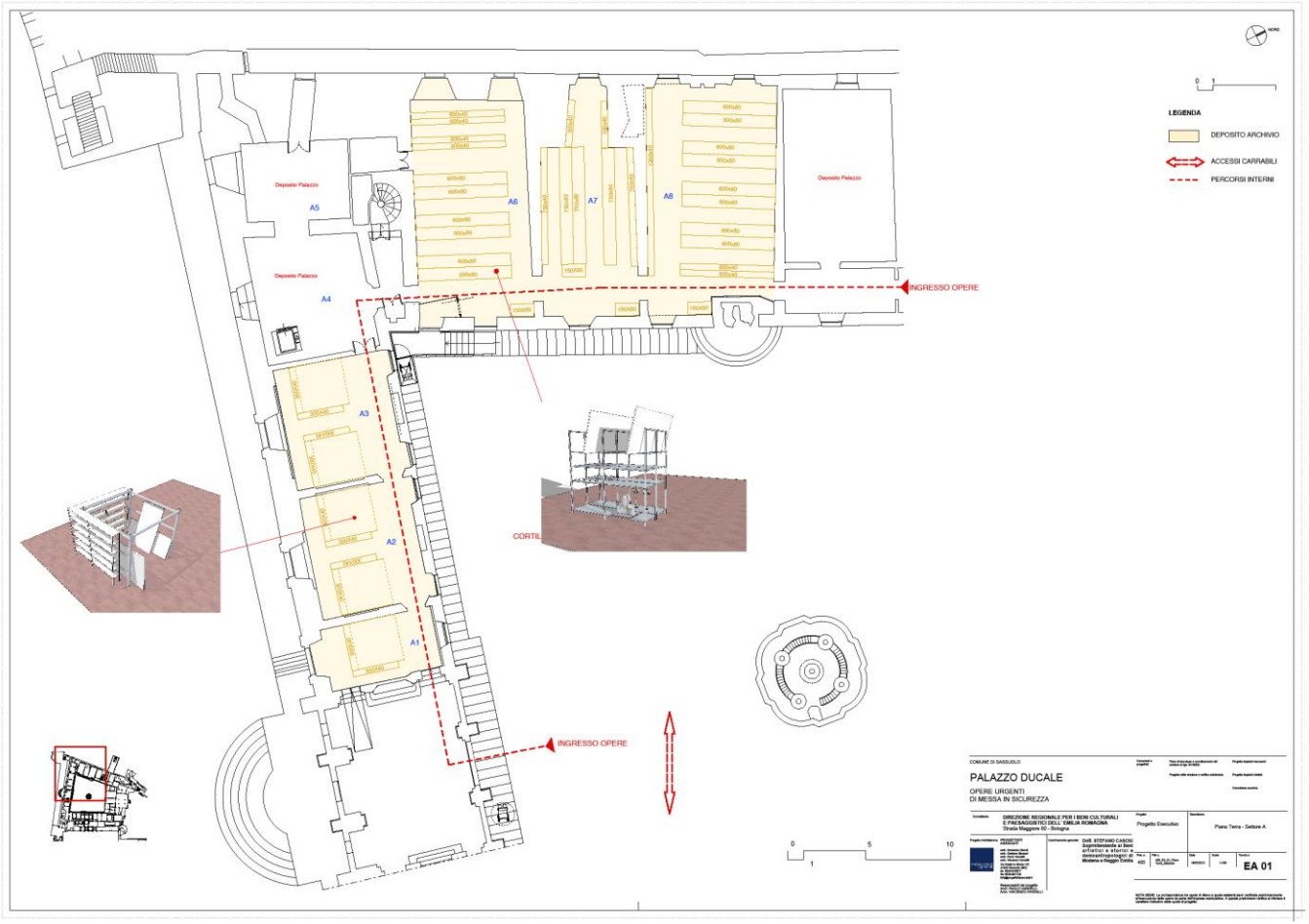
Temporary storage areas

At Celano, MiBAC agencies acted rapidly to build a structure of scaffolding pipe, subdividing the larger storage area into units. The structure was identified and mapped using georeferencing.

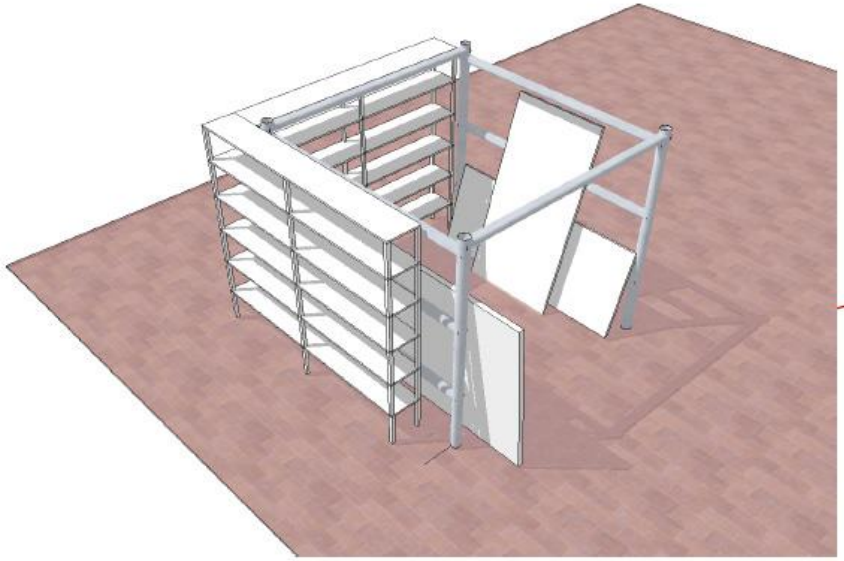
Setting up the storage area

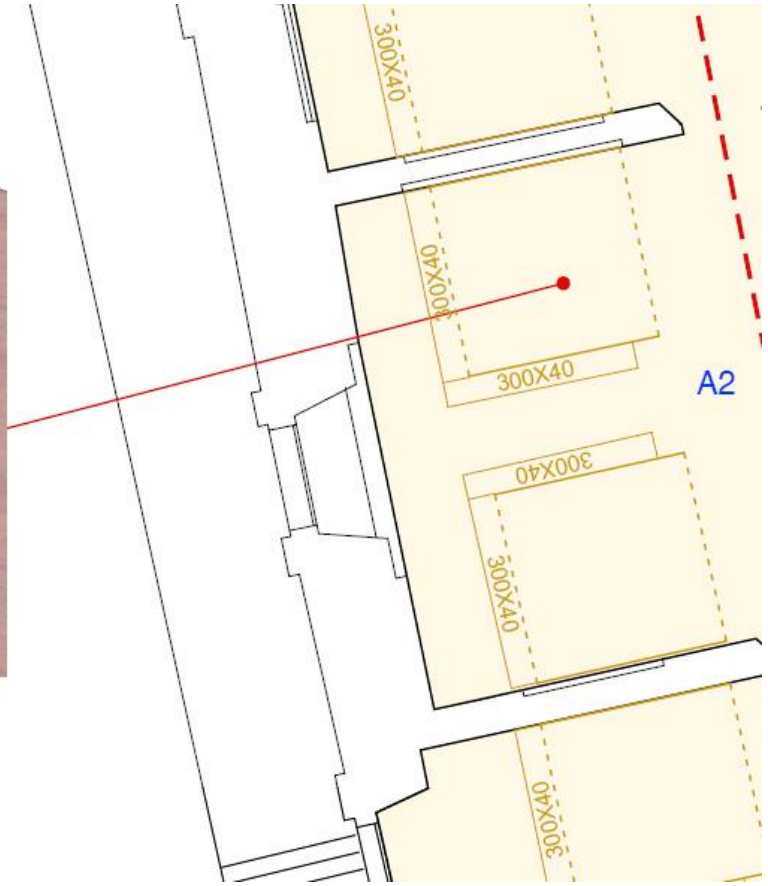
Scaffolding pipe was used again at Sassuolo, to create smaller, more versatile, independent storage units, with modular shelving.



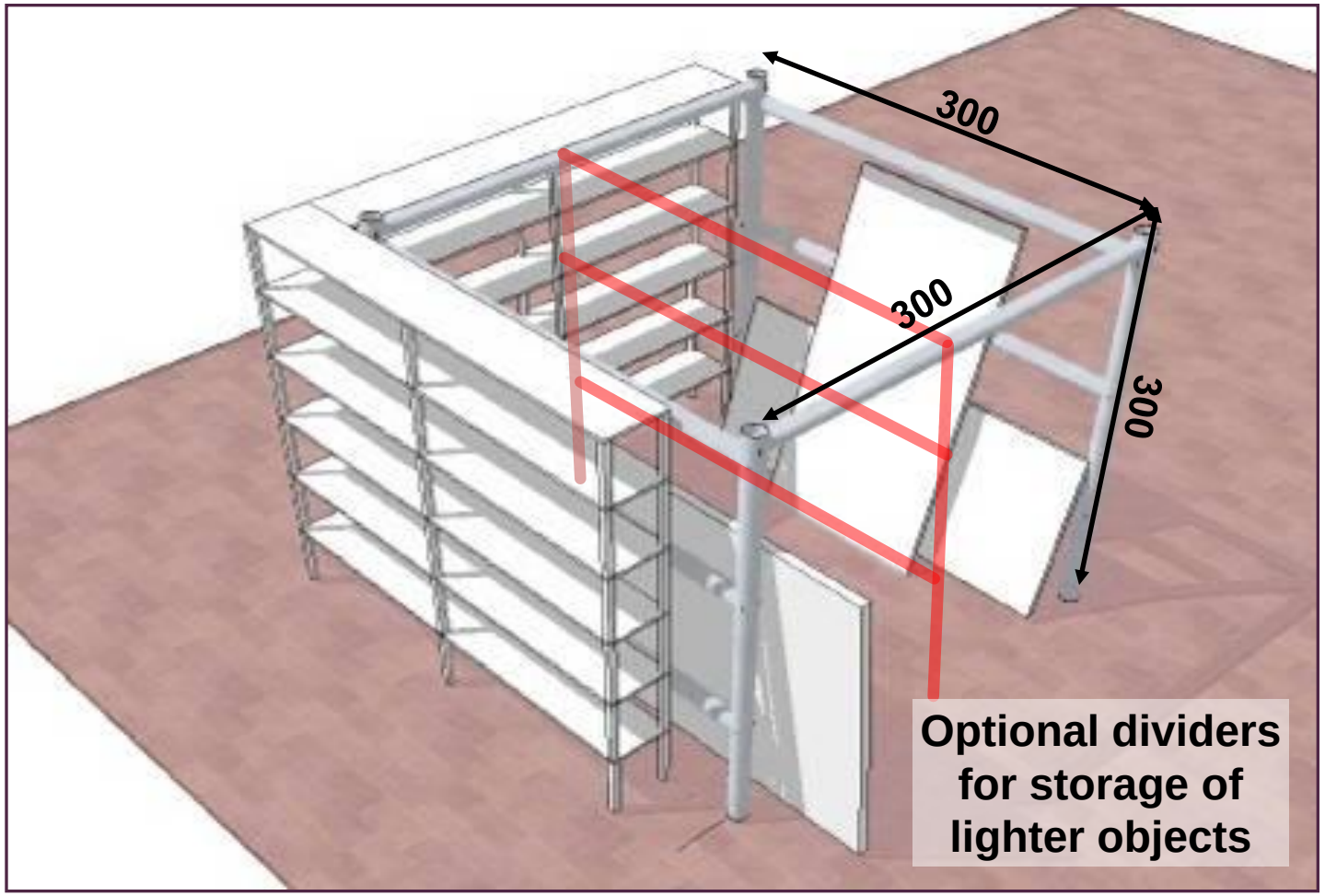
Works for upgrading the Ducal Palace were carried out over June-August 2012.

Setting up storage areas:
independent storage units

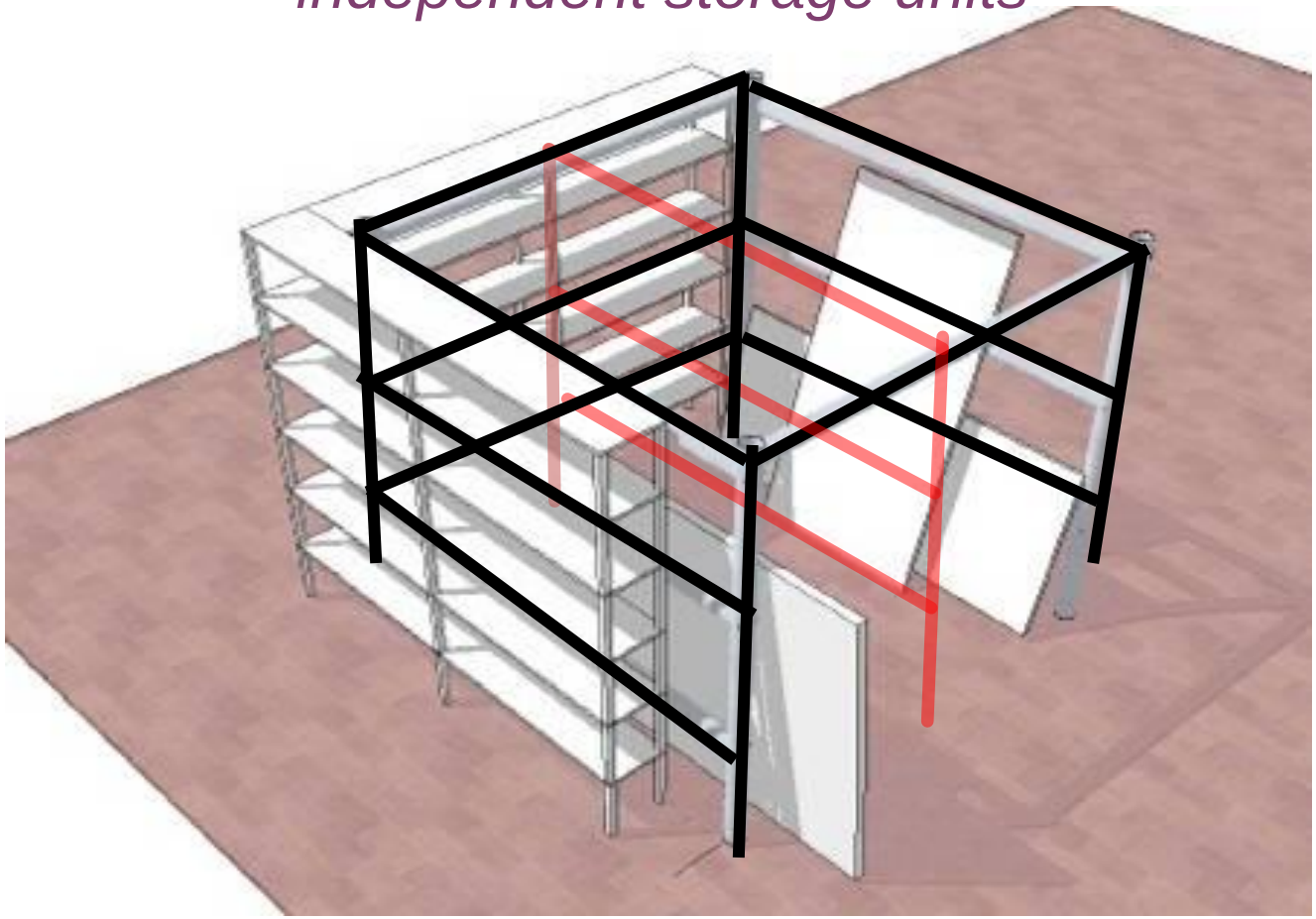




Setting up storage areas: *independent storage units*



Setting up storage areas: *independent storage units*



Each storage unit requires fourteen 3-metre pipes and 20 joints, and can accommodate additional dividers using up to 4 (+1) pipes and 7 (+3) joints.

Setting up storage areas: *independent storage units*

Case of further adaptations

Setting up storage areas: shelving

Appropriate shelving permits correct storage of large quantities of highly varied objects.

Setting up storage areas: shelving

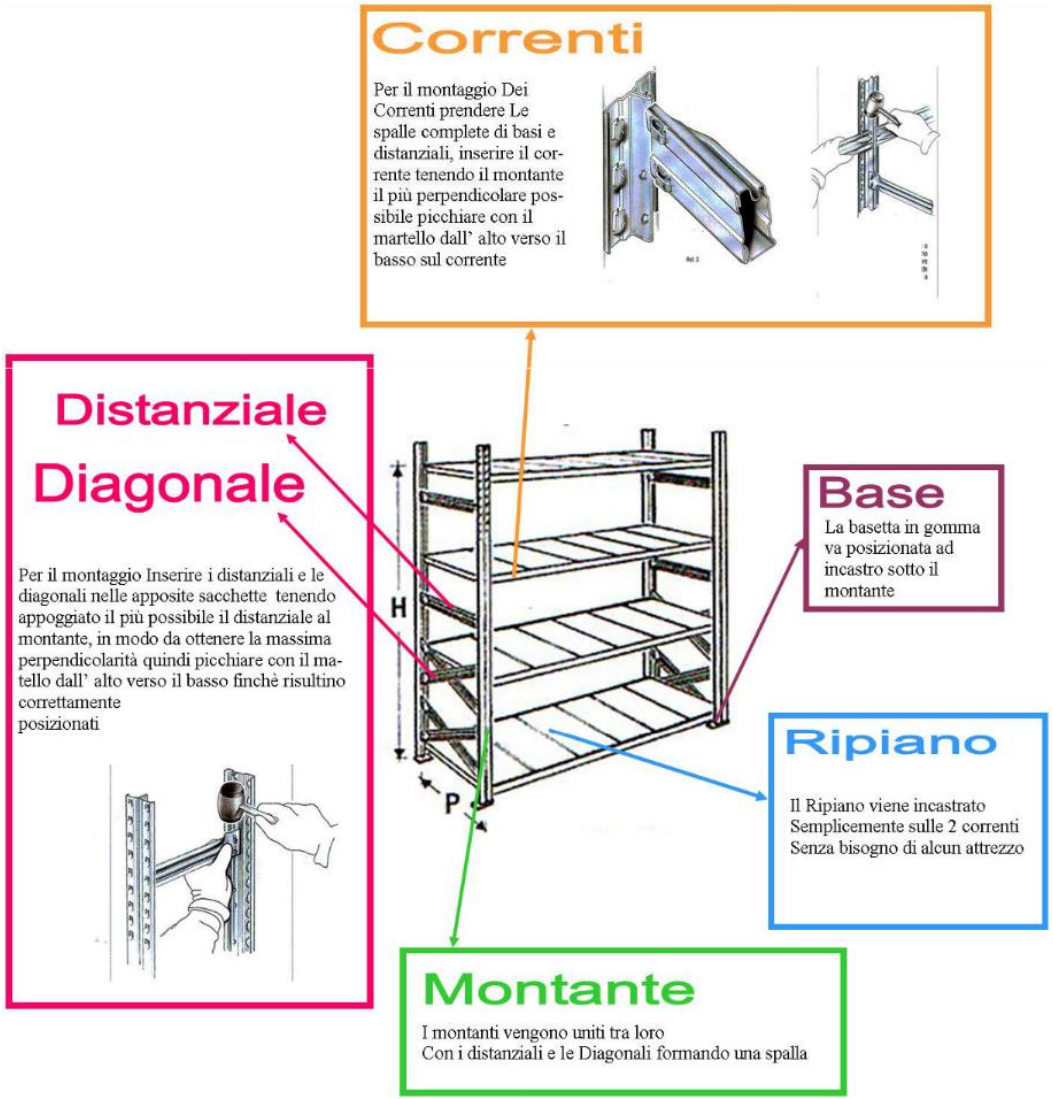
Setting up storage areas: shelving

Shelving that can be mounted with simple tools are selected. The type shown here requires only a rubber mallet.

Suitable specifications are:

- *shelf depth* - 32 to 80 cm;
- *distance between uprights* - 90 to 180 cm;
- *height* - 157 to 500 cm;
- *maximum load per shelf* - 450 daN;
- *maximum load per span* - 3600 daN.

This is a modular shelving, available in steel or polypropylene.



Setting up storage areas: shelving

Combinations can be infinite, so narrowing the selection simplifies purchasing and logistics.

A good compromise is:

- depth - 60 cm,
- spans - 90 to 150 cm,
- height - 3 metres.

Setting up storage areas

An alphanumeric code is assigned to each storage unit and to each interior box side .

Setting up storage areas: painting “beds”

At both Celano and Sassuolo, paintings on canvas were dismounted from their stretchers, for preservation reasons. We then built temporary structures (called “beds”) for storage. The peg-legs supporting the center of each bed are movable, allowing insertion and removal of paintings without removing the ones above and below.

Setting up storage areas: painting beds

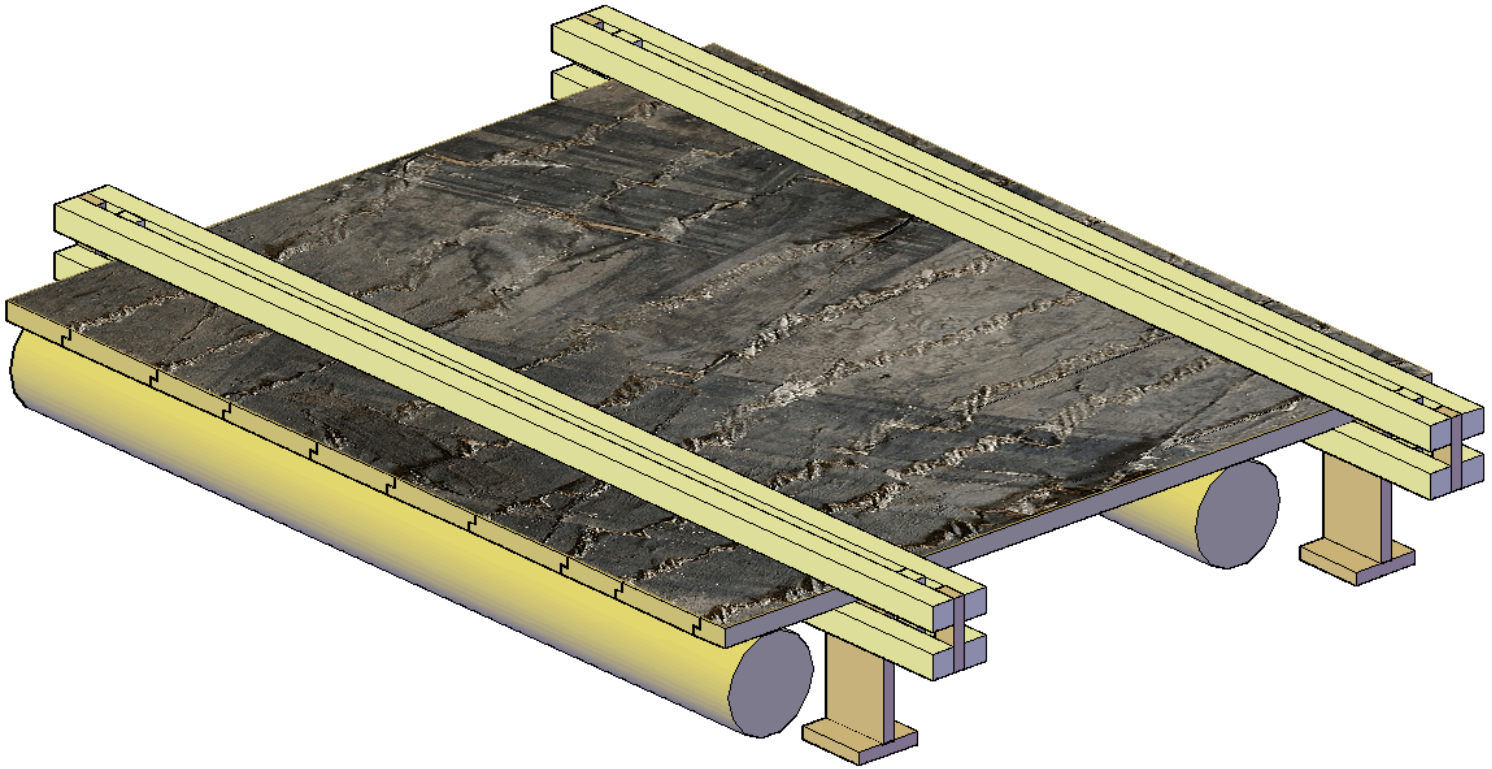
the best option is to build the beds using 6 mm particle board, reinforced with a perimeter structure (A) and center peg-legs. This solution, compared to beds in plywood (B), is lighter and allows better insertion of peg-legs.

Setting up storage areas: painting storage beds

Celano: storage beds in use

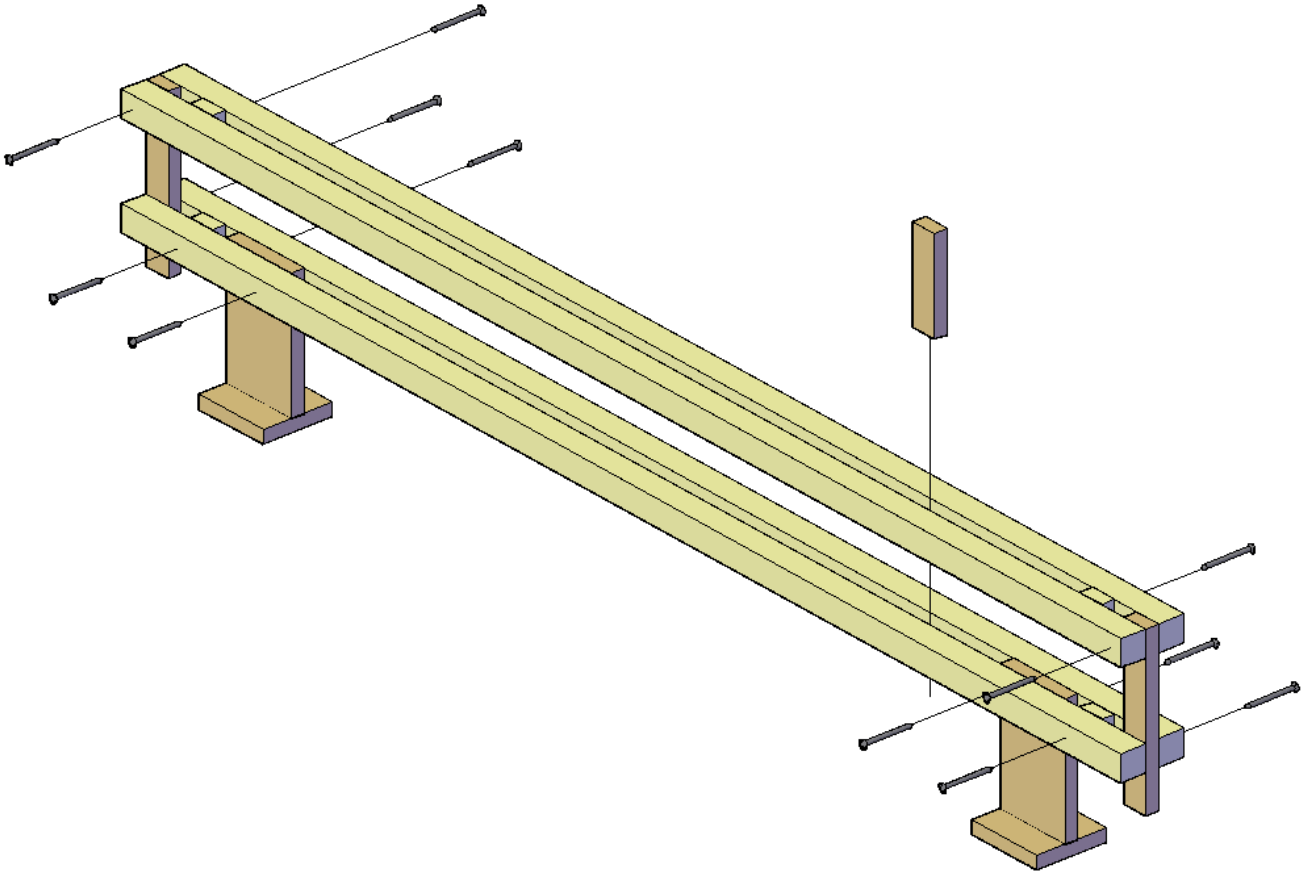
Setting up storage areas: storage beds

L'Aquila: adaptation of storage beds for panel paintings



Setting up storage areas: storage beds

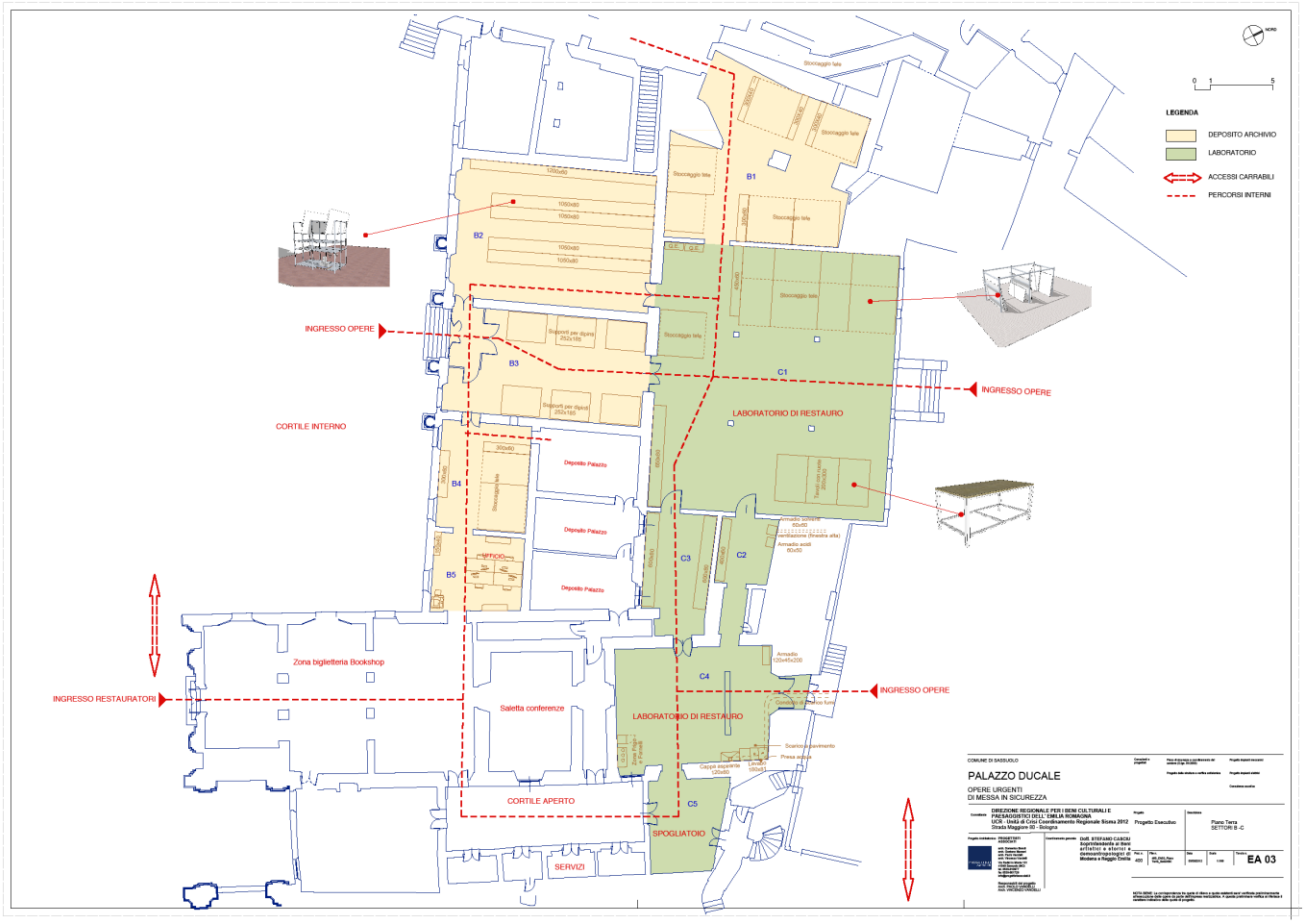
L'Aquila: adaptation for panel paintings



Setting up storage areas: “beds”

2009, L’Aquila: storing canvases from the ceiling of San Massimo Cathedral

Setting up preservation-restoration laboratories: choosing locations



Setting up preservation-restoration laboratories

The preservation-restoration laboratory should be in the same building of the storage area, for a safe management of works in precarious conditions.

The lab requires basic equipment and supplies for securing and placing the works in storage (not necessarily a “full laboratory”):

1. Fume hood and solvents cabinet;
2. Refrigerator;
3. Mobile steel tables ;
4. Vacuum cleaners (different kinds);
5. Lighting systems;
6. Small tools and materials;
7. Other basic equipment;
8. **Packing materials;**
9. Computer and communications setup;
10. Electrical plant sufficient for all equipment and lighting.

Setting up preservation-restoration laboratories: design

Setting up preservation-restoration laboratories: equipment and materials

Quantity	Description	Image
One (1)	HAZARDOUS MATERIALS CABINET: For storage of up to 80 litres of flammable liquids and solids; meeting EN 14470-1 standard, with "hot and cold fumes protection", rated for 90 minutes fire resistance; with active carbon filters and provision for attachment to external ventilation.	
One (1)	Fume hood with filtered exterior extraction; meeting EN 14175:2003 standard; including touch-screen control panel showing function, hours of operation, alarms (blocked tubes, insufficient ventilation, filters require changing, etc.) Chemical-resistant work surface. Minimum dimensions of work surface: **160x75** cm.	
One (1)	Industrial refrigerator, without freezer: External dimensions ca. cm 55 x 60 x 85h; 3 shelves, interior lighting, semi-automatic defrosting.	

2012: Sassuolo preservation-restoration laboratory

Sassuolo: laboratory for large works

Sassuolo: laboratory for large works

Temporary storage areas: *strategic priorities*

The aims of a storage area are:

1. **Open the temporary packing. (Place top priority on** “wet” materials.)
2. **Compile the record sheet.**
3. **Evaluate preservation status.**
4. Provide unavoidable emergency interventions: i.e. secure the object, remove surface soil.
5. **Evaluate priority for further intervention.**
6. **Pack the object** and attach “ID and Triage Sheet”**.**
7. **Place in storage,** registering the location.

Temporary storage areas: features

The evaluations of preservation status (point 3) and priority for further intervention (point 5) **serve a "triage" function**.

- Even if major treatments generally require medium or long-term intervention, an immediate treatment may be impossible, even for badly damaged objects.
- Other objects can be in fair to good overall condition, but require urgent treatment to avoid further damage.

Operators compile a **Conservation Emergency Record** for each object placed in storage. **The ID and Triage Sheet** of the emergency record is attached, in view.

In the last section, the operators indicate the **Preservation status** and **Urgency** for the object.

2012, Sassuolo: Operations - *ID and triage sheet*

Ministero per i Beni e le Attività Culturali

SEGRETARIATO GENERALE
UNITA' DI CRISI – COORDINAMENTO NAZIONALE UCCN-MiBAC

Frontespizio Scheda di Pronto intervento

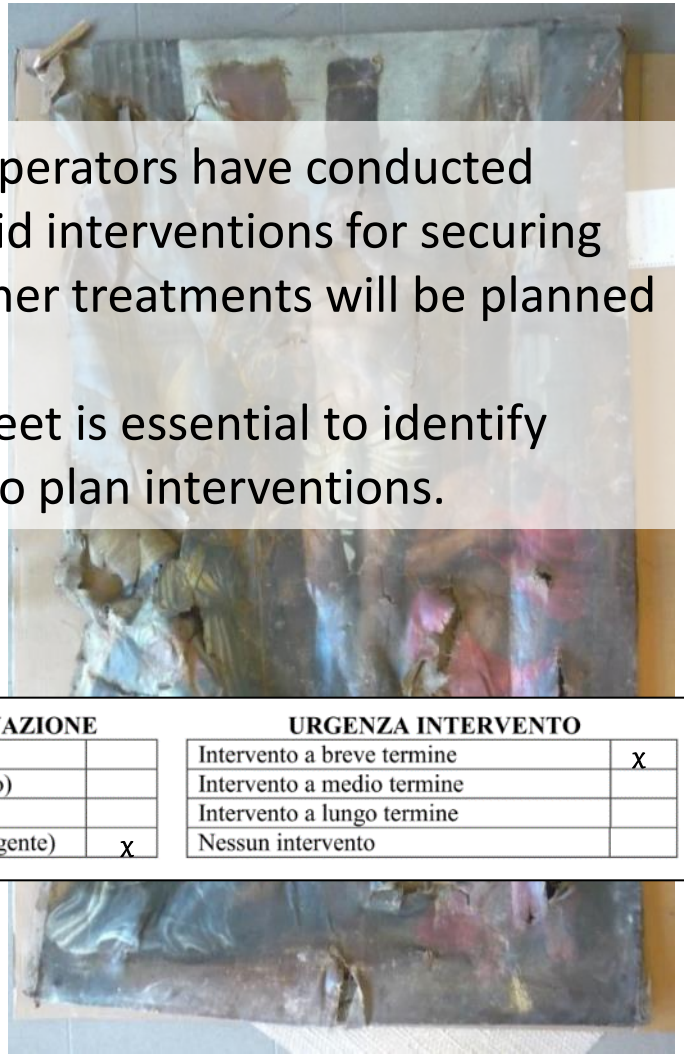
TELE

Verbale	083
data del verbale	13/08/2012
inventario d'emergenza	1019
NCTN scheda di catalogo	
Collocazione	

Provincia	Modena
Comune	San Felice sul Panaro
Località	San Felice sul Panaro
edificio di provenienza	Oratorio della Santa Croce
Oggetto	Dipinto – San Sebastiano e SS. Girolamo e Felice

STATO DI CONSERVAZIONE		URGENZA INTERVENTO	
Buono (Nessun intervento)		1-Intervento a breve termine	X
Mediocre (Intervento localizzato)		2-Intervento a medio termine	
Cattivo (Intervento generale)		3-Intervento a lungo termine	
Pessimo (Intervento generale urgente)	X	4-Nessun intervento	

Data redazione scheda di pronto intervento: 13/09/2012
Redattore/i: ISCR - sito CVRI" come (docenti di riferimento: Francesca Capanna, Carla Zacchino, Federica Morretti)
Data revisione scheda di pronto intervento:
Revisore/i:



At this point, operators have conducted minimal first-aid interventions for securing the work. Further treatments will be planned at a later date.
Exact triage sheet is essential to identify priorities and to plan interventions.

STATO DI CONSERVAZIONE		URGENZA INTERVENTO	
Buono (Nessun intervento)		Intervento a breve termine	X
Mediocre (Intervento localizzato)		Intervento a medio termine	
Cattivo (Intervento generale)		Intervento a lungo termine	
Pessimo (Intervento generale urgente)	X	Nessun intervento	

Emergency management of cultural properties:

new and planned developments

- **QR codes** for management of storage units (implemented in 2012, Sassuolo). The QR code leads to the RFID page.

- RFID (radio-frequency ID). For ID and tracing movement of properties

- PDF forms compiled on laptops or tablet computers, in the disaster site and/or emergency storage area. Data automatically feeds MiBAC databases (Risk Map, Restrictions via Internet, Conservation Worksite Database - SICAR). Digital formats are identical to the paper versions, so users are already familiar with them.