



Enhancing of Heritage Awareness and
Sustainability of Built Environment in
Architectural and Urban Design Higher Education

STATEMENTS

////////////////////
for Teaching through Design
for Sustainability of the Built
Environment and Heritage
Awareness

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TITLE

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Statements for Teaching through Design for Sustainability of the Built Environment and Heritage Awareness

IO3 lead: Vladan Djokić, Ana Nikezić, UBFA

HERSUS Project leader: Vladan Djokić, UBFA

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Note: These analysis were prepared or accomplished by individual author/group of authors in relation to their professional expertise and backgrounds. The views, thoughts, and opinions expressed in the analysis and statements belong solely to the author/s of specific analysis and do not directly reflect the view of the whole HERSUS consortium.

INTRODUCTION

HERSUS project Intellectual Output 3, titled "Statements for Teaching through Design for Sustainability of the Built Environment and Heritage Awareness" presents a strategy containing (1) necessary qualifications that an architect has to obtain in order to be competent for architectural and urban design, as well as (2) up-to-date qualification that architectural educator needs to obtain in order to advance teaching about the sustainability of the built environment and heritage awareness. The output elaborates proposals regarding the contents and the methods of teaching of the architectural education in the initial defined fields: Sustainable Reconstruction in Urban Areas, Adaptive Reuse and Resilience and Climate Change. Having in mind that the development of IO1 and IO2, as well as, HERSUS Webinar have posed different challenges for all HERSUS researchers, the IO3 aims at reaching a consensus among the HERSUS consortium on concepts and fields of action relevant to sustainability and heritage. In this sense, the initially defined fields are reviewed and hence, the IO3 enables a consensus established through a multigeographical and multicultural perspective across Europe.

GENERAL BACKGROUND:

In the 21st century, the cities urbanisation is passing through significant changes, and the practical arena of architectural and urban design requires the advancement in teaching about the sustainability of the built environment and heritage awareness. The main characteristic that could be distinguished behind the previous analysis is that the present teaching methods and practices of sustainability and heritage are widely questioned and have an increasing interest of the management of HEIs. More specifically, this issue has three-fold complementary perspectives:

- (1) the contemporary content of the teaching of the subject areas,
- (2) the qualitative and quantitative position of the subject areas in a school curriculum, and

- (3) the accomplished methods for the transmission and crossing of the knowledge of the subject areas.

In this context, a particularly important objective is to clarify this new condition of sustainability of the built environment and heritage teaching and discuss its characteristics.

The idea for IO3 arose from the need to bring together teaching staff and experts in disciplines of the built environment to formulate the new unique students' profiles. Statements for teaching bring the innovative element through the implementation of interdisciplinary teaching based on learning by design methodology. Upon completion of the IO3 publication, the HERSUS target groups (students/teachers/trainers/tutors) could use this book to gain a clearer picture of specific training and teaching activities that can enable the alignment of the needs of the practice and teaching of the sustainability of the urban and architectural heritage.

Recommendations on education for the sustainable architectural and urban design sector are produced. The strategy also builds on the results of Seminar C1 – SWOT Analysis. These tools serve to provide a coherent set of information and a programme of advanced teaching modules for architectural and urban design educators. A step closer to reaching an integral professional profile of an architect is primarily the case of thematic enhancement and specialisation rather than structural change of study programmes. This can be achieved through the introduction of different research and educational areas that follow the contemporary course of theory and practice. The project is striving to create a new innovative educational framework that can integrate vital educational challenges in the field of architectural and urban design. The aim is to link scales, to challenge different types of problems, to generate sustainable-based approaches, and to

It is expected that educators would create a new way of thinking and teaching of different European spatial contexts through the shared experience. The IO3 will be a set of recommendations for partners, whose aim is to strengthen and expand cooperation with practice and to strengthen and disseminate the idea of interdisciplinary teaching with respect to the immediate environment of different cultural contexts. Development of teaching strategies will contribute to the better understanding of needs in terms of defining a new professional profile of the students through the exchange of experiences between teaching staff, public and private sector on M1, C1 and E1 in terms of (1) Environmental and Contextual Issues relating to Architecture as well as (2) Collaboration & Interdisciplinarity in Architecture.

In the course of redefining the professional profile of architect through the HEI system, there is a constant striving towards achieving an integral profile - one that will have the capacity and skills:

- (1) to connect different scales (from urban to architectural),
- (2) to identify different types of problems and solve them through the design, and
- (3) to make our environment and cities sustainable for the future.

This output is the primary input for the development of "Book of courses" which will be developed by the academic institutions as a part of the project (IO5). It will be presented in the form of a pedagogical strategy and should be disseminated in all schools of the participating countries and to the broader audience as well. Therefore, the strategy will be available for discussion via the "HERSUS Sharing Platform" (IO4) and HERSUS Website among educators, professionals, and architects from all over Europe.

Based on activities M1, C1 and E1 and gathered experiences from IO1 and IO2, the Statements for teaching will provide ground for discussing content, pedagogical methods, guidelines and future structure of curriculum for teaching within the partner organisations in the relevant fields. IO3

should define and elaborate on professional competencies which need to be developed both by (1) architect/urban designers, and (2) architectural educators.

The Strategy will consist of two parts. The first part of the report connected to a new profile of an architect/urban designer should define both (1) general skills, and (2) specific skills which are needed to be developed through the implementation of new courses. The strategy should formulate students' profiles so that they are trained in the broad architectural domain, that possess technical, technological, socio-humanistic and artistic skills and, therefore, that can contribute to the socio-environmental challenges of the 21st century. The second part of the report connected to a new profile of architectural educator should define both (1) general skills, and (2) specific skills which are needed to be adopted among the educators before the implementation of new courses. The strategy should formulate educators' profiles so that they can be responsible for the improvement of the education and training of future architects/urbanists to enable them to meet the expectations of 21st-century societies worldwide for sustainable human settlements in different cultural contexts.

The IO3 study is prepared in a form of publication which consist of following sections:

Introduction: General Background, Research Phases and Methodology, Study Development,

Teaching Vademecum on Heritage and Sustainability: Statements on Notions, Ideas, Design Strategies, Design Tactics, Tools and Techniques, and Heritage Types relevant for the HERSUS scope through defining:

- General Definition/Explanation of Notion, Idea, Design Strategy, Design Tactic, Tool and Technique, and Heritage Type,
- Literature Selection relevant for Notion, Idea, Design Strategy, Design Tactic, Tool and Technique, and Heritage Type,
- Content WHAT? – Defining relevant content for learning and teaching on specific Notion, Idea, Design Strategy, Design Tactic, Tool and Technique, and Heritage Type,
- Methods HOW? - Defining relevant methods for learning and teaching on specific Notion,

Idea, Design Strategy, Design Tactic, Tool and Technique, and Heritage Type,

- Goals WHY? – Defining learning goals in line with specific Notion, Idea, Design Strategy, Design Tactic, Tool and Technique, and Heritage Type,

- Course Type – Mark course type/types which could engage specific Notion, Idea, Design Strategy, Design Tactic, Tool and Technique, and Heritage Type,

- Scale – Mark scale/scales which is relevant for learning on specific Notion, Idea, Design Strategy, Design Tactic, Tool and Technique, and Heritage Type,

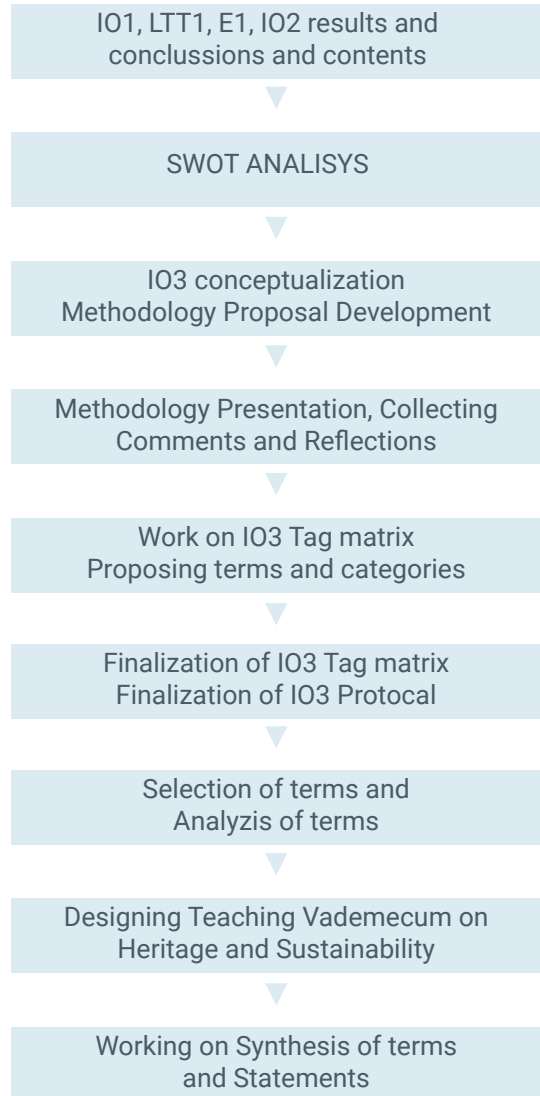
- Learning outcomes – describe expected learning outcomes for students/competencies which they could obtain through learning on specific Notion, Idea, Design Strategy, Design Tactic, Tool and Technique, and Heritage Type,

- Teachers' Competences – explain necessary competencies of teachers who could be engaged in teaching process of specific Notion, Idea, Design Strategy, Design Tactic, Tool and Technique, and Heritage Type.

Review of Statements/Strategy - defining and elaborating on professional competencies which need to be developed both by (1) architect/urban designers, and (2) architectural educators based on Teaching Vademecum on Heritage and Sustainability – synthesis of analysis.

The basic idea of the central part of IO3 entitled Vademecum on heritage and sustainability is reflected in a dual perspective: (a) establishing statements about the relevant notions, ideas, design strategies, design tactics, tools, techniques and heritage types, and (b) establishing statements about their importance for the domain of education. The Vademecum will present a series of analysed terms according to the structure from the proposed template and will together with IO1 and IO2 represent the basis for the later creation of the Book of Courses (IO5) through the intersection of different statements.

RESEARCH PROCESS



HOW TO READ HERSUS VADEMECUM STATEMENTS

1

GENERAL INFO
ON TERM AND
AUTHORS

2

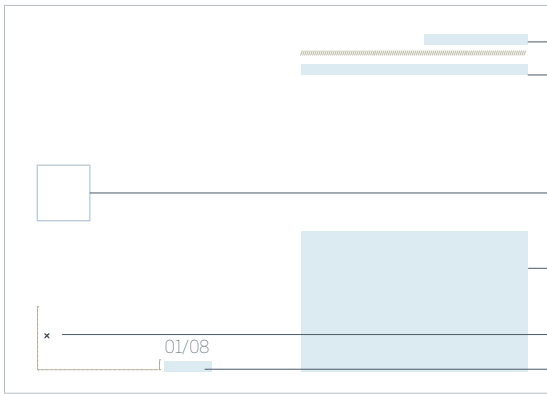
WHAT, HOW, WHY,
BY WHOM TO BE
TOUGHT

3

AT WHAT COURSE
TYPE , WHICH
SCALE AND WHAT
OUTCOMES TO
EXPECT

4

RELEVANT
REFERENCES FOR
THEORY AND
PRACTICE

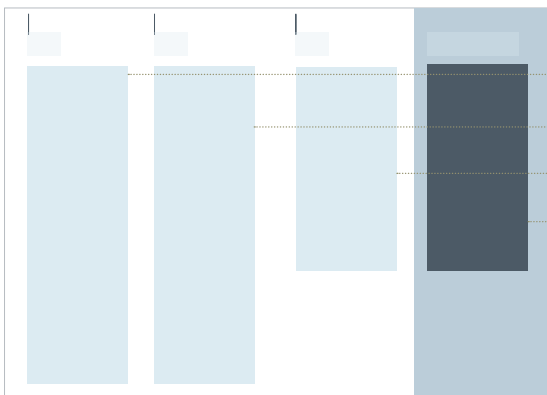


TITLE
TRANSLATION IN HERSUS PARTNERS LANGUAGES

HERSUS PARTNERS LOGO

GENERAL DEFINITION

AUTHOR/S
TYPE OF TERM

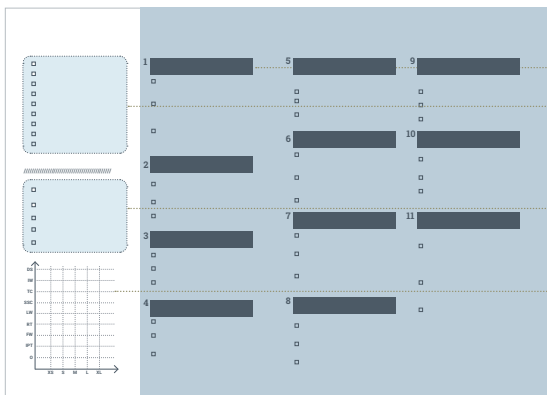


WHAT? CONTENTS

HOW? METHODS

WHY? GOALS

TEACHING COMPETENCES



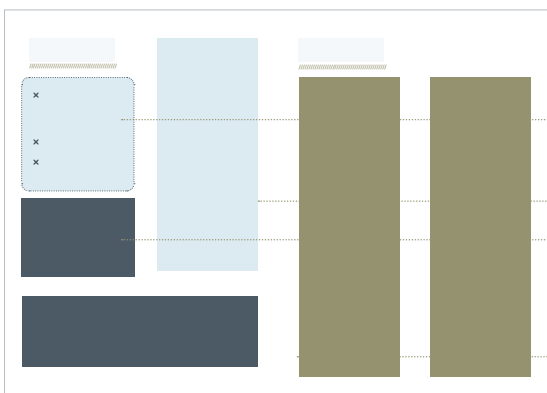
COURSE OUTCOMES

COURSE TYPE

COURSE SCALES

MATRIX - COURSE TYPE IN RELATION TO SCALE

■ □ Checklists



RELEVANT EXAMPLE ID

RELEVANT EXAMPLE EXPLANATION

RELEVANT EXAMPLE PHOTOS

KEY REFERENCES

terms

DESIGN APPROACHES

Heritage Reprogramming



Construction Centred Design



Environmentally Responsive Design



Energy Conscious Design



Climate Sensitive Design



Whole-Lifecycle Design



Carbon Neutral Design



Passive/Active Sustainable Design



Community Building and Representation



Renewable Energy Integration



Historical Urban Landscape- HUL



Design for All in Cultural Heritage



Thermal Comfort Design



Visual Comfort Design



Green Blue Infrastructure



Acoustic Comfort Design



Multiscale Design Approach



UB-FA

x

Nataša Ćuković Ignjatović

04/18

design approaches
statements

ENERGY CONSCIOUS DESIGN

енергетски одговорно пројектовање • *Energy Conscious Design* • Ενεργειακός Σχεδιασμός • *Diseño Energético Consciente*

GENERAL DEFINITION/ EXPLANATION

Energy conscious design mainly refers to design approach which involves holistically addressing energy performance of a building throughout the design process, aiming to minimise energy demands and consequently provide sustainable structure with reduced carbon footprint.

Energy retrofit of existing buildings is seen as one of key strategies in building sector that should contribute to carbon neutral goals (European and worldwide) in the forthcoming years, especially in the regions with accumulated architectural heritage where the pace of new construction is very low.

While **energy conscious design** is still mainly focused on buildings' operating energy, the embodied energy is perceived as an issue that should be further addressed since the share of embodied energy will rise as the operating energy is reduced. The same goes for the energy needed for disassembly of building components, reuse and recycling of materials and products.

The awareness of the scope of issues relevant for **energy conscious design**, as well as adequate design strategies and tools are necessary in the formation of architects that should shape our built environment through 21st century.

WHAT?

CONTENT

The students should be introduced to various aspects of energy-conscious design throughout the design process. The emphases should be placed on passive design strategies and the variety of design features applicable on existing buildings. The basic knowledge should cover the introduction to principles of passive design and complementary technical systems, especially the ones that can be integrated into building's design defines. The existing building's passive design potential such as thermal mass, orientation, zoning etc. should be detected, maintained and upgraded if possible while introducing new design features, materials and technologies used for refurbishment/upgrades. The availability of appropriate skills and tools for assessment and verification of energy performance in different design stages enables students to interactively develop their design and track energy-related consequences of various design options.

HOW?

METHODS

While the topic is by nature design-based, it requires specific basic theoretical knowledge that should be embedded in the design process. This could be achieved through combination of lectures and simple workshops that accompany the studio work. The presentation of energy-relevant design features should be explored and addressed through infographics, numerical and analytical visuals, communicating both the process and the outcomes of the holistic design approach.

WHY?

GOALS

Teaching intentions are focused on design strategy and design tactic with exposure to relevant assessment and verification tools. Design should address primarily programs and building typologies that provide topics and challenges rather typical for given environment.

Energy conscious design is embedded in integrative design approach, and relevant knowledge and skills are required as part of general architecture practice. The strategic goals referring to CO₂ and greenhouse emissions, enhanced share of renewable energy sources, combined with “renovation wave” and “new European Bauhaus” put the existing building stock in the spotlight and concepts of nearly-zero energy buildings are making their way into European legislation, hence into the everyday practice of future architects.

TEACHERS' COMPETENCIES



Teaching **energy-conscious design** requires flexible and multidisciplinary approach, both in terms of communicating knowledge to students as in coordinating potential visiting teachers from complementary disciplines and facilitating their active and effective communication with architecture students, mainly in studio and/or workshop environment.

Key competencies should cover the following aspects:

- Theoretical knowledge of building physics
- Theoretical background in bioclimatic design, passive and active design features and relevant technologies
- Practical experience in architectural design which incorporates various passive design strategies
- Active and up-to-date knowledge of relevant tools for assessment and validation of building's energy performance in various design stages
- Experience in multidisciplinary and integrative design approach

As European regulatory framework is facing dynamic changes in the field of energy efficiency and decarbonisation of buildings (both new and existing), it is very important that teachers take active role in formation and implementation of European directives and relevant national regulations.

COURSE TYPE

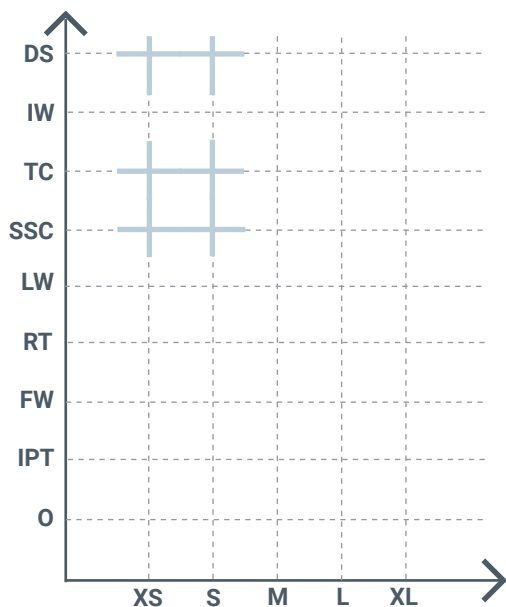


- Design Studio (DS)
- Intensive Workshop (IW)
- Theory Course (TC)
- Seminar (short comprehensive) (SSC)
- Laboratory work (LW)
- Research Thesis (RT)
- Field work (FW)
- Internship Practical training (IPT)
- Other (O)

SCALE



- Construction Detailing and Interior Design Scale (XS)
- Architecture: Buildings Scale (S)
- Urban Design Scale (M)
- Urban and Regional Planning Scale (L)
- Landscape Scale (XL)



LEARNING OUTCOMES

1 Ability to create architectural designs that satisfy both aesthetic and technical requirements. The student could have the ability to:

- prepare and present building design projects of diverse scale, complexity, and type in a variety of contexts, using a range of media, and in response to a brief;
- understand the constructional and structural systems, the environmental strategies and the regulatory requirements that apply to the design and construction of a comprehensive design project;
- develop a conceptual and critical approach to architectural design that integrates and satisfies the aesthetic aspects of a building and the technical requirements of its construction and the needs of the user.

2 Adequate knowledge of the histories and theories of architecture and the related arts, technologies and human sciences. The student will have knowledge of:

- the cultural, social and intellectual histories, theories and technologies that influence the design of buildings;
- the influence of history and theory on the spatial, social, and technological aspects of architecture
- the application of appropriate theoretical concepts to studio design projects, demonstrating a reflective and critical approach.

3 Knowledge of the fine arts as an influence on the quality of architectural design. The student will have knowledge of:

- how the theories, practices and technologies of the arts influence architectural design;
- the creative application of the fine arts and their relevance and impact on architecture;
- the creative application of such work to studio design projects, in terms of their conceptualisation and representation.

4 Adequate knowledge of urban design, planning and the skills involved in the planning process. The student will have knowledge of:

- theories of urban design and the planning of communities;
- the influence of the design and development of cities, past and present on the contemporary built environment;
- current planning policy and development control legislation, including social, environmental and economic aspects, and the relevance of these to design development.

5 Understanding of the relationship between people and buildings, and between buildings and their environment, and the need to relate buildings and the spaces between them to human needs and scale. The student will have an understanding of:

- the needs and aspirations of building users;
- the impact of buildings on the environment, and the precepts of sustainable design;
- the way in which buildings fit into their local context.

6 Understanding of the profession of architecture and the role of the architect in society, in particular in preparing briefs that take account of social factors. The student will have an understanding of:

- the nature of professionalism and the duties and responsibilities of architects to clients, building users, constructors, co-professionals and the wider society;
- the role of the architect within the design team and construction industry, recognising the importance of current methods and trends in the construction of the built environment;
- the potential impact of building projects on existing and proposed communities.

7 Understanding of the methods of investigation and preparation of the brief for a design project. The student will have an understanding of:

- the need to critically review precedents relevant to the function, organisation and technological strategy of design proposals;
- the need to appraise and prepare building briefs of diverse scales and types, to define client and user requirements and their appropriateness to site and context;
- the contributions of architects and co-professionals to the formulation of the brief, and the methods of investigation used in its preparation.

8 Understanding of the structural design, constructional and engineering problems associated with building design. The student will have an understanding of:

- the investigation, critical appraisal and selection of alternative structural, constructional and material systems relevant to architectural design;
- strategies for building construction, and ability to integrate knowledge of structural principles and construction techniques;
- the physical properties and characteristics of building materials, components and systems, and the environmental impact of specification choices.

9 Adequate knowledge of physical problems and technologies and the function of buildings so as to provide them with internal conditions of comfort and protection against the climate. The student will have knowledge of:

- principles associated with designing optimum visual, thermal and acoustic environments;
- systems for environmental comfort realised within relevant precepts of sustainable design;
- strategies for building services, and ability to integrate these in a design project.

10 The necessary design skills to meet building users' requirements within the constraints posed by cost factors and building regulations. The student will have the skills to:

- critically examine the financial factors implied in varying building types, constructional systems, and specification
- understand the cost control mechanisms which operate during the development of a project;
- prepare designs that will meet building users' requirements and comply with legislation, appropriate performance standards and health and safety requirements.

11 Adequate knowledge of the industries, organisations, regulations and procedures involved in translating design concepts into buildings and integrating plans into overall planning. The student will have knowledge of:

- the fundamental legal, professional and statutory responsibilities of the architect, and the organisations, regulations and procedures involved in the negotiation and approval of architectural designs, including land law, development control, building regulations and health and safety legislation;
- the professional inter-relationships of individuals and organisations involved in procuring and delivering architectural projects, and how these are defined through contractual and organisational structures;
- the basic management theories and business principles related to running both an architects' practice and architectural projects, recognising current and emerging trends in the construction industry.

BUILT ARCHITECTURAL / URBAN DESIGN PROJECT EXAMPLE



Project title and location:
 ✕ Transformation of 530 dwellings,
 block G, H, I, Grand Parc,
 Bordeaux, France

Authors:
 ✕ Anne Lacaton & Jean Philippe
 Vassal with Frédéric Druot and
 Christophe Hutin, architects

Year (period) of the project
 ✕ 2017
 Design years: competition 2011,
 completion 2016



Figure 1. Block G exterior before and after the transformation
 photo credit © Philippe Ruault

The project presents a showcase of sustainable design strategies used for transformation of residential buildings. Energy conscious design approach is embedded in the architectural concept and consequently integrated throughout the design development process. The fact that the project was honoured European Mies Van der Rohe Prize and that the authors are laureates of 2021 Pritzker Prize show that such approach may produce the highly recognized architecture values.

Through this project, the social housing, built heritage often criticized, shows the example of a relevant and economic transformation that produces - from an existing judged lacking in qualities and seen in a negative way - generous, pleasant and performing dwellings, that renew the typologies and the living conditions, comfort and pleasure, and improve the urban dwelling image. (extract from the authors' description of the project, available at <https://www.lacatonvassal.com/index.php?idp=80#>)



Figure 2. Apartment interior before and after the transformation
 photo credit © Philippe Ruault



Figure 3. Transformation scheme / work process
 source fiche projet (available at https://www.lacatonvassal.com/data/documents/20181214-165201LV_FchA4_HabitatTransformation_GRP_bd.pdf)

RELEVANT LITERATURE / SOURCES FOR FURTHER RESEARCH



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