POLITECNICO DI MILANO

PhD in ARCHITETTURA, INGEGNERIA DELLE COSTRUZIONI E AMBIENTE COSTRUITO / ARCHITECTURE, BUILT ENVIRONMENT AND CONSTRUCTION ENGINEERING - 38th cycle

PNRR_351_DOTT_RICERCA Research Field: REINVENTING STUDENT HOUSING: INNOVATIVE, RESILIENT AND SUSTAINABLE MASS TIMBER SOLUTIONS

Monthly net income of PhDscholarship (max 36 months)
€ 1275.0 In case of a change of the welfare rates during the three-year period, the amount could be modified.

Context of the research activity	
Motivation and objectives of the research in this field	For the period 2021-2026, the Next Generation EU (NGEU) represents the main instrument to support the ecological and economic transition of the Member States towards new development models. As a consequence of the NGEU and consistently with the RRF, the *Piano Nazionale di Ripresa e Resilienza* - Next Generation Italy (PNRR) provides for an articulated set of reforms and investments in six Missions. This research program affects the areas of green revolution and ecological transition (Mission 2) and education and research (Mission 4). As part of HOME_Lab_Innovative Solution for Student Accommodation (ABC Department Laboratory), this research programme aims to promote the study of the limits and potentials of Mass Timber building systems (Cross-Lam, X-Lam, Brock Commons, etc.) used for the construction of innovative, resilient and sustainableStudent Accommodations. This research aims at studying, in the field of Ecological Transition, promoted in Italy by PNRR, what are the limits, potentialities, perspectives of use in the context of the construction of the Student Housing, of the most innovative patents that use engineered wood. The scope aims to be an important support to the 'Reform

	1.7: Housing for students and reform of the legislation on student housing' provided by PNRR - Next Generation Italy. This reform requires innovative and original architectures for the renovation of existing structures and the construction of new greenfield university buildings, equipped with the highest environmental standards. The research program shall address issues aimed at conducting a significant development of knowledge, including applied knowledge, in the areas of student housing to support the Italian university system. Therefore, it is a scientific and technological proposal, that promotes interdisciplinarity, adherence to international networks and cross-sectoral research.The research program foresees periods of study and research abroad of up to 6 months and aims to encourage the involvement of research centers in the definition of the training path, also in the context of wider collaborations with Italian and foreign academies. The fundamental steps of the research program are: • Analysis of the most innovative wood construction systems • Analysis of student housing case studies and best practices • Definition of their price structure and environmental cost • Management and control of production factors • Analysis and control the adequacy of information between the project and its production on site • Potentiality of digitization and the use of information models (BIM5D) could give greater results towards an effective industrialization of the supply chain and optimization of its processes.
Methods and techniques that will be developed and used to carry out the research	The objective of the research program is to train the researcher: • able to set up and develop advanced R&D activities in the topics concerning Architecture, Built Environment and Construction Engineering about 'Ecological

	Transition' • endowed with enough scientific knowledge in the research field, organizational and design experiences to obtain skills needed for independent continuation of his activity and the ability to gain an outstanding position in the best international companies that use timber engineering construction. A period abroad at Chalmers University of Technology is foreseen as a part of the research programme. A period in a company (Marlegno s.r.l., Bolgare - BG) in the engineered wood industry maybe also planned. Links to dedicated webpages for further information: https://www.dabc.polimi.it/abclab/le-unita/homelab/ https://www.dabc.polimi.it/en/progetto/home-of-mobile-europeans/
Educational objectives	The educational objectives of the research program are: • Data analysis of the student housing sector • Gain knowledge in real Mass Timber building systems potentiality used in the ecological transition • Verify the feasibility of engineered wood in the student housing sector • Information management in the construction sectors (BIM) • Digitalization in construction.
Job opportunities	The opportunities of professional careers and related experiences of PhD graduate in this research field are indentified in this way: • Ecological transition and student housing • Innovative, resilient and sustainable building systems • Process and design innovation in student housing • Information management in the construction industry (BIM) • Digitization in construction.

Composition of the research group	1 Full Professors 2 Associated Professors 1 Assistant Professors 2 PhD Students
Name of the research directors	Prof. Oscar Bellini

Contacts
Prof. Oscar Bellini email: *oscar.bellini@polimi.it*

Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents (more than 80Km out of Milano)	--

Scholarship Increase for a period abroad	
Amount monthly	637.5 €
By number of months	6

National Operational Program for Research and Innovation	
Company where the candidate will attend the stage (name and brief description)	
By number of months at the company	0
Institution or company where the candidate will spend the period abroad (name and brief description)	Chalmers University of Technology - SE41296 Gothenburg, Sweden - phone: +46 (0)31-772 10 00 - www.chalmers.se
By number of months abroad	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information

Additional information can be found in the Regulations for the 37th Cycle of ABC-PhD:
download is available at link:
https://beep.metid.polimi.it/web/abcphd/documenti-e-media

Additional information about ABC department and ABC-PhD programme:
available at link:
https://www.dabc.polimi.it/

Additional support for the research activity:
a total amount of 5.197,62 Euros per student, available since the first year, to be spent according to the department rules.

Study period abroad:
a period of 6 months of study and research at *Division of Construction Management, Chalmers University of Technology* (Sweden) is mandatory, preferably during the 1st and/or 2nd year.

Internship in a company:
an internship in Marlengo company (preferably in the 1st - 2nd year) is scheduled.

Desk availability:
the ABC department provides non-permanent desks to be temporarily booked in common PhD rooms.