

Project:  
**Smart Rehabilitation 3.0**  
Innovating professional skills for existing building sector

**DATABASE 1\_ *Technological innovations for rehabilitation***  
**(IO3)**

This database organize the technological innovations by referring to different building parts/construction systems, according to the following structure:

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## 1. FOUNDATIONS, UNDERGROUND STRUCTURES AND SOIL

- ✓ **Continuous and discontinuous load-bearing masonry foundations**
- ✓ **Improvement of the quality of the soil**

## 2. VERTICAL STRUCTURES

- ✓ **2.1 Continuous masonry structures** (Bearing walls) **or wooden continuous structures** (*Blockbau* system,)
- ✓
- ✓ **2.2 Discontinuous structures. Structural frames** (wood, concrete, steel, ...)
  - 2.2.1. Pillars
  - 2.2.2. Beams
- ✓ **2.3 Masonry construction elements inserted inside vertical bearing structures**
  - 2.3.1 Arches, lintels
  - 2.3.2 Structural surrounding of openings, elements of confinement of masonry empty spaces for openings
  - 2.3.4 Supporting and reinforcement elements: reinforced concrete ring beams, wooden or metal tie rods, bracing systems, diagonal beams and struts, ...
  - 2.3.5 Seismic prevention systems and others safety measures

## 3. HORIZONTAL STRUCTURES and VERTICAL CONNECTIONS

- ✓ **3.1 Floors, loggias and trampling of porticos or covered walk-ways, ...**
- ✓ **3.2 Vaults and domes**

- ✓ 3.3 Stairs

## 4. ROOF AND TERRACES WATERPROOFING

- ✓ 4.1 Roofs waterproofing
- ✓ 4.2 Horizontal/Flat roofs and terraces waterproofing

## 5. FAÇADE and BUILDING ENVELOPE

- ✓ 5.1 Different types of façades
- ✓ 5.2 Protruding construction elements
  - 5.2.1 Cornices
  - 5.2.2 Loggias and balconies
  - 5.2.3 Gargoyles, eaves and rain descendants
  - 5.2.4 Others
- ✓ 5.3 Wall coverings (plasters, stuccos...)
- ✓ 5.4 Other decorative elements

## 6. FINISHES AND COMPLETION ELEMENTS

- ✓ 6.1 Different types of wall and floors intrados coverings
- ✓ 6.2 Indoor or outdoor paving
- ✓ 6.3 Decorative elements (glass. iron and cast iron, *majolica* tiles, mosaic, ....)
- ✓ 6.4 Joineries, doors and windows
- ✓ 6.5 Ceilings and partition walls
- ✓ 6.6 Others

## 7 INTEGRATE SERVICES (MPE)

- ✓ 7.1 Water, sewerage and drainage systems
- ✓ 7.2 Electricity and gas systems

- ✓ **7.3 Heating and cooling systems**
- ✓ **7.4 Elevators**
- ✓ **7.5 Other systems**

## **8. GENERAL STRATEGIES FOR BUILDING RECOVERY**

- ✓ **8.1 - Habitability and Comfort**
  - 8.1.1 Comfort standards
  - 8.1.2 Ventilation
  - 8.1.3 Lighting
  - 8.1.4 Protection against noise
  - 8.1.5 Protection against fire
  - 8.1.6 Accessibility (Design for all)
- ✓ **8.2 Energy efficiency strategies**
  - 8.2.1 Passive elements
  - 8.2.2 Building envelope insulation
  - 8.2.3 Active elements
  - 8.2.4 Integration of renewable energies
- ✓ **8.3 Dampness, moisture and humidity**
  - 8.3.1 Rising damp (capillarity)
  - 8.3.2 Condensation
  - 8.3.3 Water infiltrations and absorption problems
  - 8.3.4 Others

## Use of new and innovative materials and techniques associated to the original ones:

- ✓ Use of a new technique associated to ancient way to build can be repurposed;
- ✓ Technical innovation in the way to do a construction rehabilitation building work/making;
- ✓ Innovation in the technical aspect, related to the maintenance of a material or of an existing technique,
- ✓ Reversibility of the innovative technology applied;
- ✓ Compatibility of the innovative techniques with original materials and construction systems;
- ✓ Improvement of initial performance (technological, structural, sustainable envelopes, energy efficiency, elements for capturing natural light, ...);
- ✓ Experimentation of new materials and construction techniques for rehabilitation (nanotechnologies, innovative materials, green geo-polymeric concretes, eco-friendly materials, control of thermal flows, biomaterials, ...);
- ✓ Adoption of innovative intervention systems/techniques relating to construction site, scaffolding, shoring systems and safety measures, consolidation, ...
- ✓ Computer model and simulation of traditional passive cooling ventilation systems;
- ✓ others