



SUPERVISOR INFORMATION	
First and Last name	Ana Sofia Guimarães
URL of supervisor webpage	
Department	Civil Engineering
Field(s) of research	3D Printing in Construction
PROJECT PROPOSAL	
Title (optional)	Thermal performance of 3D-printed earth elements for sustainable modular construction
Brief project description	
<p>The thermal study of earth-printed building elements is part of the Eco Modular Constructions Printed on Earth project, aimed at exploring the potential of 3D printing technology using earth to develop sustainable housing solutions.</p> <p>The project focuses on the development of an extrudable Kraftterra composite, produced from natural soil and recycled paper fibres from cement bags. Initial efforts involve printing tests and comparative studies of composites with and without stabilisers (cement and lime), to create extrudable materials with good buildability, assessing their technical viability in additive printing processes.</p> <p>The thermal/hygrothermal performance of printed elements will be assessed through tests on thermal conductivity, water vapour permeability, capillary absorption and adsorption isotherm, allowing for thermal behaviour evaluation and insulation recommendations. Additionally, the project seeks to optimise building geometries through parametric studies, enhancing energy efficiency while balancing sustainability and design flexibility to address contemporary construction challenges.</p>	