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Ministère
Culture

ministère de la culture
60 ans
1959–2019

20th Century Architecture, Project Material for the 21st Century Sustainable City

Multi-year research program 2016-2020

In partnership with the Ministry for Ecological and Solidary Transition,
the Ministry of Territorial Cohesion and Relations with Local Authorities, in cooperation with
the *Plan Urbanisme Construction Architecture* (PUCA), the National Agency for Urban Renewal,
the *Caisse des dépôts et consignations* and the *Union Sociale pour l'Habitat*

Call for Research Proposals, Report

2016, 2017 and 2018 Sessions

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PREPARATION, DESIGN AND DRAFTING OF THE CALLS FOR RESEARCH PROJECTS
The Office of Architectural, Urban and Landscape Research (BRAUP), in collaboration with institutional partners of the program

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Summary

Foreword

Agnès Vince
Director of Architecture
Deputy to the General Director for Heritage,
Ministry of Culture (2014-2019)

Our cities are primarily comprised of spaces built during the twentieth century, the heritage importance of which is still to be acknowledged. We owe it to past and future generations to consider the values of this heritage in view of its envisaged transformation, particularly in terms of energy and ecological transition as well as changes in usage and lifestyle. The recognition of these values, whether cultural, social or technical, is far from being achieved. Nevertheless, it is in light of these values and the adaptability of inherited architecture that expectations of residents must be met in order to generate a better quality of life.

As part of its policy on architecture, the Ministry of Culture has been supporting and carrying out numerous initiatives to promote the awareness, knowledge, valorization and qualitative transformation of these twentieth century buildings, encouraging architects to respond to the growing demand for interventions on this recent heritage — which has been fully integrated into the National Strategy for Architecture since 2015, as well as the Multiannual Strategy for Heritage since 2017.

Regarding the architects, both the stakes and the expectations are high. Now more than ever, it is their responsibility to assert and develop their skills and expertise in order to ensure the evolution and transformation of existing buildings, vis-a-vis decision-makers and local actors, both private or public.

This year marks the twentieth anniversary of the "20th Century Architecture" certification, which was replaced by the "Remarkable Contemporary Architecture" certification under the Law on Freedom of Creation, Architecture and Heritage (LCAP law of 2016). Today, this has led to the establishment of a national certification deployment committee, a device to promote the certification's recognition and use, itself a suitable tool for raising awareness, diffusing knowledge, as well as analyzing and supporting the inevitable transformations of architecture that is manifest, in one way or another.

At a time when major reform is being carried out within the National Graduate Schools of Architecture (ENSA) throughout France — defining the status of their faculty members and encouraging a beneficial alliance between education, research and professional practices — a priority is to develop architectural expertise in existing building intervention. In each school, this materializes through the implementation of new or renewed heritage curriculum, starting with first year undergraduate students.

In order to highlight innovative pedagogical and scientific practices, symposiums within ENSA establishments will take place in 2020 surrounding the topic of transformation conditions for twentieth century architecture. One of the main actors will be the educational and research network backed by the Ministry of Culture, "Architecture, Heritage and Creation", which has been gathering referent faculty members within different schools since January 1st, 2018.

The research program, "20th Century Architecture, Project Material for the 21st Century Sustainable City", is part of the incentive-based research policy that has been led by the Ministry of Culture since 2002. These multi-year programs give way to calls for research proposals intended for ENSA establishments and their respective research labs, aiming for renewed questions with regard to current challenges and necessary methodological and practical evolutions, whether scientific, educational or professional.

The research project currently underway has a resolutely operational aim. Its primary objective is the development of tools for understanding, diagnosing and evaluating buildings (functional values, spatial, architectural, construction, urban, landscape qualities, etc.) to best support decision-making and transformation processes.

In this brochure, the presentation of thirteen multidisciplinary research projects funded by the Ministry of Culture offers an overview of a wide range of topics, reference corpuses, as well as implementation methods and partnerships, additionally defining the educational components and operational targets of each research team.

The challenge of this research program is the diffusion and appropriation of the research by relevant academic, scientific and technical circles; that is, actors on the ground, local authorities, external and decentralized state services, public or private developers, along with all of the professionals involved in the act of building, for whom the development of expertise relies on experimentation and innovation now more than ever.

I thank the members of this program's Steering Committee and Scientific Committee for their dedication to these efforts.

Introduction

Frédéric Gaston
Deputy Director of Higher Education
and Research in Architecture,
General Directorate for Heritage,
Department of Architecture, Ministry of Culture

The multi-year research program launched in 2016 by the Ministry of Culture, "20th Century Architecture, Project Material for the 21st Century Sustainable City", is situated at the heart of a scientific policy that is strongly committed to architecture. Incentivizing in nature, it follows in the footsteps of the major calls for targeted research proposals regularly developed by the Department of Architecture over the last fifteen years, covering themes necessary for disciplinary renewal[1].In terms of scientific value, it first assembles the knowledge, methods and expertise of the faculty members within the National Graduate Schools of Architecture (and Landscape Design) (ENSA[P]) throughout France[2], serving public policy that embraces the overall shared challenges of professional and socio-economic circles. The field of architectural education – both initial training and professional development – along with support for all the actors of our lived environment lie at the intersection of the program's scientific and operational aims. The strategic framework is thus defined by a virtuous circle of beneficial interaction between architectural education, research and profession.

Through present and future lenses, the subject of our inhabited built heritage and its transformation summons all of these dimensions and fields, concerning residents, regions and institutions. Within its governance and the definition of its objectives, this program thus joins together key partners in France, such as the Ministry for Ecological and Solidary Transition, the Ministry of Territorial Cohesion and Relations with Local Authorities, the *Union Sociale pour l'Habitat, the Caisse des dépôts et consignations,* the National Agency for Urban Renewal along with the *Plan Urbanisme Construction Architecture* (PUCA) and its program to requalify residential properties to achieve high energy performance (REHA). The interdisciplinary, partnership-based nature of the research projects supported by this program is therefore indispensable; which is ultimately why these scientific works are accordingly coupled with both theoretical and applied teachings, in real time and within educational establishments.

This brochure presents the contents of the research program, along with the thirteen research projects selected for funding. Three calls for research proposals[3] were successively released among faculty members of ENSA(P) in 2016, 2017 and 2018. Each of these calls for proposals received a response of about fifteen proposal applications, demonstrating the interest and expectations of the scientific community regarding this priority issue.

The Ministry of Culture organizes a working seminar on an annual basis, bringing together the financed research teams, the Steering Committee and the Scientific Committee of the program. These sessions contribute to forging a shared culture on this topic, stimulating collaboration between teams and encouraging the involvement of experts and partners in its contents over the long term. A biannual conference is organized conjointly by the Ministry of Culture and one of the ENSA establishments delegated to a research project[4]. These conferences allow for periods of exchange and intersecting debate between decision makers, actors on the ground and relevant professional circles. Furthermore, experts that are recognized in the field of architecture and heritage contribute to informing a regular dialogue with partner institutions and research teams.

RESEARCH TEAMS AND PARTNERSHIPS

Twelve ENSA establishments are delegated to a research project within this program, thus mobilizing more than half of the thirty-seven research labs of these establishments, along with teams comprised of faculty members and doctoral candidates. Each team assembles academic, scientific, educational and professional expertise within an interdisciplinary framework representative of the training of architects. Their principal investigators teach in a diverse range of disciplinary fields[*], such as History and Culture of Architecture, Theories and Practices of Architectural and Urban Design, City and Territory, Social and Human Sciences for Architecture, Sciences and Techniques for Architecture as well as Arts and Techniques of Representation. Partners include faculty members from several universities, two of which are foreign-based. Almost ten doctoral candidates play an important role, some of whom are funded through doctoral contracts from the Ministry of Culture, others supported by Industrial Contracts for Training Through Research (CIFRE Convention) within an architectural office. Three French architecture offices are stakeholders and two research projects rely on an architectural teaching and research partnership chair, certified by the Ministry of Culture[5].

The work of the research teams confronts concrete issues and case studies, working closely with the Regional Directorates for Cultural Affairs (DRAC), the Councils of Architecture Urban Planning and the Environment (CAUE), the Public Housing Offices (OPH) and local authorities (regions, metropolitan areas or cities). Close and lasting connections are thus forged with local partners who are on the front lines of research topics and fields.

Several projects involve housing associations, condominiums, union councils or real estate agencies. Public archive centers are also present (National Archives, 20th Century Architectural Archives Center, archival records of national departments, public institutions, local authorities), as well as private archives (architect's archives, in particular). Engineering consultants, experts as well as industrial or building companies are often engaged. Two research projects concerning regions that are in economic decline exemplify the strong implication of local authorities and associative or socio-economic actors.

In the calls for research proposals, partnerships are encouraged amongst team members, decision makers, local actors, developers, designers and companies alike. This reflects a significant progression in the merging of the scientific, socio-economic and political worlds, attesting to the growing importance for the recognition of faculty member expertise in their respective fields and territories.

CORPUS TYPES AND DIVERSITY OF HERITAGE CHALLENGES

Although the research program primarily focuses on collective housing, it also integrates other types of buildings, such as public facilities (schools, hospitals, cultural buildings) or individual housing in urban outskirts, in order to embrace the typological and technical diversity of twentieth century architectural heritage. In each case, the question of their development in the face of energy challenges or lifestyle changes is asked with the same level of urgency. Moreover, these subjects are examined at larger scales that determine urban areas with socio-spatial or functional coherence.

The large construction output of the post-war period legitimizes a distinct appetite and mobilization amongst the teams; that is, most of the buildings in question date from the 1950s to the 1970s, incorporating subsequent transformation cycles where appropriate. Certain teams work on a vast body of references that, through a statistical approach, allow for the identification of patterns and recurrences along with the creation of adaptation processes for building models worth rejecting. In contrast, others concentrate on a *unicum* or an exemplary fragment that is particularly sensitive to future adaptations.

Heritage value characterizes this architecture to varying degrees. Seven buildings or sites certified as "Remarkable Contemporary Architecture" (ACR)[6] by the Ministry of Culture are present within the selected corpuses. Many of the buildings within the corpus are the works of renowned architects, such as Ali Tur, Eugène Beaudouin, Henri Ciriani, Charles Delfante, Jean Dubuisson, Jean Duthilleul, Oscar Niemeyer, Jean Prouvé, Antoine Stinco or André Wogenscky. Several of the research projects concentrate on more modest or common buildings. In every case, however, the results of the research must be able to form groundbreaking processes and recommendations, along with transformation principles for preserving specific characteristics and initial qualities of these manifest or ordinary pieces of heritage.

RESEARCH METHODOLOGY, INTEGRATION OF SOCIETAL CHALLENGES AND ECOLOGICAL TRANSITION

Appropriate research protocols are necessary in order to respond to the variety of corpuses, work scales and actors involved. In addition to being necessary prerequisites for carrying out fully informed outputs, archival compilation along with quantitative and qualitative data collection are also materials conducive to theoretical and practical teachings. Historical and technical analyses, fieldwork and reasoned diagnoses thus rely upon these multiple objective resources.

In accordance with the challenges of the program, all of the research projects seek to analyze the cultural, social and technical values of these twentieth century buildings, within the context of testing the requirements for energy and ecological transition, as well as socio-economic and demographic changes. Examples of the working methods developed by the teams include: identifying new analysis indicators and cross referencing others in a reasoned and unprecedented way, in order to carry out an evaluation that better appreciates building qualities and their ability to evolve; integrating living practices and revealing the memories and expectations of residents; reinvestigating doctrines and paradigms of the modern period in terms of living as well as innovation in architectural design and technical procedures.

The projects funded within this program attest to a real diversification of scientific practices: action-based research, project-based research or experimentation are additional forms of research implemented by the teams; some of which have been incorporated at the earliest stages of research project dynamics currently underway, supporting them over time.

EDUCATIONAL COMPONENTS AND OPERATIONAL TARGETS

The expected educational components of the research projects within this program are strategic, at a time when the Ministry of Culture wishes to reinforce the teachings at various ENSA establishments with course material on existing building intervention and, to this end, update pedagogical practices[7]. For this reason, the teams take hold of the challenges of interdisciplinary teaching on the subject, combining research project practice, lecture course teachings, research seminars, technical experiments, interactions with territories and their actors, and so on. This dynamic contributes to educating future architecture graduates with a solid comprehension of the socio-economic context of the past and the future.

The teachings linked to this research occur primarily during the Master's trajectory, sometimes including final degree projects and contributing to the advancement of teachings or dissertations within ENSA establishments, as well as continuous trainings open to all professionals. Some of the teams also propose days dedicated to feedback, awareness and training sessions for local actors and professionals.

One of the necessary conditions for this is a careful and reasoned exploration of characteristics, qualities and potentials of twentieth century architecture; which favors the creation of intervention strategies that respect this heritage along with its social and cultural values. The research within this program intends to respond to the expectations of developers, condominium associations and property owners, along with social housing organizations, technical services of local authorities and even engineers and builders.

In terms of its operational objectives, revealing the potential for transformation, informing political and technical decisions and proposing 1:1 scale tests are among the expectations of this program. Specific analysis grids, new indicators, good practice or pre-project guidebooks, specifications, hypothesis simulations, demonstrator or prototype design projects, are all tools developed by the research teams to be used by institutions and professionals involved in the management and transformation of this twentieth century heritage.

Due to the necessary safeguarding of the values of twentieth century architecture, inevitably destined for transformation, the Ministry of Culture has been forced to set up an ambitious method for the evaluation and dissemination of the research results of this program. Its Steering Committee and its Scientific Committee will be responsible for putting forth innovative and daring proposals, commensurate with the threats that weigh and multiply on this heritage. The main objective of this program is thus for the diffusion of research results beyond the scientific and educational arenas, making them accessible to a wider public, embraced by professionals and residents and transferable to other types of buildings or situations. Each research project also presents its own operational aim and justifies a specific valorization method depending on whether it addresses a particular professional circle, thus transmitting detailed, context-specific recommendations, identifying unique levers and offering its own decision-making tools.

Finally, it should be noted that this research can only be carried out over the long term. Often initiated ahead of the Ministry of Culture's calls for research proposals, the hope is that the research will find simultaneous and future methods for elaborating upon this program and that it be widely accepted, encouraging other research and teachings as well as attracting more students. The possibilities for these subjects are tremendous.

* Histoire et cultures architecturales (HCA), Théories et pratiques de la conception architecturale et urbaine (TPCAU), Ville et territoire (VT), Sciences humaines et sociales pour l'architecture (SHSA), Sciences et techniques pour l'architecture (STA), Arts et techniques de la représentation (ATR)

1 The entire program may be consulted at: http://www.culture.gouv.fr/Thematiques/Architecture/Formations-Recherche-Metiers/La-recherche-architecturale-urbaine-et-paysagere/L-organisation-de-la-recherche/La-politique-incitative-a-la-recherche

2 Among the twenty ENSA establishments under the authority of the Ministry of Culture, two also offer degrees in landscape design.

3 In this brochure, only the last call for proposals (2018) is reproduced with the indication of significant changes compared to previous calls for proposals. All of the calls for proposals are accessible at: http://www.culture.gouv.fr/Thematiques/Architecture/Formations-Recherche-Metiers/La-recherche-architecturale-urbaine-et-paysagere/Lorganisation-de-la-recherche/La-politique-incitative-a-la-recherche/Architecture-du-XXe-siecle

4 In 2018, the conference "Living in buildings from the 1950s-1970s in the 21st century: Promises, realities and adaptations" co-organized with ENSA Saint-Étienne, took place in Firminy. The final conference will be held in 2022.

5 "Habitat of the future" Chair, supported by the four ENSA establishments from the Auvergne-Rhône-Alpes Region.

6 Cf. Decree number 2017-433 of March 28, 2017, concerning the "Remarkable Contemporary Architecture" certification made in pursuant to article L. 650-1 of the Heritage Code.

7 See study published with the support of Plan Urbanisme Construction Architecture (PUCA), the Ministry for Ecological and Solidary Transition, the Ministry of Territorial Cohesion and Relations with Local Authorities and the Ministry of Culture: Jean-Bernard Cremnitzer (ed.), Valter Balducci (coord.), *Former à la réhabilitation. Enseignements supérieurs et professionnels* (Trained in rehabilitation. Higher and professional teachings), ENSA Normandie and Points de vue editions, 2018, 216 pages.

Research Program Overview

Twentieth century building heritage, particularly that constructed after 1945, constitutes a major part of our urban fabric. Exhibiting great diversity in terms of typology and construction, it allows us to envision multiple strategies for its adaptation, transformation, restoration, recycle and reuse. Moreover, it represents an important source of energy savings, in addition to being a resource for property, space, economy, identity and culture, all of which can be mobilized by various architectural and planning actors.

The research program, "20th Century Architecture, Project Material for the 21st Century Sustainable City", aims to produce innovative intervention strategies and processes for adapted design projects, allowing for the development of meaningful responses to major societal challenges brought about by global change and ecological transition.

The Ministry of Culture's research program is conjointly supported by the Ministry for Ecological and Solidary Transition and the Ministry of Territorial Cohesion and Relations with Local Authorities, in cooperation with the *Caisse des dépôts et consignations,* the *Union Sociale pour l'Habitat,* the National Agency for Urban Renewal along with the *Plan Urbanisme Construction Architecture* (REHA Program).

Corresponding to the national policy in favor of sustainable urban and regional development, the aim is to support research projects that investigate the capacity of twentieth century architecture — an architectural and urban heritage that constitutes an essential part of our living environment — to shape the sustainable city and integrate challenges associated with its adaptation, transformation, restoration and valorization.

[1] Announced in 2017, this strategy is only mentioned in this program's third call for research project proposals.

A RESEARCH PROGRAM THAT RESPONDS TO THE PRIORITY ISSUES OF THE MINISTRY OF CULTURE

The *Stratégie nationale pour l'architecture of 2015* (The National Strategy for Architecture, SNA) is an effective tool serving to provide architectural policy with a fresh impetus, treating twentieth century architectural heritage and existing building intervention as strategic areas of focus for the initial training and professional development of architects. As such, it reinforces the need for close cooperation between education, research and profession, identifies existing buildings as a priority intervention sphere for planning and living environment professionals, and reaffirms the cultural value of this architecture.

***Loi n°2016-925 du 7 juillet 2016 relative à la liberté de la création, à l'architecture et au patrimoine* (Law n°2016-925 of July 7, 2016, on Freedom of Creation, Architecture and Heritage (LCAP),** includes a section on architectural quality promotion, particularly through the "Remarkable Contemporary Architecture" certification, created by its Article 78 and Decree n°2017-433 of March 28, 2017. This certification distinguishes itself from the former "Twentieth Century Heritage" certification in several regards, including buildings or developments built less than one hundred years ago with the consideration that their heritage value and interest evolve alongside perception, thus requiring some hindsight. Historical monuments, whether classified or registered, are excluded from this certification.

The *Stratégie pluriannuelle en faveur du patrimoine* (the Multi-Year Strategy in Favor of Heritage[1], 2017) highlights necessary areas for evolution in the professional training of those who play a role in the heritage sector. This is especially the case for architects, in order to better account for new challenges in regional revitalization, sustainable development or even public mediation. Based on the assessment of the initial training of architecture students, insufficiently focused on existing buildings, it consolidates the SNA, making it a strategic developmental area for the initial training and professional development of architects.

A PROGRAMM AT THE CONVERGENCE OF GOVERNMENT POLICIES ON ARCHITECTURAL QUALITY AND THE SUSTAINABLE CITY[2]

The *Nouveau programme national de renouvellement urbain* (New National Urban Renewal Program, NPNRU), implemented from 2014 to 2024 by the ANRU, has ushered urban renewal into the era of the sustainable city. It aims for better coordination between the measures affecting energy transition, architectural quality and living conditions, as well as the economic and social contexts of neighborhoods primarily built during the twentieth century. In an effort to converge their actions, the Ministries responsible for Culture and the City are bound by a three-year objectives agreement (2016 to 2020), which aims to facilitate the appropriation of living conditions and generate a better understanding of urban space (history, architectural quality, transmission of memory), especially in working-class districts.

The *Plan Ville Durable* of 2008 (Sustainable City Plan), and the **many laws** passed since, have contributed to the emergence of a new way to design, construct and transform cities and regions.

Since 2009, **the missions within the *Plan bâtiment durable* (Sustainable Building Plan)** (General Directorate of Planning, Housing and Nature (DGALN) - Ministry for Ecological and Solidary Transition and the Ministry of Territorial Cohesion and Relations with Local Authorities) have been addressing the necessity to support energy and environmental transition objectives in the building sector. In response to these challenges, a pillar of the inter-ministerial strategies already implemented has been the research and development of innovative architectural and urban planning solutions.

The *Plan de rénovation énergétique des bâtiments* (Plan for the Energy Renewal of Buildings) was launched by the Ministry for Ecological and Solidary Transition as well as the Ministry of Territorial Cohesion and Relations with Local Authorities in November, 2017. This plan, with its target to achieve carbon neutrality by 2050, aims to renovate 500,000 homes per year. It offers tools adapted to all situations, from housing to tertiary buildings, especially those that are publicly owned.

The *Plan Urbanisme Construction Architecture - Programme REHA* (PUCA's REHA experimentation program) supports developments for a major rehabilitation of the housing stock — especially social housing — from an environmental, economic and social perspective, with the idea of stimulating a new heritage culture. It therefore pursues the following objectives: to demonstrate the interest in undertaking ambitious interventions that meet performance standards of new constructions in terms of energy, environment and comfort, thus presenting sustainable solutions for long-term urban overhaul; to support innovation by guiding the development of technical and architectural solutions that are proactive, adaptive and low carbon; to develop facilitating tools to assemble these operations from a technical, financial, contractual and legal point of view.

A patronage policy in support of architecture and landscape was defined by the *Caisse des dépôts et consignations* within the context of the National Strategy for Architecture. The launch of an annual call for research and innovation proposals in the field of architectural and landscape design thus aims to promote the renewal of education and research practices, encouraging collaboration between faculty members and professionals so that the resulting theoretical, technical or methodological innovations are more readily available for use.

An innovation support program in the field of social housing (Lab Archi) is being led by the *Caisse des dépôts et consignations* and the *Union sociale pour l'habitat.* The calls for projects launched for social housing organizations aim to strengthen the regional anchorage of social housing and its positive impact on local ecosystems.

The *Action Cœur de Ville* (Action for City Core) initiative, launched at the end of 2017 by the Ministry of Territorial Cohesion and Relations with Local Authorities and supported by the Ministry for Ecological and Solidary Transition, aims to provide support for mid-sized urban center revitalization projects, especially by renovating old and degraded housing as well as maintaining a dynamic commercial and service supply. Understanding and accounting for the challenges of twentieth century heritage can help restore attractiveness to these urban centers, especially by showcasing public buildings from this period (facilities, headquarters, etc.).

[2] The policies and mechanisms here mentioned appear only in the third call for research projects (2018), the drafting of which has been updated compared to that of the previous calls for research projects (2016 and 2017), in conjunction with the program's Steering Committee.

Call for Research Projects

CONTEXT AND CHALLENGES : 20TH CENTURY ARCHITECTURE, A TOOL FOR BUILDING THE SUSTAINABLE CITY

The twentieth century constituted a radical break in the fields of architecture, urban planning along with ways of living and practicing the city. Throughout the century, the main underlying factors that created wealthy and dynamic societies were the massive urbanization generated by the industrial boom, the concentration of production means, trade globalization, new construction techniques as well as the unprecedented mobilization of financial capital and cheap fossil fuels.

The mass destruction caused by both world wars resulted in enormous population displacement and unprecedented needs for housing and public facilities. In some cities, successive reconstruction efforts led to the complete renewal of almost all of the buildings in less than a generation, going so far as to transform their urban layout and tenure structures. In certain cases, these large-scale processes have contributed to the exacerbation of social and regional imbalances, the effects of which, both real and supposed, remain a struggle to fix. In other cases, they created new fabrics with unprecedented usage qualities. This recent history has therefore strongly impacted the urban, economic and social structures of the contemporary city.

As a characteristic of the twentieth century, mass urbanization relied on theories that were both progressive and radical in their approach to urban space and social relations. This led to projects with undeniable architectural, urban or construction qualities, whether housing (individual or collective), or infrastructure and facilities. Modern architecture thus developed the conceptual and technical framework that allowed it to be the dominant system of the past century. At the same time, however, it also defined the conditions for its own disappearance, through the rapid renewal of production models and tools, as well as reducing the life cycle of built environments.

The buildings and housing estates constructed in the twentieth century are currently under much pressure, linked to their aging structural and technical elements (sometimes accelerated by inappropriate interventions), the evolution of their usage, along with their regional and political contexts. This especially concerns architectural works from the second half of the century.

→ Recent achievements rarely benefit from the attention granted to older works in terms of historical and cultural analyses of their existence, their past evolution and the material study of their future conditions. It is thus worth testifying to the contributions of cultural research as dynamics of operational action.

Understood from the sustainable city paradigm, twentieth century architecture appears as part of the analysis of the overall cycle of the city — most significantly from a quantitative point of view — closely linking new productions and the reuse of existing buildings. The sustainable, composite, open and integrated city thus considers all of its composing fabrics according to their existing potential for adaptation and the diversity of potential project strategies. Recent research and experimentation programs dealing with construction and the sustainable city have often regarded existing buildings as a source of energy savings.

→ Considering twentieth century architecture as one of the basic materials for urban renewal gives way to a shift in paradigm, thereby enabling the creation of a new methodological framework based on renewed approaches and practices.

→ Valorizing the qualities of twentieth century architecture, based on spatial, constructive and social thought, must allow entire areas of the city to be reconsidered beyond the challenges of ecological transition in order to strengthen identity and citizenship.

→ Better understanding certain qualities in terms of the design and technical implementation of past century architecture can prove to be particularly rich in teachings that address current interrogations of health-environmental topics.

The "Remarkable Contemporary Architecture" certification, which replaced the "Twentieth Century Heritage" certification, establishes processes for identifying the architectural, technical, urban and landscape values of the most iconic architectural and urban planning achievements of the twentieth and twenty-first centuries. It also allows government agencies to inform and oversee construction permit requests, in addition to monitoring certified assets. It is therefore necessary to identify the values of each architectural achievement. The certification of a building or a housing estate must be justified and based upon the identification of its own qualities, following six criteria defined by an implementation decree: the singularity of the work; the innovative or experimental character of the architectural, urban or landscape design, the technical implementation, or its place in the history of technique; the reputation of the work, particularly regarding publications that investigate or mention it; the exemplarity of the work in terms of its role in public policy; the manifest value of the work due to its connection to an architectural movement or recognized ideas; its affiliation to a housing estate or work for which the architect has received national or local recognition. Envisioned intervention works must not undermine these reasons for certification, while still allowing for its adaptation to evolutions in the program or lifestyle.

→ This evolving dynamic deserves to be reinforced by acting more directly on the material, social and economic conditions that allow for and justify the valorization of these remarkable architectures, especially amongst inhabitants and users.

→ The Regional Directorates for Cultural Affairs (DRAC), which are now receiving construction permit requests for these certified buildings, require various elements of knowledge in order to be able to provide reasoned opinions on the proposed transformations and adaptations. Above all, the goal is to be able to advise the property owner on the ways in which future transformations can preserve and amplify the cultural value deserving of recognition and which led to its certification, while still allowing the building to adapt to new uses.

The need to reinforce the skills of architects in terms of adaptation and transformation of existing buildings gives way to strengthened heritage teachings within every National Graduate School of Architecture (ENSA) in France. The inter-ENSA educational and research network, "Architecture, Heritage and Creation", aims to build a space for dialogue, exchange and reflection on the place of architectural and urban heritage within project dynamics. It examines stances, practices, theories and professional ethics along with all sustainability issues beyond just the environment. Finally, two partnership teaching and research chairs linked to the topic of the transformation of buildings and the existing city have recently been certified by the Ministry of Culture within ENSA establishments: the "Heritage, Experimentation, Project" Chair supported by ENSA Paris-Belleville and the "Habitat of the Future" Chair supported by the ENSA establishments of Lyon, Saint-Étienne, Grenoble and Clermont-Ferrand in partnership with the *Grands ateliers de l'Isle-d'Abeau*.

→ These recent developments in the fields of architectural education and research highlight issues that aim to reinforce the link between "training-research-profession", to which this research program fully intends to make contributions.

OBJECTIVES

Within the inter-ministerial research program, "20th Century Architecture, Project Material for the 21st Century Sustainable City", the call for research proposals invites the scientific community to shed new light on the adaptive capacity of twentieth century architecture to create cities that are more sustainable and citizen-based.

Its aim is to devise the epistemological conditions, conceptual hypotheses and technical bases conducive to the definition of long-term strategies for valorizing twentieth century architecture, outside of any doctrinal position.

It invites us to consider past century architecture and its diversity of urban scales, architectural types, materials, construction techniques, uses, along with ways of living as tools that are likely to significantly contribute to the challenges raised by the sustainable city paradigm.

Within the framework of this program, the production of knowledge and its application to real situations must form part of an operational aim that seeks to renew design project practices in terms of architectural, technical, social and participative innovations.

The history of architecture may be considered within an objective that allows inhabitants to re-appropriate their lived environments.

Conditions for valorizing the architectural, urban and landscape qualities of twentieth century housing ensembles, as well as their potential for transformation, will be taken into account so as to reinforce users' and inhabitants' adherence to design projects focused on urban renewal and territorial revitalization.

For this reason, the valorization of expertise among local actors will be encouraged (regional and local authorities, associations, inhabitants) and a multidisciplinary approach is preferred (architecture, urban planning, landscape design, engineering, history, sociology, anthropology, etc.).

More specifically, these calls for research projects first aim to develop intervention strategies for twentieth century architecture that are based upon detailed knowledge of the existing buildings, urban environments as well as economic and social contexts.

The scientific approach must focus on:

— The development of tools for understanding and evaluating twentieth century architecture that support decision-making processes, based on a diverse corpus of sources (archives, residents, managers, sites and buildings, etc.). Whether it be knowledge created by the team or readily available data, an already existing corpus must be taken into account whenever possible.

— The capitalization of knowledge and diffusion of research among public and private developers, regional and local authorities, decentralized governmental services, along with all the players involved in architecture, urban planning and landscape design in a larger sense.
In order to meet the program's expectations in terms of innovative operational proposals, the research projects should be based on one or more dynamic(s) of current design projects and generate the involvement of stakeholders whenever possible (regional and local authorities, developers, social housing organizations, property owners, public or private local actors).

— A consideration for the reuse of twentieth century architecture in a comprehensive research project approach that integrates dimensions of culture, history, society, property, economy, environment, energy, construction and space for each building or urban area.

DETAILS OF THE EXPECTED RESEARCH PROJECTS

Building knowledge for practical application

The expected research projects must address questions related to the theory, usage and materiality of twentieth century architecture, alongside contemporary implementation conditions for a building's transformation, adaptation or valorization. This is also the case for urban spaces and landscapes.

They must also be derived from a practical application of knowledge no matter its nature, method or purpose, with methodological and deontological frameworks that have yet to be established but which form part of the architectural design project approach: maintenance, preventative conservation, adaptation, conversion, rehabilitation, transformation, restoration, etc.

Research projects may bring together expertise in spatial disciplines (architecture, urban planning, landscape design, spatial planning) as well as skills pertaining to the humanities, social sciences, engineering and environmental sciences.

They may also use a transcalable and interdisciplinary approach to seek out experimentation methods specific to the design project.

Furthermore, they may question collaborative and digital tools (especially BIM) through topics such as the digitalization of existing buildings, building transformation and adaptation conditions, heritage management and maintenance, etc.

Informing and supplementing professional practices

The research proposals must bring new and innovative contributions to the discussion surrounding intervention methods for twentieth century architecture. They must be derived from an original and unprecedented approach, the methodological roots of which may be found in previous works or those underway, but whose overall proposed approach has not yet been implemented.

A preliminary state-of-the-art report, covering both the research works and the operations achieved, will make it possible to take stock of the existing knowledge and practices on the subject.

In order to put forth new contributions to the problems addressed, the research project may draw on the field's most significant studies and, as much as possible, on existing project dynamics. It may also rely on case studies as support for an analysis and intervention method aimed at identifying and implementing the most suitable solutions. The conditions and mechanisms for diffusing and communicating the research results to decision-makers and professional actors must be a topic for special consideration leading to proposals, particularly those regarding innovative building intervention.

Integrating educational components

Research projects must integrate educational components which conform to the format and methodology of the project, in addition to being focused on the adaptation, transformation, restoration or valorization of twentieth century building heritage.

These educational components deal with all dimensions of architectural research project teachings, including those relative to adaptation, transformation and restoration techniques, as well as construction techniques of the twentieth and twenty-first centuries. It may concern initial training (Bachelor, Master and PhD) or specialized and continuous training, be based on existing teachings or serve as support for new teachings and relate to elements of methodological or educational content.

Subjects of interest

Certain subjects are considered to be a priority, either because they lie at the heart of public policy implemented by the national government and its operators, or because they bring significant potential for innovation and development.

As such, the following are cited:

In the 1st call for research projects (2016)

- Achievements of the second half of the twentieth century
- Typologies of housing, or housing ensembles, with regard to new lifestyles
- Architectural quality criteria and regulatory constraints (especially thermal, but also seismic or accessibility)
- Energy performance in relation to the life cycle and overall cost of the building
- Renewal of urban forms and landscaped spaces from the perspective of contemporary use of public space
- Digital transition of the building sector and its application to twentieth century architecture
- Economic value of buildings within urban renewal strategies
- New uses and reuse strategies of twentieth century "non-standard" or experimental architecture

In the 2nd call for research projects (2017)

- Programs not covered by the research projects selected in 2016, whether tertiary buildings, commercial buildings, or public facilities
- Investigation of new valorization strategies for twentieth century architecture using collaborative and digital tools (particularly BIM); the proposals in this field could especially shed light on the digitalization of the existing building stock, the conditions for the transformation and adaptation of buildings as well as the management and maintenance of heritage
- Existing building approach through the "smart city" paradigm: use of information and communication technologies, optimization of natural resources, integration into communication networks and infrastructure, involvement of regional and local authorities as well as users
- Scientific procedures involving the effective participation of residents and users (participatory science work) on subjects concerning housing or any other type of building

In the 3rd call for research projects (2018)

- Issues relating to existing building intervention techniques and the development of corresponding professional knowledge (cf. thermal, acoustic, energy, climatic challenges, consideration for natural risks, changes in use and lifestyle, etc.). In this regard, research projects addressing the use of eco-materials or bio-sourced materials and the need within these practices to meet the criteria in place regarding technical, functional and environmental performance standards are sought out
- Educational environments (elementary, middle and high schools, universities, campuses, schools of architecture) as well as library environments (multimedia libraries, libraries)
- Scientific approaches involving the effective participation of residents and users (participatory science work) on subjects relating to housing or any other type of building
- Changes underway regarding the professional roles and practices of architects within these processes, which could be the subject of specific reflections and recommendations within this framework

STRUCTURE OF RESEARCH PROJECTS

Team Composition

Each team brings together the academic, scientific, pedagogical and professional skills necessary to properly conduct the research project using an interdisciplinary framework.

Their collective ambition is open to the theme of the research program in terms of innovation in specific subjects, contexts, methods, practices and scientific outputs. They bring together researchers and professionals from at least two higher education institutions, international or national partner organizations or companies, including at least one National Graduate School of Architecture as a delegate for each team. Researchers belong to one or more authorized research lab(s), or to a research group in training recognized by the Ministry of Culture. Where appropriate, cooperation should be developed and specified with staff involved in research assignments within public services and institutions of the government, local authorities as well as the R&D managers of private companies.

Candidate teams are expected to construct and build upon partnerships with:

→ Local actors and decision makers (institutions, organizations, local authorities, etc.) linked to a project dynamic currently underway. The purpose and the methods for involving each of the partners should be specified.

→ Practitioners, teams of developers, architecture companies or offices, as well as professionals with technical expertise, in order to develop joint research within the framework of this call for proposals, thus strengthening the link between training-research-profession.

A "linkage" between the candidate team and certain teams selected under the previous research incentive program, "*Ignis mutat res:* Achitecture, city and landscape from an energy perspective" can be sought out, depending on the subject.

The reception of one or more doctoral candidates within the team is strongly encouraged, particularly those with Industrial Contracts for Training Through Research (CIFRE).

Development of the Scientific Project

The research project must gather team members around a common work perspective that identifies:

→ A general research problem linked to the analysis of a topic, a housing estate or a category of buildings regarded for their specific typo-morphological characteristics, their technical and spatial potential as well as the place they occupy in a given urban fabric;

→ A particular problem that addresses the qualities of a building in terms of identified transformation, adaptation and valorization challenges in a real context;

→ Applicative and experimental tools at different scales of the project to put knowledge into action;

→ A set of reflections and investigations likely to supplement a theoretical, design-based and technical positioning within the research team that can be mobilized outside of the research program;

→ An educational strategy to valorize the methodology developed as part of the research project framework. This may concern design teachings as well as technical, theoretical or historical fields.

Methodological Expectations

The scientific research project must be structured around a shared methodological position with specified objectives, means and limitations.

Within the team, the link between educational, scientific and professional expertise must also be specified.

Each type of opportunity allowing for the development of an innovative pedagogical device within and at the service of the research project should also be considered both objectively and realistically.

Both internal and external challenges, methods and means of evaluation for collectively implemented scientific outputs must be specified within research proposal applications.

Summary Table of Submitted Proposals

1ST SESSION – 2016

Title of Research Proposal	Delegated ENSA Principal Investigator/Research Lab
SELECTED RESEARCH PROJECTS	
REDIVIVUS — When Sustainability Overtakes and Recovers Modern Movements: Lessons, adaptations and inventions of everyday spaces Bordeaux, France/ Cincinnati, Ohio, USA	ENSAP Bordeaux J. Kent Fitzsimons, PAVE
SMART FRENCH: The Resilience of the Modern City	ENSA Bretagne Raphaël Labrunye, GRIEF/ATE
Architectural Reuse and Design: Sustainable project potential in a district's material, technical and cultural resources	ENSA Grenoble Pierre Belli-Riz, AE&CC
Toulouse, From Large Housing Estate to the Sustainable City: Prospects and initiatives	ENSA Toulouse Rémi Papillault and Audrey Courbebaisse, LRA
Reconstructed Housing Intervention: From research methodology to action strategies	ENSA Versailles Christel Palant-Frapier, LéaV
PROJECTS TO BE CONSOLIDATED	
Reconstruction, the sustainable city	ENSA Normandie Patrice Gourbin and Caroline Maniaque, ATE
When "Interior Brings Exterior": Windows in the architecture of grands ensembles	ENSA Versailles Paolo Amaldi and Annalisa Viati Navone, LEAV
PROJECTS NOT SELECTED	
REGEN 20: Ecological renewal of 20th century grands ensembles through intermediary spaces. A comparative approach of France, Hungary and Greece	ENSA Grenoble Magali Paris, CRESSON/ UMR AAU
From the Radiant City to Recreational Urban Planning: Imagination of the beach as an instrument for transforming modernist public spaces	ENSA Nantes Daniel Siret, CRENAU/ UMR AAU
20th Century Architecture in Terms of Cultural Hybridization: A resource for the sustainable city	ENSA Nantes Anne Bossé, CRENAU/ UMR AAU
Heritagization, Urban Renewal and the Sustainable City: Challenges of a neighborhood symbolizing 20th century architectural, urban and social experimentation - La Maladrerie in Aubervilliers	ENSA Paris-La Villette Ioana Iosa, LAA/ UMR LAVUE
Facades: Re-inhabiting and rehabilitating the lived environment. Thermal insulation and biodiversity	ENSA Paris-La Villette Yann Nussaume, AMP/ UMR LAVUE
Initiating Construction Work in the Public Spaces of Clos Saint-Lazare	ENSA Paris-La Villette Manola Antonioli, AMP/ UMR LAVUE
20th Century Therapeutic Architecture and Environment: A key for the sustainable city of the 21st century	ENSA Paris-Val de Seine Donato Severo, EVCAU

2ND SESSION – 2017

Title of Research Proposal	Delegated ENSA Principal Investigator/Research Lab
SELECTED RESEARCH PROJECTS	
Rethinking Innovation: Understand and manage the legacy of experimental and innovative social housing from 1968-1978	ENSA Marseille Ana bela de Araujo, INAMA
Cultural Resource and Urban Design Proposal: Mid-sized cities of the post-war reconstruction	ENSA Normandie Patrice Gourbin and Caroline Maniaque, ATE
Firminy, From Modern City to the Sustainable City	ENSA Saint-Étienne Jean-Michel Dutreuil and Rachid Kaddour, Transformations
PROJECTS TO BE CONSOLIDATED	
Tropical Modernity in the Face of Seismic Risk: Histories of situated modernism and adaptability strategies of the Ali Tur school groups in Guadeloupe (1930, 1950-1965)	ENSA Grenoble Sophie Paviol, AE&CC
Renaudie-Gailhoustet in Plaine-Commune: 20th century heritage as a driver for social cohesion	ENSA Paris-Belleville Vanessa Fernandez and Virginie Picon-Lefebvre, IPRAUS/ UMR AUSSER
The Future of 20th Century Education Facility Heritage: Knowledge and strategies for requalifying secondary education buildings of the 1960s and 1970s, in France and Italy	ENSA Paris-Belleville Roberta Morelli, IPRAUS/ UMR AUSSER
Individual Design: What is the future of the existing individual housing stock facing contemporary energy transition?	ENSA Paris-La Villette Yann Nussaume, AMP/ UMR LAVUE
PROJECTS NOT SELECTED	
ReMIX — The Reinvention of Industrial Sectors: A tool for 21st century regions	ENSA Paris-Est Isabelle Biro and Antonella Tufano, OCS/ UMR AUSSER
MARTA: Critical mass and transect in the service of architecture	ENSA Montpellier Hassan Aït Haddou, LIFAM
SharingLand: From Nîmes to Port-Camargue	ENSA Montpellier Laurent Duport, LIFAM
DOMUS LAB: Housing Program and Architectural Transition for Architectural Innovation in Housing, Heritage Identity and Sustainable Investment Cultures	ENSA Nancy Nadège Bagard, LHAC
Augmented Architecture: Technical-cultural experimentation for the ecological transition of architecture	ENSA Toulouse Daniel Estevez, LRA
20th Century Therapeutic Architecture and Environment: A key for the sustainable city of the 21st century	ENSA Paris-La Villette Manola Antonioli, AMP/ UMR LAVUE
When "Interior Brings Exterior": Windows in the architecture of *grands ensembles*	ENSA Versailles Paolo Amaldi and Annalisa Viati Navone, LEAV

3RD SESSION – 2018

Title of Research Proposal	Delegated ENSA Principal Investigator /Research Lab
S E L E C T E D R E S E A R C H P R O J E C T S	
Tropical Modernity and Seismic Risk: Histories of situated modernism and adaptability strategies from the Ali Tur school groups in Guadeloupe (1930-1937)	ENSA Grenoble Sophie Paviol, AE&CC
EC 45/85 - Cultural Achievements From 1945-1985 in France: Architecture of the 21st Century? Multidisciplinary research examining five rehabilitation projects	ENSAP Lille Xavier Dousson, LACTH and Elise Guillerm, ATE
Rehabilitation of Light-Weight Facades in 20th Century Housing: From research to experimentation	ENSA Lyon Philippe Dufieux, LAURE/ UMR EVS and Olivier Balaÿ, CRESSON/ UMR AAU
Individual Design: What is the future of the individual housing stock in the immediate outskirts of French cities in the face of energy transition?	ENSA Paris-La Villette Yann Nussaume, AMP/ UMR LAVUE
Conversion of 20th Century Therapeutic Architecture: A key for the sustainable city of the 21st century. The cases of Beaujon Hospital (Clichy) and Bichat-Claude Bernard Hospital (Paris)	ENSA Paris-Val de Seine Donato Severo, EVCAU
P R O J E C T S N O T S E L E C T E D	
Sensation Machines. Transformation Proposals for Intermediary Spaces of Le Corbusier's Housing Units	ENSA Grenoble Magali Paris, CRESSON/ UMR AAU
The Subdivision of Low-Rise Residential Housing Neighborhoods: Material for the sustainable city of the 21st century... under what conditions?	ENSA Marseille Séverine Steenhuyse, PROJECT(S)
The Future of 20th Century Education Facility Heritage in France and Italy: Knowledge and strategies for requalifying secondary education buildings of the 1960s and 1970s	ENSA Paris-Belleville Roberta Morelli, IPRAUS/ UMR AUSSER
The Richness of Emptiness: In search of hollow walls. A history of architecture and construction techniques serving thermic restoration of existing buildings with vacuum aired outer walls	ENSA Paris-La Villette Emmanuelle Gallo, AHTTEP/ UMR AUSSER
Modernity, Memories and Milieu: Reprogramming the 20th century base tower for the 21st century, based on the work of A. Wogenscky	ENSA Paris-Malaquais Jac Fol, ACS/ UMR AUSSER
The Library in the Spotlight of Public Space: Cartography, perspectives and intervention strategies for 20th century housing stock	ENSA Paris-Malaquais Cristiana Mazzoni, UMR AUSSER
REHAB: Receiving and Studying a Standardized Architectural Heritage - Transmitting and intervening in the daily heritage of the *trente glorieuses*	ENSA Paris-Val de Seine Yankel Fijalkow, CRH/ UMR LAVUE
ACOR: Autonomy Comfort and Optimization of Renovation - Aging at Home: Against energy poverty, for the control of environmental qualities	ENSA Strasbourg Emmanuel Ballot, AMUP
Augmented Architecture France-Vietnam: Non-extractive architectural design approaches in the face of the climate crisis	ENSA Toulouse Daniel Estevez, LRA
For a "Climatic" Rehabilitation of University Building Heritage of the Second Half of the 20th Century	ENSA Versailles Grégory Azar, LEAV

Summaries of Selected Proposals

2016 SESSION

REDIVIVUS **— When Sustainability Overtakes and Recovers Modern Movements: Lessons, adaptations and inventions of everyday spaces**
Bordeaux, France | Cincinnati, Ohio, USA
ENSAP Bordeaux
J. Kent Fitzsimons, Associate Professor
at ENSAP Bordeaux, PAVE research lab

SMART FRENCH: The Resilience of the Modern City
ENSA Bretagne
Raphaël Labrunye, Associate Professor
at ENSA Normandie, ATE research lab

Architectural Reuse and Design: Sustainable project potential in a district's material, technical and cultural resources
ENSA Grenoble
Pierre Belli-Riz, Associate Professor
at ENSA Grenoble, AE&CC Labex research lab

Toulouse, From Large Housing Estate to the Sustainable City: Prospects and initiatives
ENSA Toulouse
Rémi Papillault, Full Professor at ENSA Toulouse, LRA research lab and Audrey Courbebaisse, Assistant Professor at ENSA Toulouse

Reconstructed Housing Intervention: From research methodology to action strategies
ENSA Versailles
Christel Palant-Frapier, Associate Professor
at ENSA Versailles, LéaV research lab

2017 SESSION

Rethinking Innovation: Understand and manage the legacy of experimental and innovative social housing from 1968-1978
ENSA Marseille
Ana Bela de Araujo, Associate Professor
at ENSA Marseille, INAMA research lab

Cultural Resource and Urban Design Proposal: Mid-sized cities of the post-war reconstruction
ENSA Normandie
Patrice Gourbin, Associate Professor at ENSA Normandie and Caroline Maniaque, Full Professor
at ENSA Normandie, ATE research lab

Firminy, From Modern City to the Sustainable City
ENSA Saint-Étienne
Jean-Michel Dutreuil, Associate Professor at ENSA Saint-Étienne and Rachid Kaddour, Associate Professor
at ENSA Saint-Étienne, Transformations Research Group

2018 SESSION

Tropical Modernity and Seismic Risk: Histories of situated modernism and adaptability strategies from the Ali Tur school groups in Guadeloupe (1930-1937)
ENSA Grenoble
Sophie Paviol, Associate Professor at ENSA Grenoble, AE&CC research lab

EC 45/85 – Cultural Achievements From 1945-1985 in France: Architecture of the 21st century? Multidisciplinary research examining five rehabilitation projects
ENSAP Lille
Xavier Dousson, Associate Professor at ENSA Paris-Val de Seine, LACTH research lab and Elise Guillerm, Research Engineer at ENSA Normandie, ATE research lab

Rehabilitation of Light-Weight Facades in 20th Century Housing: From research to experimentation
ENSA Lyon
Philippe Dufieux, Full Professor at ENSA Lyon, LAURE research lab - UMR EVS-LAURE research and Olivier Balaÿ, Full Professor at ENSA Lyon, CRESSON research lab – UMR AAU

Individual Design: What is the future of the individual housing stock in the immediate outskirts of French cities in the face of energy transition?
ENSA Paris-La Villette
Yann Nussaume, Full Professor
at ENSA Paris-La Villette, AMP research lab - UMR LAVUE

Conversion of 20th Century Therapeutic Architecture: A key for the sustainable city of the 21st century The cases of Beaujon Hospital (Clichy) and Bichat-Claude Bernard Hospital (Paris)
ENSA Paris-Val de Seine
Donato Severo, Full Professor
at ENSA Paris-Val de Seine, EVCAU research lab

REDIVIVUS
WHEN SUSTAINABILITY OVERTAKES AND RECOVERS MODERN MOVEMENTS
Lessons, adaptations and inventions of everyday spaces
Bordeaux – France | Cincinnati – United States

1st SESSION 2016

2-year project

Bordeaux National Graduate School of Architecture and Landscape Design (ENSAP Bordeaux)

Principal Investigator
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Rebecca Williamson, Registered Architect,
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Partners
Urban Forum, Center for Societal Innovation
Excellence Initiative of University of Bordeaux, IdEx

PROPOSAL OBJECTIVES

Focusing on housing districts and residential buildings designed and constructed around 1970, this research aims to analyze the issues related to the overhaul, rehabilitation and urban reintegration of inherited architecture in light of requirements stemming from the sustainable city paradigm.

Our main hypothesis is that, from the perspective of sustainable urban development in the twenty-first century, the interest of considering these operations as heritage is twofold. As the final manifestations of a modernist lineage initiated several decades earlier, these pieces of heritage constitute both specific problems and distinctive opportunities amidst a system of architectural and urban production that has narrowed itself around relatively constrained standards and typologies. This research therefore attempts to reveal the remarkable qualities of this heritage while shedding light on the technical, political and social mechanisms at play in its adaptation to the constraints of the sustainable city.

Combining methods and tools drawn from architectural design, social sciences and physical sciences, the research underscores the ways in which everyday users view their modernist heritage. Four cases in Bordeaux that have been "overtaken" and "salvaged" by present-day urbanization are investigated: two neighborhoods combining individual housing and small housing blocks (Pontet-Lamartine district & Hameau de Noailles) and two podium-and-tower districts (Mériadeck district in Bordeaux's city centre & Aubiers housing estate in the Bordeaux Lac peripheral district). These cases embody spatial theories, doctrines and principles that are legacies of the modern movement and function as "analyzers" of changes currently underway. They were chosen to cover a diversity of parameters: the principles they materialize (morphology, typology, location); the initiators, managers and participants of their requalification (territorial collectivities, social housing organizations, condominium associations, residents) and the operational context of the project (ex: the "50,000 housing units surrounding public transportation routes" program, the Ginko eco-district in Bordeaux, or the "Hope VI" program in the United States).

While the cases in Bordeaux are at the heart of the research, a sample of operations in Cincinnati provides perspective on the French context in light of two transnational phenomena: the variations on modernism as it spread through different countries during the post-war era, and the global dimension of sustainable development issues today.

METHODOLOGY

Our initial observation is that housing operations that exemplify various currents of post-war modernism are currently being overtaken by urban growth that, in contrast, embodies a combination of challenges, principles and objectives that have emerged since the 1980s. Gathered under the concept of sustainable city, these contemporary characteristics tend to discredit architecture that predates the energy crises of the 1970s.
The following hypotheses are thus formulated:

- While current sustainability injunctions can complicate the preservation of this architecture and provoke its stigmatization, certain of its inherent qualities make it conducive to a certain idea of sustainability and available for achieving sustainable objectives at the metropolitan scale.
- These qualities can serve as a positive reference for residents of this modernist architecture and promote its preservation as heritage of everyday life.

To test these hypotheses, forty-nine semi-structured interviews were conducted with residents, property owners, and managers of the study sites in Bordeaux and Cincinnati, as well as with experts and scholars familiar with them. As-occupied plans and environmental measurements in the housing units and neighborhoods were systematically carried out, along with an analysis of consumption readings. The data was completed with spatial analyses (from the scale of the building to that of the district) using maps and plans to show environmental qualities as well as how urban fabric and uses evolved over time. Throughout the entirety of the research project, residents were involved in workshops, seminars and conferences in order to forge shared experiences and collective knowledge.

EDUCATIONAL COMPONENTS

2017: ENSAP Bordeaux - University of Cincinnati Multi-Institutional International Workshop "Living Modern Architectural Heritage in the Age of Sustainability: Ambiances and Quality of Use", open to Master's students. Coordinators: Fanny Gerbeaud; Academic team: Aline Barlet and J. Kent Fitzsimons (ENSAP Bordeaux), Conrad Kickert and Rebecca Williamson (UC). Lectures by Sylvain Schoonbaert (City of Bordeaux), Ignacio Requena-Ruiz (ENSA Nantes) and Simon Schmidig (MSV Architects and Urban Planners, Geneva).
2017 – 2018: Option studio "Affiliation and typo-morphological genealogies" Master 1. Academic team: Loeiz Caradec and Caroline Mazel (academic coordinator). Architectural analysis of cases in Bordeaux using primary sources and *in situ* surveys.
2018: Continuation of the 2017 studio: conference and debate with Giulia Marino (Swiss Federal Institute of Technology in Lausanne EPFL) and Caroline Mazel (ENSAP Bordeaux).
2019: Design studio "Of Other (in)Habita(n)ts" Master 2. Research results used as a basis for developing projects for the evolution of Aubiers district, in light of broader urban development in its environs. Instructor: J. Kent Fitzsimons.

OPERATIONAL TARGETS

This research aims for two principal outcomes.

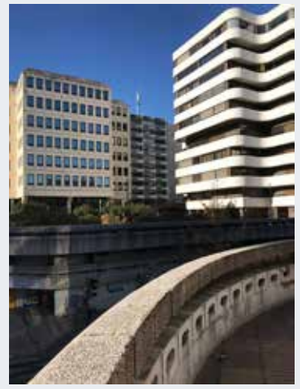
The first is to generate a deeper understanding of each Bordeaux case using a monographic approach. The novelty of this knowledge lies in its situation at the intersection of architectural analysis, testimonials from residents and other actors, and environmental and comfort studies. This is both valuable for those responsible for the management of this heritage, whether they be co-owners or professionals, and for those who admire architecture from this era.

The second result has a larger operational target. The "pre-project handbook" is a project tool for experts, designers and other organizations—National Housing Information Agency (ADIL), National Housing Agency (ANAH), Council of Architecture Urban Planning and the Environment (CAUE)—summoned to work on residential heritage built around 1970 that exhibits architectural characteristics whose preservation may be contradictory to improved performance. Various subjects that emerged through the tri-partite approach and that are addressed in the handbook (i.e. forms of ownership and occupancy, confrontation between positions of legitimacy, architectural resonances) make it possible to fully characterize each case, and then orient and justify choices regarding it.

REFERENCE CORPUS

• Mériadeck Neighborhood, Bordeaux (1969 - 1980)
Architect in Chief: Jean Royer
Coordinating Architects: Jean Willerval and Paul Lagarde.
Developer: Urban Community of Bordeaux, City of Bordeaux
Delegated developer: Bordeaux Planning and Construction Corporation (SBRU)
Pontet-Lamartine, Pessac (1970 - 1971)
Architects: AUA33 (Architecture and Urban Design Studio: Pierre Calmon, André Bergasol, Claude Bouey, Pierre Mathieu and Roger Tagini)
Developer: Gilbert Saramite
Noailles Hamlet, Talence (1968 - 1973)
Architects: Adrien Courtois, Pierre Lajus, Michel Sadirac and Yves Salier
Developer: Jean-Claude Mérigot, FIFE, Raoul Téchenet
"Remarkable Contemporary Architecture" certification (2015).

• Cincinnati
Park Town Co-op (1960 - 1961)
Architect: Constantinos Apostolou Doxiadis
Developer: Reynolds Aluminium Service Corporation
Three Sisters (1964)
Architect: Fred W. Pressler and Associates
Developer: University of Cincinnati
Regency Square (1969 - 1971)
Architect: Louis Sauer
Developer: E.J. Frankel Enterprises



Mériadeck, Bordeaux
In the foreground: Le Centre, 1973-1976
Developer: UFFI.
Architect: Francisque Perrier.
In the background: Le Guyenne, 1976
Architects: André Lagarde, Pierre Rignols and Jean Willerwal.
© J. Kent Fitzsimons

Les Aubiers, Bordeaux, 1968-1972
Architects: Bertrand Delorme, Pierre Dugravier and André Sabron.
Developer: Bordeaux Urban Community Public Housing Office (OPHLM), Gironde public housing corporation
© Louise Jammet

One Lytle, Cincinnati, Ohio, United States of America, 1970-1979
Developer: E.J. Frankel Enterprises
Architect: Louis Sauer
© J. Kent Fitzsimons

SMART FRENCH - The Resilience of the Modern City

1st SESSION 2016

2-year project

Bretagne National Graduate School of Architecture
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AAU-CRENAU, UMR MC CNRS 1563 / ENSA Nantes
Department of Architectural Engineering / Free University of Brussels, Belgium
GRIEF / ENSA Bretagne
GRF Resources / ENSA Clermont-Ferrand
Passages, UMR MC CNRS 5319 / ENSAP Bordeaux

PROPOSAL OBJECTIVES

The primary focus of the research is to form a deeper understanding of the collective housing stock built for operational purposes after World War II. This stock suffers from a globalizing depreciative judgment, both on the part of the public concerned as well as development stakeholders, elected officials and technicians; the latter having initiated recurrent major transformation policies since the early 1980s, especially in the field of social housing. Through normalized computing engines, financial and regulatory measures have favored a general thermal approach by redeploying new construction methods on already existing architecture. Furthermore, previous studies have already demonstrated the architectural, urban, landscape and environmental qualities found within the building heritage of the post-war period.

The initial hypothesis claims that it appears possible to extrapolate the evaluation at a larger scale with the use of statistical tools. The research seeks to engage with the quantitative and qualitative reality of this heritage within the following fields: history, heritage, architectural and construction analysis, material sciences, as well as the control of environmental qualities. Its goal is to propose new approaches for the development of a global energy performance initiative by building on existing capacities and potentials.

METHODOLOGY

The methodology played out in several simultaneous phases. Firstly, a systematic examination of architectural reviews allowed for the creation of a database using File Maker Pro.

Several studies were then conducted on all or part of the corpus, making it possible to carry out simulations and specify the methodology for creating relevant indicators. The analyses concentrated on shadow masks, bioclimatic characteristics, natural ventilation or light quality.

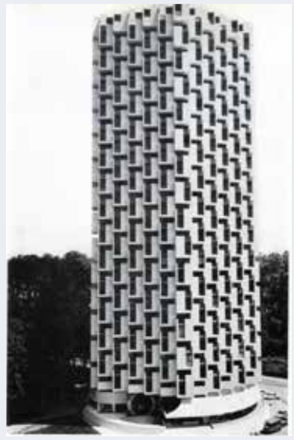
A classification of primary recurrences was also carried out based on master plans and distribution frameworks. In order to extract data analysis for each recurrence, the database was restructured in terms of these results.

* The research project Smart French was accepted in 2016, while its Principal Investigator was a Faculty Member at ENSA Bretagne and a member of GRIEF research lab.

REFERENCE CORPUS

The initial corpus consists of more than 600 project summaries of collective housing operations constructed between 1945 and 1975.

Studies focus on 80 operations where sufficient information is available for work to be carried out, including mass plans and floor layouts.



***ile verte Residences,* Grenoble, 1963**
Architects: R.h. Anger & P. Pucinelli
© D.R.
"Remarkable Contemporary Architecture" certification (2003)

Residential building in Sedan, Sedan, 1950
Architect: Jean De Mailly
© D.R.
"Remarkable Contemporary Architecture" certification (2000)

***Les Buffets,* Fontenay-Aux-Roses, 1958**
Architect: Guy Lagneau
© D.R.

Ardenay District, Palaiseau, 1960
Architect: R. Audigier
© D.R.

***Cité des Provinces Françaises,* Nanterre, 1957**
Architect: B. Zehrfuss
© D.R.

EDUCATIONAL COMPONENTS

The educational components relied on various academic settings. Initial drawing and analysis works were carried out by 3rd year Bachelor's students of History at the Bretagne National Graduate School of Architecture (ENSA Bretagne). Students were exposed to a body of routine quality operations, often derived from iconic models and proposing unique frameworks. Data analysis was additionally conducted during the research portion of a seminar at ENSA Bretagne.

Data collection and the definition of work themes allowed students to take part in unprecedented research, outlining new knowledge as a result of their work.

The reflections led by the research team also supported a research project studio in Bordeaux, which set out to preserve the initial design characteristics and improve upon devices deemed obsolete.

Finally, specialized Master's internships in Nantes allowed for students to gain experience in a laboratory setting, where they participated in creating new analytical methods.

OPERATIONAL TARGETS

The first operational target is to present a comprehensive analysis of a constructed context, illustrated by a variety of mechanisms, with particular attention allotted to the constructed or distributive qualities of the existing landscape. Certain aspects of recurrences have also led to the emergence of construction practices that hold great potential for improving the energy efficiency of these housing estates.

The definition of recurrences based on qualitative and quantitative data made it possible to draft a series of context-specific recommendations.

Finally, the project highlights the value of statistical tools in architectural and urban analyses for the development of a relevant macro approach.

ARCHITECTURAL REUSE AND DESIGN

Sustainable project potential in a district's material, technical and cultural resources

1st SESSION 2016

3-year project

Grenoble National Graduate School of Architecture (ENSA Grenoble)

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Rotor Collective (Brussels, Belgium)
City of Grenoble-Alpes (Metro)
NA ! Architecture (Grenoble)
SEM Innovia (Grenoble)
SPL SAGES (Grenoble)
Grenoble Alpes University, Master's of Civil Engineering

PROPOSAL OBJECTIVES

The reuse of construction materials has been a topic of increasing interest throughout the last several years. Many reasons exist for its resurgence and newfound popularity. In addition to being a practice exhibiting ecological parameters for validation, reuse raises a wide variety of both tangible and intangible issues, concerning all disciplines implicated in architectural and urban production.

Based on the resources of a local territory, this research questions the potential for the development of professional reuse practices in the construction industry according to two main themes:

- With regard to building construction and operational action conditions: how can the methods and processes for diagnosing and evaluating reusable elements be improved?
- In terms of models and processes for architectural design: how can reusable resources influence architectural design, both in the professional and academic realms?

The research program is thus interdisciplinary, connecting different partners and areas of expertise.

METHODOLOGY

Several guiding principles characterize this research project:

- Research from a territorialized pool of resources located in the City of Grenoble;
- An educational activity within ENSA Grenoble and the University of Grenoble-Alpes supports part of the research;
- The principle of action-based research involving public operational partners and local authorities;
- Cooperation between universities in Grenoble.

Three areas of development are proposed:

- Diagnostics: the state of current practices, methodological tests and comparisons, participation in the development and implementation of a "catalogue of local reusable resources";
- Circulation of resources, the relationship between supply and demand, supply chain, affiliates, networks and platforms;
- Processes of design and implementation using reusable resources, both in the professional and academic fields.

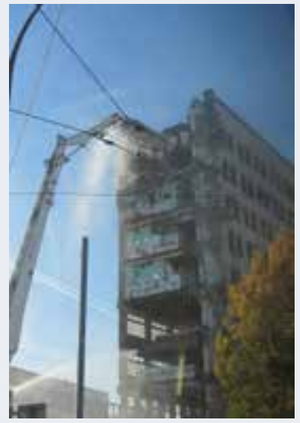
Experts, Rotor and Bellastock, are invited to participate in study days organized by professionals and based on these three themes.

REFERENCE CORPUS

The resources studied are initially situated in the mixed development zone (ZAC) of Flaubert, Grenoble, or in other districts of the City of Grenoble (peripheral districts, university districts, the old Allibert factory, etc.). Other examples of non-local reuse are also studied to support the general framework of this investigation.

Student works form part of a corpus that supplements this line of thought and research.

The purpose of these images is not to show a particular corpus, but to illustrate a general issue.



Demolition of a building in Grenoble, 2006
© Pierre Belli-Riz

Facade of the European Council in Brussels, Belgium, with recycled chassis-frame base, 2016
Architect: Philippe Samyn
© Pierre Belli-Riz

Rotor Dump in Brussels, Belgium: a classic source, 2018
© Pierre Belli-Riz

EDUCATIONAL COMPONENTS

- Theoretical courses with external interventions
- Studio tutorials
- Student works:
  - "challenge day", design-fabrication exams
  - diagnostics tests
  - in-studio research project exercises

The academic module is evaluated by students.

Comparisons are made with similar work carried out at ENSA Paris-Belleville.

OPERATIONAL TARGETS

Operational corpus:

- Diagnostics of resources proposed by operational partners
- "Catalogue of local reusable resources" (by NA! Architecture)
- A local operational framework is used to monitor the approaches of developers and architects
- A variety of examples for operational reuse

Expected "operational" targets and deliverables:

- Improvement of diagnostics methods — "resources", examples and methodological reports
- Examples of value analysis frameworks
- Examples of resource "catalogues"
- Case study overviews (sector organization, architectural achievements)
- Proposed improvements in decision making processes and company consultation specifications
- Reports of the three study days

TOULOUSE, FROM LARGE HOUSING ESTATE TO THE SUSTAINABLE CITY - Prospects and initiatives

1st SESSION 2016

3-year project

Toulouse National Graduate School of Architecture
(ENSA Toulouse)

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Partners
Association de quartier Si T Libre / Association de quartier les Amis de la Piscine Ancely / Association pour la Défence de l'Environnement et la Qualité de Vie à Ancely et Arênes Romaines (ADEQVAAR) / Contrat de Ville et Renouvellement Urbain / Conseil syndical Ancely / Conseil syndical résidence Belle Paule / Collectif Locataires du Tintoret / Groupe les Châlets Toulouse / Patrimoine Languedocienne, direction des Investissements et Programmes / Toulouse métropole, direction de l'aménagement / Toulouse métropole Habitat / URCAUE 31 / Union Sociale pour l'Habitat, agence Midi-Pyrénées / Syndicat de copropriété Barthas / Syndicat de copropriété Martin Gestion Les habitants des grands ensembles de Papus, Ancely et Belle Paule à Toulouse

PROPOSAL OBJECTIVES

Throughout France, many large housing estates are viewed as closed structures having experienced various ineffective resorption policies over the last several decades. Since 2003, the National Urban Renewal Agency (ANRU) signed 399 conventions for the implementation of policies in "sensitive neighborhoods", under the framework of the National Plan for Urban Renewal. In a close analysis of these districts, significant technical and financial means have been largely used for radical recomposition rather than restoration-transformation projects.

The research "Toulouse, From Large Housing Estate to the Sustainable City: Prospects and initiatives" thus explores the large housing estate rehabilitation project based on its architectural, urban and landscape qualities, as well as usage and transformational capacities.

How can large housing estates be integrated into the sustainable city? Considering their nature, their resident identity as well as their structural (including construction), environmental and landscape qualities, how can we imagine motivated, receptive and reasoned transformations that both respect continuity and are open to change?

These inquiries concern the future of the large housing estates constructed within the administrative city limits of Toulouse between 1950 and 1975; that is, 17 large scale projects comprised of 300 to 1,600 housing units, either condominiums or social housing. Three of these are studied more carefully.

This interdisciplinary and multi-scale research project surrounds the concepts of "mixity(ies)", "shared nature" and "energy(ies)", recurring terms in sustainable housing programs as seen through the questions of use and time, which underscore the rehabilitation projects of the buildings concerned. These concepts are explored relative to the singular issues of each large housing estate at the scale of the residential building, the large housing estate and the district. Throughout the three years of research, they are handled through a sequence of critical analyses, project and experimentation.

This approach questions both the research methodology as well as the process of safeguarding or heritagizing large housing estates.

REFERENCE CORPUS

***Cité Papus* (1948-1970), Toulouse**
Architects Pierre and Joachim Génard on behalf of the National Industrial Office of Azote (ONIA), 734 collective housing units and 40 duplex homes, preschool, primary school and two commercial centers;

Belle Paule Residence (1952-1956), Toulouse
Architect Robert Louis Valle on behalf of the Déromédi Brothers, 350 collective housing units, collective heating systems, shops;

Ancely (1963-1973), Toulouse
Architect Henri Brunerie on behalf of the Haute Garonne Public Housing Corporation, 766 collective housing units and 90 individual homes, preschool and primary school, pool, community centers, shops, sports fields and facilities.

***Cité Papus* 1948-1970),**
© Audrey Courbebaisse

Belle Paule Residence (1952-1956),
© Audrey Courbebaisse

Ancely (1963-1973),
© Audrey Courbebaisse

METHODOLOGY

Both for analysis and foresight, the methodology relies on three themes of the sustainable city paradigm which are developed through a multi-scalar intersection.

Multiple tools are used, derived from both the social sciences and engineering sciences as well as architecture.

"Mixity(ies)", be it functional, typological or social, is/are addressed by combining quantitative statistical analysis with cartographic formatting and qualitative analysis from interviews with residents.

"Shared nature", which addresses the collective spaces of the large housing estates (its surroundings, housing extensions, etc.), gives way to architectural and landscape surveys that are supplemented by an analysis of collective space use within the large housing estates.

"Energy(ies)", focusing on grids, materials, lighting, etc., requires detailed technical and environmental diagnoses based on the thermodynamic simulation method.

We hypothesize that the values of use and capacity for conversion are revealed by the residents themselves at different scales of the large housing estate.

While recording and analyzing testimonies allows for the identification of a shared intangible (and tangible) heritage, the qualities and/or dysfunctions are highlighted through survey drawings of material appropriation and alterations already carried out based on the original plans.

This action research relies on resident appropriation and regular dialogue in order to envision a fair rehabilitation project that balances both renewal and maintenance of existing qualities.

EDUCATIONAL COMPONENTS

Both in practice and in teaching, evaluating what constitutes quality or problematic and in need of change is done through analysis and research within a framework that uses an interdisciplinary approach, thus allowing for disciplinary decompartmentalization. In this context, the research brings together several teachings from ENSA Toulouse:

- → Seminar: "Heritage, theories and mechanisms"
- → Master 1 and 2 Research Project Studio "Proposed Heritage: Collective housing of the 20th century"
- → Final Research Project Studio "Design in the complexity of heritage";
- → National Institute of Applied Sciences (INSA) Civil Engineering Curriculum "Energy rehabilitation of 20th century architectural heritage".

Studio exercises allow for tools developed in the dissertation to be tested.

OPERATIONAL TARGETS

By means of Cédric Dupuis' dissertation (Adjunct Doctoral Candidate) on the strategies of actors involved in the rehabilitation-conversion of large housing estates in Toulouse, the partnerships with condominium associations and landlords as well as our design-experimentation proposals, the operational objectives are:

- → To emphasize the architectural, landscape, urban and usage qualities, as well as the transformative capacity of these large housing estates amongst property managers, residents and professionals;
- → To reveal the implementation conditions of such transformations through the instruction of thermal renovation and within national urban renewal programs;
- → To develop appropriate tools (in academia and in both pre-operations and operations) specific to the transformation and with respect to the large housing estates.

RECONSTRUCTED HOUSING INTERVENTION

From research methodology to action strategies

1st SESSION 2016

3-year project

Versailles National Graduate School of Architecture
(ENSA Versailles)

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at University of Paris I, Pantheon-Sorbonne
Alice Marsal, then Boris Labidurie, Research Manager
at the National Archives, City of Pierefitte
Emilie d'Orgeix, Director of Studies
at the *École Pratique des Hautes Etudes* (EPHE)
Benoît Pouvreau, Researcher at County Council #93
Simon Texier, Full Professor at the University
of Picardie Jules Verne
Karine Thilleul, Architect, Doctor, Associate Professor
at ENSA Nancy

Scientific Partnership Agreement
with the National Archives, City of Pierrefitte

PROPOSAL OBJECTIVES

The research project "Reconstructed Housing Intervention: From research methodology to action strategies" provides a strong link between research, education and intervention strategies. The goal is to promote new methodologies amongst the future generation of architects in particular, both in terms of historical knowledge as well as building analysis. More than just a simple historical study, the research incorporates action methods that rely on historical knowledge and archival resources in order to undertake educated interventions on existing buildings.

Bringing together a diverse range of participants, from researchers to professionals, allows for the intersection of scientific knowledge and the challenges presented by the future of post-war era housing.

The implementation makes it possible to shed light on the question of reconstructed housing units and their adaptability to current livability standards. Its goal is to collect and produce knowledge on post-war constructions, both from a historical perspective and from that of understanding buildings and construction techniques.

Still in use today, housing units from the reconstruction period raise different case-dependent issues when thinking of their evolution in terms of rehabilitation, modification, destruction and heritagization. In order to conduct this comprehensive undertaking, the research relies on both experimentation, as well as research actions and knowledge enrichment projects.

REFERENCE CORPUS

***Cité Rotterdam*, Strasbourg**
Architect: Eugène Beaudouin, 1951-1953
"Remarkable Contemporary
Architecture" certification (2014)

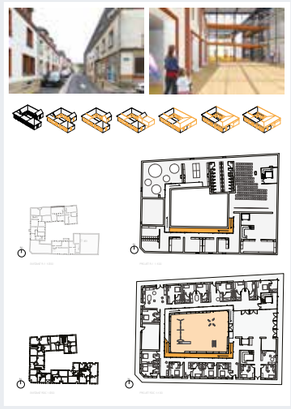
Reconstructed City Center of Sully-sur-Loire
1947-1962

Villeneuve-Saint-Georges
Architects: Marc and Léo Solotareff,
1949-1952

Reconstructed City Center of Gien
1947-1962

Block #4, City of Orléans
1944-1949
"Remarkable Contemporary
Architecture" certification (2014)

Reconstructed City Center of Vendôme
1949 - 1955



Reconversion of block #3 into
a preschool and a retirement home
Sully-sur-Loire
Student work: Coline Manenc (Master 1) ENSA
Versailles, 2018

Pont de Sologne Hotel, Sully-sur-Loire
Photo by Vanessa Lamorlette, 2014
© Centre-Val de Loire Region, General inventory

Analysis model of the Sully-sur-Loire
cinema, 2018
Student Work: Christopher Gares (Master 1),
ENSA Versailles, 2018
© Christopher Gares

METHODOLOGY

The goal of this research is to promote new design methods to future architects, both in terms of historical research and housing analyses. It intends to expose students to current issues brought about by context-specific realities, and to train them in methodologies for historical research.

Several action research studies on reconstructed districts were conducted throughout France, combining architectural and urban analysis with archival document comparison. These studies have given way to both design proposals along with publications.

The organization of *"Protect, Promote and Intervene: Architecture and urban planning of the post-war reconstruction in France. Current events and the future of a little-known heritage"* in Saint-Dié des Vosges in May 2018 enabled researchers to connect with actors in the field, as well as professionals and residents. The goal of this dialogue was for the intersection of views and investigations on the future of ordinary reconstruction heritage, in connection with current regional and national ideas on the attractiveness of mid-sized cities.

EDUCATIONAL COMPONENTS

→ In-depth History study courses for 3rd year students: Strasbourg (2017)
→ In-depth History study courses for 3rd year students: Villeneuve-Saint-Georges (2018)
→ Design Studio Master Course 1: Sully-sur-Loire (2017)
→ Design Studio Master Course 1: Vendôme (2018)
→ Thesis seminar Master 1: "Intervening on the existing" (2017-2018; 2019-2020)
→ Research Masters Internship: Gien (2016)
→ Research Masters Internship: Orléans (2017)
→ Research Masters Internship: Orléans (2018)

OPERATIONAL TARGETS

The repercussions for professional and operational milieu were researched in the cities of Vendôme, in Department 41, Sully-sur-Loire, in Department 45, and Saint-Dié des Vosges, in Department 88. The aim of the research is to support local and regional authorities in order to develop concrete ideas and actions for the enhancement and/or development of the reconstructed heritage of their cities.

A new graduate training session on twentieth century architecture and ecological transition is under examination at ENSA Versailles. Training days were additionally planned for future curators at the National Heritage Institute (INP) in 2019.

RETHINKING INNOVATION

Understand and manage the legacy of experimental and innovative social housing from 1968-1978

2st SESSION 2017

2-year project

Marseille National Graduate School of Architecture (ENSA Marseille)

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PROPOSAL OBJECTIVES

In the midst of the mass housing era, the failure of the urban form generated by large housing estates forced the French government to reorient its housing construction policies towards the revival of French life quality. Innovation became the new motto of the state and was promoted as a source of growth. In 1971, a large housing research program was initiated with the creation of the *Plan Construction,* which favored innovation in building technology as well as typological renewal. Initiated by public authorities and relying on new procedures (*Programme Architecture Nouvelle,* experimental architecture, *Modèles-Innovation*), this housing research lab produced plural housing.

The first hypothesis suggests that the experiments carried out by the *Plan Construction* hardly fulfilled this long-awaited union between technological progress and the revival of spatial quality; often prioritizing innovation rooted in industrial and technical devices at the detriment of typo-morphological renewal. As part of the model policy submitted for approval and aimed at reproducibility, *Modèles-Innovations* generated engineering dominated architecture-systems (three-dimensional, Meccano, etc.) that mainly favored the collective, albeit individualized. The second hypothesis rests on the idea that innovative architectural production was not a priority of the central authority. Questioning rationalist conceptions of the 1960s-era modern movement drove architects to rethink the relationship between the housing unit, as a base, and the city, resulting in the reemergence of the intermediary's compact form. In contrast to the collective individualization movement known as *Modèles-Innovations* was intermediary housing, which began with the housing unit to explore their grouped forms, aiming for the collectivization of the individual (C. Moley, 1979). Launched by the renewed urban policy of new cities, major architectural design competitions heavily contributed to the revival of this grouped individual housing.

Departing from a triple approach in terms of critical history, architectural analysis along with contemporary and heritage expertise, the objective of the research is to question the innovative character of the experimental and qualitative social housing production of the 1960s and 1970s. It does so by comparing the actively promoted experiment of the French Department of Construction with those various voluntary measures conducted by the state within a framework that we have characterized as "freer".

REFERENCE CORPUS

Two corpuses are defined.

Around sixty operations for intermediary housing.

Ninety-two *"Modèles-Innovations"* operations in Haut-de-France.

First corpus: "Intermediary Housing"
Example: Notre-Dame Residence
Architect: Fabien Vienne, La Ciotat, 1967-1971
© Fabien Vienne

Second corpus: "Modèle-Innovation"
Example: Structure Acceuil
Architect: Louis Schneider, around 1977
© Epale Archives

METHODOLOGY

In terms of fundamental research, the aim is to question representativeness as well as cultural and historical value, along with the material value of experimental social housing. This will be done through the concept of innovation, based on two very distinct corpuses: *Modèles-Innovation* at ENSAP Lille and intermediary housing at ENSA Marseille.

In terms of heritage approach, the first step consists of, in the case of Lille, documenting *Modèles-Innovation* operations in Hauts-de-France and, for Marseille, classifying intermediary housing operations based on a sample that includes architects who are engaged in this genre. The research then develops a study of these operations from the perspective of their initial proposal, planning, design, implementation, evolution and reception up to today.

The research/educational collaboration enables these same experimental housing operations — already examined from a historical, spatial and technical angle — to also be analyzed through the lens of energy efficiency, thermal comfort and quality of use, in order to generate architectural intervention strategies with respect to their inherent transformation potential (design of "empty" space, densification processes by extension/ elevation, improvement in use and/or materiality).

EDUCATIONAL COMPONENTS

ENSA Marseille
Bachelor's trajectory option: "Augmented reality and digital models".
Master's:
- Seminar, *Critical History* of the proposal, Master 1 and 2
- *Eco-construction* Seminar, Master 1 and *Transitions & Sustainable Construction Seminar,* Master 1 and 2
- Research project studio, *Transformation of forms and use,* Master 1 and 2

ENSAP Lille
Four research seminars throughout the Master's trajectory.
Three research seminars:
- *Project Archaeology*
- *Contemporary Architectural History*
- *Materiality and Tectonic*

And an exploratory seminar during the Master's
- *Contribution*

Two Master's trajectory research project studios in the field of History, Theories and Design (autumn and spring semesters).

OPERATIONAL TARGETS

The aim of this research is to generate expertise within the technical, spatial and urban qualities of these innovative operations by following the scientific protocol of the Documentation and Conservation of Buildings and Sites of the Modern Movement (docomomo), followed by an evaluation of the heritage value along with the contemporary value of this heritage.

These guidelines will be the basis for proposals under the "Remarkable Contemporary Architecture" (ACR) certification for unidentified large housing estates and inquiries on the ways in which this important corpus can respond to present situations, both from the perspective of heritage management (typo-morphological conditions and potential for evolution, the definition of serial-type technical and spatial interventions at domestic and urban scales, etc.), as well as from the viewpoint of its value and potential as an architectural and urban model that responds to current environmental and social challenges (alternative to low-rise residential housing and reduction of property requirements, technical norms oriented by sustainability requirements, etc.).

CULTURAL RESOURCE AND URBAN DESIGN PROPOSAL

Mid-sized cities of the post-war reconstruction

2nd SESSION 2017

2-year project

Normandie National Graduate School of Architecture (ENSA Normandie)

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Françoise Laty, Heritage Curator
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Isabelle Roberge, Responsible for Urban Policy at the Normandie Regional Council
Claire Servant, Responsible for the Lisieux Project House
Marie-Jeanne Villeroy, Curator, Director of the Museum of Vire, Normandie
Judith Wach, Heritage Architect for the City of Vire, Architecture Heritage and Local Development Department

Partners
Louviers Museum / Coutançais Town of Art and History / Normandie Region / City of Lisieux / City of Saint-Lô / City of Vire

PROPOSAL OBJECTIVES

The research "Cultural Resource and Urban Design Proposal" examines the heritage process as a tool for the development and transformation of mid-sized urban centers in Normandie.

We chose to focus on reconstructed cities, which constitute an important piece of heritage in the region, both in quantity and quality, and which currently receive heavy institutional investment.

In the five cities selected for the study (Vire, Saint-Lô, Louviers, Lisieux, Coutances), the research team undertakes a retrospective and prospective examination of the intersection between planning and recognition processes of this architecture.

Its members are involved in various valorization and mediation efforts (regional certification implementation, a revitalization program in Lisieux and Saint-Lô, a participatory exhibition in Louviers, etc.).

The goal is to pave the way for the requalification of architecture and urban planning from the post-war reconstruction, by taking into account its material (historical, aesthetic, architectural, urban) and social (memory, sociability) qualities.

METHODOLOGY

The project is deeply embedded in a regional context that is highly active in the types of cities chosen. It is additionally rooted in the current national context of mid-sized urban center revival.

The research first aims to understand these local intervention mechanisms, integrating a team comprised of numerous planning actors. The study thus relies on a constant dialogue between the resource persons from each of the chosen cities.

At the national scale, the research also includes a retrospective analysis of first generation studies on reconstructed cities, which took place in the 1980s and 1990s and which constituted one of the first interdisciplinary encounters in this field.

REFERENCE CORPUS

The research focuses on five mid-sized cities that were rebuilt in the 1940s and 1950s:

- Louviers
- Saint-Lô
- Coutances (Safeguarded sectors or protection zones ZPPAUP)
- Vire (PLUI patrimonial)
- Lisieux

In each city, a different actor accordingly ensures the link between heritage action and urban design proposal: country of art and history, municipal museum, heritage architect, project house. These structures all serve as references for the research group.

Louviers, block E
Architects: Jacques Michelon and Jacques Souliack-Eck
©Patrice Gourbin

Saint-Lô, Torteron Street
Architect in Chief: Marcel Mersier
©Patrice Gourbin

Lisieux, reconstucted center
Architect in Chief: Robert Camelot
©Patrice Gourbin

EDUCATIONAL COMPONENTS

→ The implementation of a diagnostic and research project exercise (during the Master 1) in Louviers and Saint-Lô, in order to imagine innovative and participative courses of action that foster urban growth which takes human dimensions and sustainable development into account.

→ The organization of an "urban registry" workshop in Lisieux, open to students and young graduates. The aim is to integrate new urban functionalities into an "in-between" of urban design proposals: between the "Lisieux 2025" reconstructed center renovation proposal and the National Urban Renewal Center (ANRU) Hauteville large housing estate proposal.

The workshop is the subject of a partnership with the City of Lisieux and the Prisme club.

OPERATIONAL TARGETS

The study aims to experiment with new project strategies, particularly through pedagogical activities.

On the ground, we seek to highlight the inherent strengths and dysfunctions of both public space and the urban systems of reconstructed cities which lack an established heritage character. In that sense, our goal is to reveal the design project potential in the places studied, along with their changeability and capacity to evolve and transform.

The work of the research team focuses particularly on the strategies of actors and their training.

The gathered observations also seek to distinguish the ways in which networks are organized from the perspective of information and method diffusion.

FIRMINY, FROM MODERN CITY TO THE SUSTAINABLE CITY

2nd SESSION 2017

2-year project

Saint-Étienne National Graduate School of Architecture (ENSA Saint-Étienne)

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Partners
Partnership Chair Housing of the Future
Firminy Public Housing Office (OPH)
Social Union for Housing
University of Jean Monnet Saint-Étienne
UMR 5600 EVS-Isthme and UMR 5206 Triangle research labs

PROPOSAL OBJECTIVES

Can *grand ensembles* constructed during the modern city paradigm be "seized" by the sustainable city paradigm? Is this desirable? For who and why? Under what conditions? How can it be done pragmatically?

"Firminy, From Modern City to the Sustainable City" addresses these issues by exploring at least two pathways for investigation and hypothesis:

- *Grand ensemble* livability, in terms of contemporary lifestyles and housing issues (including energy transition), which is investigated and analyzed from architectural and technical perspectives as well as social and human;
- Sustainable management of *grand ensembles*, which is investigated through two key components: firstly, the global economy of architectural and urban design proposals (not solely in terms of financial questioning, and within a highly-regulated context); secondly, political, addressing the role and the implication of residents.

This issue, these investigations and these hypotheses are embodied, rooted and tested in one specific case, that is the Firminy-Vert *grand ensemble* in Firminy, Loire, France. This *grand ensemble* presents two specificities, rendering it particularly interesting in regards to the questions raised. On the one hand, Ferminy-Vert (1957-1961) is an icon of the Modern City, with the Athens Charter as a source of inspiration as claimed by its designers. It is therefore recognized and valued as heritage, with numerous measures such as the "Remarkable Contemporary Architecture" certification, along with historical monuments for Le Corbusier and Wogenscky's buildings as well as Areas for the Enhancement of Architecture and Heritage (AVAP), a UNESCO Management Plan.

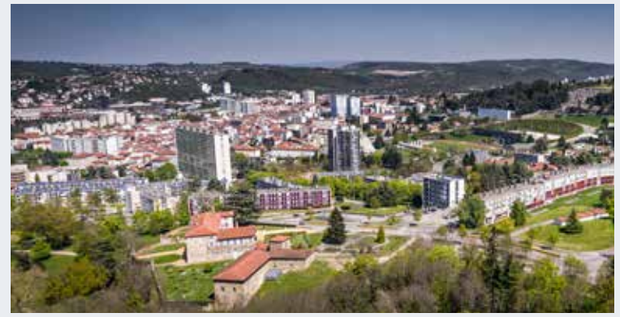
On the other hand, a peculiarity of Firminy-Vert is its location in a municipality that has been experiencing a decrease in population since the late 1960s, caused by the decline of the metallurgic industry. This situation has led to the emergence of distinct and harmful phenomena in Firminy-Vert, including population insecurity, building vacancy and elimination of low-income housing (undermined by the private stock). As a result of this troubling situation, the Public Housing Office (OPH) was forced to intervene in the sector to adapt it, both in quantity and quality, in order to restore attractiveness. In the case of Firminy-vert, however, such motives are at odds with the question of heritage and its conservation.

In this context, the research aims to explore the changeability of Firminy-Vert, from modernity to sustainability, with great urgency and as a challenge.

REFERENCE CORPUS

Firminy-Vert was designed by Charles Delfante, Marcel Roux, André Sive and Jean Kling, and requested by Eugène Claudius-Petit, Mayor of Firminy and President of the Public Housing Office. Completed in 1961, the estate includes 1,070 housing units, as well as other facilities (schools, sports fields, shops, community centers, laundromats).

It was renovated during the second half of the 1980s.



***Les Tilleuls* and *Les Peupliers* Buildings, 2018**
© Firminy Public Housing Office

***Les Peupliers* Building soon after completion**
© Firminy Public Housing Office

Firminy-Vert seen from the roof of the housing unit
© J.M. Pastor – Saint-Étienne Tourism, Le Corbusier Foundation / ADAGP

METHODOLOGY

In order to achieve these objectives, the methodology put in place gathers the skills and expertise of a team of faculty members with diverse disciplinary and experiential backgrounds — architects, geographers, historians, political scientists, thermal engineers (urban and building climatology) and BIM (Building Information Modeling).

The methodology is organized into six units:

- → Unit 1: State of the art and reference corpus
- → Unit 2: Historical study of Firminy-Vert and Firminy low-income housing (HLM), architectural, social, economic and political aspects
- → Unit 3: Social, economic and political investigation (a significant part of which includes interviews with institutional actors and residents)
- → Unit 4: Architectural and technical diagnostics
- → Unit 5: Simulation projects
- → Unit 6: Experimentation at a 1:1 scale (prototype - demonstrator - facade excerpt)

First, each unit investigates the issue and hypotheses using their own approaches, expertise and goals. A second phase of the research will differentiate and discuss all of the results obtained in the different units.

To allow this discussion to henceforth take place, the units are linked by BIM (transversal activity), a working method that allows the various disciplines to collaborate around digital models among other things.

EDUCATIONAL COMPONENTS

Research and pedagogy supplement one another within the framework of various teachings at the Saint-Étienne National Graduate School of Architecture (ENSA Saint-Étienne) and at the University of Saint-Étienne. Each studio has been linked to a course or a research project studio:

- → Studio 1: *Social Housing Course* (Master 1 ENSA Saint-Étienne)
- → Studio 2: Research Tools Course: *Archives* (Master 1 ENSA Saint-Étienne) and Research Project Studio
- → Studio 3: *Collective Design Studio* (Master of City and Urban Environment, Alterville trajectory, University of Saint-Étienne)
- → Studios 4 and 5: *Housing, Urbanity and Environment,* Design Studio (Master 2 ENSA Saint-Étienne)

OPERATIONAL TARGETS

The research will use its insights and analyses to contribute to the advancement of the critical situation in Firminy-Vert (economic, social and heritage problems) by mobilizing and informing various actors, as well as reducing contradictions found within different proposed responses.

To this end, a central role is granted to *project-based research,* which alone allows for concrete verification (typological, architectural, technical, economic and social) of the potential for the replication and coherent reclassification (feasibility) necessary for this heritage and this site.

This work should ultimately culminate in a project-tool allowing for the simulation of hypotheses and expertise with regard to the various objectives; and for operators, the preparation of concrete solutions and proposals.

TROPICAL MODERNITY AND SEISMIC RISK

Histories of situated modernism and adaptability strategies from the Ali Tur school groups in Guadeloupe (1930-1937)

3rd SESSION 2018

2-year project

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Partners
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- Division of Environment, Planning and Housing of Guadeloupe, "Natural Risks" Section

Grenoble National Graduate School of Architecture (ENSA Grenoble)

PROPOSAL OBJECTIVES

What is the future of tropical modernism in the face of seismic risk? Modernism in the French West Indies concerns us today more than ever; as it raises the social issue of local recognition for this colonial heritage, along with the technical issue of reducing the earthquake vulnerability of its buildings. Compared to Martinique and Guyana, the case of Guadeloupe is unique; its early modernity displaying a tri-unity of time, place and architect that render it a remarkable creation in the history of twentieth century architecture. Furthermore, modern architecture and its use of reinforced concrete were introduced in Guadeloupe following the cyclone of September 1928, which caused over 1,200 deaths and 15,000 injuries in just a few hours. It was under these conditions that Ali Tur, a Parisian architect commissioned by the Ministry of Colonies, succeeded in constructing over one hundred different public buildings over the duration of seven years.

Although this architecture was celebrated in its time and is well-known by heritage experts, it never seemed to generate interest amongst Guadeloupians, despite its presence in every municipality throughout the archipelago. The recognition of its architectural and urban qualities is thus all the more strategic, as the question arises surrounding its vulnerability in the event of an earthquake. The "Caribbean Earthquake Plan" made public safety an emergency, especially for children. Nevertheless, the high cost of earthquake reinforcement for the school groups built in the first half of the twentieth century makes it difficult to reasonably foresee, specifically in regards to the techniques recommended by consultants. Ali Tur's architecture is therefore left vacant, opting to ensure children's safety through the construction of new schools.

In this context, the research intends to propose alternative, more frugal strategies that comply with public safety standards, in order to adapt the schools built between 1930-1937 in Guadeloupe. Two objectives are therefore pursued accordingly. On the one hand, to support the creation of a Guadeloupian sense of heritage for early twentieth century architecture by analyzing its architectural and urban qualities and by writing its political, architectural and material histories. On the other, to increase the likelihood of the continued existence of the schools by developing low-cost earthquake risk mitigation strategies associated with potential changes in use..

REFERENCE CORPUS

The research deals with school groups that were constructed by Ali Tur across the Guadeloupian archipelago between 1930 and 1937.

They were chosen based on the assumption that their concrete would be more vulnerable than in those constructed between 1950 and 1965 by Gérard Michel Corbin and Gilbert Amarias.
Ali Tur's architecture was the subject of a general inventory between 2008 and 2010. Seven buildings are classified as historical monuments. The school groups are not protected.

Hameau School
Architect: Ali Tur
Encyclopédie de l'architecture : constructions modernes, Morancé, Paris, s.d.
© D.R.

Port-Louis School Group
Architect: Ali Tur
Architecture d'Aujourd'hui, March 1936, p. 103.
© D.R.

Capesterre-de-Marie-Galante School Group
Architect: Ali Tur
© Sophie Paviol.

METHODOLOGY

The research combines historical and engineering approaches to carry out an informed evaluation, then resituate the 1930s-era Guadeloupian school groups into a project setting. It begins with extensive field work: archival reviews, identification of buildings, architectural and construction surveys, identification of pathologies, surveys, samples of material, static laboratory testing and dynamic tests in the buildings.

After reviewing the political and economic conditions in which these buildings were constructed, the goal is to clarify their material history in order to identify and appreciate some of their physical characteristics.

Earthquake-resistant diagnostics reports from six of the schools, based on guidelines that include all major tools for seismic vulnerability reduction, are compared with the diagnoses and recommendations formulated in the 2009 "Caribbean Earthquake Plan" framework. Three of these are incorporated into a detailed investigation, along with architectural, urban and heritage quality analyses. A typology of foreseeable intervention procedures can then be established at the intersection of architectural and engineering methods.

EDUCATIONAL COMPONENTS

The project approach (new or rehabilitation), associated with the concept of limited resources, serves as an excellent educational tool for training architects in seismic design, requiring that "turnkey" reinforcement solutions be replaced with the use of intelligent design.

The output of this research supplements the following teachings:

- → Research Studio Course, Master 2 at ENSA Grenoble (comparisons with similar heritage situations in Europe and Africa in terms of fragility and vulnerability).
- → Continuous earthquake-resistant architecture training of ENSA professors (directors A. de la Foye and J.-C. Grosso).
- → *Diplômes Propres aux Écoles d'Architecture* (DPEA) "Engineering for architecture in situations of intense natural risks and resource scarcity" (Creation in progress at ENSA Grenoble, Director J.C. Grosso).

OPERATIONAL TARGETS

This research focuses primarily on the technical departments of the developers responsible for the earthquake risk mitigation operations of heritage buildings constructed prior to the arrival of seismic construction standards.

More specifically, the goal is to create a first level of methodological tools, as part of a call for design proposals aimed at reducing the seismic vulnerability of a heritage building, allowing them to:

- → Draft specifications that prioritize the emergence of cost-efficient responses and are concerned with the architectural and heritage dimensions.
- → Expand the analytical framework for assessing the technical and architectural relevance of responses.

EC 45/85 - CULTURAL ACHIEVEMENTS FROM 1945-1985 IN FRANCE: ARCHITECTURE OF THE 21ST CENTURY?

Multidisciplinary research examining five renovation projects

3rd SESSION 2018

2-year project

Lille National Graduate School of Architecture and Landscape Design (ENSAP Lille)

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ATE research lab (ENSA Normandie)
UMR AAU-CRESSON research lab (ENSA Grenoble)
CRAE research lab (University of Picardie - Jules Verne)

A Scientific, Technical and Artistic Council (CSTA)
of around twenty members supports this team.

Partners
National Fresnoy-Studio of Contemporary Art
Film Archive of Grenoble

PROPOSAL OBJECTIVES

This research aims to establish an understanding and knowledge of late twentieth century cultural facilities — a singular architectural typology — through the lens of building evolution, which will be measured using a multidisciplinary approach.

The research encompasses a wide range of topics, rendering statistical studies or inventory work difficult to carry out. It is thus centered around a pre-established corpus of multifunctional buildings that were constructed from 1945-1985, situated throughout France and having undergone various adaptations and renovations. These sources are meant to be representative of "problematic nodes" in heritage material and in rehabilitation practices.

In their day, these experimental buildings were at the intersection of spatial arts (studio art, scenography, lighting, music, etc.), enabling designers to conduct open architectural research. As such, they represent original and prestigious objects that are defined by users. Due to their rarity as architectural constructions of the post-war era, in addition to their marking a specific moment in public policy (for example, the evolution of requests leading to their renovation), we are invited to reflect upon the questions brought about by their transformation in a cross-sectional and in-depth way. After over fifty or sixty years of existence, many of these buildings have reached the end of a usage cycle. The renovation of a significant number of these structures has thus been triggered by the obsolescence of certain technical devices, by current requirements regarding accessibility and energy expenditure, along with new trends and needs of cultural world consumers.

The challenge of this research will therefore be to highlight their surrounding cultural and collective value from the time of their construction up until today. The aim is to bring forth the symbolic and imaginary aspects of these architectural buildings, which are seldom called into play as building adaptation projects.

The research thus seeks to highlight unforeseen moments linked to their evolution, which somewhat elude the technical and decision-making spheres. Through the development of five building monographs, unexpected sources linked to the renovated buildings are examined: memory, popular appropriation, stories, artistic expression, media reception, audiovisual production.

METHODOLOGY

The research is based on a collaboration between several areas of expertise (human and social sciences, art and architecture) found within different working groups affiliated with the research: the "nucleus" of researchers, the student sphere, the Scientific, Technical and Artistic Council (CSTA) along with professional and institutional partners.

REFERENCE CORPUS

National Museum of Popular Art and Traditions - MNATP
Jean Dubuisson, architect, 1953-1972 / closed in 2005 / Frank O. Gehry and Thomas Dubuisson, architectural reconversion, in progress

Amiens House of Culture
Pierre Sonrel, Jean Duthilleul and Marcel Gogois, architects, 1960-1965 / Gilles Duez, Roland Gaignard, Igor Hilbert, Van Hoa Huu, architect, restructuring, 1993

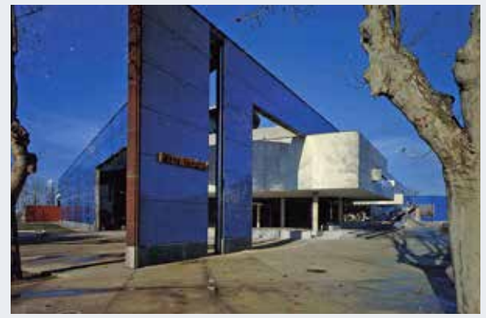
MC2 - Grenoble House of Culture
André Wogenscky, architect, 1966-1968 / Antoine Stinco, architect, Rehabilitation and extension, 2004; "Remarkable Contemporary Architecture" certification (2013)

Le Volcan - Le Havre House of Culture
Oscar Niemeyer, architect, 1978-1982 / Architectural office Deshoulières Jeanneau Architects (for the rehabilitation of the Grand Volcan), Sogno Architecture (for the library of the Petit Volcan) + Group SLH, BET, 2010-2015); "Remarkable Contemporary Architecture" certification (2002)

Ancient Arles Departmental Museum
Henri Ciriani, architect, 1983-1995 / Architectural Service of the Departmental Council of Bouches-du-Rhône, extension 2011-2013

Amiens House of Culture
Postcard, MAGE editors, Paris,
undated (predates 1973),
© D.R. collection EC-45/85

National Museum of Popular Art and Traditions - MNATP
Postcard edited by the Union of National Museums (RMN), Paris 1900
Reference: IC - 00-4747
© Photography A.T.P. / A. Pelle / collection XD



Museum of Ancient Arles
Postcard printed by Imprimerie Floch, numbered: n. 1540, undated
© Photography M. Lacanaud / collection XD

The project seeks to pay close attention to the intersection of different levels of complementary skills, particularly by organizing specific exchange periods between everyone (*In situ* exploratory seminars, workshops, CSTA meetings, etc.).

Two devices are imagined to support and showcase these collaborations and exchanges:

- The creation of an online research blog which articulates the inputs of concentrated or extensive teams (CSTA), from students and a wide range of stakeholders.
- Regular film work, whether internal, with the CSTA or open (teaching periods, study days, etc.), to document each period of exchange between the team. The film also serves to produce new documents for the research project (filmed interviews with various actors involved in implementation, thematic and/or poetic films, filmed transitions, etc.). These documents are shared interactively on an ongoing basis, through an online platform on the research blog which foreshadows a substantial component of the final interactive exhibition.

EDUCATIONAL COMPONENTS

Throughout the research, the imagined curricula are improved upon based on these first results.

- Caroline Bauer's lecture course (ENSAP Lille) allows for the creation of a useful focus for this type of request.
- Guillaume Meigneux's studio and visual arts course (ENSA Paris-Val de Seine) uses the same corpus as this research.
- Several other research seminars also include this corpus, particularly those of Guillaume Meigneux and Xavier Dousson (ENSA Paris-Val de Seine), Bruno Proth, Elise Guillerm and Dominique Dehais (ENSA Normandie) or even Éric Monin and Catherine Blain (ENSAP Lille).
- Other seminars offer research counterpoints, such as that of Nathalie Simmonot (ENSA Versailles and the University of Paris Saclay), Gauthier Bolle (ENSA Strasbourg), Simon Texier (University of Picardie) or Ariela Katz (ENSA Paris-Malaquais).

OPERATIONAL TARGETS

One of the challenges of this research is to encourage alternative forms of professional appropriation of the issues related to the renovation of cultural facilities.

For this purpose, various tools are deployed throughout the research:

- A good practice guide booklet, which aims to promote consideration for the artistic, symbolic and memorial value of these facilities.
- The creation of an online video channel, for the purpose of film publication on a digital platform throughout the duration of the research project.
- Upon completion of the research, a study day for the consideration of actors implicated in existing building projects (OPECUTEC, France Domaine, *Plan Urbanisme Construction Architecture,* user institutions and site managers, architects, Council of Architecture Urban Planning and the Environment (CAUE), etc.).

REHABILITATION OF LIGHT-WEIGHT FACADES IN 20TH CENTURY HOUSING

From research to experimentation

3rd SESSION 2018

2-year project

Lyon National Graduate School of Architecture (ENSA Lyon)

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TRIBU Design Office, thermal and sustainable design
Business
KCM, locksmith and metal workers
Other
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Franchet Local Authority
The Grands Ateliers: Innovation Architecture (GAIA / l'Isle d'Abeau), with Maxime Bonnevie for prototypes
Academic Consultants
Franz Graf, Architect, Researcher at TSAM research lab, Swiss Federal Institute of Technology in Lausanne (EPFL)
Florence Delomier-Rollin, State Architect and Urban Planner in chief, Architect at the French Building Institute

PROPOSAL OBJECTIVES

This research serves to finance the construction site of a demonstration project developed around a manifest-building (Les Cèdres) built by architect François-Régis Cottin and engineer Jean Prouvé in Lyon (1959-1962). The condominium currently has limited resources.

The research focuses on several objectives. On the one hand, it serves to provide an overview of the investigations conducted on this building since 2017, involving numerous actors in an interdisciplinary approach. This will allow us to provide a detailed overview of the issues pertaining to history, heritage, architecture, construction, thermal, acoustics and environment, along with social (residents) and management (condominium regulation) demands. On the other hand, it serves to construct working hypotheses aimed at resolving these issues, identified through the specific problems raised during the renovation of the building's curtain facade. In an approach combining heritage, comfort, energy and economy, these hypotheses seek to design and construct a panel prototype capable of being manufactured on a larger scale at the *Grands Ateliers Innovation Architecture* in Isle d'Abeau.

METHODOLOGY

The first phase of the research process focuses on understanding the building and its needs.

It begins with significant data collection across documents from private or public archives, a bibliographic review and many interviews with actors (managers, residents and surviving members of architecture teams). These explorations will allow us to better understand the initial logic and principles developed by the designers.

To identify the internal composition of the panels, the research is completed with a detailed survey and core sampling. These surveys are themselves achieved by observing the technical and mechanical characteristics of the building, such as its level of thermal and acoustic insulation, its airtightness, the state of its carpentry and expansion joint degradation as well as natural ventilation. Measurement campaigns and a structure study are also carried out.

Complementary to these diagnoses are interviews and consultations with residents in order to identify comfort issues and expectations. Past and present uses are analyzed by way of interviews and participatory observation practices (CRESSON research lab). Through these interviews, the team can draw up both normative and performance-sensitive specifications for the future facade.

REFERENCE CORPUS

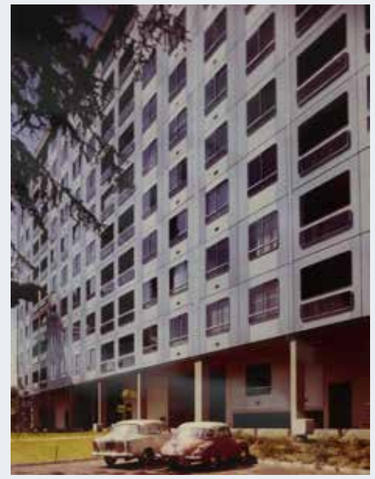
Les Cèdres building stands at the heart of a plot located at 44 rue de la Favorite in the 5th arrondissement of Lyon.

It concerns a low-rise, nine level housing complex, oriented north/ south and with a double-height ground floor dedicated to common areas. Each floor has 60 housing units, ranging from one room to six rooms, and is divided into three corridors. The main building facades are made up of curtain walls with prefabricated panels, giving it a unique, perfectly smooth and homogeneous appearance, with astonishing finesse and lightness for such a massive building.

The construction of Les Cèdres occurred at a decisive moment in Jean Prouvé's contemporary reflections on facade panels, the first patents of which he tested in 1947, relating to double-walled aluminum sheet panels.
"Remarkable Contemporary Architecture" certification (2003)

Les Cèdres from rue de la Favorite.
Date of photo: September, 2017
Photographers: Igor Bougnot and Simon Robin
© Igor Bougnot and Simon Robin

The Prouvé panels, south facade.
Date of photo: March 19, 2018
Photographer: Mathilde Padilla
© Research Project RFL – Rehabilitation of Light-Weight Facades in 20th Century Housing



The Les Cèdres building after its construction.
Date of Photo: 1962
Photographer: François-Régis Cottin
© SAAL – *Société Académique d'Architecture de Lyon*

EDUCATIONAL COMPONENTS

Preliminary investigation work was carried out in 2017/2018 within the *Architecture and Eco-Construction Transitions* Master's Program in the post-carbon studio at AA&CC research lab, directed by Olivier Balaÿ and two students from ENSA Lyon (final project carried out on Les Cèdres building). Their research led to the development and manufacture of a solar protection prototype at the *Grands Ateliers Innovation Architecture* in Isle d'Abeau.

An exhibition project on lightweight facade panels designed by Jean Prouvé is under examination at ENSA Lyon for autumn 2019.

OPERATIONAL TARGETS

The construction site constitutes the final "rendering" of this research. Its purpose is to assess the rehabilitation of the building's original light-weight facade through a set of assembled components. These components characterize a new light-weight envelope made of bio-sourced materials, adapted to the local environmental context and the needs of the inhabitants.

In order to evaluate the viability of the proposed solution, plans to carry out one or more full-scale prototypes are underway, which will be proposed to residents and spatial experts and debated upon based on their experiences on the ground.

This prototype will allow for the interdisciplinary work carried out by professionals (who will have participated in solution development) to be validated, for *in situ* perceptions and adaptations of the future site to be anticipated and for implementation costs to be specified.

Through this approach, our hope is to extend the life of a building and its light-weight facades while respecting the architecture, economic conditions of its implementation, comfort as well as sensitive requests from experts and residents.

Furthermore, the transferability of such an initiative must be examined. Since the design phase is largely dependent on existing elements, the proposed solutions may vary depending on the case. In contrast, it appears that the overall approach must be adaptable to projects carried out by condominium and housing associations.

INDIVIDUAL DESIGN

What is the future of the individual housing stock in the immediate outskirts of French cities in the face of energy transition?

3rd SESSION 2018

2-year project

Paris-La Villette National Graduate School of Architecture
(ENSA Paris-La Villette)

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PROPOSAL OBJECTIVES

The purpose of this research is to study the adaptation and transformation of the existing individual housing stock within the immediate outskirts of several French cities (Paris, Nantes, Orléans, Grenoble) in the context of energy transition, with regard to new thermal and spatial comfort requirements. Representing almost 57% of the housing stock in France, individual homes (IH) dominate the total energy consumption of housing throughout the country. Their renewal in terms of technical comfort and architectural quality is thus considered a priority in dealing with contemporary climate and energy challenges, with several measures already having taken place over the last fifteen years in France. Following the Grenelle Environmental Forum in 2007, the Grenelle I (August 3, 2009) and Grenelle II (July 12, 2010) Laws were passed, stipulating for the renovation of existing buildings (Art. 5) and setting the primary energy consumption limit of new buildings at 50 kWh/m2/year (Art. 4); the latter of which was implemented in the Thermal Regulations (RT) of 2012. The future RT in 2020 should in turn lead to the construction of Energy-Positive Buildings (BEPOS). In addition, the "Access to Housing and Renovated Urban Planning" Law (ALUR) of March 14, 2014, promotes the densification of residential areas by eliminating the Floor Area Ratio and the minimum land surface dimension for buildings. According to André Caron, an economist in this sector, the progressive regulatory reinforcement, and especially the development of zero-energy homes following RT 2020, will render many individual homes obsolete.

Ways of rethinking this building heritage is one of the interests of this research. This will be done by documenting the evolution of various IH conditions in different settings from the perspective of the living trajectories of different types of owners. In such cases, the demolition and construction of new high-performance IH cannot be carried out in the short term.

REFERENCE CORPUS

Four field investigations were selected in which individual housing is faced with significant challenges in terms of property and economy:

- Fontenay aux Roses, Paris
- Rezé, Nantes
- Saint-Egrève, Grenoble
- Olivet, Orléans

Cité Foch, Olivet, Google earth (City of Orléans)

Clair Cité, Rezé (City of Nantes)
© Céline Drozd 2019

Domaine Saint-Hugues, Saint Egrève (City of Grenoble)
©Walter Simone 2019

In the coming years, a significant portion of the IH stock will need to be renovated to ensure that energy consumption in the buildings can truly be reversed. With respect to the renovation taking shape in these IH, we can already notice a range of situations: implementation of technical devices aimed at improving thermal comfort, morphological modifications, extensions, redesign, etc.

METHODOLOGY

This research examines the evolution of existing individual homes as a result of new thermal requirements through two components:

→ A situated study on the evolution of existing low-rise residential housing in the four chosen settings, including:
- Geographical, historical and typological analyses to highlight the features of low-rise residential housing and its respective land;
- Interviews with mayors, technical departments, real estate agencies and property owners;
- Multi-criteria studies of houses that recently underwent construction work, integrating different typologies.

→ A prospective study, corresponding to project-based research:
- This will be based on analyses, suggestions for operational transformations or even prognosis work for some of the analyzed districts, in order to promote their thermal and spatial improvement and/or restructuring;
- It will include an examination of potential developments beyond the individual scale of these homes, focusing instead on the housing blocks that shape them, thereby allowing for the selection of different settings as cases to be tested.

Throughout the study, a state of the art on low-rise residential housing transformation is conducted in order to take into account the constant evolution of the research and design proposals on this topic.

EDUCATIONAL COMPONENTS

Educational interaction is planned at multiple levels:

→ Through the engagement of students at different degree levels (Bachelor, Master, PhD) in the fulfilment of research objectives;

→ By raising awareness for the contemporary questions essential to thermal renovation and "sustainable" densification of the existing individual housing stock, within the framework of research project modules along with theoretical courses on building pathology.

This research additionally engages research teams from four graduate schools, and also promotes inter-institutional academic encounters on the topic.

It will contribute to the implementation of the Energy Efficiency Training for Companies and Building Professionals (FEEBAT) program, on which the Ministry of Culture is currently collaborating with the *Environment & Energy Management Agency* (ADEME) and *Électricité de France* (EDF).

OPERATIONAL TARGETS

The objective is twofold:

→ To create an updated synthesis of knowledge on the future of the individual housing stock in the immediate outskirts of French cities, questioning its obsolescence in the age of contemporary energy transition through investigations among various actors (mayors, technical department directors, real estate agencies, property owners) and analyses of the construction carried out.

→ To propose "frugal" low-rise residential housing transformation methods through project-based research, with interdisciplinary cohesion amongst professionals, researchers and residents that results in an analysis, agreed upon by all, at the scale of the housing district in order to develop a sustainable built landscape.

CONVERSION OF 20TH CENTURY THERAPEUTIC ARCHITECTURE: A KEY FOR THE SUSTAINABLE CITY OF THE 21ST CENTURY

The cases of Beaujon Hospital (Clichy) and Bichat-Claude Bernard Hospital (Paris)

3rd SESSION 2018

2-year project

Paris-Val de Seine National Graduate School of Architecture (ENSA Paris-Val de Seine)

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University of Paris Diderot

An agreement was signed in April 2017 between ENSA *Paris-Val de Seine,* EVCAU research lab, APHP, University Hospitals of *Paris Nord Val de Seine* and the University of Paris Diderot.

PROPOSAL OBJECTIVES

The purpose of the research is to define heritage values — historical, architectural, memorial, topical, utility, artistic — of twentieth century hospital architecture, within a framework that characterizes its future; that is, the decommissioning of buildings and hospital activities as well as future conversion. What values are enshrined in hospital architecture of the twentieth century? What should be protected? What should be conserved? What should be transformed? How can time stratifications be identified and understood? As twentieth century hospital architecture is confronted with the challenges of contemporary well-being, questioning its transformation is tantamount to reflecting upon the sustainable city. Hospital facilities, treatment facilities and educational facilities (CHU) are project material for the sustainable city and a testing ground for other facilities or architectural estates.

The selected issue is based on three main hypotheses. Firstly, that granting attention to therapeutic architecture is a relevant tool for analyzing heritage in an interdisciplinary way. Secondly, that cultural dimensions of the relationship between architecture and nature, typical of the twentieth century, are disrupted by a new paradigm: that of the environment, both in terms of the surrounding world as well as physical, human and urban ecology. Finally, in order for twentieth century healthcare buildings and sites to form part of a successful transformation project in the twenty-first century, differences between the spatial, philosophical and cultural thought of both centuries must be understood. Through case studies of twentieth century hospital buildings, including interior spaces and exterior design, the proposed research aims to highlight the means and potential for future transformation and conversion in order to collect project materials for the city of the twenty-first century. The research links architectural and heritage analyses of existing buildings, paying particular attention to the question of the building envelope and its transformation. Two lines of work are favored: to describe (surveys, diagnostics, architectural analysis, historical analysis) and to classify (archive and document works) the constructed, programmatic and architectural complexity of sanitary buildings.

REFERENCE CORPUS

The corpus consists of two building complexes:

Beaujon Hospital, Clichy, 1935 (J. Walter, L.V. Plousey and U. Cassan, architects)

Bichat – Claude Bernard Hospital (Paris, 18th arrondissement) comprised of pavilions (1930s), buildings from 1980 to 2000, and a 23 floor CHU (1979).

Beaujon Hospital during construction.
APHP Archives (1934)

Bichat Claude Bernard Hospital. View from the entrance of CHU.
© Florent Paoli.

Beaujon Hospital. View from the monumental staircase.
© Donato Severo.

METHODOLOGY

The methodology is based upon a comparative approach of concrete case studies that reflect the diversity of conversion strategies and potentials.

The objective of this research is first to specify the history, the original context and the different stages of implementation, then to attempt to shed light on the evolution of these sites since the time of their creation.

Inspections of the buildings allow for the identification of values, in order to recognize which heritage interests of the sites all future conversion projects must strive to preserve. The various residual value components of the building's authenticity in its current state are identified and evaluated, as well as different categories of disturbance and alteration. An analysis of technical devices is also established in order to specify the state of the facilities and the architectural and spatial layout of the buildings with regard to current regulations (fire, accessibility for people with reduced mobility, etc.) and thermal environmental standards.

This analysis serves to highlight the conversion and transformation potential of the site and its buildings. To respond to these various aspects, archives and documents provided by the Archives of the Public Assistance of Paris Hospitals and the technical departments of Beaujon and Bichat-Claude Bernard Hospital are reviewed and analyzed.

EDUCATIONAL COMPONENTS

The first objective is to ensure genuine synergy between research and pedagogy during the Master's program. In terms of teaching, interdisciplinary experience and themes addressed in the research project are led by and developed upon in project groups and research seminars within the following field of study: "Transformations: The temporalities of heritage".

Involved in this discussion are research units from EVCAU research lab, ENSA Paris-Val de Seine, particularly in regards to the use of IT resources and techniques as well as the creation of digital models. After one year, a doctoral seminar is offered around the themes of architecture, health and well-being, as part of the research focus within EVCAU.

OPERATIONAL TARGETS

The project supplements a more general reflection on public and urban policy as well as public service missions. In order to rethink the suitability of the idea (invention) and implementation by all the various actors on the ground (innovation), it also seeks to imagine new collaborative tools in the space between public and private actors involved in the conversion of hospital buildings

Analyzing the results of the approach must allow for a theoretical framework (theoretical and methodological proposals) to be established, which will be verified in the field.

The research also integrates aspects of action research in order to produce knowledge that concerns the transformation of already existing architecture and landscapes.

Appendices

PROPOSAL APPLICATION FORMAT

Research teams that are specifically organized to respond to calls for research project proposals must prepare an application (maximum 20 pages in A4 format), the content of which will not be examined until confirming its compliance to the structural requirements of the sections outlined below:

A. Content of the Research Project (max. 5 pages)

A1. General topic, research hypotheses and state of the art
A2. Specific question pertaining to the subject of study and field of investigation, presentation of the reference corpus
A3. Objectives in terms of epistemological reflection and theoretical construction
A4. Objectives in terms of project and experimentation
A5. Objectives in terms of pedagogical innovation

B. Methodological principles (max. 4 pages)

B1. Interdisciplinary approach of the team
B2. Methods of integrating the combined skills
B3. Methods of the team's work organization

C. Valorization perspectives (max. 2 pages)

C1. Diffusion and valorization of the research results
C2. Valorization of the pedagogical developments within the schools
C3. Diffusion of the hypotheses amongst professional circles

D. Team composition (max. 6 pages)

D1. Name and position of the team's principal investigator
D2. Composition of the research team
D3. Individual references of team members
D4. Institutional references of partners of the team

E. Calendar, budget and abstract (max. 3 pages)

E1. Calendar and phases
E2. Estimated budget and funding request amount
E3. Research project abstract in 4,000 characters

The application must be accompanied by a letter from the director of the delegated establishment.

TERMS OF THE CONSULTATION

Resources

Selected research projects may receive funding between 40,000€ and 80,000€.

Research projects can be co-funded by other incentive schemes or through public or private partnerships. In the case of co-financing, partnerships and additional amounts will be precisely indicated.

Criteria for Selection

For the calls for research projects of the three sessions:

1. Originality and relevance of the research question, particularly with regard to the challenges raised by the Multi-Annual Strategy for Heritage, the National Strategy for Architecture (SNA) and the Law on Freedom of Creation, Architecture and Heritage (LCAP)

2. Relevance and exemplarity of the method

3. Feasibility of the investigation timeline

4. Consideration for educational challenges

5. Dimensions and synergy of national and international partnerships

6. Prospects for scientific valorization and circulation amongst professional circles

7. Adequacy of human resources and budgetary means

CALENDAR

Calls for research project proposals

1st session
→ Publication of the call for research proposals: June 17, 2016
→ Deadline for proposal submissions: September 18, 2016
→ Announcement of the selected teams: October 2016

2nd session
→ Publication of the call for research proposals: February 27, 2017
→ Deadline for proposal submissions: June 5, 2017
→ Announcement of the selected teams: July 2017

3rd session
→ Publication of the call for research proposals: July 5, 2018
→ Deadline for proposal submissions: October 1, 2018
→ Announcement of the selected teams: November 2018

Research duration

→ For the 2016 call for research proposals: 2, 4 or 6 semesters (the latter case if the proposal is linked to doctoral dissertation research).
→ For the 2017 call for research proposals: 2 to 4 semesters.
→ For the 2018 call for research proposals: 4 semesters.

Research program schedule

It is expected that the selected teams:
→ Participate in symposiums organized within the research program framework
→ Participate in annual seminars bringing together research teams financed by the program
→ Submit one or more intermediate research reports and then a final report.

	2016	2017	2018			2019		2020			2021	2022
1st session 2016	**January**	**April**	**April**	**May**	**November**	**February**	**May**	**February**	**May**	**Novembre**	Valorization	Valorization Final Symposium
3 projects over 2 years	Research begins	Seminar	Intermediate report	Seminar	Symposium	Final report	Seminar		Seminar	Symposium (Cancelled)		
2 projects over 3 years	Research begins	Seminar	Intermediate report	Seminar	Symposium	2nd Intermediate report	Seminar	Final report	Seminar	Symposium (Cancelled)		

	2017	2018		2019		2020			2021	2022
2nd session 2017	**September**	**May**	**November**	**February**	**May**	**February**	**May**	**November**	Valorization	Valorization Final Symposium
3 projects over 2 years	Research begins	Seminar	Symposium	Intermediate report	Seminar	Final report	Seminar	Symposium (Cancelled)		

	2018		2019	2020			2021	2022
3rd session 2018	**January**	**November**	**May**	**February**	**May**	**November**	**February**	Valorization Final Symposium
5 projects over 2 years	Research begins	Symposium	Seminar	Intermediate report	Seminar	Symposium (Cancelled)	Final report	

RÉSEAU SCIENTIFIQUE ET PÉDAGOGIQUE
ARCHITECTURE PATRIMOINE & CRÉATION

The APC Educational and Research Network (Architecture, Heritage and Creation)

The Architecture, Heritage and Creation Network aims to construct a space for dialogue, exchange and reflection on the place of architectural and urban heritage within design project dynamics. It exceeds objects and temporalities to question instances, practices, theories and professional ethics as well as issues of sustainability beyond just environmental challenges. The APC network aims to capitalize educational experiences related to training, as well as heritage awareness and intervention on existing built areas, within National Graduate Schools of Architecture and their respective research labs; to establish an inventory of the debates, theories and doctrines at work in this field by promoting interdisciplinary dialogue; to combine educational practices, professional issues and scientific outputs surrounding the specific questions that heritage interventions raise; to promote and diffuse scientific research about issues that arise through dialogues between contemporary architectural and urban history and design; and finally, to develop a network on a national and international scale. The Lyon National Graduate School of Architecture pilots the APC network, which was certified by the Ministry of Culture in 2018 for a duration of three years. It is directed by Philippe Dufieux, Full Professor at ENSA Lyon (Laure/ UMR EVS), Benjamin Chavardés, Associate Professor at ENSA Lyon, and coordinated by Étienne Léna, Associate Professor at ENSA Grenoble, and Mathilde Lavenu, Associate Professor at ENSA Clermont-Ferrand. The network brings together twenty ENSA establishments and the École de Chaillot, along with individual and institutional partners, particularly internationally. Many of the team's faculty members from the program, "20th Century Architecture, Project Material for the 21st Century Sustainable City", are members of the APC network which, through its actions, contributes to the valorization of research projects underway and promotes coherence between the teams.

The National Strategy for Architecture (2015) identifies six key strategic pathways for changing our society's relationship to architecture and achieving "ordinary excellence in everyday spaces":

1 Raise awareness for and develop knowledge of architecture amongst the general public and all public and private actors of the building sector

2 Account for twentieth and twenty-first century architectural heritage and develop upon architectural intervention in order to valorize and transform the existing built environment

3 Link training-research-profession and bring together the professional worlds of architecture, construction and living environment

4 Identify and mobilize architectural skills

5 Distinguish the economic value of architecture and guide professional transformations

6 Support experimental approaches and their cultural value

The Multiannual Heritage Strategy (2017) sets out four challenges for heritage: restoration, valorization, transmission and advancement of Europe. These challenges are part of a cultural policy focused on "proximity", for which heritage is one of the "pillars".

architecture
contemporaine
remarquable

The **"Remarkable Contemporary Architecture"** certification was created by article n° 78, law n° 2016-925 of July 7, 2016, on Freedom of Creation, Architecture and Heritage and by its implementing decree n° 2017-433 of March 28, 2017.

It aims to identify works of architectural interest less than 100 years old, to promote their quality to the public and to guide their transformation.

Ministry of Culture
General Directorate for Heritage
Department of Architecture

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