CV date	20/05/2022

Part A. PERSONAL INFORMATION

First name	Carmen		
Family name	Llatas Oliver		
e-mail	cllatas@us.es	URL Web: https://www.us.es/	
Open Researcher and Contributor ID (ORCID)		0000-0001-5690-7005	

A.1. Current position

Position	Profesora Titular de Universidad		
Initial date	22/10/2018		
Institution	Universidad de Sevilla		
Department/Center	Construcciones Arquitectónicas I		
Country	Spain	Teleph. number	954556591
Key words	Sustainability, Architecture, Building, Environment, Embodied Carbon Life Cycle Assessment, Circular Economy, Construction Waste		

A.2. Previous positions (research activity interruptions, art. 45.2.b)

Period	Position/Institution/Country/Interruption cause
1996-2004	Profesor Asociado/Universidad de Sevilla/Spain
2005-2008	Profesor Colaborador/Universidad de Sevilla/Spain
2009-2018	Profesor Contratado Doctor/Universidad de Sevilla/Spain

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Architect	Universidad de Sevilla/Spain	1995
PhD Architect	Universidad de Sevilla/Spain	2001

Part B. CV SUMMARY *(max. 5000 characters, including spaces)*

I am associate Professor at the University of Seville since 1996, in the field of sustainable construction. My research career started in 1998, with a PhD Research Grant (Ministerio de Fomento). My interest focused on solving one of the main social problems of the construction sector, the generation of construction waste. I completed my PhD Thesis in 2001, which was recognized with two Environmental Awards, a Special Mention (Concurso para el Desarrollo Sostenible, Fundación Agbar) and a First Prize (XI Premio de Investigación Medio Ambiente Urbano, Ayuntamiento de Sevilla).

My research focuses on sustainable architecture and in the development of models and tools that have been validated. I have actively participated in the diffusion of research studies. At the beginning (1996-2010), in the production of 6 Books, 20 Book Chapters and 35 communications. In the last decade (2011-2021), in the achievement of publications with greater scientific impact. My scientific career starts in 2011 with a JCR Q1 paper as sole author, which presents a model for quantifying construction waste during design phase. Subsequently I have been recognized with two 6-year research periods (1998-2012, 2013-2018). My scientific production, after the last period (2019-2021), includes 8 papers JCR Q1/Q2 and 8 papers (JCR Q3; SJRQ1-Q4). I appear among the first authors and I have collaborated in co-authorship with international experts from prestigious institutions (e.g. ETH Zurich, TU Graz, Loughborough University). As a result of these collaborations, my scientific production is being increasingly cited in recent years; e.g. Scopus data: 645 citations, 500 of them in the last three years (2019-2021), h-index 10.

Since 2005, I have led and participated in competitive projects. These projects contributed to improving sustainability performance in buildings. For example, an open access waste reduction tool was developed and published in 2013 on the website of the Junta de Andalucía. I am currently leading three competitive projects, related to the quantification of impacts in Building Information Modelling (BIM) (BIA2017-84830-R) based on Life Cycle Sustainability Assessment (LCSA), the application of Artificial Intelligence to housing design (ODISEA), and the implementation of BIM in the administration (Eva-BIM). The projects are developed in real buildings, collaborating with companies such as AVRA (Agencia de la Vivienda y Rehabilitación en Andalucía) and EMVISESA (Empresa Municipal de la Vivienda de Sevilla). I also participate in international projects, one of them with the International Energy Agency (Annex 72), in which a harmonized Life Cycle Assessment (LCA) methodology is being carried out among the countries involved. Research results are being disseminated in collaboration with these international groups and experts.
Since 2001, I have participated in six PhD programs and six Masters, tutoring more than fifteen Master's Thesis. I have supervised 4 PhD theses in the field of LCA. In 2010, an LCA methodology to obtain Environmental Declarations for Housing was developed (with an international Mention). In 2014, LCA was applied to construction waste management. In 2017, two theses integrated BIM in the environmental-LCA and the social-LCA to buildings. These theses are Open Access, and their results have been published in indexed journals. Thanks to these studies we were invited to participate in the Annex 72, as representatives of Spain in the field of LCA.
I am familiar with the construction industry as I initially practiced as an architect, collaborating in the design and construction of more than 100 buildings, and working as a Municipal Architect for a City Council in the province of Seville (1995-1998). I have also collaborated with Professional Associations (Architects and Technical Architects) in the delivery of expert courses, and with companies such as the Base de Costes de la Construcción de Andalucía. In 2013, I created the Entidad de Control de la Universidad de Sevilla (ECCUS), the only entity of a Spanish university, which I direct. Since then, this entity has been issuing verification reports mainly to administrations, developers and companies in the construction sector. We intend to transfer the results of the research through this company. As an example, two software (REDUCE; APRENDE) were registered and two others (TBL database, BIM-LCSA plug-in) are being registered. I have also reviewed articles in JCR Q1 journals since 2011 and evaluated State Research Agency research projects, since 2019.
Finally, this year I have created my research team (TEP-986 Architecture and Sustainability), in which we are training young doctors, and students of the doctoral program: a pre-doctoral fellow of the Junta de Andalucía, a pre-doctoral contract holder of the youth employment plan and two pre-doctoral researchers hired in the projects. Our next challenge is to strengthen our transfer skills.

Part C. RELEVANT MERITS *(sorted by typology)*

C.1. **Publications** *(see instructions)*

1. **Scientific paper**. LLatas, C.; Soust-Verdaguer, B.; Hollberg, A.; Palumbo, E.; Quiñones, R. (1/5). 2022. BIM-based LCSA application in early design stages using IFC. AUTOMATION IN CONSTRUCTION (0926-5805 / 1872-7891).
2. **Scientific paper**. Soust-Verdaguer, B.; Galeana, I. Bernardino; Llatas, C.; Montes, M.V.; Hoxha, E.; Passer, A.(3/6). 2022. How to conduct consistent environmental, economic, and social assessment during the building design process. A BIM-based Life Cycle Sustainability Assessment method JOURNAL OF BUILDING ENGINEERING. ELSEVIER SCIENCE BV. 45. ISSN 2352-7102.
3. **Scientific paper**. Quiñones, R.; Llatas, C.; Montes, M. V.; Cortés, I. (2/4). 2021. A multiplatform BIM-integrated construction waste quantification model during design phase. The case of the structural system in a Spanish building Recycling. MDPI AG. 6-3. ISSN 2313-4321.
4. **Scientific paper**. Mileto, C.; Vegas, F.; Llatas, C.; Soust-Verdaguer, B. (3/4). 2021. A sustainable approach for the refurbishment process of vernacular heritage: the Sesga house case study (Valencia, Spain) SUSTAINABILITY. MDPI. 13-17. ISSN 2071-1050.
5. **Scientific paper** Llatas, C.; Bizcocho, N.; Soust-Verdaguer, B.; Montes, Mª. V.; Quiñones, R.(1/5). 2021. An LCA-based model for assessing prevention versus non-prevention of construction waste in buildings. WASTE MANAGEMENT. PERGAMON-ELSEVIER SCIENCE LTD. 126, pp.608-622. ISSN 0956-053X, ISSN 1879-2456.

6 **Scientific paper** Soust-Verdaguer, B.; Llatas, C.; Moya, L. (2/3). 2020. Comparative BIM-based Life Cycle Assessment of Uruguayan timber and concrete-masonry single-family houses in design stage JOURNAL OF CLEANER PRODUCTION. ELSEVIER SCI LTD. 277. ISSN 0959-6526, ISSN 1879-1786.

7 **Scientific paper** Palumbo, E.; Soust-Verdaguer, B.; Llatas, C.; Traverso, M. (3/4). 2020. How to obtain accurate environmental impacts at early design stages in BIM when using environmental product declaration. A method to support decision-making SUSTAINABILITY. MDPI. 12-17. ISSN 2071-1050.

8 **Scientific paper** Llatas, C.; Soust-Verdaguer, B.; Passer, A. (1/3). 2020. Implementing Life Cycle Sustainability Assessment during design stages in Building Information Modelling: From systematic literature review to a methodological approach BUILDING AND ENVIRONMENT. PERGAMON-ELSEVIER SCIENCE LTD. 182. ISSN 0360-1323, ISSN 1873-684X.

9 **Scientific paper**. Bizcocho, N.; Llatas, C. (2/2). 2019. Inclusion of prevention scenarios in LCA of construction waste management INTERNATIONAL JOURNAL OF LIFE CYCLE ASSESSMENT. SPRINGER. 24-3, pp.468-484. ISSN 0948-3349, ISSN 1614-7502.

10 **Scientific paper**. Soust-Verdaguer, B.; Llatas, C.; García-Martínez, A.; Gómez de Cózar, J. C. (2/4). 2018. BIM-Based LCA Method to Analyze Envelope Alternatives of Single-Family Houses: Case Study in Uruguay Journal of Architectural Engineering. American Society of Civil Engineers. 24-3. ISSN 1076-0431, ISSN 1943-5568.

11 **Scientific paper**. Llatas, C. (AC); Osmani, M.(1/2). 2016. Development and validation of a building design waste reduction model WASTE MANAGEMENT. PERGAMON-ELSEVIER SCIENCE LTD. 56-56, pp.318-336. ISSN 0956-053X, ISSN 1879-2456.

C.2. Congress

1. SBE 2022. Sustainable Built Environment Conf. 2022. April 2022. Oral Communication. Delft, Netherlands. Llatas, C. et al. Comparative analysis between different building life cycle assessment workflows in design stages.
2. LCM 2021. X International Conference on Life Cycle Management, September 2021, Oral Communication. Stuttgart, Germany. Soust, B. et al. A workflow to integrate operational and embodied aspects when implementing Life Cycle Sustainability Assessment in BIM.
3. BEYOND 2020. World Sust. Built Environment Conference. November 2020. Oral Communication. Chalmers, Suecia. Frischknecht et al., Comparison of the greenhouse gas emissions of a high-rise residential building assessed with different national LCA approaches - IEA EBC Annex 72.
3. SBE 2019. Sustainable Built Environment D-A-CH Conf. 2019, September 2019. Oral Communication and Publication, Graz, Austria, Llatas, C. et. al. Towards a Life Cycle Sustainability Ass. method for the quantif. and reduction of impacts of life cycle of buildings.
4. X. International Conference on Economics (EconWorld2019@Budapest), June 2019, Oral Communication by Invitation, Budapest, Hungría. T. Rojo, S.López, C.Llatas.
5. International Conf on Critical Thinking in Sustainable Rehabilitation and Risk Management of the Built Environment - CRIT-RE-BUILT -, November 2019, Iasi, Romania, Oral communication, R. Quiñones et al. Rehabilitation vs Demolition. Methodology to compare the waste generated in alternative scenarios of building elements in BIM during the Design

C.3. Research projects

1. **Regional Project:** P20_00541. ODISEA- Optimizacion para el Diseño Inteligente y Sostenible de Edificios en Andalucía. Consejería de Economía, Conocimiento, Empresas y Universidad, Junta de Andalucía. Proyectos de I+D+i, en el ámbito del Plan Andaluz de Investigación, Desarrollo e Innovación, (PAIDI 2020), convocatoria 2020. Llatas, Carmen. Universidad de Sevilla. 05/10/2021-30/06/2023. 85.510 €. Principal investigator.
2. **Regional Project:** US.20-03. Eva-BIM. Evaluacion de Viviendas en Andalucía con BIM. Consejería de Fomento, Infraestructuras y Ordenación del Territorio, Junta de Andalucía. Subvenciones, en régimen de concurrencia competitiva, destinadas a Universidades Públicas Andaluzas para el desarrollo de proyectos de investigación en las materias de vivienda, rehabilitación y arquitectura, convocatoria 2020. Llatas, Carmen. Universidad de Sevilla. 10-09-2021- 09-12-2022. 46.500 €. Principal investigator.
3. **International Project:** IEA-EBC Programme Annex 72. Assessing Life Cycle Related Environmental Impacts Caused by Buildings. International Energy Agency in Buildings and Community (IEA-EBC).

International energy research and innovation programme in the buildings and communities field. Frischknecht, Rolf. 19 member countries. 01/01/2018-31/12/2022. Spanish research team.

4. **National Project:** BIA2017-84830-R. Elaboración de una herramienta unificada para la cuantificación y reducción del impacto ambiental, social y económico del ciclo de vida de los edificios en plataformas BIM. Ministerio de Economía y Competitividad, Gobierno de España. Plan Estatal 2013-2016 Retos - Proyectos I+D+i, convocatoria 2017. Llatas, Carmen. Universidad de Sevilla. 01/01/2018-30/09/2022. 54.450 €. Principal investigator.
5. **International Project:** RE-BUILT. Rehabilitation of the Built Environment in the Context of Smart City and Sustainable Development Concepts for Knowledge Transfer and Lifelong Learning. PL: Rotaru, Ancuta (Technical University of Iasi Faculty of Civil Engineering and Building Services, Romania). Erasmus + 01/01/2018-30/09/2021. 42400 €. Spanish research team.
6. **Regional Project:** SUBJA09-031. -RCDS=+ECO eficiencia. Reducción de residuos en el diseño y construcción de viviendas en Andalucía. Consejería de Vivienda y Ordenación del Territorio, Junta de Andalucía. Subvenciones, en régimen de concurrencia competitiva, destinadas a Universidades Públicas Andaluzas para el desarrollo de proyectos de investigación en las materias de vivienda, rehabilitación y arquitectura, convocatoria 2009 Llatas, Carmen. Universidad de Sevilla. 02/12/2009-03-12-2012. 58400 €. Principal investigator.

C.4. Contracts, technological or transfer merits

C.4.1. Business start-up

1. Company Creation and Management of the Empresa de Control de Calidad de la Universidad de Sevilla (ECCUS) since April 25, 2013. AND-E-009 entity. General Registry of the CTE. Section 5-2: General Registry of Building Quality Control Entities. Secretary of State for Infrastructure, Transport and Housing. General Directorate of Architecture, Housing and Land. Subdirectorate General for Architecture and Building. Ministry of development, Spanish Government. https://www.codigotecnico.org/pdf/Registro/Entidades/2021_05_04_Entidades.pdf.

C.4.2. Contracts

1. 2018-2021. Collaboration with EMVISESA-Empresa Municipal de la Vivienda en Sevilla, within the framework of the EMVISESA-University of Seville Agreement, for the development of Research Projects (ref. SUBJA09-031, ref. 277/2005/3-B, ref. BIA2017-84830-R).
2. 2021-2023. Collaboration with AVRA-Agencia de la Vivienda y Rehabilitación en Andalucía, within the framework of the AVRA-University of Seville Agreement, for the development of Research Projects (ref. P20_00541, ref. US.20-03).
3. 2008-2012. Several contracts with BCCA-Base de Costes de la Construcción de Andalucía S.L. PI: Antonio Ramírez de Arellano.

C.4.3. Patents

1. **Software registration:** APRENDE: Aprendizaje en Patología y Rehabilitación de Edificios con Nuevas Dinámicas Educativas. Inventors: Llatas, C. et al. Register Nº: 04/2021/31. Date: 24/09/2020.
2. **Software registration:** REDUCE: Reducción de Escombros en el Diseño, Uso y Construcción de Edificios. Inventors: Llatas, C. et al. Register Nº: 04/2018/734. Date: 12/01/2018

C.5 PhD supervisor

1. Soust Verdaguer, Bernardette. Life Cycle Assessment of residential buildings. Methodological proposal for the design of a simplified tool. Universidad de Sevilla. Doctoral Program in Architecture, 2017.
2. López-Alonso, Silvia. Social Life Cycle Analysis. Proposal of a methodology for its application to buildings. Doctoral Program in Architecture, 2017.
3. Bizcocho Tocón, Nuria: Aplicación del Análisis de Ciclo de Vida a la gestión de los residuos de construcción. Doctoral Program in Architecture, 2014.