CERIS : Civil Engineering Research and Innovation for Sustainability

CERIS - CIVIL ENGINEERING RESEARCH AND INNOVATION FOR SUSTAINABILITY

Scientific Report 2024

Planned Research for 2025

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TABLE OF CONTENTS

SUMMARY 1

1. UNIT DESCRIPTION 3

1.1 General description 3
1.2 Organization 4
1.3 Research staff 6
1.4 Administrative and technical staff 7
1.5 Facilities 8
1.6 Instruments for Transfer of Knowledge 9
1.7 Analysis of the scientific activity 9

2. RESEARCH OBJECTIVES 11

2.1 Institutional objectives 11
2.2 Research Groups (RG) 11
2.3 Thematic strands (TS) 12
2.4 Research areas 13
2.5 Activity of Research Groups 15

3. MAIN ACHIEVEMENTS 22

3.1 Doctoral programmes 22
3.2 Evolution in the Number of Researchers 22
3.3 Activity indicators 24
3.3.1 Evolution of the main activity indicators 26
3.3.2 Evolution of research and consultancy funding 32
3.4 Research group results 36

4. FUTURE RESEARCH 37

5. CLOSURE 44

ANNEXE A – PHD THESES COMPLETED IN 2024 47

ANNEXE B – PAPERS PUBLISHED IN 2024 53

ANNEXE C–RESEARCH GROUP ACTIVITIES IN 2024 135

RESEARCH GROUP 1 - Hydraulics 137

RESEARCH GROUP 2 - ENVIRONMENT AND WATER RESOURCES 151
RESEARCH GROUP 3 - SYSTEMS AND MANAGEMENT 163
RESEARCH GROUP 4 - TRANSPORTATION SYSTEMS 173
RESEARCH GROUP 5 – STUDIES ON CONSTRUCTION 183
RESEARCH GROUP 6 - STRUCTURAL DESIGN AND GEOTECHNICS 201

SUMMARY

CERIS is a research unit of Instituto Superior Técnico (IST), University of Lisbon (UL), hosted by the Department of Civil Engineering, Architecture and Environment (DECivil), and integrated into the Association of IST for Research and Development (IST-ID). At the end of 2024, CERIS comprised **153 PhD members, 37 PhD collaborators, and 250 non-PhD collaborators**, and covers the following domains: Construction, Environment, Geotechnics, Hydraulics, Regional and Urban Planning, Structures, Systems and Management, Transport Systems, and Water Resources.

CERIS was formally established in 2015 to integrate three research centres from the Civil Engineering Department at Instituto Superior Técnico (IST). This is the ninth report on the scientific activity, being the sixth report after the 2017-18 FCT evaluation, in which CERIS emerged as one of the two research centres in Civil Engineering in Portugal classified as Excellent. This report provides information relevant to mapping CERIS' position in the national and international contexts, addressing the integration of scientific objectives, and presenting the 2024 performance indices.

This report is organised into four main parts. The first part focuses on the centre description, including an overview of CERIS and a description of its internal organisation, governance structure, technical and administrative staff, and supporting laboratory facilities. The second part refers to research objectives, namely the general objectives of CERIS and the specific objectives of the research groups. The third part reports and discusses the main achievements in 2024. Global figures regarding publications in WoS/Scopus-indexed journals, concluded PhD theses and research and consultancy funding are presented. The final section outlines the planned research activities for each research group in 2025.

As anticipated, merging centres with diverse cultures and operational practices has presented significant challenges regarding governance and coordination. Nonetheless, the centres have now been fully consolidated and are aligned with CERIS' mission and objectives. Furthermore, the involvement of an expert in the management of Science and Technology, along with at least four researchers for the thematic strands in 2022, has provided a boost to CERIS.

CERIS demonstrated **strong scientific productivity and funding performance** in 2024. Highlights include:

- **Theses: 31 PhD theses were completed**, with 244 ongoing beyond 2024. 121 MSc dissertations were concluded. The ratio of completed PhD theses per PhD researcher was 0.19.
- **Publications: 421 papers were published in WoS or Scopus-indexed journals**. The total number of papers in these journals has shown a slight decrease compared to 2023. The ratio of WoS/Scopus publications per PhD researcher reached a high value of **2.5 in 2024**. A significant development was the increase in high-impact publications, with the percentage of papers in **Q1 WoS journals rising to 50%**. The combined percentage for Q1 and Q2 WoS journals was 84%. 282 papers were published in international conference proceedings.
- **International visibility:** Members held positions as **Associate Editors in 18 WoS or Scopus-indexed journals** and served on 116 editorial boards. Participation in technical committees for drafting codes and standards (i.e., 65 national and 82 international). They participated in the organisation of

10 international events and the scientific committees of 24 international events. Members of CERIS have been invited to deliver 22 lectures and short courses, including keynote lectures. **39 international recognition awards** were received. However, the Editor-in-Chief and Associate Editor positions in high-impact journals, as well as refereeing for funding agencies, were noted as areas for improvement.

- **Other Initiatives: 2 national patents were registered**. **Outreach and dissemination activities increased significantly** in 2024, nearly doubling the total from 2023 and reaching the highest number recorded.
- **Funding**: 2024 was a financially strong year, with the total annual funding for CERIS reaching a new peak, surpassing 2023 values and the previous maximum from 2014. This growth was mainly driven by competitive research projects (R&D), which secured 2.89 M€, significantly more than funding from consultancy (0.81 M€). R&D funding was almost 3.5 times the consultancy funding in 2024. The increase in R&D funding is partly attributed to a higher number of EU-funded projects. The average total funding per CERIS member continued its upward trend, reaching 27 k€ in 2024, predominantly due to increased R&D funding per member.

The planned activities for 2025 re a natural continuation of the research conducted in 2024, structured within the established thematic strands and research areas. A central theme is a renewed effort to foster deeper and more effective collaboration, both among Research Group (RG) members and with internationally renowned researchers, as well as benefiting from an internal programme designed to promote cooperation. This dynamic will be further strengthened in January 2025 with the integration of the Risco research unit, which is expected to bring significant added value through its expertise and complementary perspectives.

Key strategic objectives for 2025 include:

- Actively seeking greater participation in research projects funded by the European Union.
- Increasing the internationalisation of the research groups and strengthening links to industry through funding calls, standardisation, academic events, teaching, consultancy, and direct partnerships.
- Significant effort is directed towards the Digital Built Environment and the Twin Transition (Digital and Climate), and the application of Digital Twins in Asset Management and other systems (water networks, hydropower, hydrogeology).

Overall, the planned activities for 2025 aim to build upon the significant achievements of 2024, reinforcing CERIS mission in creating and disseminating knowledge and fostering innovation for sustainability in the Built and Natural Environment.

1. UNIT DESCRIPTION

1.1 General description

CERIS - Civil Engineering Research and Innovation for Sustainability - is a research unit of Instituto Superior Técnico (IST), University of Lisbon (UL), hosted by the Department of Civil Engineering (DECivil), Architecture and Environment (DECivil) and integrated into the Association of Instituto Superior Técnico for Research and Development (IST-ID). The IST-ID is a private non-profit institution that primarily aims to carry out science and technology activities, foster knowledge transfer, and promote the involvement of national and foreign researchers in RD&I activities and projects in their areas of expertise.

Although CERIS was formally created in 2015, through government dispatches 7822/2015 and 12360/2015, its formation as an RD&I unit registered (number 04625) with Fundação para a Ciência e a Tecnologia (FCT), the Portuguese research-funding agency, was proposed in the framework of the 2008-2012 evaluation of the National Science and Technology System, as the merge of three centers of DECivil: CEHIDRO, CESUR, and ICIST. Their integration in CERIS enhances a comprehensive thematic coverage, in-depth and scope. It promotes synergies in the inherently multidisciplinary fields of built and natural environments, which they previously addressed in a non-integrated manner. The engagement of an expert in the management of Science and Technology in 2021 and of four researchers for the Thematic Strands between 2022 and 2024 provided a definitive boost to CERIS by articulating the installed expertise, the funding opportunities, and the new avenues for the promotion of CERIS products made available by social networking and specialised platforms.

At the end of 2024, CERIS benefited from the expertise of 153 PhD members, 37 PhD collaborators (as defined below), and 250 non-PhD collaborators. CERIS has no parallel in the national context regarding size and scope, and has the right profile needed to attain a strong international presence. This key driver for establishing CERIS was set on a wider vision of the national research system and resulted from discussions initiated in 2010 on national and international prospects. It was based on the ASCE report ‘The Vision for Civil Engineering in 2025’ and framed by three key documents: 'Europe 2020', 'Horizon 2020', and 'Portugal 2020'.

The mission and objectives of CERIS and the policy guidelines address the sector's needs in research and knowledge transfer. They are set under the guiding principle of basing research and innovation on PhD programmes while exploiting the diversity of profiles of its members. This diversity is instrumental in promoting the different forms of knowledge transfer practiced by CERIS, ranging from continuous training and skills development to direct support to public institutions and industrial and service companies. New policies on membership support the merging of the founding centres into CERIS, work organization, and restructuring their research lines into thematic strands that derive directly from national and EU directives. Their research is typically based on mathematical modelling, experimentation, and fieldwork.

1.2 Organization

The organic structure of CERIS meets the recommendations set by IST and FCT. It comprises the President, the Executive Board, the Scientific Council, the External Advisory Committee, the Coordinating Committee, the Research Groups (RG), the Thematic Strands (TS), and the two Hubs, as presented in Figure 1.

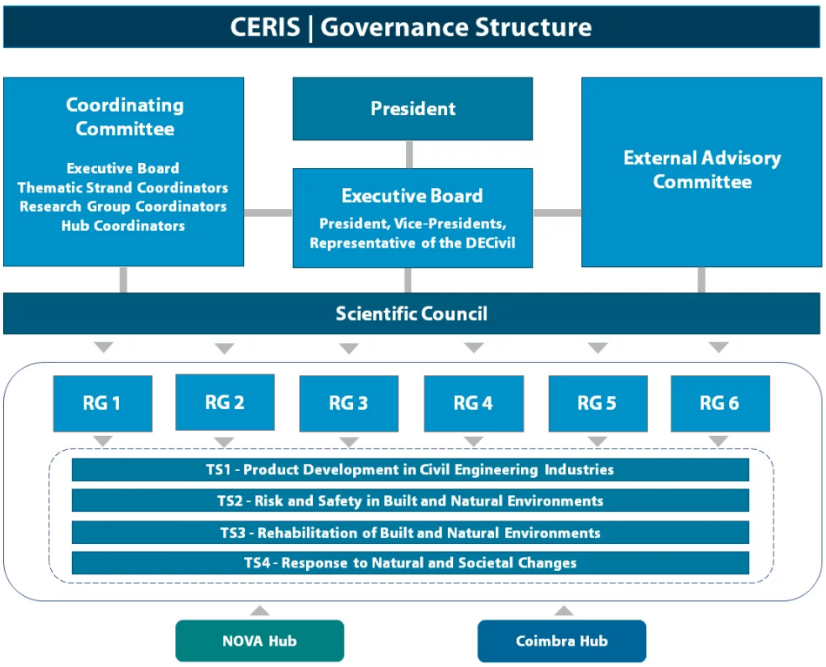


Figure 1 | Structure of Governance in 2024

The President of CERIS is responsible for the overall CERIS management. The President is assisted by the Executive Board and, whenever necessary, by the Scientific Council Advisory Board. The President of CERIS chairs the Executive Board, Scientific Council Plenary and Advisory Board meetings.

The Executive Board assesses, assists, and promotes the policies on cooperation through coordination and comprises five members: the President of CERIS, Vice Presidents from different research groups, and a member of the Executive Board of DECivil. Additionally, since 2025, the Executive Board also includes representatives of CERIS Hubs. In the current Executive Board (Table 1), João Gomes Ferreira (RG5), the President, is responsible for administrative, financial, and project management matters. João Ramôa Correia (RG5), also a member of the Executive Board of DECivil, oversees scientific affairs; Filipa Ferreira (RG2) is responsible for the Science and Technology Management Office, José Neves (RG4) is responsible for financial matters; and Rui Carrilho Gomes (RG6) is responsible for human resources. Rodrigo Gonçalves, António Tadeu and Romeu Vicente represent the Hubs CERIS NOVA, CERIS Coimbra and CERIS Aveiro (new CERIS Hub since January 2025), respectively.

The previous Executive Board, which directed CERIS in 2023-2024, was formed by the president Dídia Covas (RG1) and the following vice presidents: Inês Flores-Colen (RG5), Rafaela Cardoso (RG6), João Abreu e Silva (RG4), Filipa Ferreira (RG2) and João Ferreira (RG5).

The Scientific Council comprises researchers who comply with curricular selection criteria based on

scientific production. Yearly, the Scientific Council approves scientific reports, plans, financial reports, and budgets. It may delegate competencies on the Advisory and Executive Boards, but it rules all relevant matters of CERIS. The Coordinating Committee includes the members of the Executive Board, the Coordinators of the four Thematic Strands, the Coordinators of the six Research Groups, and the Coordinators of the CERIS Hubs. Its main competence is to design and supervise the strategic programme of CERIS. The thematic strands structure the scientific activity developed by the six Research Groups. Their coordinators in 2024 and 2025 are identified in Tables 2 and 3.

Table 1 | Executive Boards

Position	Previous (2023-2024)	Present (2025-2026)
CERIS President	Dídia Covas	João Gomes Ferreira
CERIS Vice Presidents	Filipa Ferreira	Filipa Ferreira
	Inês Flores-Colen	José Neves
	João Abreu e Silva	Rui Carrilho Gomes
	João Ferreira	João Ramôa Correia
	Rafaela Cardoso	Rodrigo Gonçalves
	-	António Tadeu
	-	Romeu Vicente

Table 2 | Thematic Strands and Coordinators

Domain	2024	Present (2025)
Product Development in Civil Engineering Industries	Jorge de Brito	Nuno Simões
Risk and Safety in Built and Natural Environments	Filipe Moura	Vítor Silva
Rehabilitation of Built and Natural Environments	Maria da Glória Gomes	Paulina Faria
Response to Natural and Societal Changes	Manuel Pinheiro	Manuel Pinheiro

Table 3 | Research Groups and Coordinators

Group	Designation	2024	Present (2025)
RG1	Hydraulics	António Pinheiro	Helena Ramos
RG2	Environment and Water Resources	José Saldanha Matos	Maria Manuela Portela
RG3	Systems and Management	António Aguiar Costa	António Aguiar Costa
RG4	Transportation Systems	Luis Picado Santos	Luis Picado Santos
RG5	Studies on Construction	João Ramôa Correia	Jorge de Brito
RG6	Structures and Geotechnics	Eduardo Júlio	Rafaela Cardoso

The External Advisory Committee of CERIS consists of well-known scientists and representatives from the industry with recognised knowledge and experience on the challenges faced by institutions with similar missions and objectives. Besides advising on strategic planning and long-term perspectives, its main competence is to periodically assess the quality and the relevance of the scientific activity of CERIS, the adequacy of its organisation, the quality of the scientific environment, the level of internationalization of its activities and its performance in the transfer of knowledge, technology, and dissemination. The composition of the External Advisory Committee in 2024 is defined in Table 4.

Table 4 | External Advisory Committee

Advisor	Institution
Anton Schleiss	École Polytechnique Fédérale de Lausanne | Switzerland
José Manuel Vassallo	Universidad Politécnica de Madrid | Spain
Michael Lacasse	National Research Council Canada | Canada
Luc Taerwe	Ghent University | Belgium
José Príncipe	University of Florida | United States of America

1.3 Research staff

According to CERIS rules and regulations, researchers are classified as *members* and *collaborators* (Table 5). *Members* are PhD researchers who meet the productivity criteria set by the Scientific Council of CERIS. *Collaborators* are typically PhD students and specialists employed by firms, public services, and agencies. The PhD researchers who do not meet the productivity criteria set by the Scientific Council each year are *collaborators*. As FCT requested in 2013, there was a need to add the classification of *Integrated members,* selected from the members to identify the unit's core team.

The productivity criteria are based on the research component of the academic evaluation system set by IST for every three years of evaluation, which values the publication of papers and the number of citations, supervision of PhD theses, coordination and participation in concluded competitive research projects, and knowledge transfer. In 2015, the Scientific Council of CERIS set the minimum requirement to be proportional to the grade of Excellent in the IST evaluation system.

In this report, members of the Scientific Council are referred to as 'Members'. They all hold a PhD. The terms 'PhD researchers' or the synonym 'Researchers with PhD' combine members and collaborators with a PhD. The PhD researchers may be permanent staff in their institutions, hired as researchers under DL57, or hold post-doctoral scholarships.

The term 'non-PhD collaborator' includes all collaborators who do not hold a PhD degree. The term 'PhD students' combines PhD students registered at IST-UL (i.e. CERIS-IST PhD students) with PhD students registered at other institutions (i.e. External PhD Students). Note that 'PhD students' is not a subgroup of 'non-PhD collaborator'. There are PhD students who are not non-PhD collaborators; they may be collaborators in other research centres or state laboratories.

The 2024 distribution of researchers is summarized in Table 5. They include IST and Hubs academic staff and fourteen other universities and polytechnics[1], besides private companies and foundations.

Table 5 | Profile of research staff

Type	Permanent	Non-permanent		Total
		Contract	Scholarship	
Members	132	19	2	**153**
Collaborators with PhD	25	13	0	**37**
Collaborators without PhD	0	0	250	**250**

1.4 Administrative and technical staff

In 2024, CERIS shared with CITUA the support of the administrative staff from DECivil, namely the accounting services, secretariat, and technical staff assigned to computational and experimental laboratories.

The central services of IST ensure the provision of accounting services. CERIS has one administrative staff member (Ana Soares Ramos, hired by IST) dedicated to the activities of the Executive Board and 9.5 administrative staff supporting the activities of the RG. These staff members are employed by IST (8) and IST-ID (2), with one of them part-time with CITUA.

Informatics services, including support for the Laboratory of Computational Mechanics, are provided by an informatics technician (Filipe Aparício, who also supports CERIS). The technical staff assigned to CERIS laboratories is detailed in Table 6, comprising four employees, of whom IST hired three and ADIST hired one.

The hiring process for the science and technology manager was completed in 2021. In the medium term, this contract will increase the dynamism of researchers in international competitive tenders and increase interaction between research groups. Additionally, the recruitment of four researchers per thematic strand was initiated in 2021 and completed in 2022. It is also important to note that, by the end of 2024, the Science Management team experienced a significant setback with the departure of three researchers

[1] Academia Militar, Instituto Politécnico de Leiria, Instituto Politécnico de Setúbal, Instituto Superior de Agronomia, Instituto Superior de Engenharia de Coimbra, Instituto Superior de Engenharia de Lisboa, Universidade da Madeira, Universidade do Algarve, Universidade do Minho, Universidade Lusíada, Universidade Lusófona, Universidade da Integração Internacional da Lusofonia Afro-Brasileira (Brazil), Universidade Estadual de Goiás (Brazil), Universidade Federal do Ceará (Brazil).

affiliated with the thematic strands, which may impact the continuity and development of ongoing research initiatives.

However, the number of technical staff assigned to operate its computational and experimental laboratories, as presented in Table 6, is low. This has been an ongoing challenge primarily due to a long-standing hiring freeze. This staff is complemented by the DECivil Laboratories Coordinator, who is supported by a joint supervisor for the Structures, Construction, and Geotechnics laboratories (LERM, LC, and LG). A significant portion of the daily operations is managed by PhD researchers and students, which offers a valuable opportunity for their technical education; however, it is limited to their theses, making long-term knowledge transfer challenging.

Table 6 | Laboratories and technical staff

Laboratory	Staff (no.)
Laboratory of Computational Mechanics (LMC)	1
Laboratory of Construction (LC) RG5	0.4+0.5
Laboratory of Geotechnics (LG) RG6	0.2
Laboratory of Hydraulics, Water Resources and Environment (LHRHA) RG1, RG2	0.5
Laboratory of Structures and Strength of Materials (LERM) RG6	1+0.4
Laboratory of Transport Infrastructures (LVCT) RG4	1

1.5 Facilities

The research methods adopted by CERIS include mathematical and numerical modelling, laboratory experimentation, and *in situ* studies. CERIS has up-to-date hardware and software and adequately equipped experimental facilities. The main difficulties in this context are the limitations and constraints on procurement, acquisition/renovation, and maintenance/calibration of equipment caused by Government procedures.

CERIS-IST has five experimental labs (Hydraulics, Construction, Structures & Strength of Materials, Geotechnics, Transport Infrastructures) and one IT lab (Computational Mechanics). Each CERIS hub (NOVA and Coimbra) has several experimental labs, including facilities for Structures, Construction, Geotechnics, and Pavements, as well as an IT lab. CERIS-Coimbra labs are also equipped for electrical testing and chemical analysis of materials. CERIS labs are equipped with a wide range of advanced equipment and instrumentation to conduct various types of tests, from micro to large scale.

These laboratories support experimental research and PhD projects. In some cases, certain researchers and joint projects utilise the experimental facilities of the Laboratório Nacional de Engenharia Civil (LNEC), located within 3 km of IST, as well as other research centres such as IST, IST-ID, UNL, INESC, and others, with institutional collaboration duly protocolled. Of course, the opposite also occurs.

1.6 Instruments for Transfer of Knowledge

The two main ways CERIS promotes knowledge transfer are through specialised consultancy and advanced training. CERIS members offer a large and diversified set of specialisation courses through FUNDEC, the advanced training instrument of DECivil, a private partnership with the major companies operating in the Civil Engineering sector created in 1995. Consultancy is regulated regarding conflicts of interest and unfair competition, and can be directly contracted with CERIS or through FUNDEC or IST. CERIS Hubs also have branches specialised in consultancy and training.

1.7 Analysis of the scientific activity

The analysis of the activity in 2024 presented in this report is set within the framework of the statutory objectives of CERIS and centred on the research content, the research organisation, and the evolution of scientific productivity indicators.

The research content is addressed in Section 2, where the thematic strands that structure the research activity and their primary areas of focus are defined. The areas of activity of the Research Groups in 2024 are also summarised to support the analysis of three key aspects: the 2024 profiles of the research groups, their organisation, and the existing and planned forms of internal cooperation. Identifying these aspects should sustain internal policies on membership and internal funding initiatives to promote collaboration and research focus.

The information summarised in Section 3 covers a wide range of research activity indicators, namely on theses and publications, visibility and recognition of the research, and research and consultancy contracts. The analysis of the 2024 results is based on the evolution over time (i.e., since 2013) of the number of researchers, the capacity to secure research and consultancy funds, the completion of PhD theses, and the publication of papers in WoS/Scopus-indexed journals.

The performance of research units is typically assessed in terms of production rates per team member, which requires a clear definition of the research team's composition, specifically including members and PhD researchers. The production rates are presented in terms of Members and, in some instances, PhD researchers, to highlight the importance of the internal membership policies. Those rates are presented both at the global level and at the RG level.

The same information at the group level is available in Annexe C.

2. RESEARCH OBJECTIVES

2.1 Institutional objectives

The research objectives of CERIS are set to comply with its statutory mission: “To create and disseminate scientific knowledge and to promote innovation in the Built and Natural Environment filled through the active involvement in fundamental and applied research, at both national and international levels, and to enhance higher education and research training”. CERIS operates under a set of objectives to accomplish its mission and organizes its activity in thematic strands selected according to national and European policy guidelines.

CERIS coordinates, under the same host institution, knowledge and skills on Built and Natural Environment topics with the following objectives: (i) to promote quality research based on PhD programmes; (ii) to transfer its expertise by providing specialised training and services and consulting; (iii) to ensure wide dissemination of its results.

To attain its first objective, the policy of CERIS is to organise PhD programmes in the framework of national and international networks and consortia and to integrate doctoral theses in competitive research funding projects. CERIS also benefits from the direct participation of IST in international networks and programmes set up to promote the mobility of students and researchers.

CERIS participates in international initiatives promoted by IST and cooperates with national professional associations regarding ongoing specialised training. To develop mutually beneficial relationships with industrial and engineering firms, central and local administration, and governmental agencies, CERIS focuses on the formulation of public and private policies and on innovation programmes that address the specific needs of the sector, namely through the Portuguese Technological Platform for Construction, the Portuguese Water Partnership, and the Sustainable Habitat Cluster.

CERIS values the dissemination of research results through the best-ranked journals and the best-established conferences. They have a decisive impact on recognition, visibility, and engagement in contracted research and recruiting young researchers. The partnerships mentioned above play a key role in knowledge transfer initiatives, enabling a closer relationship with public and private institutions.

2.2 Research Groups (RG)

The research groups in 2024 are numbered as shown in Table 7.

Table 7 | Research Groups (RG)

Before	Designation
RG1	Hydraulics
RG2	Environment and Water Resources
RG3	Systems and Management
RG4	Transportation Systems
RG5	Studies on Construction
RG6	Structures and Geotechnics

2.3 Thematic strands (TS)

Thematic strands have been defined in a sufficiently comprehensive manner, covering priority work areas. Their relevance in content and the adequacy of internal expertise should guide the progressive realignment of the activities planned at the group level through the periodic reassessment of strategic and operational objectives and supporting internal seeding programmes.

The interdisciplinary knowledge in the Built and Natural Environments field addresses issues centred on the Construction Industry, namely structural rehabilitation, safety and security, and innovation regarding eco-efficient materials, solutions, and technologies. It encompasses urban and regional planning and management, the mobility of people and freight, environmental and water resources planning, management and policy, and water services, including drinking water distribution, sewage treatment, hydraulic infrastructure, and renewable energy. Moreover, they include dimensions that cut across several areas, such as strategic environmental assessment, systems modelling and optimisation, decision processes, relevant public policies, and governance issues.

In this context, and taking into consideration national and European policy guidelines, the following thematic strands (TS) were established in 2013 to structure the activities of CERIS:

- TS1 - Product Development in Civil Engineering Industries;
- TS2 - Risk and Safety in Built and Natural Environments;
- TS3 - Rehabilitation of Built and Natural Environments;
- TS4 - Response to Natural and Societal Changes.

TS1 – Product Development in Civil Engineering Industries embraces research activities whose main purpose is to improve the competitiveness of civil engineering industries by developing innovative products and procedures and by improving the efficiency of existing ones. The applied research focuses on developing projects with a strong emphasis on "idea to business," implying a robust involvement of industrial partners and using the interdisciplinary nature of CERIS. The deepening of existing collaborations with the industry is encouraged. The Portuguese Technological Platform for Construction (PTPC), whose university-industry work groups are already developing proposals for new projects, is an important partner in this context.

TS2 – Risk and Safety in Built and Natural Environments focus on the reduction of risk to people, the environment, and natural and built heritage that may be affected by the occurrence of extreme events, either natural, such as floods, droughts, earthquakes, windstorms, and tsunamis, or due to man's activities, such as accidental pollution, deficient structures, and infrastructures, blasts, and fires. Environmental and man-made hazards may devastate the built and natural environment, namely, natural resources. Hazard and risk assessment and the development of structural and non-structural safety measures are major societal challenges in a rapidly changing world, with people concentrated in large urban areas and the growing exploitation of limited natural resources.

TS3 – Rehabilitation of Built and Natural Environments stands out as the new construction sector paradigm and environment preservation paradigm. New knowledge and skills gathered through interdisciplinary activity are needed to respond to current demands. The main goals include reducing risks, ensuring safety, and promoting more efficient and sustainable life cycle management of energy and natural resources to foster urban cohesion and protect natural and cultural heritage. This thematic strand seeks to mobilize activity within the CERIS research groups in rehabilitation and restoration and promote synergies to carry out research at the forefront of existing knowledge.

TS4 – Response to Natural and Societal Changes addresses issues related to the characterisation, mitigation, and adaptation to natural and societal changes, as they induce stress or even ruptures in the "business as usual" approach to the built and natural environment, especially in what concerns the relevant policies, procedures and design and operation of infrastructures for a sustainable interaction between man and nature. Climate change is of immense importance as a driver, forcing adaptation measures in all areas of economic activity and social life and aggravating all the pre-existing problems caused by social and economic changes.

2.4 Research areas

The principal areas of work selected in each Thematic Strand are the following, as defined by their coordinators:

TS1 – Product Development in Civil Engineering Industries

(i) Developing eco-efficient, high-performance, and durable cementitious materials and products for new construction and rehabilitation.
(ii) Advanced composite materials and products for civil engineering applications.
(iii) Develop components, devices, and software to improve the seismic performance of civil infrastructure.
(iv) Sensors, intelligent systems, and knowledge-based management infrastructure concern improved safety, maintenance, and management procedures.
(v) Improvement of products and project efficiency, including life cycle analysis, conflict management, negotiation procedures, private and public values, and use of e-business and e-procurement platforms.

(vi) Development of synergic management to sustainable tourism destination - LiderA destinations (i.e., to improve product efficiency and performance).

(vii) Improve natural treatment systems through pilot facilities to define the best procedures when facing seasonal interruptions and determine maximum load capacity.

TS2 – Risk and Safety in Built and Natural Environments

(i) Risk assessment of natural and man-made hazards to support decision-making on allocating resources for safety improvement works.

(ii) Engineering expertise for improving the safety of people and the environment, namely the development of solutions and techniques for improving construction robustness and resilience, as well as for structural protection, strengthening, and rehabilitation.

(iii) Prevention, preparedness, and management of risk considering natural hazards and climate change scenarios, concerning non-structural measures related to management, elaboration of risk prevention, preparedness plans, and operational and management procedures.

TS3 – Rehabilitation of Built and Natural Environments

(i) Enhancement of the spatial functionality, energy efficiency, and structural performance of civil infrastructures, including improving seismic and fire resistance.

(ii) Study of deterioration processes and development of advanced inspection and monitoring techniques to enhance the durability and safety of civil infrastructures.

(iii) Development of urban management models to establish financing systems of urban rehabilitation and public investments and flexibility and efficiency of the existing transport network infrastructure and management.

(iv) Rehabilitation of natural and transformed water bodies, namely rivers, lakes, reservoirs, and aquifers, and improvement of the flexibility and efficiency of the existing water infrastructure and management systems, mainly concerning water supply and wastewater services.

TS4 – Response to Natural and Societal Changes

(i) Understanding the complexity of natural and societal changes regarding adaptation and resilience, competition and mitigation, path dependence, emergence, self-organization, and metabolic mechanisms.

(ii) Improving governance, seeking better integration of policies, new flexible planning, and management tools, searching for new methods, tools, and devices for efficiency, economy, and equity concerning energy, resources, and the materials used.

(iii) Enhancing the tools to respond adaptively to natural and societal changes concerning information and communication technologies, computation, and network systems provides the platform for designing more intelligent and interconnected tools and smarter buildings, infrastructures, and services.

The principal areas of work selected in each Thematic Strand reflect the number of research groups involved in core and complementary topics, as shown in Table 8. This information is complemented in the next section with data on existing and expected forms of cooperation at the group level.

Table 8 | Groups participating in Thematic Strands

Thematic strand	RG1	RG2	RG3	RG4	RG5	RG6
TS1 - Product Development	✓		✓	✓	✓	✓
TS2 - Risk and Safety	✓	✓	✓	✓		✓
TS3 - Rehabilitation	✓	✓	✓	✓	✓	✓
TS4 - Response to Changes	✓	✓	✓	✓		

2.5 Activity of Research Groups

The following describes each Research Group (RG) principal research areas and related topics addressed in 2024, as defined by their coordinators. Annexe C describes each RG main achievements.

RG1 | Hydraulics

15 PhD members | 5 PhD collaborators | 21 non-PhD collaborators

The activity of RG1 was organised into the following major topics:

a) Pressurised water systems. Numerical and experimental analysis of hydraulic transients in pressurized pipes (RS); Condition assessment of water and wastewater assets (RS); Water mixing and renewal processes in water storage tanks (RS); Water-use and energy efficiency in urban water systems (RS); Energy recovery in water services and the use of pumps as turbines (PD). Digital twin in water distribution networks. New tools, technologies, and algorithms using the Internet of Things, artificial intelligence, and machine learning for the digital transition in the water sector.

b) Hydropower solutions based on new energy converter devices, hybrid energy schemes, and pumped-storage hydropower for the energy transition, allowing the integration of other renewable sources (i.e., wind and solar PV).

c) Fluvial hydraulic structures. Development of mitigation strategies and pre-cast shelters for fish downstream of powerhouses with the hydropeaking operation (RS); Numerical and experimental modeling of different flood release and related hydraulic structures (RS; RNBE); Study of the hydraulics of PKW weirs combined with spillways (RS, RNBE); Study of the pressure field and slab stability in a plunge pool lined with concrete slabs (RS). Sluice gate hydraulic performance improvements, Pumped storage hydropower, Investigation of hydraulic properties of vertical drop

d) River restoration and management. Monitoring tools, based on physically based computational models, for water and sediment quality in rivers and estuaries (RNBE); Risk management in the valleys downstream of dams (RS; RNSC); Environmental flows determination procedures and hydropower station operation rules to reduce ecological risk downstream of dams (RS, RNBE); River restoration and development of fish passes for low height river obstacles to improve ecological connection along regulated rivers (PD; RNBE; RNSC).

e) Environmental fluid mechanics. Laboratory investigation of rough-wall open-channel turbulence (RNBE); CFD simulation of solid-fluid interactions in turbulent flows (RNBE); Laboratory investigation and mathematical simulation of transport of dissolved substances (RS, RNBE); Heat and mass transport in wetlands (RNBE).

f) Sediment transport and river morphodynamics: Hydrodynamics of river diversions in equilibrium (RS; RNBE). Desilting efficiency of vane fields in channel bifurcations. Local scour at transversally inclined sand bed channels. Application to long-term channel morphology evolution, dam-breaching, dam-break flows, and overland tsunami propagation (RS); Mathematical simulation (Eulerian and Lagrangian) of transport processes (RS). Application to long-term channel morphology evolution, dam-breaching, dam-break flows, and overland tsunami propagation (RS); Application of machine learning in stage-discharge prediction.

g) Coastal morphodynamics and coastal and port structures. Assessment of the vulnerability to flooding of the built environments on low-lying areas of estuaries due to extreme ocean storm surge events and climate action (RNBE; RNSC); Modular port facilities in rivers for bulk cargo; (RNBE); Morphological modeling of beach morphology in the presence of coastal structures. (RS); Tidal energy in estuaries; (RNBE).

RG2 | Environment and Water Resources

19 PhD members | 3 PhD collaborators | 38 non-PhD collaborators

The E&WR group (RG2) develops research in the following areas: 1. Water resources modelling and integrated water resources management and planning; 2. Water and wastewater/stormwater systems and services; 3. Groundwater and the environment; and 4. Sustainability assessment and management.

RG2 is involved in the four thematic strands of CERIS and has the following main objectives:

- To promote adequate water resources management through policy formulation and governance;
- To promote integrated water resources management, including the development of advanced knowledge on hydrologic processes and groundwater assessment tools and modelling;
- To promote the application of new technologies (AI) to water resources modelling
- To promote circular economy and resilience of urban water services, including valorisation of sub-products and promotion of nature based solutions;
- To promote sustainable water supply and dry sanitation approaches and solutions for the urban poor (developing countries);
- To develop an environmentally sustainable assessment of the built environment (LiderA system) and new ways of sustainable management.
- To develop methodologies for the identification of groundwater-dependent ecosystems and effective methods for risk-based environmental decision-making;

- To develop advanced potentialities in hydrogeology and groundwater research.

- To develop a digital twin framework that supports the monitoring, simulation, and optimization of groundwater systems to improve resilience against environmental and anthropogenic stressors.

RG3 | Systems and Management
9 PhD members | 2 PhD collaborators | 34 non-PhD collaborators

RG3 develops research in the following general domains:

1. Decision support systems, operations and project management;
2. Information modelling and digital technologies;
3. Asset management and digital representation of the built environment.

RG3 is mostly involved in these three thematic strands and has the following main objectives:

- To develop and apply methods for simulation, optimisation, and assessment aimed at improving the efficiency of processes and the effectiveness of decision support systems;
- To investigate the causes of inefficiencies in project management and support the development of strategies for delay mitigation based on professional feedback;
- To study strategic challenges in construction operations, including modular construction, lean approaches, reverse logistics, and procurement planning;
- To advance the use of information modelling in the built environment, including the development of digital workflows and the integration of real-time data to support asset management and emergency planning;
- To explore and apply GIS-based analysis for spatial planning, environmental monitoring, and risk assessment, incorporating long-term sustainability indicators and future climate scenarios;
- To promote the digital transformation of the construction sector by contributing to the development of tools, methodologies, and standards that foster interoperability and support circular and sustainable practices;
- To contribute to the integration of digital representations of physical assets and infrastructures, enabling lifecycle-based management supported by data-driven insights and real-time monitoring.

The S&M group has a long tradition of engagement in applied research and innovative services provided for private and public organizations, and we intend to reinforce these industrial links. It is also our objective to consolidate our reputation as one of the leading groups in the areas of Operational Research and Engineering Systems and Information in the Civil Engineering field in Portugal and abroad in particular areas, aiming at strengthening our international collaborative ties and recognition. Providing contributions to the literature and increasing the number of published papers in leading

international journals, in parallel with active participation in international forums and projects, is also a means to promote international visibility and recognition.

- The research development strategy is based on three fundamental pillars:
- Existing skills and capacities to capture the essence of each problem and to devise appropriate frameworks that fit the decision context;
- Societal and industrial relevance of the issues to be addressed and capability to attract and engage partners that provide case studies and funding;
- Internationalisation and networking of their members, ability to attract young researchers and involvement in international project teams.

RG4 | Transportation Systems

13 PhD members | 0 PhD collaborators | 33 non-PhD collaborators

RG4 research focused on the following three main topics:

a) Road, Airport, and Rail Infrastructure Systems, including methodologies and models to predict degradation and improve maintenance, renewal, and investment decisions within the different transport infrastructure systems and across them (i.e., integrated asset management) and Retrofitting transport systems: changing and adapting “old to like-new” transport systems to meet new performance standards while extending the existing ones;

b) Transport Systems Planning and Operations, including urban mobility, and active and shared mobility, as vehicle-sharing systems, the modeling and testing of demand response transportation, multi-modal systems, bike-sharing, and freight services supported by the development of appropriate ITS tools;

c) Strategy and Policy in Transport Systems, including new types of integration of public and private transportation modes and services (i.e., among each type and across the types), new types of business models for freight and passengers’ services, enhancing more efficient intermodality.

RG5 | Studies on Construction

53 PhD members | 15 PhD collaborators | 114 non-PhD collaborators

The research activities aim at developing research projects in the following domains:

- Construction Materials, Technology, and Management Innovation: advanced materials (GFRP, CFRP); waterproofing systems; concrete and mortars technology; construction quality, safety, environmental, and health management; virtual reality applications in construction;
- Sustainable Construction: sustainability and deconstruction strategies; sustainable traditional materials; demolition and recycling; recycled aggregates; building physics and passive design; building acclimatization and mechanical systems;

- Monitoring, Rehabilitation, and Conservation of the Built Heritage: Inspection, diagnosis, maintenance, and rehabilitation systems; maintenance of buildings envelope; conservation of historical building heritage; sensors, technological innovation, and structural assessment;
- Fire Design: fire resistance and risk evaluation of cultural heritage.

RG6 | Structures and Geotechnics
44 PhD members | 13 PhD collaborators | 75 non-PhD collaborators

The research activity of RG6 is planned to focus on six major research areas: Mechanics, Modelling, and Analysis of Structures; Earthquake Engineering and Seismology; Structural Concrete; Steel and Composite Structures; Bridge Design; Geotechnics.

In general terms and as transversal objectives, it was intended to:

- Develop new products with enhanced performance, durability, and eco-efficiency;
- Reduce risk and improve the safety of infrastructures, namely regarding seismic hazard characterization and seismic vulnerability assessment;
- Increase the efficiency of structural systems and the incorporation of innovative materials and devices;
- Develop more powerful and friendly models for structural and geotechnical analysis, directly linking to code standards;
- Develop alternative solutions for the rehabilitation of existing structures, in particular of historical buildings;
- Use the above to address specific societal challenges.

On the subject field of Mechanics, Modelling, and Analysis of Structures, the activity of the group was centred on the analysis of nonlinear, coupled structural problems using conventional and hybrid finite element formulations, focusing on the following topics:

- Dynamic instabilities and algorithms for the numerical analysis of the mechanical behaviour of non-smooth structures with frictional or elastoplastic components;
- Modelling of moving loads on beams on nonlinear foundations;
- Numerical simulation of the wildfire effects in dwellings located in forest areas using computational fluid dynamics by solving the Navier-Stokes equations for low-speed, thermally-driven flows, including smoke and heat transport from fires.
- Developing of hybrid-Trefftz stress plate elements for Reissner-Mindlin plates with an exact Kirchhoff limit.
- Development and application of finite element formulations for limit analysis.
- Numerical modelling of old stone masonry walls using particle models.
- Feasibility study of automatic generation of structural meshes and effects of explosions.

On the subject field of Earthquake Engineering and Seismology, the activity of the group kept focused on the following topics:

- History of construction and structural behaviour and construction techniques of traditional masonry tile vaults.
- Assessment of existing structures (e.g., dynamic characterization, seismic vulnerability, and seismic risk assessment).
- Update and improve a model for quick evaluation of the potential seismic performance of masonry and reinforced concrete buildings based on its application to existing buildings.
- Structural rehabilitation (e.g., seismic strengthening techniques, passive protection).
- Development of tools to improve preparedness and community resilience, aiming to reduce the seismic risk through non-structural elements.
- Seismic design of new masonry constructions.

On the subject of Structural Concrete, the activity aimed to deepen the work developed in previous years and kept focused on the following topics:

- Advanced cementitious materials.
- High-performance ordinary and prestress reinforcement.
- Enhanced durability.
- Sustainable and eco-efficient solutions.
- Modelling and design models (e.g., stress-fields models, FEM-based software with strongly embedded discontinuities, concrete reinforced with embedded fibres).
- Assessment of existing structures (e.g., reliability, structural robustness, monitoring, seismic vulnerability).
- Structural rehabilitation (e.g., repairing and strengthening techniques, seismic strengthening, passive protection).
- Study on the use of recycled aggregate concrete in slab-column connections subjected to centred vertical loads.
- Study of anchorage zones for prestressing cables.
- Prefabrication and innovation.

On the subject field of Steel and Composite Structures, the activity of the group was planned to develop in-house expertise in the following topics:

- GBT formulations to perform buckling, post-buckling, and vibration analyses of isolated members and structural systems (e.g., continuous beams or simple frames) prone to local, distortional, and global deformations.
- In-depth investigations on the non-linear behaviour, ultimate strength, and design of cold-formed steel open-section and tubular members experiencing coupling phenomena involving local and/or distortional buckling.
- Novel rational approaches for the design of cold-formed and hot-rolled steel angle columns.

- Development and implementation of (a) a displacement-based finite element for the linear analysis of curved members (circular axis), (b) a finite element formulation for the bifurcation analysis of composite steel-concrete beams.
- In-depth investigations on steel sub-assemblages with bolted and welded dissipative fuses.
- Proposal of design rules for composite structural members and parts.
- Applications to steel and composite bridges.
- Development of formulations of the Generalized Beam Theory for polygonal tubes of variable cross-section.
- Study of the resistance to lateral buckling of steel profiles subjected to deviated bending.

In the field of Bridge Design, the activity was planned to deepen the work developed in previous years, focusing mainly on the following:

- Buckling resistance of steel plated girders considering M-V interaction with high compression forces (application to cable-stayed bridges).
- Curved steel plates on bridge deck beam: Post buckling behaviour and ultimate strength.
- The use of high-strength steels in the bridge deck.
- Fatigue assessment of composite steel-concrete cable-stayed bridge decks.
- Higher order beam theory (developments and applications to steel structures and bridges analysis).
- Analysis of the distortion effect on the dynamic behaviour of high-speed railway bridges.
- Analysis of substructures of offshore wind turbines.

In the field of Geotechnics, the activity the group focused mainly on the following topics:

- Dynamic characterization of soils from small to large strains, including liquefaction.
- Studies on the elastic response measured in resonant columns and using bender elements.
- Characterisation of the chemo-hydro-mechanical behaviour of clayey and treated soils considering their structure and degree of saturation.
- Characterisation of soils treated with lime, cement, and bacteria.
- Numerical analysis of geotechnical structures involving strong soil structure interaction (e.g., tunnels, retaining structures, piles, and thermoactivated structures).
- Studies on soil decontamination techniques (e.g., electro-osmosis).
- Study and development of failure criteria for rock materials.
- Reliability analysis of geotechnical structures in undrained conditions - development of techniques for determining collapse loads with the introduction of spatial variability of soils.
- Numerical simulation of gas migration, temperature, and solute transport in soils.

3. MAIN ACHIEVEMENTS

3.1 Doctoral programmes

Besides 4 Master's courses promoted by IST, 2 Master's courses promoted by NOVA-FCT, and 3 Master's courses promoted by FCTUC, CERIS researchers are presently engaged in PhD courses leading to 4 Doctoral degrees in IST, 1 in NOVA-FCT and 2 in FCTUC. Students and their supervisors can select structured, thematic PhD programmes or a combination of PhD-level subjects offered by IST, other UL schools, or other universities under protocolled agreements.

The doctoral degrees and the structured PhD programmes with which CERIS is engaged are listed in Table 9, which includes information on coordination. One PhD programme is offered under international protocols. One PhD programme is IST-interdepartmental, and the schools of UL jointly promote another.

Table 9 | Participation in doctoral programmes

Doctoral Degree	Observations
Civil Engineering (Jorge de Brito) (1) - IST	
Civil Engineering (Rodrigo Gonçalves) (1) - NOVA-FCT	
Civil Engineering (Paulo Coelho) - FCTUC	
Environmental Engineering (Maria do Rosário Partidário)	
Climate Change and Sustainable Development Policies (José Saldanha Matos) (1)	Consortium of 3 universities (involving seven schools)
River Restoration and Management (António Pinheiro) (1)	Involves 4 UL schools
Transportation Systems (Luís Picado Santos) (1)	Consortium of 3 universities (involving three schools)
Sustainability Science (Amélia Branco)	Consortium of 17 faculties and institutes UL
Fire Safety Engineering (João Paulo Rodrigues) (1) - FCTUC	

(1) Coordinated by CERIS members.

3.2 Evolution in the Number of Researchers

The evolution in the number of Members and PhD researchers is presented in Figure 2. The increase in 2015 reflects the integration of the academic staff of UNL and the internal reclassification of PhD members and collaborators. The number of PhD researchers remained stable in 2016 and 2017, but in 2017 the increase in the internal numerical criterion for selecting members reduced the number of members, who became collaborators. In 2018, there was a slight decrease in both, mainly because Architecture and Urban Planning researchers left to found a new Architecture and Urban Planning Research Centre. The number of Members considerably decreased in 2023, and decreased again in 2024, while the number of PhD members and collaborators decreased from 228 in 2022 to 166 in 2024.

The evolution of the number of researchers - combining Members, PhD collaborators, and non-PhD researchers (i.e. PhD students and scholars) - is presented in

Figure 3. The numbers before 2016 and after 2018 are similar, around 350, which indicates some stability. In 2016, 2017, and 2018, a quite significant increase occurred, which is explained by three main reasons: (i) the fulfilment of the last calls of the various FCT-funded doctoral programmes, most of which were led by CERIS; (ii) an increase of international PhD students, namely from Brazil; and (iii) a more exact collection of the data concerning PhD supervision by CERIS researchers, namely of external students.

The decrease observed in 2018 is mainly explained by researchers' departure from Architecture and Urban Planning. In 2019, there was a sharper decrease in non-PhD collaborators. In 2022, a decrease was observed, followed by an increase in the number of PhD and non-PhD collaborators from 370 in 2022 to 391 in 2024, in 2023 and 2024, respectively.

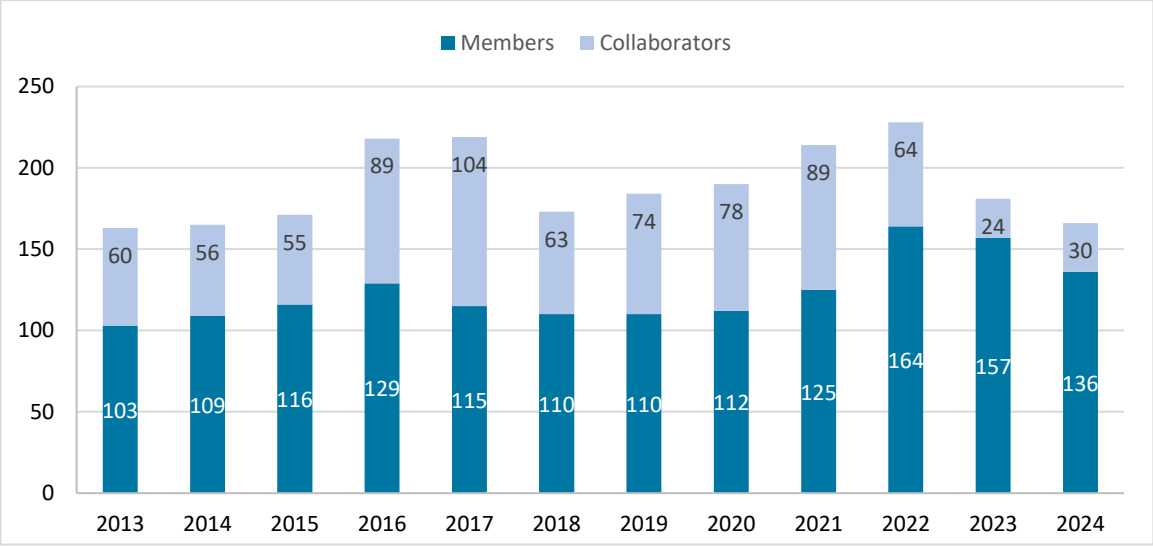


Figure 2 | Evolution of Members and PhD Collaborators.

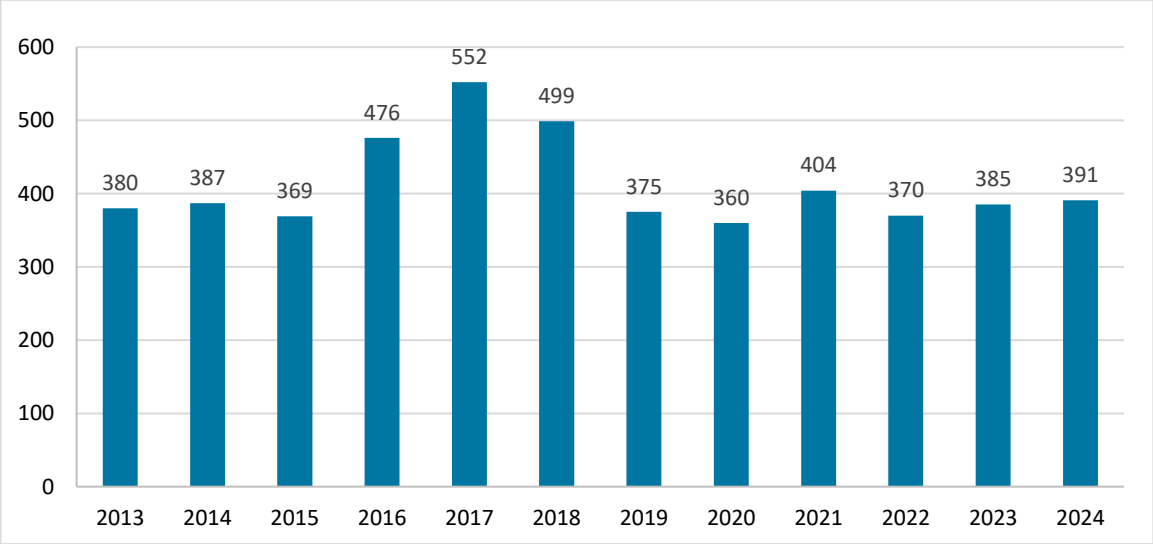


Figure 3 | Evolution of the Members, PhD collaborators and non-PhD collaborators.

3.3 Activity indicators

The main scientific outputs of CERIS in 2024 are presented in Table 10. They include:

(i) 31 concluded PhD theses and 244 in progress beyond 2024;
(ii) 121 concluded MSc dissertations;
(iii) three authored books, five edited books, and 13 book chapters;
(iv) 421 papers published in journals included in WoS or Scopus databases, plus 27 papers in international and national peer-reviewed journals (i.e. non-WoS, non-Scopus);
(v) 282 papers published in international conference proceedings;
(vi) 51 papers published in national conference proceedings.

The list of PhD theses published in 2024 can be seen in Annexe A. The list of papers published in 2024 can be seen in Annexe B.

Table 10 | 2024 activity indicators: theses and publications

ACTIVITIES			**RG1**	**RG2**	**RG3**	**RG4**	**RG5**	**RG6**	**CERIS**
MSc Dissertations concluded in 2024			5	5	6	9	44	50	**121**
PhD Theses		Concluded	3	3	1	3	13	8	**31**
		To be concluded after 2024	15	32	32	30	102	68	**244**
Publications	Papers in peer-reviewed journals	International peer-reviewed journals (WoS AND Scopus)	91	39	18	30	161	102	**404**
		Peer-reviewed journals (non-WOS OR non-Scopus)	5	2	1	3	6	3	**17**
		Peer-reviewed journals (non-WOS AND non-Scopus)	1	7	3	0	10	7	**27**
	Papers in proceedings	International	27	22	15	28	157	79	**282**
		National	1	12	5	0	25	19	**51**
	Books	Entire	0	2	0	2	0	0	**3**
		Chapters	0	1	3	0	8	4	**13**
		As editor	0	0	0	0	5	2	**5**
Reports		Scientific	0	3	1	0	24	6	**25**
		Consultancy/others	5	3	1	6	19	10	**44**

The indicators frequently used to assess national and international visibility are summarized in Table 11, namely:

(i) Associate Editor of WoS or Scopus-indexed journals (18);
(ii) Membership of editorial boards of WoS or Scopus-indexed journals, including Guest or Issue Editor (116);
(iii) Participation in organizing committees of international conferences (35);
(iv) Participation in organizing committees of national conferences (20).

Other indicators that reflect the visibility and recognition of the scientific activity of CERIS members are:

(i) 8 keynote lectures at international conferences and 14 invited lectures;

(ii) 39 international recognition awards.

Table 11 | 2024 activity indicators: visibility and recognition of the research

ACTIVITIES			RG1	RG2	RG3	RG4	RG5	RG6	TOTAL
Collective guidance in scientific work	Editor-in-Chief	WoS/Scopus-indexed Journals	0	0	0	0	0	0	**0**
		Other journals	0	0	1	0	0	0	**1**
	Associate Editor	WoS/Scopus-indexed Journals	3	0	0	0	7	8	**18**
		Other journals	0	0	0	0	0	0	**0**
	Issue Editor/Guest editor/Membership in Editorial Boards	WoS/Scopus-indexed Journals	2	5	1	3	18	8	**116**
		Other journals	0	0	0	0	0	1	**1**
	Membership in Scientific Committees	International	9	6	1	6	67	18	**108**
		National	1	0	0	0	23	10	**34**
	Drafting of codes, Recommendations	International	0	4	1	2	27	48	**82**
		National	0	1	3	13	25	22	**65**
Organization of scientific events		International	0	0	0	1	30	2	**35**
		National	0	0	0	0	17	1	**20**
Awards		International	1	1	0	0	12	3	**39**
		National	0	1	0	0	4	0	**12**
Refereeing for funding agencies		International	0	0	0	0	0	0	**0**
		National	0	0	0	0	0	0	**0**
Invited lectures		Keynote lectures at international conferences	0	0	0	0	4	2	**8**
		Other	1	0	0	0	11	2	**14**

While these numbers show that CERIS has an international projection, the number of Editor-in-Chief positions is now null, and the number of Associate Editors in high-impact journals (Q1 and Q2 WoS-indexed journals) remains low. Additionally, no refereeing for funding agencies was performed during 2024. These numbers are, therefore, well below CERIS potential.

Table 12 summarises the 2024 initiatives to obtain funding through competitive research and consultancy. The number of competitive individual grants attributed to CERIS researchers in 2024 is high when compared to those that were attributed before and are still active.

Concerning the indicators presented in Table 13 (Other Initiatives), no models, software applications, pilot plants, or prototypes were developed; however, two national patents were registered. The number of outreach and dissemination initiatives is listed in Table 14.

The databases in Tables 10-14 will be embedded on the CERIS website.

Table 12 | 2024 activity indicators: research and consultancy contracts

ACTIVITIES			RG1	RG2	RG3	RG4	RG5	RG6	TOTAL
Competitive research projects	International research grants	Started in 2024	1	2	0	2	2	1	**9**
		Active in 2024	7	8	5	10	20	12	**43**
	National research grants	Started in 2024	0	0	0	0	1	0	**6**
		Active in 2024	6	13	1	7	22	16	**42**
Competitive individual research grants (PhD, Post-doc, sabbatical, etc.)		Started in 2024	2	2	2	1	8	3	**29**
		Active in 2024	5	2	1	3	19	11	**46**
Consultancy projects finalized in 2024			6	7	2	15	23	19	**72**

Table 13 | 2024 activity indicators: other initiatives

ACTIVITIES		RG1	RG2	RG3	RG4	RG5	RG6	TOTAL
Models		0	0	0	0	0	0	**0**
Software applications		0	0	0	0	0	0	**0**
Pilot plants		0	0	0	0	0	0	**0**
Prototypes		0	0	0	0	0	0	**0**
Patents	International	0	0	0	0	0	0	**0**
	National	0	0	0	0	2	0	**2**

Table 14 | 2023 Dissemination to a broad audience and Outreach

ACTIVITIES	RG1	RG2	RG3	RG4	RG5	RG6	TOTAL
Other actions (e.g., scientific dissemination to a broad audience, social media)	4	8	0	8	13	5	**37**

3.3.1 Evolution of the main activity indicators

The number (121) of MSc dissertations concluded in 2024 is higher than the number (85) reached in 2023. This may represent a slight recovery in the number of students in Civil Engineering. The number of completed PhD theses in 2024 (31) is lower than that in 2023 (33), as presented in Figure 4. Amongst those, 17 theses were in IST-UL doctoral programmes, 4 in NOVA-FCT, and 2 in the University of Coimbra. The number of supervised doctoral students whose PhD theses will be concluded after 2024 is 250, including 173 registered at IST-UL, 16 at NOVA-FCT and 15 at the University of Coimbra. The distribution of PhD students is heterogeneous in terms of scientific areas and the number of students per supervisor.

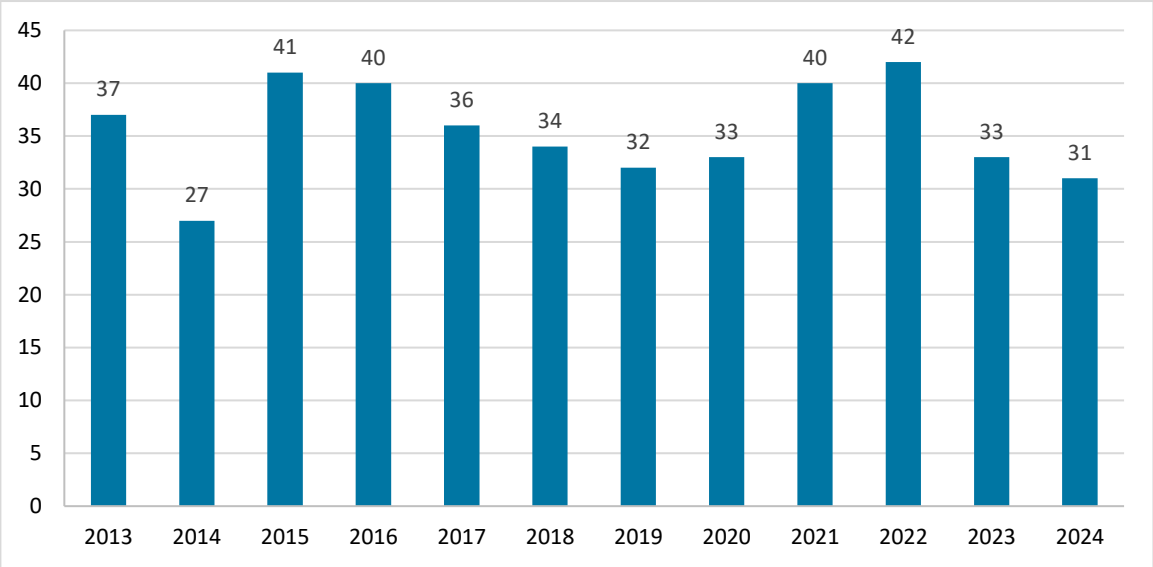


Figure 4 | Concluded PhD theses.

The ratio of concluded theses per PhD researcher (0.19, as seen in Figure 5) is equal to that of 2021, slightly higher than that of 2022 and 2023, while the ratio of ongoing doctoral theses has increased (from 1.18 in 2023 to 1.51 in 2024, considering supervised or co-supervised active doctoral theses).

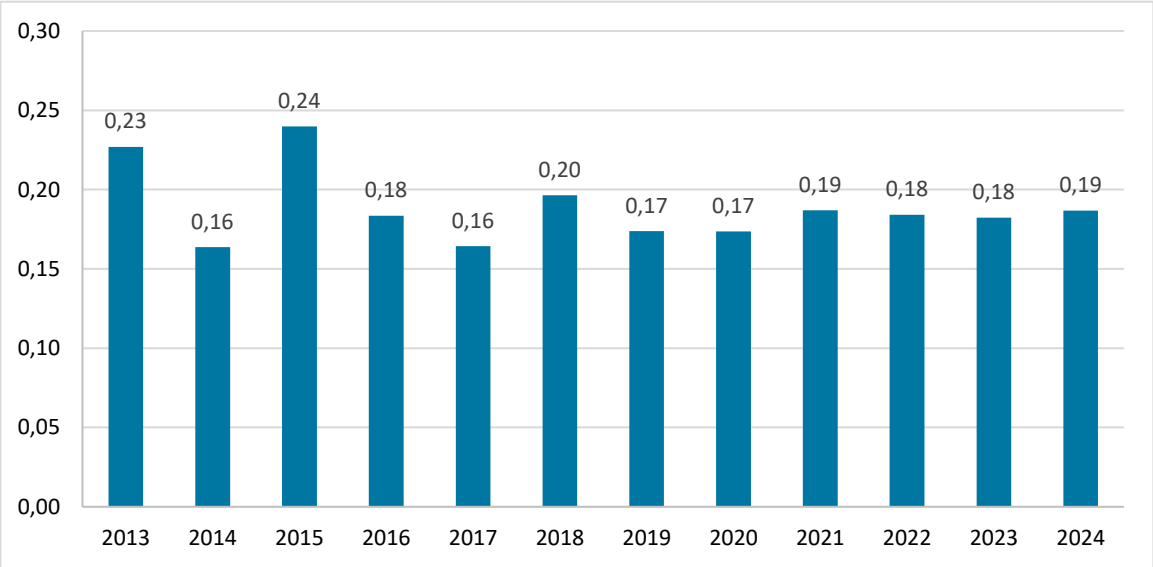


Figure 5 | Concluded PhD theses per PhD researcher.

The numbers reflect the relevance of the PhD programmes headed by CERIS researchers. The oscillations may be associated with the competitiveness of PhD scholarship calls as well as with the dynamics of the labour market in the Architecture, Engineering and Construction sector, which has had a high demand for Civil Engineers in recent years. Moreover, most FCT-funded PhD programmes had their last call for applications in 2021, which also contributed to the drop in 2023 and 2024.

In 2024, the number (282) of papers published in international conferences increased when compared to 2023 (233 papers in international conferences), but is still below the level of 2019 (306 papers in international conferences, before the COVID-19 pandemic). In 2024, the number of international conference papers per researcher with a PhD was 1.69 (higher than in 2023).

The number of papers published in international WoS or Scopus-indexed journals decreased from 443 in 2023 to 421 in 2024 (see Figure 6). As expected, the number of papers published in WoS or Scopus-indexed journals was larger than those published in proceedings of international conferences, following the trend observed since 2018.

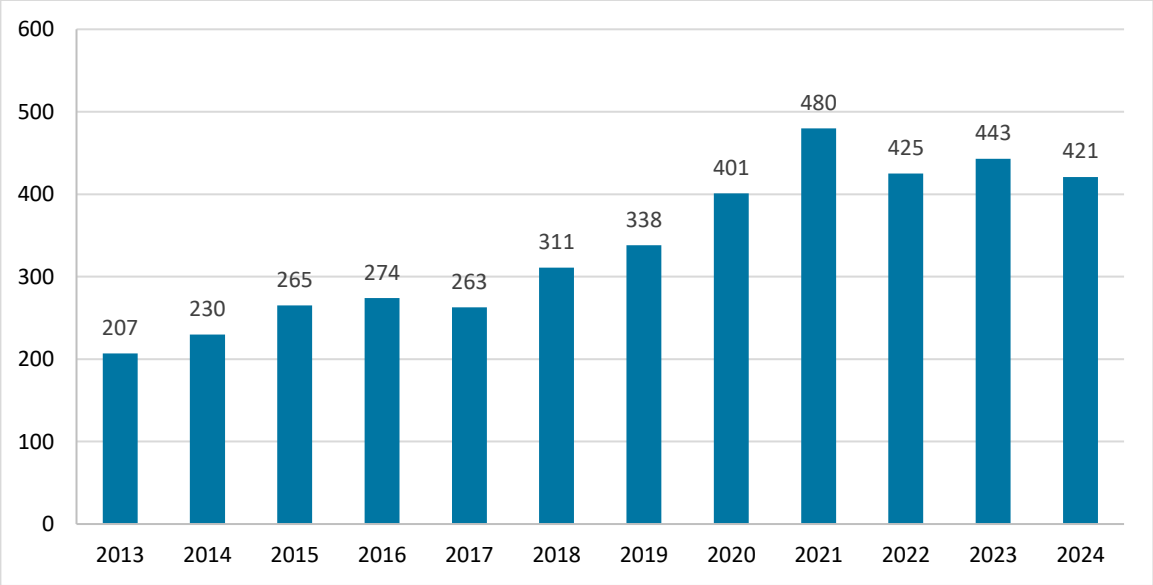


Figure 6 | Papers published in international journals (WoS and/or Scopus).

The evolution of the total number of papers published in international WoS or Scopus-indexed journals, presented in Figure 6, shows a consistent increase in scientific activity from 2013 onwards and a stabilization plateau from 2015 to 2017. From 2018 to 2021, there is an evident increase in all indicators — bulk number of papers, papers per PhD researcher, and papers per member. This may be attributed to the good level of completed PhD theses and the incorporation of highly productive junior researchers in post-doctoral positions. In 2022, the number of published papers decreased and then slightly recovered in 2023, decreasing once again in 2024, although the number of papers in Q1 and Q2 WoS journals lowered from 2021 to 2023 and recovered in 2024 (Figure 7).

The publication ratios per member and PhD researchers are presented in Figures 8 and 9, respectively. In 2024, 3.0 WoS/Scopus papers were published per CERIS member. In 2022, the publication ratios (both per member and PhD researcher) decreased, but in 2023 a recovery was observed, which continued in 2024. The 2023 increase is more evident in the ratio per PhD researcher, which reached the highest number (2.5 in 2024) since 2013. Additionally, when compared to the 2013-2017 period, the observed ratios in 2018-2024, both per member and PhD researcher, show a consolidated improvement.

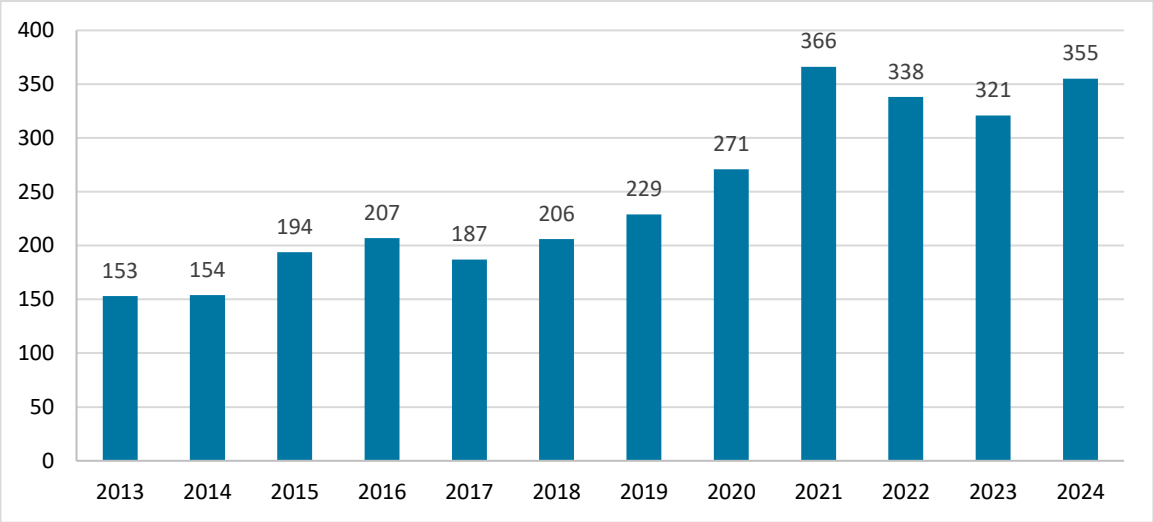


Figure 7 | Papers published in international Q1 or Q2 WoS journals.

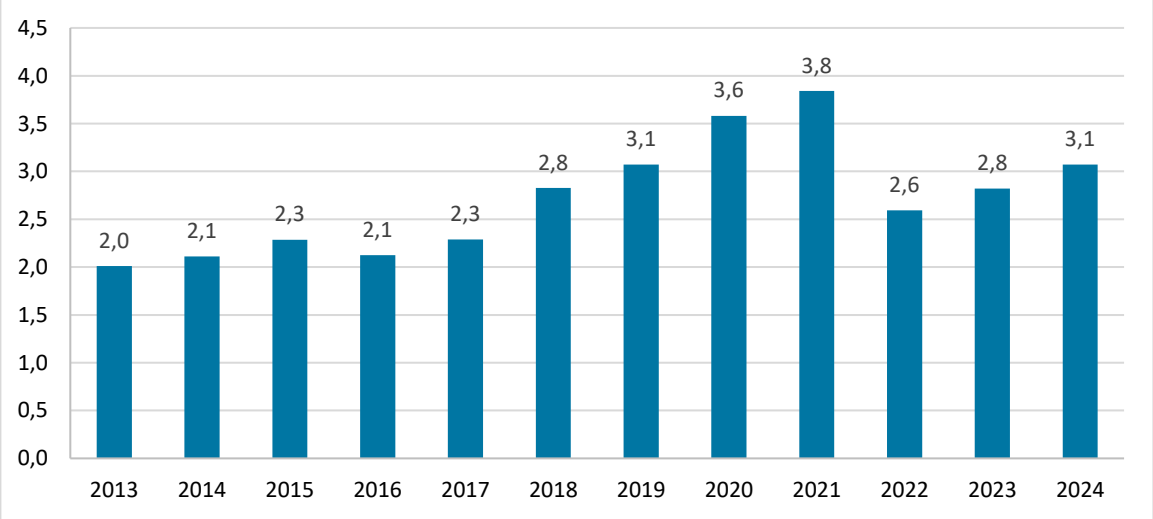


Figure 8 | Publication in WoS/Scopus journals per member.

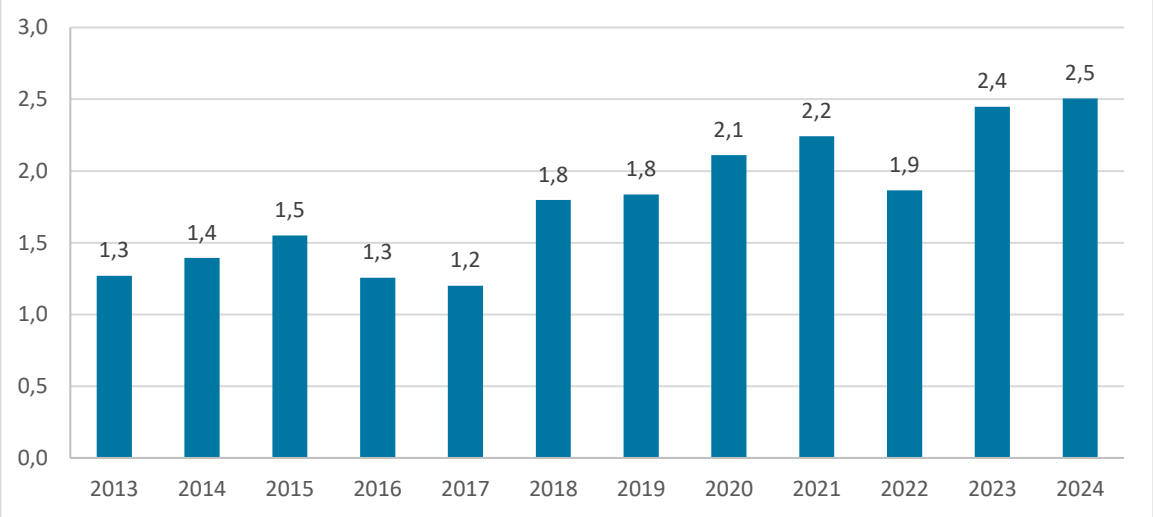


Figure 9 | Publication in WoS/Scopus journals per PhD researcher.

The number of WoS-indexed Q1 and Q2 papers per researcher with a PhD increased from 1.77 to 2.14, from 2023 to 2024 (Figure 10). The ratio of papers in WoS/Scopus-indexed journals with lower impact factors (Q3 and Q4, and Scopus journals) per researcher with a PhD decreased from 0.67 to 0.40. The 2024 ratio is among the lowest (Figure 11).

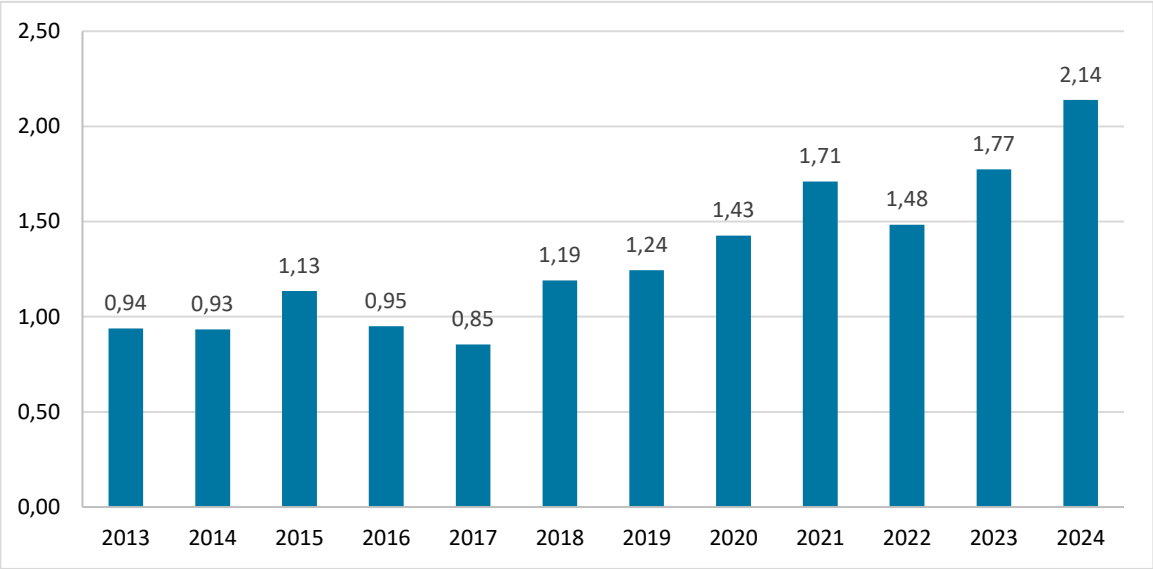


Figure 10 | Publication in Q1 or Q2 WOS journals per PhD researcher.

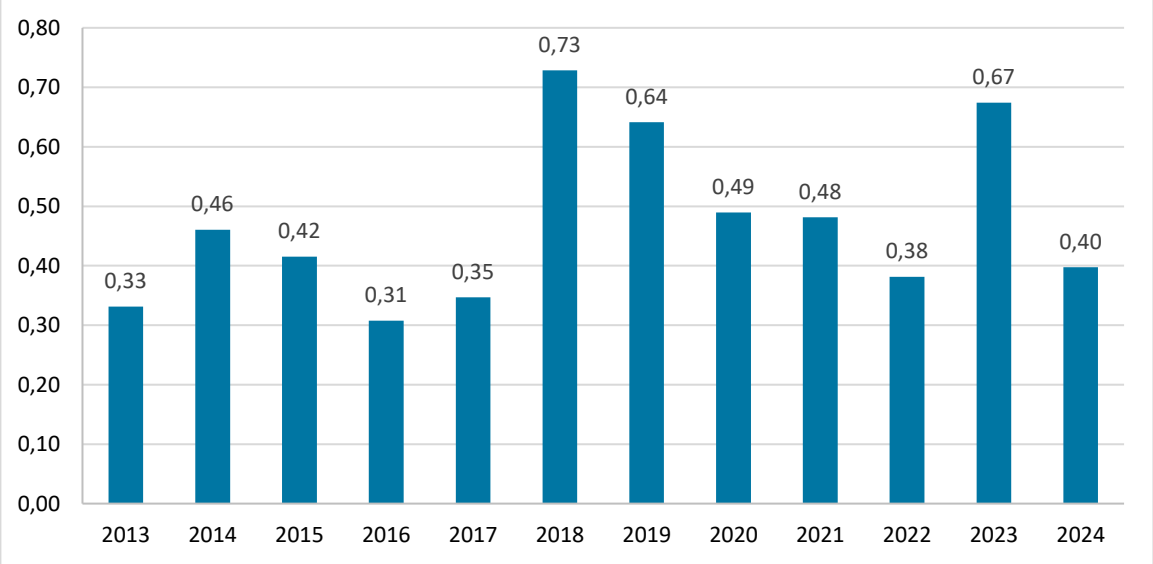


Figure 11 | Publication in other (non-Q1 and non-Q2) WoS or Scopus journals per PhD researcher.

The distribution of papers published in WoS journals per impact factor quartile is shown in Figure 12. In 2013-2017, about 50% of the papers were published in Q1 journals. This percentage was stable during that period. In 2019, this figure was 48%, and in 2020 this percentage dropped to 40%. In 2021, this percentage increased to 42%, but in 2022, it dropped to 35%, and again in 2023, to 28%. In 2024, the percentage of papers published in Q1 journals rose to 50%. If Q1 and Q2 journals are considered, the percentage is 84%.

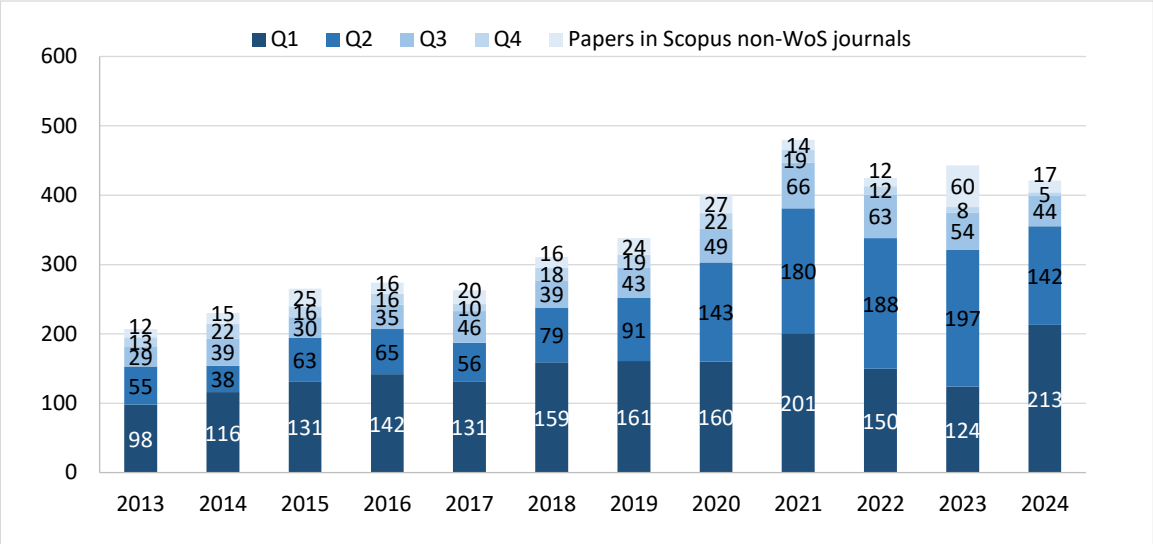


Figure 12 | Distribution of papers published in WOS journals per quartile (Q1 to Q4) of impact factor.

Figure 13 shows the number of papers in WoS/Scopus journals per member grouped by impact factors (Q1 and Q2 compared to other quartiles). In 2024, on average, each member published 2.59 papers in Q1 or Q2 WoS-indexed journals.

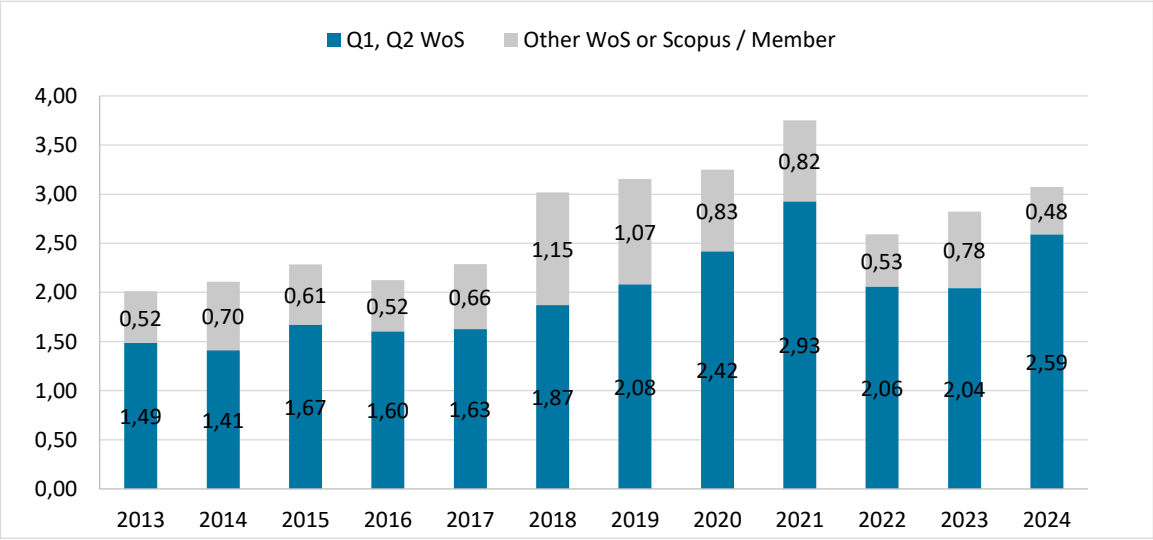


Figure 13 | Distribution of papers per member published in WoS or Scopus journals, considering WoS quartiles Q1 and Q2 and other journals indexed in Scopus or WoS.

The analysis of these data suggests the following comments:

(i) In 2024, the number of papers in international conference proceedings recovered from the low number in 2023.

(ii) Simultaneously, the number of publications in non-Q1 WoS-indexed journals decreased (from 319 in 2023 to 208 in 2024). The number of publications in Q1 WoS-indexed journals increased (from 124 in 2023 to 213 in 2024), while publications in Q2 WoS-indexed journals decreased (from 197 in 2023 to 142 in 2024).

Outreach and dissemination efforts for a broad audience in 2024 almost doubled those of 2023, and the number of actions has never been higher. Carrying out dissemination and outreach is becoming imperative to promote CERIS visibility and expand the opportunities to apply CERIS members' expertise. These initiatives are expected to positively impact the capacity of CERIS researchers to form fruitful partnerships and to attract high-quality PhD students. The number of Editors in Chief and Associate Editors in high-impact journals (Q1 and Q2 WOS-indexed journals) and the number of keynote lectures in international conferences are believed to be below CERIS potential.

Finally, for the indicators classified as other initiatives, in 2024: a) models are typically laboratory test-rigs; there was no model developed in 2024, as in 2023; b) the software applications listed are limited to those accessible on the internet for public use; no software applications were made available for public use in 2024; c) in general terms, researchers first register national patents before submitting to international registration; in 2024, 2 national patents were registered. Four fewer national patents were registered in 2024 when compared to 2023.

3.3.2 Evolution of research and consultancy funding

The aspects of the national economic scenario that are relevant in the present context are the following:

(i) Austerity policies started to be implemented in 2010-2011 and induced an economic recession in 2013-2014, followed by a weak recovery after 2015;
(ii) Public investment in RD&I, which had peaked in 2009, steadily decreased afterward;
(iii) Local and regional authorities and public agencies also suffered budget cuts in the same period;
(iv) From 2007-2008 onwards, the largest contractors in the Civil Engineering sector invested in the internationalisation of their activity as the national infrastructure approached completion;
(v) The economic crisis virtually paralysed the Construction sector throughout this period, with a recent recovery based on the rehabilitation sector.

Figure 14 shows the evolution of total funding between 2013 and 2024. Funding from contracted research attained a local minimum in 2013 with 785 k€ worth of industry contracts due to the economic crisis (i.e. between 2011-2014, Portugal was under the supervision of FMI and the European Union through the Portuguese Adjustment Plan). Between 2014 and 2017, recovery and funding stabilized around an average of 1190 k€ (with a slight dip in 2016). The local maxima of 2014 were associated with strong results in the last FP7 calls for research projects in 2013 and 2014 and an increase in industry contracts in 2014. These results can be seen in Figure 15 and Figure 16. Funding steadily decreased until 2017, mostly influenced by a reduction in the value of R&D projects.

In 2018, there was a recovery in R&D funding, influenced by the success of CERIS researchers in securing funding for their research through FCT-funded national projects. Consultancy, however, remained at low values compared with pre-2013 standards.

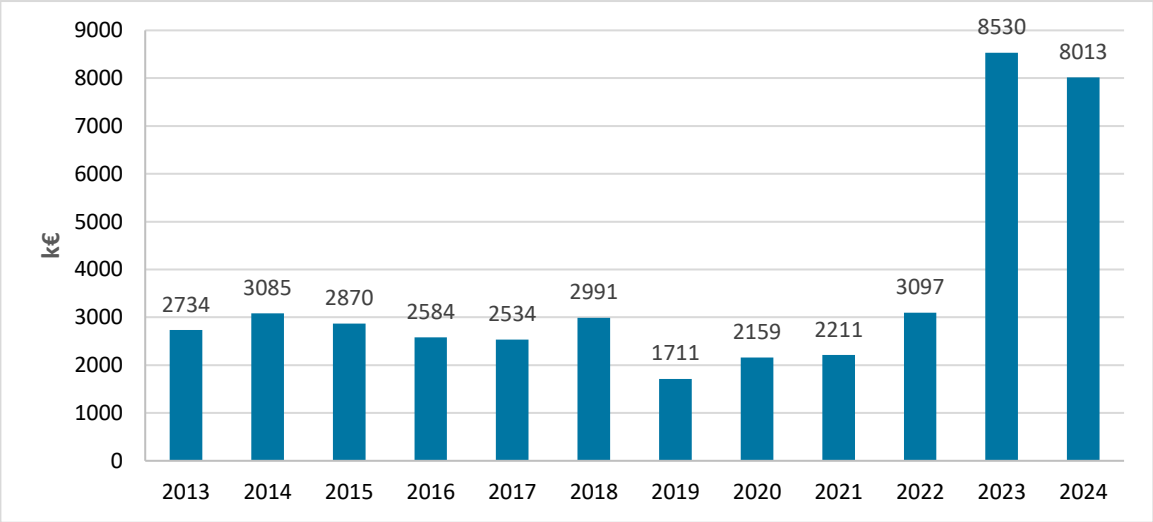


Figure 14 | Total annual CERIS funding (research and consultancy).

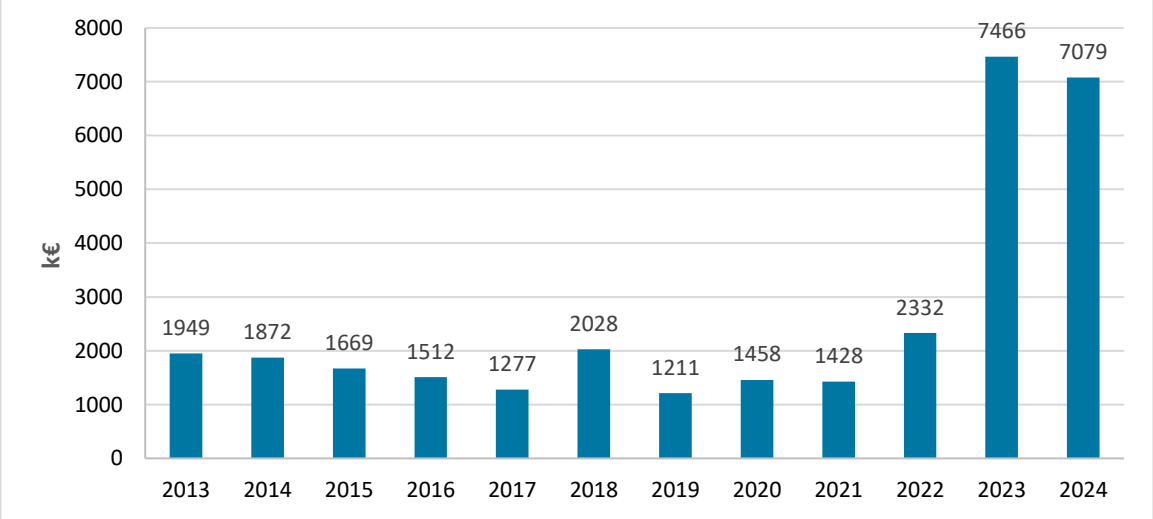


Figure 15 | R&D annual CERIS funding.

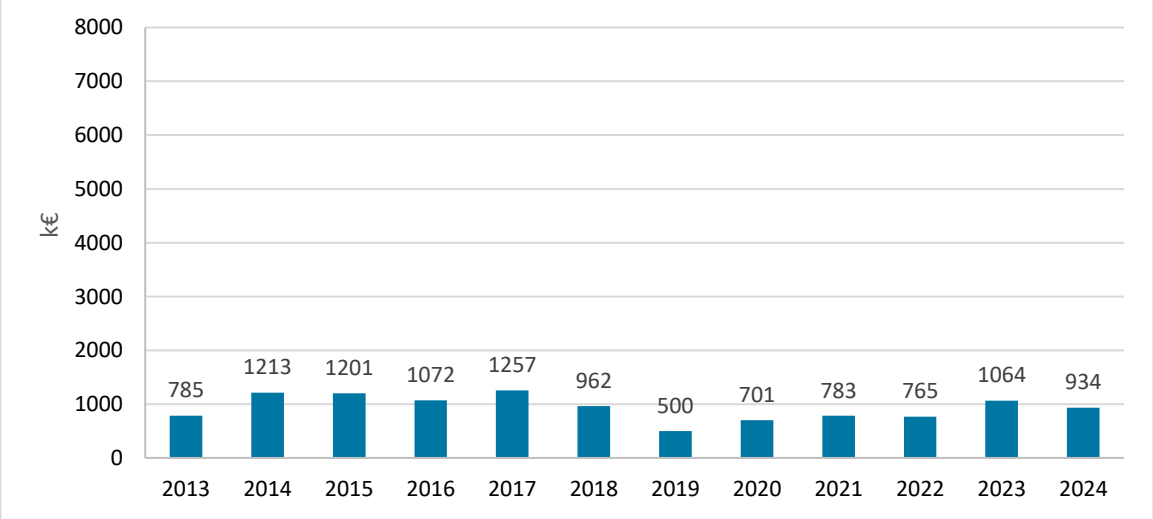


Figure 16 | Consultancy annual CERIS funding.

Consultancy funding decreased again in 2019, falling to an all-time low of 500 k€ (Figure 14 and Figure 16). Both R&D and consultancy funding grew in 2020. The reduction of public investment in research may still be the root cause of these low values. Still, the possibility that the market has adapted to the crisis by lowering the net value of the consultancy work provided by CERIS should be considered. If this is the case, likely, industry contracts will not return to their pre-2010 values soon.

The marked rise in R&D funding levels in 2023 reflects the inclusion of data from the CERIS Hubs established in 2022, namely CERIS NOVA and CERIS Coimbra, which had not been considered in the previous report (Figure 15). This increase is also linked to improved performance driven by EU-funded projects, with nine new research grants commencing in 2024 and 34 more projects active during that year (Table 12). Given the significant impact of EU-funded projects on CERIS overall funding, sustained participation in international funding calls should remain a strategic priority for CERIS members to maintain the strong performance demonstrated in 2024.

While funding from R&D contracts steadily decreased between 2013 and 2017, it remained above 1.25 M€. In 2018, research funding increased to 2.02 M€ (i.e. the best result since 2009), which was attributed to the success of CERIS researchers in the 2017 FCT call for projects across all scientific domains. If that was the case, the increase was related to the initial funds transfer from FCT to the CERIS project managing institutions. However, in 2019, research funding hit an all-time low of 1.21 M€ (Figure 15). The cause for this strong reduction is not evident. It may simply express a lag in subsequent payments by FCT, in which case a recovery is expected in the next years. This reduction highlights the need to secure additional funding, specifically through EU-funded projects.

The imbalance between R&D and consultancy funding in 2018 was high: 68% of the budget was sourced through R&D and 32% through consultancy; the latter was about 45% of the former (Figure 17 and Figure 18), as high as in 2013. Yet, the 2019 budget (ca. 1.71 M€) has deepened this trend, with R&D funding about 3.4 times the consultancy funding. It is worth mentioning that this ratio has been highly variable in the last few years — R&D and consultancy funding have converged from 2013 to 2017, as the latter increased and the former decreased. In 2017 parity was achieved. In 2018, R&D funding increased to about twice consultancy funding, a result mostly attributed to the satisfactory performance of CERIS in securing R&D funding. In 2019, the imbalance was the largest recorded despite the reduction of R&D funding. This trend was inverted in 2020, and the ratio returned to the figures of 2018. In 2022, the disparity between consultancy and R&D funding increased again, as R&D funding exceeded that through consultancy by more than three times.

In 2023, the budget secured through competitive research projects (7.47 M€) was approximately seven times higher than that obtained through consultancy (1.06 M€). The gap widened further in 2024, with research projects securing 7.08 M€—about 7.5 times the consultancy funding of 0.93 M€. While funding from specialised consultancy and industry-funded projects saw a slight increase in 2017, it declined in 2018 and reached an all-time low in 2019, followed by a modest recovery in 2020 and 2021. Consultancy funding rose from 0.77 M€ in 2022 to 1.06 M€ in 2023, but fell again in 2024. This drop is associated with a reduced number of projects and the typically small scale of CERIS consultancy initiatives. Additionally, market

adjustments following the recent crisis may have led to lower net values for the consultancy work provided by CERIS. It is also important to note that CERIS NOVA and CERIS Coimbra Hubs reported only R&D funding, contributing no values to consultancy figures.

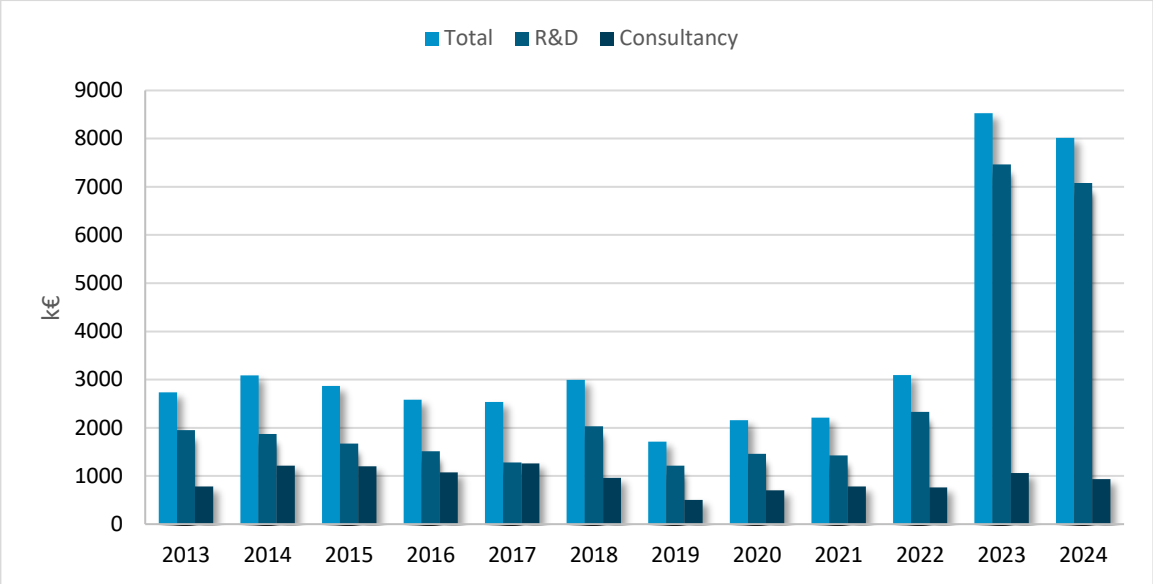


Figure 17 | Annual funding in research and consultancy.

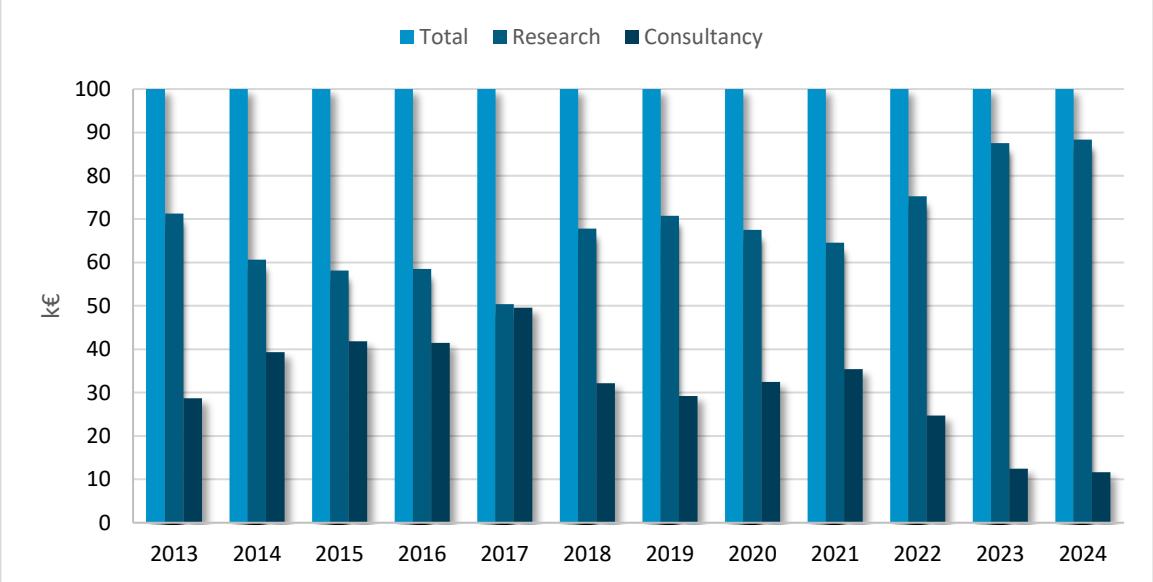


Figure 18 | Percentage of annual funding in research and consultancy.

The evolution of PhD members' capacity to secure either form of funding is presented in Figure 19. The lowest value was in 2019 when the average total funding was 16 k€ per CERIS member. There was a slight recovery in 2022 to 19 k€ per CERIS member. In 2023, another increase occurred, with 54 k€ per CERIS member, and the increasing trend continued in 2024 (58 k€ per CERIS member). This increase is due to the values associated with R&D funding per CERIS member (52 k€ per member in 2024), as consultancy funding decreased in 2024.

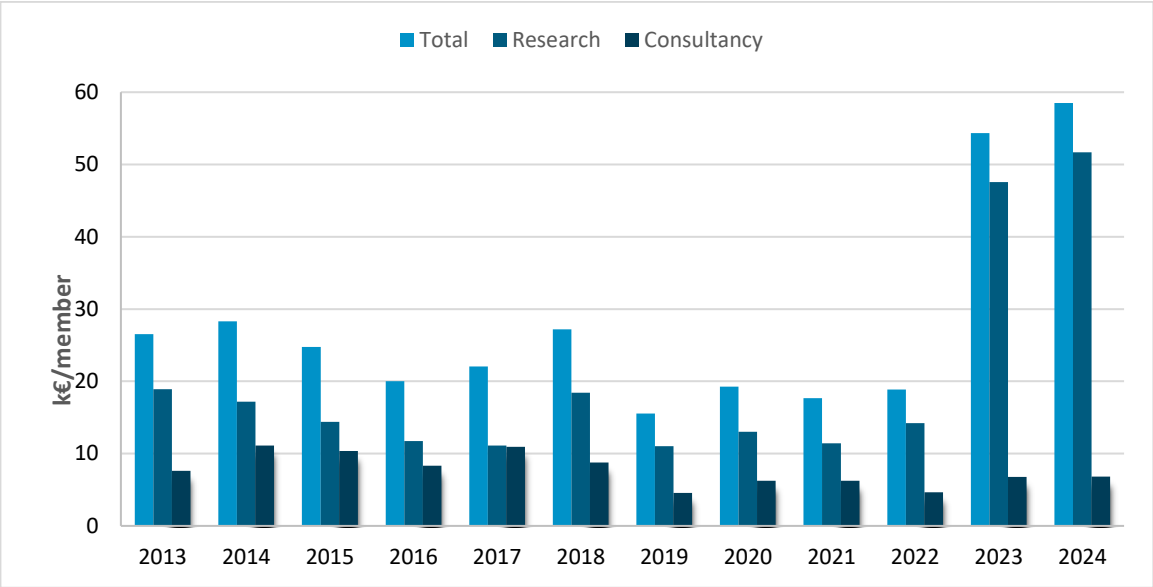


Figure 19 | Total annual funding per member.

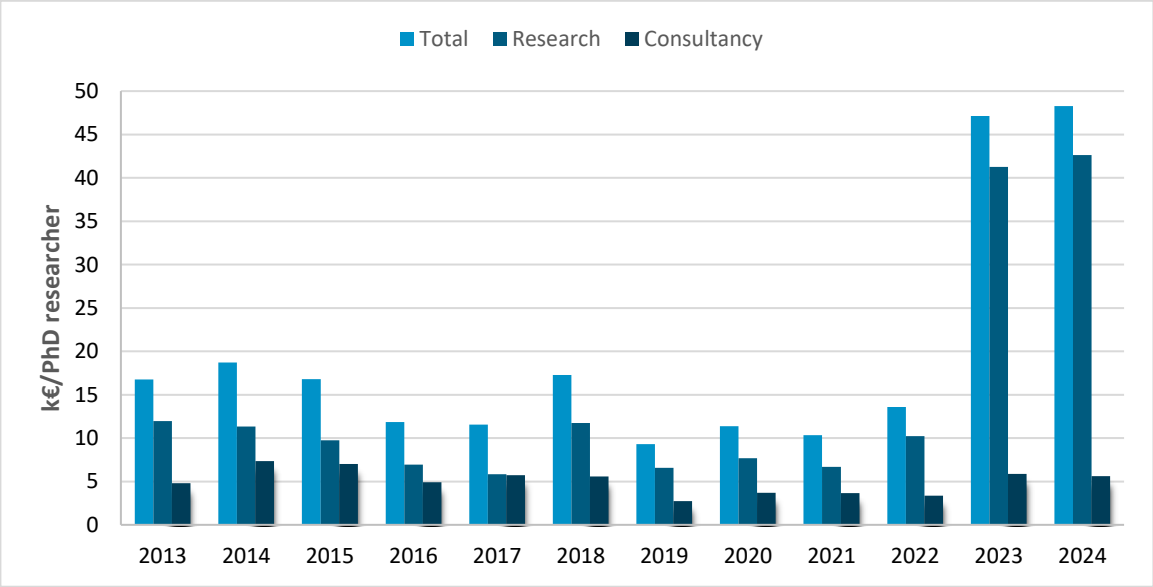


Figure 20 | Total annual funding per PhD researcher.

3.4 Research group results

The contribution of the research groups to the activity indicators presented above is presented in Annexe C.

4. FUTURE RESEARCH

The CERIS activities planned for 2025 are a natural follow-up of the research carried out in 2024, as summarised in Section 2.4. As submitted by the research group coordinators, the proposed activity will benefit from the internal programme to promote cooperation in research, as framed in the thematic strands and the work areas presented in Sections 2.2 and 2.3.

RG1 | Hydraulics

The RG activities for 2025 will be organised according to major research topics as follows:

Pressurised water systems

- Numerical and experimental analysis of hydraulic transients in pressurised pipe systems (RS).
- Energy recovery in water services systems, using pumps as turbines, and developing new low-cost energy-harvesting technologies (e.g. propellers, centrifugal micro-turbine, water wheels) (PD), towards the digital and energy transition in the water sector.
- Anomalous events (e.g., bursts) detection, location, and quantification in water supply systems using machine learning techniques (RS).
- Modelling rapid pipe filling events in intermittent water supply systems (RS).
- Analysis and improvement of the resilience of drinking water systems for demand increase and pipe failure (RS).
- Multicriteria analysis for scheduling rehabilitation interventions in water distribution networks (RS).
- New energy converters, hybrid pumped hydropower, and energy storage solutions in renewables integration (RS).
- Digital twin modeling in the context of water networks, hydropower design, and hydraulic transients refers to the creation of real-time, data-driven virtual models that replicate physical systems to improve performance, monitoring, and decision-making such as: Leak detection and predictive maintenance; Real-time system monitoring and control; Scenario analysis for operational decisions and emergency responses; Optimization of pump schedules and energy use; Real-time detection and analysis of pressure surges; Prediction of transient impacts on pipelines and valves; Design and testing of mitigation measures (e.g., surge tanks, air valves); Improved safety and reliability of water conveyance systems; Simulate water flow, turbine performance, and energy generation; Analyse structural and mechanical behaviour under different operating conditions; Support design optimisation and operational efficiency; Integrate environmental and hydrological data for sustainable hydraulic design.
- Hybrid energy solutions with pumped storage combine renewable sources (like solar or wind) with pumped hydro systems to store excess energy and stabilize the grid. This enhances reliability, enables energy shifting, and supports the integration of intermittent renewable energy sources.

Fluvial hydraulic structures

- Development of mitigation strategies and pre-cast shelters for fish downstream of powerhouses with a hydropeaking operation (RS).
- Numerical and experimental modelling of flood releases and related hydraulic structures (RS; RNBE).
- Study the hydraulics of PKW weirs combined with spillways (RS, RNBE).
- Study the pressure field and slab stability in a plunge pool lined with concrete slabs (RS).

River restoration and management

- Risk management in the valleys downstream of dams (RS; RNSC).
- Environmental flow determination procedures and hydropower station operation rules to reduce ecological risk downstream of dams (RS, RNBE).
- River restoration and development of eco-efficient fish pass solutions to improve ecological connectivity in regulated rivers (PD; RNBE; RNSC).
- Assessment and development of selective fish passes to prevent the spread of invasive fish species (RS, RNBE).
- Development of innovative dam removal impact assessment monitoring tools (RS, RNBE).
- River Digital Twins for prediction of hydro-morphological outcomes of river interventions (PD; RNBE; RNSC).

Environmental fluid mechanics

- Laboratory investigation of rough-wall open-channel turbulence (RNBE).
- CFD simulation of solid-fluid interactions in turbulent flows (RNBE).
- Laboratory investigation and mathematical simulation of the transport of dissolved substances (RS, RNBE).
- Heat and mass transport in wetlands (RNBE).

Sediment transport and river morphodynamics

- Hydrodynamics of river diversions in equilibrium (RS; RNBE).
- Mathematical modelling of shallow flows with mobile beds. Application to long-term channel morphology evolution, dam-breaching, dam-break flows, and overland tsunami propagation (RS).
- Development of stabilisation techniques for river meanders in equilibrium (RNBE).

Maritime hydraulics, coastal engineering and coastal morphodynamics

- Characterisation of offshore wave climate and storm wave events (RS).
- Analysis of wave-structure interaction (RS).
- Morphodynamic modelling and field observations of beaches and tidal inlets hydro-sedimentary dynamics, including engineering interventions (RS).
- Development of Nature-Based Solutions for Coastal Engineering (RNBE).
- Medium- and long-term shoreline evolution associated with coastal engineering interventions.

- Benefit-cost analysis of coastal engineering interventions for coastal management and planning.

RG2 | Environment and Water Resources

The E&WR will continue to focus on environmental and water resources research activities to develop approaches, methodologies, and tools that cut across these areas, improving knowledge and capabilities to manage natural and built environments sustainably.

The research objectives will cover different cross-cutting issues related to the thematic strands defined for CERIS. The main activities will focus on “Natural and Societal Changes” and “Risk and Safety in Natural and Built Environments," with more limited contributions to the other two thematic strands.

The E&WR will continue concentrating its activities on the following major topics:

- Hydrology and water resources: characterization and modelling of hydrologic variables and processes, including extreme event analysis, with emphasis on heatwaves, topic that is still pioneering in Portugal, planning and management of water resources, and water policy formulation;
- Integrated water resources management, including the joint management of water supply from surface and groundwater sources, controlling water uses and demand, and managing water quality and ecological requirements, specialising in transboundary river basins.
- Assessment and analysis of climate change impacts on natural and man-made systems, with special emphasis on water resource systems, including the formulation of measures and policies for promoting adaptation and mitigation;
- Coastal urban wastewater systems, including adaptation actions to climate change given sea level rise and risks of saline water inflows;
- Non-sewer solutions and faecal sludge management options and techniques for in low-income countries;
- Water asset management, performance indicators, and urban resilience related to urban water/wastewater/stormwater systems;
- Integrated sustainable wastewater solutions, including the hydraulic and environmental performance of nature-based solutions for mitigation and adaptation to climate change, such as constructed wetlands, green roofs, and detention ponds;
- Environmentally sustainable assessment (LiderA system) and management of built environments;
- Approaches to the transition to the carbon-neutral and circular economy, including sustainable buildings, infrastructures, and urban areas with a focus on water, energy, and materials cycles, with special emphasis on life-cycle framework;

- Implement monitoring, aquifer and geophysical testing and groundwater quality assessment to identify groundwater pollution sources (saline intrusion, agriculture, industry, mining), to quantify surface-groundwater exchange and to delineate groundwater-dependent ecosystems accurately;
- Employ advanced numerical and stochastic groundwater modeling techniques along with decision support systems (DSS) to improve groundwater management practices;
- Implement nature-based solutions and climate change mitigation measures to enhance groundwater quality and quantity, to minimize groundwater contamination and strengthen integrated water management approaches effectively;
- Utilise cutting-edge technology such as satellite-based remote sensors and drone-based sensors to enhance monitoring capabilities, including land use evaluation, soil moisture assessment, water availability analysis, and identification of aquifer recharge and discharge zones. Additionally, leverage satellite-based sensors, radar data, and meteorological reanalysis to monitor climate variables comprehensively;
- Investigate the importance of groundwater resources for ensuring water and food security in arid and semi-arid regions facing water scarcity.

RG3 | Systems and Management

In the future, the group will continue to grow on the following areas of development:

1. Digital Built Environment and Twin Transition
2. Digital Twin and Asset Management

Digital Built Environment and Twin Transition

Our research group has made groundbreaking strides in the field of the digital built environment. One of our significant achievements is the innovative use of BIM, particularly for heritage management. We have tailored scan-to-BIM workflows at UNESCO World Heritage sites in Sintra, which have pioneered the integration of seismic assessment with BIM. We have also optimised emergency response routes and developed advanced sensor data integration, which has significantly enhanced heritage protection and facility management.

Using other information technologies, such as GIS, we conducted GIS-based data processing in various applications, including optimising crop distribution in Portugal in collaboration with the National Institute of Agricultural and Veterinary Research (INIAV). We have also mapped and monitored urban green roofs to assess their biodiversity potential and incorporated future global climate scenarios in risk evaluation for several natural hazards in Portugal.

Complementarily, our research group coordinated several projects that revolutionised the construction industry through digital transformation. Under the REV@Construction project, we have developed several digital tools for construction, influencing significant updates to standards and laws and promoting

interoperability. Recently, our research group has been given support to the development of a National Strategy for BIM implementation in Portugal, which will start to be implemented in 2025.

Focusing on the Twin Transition, several initiatives have been conducted, such as the Circular ECO BIM project, which allowed the development of tools that can evaluate circularity and sustainability. One of these is the SmartLCA tool, which is a BIM-based LCA digital tool that has been developed and is now being deployed within the industry. Recently, a team of PhDs has been formed, constituting the TwinLab research group, which is conducting innovative research in digital and climate transition, always with a strong emphasis on industry connections.

Digital Twin and Asset Management

Understanding the importance of asset management for the built environment, the group conducted several works on this topic. Notably, it firmly pushed the standardisation ecosystem around this matter, coordinating the respective standardisation technical committee. Specialising in asset management, our research group has also embraced the challenges of integrating Digital Twin (DT), especially within the demanding context of complex infrastructures. We have made significant strides in advancing asset management through the deployment of DTs, which serve as dynamic, real-time replicas of physical assets. This transformative approach facilitates data-driven management across the asset's lifecycle, enhancing operational efficiency and decision-making. Central to our efforts was the DT4Health project, which has established a comprehensive framework for DT application in hospital settings.

Furthermore, closer coordination with the CERIS strategy and the general orientations stemming from its thematic strands will be promoted. The horizontal character of the S&M group skills and competencies creates opportunities for synergetic cooperation and interactions with other CERIS research groups and to make relevant contributions closely linked to the thematic strands' objectives.

RG4 | Transportation Systems

The RG4 for 2025 will pursue the objectives described in section II.1 using the means and the routes offered by EU (Horizon Europe) and national (Portugal 2030 and FCT) financed research projects, by the research involved in each ongoing Ph.D. works integrated on the doctoral programme in Transportation Systems, by the innovation, the technology and the development transfer to society and industry, by supporting the professional training programmes set with several stakeholders on the transportation and infrastructure systems, and by the improvement of the results achieved within the international networks already established and the ones to enhance if the opportunity comes.

RG5 | Studies on Construction

The RG activities in 2025 will be a natural follow-up of the research carried out in 2024. These activities will cover research objectives that include different cross-cutting issues with branches in the four thematic

strands: Product development in Civil Engineering industries (PD); Risk and safety in natural and built environments (RS); Rehabilitation of natural and built environments (RNBE); Response to natural and societal changes (RNSC).

The RG activities for 2025 will be organized according to major research topics as follows:

- To develop research projects in Construction Materials, Building Technology, and Management Innovation; Sustainable Construction Practices; Monitoring, Rehabilitation, and Conservation of the Built Heritage;
- An effort will be made to concentrate on increasingly less wide and more specific fields to produce relevant results in national and international forums (measured in a significant increase in the number and impact factor of papers in peer-reviewed international journals, the supervision of PhD theses, the approval of national and international research grants and the engagement in international research networks):
    - Advanced materials and technologies also focusing on nanomaterials - establish international cooperation and be a national leader in the field of composites (GFRP and CFRP);
    - Concrete and mortars technology - increase the number of PhD and MSc studies under way (in strong collaboration with LNEC and foreign universities) and improve the Mortars Section of the Construction Laboratory at IST;
    - Sustainable and functional bio-based construction products and building elements - research and development of innovative materials through international collaboration;
    - Risk informed quality, safety and environmental management in construction - increase the already large international cooperation via technical committees and international conferences;
    - Sustainability and deconstruction strategies and technology - increase the number of PhD and MSc studies under way and continue to be a national and international reference in the field of recycled aggregates and supplementary cementitious materials for concrete and mortars production;
    - Building physics and passive design - continue the very good results in the near past and expand its potential through studies on indoor environmental comfort, energy efficiency, energy storage systems and acoustics, anchored on the development, multi-scale testing and real-scale application of innovative materials, products, components and construction systems;
    - Building acclimatization and mechanical systems - continue collaboration with the Mechanics and Physics Departments of IST and with universities from other countries, strategically important in terms of sustainable construction in terms of energy-saving; inspection, diagnosis, maintenance and rehabilitation systems - increase the number of PhD and MSc studies under way and be a national and international reference in the field of inspection and diagnosis systems;

- Conservation of historical building heritage - continue and strengthen national and international cooperation projects, namely within technical/scientific national/international networks;

- To continue participating in national and international scientific committees, participating/organising national and international conferences, publishing scientific articles, books and book chapters, editorial activities, teaching in Graduation and Post-Graduation courses in the field of construction, and participating in academic events and performing consultancy work.

RG6 | Structures and Geotechnics

In 2025, it is planned that the members of the RG6 continue working on the most relevant research topics of the area, according to reference international organizations and current priorities of the country.

A renewed effort to promote deeper and more effective collaboration between RG members and between these and internationally renowned researchers will be made to deliver relevant contributions to the sector and increase participation in research projects funded by the European Union. The main general purpose is to improve the construction sector's competitiveness, reduce risk and improve the safety of infrastructures, supporting the development of economical and eco-efficient materials and products and new technologies to design, build and maintain high-quality and long-lasting structures. This embraces the development of (i) sustainable materials and products, (ii) innovative construction methods, addressing, particularly prefabrication, as well as rehabilitation, (iii) advanced computational tools for structural and geotechnical analysis, (iv) contributions to standards and design guidelines for both new and existing structures, including their foundations, (v) novel health monitoring and life-cycle assessment tools for structural and geotechnics use, (vi) study of the effects of explosions in urban environments, (vii) evaluation and rehabilitation of structures damaged by fire, and (vii) steel industrial research and innovation in line with the European Green Deal.

Other more general objectives are the increase of the group internationalisation and the links to industry, namely through:

- improvement of the competitive funding capacity in international and national research projects calls
- participation in national and international standardization committees,
- organisation of academic national and international events,
- participation in national and international Graduation and Post-Graduation courses (namely ERASMUS and FCT Doctoral Programmes) in the field of Structures and Geotechnics,
- expert consultancy work to partially fund research and provide practical applications to the results of research,
- cooperation with design offices and private companies,
- partnership with the industry for the optimisation of resources and industrial efficiency upgrading

5. CLOSURE

In 2024, CERIS relied on the expertise of 166 PhD and 225 non-PhD researchers, possessing the necessary profile and critical mass to maintain a leading national position and establish a strong international presence in the sector. The number of CERIS Members increased in 2024, primarily due to the establishment of two new hubs in CERIS and to the increase in members due to their past productivity.

FCT classifies CERIS as the only ‘large research unit’ in Civil Engineering. In day-to-day operations, one set of difficulties relates to inherited weaknesses in technical staff regarding the operation of laboratories and, especially, the creation of an administrative structure competent in the management of Science and Technology. The merging of the centres at CERIS's origin aimed to improve the use of human resources; however, the current freeze on recruiting technical staff remains an obstacle, and CERIS should use its existing resources to address the foreseen difficulties.

The discussion that led to the creation of CERIS was focused on the dual challenge of respecting the identity of the founding centres while actively promoting internal cooperation in a new unit rich in synergies in the principal areas of the Built and Natural Environment. The first seven years of operation have shown that loss of identity is not an issue and confirmed that the core challenge of the merge was the progressive realignment of the activity of the research groups in the framework of the main work areas of the common thematic strands. It should not be expected that groups with long-established areas of operation would immediately readjust and start new forms of cooperation. However, the first signs of group cooperation result from sustained proactive internal initiatives (seed projects, etc.).

Key achievements included the conclusion of 31 PhD theses, with 244 more in progress beyond the year. Researchers published a total of 421 papers in WoS or Scopus-indexed journals and 282 papers in international conference proceedings. Additionally, 121 MSc dissertations were concluded. The analysis of activity indicators shows a consistent increase in scientific activity since 2015. A significant development in 2024 was the increase in publications in high-impact journals, with the percentage of papers published in Q1 WoS-indexed journals rising to 50%. The ratio of publications in WoS/Scopus-indexed journals per PhD researcher also reached a high of 2.5, the highest since 2015.

Visibility and recognition indicators highlight CERIS members' engagement in the scientific community, including serving as Associate Editors for 18 WoS or Scopus-indexed journals and participating in numerous editorial boards and conference organising committees. However, there is still a way to go to materialize that recognition into stable cooperation leading to international projects.

Financially, 2024 was a strong year, with total annual funding for CERIS reaching a new peak, surpassing the values achieved in 2023. This growth was primarily driven by competitive research projects (R&D), which secured 2.89 M€, significantly outweighing funding from consultancy (0.81 M€). The increase in R&D funding is partly attributed to a higher level of EU-funded projects. Correspondingly, the average total funding per CERIS member continued its increasing trend, reaching 27 k€ in 2024, predominantly due to the rise in R&D funding per member. Still, there are some difficulties in securing funding, namely related to the discouraging conditions that the universities in the Lisbon area must face when applying to

Portugal 2030 calls. Nevertheless, funding through competitive research projects increased, which may be attributed to the improved dynamics of researchers applying to such calls, also associated with the establishment of the CERIS hubs in 2022.

Based on the high level of activities of CERIS in the 2013-23 period and the positive mark (Excellent) in the 2017 FCT evaluation, and confirmed in 2023/24 evaluation, CERIS expects to maintain the leading position in the Civil Engineering area. Such a result would be consistent with all major international scientific rankings, where the University of Lisbon (in which CERIS is the only research unit in Civil Engineering) ranks first in this subject in Portugal.

ANNEXE A – PHD THESES COMPLETED IN 2024

PhD theses completed in 2024

Student name	Supervisor	Co-Supervisor #1	Co-Supervisor #2	Title	PhD programme
Alejandro Baladrón Julian	António Alberto do Nascimento Pinheiro	Isabel Maria Bento de Matos Boavida	Maria Dolores Bejarano Carrión	Mitigation of the ecological impacts of hydropeaking on riverine vegetation and its functions.	River Restoration and Management
Amir Gholipour	Elizabeth Duarte	Rita Fragoso	Ana Galvão	Sludge treatment by earthworm-enhanced reed beds towards smart-cities.	Environmental Engineering
Ana Chambel da Silva Carriço	José Alexandre de Brito Aleixo Bogas	Ana Mafalda Saldanha Guedes		Eco-efficient binders obtained from the thermal activation of cementitious materials.	Civil Engineering
Arianna Lupattelli	Diana Salciarini	Peter John Bourne-Webb	Teresa Maria Bodas Freitas	Insights on the Thermo-Mechanical Behavior of Energy Geostructures from Laboratory-Scale Samples to Urban-Scale Installations - Experimental, Numerical and Analytical Frameworks	Civil Engineering
Bernardete de Lourdes Ferreira Minervino	Cristina Calmeiro dos Santos	João Paulo Rodrigues	Paulo von Krüguer	Fire risk analysis applied to buildings of historical value in Brazil.	Fire Safety Engineering
Catarina Sofia Freitas Teixeira Ribeiro	Nuno Ramos	Inês dos Santos Flores Barbosa Colen	Nuno Valentim Lopes	The balcony as na archetype of well-being. The impacts on the indoor environment and inhabitants' perception	Civil Engineering
Eleonora Cintura	Lina Nunes	Maria Paulina Santos Forte de Faria Rodrigues		Development of insulation and indoor boards with bio-based waste materials and natural glues or biocementation.	Civil Engineering

Student name	Supervisor	Co-Supervisor #1	Co-Supervisor #2	Title	PhD programme
Elisson Bilheiro Ferreira Filho	Alexandre Landesmann	Dinar Reis Zamith Camotim		Behaviour, strength and DSM design of cold-formed steel columns affected by distortional-global interaction at elevated temperatures.	Civil Engineering
Fábio Moutinho Paiva	Luís Manuel Coelho Guerreiro	Rui Manuel Menezes Carneiro de Barros		Risk analysis of transmission line systems to natural hazards with emphasis on earthquakes and extreme winds.	Civil Engineering
Gabriel de Jesus Gomes	Válter José da Guia Lúcio	Corneliu Cismasiu		Protection of infrastructures against explosions using ductile blast energy-absorption connectors.	Civil Engineering
Gustavo Felipe Medeiros da Câmara	Rui Alexandre Lopes Baltazar Micaelo	Nuno Monteiro Azevedo		Computation tool development for self-healing asphalt mixture modelling.	Civil Engineering
Gustavo Silva da Rocha	João Paulo Rodrigues	Daniel da Silva Gazzana		Fire risk analysis in electrical installations.	Fire Safety Engineering
Henriqueta Sofia de Almeida Teixeira	Maria da Glória de Almeida Gomes	Daniel Aelenei	António Heleno Domingues Moret Rodrigues	Thermal, luminous, energy and environmental performance of smart glazing in building façades.	Civil Engineering
Ítalo Pereira Fernandes	Norberto Corrêa da Silva Moura	António Morais Aguiar da Costa		Desvendando percepções dos usuários sobre o espaço urbano noturno brasileiro	
Joana Alexandra Mirante Barrelas	Jorge Manuel Caliço Lopes de Brito	António Tadeu	Ana Filipa Ferreira da Silva Cigarro Matos	Impact of climate change on the service life of building components. Application to external cement renders in façades in a progressively warmer and drier climate.	Civil Engineering
João Luís Carreiras Ribeiro Parracha	Maria do Rosário da Silva Veiga	Inês dos Santos Flores Barbosa Colen	Lina Maria Ribeiro Nunes	Durability for sustainability of multilayer external wall thermal insulation systems.	Civil Engineering
João Pedro Lopes Barreiro	José Manuel de Saldanha Gonçalves Matos	Filipa Maria Santos Ferreira		Development of a resilience framework for urban stormwater services	Environmental Engineering

Student name	Supervisor	Co-Supervisor #1	Co-Supervisor #2	Title	PhD programme
Kamar Aljundi	Ana Maria Carvalho Pinheiro Vieira	Maria Rafaela Pinheiro Cardoso	José Alberto Marques Lapa	Sustainability and optimization guidelines of efficient solutions in shallow geothermal systems. Case study of Aveiro University.	Civil Engineering
Liliana Caria Oliveira	Luis Matias	Rui Pedro Carrilho Gomes	Sara Amoroso	Seismic microzonation studies for Lisbon.	Geophysical Sciences and Geoinformation
Luís Palma Nunes Mendes	Alexandre José Malheiro Bernardino	Rui Miguel Lage Ferreira		Combined real-time velocimetry for natural and built environments.	Electrical and Computer Engineering
Maria Madalena Saraiva Lamas de Oliveira da Ponte	Rita Maria do Pranto Nogueira Leite Pereira Bento	Andrea Penna		Reduction of the seismic vulnerability of historical masonry structures: numerical and experimental analyses	Civil Engineering
Miguel Nobre da Costa	Filipe Manuel Mercier Vilaça e Moura	Manuel Ricardo de Almeida Rodrigues Marques	Carlos Lima Azevedo	Objective and subjective risk mapping for urban cyclists.	Transportation Systems
Natan Sian das Neves	Alexandre Landesmann	Dinar Reis Zamith Camotim		Distortional-global interaction and DSM design of cold-formed steel beams under elevated temperatures.	Civil Engineering
Pedro Gabriel Condelipes Monteiro	João Pedro Conde	Ricardo Jaime Pereira Rosário dos Santos		Advanced microfluidic devices for cell culture and point-of-care immunoassays.	Biotechnology and Biosciences
Pedro Miguel Guerreiro Rodrigues	Paulo Manuel da Fonseca Teixeira			Modelling the degradation of local defects in railway track geometry	Transportation Systems
Qifan Ren	Jorge Manuel Caliço Lopes de Brito	João Pacheco	Jianhua Hu	Finite element numerical simulation of the mechanical behaviour of recycled aggregate concrete at the meso-scale.	Civil Engineering
Raphael Augusto Vasconcelos Carneiro Nascimento Pachamama	Marco de Rezende	Maria Paulina Santos Forte de Faria Rodrigues		Effects of cow dung addition on the psysical and mechanical properties and water resistance of eco-efficient clay mortars.	Built Environment, Heritage and Sustainability

Student name	Supervisor	Co-Supervisor #1	Co-Supervisor #2	Title	PhD programme
Salem Alnezami	Jorge Manuel Caliço Lopes de Brito	Rui Vasco Pacheco Santos da Silva	Rawaz Mohammed Saleem Kurda	Environmental impact and technical performance of recycled concrete containing municipal solid waste incinerator bottom ash.	Civil Engineering
Sara de Brito Coimbra	Daniel Aelenei	Maria da Glória de Almeida Gomes	António Moret Rodrigues	Thermal rehabilitation of buildings using solar passive techniques.	Civil Engineering
Teresa Pinheiro de Almeida Alvarez	Rui Miguel Lage Ferreira	Maria Teresa Santos Viseu Sarrico Santos		Experimental characterization of the failure by overtopping of homogeneous and zoned dams: hydrodynamics and morphodynamics	Civil Engineering
Tiago Liberalesso	Maria Cristina de Oliveira Matos Silva	Carlos Paulo Novais Oliveira da Silva Cruz		Green infrastructure solutions: A decision-support system for green roof incentive policies.	Civil Engineering

ANNEXE B – PAPERS PUBLISHED IN 2024

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Abd-Elaty I.; Kuriqi A.; Ahmed A.	Assessing salinity hazards in coastal aquifers: implications of temperature boundary conditions on aquifer–ocean interaction	Applied Water Science	V. 14, n.º 6(132)	10.1007/s13201-024-02145-y	WoS AND SCOPUS		Q1	Q1
Abd-Elaty I.; Kuriqi A.; Ahmed A.	Effectiveness of different mixed physical barriers in controlling seawater intrusion in homogeneous and layered coastal aquifers	Groundwater for Sustainable Development	V. 27 (101318)	10.1016/j.gsd.2024.101318	WoS AND SCOPUS		Q1	Q1
Abd-Elaty I.; Kuriqi A.; Ahmed A.; Ramadan E.M.	Enhanced groundwater availability through rainwater harvesting and managed aquifer recharge in arid regions	Applied Water Science	V. 14, n.º 6(121)	10.1007/s13201-024-02166-7	WoS AND SCOPUS		Q1	Q1
Abd-Elaty I.; Kuriqi A.; Pugliese L.; Ahmed A.	Shoreline subsurface dams to protect coastal aquifers from sea level rise and saltwater intrusion	Applied Water Science	V. 14, n.º 3(49)	10.1007/s13201-023-02032-y	WoS AND SCOPUS		Q1	Q1
Abd-Elaty I.; Kuriqi A.; Ramadan E.M.; Ahmed A.A.	Hazards of sea level rise and dams built on the River Nile on water budget and salinity of the Nile Delta aquifer	Journal of Hydrology: Regional Studies	V. 51 (101600)	10.1016/j.ejrh.2023.101600	WoS AND SCOPUS		Q1	Q1
Abd-Elaty I.; Ramadan E.M.; Elbagory I.A.; Nosair A.M.; Kuriqi A.; Garrote L.; Ahmed A.A.	Optimizing Irrigation Systems for Water Efficiency and Groundwater Sustainability in the Coastal Nile Delta	Agricultural Water Management	V. 304 (109064)	10.1016/j.agwat.2024.109064	WoS AND SCOPUS		Q1	Q1
Abd-Elaziz W.; Elsaiad A.; Sallam G.A.H.; Kuriqi A.; Ahmed A.A.; Abd-Elaty I.	Performance of subsurface drainage systems considering groundwater flow directions and network alignment	Frontiers in Earth Science	V. 12 (1299495)	10.3389/feart.2024.1299495	WoS AND SCOPUS		Q1	Q3

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Abdo H.G.; Vishwakarma D.K.; Alsafadi K.; Bindajam A.A.; Mallick J.; Mallick S.K.; Kumar K.C.A.; Albanai J.A.; Kuriqi A.; Hysa A.	GIS-based multi-criteria decision making for delineation of potential groundwater recharge zones for sustainable resource management in the Eastern Mediterranean: a case study	Applied Water Science	V. 14, n.º 7(160)	10.1007/s13201-024-02217-z	WoS AND SCOPUS		Q1	Q1
Abdulrahman, PI; Jaf, DKI; Malla, SK; Mohammed, AS; Kurda, R; Asteris, PG; Sihag, P	Predictive modeling of compressive strength in silica fume-modified self-compacted concrete: A soft computing approach	Structural Concrete	V. , n.º ()	10.1002/suco.202400931	WoS AND SCOPUS		Q1	Q2
Abreu M.C.S.á.D.; da Silva L.A.; Consciência Silvestre H.; Emmendoerfer M.L.	Does self-organizing policy network provide effective waste services? An empirical evaluation of institutional collective action and transaction cost dilemmas	Public Administration and Development	V. 44, n.º 3(157-169)	10.1002/pad.2046	WoS AND SCOPUS		Q2	Q2
Achite M.; Caloiero T.; Jehanzaib M.; Wałęga A.; Kuriqi A.; Pellicone G.	Geo-Statistical Characterization of Annual Maximum Daily Rainfall Variability in Semi-Arid Regions	Atmosphere	V. 15, n.º 12(1519)	10.3390/atmos15121519	WoS AND SCOPUS		Q2	Q3
Afonso G.P.; Ferreira D.C.; Figueira J.R.	A Network-DEA model to evaluate the impact of quality and access on hospital performance	Annals of Operations Research	V. 342, n.º 3 (2169-2199)	10.1007/s10479-023-05362-x	WoS AND SCOPUS		Q1-Q2	Q1
Afonso G.P.; Figueira J.R.; Ferreira D.C.	Dealing with uncertainty in healthcare performance assessment: a fuzzy network-DEA approach with undesirable outputs	International Transactions in Operational Research	V. , n.º (-)	10.1111/itor.13490	WoS AND SCOPUS	3.1	Q2	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Ali, BA; Mohammed, AS; Salih, MA; Salih, SH; Omer, M; Kurda, R; Emad, W; Asteris, PG; Sihag, P	Artificial neural network and soft computing models to predict the compressive strength in self-compacting green concrete	Innovative Infrastructure Solutions	V. 9, n.º 11 (412)	10.1007/s41062-024-01723-y	WoS AND SCOPUS		Q2	Q2
Aljundi K.; Figueiredo A.; Vieira A.; Lapa J.; Cardoso R.	Geothermal energy system application: From basic standard performance to sustainability reflection	Renewable Energy	V. 220 (119612)	10.1016/j.renene.2023.119612	WoS AND SCOPUS		Q1	Q1
Aljundi K.; Pereira C.; Vieira A.; Maranha J.R.; Lapa J.; Cardoso R.	Test conditions influence on thermal conductivity and contact conductance of sand at transient state	Soils and Foundations	V. 64, n.º 1(101405)	10.1016/j.sandf.2023.101405	WoS AND SCOPUS		Q1	Q2
Aljundi K.; Vieira A.; Lapa J.; Figueiredo A.; Cardoso R.	Assessing the Impact of a Shallow Geothermal System Operation through Multi-Layer Temperature Monitoring in a Mediterranean Climate	Geosciences (Switzerland)	V. 14, n.º 1(19)	10.3390/geosciences14010019	WoS AND SCOPUS		Q2	Q2
Almeida, A.	2.ª geração do Eurocódigo 2 – Projeto de estruturas de betão	Revista Portuguesa de Engenharia de Estruturas	Série III, nº 25, Julho 2024, pp. 39-48.		Non WoS AND non SCOPUS			
Almukashfi A.M.A.; Castellanza R.; Correia A.G.; Arroyo M.; Zuretti C.; Bendea D.; Moldovan I.D.	A Modified Rowe Cell with Bender Elements for Small Strain Shear Modulus Measurements	Geotechnical Testing Journal	V. 47, n.º 5(985-1005)	10.1520/GTJ20230329	WoS AND SCOPUS		Q2	Q3

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Alnezami S.; Lamaa G.; Pereira M.F.C.; Kurda R.; de Brito J.; Silva R.V.	A sustainable treatment method to use municipal solid waste incinerator bottom ash as cement replacement	Construction and Building Materials	V. 423 (135855)	10.1016/j.conbuildmat.2024.135855	WoS AND SCOPUS		Q1	Q1
Amorim J.M.; de Abreu e Silva J.	Comparing the application of different justice theories in equity analysis of transit projects: A case study of the Lisbon Metro Circular Line	Journal of Transport and Land Use	V. 17, n.º 1(21-40)	10.5198/jtlu.2024.1895	WoS AND SCOPUS		Q1	Q4
Amorim M.; de Freitas V.P.; Torres I.	Influence of Moisture on the Energy Performance of Retrofitted Walls - Experimental Assessment and Validation of an Hygrothermal Model	International Journal of Architectural Heritage	V. 18, n.º 3(477-491)	10.1080/15583058.2022.2157777	WoS AND SCOPUS		Q1	Q2
Antunes A.; Costa H.; do Carmo R.; Júlio E.	Mortars produced with recycled aggregates from construction and demolition waste – Analysis and construction site application	Construction and Building Materials	V. 457 (139395)	10.1016/j.conbuildmat.2024.139395	WoS AND SCOPUS		Q1	Q1
Antunes A.; Silvestre J.; Costa H.; Carmo R.D.; Júlio E.	Reducing the environmental impact of the end-of-life of buildings depending on interrelated demolition strategies, transport distances and disposal scenarios	Journal of Building Engineering	V. 82 (108197)	10.1016/j.jobe.2023.108197	WoS AND SCOPUS		Q1	Q1
Antunes A.; Soldado E.; Costa H.; do Carmo R.; Júlio E.	Investigating the Influence of SCMs on Mechanical Performance through Experimental Feret's Coefficients in Low-carbon Concrete	Journal of Advanced Concrete Technology	V. 22, n.º 8(471-484)	10.3151/jact.22.471	WoS AND SCOPUS		Q2	Q3
Arantes A.; Ferreira L.M.D.F.	Development of delay mitigation measures in construction projects: a combined interpretative structural modeling and MICMAC analysis approach	Production Planning and Control	V. 35, n.º 10(1164-1179)	10.1080/09537287.2022.2163934	WoS AND SCOPUS		Q1	Q1
Araújo G.R.; Gomes R.; Ferrão P.; Gomes M.G.	Optimizing building retrofit through data analytics: A study of multi-objective optimization and surrogate models derived from energy performance certificates	Energy and Built Environment	V. 5, n.º 6(889-899)	10.1016/j.enbenv.2023.07.002	Non WoS OR non SCOPUS		Q1	

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Arruda M.R.T.	Orthotropic damage model for composite structures using the 3D Tsai-Wu failure criterion	Mechanics of Advanced Materials and Structures	V. 31, n.º 27(9584-9600)	10.1080/15376494.2023.2277849	WoS AND SCOPUS	3.6	Q2	Q1
Arruda M.R.T.; Bicelli A.R.A.; Branco F.	Ignition Locations and Simplified Design Guidelines for Enhancing the Resilience of Dwellings against Wildland Fires	Fire	V. 7, n.º 2(40)	10.3390/fire7020040	WoS AND SCOPUS		Q1	Q1
Arruda M.R.T.; Cantor P.; Bicelli A.; Branco F.	Thermal reaction of firebrand accumulation in construction materials	Case Studies in Construction Materials	V. 20 (e02985)	10.1016/j.cscm.2024.e02985	WoS AND SCOPUS		Q1	Q1
Arruda M.R.T.; Castro L.	State of art for hybrid mixed finite element formulation in non-linear analysis of structures	Engineering Solid Mechanics	V. 12, n.º 1(51-64)	10.5267/j.esm.2023.7.002	Non WoS OR non SCOPUS		Q3	
Arruda M.R.T.; Deividas M.; Vadimas K.	State of the art on structural reinforced concrete design guidelines with non-linear analyses	Mechanics of Advanced Materials and Structures	V. 31, n.º 17(4154-4168)	10.1080/15376494.2023.2192214	WoS AND SCOPUS	3.6	Q2	Q1
Arruda M.R.T.; Ribeiro F.; Gomes M.	Numerical study of high-velocity impact on aeronautic carbon composites	Mechanics of Advanced Materials and Structures	V. , n.º (-)	10.1080/15376494.2024.2380385	WoS AND SCOPUS	3.6	Q2	Q1
Arruda M.R.T.; Shen J.	Jacobian vs. disturbance method for UMATs in ABAQUS: An application to isotropic damage mechanics	International Journal of Non-Linear Mechanics	V. 167 (104928)	10.1016/j.ijnonlinmec.2024.104928	WoS AND SCOPUS	2.8	Q1	Q2
Avila Y.; de Brito J.; Silva R.V.	Pre-treated municipal solid waste bottom ash as alkali-activated mortar precursor	Magazine of Concrete Research	V. , n.º (-)	10.1680/jmacr.24.00150	WoS AND SCOPUS		Q2	Q3

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Azevedo A.G.S.; Filomeno R.; Gonçalves M.M.; Faria P.; Savastano H.	Innovative MOS-based fiber cement boards: Effect of kraft pulp mills waste and curing by accelerated carbonation	Construction and Building Materials	V. 431 (136525)	10.1016/j.conbuildmat.2024.136525	WoS AND SCOPUS		Q1	Q1
Azevedo A.G.S.; Molano J.C.A.; Parente I.; Freitas T.O.G.; Camões A.; Faria P.; Savastano H., Jr.	Effect of the Rehydration Method on the Physical–Mechanical Properties of CO2-Cured Magnesium-Based Fiber Cement Boards	CivilEng	V. 5, n.º 1(247-264)	10.3390/civileng5010013	WoS AND SCOPUS		Q2	
Azevedo A.S.; Firmo J.P.; Correia J.R.	Bond behaviour at high temperatures between concrete and CFRP or steel strengthening bars applied according to the embedded through-section (ETS) technique	Cement and Concrete Composites	V. 151 (105580)	10.1016/j.cemconcomp.2024.105580	WoS AND SCOPUS		Q1	Q1
Azevedo A.S.; Firmo J.P.; Correia J.R.	Three-dimensional finite element modelling of the fire response of passive and prestressed near-surface mounted (NSM)-CFRP-strengthened reinforced concrete slab strips	Composite Structures	V. 331 (117872)	10.1016/j.compstruct.2023.117872	WoS AND SCOPUS		Q1	Q1
Bammou Y.; Benzougagh B.; Igmoullan B.; Kader S.; Ouallali A.; Spalevic V.; Sestras P.; Kuriqi A.	Spatial Mapping for Multi-Hazard Land Management in Sparsely Vegetated Watersheds Using Machine Learning Algorithms	Environmental Earth Sciences	V. 83, n.º 15(447)	10.1007/s12665-024-11741-9	WoS AND SCOPUS		Q2	Q2
Barreiro J.; Ferreira F.; Brito R.S.; Matos J.S.	Development of Resilience Framework and Respective Tool for Urban Stormwater Services	Sustainability (Switzerland)	V. 16, n.º 3(1316)	10.3390/su16031316	WoS AND SCOPUS		Q2	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Barreiros A.M.; Durão A.; Galvão A.; Matos C.; Mateus D.; Araújo I.; Neves L.; Mourato S.	Higher Education Institutions' Students' Literacy in Sustainable Use of Potable Water	Sustainability (Switzerland)	V. 16, n.º 12(5217)	10.3390/su16125217	WoS AND SCOPUS		Q2	Q2
Barrelas J.; Silva A.; de Brito J.; Tadeu A.	Influence of temperature increase and precipitation decrease on the degradation evolution of rendered façades in service conditions	Journal of Building Engineering	V. 94 (109843)	10.1016/j.jobe.2024.109843	WoS AND SCOPUS		Q1	Q1
Barrelas J.; Silva A.; de Brito J.; Tadeu A.	A new methodology for projecting the future degradation of rendered façades under the influence of a changing climate based on the gradual evolution of maximum temperatures	Science of the Total Environment	V. 953 (176112)	10.1016/j.scitotenv.2024.176112	WoS AND SCOPUS		Q1	Q1
Bashir O.; Bangroo S.A.; Shafai S.S.; Shah T.I.; Kader S.; Jaufer L.; Senesi N.; Kuriqi A.; Omidvar N.; Naresh Kumar S.; Arunachalam A.; Michael R.; Ksibi M.; Spalevic V.; Sestras P.; Marković S.B.; Billi P.; Ercişli S.; Hysa A.	Mathematical vs. machine learning models for particle size distribution in fragile soils of North-Western Himalayas	Journal of Soils and Sediments	V. 24, n.º 6(2294-2308)	10.1007/s11368-024-03820-y	WoS AND SCOPUS		Q1	Q3
Bashiri M.; Ghazavi M.; Bourne-Webb P.J.	Small-scale physical modelling of vertically loaded, cyclically thermally-activated helical piles	Geomechanics for Energy and the Environment	V. 40 (100589)	10.1016/j.gete.2024.100589	WoS AND SCOPUS		Q1	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Bastos D.; Brazão Farinha C.; Maia Pederneiras C.; Veiga R.; Bogas J.A.; Infante Gomes R.; Santos Silva A.	Pathway to Carbon Neutrality in the Cement Industry: CO2 Uptake by Recycled Aggregates from Construction and Demolition Waste	Applied Sciences (Switzerland)	V. 14, n.º 12(5224)	10.3390/app14125224	WoS AND SCOPUS		Q2	Q1
Bedon C.; Santos F.A.; Fasan M.	Mechanical Analysis of the Quasi-Static and Dynamic Composite Action in PV Modules with Viscoelastic Encapsulant	Materials	V. 17, n.º 6(1317)	10.3390/ma17061317	WoS AND SCOPUS		Q2	Q2
Belletreche M.; Bailek N.; Abotaleb M.; Bouchouicha K.; Zerouali B.; Guermoui M.; Kuriqi A.; Alharbi A.H.; Khafaga D.S.; EL-Shimy M.; El-kenawy E.-S.M.	Hybrid attention-based deep neural networks for short-term wind power forecasting using meteorological data in desert regions	Scientific Reports	V. 14, n.º 1(21842)	10.1038/s41598-024-73076-6	WoS AND SCOPUS		Q1	Q1
Bencardino F.; Mazzuca P.; do Carmo R.; Costa H.; Curto R.	Cement-Based Mortars with Waste Paper Sludge-Derived Cellulose Fibers for Building Applications	Fibers	V. 12, n.º 2(13)	10.3390/fib12020013	WoS AND SCOPUS		Q2	Q2
Benrebouh I.; Hafhouf I.; Douadi A.; Merdas A.; Meguellati A.; Faria P.	Salinity Effects on the Physicochemical and Mechanical Behavior of Untreated and Lime-Treated Saline Soils	Minerals	V. 14, n.º 12(1217)	10.3390/min14121217	WoS AND SCOPUS		Q2	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Bento Rebelo H.; Assunção B.; Bedon C.; Amarante dos Santos F.	Exploratory study on the use of bi-stable supports for the impact protection of point-fixed glazing systems	International Journal of Protective Structures	V. 15, n.º 3(419-441)	10.1177/20414196231175979	WoS AND SCOPUS		Q2	Q2
Bento S.; Melo M.T.C.; Gramaglia C.	Ethical reflections on groundwater in contaminated areas	Sustainable Water Resources Management	V. 10, n.º 1(5)	10.1007/s40899-023-00983-3	WoS AND SCOPUS		Q2	Q3
Bento, R.	2.ª geração do Eurocódigo 8 – Projeto de estruturas para resistência aos sismos.	Revista Portuguesa de Engenharia de Estruturas	Série III. n.º 25 (99-108)	10.34638/rpee-sIII-n25-011	Non WoS AND non SCOPUS			
Bersch J.D.; da Silva Andrade Neto J.; do Socorro Matos da Silva T.; Masuero A.B.	Effect of Different Types of Paint on the Hygrothermal Behavior of Facade-Rendering Mortars in Brazil	Journal of Architectural Engineering	V. 30, n.º 2(04024005)	10.1061/JAEIED.AEENG-1648	WoS AND SCOPUS	1.5	Q1	Q3
Bodas Freitas T.M.; Matos Sirgado R.A.; Bourne-Webb P.J.; de Jesus Silva D.N.	The influence of geometry on the heat exchange potential of embedded planar retaining walls with seasonally-balanced thermal load	Applied Thermal Engineering	V. 246 (122893)	10.1016/j.applthermaleng.2024.122893	WoS AND SCOPUS		Q1	Q1
Bombar G.; Cardoso A.H.C.	Effect of Transversal Bed Slope on the Equilibrium Scour Depth at Bridge Piers	Journal of Hydraulic Engineering	V. 150, n.º 4(04024015)	10.1061/JHEND8.HYENG-13756	WoS AND SCOPUS		Q2	Q2-Q3

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Bonilla-Correa D.M.; Coronado-Hernández O.E.; Arrieta-Pastrana A.; Fuertes-Miquel V.S.; Pérez-Sánchez M.; Ramos H.M.	Mathematical Approach for Directly Solving Air–Water Interfaces in Water Emptying Processes	Water (Switzerland)	V. 16, n.º 22(3203)	10.3390/w16223203	WoS AND SCOPUS		Q2	Q2
Bonilla-Correa D.M.; Coronado-Hernández O.E.; Arrieta-Pastrana A.; Pérez-Sánchez M.; Ramos H.M.	Proposed Approach for Modelling the Thermodynamic Behaviour of Entrapped Air Pockets in Water Pipeline Start-Up	Fluids	V. 9, n.º 8(185)	10.3390/fluids9080185	WoS AND SCOPUS		Q2	Q3
Brasil Cirilo da Silva W.; Barroso S.H.D.A.; de Picado-Santos L.G.; Cabral A.E.B.; Stefanutti R.	Potential application of by-products from the construction industry and waste from coconuts for concrete road paving blocks: physical and mechanical properties	International Journal of Pavement Engineering	V. 25, n.º 1(2424392)	10.1080/10298436.2024.2424392	WoS AND SCOPUS		Q1	Q1
Brazão Farinha C.; Maia Pederneiras C.; Infante Gomes R.; Bastos D.; Veiga R.	Life Cycle Carbon Assessment of Mortars with Carbonated and Non-Carbonated Recycled Aggregates	Applied Sciences (Switzerland)	V. 14, n.º 17(7442)	10.3390/app14177442	WoS AND SCOPUS		Q2	Q1
Bud M.A.; Nedelcu M.; Moldovan I.; Figueiredo E.	Hybrid Approach for Supervised Machine Learning Algorithms to Identify Damage in Bridges	Journal of Bridge Engineering	V. 29, n.º 8(04024056)	10.1061/JBENF2.BEENG-6537	WoS AND SCOPUS		Q1	Q2
Büngener L.; Galvão A.; Postila H.; Heiderscheidt E.	Microplastic retention in green walls for nature-based and decentralized greywater treatment	Environmental Pollution	V. 363 (125047)	10.1016/j.envpol.2024.125047	WoS AND SCOPUS		Q1	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Cabette M.; Pais J.; Micaelo R.	Extrinsic healing of asphalt mixtures: a review	Road Materials and Pavement Design	V. 25, n.º 6(1145-1173)	10.1080/14680629.2023.2266506	WoS AND SCOPUS		Q1	Q1
Cabette, M; Micaelo, R; Pais, J	Fatigue Resistance of Unaged and Aged Bio-bitumen: Time Sweep Test versus Linear Amplitude Sweep Test	Journal of Testing and Evaluation	V. 53 , n.º 2 ()	10.1520/JTE20240213	Non WoS OR non SCOPUS		Q3	Q4
Cabral M.; Gray D.; Brentan B.; Covas D.	Assessing Pipe Condition in Water Distribution Networks	Water (Switzerland)	V. 16, n.º 10(1318)	10.3390/w16101318	WoS AND SCOPUS		Q2	Q2
Cabral M.; Loureiro D.; Amado C.; Covas D.	Deterioration Models and Service Life Prediction of Vertical Assets of Urban Water Systems	Water Resources Research	V. 60, n.º 4(e2023WR034854)	10.1029/2023WR034854	WoS AND SCOPUS		Q1	Q1
Cabrita S.; Matos J.S.; Ferreira F.	Critical Infrastructures in Informal Settlements of Maputo City, Mozambique: The Importance of Interdependencies for Interventions Prioritization	Urban Science	V. 8, n.º 4(195)	10.3390/urbansci8040195	WoS AND SCOPUS		Q1	Q2
Callefi M.H.; Ganga G.M.D.; Godinho Filho M.; Ribeiro da Silva E.; Osiro L.; Reis V.	Illuminating the road ahead: unlocking the potential of ICTs for enhanced data visibility in road transportation	Industrial Management and Data Systems	V. 124, n.º 2(786-819)	10.1108/IMDS-02-2023-0115	WoS AND SCOPUS	4.2	Q1	Q1
Callefi M.H.; Ganga G.M.D.; Godinho Filho M.; Ribeiro da Silva E.; Osiro L.; Reis V.	A roadmap for prioritising technology-enabled capabilities in road freight transportation management	International Journal of Logistics Research and Applications	V. , n.º (-)	10.1080/13675567.2024.2389069	WoS AND SCOPUS	4.5	Q1	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Câmara G.; Micaelo R.; Azevedo N.M.; Silva H.	Incremental Viscoelastic Damage Contact Models for Asphalt Mixture Fracture Assessment	Infrastructures	V. 9, n.º 7(118)	10.3390/infrastructures9070118	WoS AND SCOPUS		Q2	Q2
Cantero B.; Neves R.; Sequeira L.; de Brito J.; Bravo M.	Optimisation of the performance of alkali-activated mortars using CDW binders from different sources	Construction and Building Materials	V. 442 (137677)	10.1016/j.conbuildmat.2024.137677	WoS AND SCOPUS		Q1	Q1
Capponi C.; Martins N.M.C.; Covas D.I.C.; Brunone B.; Meniconi S.	Transient Test-Based Techniques for Checking the Sealing of In-Line Shut-Off Valves and Capturing the Effect of Series Junctions—Field Tests in a Real Pipe System	Water (Switzerland)	V. 16, n.º 1(3)	10.3390/w16010003	WoS AND SCOPUS		Q2	Q2
Caracol C.; Kravchanka L.; Bravo M.; de Brito J.; Agrela F.; Rosales J.	Recycled aggregate concrete using seawater: Optimizing concrete's sustainability	Journal of Building Engineering	V. 97 (110841)	10.1016/j.jobe.2024.110841	WoS AND SCOPUS		Q1	Q1
Cardoso B.; Cavaco E.; Júlio E.; Tavares M.E.	Numerical investigation on the behavior of thin concrete shells subjected to nonuniform and asymmetrical loads	Structural Concrete	V. , n.º (-)	10.1002/suco.202400532	WoS AND SCOPUS		Q1	Q2
Cardoso R.; Scholler L.; Pinto M.M.; Flores-Colen I.; Covas D.	Experimental analysis of biocementation technique for sealing cracks in concrete water storage tanks	Construction and Building Materials	V. 412 (134854)	10.1016/j.conbuildmat.2023.134854	WoS AND SCOPUS		Q1	Q1
Cardoso V.E.M.; Sanhudo L.; Silvestre J.D.; Almeida M.; Costa A.A.	Challenges in the harmonisation and digitalisation of Environmental Product Declarations for construction products in the European context	International Journal of Life Cycle Assessment	V. 29, n.º 5(759-788)	10.1007/s11367-024-02279-w	WoS AND SCOPUS		Q1	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Cardoso, D.; Flores-Colen, I; Pereira,M. F. C.; Ferreira, P.; Sequeira, P.; Silva,L.	Melhoria de desempenho do ETICS, com base em lã mineral, por homogeneização da superfície de interação entre componentes	Revista Engenharia Civil UM	n.º 67, pp. 33-42	10.22181/aer.2024.0104	Non WoS AND non SCOPUS			
Carmo R.; Costa H.; Soldado E.; Soares A.C.; Júlio E.	Bond stress and cracking in low carbon concrete with fly ash addition	Engineering Structures	V. 316 (118561)	10.1016/j.engstruct.2024.118561	WoS AND SCOPUS		Q1	Q1
Carmos, R.; Martins, R.; Sousa, R.; Furtado, A.; Júlio, E.	Novas soluções de ligações entre elementos estruturais de construções modulares" —	Construção Magazine	nº 124, pp. 13-15		Non WoS AND non SCOPUS			
Carneiro J.; Loureiro D.; Cabral M.; Covas D.	Comprehensive Resilience Assessment Framework for Water Distribution Networks	Water (Switzerland)	V. 16, n.º 18(2611)	10.3390/w16182611	WoS AND SCOPUS		Q2	Q2
Carneiro J.; Loureiro D.; Cabral M.; Covas D.	Integrating Uncertainty in Performance Assessment of Water Distribution Networks by Scenario Building	Water (Switzerland)	V. 16, n.º 7(977)	10.3390/w16070977	WoS AND SCOPUS		Q2	Q2
Carvalho C.; Sousa A.; Silva A.; Mendes M.P.	User Perceptions and Conservation Practices: A Case Study of Maintenance Strategies at S. Bento Railway Station	Buildings	V. 14, n.º 12(3855)	10.3390/buildings14123855	WoS AND SCOPUS		Q2	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Castelo S.; Bussolotti V.M.; Pellegrini I.; Ferreira F.; Ismail N.A.; Poggi F.; Amado M.	The Impact of Street Trees on Temperature Reduction in a Nature-Based Climate Adaptation Program in George Town, Malaysia	Climate	V. 12, n.º 10(154)	10.3390/cli12100154	WoS AND SCOPUS		Q2	Q2
Castelo S.; Ferreira F.; Amado M.	Designing a knowledge transfer model for accelerating urban climate adaptation in Malaysia	Journal of Infrastructure, Policy and Development	V. 8, n.º 10(6143)	10.24294/jipd.v8i10.6143	Non WoS OR non SCOPUS		Q2	Q4
Castelo, S; Antunes, L; Ashrafuzzaman, M	The impact of the climate crisis on gender inequality. Looking to the frontlines in search of priorities for policy	Frontiers in Sustainable Cities	V. 6, n.º (1304535)	10.3389/frsc.2024.1304535	WoS AND SCOPUS	2.4	Q1	Q3
Castro N.; Romão F.; Félix P.M.	A foreign settler: The anthropogenic displacement of sea cucumbers through fisheries discards	Journal of the Marine Biological Association of the United Kingdom	V. 104 (e67)	10.1017/S0025315424000614	WoS AND SCOPUS	1.1	Q3	Q3
Catelas J.M.R.; Fernandes J.F.P.; Pérez-Sánchez M.; López-Jiménez P.A.; Ramos H.M.; Branco P.J.C.	Energy Efficiency and Stability of Micro-Hydropower PAT-SEIG Systems for DC Off-Grids	Energies	V. 17, n.º 6(1382)	10.3390/en17061382	WoS AND SCOPUS		Q1	Q3
Cerqueira E.; Oliveira C., Jr; Landesmann A.; Camotim D.; Dinis P.B.; Martins A.D.	DSM-Based failure load prediction of CFS pin-ended singly symmetric columns buckling in flexural-torsional modes	Thin-Walled Structures	V. 204 (112334)	10.1016/j.tws.2024.112334	WoS AND SCOPUS		Q1	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Chougan, M; Skibicki, S; Al-Noaimat, YA; Federowicz, K; Hoffmann, M; Sibera, D; Cendrowski, K; Techman, M; Pacheco, JN; Ghaffar, SH; Sikora, P	Comparative analysis of ternary blended cement with clay and engineering brick aggregate for high-performance 3D printing	Developments in the Built Environment	V. 20, n.º (100529)	10.1016/j.dibe.2024.100529	WoS AND SCOPUS		Q1	Q1
Cintura E.; Faria P.; Molari L.; Barbaresi L.; D'Orazio D.; Nunes L.	Characterization of an Arundo donax-based composite: A solution to improve indoor comfort	Industrial Crops and Products	V. 208 (117756)	10.1016/j.indcrop.2023.117756	WoS AND SCOPUS	5.6	Q1	Q1
Cintura E.; Faria P.; Molari L.; Barbaresi L.; D'Orazio D.; Nunes L.	A feasible re-use of an agro-industrial by-product: Hazelnut shells as high-mass bio-aggregate in boards for indoor applications	Journal of Cleaner Production	V. 434 (140297)	10.1016/j.jclepro.2023.140297	WoS AND SCOPUS		Q1	Q1
Cintura E.; Faria P.; Molari L.; Mazzocchetti L.; Dalle Donne M.; Giorgini L.; Nunes L.	Bio-based boards made of hazelnut shell and A. donax for indoor applications - A solution with good performance in case of fire	Journal of Building Engineering	V. 95 (110274)	10.1016/j.jobe.2024.110274	WoS AND SCOPUS		Q1	Q1

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Cintura E.; Nunes L.; Molari L.; Bettuzzi M.; Morigi M.P.; Brancaccio R.; Faria P.	Hygroscopicity and Morphology of Bio-Based Boards—The Influence of the Formulation	Applied Sciences (Switzerland)	V. 14, n.º 2(873)	10.3390/app14020873	WoS AND SCOPUS		Q2	Q1
Cloux S.; Pérez P.; de Pablo H.; Pérez-Muñuzuri V.	A regional Lagrangian model to evaluate the dispersion of floating macroplastics in the North Atlantic Ocean from land and river sources in the western coast of Spain	Marine Pollution Bulletin	V. 209 (117110)	10.1016/j.marpolbul.2024.117110	WoS AND SCOPUS		Q1	Q1
Coelho J.S.T.; Alves A.B.; Morillo J.G.; Coronado-Hernández O.E.; Perez-Sanchez M.; Ramos H.M.	Hybrid Energy Solution to Improve Irrigation Systems: HY4RES vs. HOMER Optimization Models	Energies	V. 17, n.º 16(4037)	10.3390/en17164037	WoS AND SCOPUS		Q1	Q3
Coelho J.S.T.; Pérez-Sánchez M.; Coronado-Hernández O.E.; Sánchez-Romero F.-J.; McNabola A.; Ramos H.M.	Hybrid Renewable Systems for Small Energy Communities: What Is the Best Solution?	Applied Sciences (Switzerland)	V. 14, n.º 21(10052)	10.3390/app142110052	WoS AND SCOPUS		Q2	Q1
Coelho J.S.T.; van de Loo M.; Díaz J.A.R.; Coronado-Hernández O.E.; Perez-Sanchez M.; Ramos H.M.	Multi-Objective and Multi-Variable Optimization Models of Hybrid Renewable Energy Solutions for Water–Energy Nexus	Water (Switzerland)	V. 16, n.º 17(2360)	10.3390/w16172360	WoS AND SCOPUS		Q2	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Coelho J.T.; Pérez-Sánchez M.; Coronado-Hernández O.E.; Besharat M.; Feng R.-L.; Tasca E.; Zhou L.; Ramos H.M.	Hydropneumatic storage methodology towards a new era of hybrid energy system's efficiency and flexibility	Results in Engineering	V. 24 (103117)	10.1016/j.rineng.2024.103117	WoS AND SCOPUS		Q1	Q1
Coelho L.M.; Kox R.P.; Guimarães A.C.R.; Travincas R.; Monteiro S.N.	Influence of Curing Time on the Mechanical Behavior of Cold Recycled Bituminous Mix in Flexible Pavement Base Layer	Applied Sciences (Switzerland)	V. 14, n.º 17(7612)	10.3390/app14177612	WoS AND SCOPUS		Q2	Q1
Colacicco A.; Zacchei E.	Innovative method for the brine treatment by electrokinetic principles integrated with solar photovoltaic plants	Marine Pollution Bulletin	V. 198 (115886)	10.1016/j.marpolbul.2023.115886	WoS AND SCOPUS		Q1	Q1
Colaço R.; de Abreu e Silva J.	Commercial land use change and growth processes – An assessment of retail location in Lisbon, Portugal, 1995–2020	Journal of Urban Management	V. 13, n.º 1(157-170)	10.1016/j.jum.2023.11.005	WoS AND SCOPUS		Q1	Q1
Colaço R.; Kappler L.B.; de Abreu e Silva J.	Pandemic immobilities and consequences for commuting: Implications for mobility of COVID-19 mandatory telecommuting	Journal of Transport Geography	V. 114 (103780)	10.1016/j.jtrangeo.2023.103780	WoS AND SCOPUS		Q1	Q1
Colaço, R.; de Abreu e Silva, J.	Interactions between Online Shopping, In-Store Shopping and Weekly Travel Behavior: An Analysis Before and in the Aftermath of COVID-19 in Lisbon, Portugal	Transportation Research Record	V. 2678, n.º 12(2112-2124)	10.1177/03611981231194628	WoS AND SCOPUS		Q2	Q3

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Cordeiro V.; Sá-da-Costa M.; Alpiarça C.; Neves J.; Galhano dos Santos R.; Bordado J.; Micaelo R.	The Effect of a Liquified Wood Heavy Fraction on the Rheological Behaviour and Performance of Paving-Grade Bitumen	Sustainability (Switzerland)	V. 16, n.º 3(972)	10.3390/su16030972	WoS AND SCOPUS		Q2	Q2
Coronado-Hernández O.E.; Pérez-Sánchez M.; Arrieta-Pastrana A.; Fuertes-Miquel V.S.; Coronado-Hernández J.R.; Quiñones-Bolaños E.; Ramos H.M.	Dynamic Effects of a Regulating Valve in the Assessment of Water Leakages in Single Pipelines	Water Resources Management	V. 38, n.º 8(2889-2903)	10.1007/s11269-024-03797-w	WoS AND SCOPUS		Q1	Q1
Costa M.; Lima Azevedo C.; Siebert F.W.; Marques M.; Moura F.	Unraveling the relation between cycling accidents and built environment typologies: Capturing spatial heterogeneity through a latent class discrete outcome model	Accident Analysis and Prevention	V. 200 (107533)	10.1016/j.aap.2024.107533	WoS AND SCOPUS	5.7	Q1	Q1
Costa M.J.; Leite R.; Merianne A.; Santos J.M.; Boavida I.	Freshwater habitat invaders: Impacts on artificial flow refuge use by native fish under pulsed flows	Science of the Total Environment	V. 955 (176924)	10.1016/j.scitotenv.2024.176924	Non WoS OR non SCOPUS		Q1	Q1
Costa S.; Meireles I.; Sousa V.	Understanding residential water demand: insights from a survey in a Mediterranean city	Urban Water Journal	V. 21, n.º 4(521-537)	10.1080/1573062X.2024.2312501	WoS AND SCOPUS		Q2	Q3
Couto R.; Mucedero G.; Bento R.; Monteiro R.	A Practice-Oriented Approach for Seismic and Energy Performance Upgrading of Existing Buildings	Journal of Earthquake Engineering	V. 28, n.º 15(4380-4407)	10.1080/13632469.2024.2382474	WoS AND SCOPUS		Q1	Q2

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Couto R.; Mucedero G.; Bento R.; Monteiro R.	Understanding the Impact of Seismic Hazard and Climate Conditions on Multi Criteria–Based Retrofitting of Existing Buildings	Sustainability (Switzerland)	V. 16, n.º 10(4318)	10.3390/su16104318	WoS AND SCOPUS		Q2	Q2
Covas D.; Cabral M.; Ferreira J.P.; Ramos H.	Contributions to Leak and Air Pocket Detection Using Transient Pressure Signals	Engineering Proceedings	V. 69, n.º 1(139)	10.3390/engproc2024069139	Non WoS OR non SCOPUS		Q3	
Crucho J.M.L.; Picado-Santos L.G.D.; Neves J.M.C.D.	Assessment of the durability of cement-bound granular mixtures using reclaimed concrete aggregate and coconut fiber	Construction and Building Materials	V. 441 (137550)	10.1016/j.conbuildmat.2024.137550	WoS AND SCOPUS		Q1	Q1
Cruz R.; Bogas J.A.	Durability of compressed earth blocks stabilised with recycled cement from concrete waste and incorporating construction and demolition waste	Construction and Building Materials	V. 450 (138673)	10.1016/j.conbuildmat.2024.138673	WoS AND SCOPUS		Q1	Q1
Cruz R.; Bogas J.A.; Balboa A.; Faria P.	Water Resistance of Compressed Earth Blocks Stabilised with Thermoactivated Recycled Cement	Materials	V. 17, n.º 22(5617)	10.3390/ma17225617	WoS AND SCOPUS		Q2	Q2
Cruz, R.; Bogas, J.; Real, S.; Rodrigues, J.	Durabilidade de blocos de terra comprimida estabilizados com ligantes recuperados a partir da fração cimentícia de resíduos de betão	Construção Magazine	n. º 123, pp. 22-26		Non WoS AND non SCOPUS			
Dapper S.T.H.; Bersch J.D.; Masuero A.B.	Impact of Formwork Materials on Concrete Surface Quality	Buildings	V. 14, n.º 11(3450)	10.3390/buildings14113450	WoS AND SCOPUS		Q2	Q2
das Neves N.S.; Landesmann A.; Camotim D.	CFS lipped channel beams buckling in distortional modes at elevated temperatures: Behaviour, failure and DSM design	Thin-Walled Structures	V. 195 (111366)	10.1016/j.tws.2023.111366	WoS AND SCOPUS		Q1	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Daza-Marquez, N; Guzmán, A; Avila, Y; Abellan-Garcia, J	Exploring the potential of nitrophosphogypsum and calcined water-treatment plant sludges in mortar mixtures: A study on workability and strength	Construction and Building Materials	V. 432, n.º (136646)	10.1016/j.conbuildmat.2024.136646	WoS AND SCOPUS		Q1	Q1
Daza-Marquez, N; Guzmán, A; Avila, Y; Abellan-Garcia, J	Corrigendum to “Exploring the potential of nitrophosphogypsum and calcined water-treatment plant sludges in mortar mixtures: A study on workability and strength” [Construction and Building Materials Volume 432, 21 June 2024, 136646] (Construction and Building Materials (2024) 432, (S0950061824017872), (10.1016/j.conbuildmat.2024.136646))	Construction and Building Materials	V. 433, n.º (136792)	10.1016/j.conbuildmat.2024.136792	WoS AND SCOPUS		Q1	Q1
de Abreu e Silva J.; de Menezes Amorim J.	The Role of Technophilia and User Goals in the Intention to Use a Mobility Management Travel App	Sustainability (Switzerland)	V. 16, n.º 22(9645)	10.3390/su16229645	WoS AND SCOPUS		Q2	Q2
de Figueiredo D.R.; Condesso de Melo M.T.; Saraiva P.P.; Oliveira J.; Gonçalves A.M.M.; Reboleira A.S.P.S.; Polónia A.R.M.; Abrantes N.; Cleary D.F.R.	Bacterioplankton Community Diversity of a Portuguese Aquifer System (Maciço Calcário Estremenho)	Water (Switzerland)	V. 16, n.º 13(1858)	10.3390/w16131858	WoS AND SCOPUS		Q2	Q2
de Lourdes Ferreira Minervino B.; Calmeiro C.C.; Von Kruguer P.G.; Rodrigues J.P.C.	Fire Risk Analysis: A Proposal for Historic Buildings in Brazil	International Journal of Architectural Heritage	V. , n.º (-)	10.1080/15583058.2024.2308512	WoS AND SCOPUS		Q1	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
de Mello, FP	Voluntary carbon offset programs in aviation: A systematic literature review	Transport Policy	V. 147, n.º (471-484)	10.1016/j.tranpol.2023.12.023	WoS AND SCOPUS	6.3	Q1	Q1
de Paula D.J.; Rodrigues J.P.C.; Camargo A.L.; Lopes R.F.R.	Performance fire tests on building external walls made of sandwich panels	Fire Safety Journal	V. 150 (104273)	10.1016/j.firesaf.2024.104273	WoS AND SCOPUS		Q1	Q2
de Sousa Figueira J.; Nachbaur S.; Wehinger S.; Bourne-Webb P.	The Implementation and Comparison of Conventional and Enhanced Borehole Thermal Response Tests: A Case Study	Energies	V. 17, n.º 13(3161)	10.3390/en17133161	WoS AND SCOPUS		Q1	Q3
Di Lollo G.; Adduce C.; Brito M.; Ferreira R.M.L.; Ricardo A.M.	Turbulent kinetic energy redistribution in a gravity current interacting with an emergent cylinder	Advances in Water Resources	V. 183 (104585)	10.1016/j.advwatres.2023.104585	WoS AND SCOPUS		Q1	Q1
Dias L.C.; Marques P.; Garcia R.; de Santo F.; Tentúgal R.; Natal-da-Luz T.; Sousa Á.; Sousa J.P.; Freire F.	Using qualitative information elicited from a panel to obtain robust conclusions: a protocol and an application to improve integrated pest management systems	Annals of Operations Research	V. , n.º (-)	10.1007/s10479-024-06162-7	WoS AND SCOPUS		Q1	Q1
Dias S.; Almeida J.; Tadeu A.; de Brito J.	Alternative concrete aggregates - Review of physical and mechanical properties and successful applications	Cement and Concrete Composites	V. 152 (105663)	10.1016/j.cemconcomp.2024.105663	WoS AND SCOPUS		Q1	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
do Nascimento T.V.M.; de Oliveira R.P.; Condesso de Melo M.T.	Impacts of large-scale irrigation and climate change on groundwater quality and the hydrological cycle: A case study of the Alqueva irrigation scheme and the Gabros de Beja aquifer system	Science of the Total Environment	V. 907 (168151)	10.1016/j.scitotenv.2023.168151	WoS AND SCOPUS		Q1	Q1
Dos Santos F.A.; Favata A.; Micheletti A.; Paroni R.; Picchi Scardaoni M.	Programming quadric metasurfaces via infinitesimal origami maps of monohedral hexagonal tessellations: Part i	Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences	V. 480, n.º 2283(20230430)	10.1098/rspa.2023.0430	WoS AND SCOPUS		Q1	Q1
dos Santos F.A.; Favata A.; Micheletti A.; Paroni R.; Scardaoni M.P.	Programming quadric metasurfaces via infinitesimal origami maps of monohedral hexagonal tessellations: Part II	Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences	V. 480, n.º 2284(20230449)	10.1098/rspa.2023.0449	WoS AND SCOPUS		Q1	Q1
Duarte R.; Moret Rodrigues A.; Pimentel F.; Gomes M.D.G.	The Effect of Occupancy and Environmental Physical Variables on Classrooms' Natural Ventilation: A Path Modeling Approach	Applied Sciences (Switzerland)	V. 14, n.º 24(11705)	10.3390/app142411705	WoS AND SCOPUS		Q2	Q1
El-kenawy E.-S.M.; Bailek N.; Bouchouicha K.; Zerouali B.; Hassan M.A.; Kuriqi A.; Jamil B.; Colak I.; Khalil A.; Ibrahim A.	Global scale solar energy harnessing: An advanced intra-hourly diffuse solar irradiance predicting framework for solar energy projects	Neural Computing and Applications	V. 36, n.º 18(10585-10598)	10.1007/s00521-024-09608-y	Non WoS OR non SCOPUS		Q1	Q2
Elmoudnia H.; Faria P.; Jalal R.; Waqif M.; Saâdi L.	A comprehensive chemical, physical, mechanical, and thermal characterization of novel cellulosic plant extracted from the petiole of Washingtonia robusta fibers	Biomass Conversion and Biorefinery	V. , n.º (-)	10.1007/s13399-024-06178-w	WoS AND SCOPUS		Q2	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Espinosa L.A.; Portela M.M.; Gharbia S.	Assessing Changes in Exceptional Rainfall in Portugal Using ERA5-Land Reanalysis Data (1981/1982–2022/2023)	Water (Switzerland)	V. 16, n.º 5(628)	10.3390/w16050628	WoS AND SCOPUS		Q2	Q2
Espinosa L.A.; Portela M.M.; Ocampo-Guerrero N.	Beyond Temperature Peaks: The Growing Persistence and Intensity of Tmin and Tmax Heatwaves in Portugal's Changing Climate (1980/1981–2022/2023)	Atmosphere	V. 15, n.º 12(1485)	10.3390/atmos15121485	WoS AND SCOPUS		Q2	Q3
Fagundes T.S.; Cunha Marques R.; Malheiros T.F.	Are Brazilian water auction prices affordable for vulnerable families?	Utilities Policy	V. 88 (101749)	10.1016/j.jup.2024.101749	WoS AND SCOPUS		Q1	Q2
Fagundes T.S.; Marques R.C.; Malheiros T.F.	Impact of efficiency on affordability: A study of the Brazilian new water loss goals	Water Supply	V. 24, n.º 5(1645-1657)	10.2166/ws.2024.098	Non WoS OR non SCOPUS		Q2	Q3
Fanha, P.; Ferreira, T.; Silva, J. M.	Contributos da fotogrametria para a salvaguarda e promoção do património cultural edificado: caso de estudo em Évora	Revista Pedra & Cal	n.º 77 - Julho-Dez 2024		Non WoS AND non SCOPUS			
Farhadian M.; Khalafbeigi M.; Akbarfahimi M.; Abharian P.H.; Yazdani F.; Shoaei A.	The Persian Version of the Nottingham Leisure Questionnaire: Translation, Cultural Adaptation, and Psychometric Properties	Journal of Rehabilitation Sciences and Research	V. 11, n.º 4(202-207)	10.30476/jrsr.2023.99427.1391	Non WoS OR non SCOPUS		Q4	
Feitosa, I; Santos, B; Almeida, PG	Pavement Inspection in Transport Infrastructures Using Unmanned Aerial Vehicles (UAVs)	Sustainability (Switzerland)	V. 16, n.º 5 (2207)	10.3390/su16052207	WoS AND SCOPUS		Q2	Q2
Fernandes M.; Neves R.	Assessment of Fiber Corrosion Influence in the Flexural Performance of Steel Fiber-Reinforced Concrete	Applied Sciences (Switzerland)	V. 14, n.º 13(5611)	10.3390/app14135611	WoS AND SCOPUS		Q2	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Fernandes P.; Cavaco E.; do Carmo R.; Maranha P.; Júlio E.	Long-term behavior of slender long-span precast prestressed high-strength concrete girders	Structural Concrete	V. 25, n.º 3(1571-1589)	10.1002/suco.202300163	WoS AND SCOPUS		Q1	Q2
Fernandes P.; Elbashir D.; Agante M.	Experimental characterization of indented dry connections for precast double-curved concrete shells	Structural Concrete	V. , n.º (-)	10.1002/suco.202400647	WoS AND SCOPUS		Q1	Q2
Fernandes, JN; Leal, JB; Cardoso, AH	Shear Layer Development and Fully Developed Flows in Compound Channels	Water Resources Management	V. 39, n.º 3 (1055 - 1072)	10.1007/s11269-024-04005-5	WoS AND SCOPUS		Q1	Q1
Fernández Rodríguez R.; Cardoso R.	Applicability of electrical resistivity measurements for monitoring biocementation treatment in soils	Engineering Geology	V. 335 (107533)	10.1016/j.enggeo.2024.107533	WoS AND SCOPUS		Q1	Q1
Ferreira Filho E.B.; Landesmann A.; Camotim D.	DSM design of cold-formed steel fixed-ended lipped channel columns undergoing distortional-global interaction	Thin-Walled Structures	V. 203 (112217)	10.1016/j.tws.2024.112217	WoS AND SCOPUS		Q1	Q1
Ferreira J.P.; Ferràs D.; Covas D.I.C.; Kapelan Z.	Air entrapment modelling in water supply networks during pipe filling events	Urban Water Journal	V. 21, n.º 6(685-697)	10.1080/1573062X.2024.2342785	WoS AND SCOPUS		Q2	Q3
Ferreira J.P.; Ferràs D.; Covas D.I.C.; van der Werf J.A.; Kapelan Z.	Air entrapment modelling during pipe filling based on SWMM	Journal of Hydraulic Research	V. 62, n.º 1(39-57)	10.1080/00221686.2024.2305354	WoS AND SCOPUS		Q2	Q3
Ferreira L.D.P.S.; Teloli R.D.O.; da Silva S.; Figueiredo E.; Maia N.; Cimini C.A., Jr	Bayesian data-driven framework for structural health monitoring of composite structures under limited experimental data	Structural Health Monitoring	V. , n.º (-)	10.1177/14759217241236801	WoS AND SCOPUS		Q1	Q1

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Ferreira L.D.P.S.; Teloli R.D.O.; da Silva S.; Figueiredo E.; Moldovan I.D.; Maia N.; Cimini C.A., Jr.	Bayesian calibration for Lamb wave propagation on a composite plate using a machine learning surrogate model	Mechanical Systems and Signal Processing	V. 208 (111011)	10.1016/j.ymssp.2023.111011	WoS AND SCOPUS		Q1	Q1
Ferreira M.A.; Oliveira C.S.; Francisco R.	Tsunami risk mitigation: the role of evacuation routes, preparedness and urban planning	Natural Hazards	V. , n.º (-)	10.1007/s11069-024-07061-7	WoS AND SCOPUS		Q1	Q2
Ferreira P.L.; Covas D.I.C.	Mesh Sensitivity Analysis of Axisymmetric Models for Smooth–Turbulent Transient Flows	Fluids	V. 9, n.º 11(268)	10.3390/fluids9110268	WoS AND SCOPUS		Q2	Q3
Ferreira, F.	A nova Diretiva de Águas Residuais Urbanas e o controlo da poluição de origem pluvial	Indústria e Ambiente	nº 146, maio/ junho 2024		Non WoS AND non SCOPUS			
Ferreira, F.; Pisoeiro, J.; Mazuze, F.; Júnior, R.; Matos, J.S.	Gestão e tratamento de lamas fecais em países da África Subsariana - o caso da ETAR do Infulene, Maputo, Moçambique	Águas & Resíduos	Série V, n.º 01, janeiro 2024	10.22181/aer.2024.0102	Non WoS AND non SCOPUS			
Ferreira, R.M.L.; Ricardo, A.M.; Fernandes, J.N.; Carvalho, E.; Bento, A.M.; Batoréu, A.; Lima, M.; Fernandes, A.; Sousa, A.M.	Notas sobre a criação da Comissão Especializada em Rios	Recursos Hídricos	V. 45, n.º1 (75-77)		Non WoS AND non SCOPUS			

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Figueira, JS; Gil, AG; Vieira, A; Michopoulos, AK; Boon, DP; Loveridge, F; Cecinato, F; Götzl, G; Epting, J; Zosseder, K; Bloemendal, M; Woods, M; Christodoulides, P; Vardon, PJ; Borg, SP; Poulsen, SE; Andersen, TR	Shallow geothermal energy systems for district heating and cooling networks: Review and technological progression through case studies	Renewable Energy	V. 236, n.º (121436)	10.1016/j.renene.2024.121436	WoS AND SCOPUS		Q1	Q1
Figueiredo E.; Peres N.; Moldovan I.; Nasr A.	Impact of climate change on long-term damage detection for structural health monitoring of bridges	Structural Health Monitoring	V. , n.º (-)	10.1177/14759217231224254	WoS AND SCOPUS		Q1	Q1
Figueiredo J.M.; Simões F.M.F.; Pinto da Costa A.	Unilateral buckling of thin plates by complementarity eigenvalue analyses	Thin-Walled Structures	V. 205 (112387)	10.1016/j.tws.2024.112387	WoS AND SCOPUS		Q1	Q1
Fonseca J.; Antunes V.; Freire A.C.	Contributions to Incorporation of Non-Recyclable Plastics in Bituminous Mixtures	Sustainability (Switzerland)	V. 16, n.º 22(9945)	10.3390/su16229945	WoS AND SCOPUS		Q2	Q2
Forero J.A.; de Brito J.; Evangelista L.; Pereira C.H.F.	Mechanical and fracture properties of concrete with recycled concrete aggregates treated with acids and addition of aluminium sulphate	Construction and Building Materials	V. 447 (137947)	10.1016/j.conbuildmat.2024.137947	WoS AND SCOPUS		Q1	Q1
Francisco R.; Matos J.P.	Deep Learning Prediction of Streamflow in Portugal	Hydrology	V. 11, n.º 12(217)	10.3390/hydrology11120217	WoS AND SCOPUS		Q2	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Freitas P.; Nascimento S.; Pedro J.J.O.	Shear buckling resistance and intermediate transverse stiffeners internal forces of full-scale steel plate girders – Experimental tests and numerical investigation	Engineering Structures	V. 314 (118303)	10.1016/j.engstruct.2024.118303	WoS AND SCOPUS		Q1	Q1
Furtado, A.; Sousa,R.; Carmo, R.; Júlio, E.	Comportamento sísmico de estruturas modulares pré-fabricadas em betão armado	Construção Magazine	nº 124, pp. 38-39		Non WoS AND non SCOPUS			
Gaitero J.J.; Prabhu A.; Hochstein D.; Mohammadi-Firouz R.; Ouellet-Plamondon C.; Bendouma M.; Snoeck D.; Ramón-Álvarez I.; Sánchez-Delgado S.; Torres-Carrasco M.; Dolado J.S.	Reviewing experimental studies on sensible thermal energy storage in cementitious composites: report of the RILEM TC 299-TES	Materials and Structures/Materiaux et Constructions	V. 57, n.º 4(100)	10.1617/s11527-024-02369-z	WoS AND SCOPUS		Q1	Q1
Galhofo D.; Duarte A.P.C.; Silvestre N.	All-scale approach to evaluate the elasticity and strength of carbon-allotrope reinforced polyimide	Composite Structures	V. 331 (117841)	10.1016/j.compstruct.2023.117841	WoS AND SCOPUS		Q1	Q1
Galindo M.; Alberdi E.; Sánchez-Burgos M.A.; Nieves F.J.; Flores-Colen I.	Polypropylene as an absorbent layer for acoustic ceilings: Sound absorption and life cycle assessment	Journal of Building Engineering	V. 96 (110655)	10.1016/j.jobe.2024.110655	WoS AND SCOPUS		Q1	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Galuppi L.; Zacchei E.; Esteves M.; Ferrão J.; Simões N.	Experimental validation of the Betti's Analytical Method for Double Glass Units	Engineering Structures	V. 315 (118468)	10.1016/j.engstruct.2024.118468	WoS AND SCOPUS		Q1	Q1
Galvão, A.	Reutilização de água na agricultura: que desafios enfrentamos?	Indústria e Ambiente	nº 148, setembro/outubro 2024		Non WoS AND non SCOPUS			
Garcia C.; Pérez-Sánchez M.; Ramos H.M.; López-Jiménez P.A.; Sánchez-Romero F.-J.	New strategies in wastewater treatment plants to evaluate the achievement of sustainable development goals: a case study	Urban Water Journal	V. 21, n.º 10(1201-1212)	10.1080/1573062X.2024.2323962	WoS AND SCOPUS		Q2	Q3
García-Monteagudo D.; Gonçalves Mendes L.F.; Coelho Lastória A.	Teacher´s Perceptions about Social Sciences: The Case of Nosotros Proponemos; [Percepções docentessobre Ciências Sociais: o caso de Nosotros Proponemos]; [Percepciones docentes sobre ciencias sociales: el caso de Nosotros Proponemos]	Revista Colombiana de Educacion	V. , n.º 90(9-34)	10.17227/rce.num90-14391	Non WoS OR non SCOPUS		Q4	
Gholipour A.; Fragoso R.; Galvão A.; Duarte E.	A comparative study of worm-sludge treatment reed bed planted with Phragmites australis and Arundo donax in the Mediterranean region	Environmental Science and Pollution Research	V. 31, n.º 39(51551-51567)	10.1007/s11356-024-34632-9	Non WoS OR non SCOPUS		Q1	Q1
Gholipour A.; Fragoso R.; Galvão A.; Duarte E.	A pilot-scale evaluation of residual sludge quality in a worm-sludge treatment reed bed in the Mediterranean region	Journal of Environmental Management	V. 370 (122772)	10.1016/j.jenvman.2024.122772	WoS AND SCOPUS		Q1	Q1
Gholipour A.; Fragoso R.; Galvão A.; Duarte E.	Evaluating drained water quality in a pilot worm-sludge treatment reed bed planted with Arundo donnas in the Mediterranean climate	Science of the Total Environment	V. 928 (172587)	10.1016/j.scitotenv.2024.172587	WoS AND SCOPUS		Q1	Q1

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Gholipour A.; Fragoso R.; Galvão A.; Duarte E.	Water balance analysis in a novel pilot-scale of the Worm-sludge treatment reed bed (W-STRB) planted with Arundo donax	Water Research	V. 250 (121066)	10.1016/j.watres.2023.121066	WoS AND SCOPUS		Q1	Q1
Gomes G.D.J.; Lúcio V.J.D.G.; Cismasiu C.	Development of a high-performance blast energy-absorbing system for building structures	International Journal of Protective Structures	V. 15, n.º 3(484-508)	10.1177/20414196231183006	WoS AND SCOPUS		Q2	Q2
Gomes M.G.; Marques da Silva F.; Sousa J.H.; Martinho N.; Moret Rodrigues A.	Experimental and numerical study of wind effect on an ultra-thin concrete triangular plan shell structure	Structural Concrete	V. , n.º (-)	10.1002/suco.202400409	WoS AND SCOPUS		Q1	Q2
Gomes, L.; Portela, M. M.; Espinosa, L.A.	Modelação bivariada de precipitações extremas de curta duração. Aplicação ao estudo das aluviões na região do Funchal (ilha da Madeira)	Territorium, Riscos Hidrogeomorfológicos e seus Impactes Socioambientais	31(I):31-32	10.14195/1647-7723_31-1_3	Non WoS AND non SCOPUS			
Gomez J.; Triana K.; Vargas M.; Escobar D.; Zuluaga-Villermo J.	General condition assessment method for signalized intersections: the case of Ibague, Colombia	Geojournal of Tourism and Geosites	V. 52, n.º 1(125-132)	10.30892/gtg.52109-1189	Non WoS OR non SCOPUS		Q3	
Gonçalves H.; Magalhães V.S.M.; Ferreira L.M.D.F.; Arantes A.	Overcoming Barriers to Sustainable Supply Chain Management in Small and Medium-Sized Enterprises: A Multi-Criteria Decision-Making Approach	Sustainability (Switzerland)	V. 16, n.º 2(506)	10.3390/su16020506	WoS AND SCOPUS		Q2	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Gonçalves M.; Freire F.; Garcia R.	Material flow analysis and circularity assessment of plastic packaging: An application to Portugal	Resources, Conservation and Recycling	V. 209 (107795)	10.1016/j.resconrec.2024.107795	WoS AND SCOPUS		Q1	Q1
Gonçalves M.; Ponte M.; Bento R.	Seismic Assessment of Existing Masonry Buildings Using Damage Mechanics	Buildings	V. 14, n.º 8(2395)	10.3390/buildings14082395	WoS AND SCOPUS		Q2	Q2
Gonçalves R.; Nedelcu M.	First-order GBT for truncated conical shells with circular cross-section	Thin-Walled Structures	V. 203 (112210)	10.1016/j.tws.2024.112210	WoS AND SCOPUS		Q1	Q1
Gonçalves, R	A Geometrically Exact Beam Finite Element for Non-Prismatic Strip Beams: The Spatial Case	International Journal of Structural Stability and Dynamics	V. 24, n.º 12 (2450138)	10.1142/S0219455424501384	WoS AND SCOPUS		Q1	Q2
Gong Y.; Chu J.; Kwong R.; Nunes L.M.; Zhao D.; Tang W.; Li C.; Wei Z.; Ju Y.; Li H.; Ma L.Q.; Yu X.; Zhong H.	Contamination and Carcinogenic Risks of Lead in Lip Cosmetics in China	Bulletin of Environmental Contamination and Toxicology	V. 112, n.º 2(27)	10.1007/s00128-024-03851-8	WoS AND SCOPUS		Q2	Q3
Gonilha J.; Martins D.; Correia J.R.; Silvestre N.; Guerreiro L.	Seismic Response of Three-Dimensional Pultruded GFRP Frames	Journal of Composites for Construction	V. 28, n.º 4(04024021)	10.1061/JCCOF2.CCENG-4562	WoS AND SCOPUS		Q1	Q2
Gu C.; Yang B.; Yang F.; Ren Q.; Silva M.C.E.	Fluidity and rheological properties with time-dependence of cemented fine-grained coal gangue backfill containing HPMC using response surface method	Construction and Building Materials	V. 451 (138691)	10.1016/j.conbuildmat.2024.138691	WoS AND SCOPUS		Q1	Q1

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Gumgum F.; Cardoso A.H.	Effect of diversion angle and vanes' skew angle on the hydro-morpho-dynamics of mobile-bed open-channel bifurcations controlled by submerged vane-fields	Physics of Fluids	V. 36, n.º 7(073318)	10.1063/5.0211623	WoS AND SCOPUS		Q1	Q1
Gumgum, F; Cardoso, AH	Erratum: Effect of diversion angle and vanes' skew angle on the hydro-morpho-dynamics of mobile-bed open-channel bifurcations controlled by submerged vane-fields (Phys. Fluids (2024) 36 (073318) DOI: 10.1063/5.0211623)	Physics of Fluids	V. 36, n.º 11 (119901)	10.1063/5.0235767	WoS AND SCOPUS		Q1	Q1
Gupta S.; Kumar P.; Kishore G.; Ali R.; Al-Ansari N.; Vishwakarma D.K.; Kuriqi A.; Pham Q.B.; Kisi O.; Heddam S.; Mattar M.A.	Sensitivity of daily reference evapotranspiration to weather variables in tropical savanna: a modelling framework based on neural network	Applied Water Science	V. 14, n.º 6(138)	10.1007/s13201-024-02195-2	WoS AND SCOPUS		Q1	Q1
Hasan T.; Correia J.R.; Garrido M.; Soares F.; Cabral-Fonseca S.; Jorge M.; Sena-Cruz J.	Freeze-thaw durability of vacuum infused glass fibre composites with unsaturated polyester and vinyl ester matrices	Construction and Building Materials	V. 455 (139037)	10.1016/j.conbuildmat.2024.139037	WoS AND SCOPUS		Q1	Q1
Hassanloui M.V.; Lajevardi S.H.; Ahmadi H.; Saba H.R.; Kuriqi A.	Correction to: Evaluation of Geotechnical Properties of Sediments of the Top Layer of Hypersaline Lakes: The Case of Lake Urmia (International Journal of Civil Engineering, (2024), 10.1007/s40999-024-01040-6)	International Journal of Civil Engineering	V. , n.º (-)	10.1007/s40999-024-01051-3	WoS AND SCOPUS		Q2	Q3

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Hassanloui, MV; Lajevardi, SH; Ahmadi, H; Saba, HR; Kuriqi, A	Evaluation of Geotechnical Properties of Sediments of the Top Layer of Hypersaline Lakes: The Case of Lake Urmia	International Journal of Civil Engineering	V. 23, n.º1 (243–259)	10.1007/s40999-024-01040-6	WoS AND SCOPUS		Q2	Q3
Hatem I.; Alwan I.A.; Ziboon A.R.T.; Kuriqi A.	Assessment of agricultural drought in Iraq employing Landsat and MODIS imagery	Open Engineering	V. 14, n.º 1(20220583)	10.1515/eng-2022-0583	WoS AND SCOPUS		Q3	Q2
Hatem I.; Alwan I.A.; Ziboon A.R.T.; Kuriqi A.	Unveiling the persistence of meteorological drought in Iraq: a comprehensive spatiotemporal analysis	Sustainable Water Resources Management	V. 10, n.º 5(165)	10.1007/s40899-024-01145-9	WoS AND SCOPUS		Q2	Q3
Henriques D.; Gonçalves R.	On buckling of compact I-section beams subjected to biaxial bending	Advances in Structural Engineering	V. 28 , n.º 6 (1041-1057)	10.1177/13694332241300678	WoS AND SCOPUS		Q1	Q2
Hokmabadi H.; Rezvani S.M.H.S.; de Matos C.A.	Business Resilience for Small and Medium Enterprises and Startups by Digital Transformation and the Role of Marketing Capabilities—A Systematic Review	Systems	V. 12, n.º 6(220)	10.3390/systems12060220	WoS AND SCOPUS		Q3	Q1
Hosamo H.; B. A. Coelho G.; Nordahl Rolfsen C.; Kraniotis D.	Building performance optimization through sensitivity Analysis, and economic insights using AI	Energy and Buildings	V. 325 (114999)	10.1016/j.enbuild.2024.114999	WoS AND SCOPUS		Q1	Q1
Hosamo H.; Coelho G.B.A.; Buvik E.; Drissi S.; Kraniotis D.	Building sustainability through a novel exploration of dynamic LCA uncertainty: Overview and state of the art	Building and Environment	V. 264 (111922)	10.1016/j.buildenv.2024.111922	WoS AND SCOPUS		Q1	Q1
Hoxha B.; Kuriqi A.; Filkoski R.V.	Influence of seasonal air density fluctuations on wind speed distribution in complex terrains in the context of energy yield	Energy, Ecology and Environment	V. 9, n.º 2(175-187)	10.1007/s40974-023-00301-9	WoS AND SCOPUS		Q1	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Jaf, DKI; Abdalla, A; Mohammed, AS; Abdulrahman, PI; Kurda, R; Mohammed, AA	Hybrid nonlinear regression model versus MARS, MEP, and ANN to evaluate the effect of the size and content of waste tire rubber on the compressive strength of concrete	HELIYON	V. 10, n.º 4 (e25997)	10.1016/j.heliyon.2024.e25997	WoS AND SCOPUS		Q1	Q1
Jia X.; Macário R.; Buyle S.	How do airports align with sustainability? An analysis of the world's 150 busiest airports	Sustainable Development	V. 32, n.º 6(7409-7433)	10.1002/sd.3029	WoS AND SCOPUS		Q1	Q1
Jorge C.; Almeida M.C.; Covas D.	From assessment to a decision: a global framework for the management of energy use in wastewater systems	International Journal of Environmental Science and Technology	V. 21, n.º 2(1729-1744)	10.1007/s13762-023-05082-6	WoS AND SCOPUS		Q2	Q2
Jurasz J.; Guezgouz M.; Campana P.E.; Kaźmierczak B.; Kuriqi A.; Bloomfield H.; Hingray B.; Canales F.A.; Hunt J.D.; Sterl S.; Elkadeem M.R.	Complementarity of wind and solar power in North Africa: Potential for alleviating energy droughts and impacts of the North Atlantic Oscillation	Renewable and Sustainable Energy Reviews	V. 191 (114181)	10.1016/j.rser.2023.114181	WoS AND SCOPUS		Q1	Q1
Jurasz J.; Tomczyk P.; Bochenek B.; Kuriqi A.; Kasiulis E.; Chen D.; Ming B.	Solar-hydro cable pooling – Utilizing the untapped potential of existing grid infrastructure	Energy Conversion and Management	V. 306 (118307)	10.1016/j.enconman.2024.118307	WoS AND SCOPUS		Q1	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Kartal V.; Karakoyun E.; Akiner M.E.; Katipoğlu O.M.; Kuriqi A.	Optimizing river flow rate predictions: integrating cognitive approaches and meteorological insights	Natural Hazards	V. , n.º (-)	10.1007/s11069-024-07043-9	WoS AND SCOPUS		Q1	Q2
Király K.; Dunai L.; Calado L.; Balázs Kocsis A.	Push-out tests of demountable shear connectors for sustainable composite structures	Steel Construction	V. 17, n.º 4(200-211)	10.1002/stco.202300044	WoS AND SCOPUS		Q2	Q3
Knapcová V.; Pacheco J.; de Brito J.; Sonnenschein R.	Eurocode 2 design of recycled aggregate concrete elements under compression: Evaluation through model uncertainties from tests on columns	Structural Concrete	V. 25, n.º 5(3050-3064)	10.1002/suco.202300715	WoS AND SCOPUS		Q1	Q2
Korkmaz M.; Kuriqi A.	Regional Climate Change and Drought Dynamics in Tunceli, Turkey: Insights from Drought Indices	Water Conservation Science and Engineering	V. 9, n.º 2(49)	10.1007/s41101-024-00281-9	WoS AND SCOPUS		Q3	Q4
Kumar A.; Tripathi M.P.; Khalkho D.; Dewangan R.; Baghel S.; Kuriqi A.	Correction to: Groundwater quality evaluation for drinking and irrigation using analytical hierarchy process with GIS in semi critical block of Chhattisgarh, India (Environmental Earth Sciences, (2024), 83, 10, (334), 10.1007/s12665-024-11656-5)	Environmental Earth Sciences	V. 83, n.º 13(384)	10.1007/s12665-024-11692-1	WoS AND SCOPUS		Q2	Q2
Kumar A.; Tripathi M.P.; Khalkho D.; Dewangan R.; Baghel S.; Kuriqi A.	Groundwater quality evaluation for drinking and irrigation using analytical hierarchy process with GIS in semi critical block of Chhattisgarh, India	Environmental Earth Sciences	V. 83, n.º 10(334)	10.1007/s12665-024-11656-5	WoS AND SCOPUS		Q2	Q2
Kuriqi A.; Abd-Elaty I.	Groundwater salinization risk in coastal regions triggered by earthquake-induced saltwater intrusion	Stochastic Environmental Research and Risk Assessment	V. 38, n.º 8(3093-3108)	10.1007/s00477-024-02734-y	WoS AND SCOPUS		Q1	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Lamaa G.; Kassim D.; Silva B.A.; Duarte A.P.C.; Brito J.D.; Silva R.V.	Utilization of Aluminosilicate Industrial Wastes as Precursors in CO2-Cured Alkali-Activated Precast Concrete Pavement Blocks	Construction Materials	V. 4, n.º 2(353-381)	10.3390/constrmater4020020	Non WoS OR non SCOPUS			
Lamaa, G., Duarte, A., de Brito, J., Silva, R.	Optimização da Cura por Carbonatação Acelerada para um Aumento do Desempenho de Materiais Activados Alcalinamente	Construção Magazine	n.º 123, , pp. 42-46		Non WoS AND non SCOPUS			
Lazzari J.A.D.; Gonilha J.; Correia J.R.; Silvestre N.	Experimental study of the quasi-static axial compressive resistance of pultruded GFRP composite stub columns	Construction and Building Materials	V. 449 (138252)	10.1016/j.conbuildmat.2024.138252	WoS AND SCOPUS		Q1	Q1
Lazzari J.A.D.; Martins L.L.; Ribeiro Á.S.; Pinheiro A.; Correia J.R.; Silvestre N.	Global and local geometrical imperfections of pultruded GFRP profiles based on a modal approach	Construction and Building Materials	V. 412 (134813)	10.1016/j.conbuildmat.2023.134813	WoS AND SCOPUS		Q1	Q1
Leite R.; Costa M.J.; Mameri D.; Afonso F.; Pinheiro A.; Santos J.M.; Boavida I.	The hide-and-seek effect of pulsed-flows in a potamodromous cyprinid fish	Hydrobiologia	V. 851, n.º 17(4201-4212)	10.1007/s10750-024-05575-6	WoS AND SCOPUS		Q1	Q1
Lemos J.V.; Oliveira C.S.; Rupakhety R.	Collapse of the Dharahara Tower During the April 25, 2015 Nepal Earthquake: A New Interpretation Based on Video-Camera Footage	International Journal of Architectural Heritage	V. , n.º (-)	10.1080/15583058.2024.2385964	WoS AND SCOPUS		Q1	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Li T.; Nogueira R.; Costa Pereira M.F.; de Brito J.; Liu J.	Effect of the incorporation ratio of recycled concrete aggregate on the properties of self-compacting mortar	Cement and Concrete Composites	V. 147 (105429)	10.1016/j.cemconcomp.2024.105429	WoS AND SCOPUS		Q1	Q1
Li T.; Nogueira R.; de Brito J.; Liu J.	A simple method to address the high water absorption of recycled aggregates in cementitious mixes	Construction and Building Materials	V. 411 (134404)	10.1016/j.conbuildmat.2023.134404	WoS AND SCOPUS		Q1	Q1
Li T.; Nogueira R.; de Brito J.; Liu J.	Prediction model of the mortar's yield stress based on the aggregate's volume fraction and properties	Journal of Materials Research and Technology	V. 29 (3591-3597)	10.1016/j.jmrt.2024.02.103	WoS AND SCOPUS		Q1	Q1
Liberalesso T.; Silva C.M.; Cruz C.O.	Combined strategies for green roof incentive policies in Lisbon: Evaluating the potentiality of concession grants and identifying priority intervention areas	Urban Forestry and Urban Greening	V. 99 (128451)	10.1016/j.ufug.2024.128451	WoS AND SCOPUS		Q1	Q1
Lolla, S; Oinam, RM; Furtado, A; Varum, H	Tensile strength and flexural behavior of steel fiber-reinforced concrete beams	Structural Concrete	V. , n.º ()	10.1002/suco.202400074	WoS AND SCOPUS		Q1	Q2
Lopes G.C.; Silva V.; Costa C.; Vicente R.; Oliveira C.S.	Advancing the understanding of earthquake risk in Portugal	Bulletin of Earthquake Engineering	V. 22, n.º 11(5379-5401)	10.1007/s10518-024-01975-0	WoS AND SCOPUS		Q1	Q1
López-Uceda A.; Cantador-Fernández D.; Da Silva P.R.; de Brito J.; Fernández-Rodríguez J.M.; Jiménez J.R.	Mechanical and durability performance of self-compacting mortars made with different industrial by-products as fillers	Construction and Building Materials	V. 431 (136536)	10.1016/j.conbuildmat.2024.136536	WoS AND SCOPUS		Q1	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Loureiro D.; Beceiro P.; Fernandes E.; Alegre H.; Covas D.	Energy efficiency assessment in collective irrigation systems using water and energy balances: methodology and application	Irrigation Science	V. 42, n.º 4(745-768)	10.1007/s00271-023-00891-6	WoS AND SCOPUS		Q2	Q2
Ludovico-Marques M.; Chastre C.	Onset of Alveolization Processes in Sandstones Exposed to Salt Weathering	Buildings	V. 14, n.º 3(706)	10.3390/buildings14030706	WoS AND SCOPUS		Q2	Q2
Ludovico-Marques M.; Chastre C.	Modelling the Mechanical Effect of Salt Weathering on Historical Sandstone Blocks through Microdrilling	Sustainability (Switzerland)	V. 16, n.º 15(6277)	10.3390/su16156277	WoS AND SCOPUS		Q2	Q2
Lupattelli A.; Salciarini D.; Cecinato F.; Veveakis M.; Bodas Freitas T.M.; Bourne-Webb P.J.	Temperature dependence of soil-structure interface behaviour in the context of thermally-activated piles: A review	Geomechanics for Energy and the Environment	V. 37 (100521)	10.1016/j.gete.2023.100521	WoS AND SCOPUS		Q1	Q2
Magalhães F.C.; Bellei P.; Flores-Colen I.; da Costa E.M.	Blue Circular Economy—Reuse and Valorization of Bivalve Shells: The Case of Algarve, Portugal	Recycling	V. 9, n.º 2(27)	10.3390/recycling9020027	WoS AND SCOPUS		Q1	Q2
Mahmood, WI; Abdulrahman, PI; Kakasor, D; Mohammed, AS; Kurda, R; Asteris, PG; Sihag, P	Multiscale modeling for accurate forecasting of concrete wear depth: a comprehensive study on mixture proportions and environmental factors	Multiscale and Multidisciplinary Modeling, Experiments and Design	V. 7, n.º 6 (5971-5989)	10.1007/s41939-024-00564-7	WoS AND SCOPUS	1.9	Q3	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Malik, A; Sudhamsu, G; Wratch, MK; Singh, S; Sagiraju, SR; Mansour, L; Rai, P; Ali, R; Kuriqi, A; Yadav, KK	Soil temperature estimation at different depths using machine learning paradigms based on meteorological data	Environmental Monitoring and Assessment	V. 197, n.º 1 (104)	10.1007/s10661-024-13497-y	WoS AND SCOPUS	2.9	Q2	Q3
Manera R.D.S.; Basaglia C.; Camotim D.	Direct Strength Design of Circular Cylindrical Steel Shells under Uniform External Pressure	Buildings	V. 14, n.º 9(2992)	10.3390/buildings14092992	WoS AND SCOPUS		Q2	Q2
Marasco G.; Moldovan I.; Figueiredo E.; Chiaia B.	Unsupervised transfer learning for structural health monitoring of urban pedestrian bridges	Journal of Civil Structural Health Monitoring	V. 14, n.º 6(1487-1503)	10.1007/s13349-024-00786-w	WoS AND SCOPUS		Q1	Q1
Marchão C.; Marreiros R.; Ribeiro F.	Experimental study on the cracking behavior of anchorage zones	Structural Concrete	V. 25, n.º 1(154-168)	10.1002/suco.202300554	WoS AND SCOPUS		Q1	Q2
Marques A.; Januário J.F.; Cruz C.O.	Sustainability Certifications in Real Estate: Value and Perception	Buildings	V. 14, n.º 12(3823)	10.3390/buildings14123823	WoS AND SCOPUS		Q2	Q2
Marreiros C.; Alves P.M.; Custódio S.; Oliveira C.S.; Carrilho F.	“Did You Feel It 50 Years Ago?” The 1969 Mw 7.8 Cape Saint Vincent Earthquake	Seismological Research Letters	V. 95, n.º 1(512-525)	10.1785/0220230191	WoS AND SCOPUS		Q1	Q2
Martínez-García C.; González-Fonteboa B.; Carro-López D.; Faria P.	Can mussel shell waste optimize cement and air lime mortars hygrothermal performance?	Construction and Building Materials	V. 451 (138851)	10.1016/j.conbuildmat.2024.138851	WoS AND SCOPUS		Q1	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Martinho F.C.G.; Silva H.M.R.D.; Oliveira J.R.M.; Moura C.F.N.; Loureiro C.D.A.; Silvestre J.D.; Rodrigues M.M.M.	Mechanical and Environmental Performance of Asphalt Concrete with High Amounts of Recycled Concrete Aggregates (RCA) for Use in Surface Courses of Pavements	Sustainability (Switzerland)	V. 16, n.º 1(248)	10.3390/su16010248	WoS AND SCOPUS		Q2	Q2
Martins A.D.; Peres N.; Jacinto P.; Gonçalves R.	An Assessment of the Eurocode 3 Simplified Formulas for Distortional Buckling of Cold-Formed Steel Lipped Channels	Applied Sciences (Switzerland)	V. 14, n.º 11(4924)	10.3390/app14114924	WoS AND SCOPUS		Q2	Q1
Martins A.D.; Teixeira Â.P.; Correia J.R.; Silvestre N.; Figueiredo e Sá M.	Reliability-based code calibration of local buckling strength design of pultruded GFRP I- and H-section columns	Engineering Structures	V. 318 (118687)	10.1016/j.engstruct.2024.118687	WoS AND SCOPUS		Q1	Q1
Martins J.C.; Pinheiro M.D.	Energy Communities and Electric Mobility as a Win–Win Solution in Built Environment	Energies	V. 17, n.º 12(3011)	10.3390/en17123011	WoS AND SCOPUS		Q1	Q3
Martins N.M.C.; Covas D.I.C.; Brunone B.; Meniconi S.; Capponi C.	Transient response of discrete partial blockages in laminar pressurized flow: Insights into pressure and velocity variations by Computational Fluid Dynamics	Physics of Fluids	V. 36, n.º 10(106112)	10.1063/5.0223173	WoS AND SCOPUS		Q1	Q1
Martins N.M.C.; Covas D.I.C.; Capponi C.; Meniconi S.; Brunone B.	Unified Approach for Damping Rate of Transient Laminar Flow: Experiments, Computational Fluid Dynamics, and One-Dimensional, and Global Models	Journal of Fluids Engineering	V. 146, n.º 2(021306)	10.1115/1.4063697	WoS AND SCOPUS		Q2	Q3

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Martins R.; Carmo R.D.; Costa H.; Júlio E.	Low cement concretes with ultra-high durability for innovative composite lightweight precast walls	Journal of Building Engineering	V. 86 (108922)	10.1016/j.jobe.2024.108922	WoS AND SCOPUS		Q1	Q1
Martins R.; do Carmo R.; Costa H.; Júlio E.	Shear study on the interface between ultra-high durability concrete and low-cement-lightweight concrete for precast composite walls	Construction and Building Materials	V. 438 (137211)	10.1016/j.conbuildmat.2024.137211	WoS AND SCOPUS		Q1	Q1
Martins S.; Capitão S.; Santos L.A.; Rodrigues C.	Valorisation of Pulp and Paper Industry Wastes—Incorporation in Bituminous Mixtures for Road Construction	Sustainability (Switzerland)	V. 16, n.º 3(1254)	10.3390/su16031254	WoS AND SCOPUS		Q2	Q2
Martins T.N.; Leitão T.E.; Oliveira M.M.; Panagiotou C.F.; Stefan C.; Chkirbene A.; Portela M.M.	Proposal for a managed aquifer recharge feasibility index for southern Portugal using multi-criteria decision analysis	Groundwater for Sustainable Development	V. 26 (101280)	10.1016/j.gsd.2024.101280	WoS AND SCOPUS		Q1	Q1
Martins T.N.; Oliveira M.M.; Portela M.M.; Leitão T.E.	Assessing climate change impacts on water availability in southern Portugal using a daily sequential soil-water budget model	Journal of Water and Climate Change	V. 15, n.º 7(2899-2917)	10.2166/wcc.2024.244	WoS AND SCOPUS		Q2	Q2
Mathew A.; A. Gonilha J.; Nadir Y.; Ye Y.	Exterior weak-axis beam-to-column bolted connections between GFRP I-shaped pultruded profiles using stainless steel cleats	Engineering Structures	V. 314 (118366)	10.1016/j.engstruct.2024.118366	WoS AND SCOPUS		Q1	Q1
Matos B.C.; Cruz C.O.; Branco F.B.	DIGITALIZATION AND PROCUREMENT IN CONSTRUCTION PROJECTS: AN INTEGRATED BIM-BASED APPROACH	Journal of Information Technology in Construction	V. 29 (400-423)	10.36680/j.itcon.2024.019	WoS AND SCOPUS		Q2	Q1
Matos B.C.; Cruz C.O.; Branco F.B.	DIGITALIZATION AND TENDER EVALUATION IN CONSTRUCTION PROJECTS: A BIM-INTEGRATED MCDA APPROACH SUPPORTED BY MACBETH	Journal of Information Technology in Construction	V. 29 (662-685)	10.36680/j.itcon.2024.030	WoS AND SCOPUS		Q2	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Matos, R.; Ferreira, F.; Alves, L.; Dolores, M.; Ferraz, P.; Ramos, E.; Costa, L.; Matos, J. S.	Mitigação de Alterações Climáticas-projetos de saneamento em cidades costeiras do norte de Angola	Águas & Resíduos	Série V, n.º 02	10.22181/aer.2024.0201	Non WoS AND non SCOPUS			
Mazzuca P.; Pisani B.; Firmo J.P.; Ombres L.	Tensile and bond properties at elevated temperatures of a PBO-FRCM composite system for strengthening concrete elements: Experimental and analytical investigations	Construction and Building Materials	V. 432 (136519)	10.1016/j.conbuildmat.2024.136519	WoS AND SCOPUS		Q1	Q1
Mazzuca, P	Flexural behaviour of GFRP sandwich panels with eco-friendly PET foam core for the rehabilitation of building floors	Structures	V. 60, n.º (105815)	10.1016/j.istruc.2023.105815	WoS AND SCOPUS		Q1	Q1
Meireles I.; Martín-Gamboa M.; Sousa V.; Kalthoum A.; Dufour J.	Comparative environmental life cycle assessment of partition walls: Innovative prefabricated systems vs conventional construction	Cleaner Environmental Systems	V. 12 (100179)	10.1016/j.cesys.2024.100179	WoS AND SCOPUS		Q1	Q1
Melo R.H.R.Q.; Falcão J.R.; Bersch J.D.; Baptista D.T.; Masuero A.B.	Performance and Durability of Paints for the Conservation of Historic Façades	Buildings	V. 14, n.º 4(1016)	10.3390/buildings14041016	WoS AND SCOPUS		Q2	Q2
Melo S.; Gomes R.; Abbasi R.; Arantes A.	Demand-Responsive Transport for Urban Mobility: Integrating Mobile Data Analytics to Enhance Public Transportation Systems	Sustainability (Switzerland)	V. 16, n.º 11(4367)	10.3390/su16114367	WoS AND SCOPUS		Q2	Q2
Mendes L.	New urban spaces: Urban theory and the scale question by Neil Brenner	Finisterra	V. 60, n.º 127(e36364)	10.18055/Finis36364	WoS AND SCOPUS	0.5	Q3	Q3

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Mendes L.; Tulumello S.	Changing Social Movements in Lisbon? Housing Financialisation and Post-pandemic Activism	Critical Housing Analysis	V. 11, n.º 1(115-126)	10.13060/23362839.2024.11.1.569	Non WoS OR non SCOPUS		Q2	
Mendes L.P.N.; Ricardo A.M.C.; Bernardino A.J.M.; Ferreira R.M.L.	A Hybrid PIV/Optical Flow Method for Incompressible Turbulent Flows	Water (Switzerland)	V. 16, n.º 7(1021)	10.3390/w16071021	WoS AND SCOPUS		Q2	Q2
Mendes M.P.; Raimundo A.; Bimbati M.; Nogueira R.; Flores-Colen I.; de Brito J.	The Effect of Rice Husk on the Variability of Physical and Mechanical Properties of Composites	Journal of Testing and Evaluation	V. 52, n.º 1(-)	10.1520/JTE20230238	WoS AND SCOPUS		Q3	Q4
Mendes S.V.; Ferreira R.M.L.; Aleixo R.; Larcher M.; Amaral S.	Granular Cooling of Uni-Sized Inelastic Particles in an Obstructed Chute	Water Resources Research	V. 60, n.º 10(e2023WR036320)	10.1029/2023WR036320	WoS AND SCOPUS		Q1	Q1
Merino-Lechuga A.M.; Lamaa G.; Silva R.V.; de Brito J.; Jiménez J.R.; Fernández-Rodríguez J.M.; González-Caro Á.	Accelerated carbonation of alkali-activated vibro-compacted pervious concrete paving blocks	Construction and Building Materials	V. 449 (138458)	10.1016/j.conbuildmat.2024.138458	WoS AND SCOPUS		Q1	Q1
Messaoudi A.; Chebili R.; Mohamed H.; Furtado A.; Rodrigues H.	The In-Plane Seismic Response of Infilled Reinforced Concrete Frames Using a Strut Modelling Approach: Validation and Applications	Buildings	V. 14, n.º 7(1902)	10.3390/buildings14071902	WoS AND SCOPUS		Q2	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Mir Y.H.; Ganie M.A.; Baba Z.A.; Mir S.; Bhat M.A.; Bhat J.A.; Lone A.H.; Wani F.J.; Kader S.; Jaufer L.; Hysa A.; Kuriqi A.	Assessing the impact of land use change on carbon and soil quality in Kashmir Himalayas	Turkish Journal of Agriculture and Forestry	V. 48, n.º 5(658-676)	10.55730/1300-011X.3210	WoS AND SCOPUS		Q2	Q1
Miranda D.T.; Barreto D.; Flores-Colen I.	An Evaluation of the Luminous Performance of a School Environment Integrating Artificial Lighting and Daylight	Sustainability (Switzerland)	V. 16, n.º 4(1426)	10.3390/su16041426	WoS AND SCOPUS		Q2	Q2-Q3
Mirboluki A.; Mehraein M.; Kisi O.; Kuriqi A.; Barati R.	Groundwater level estimation using improved deep learning and soft computing methods	Earth Science Informatics	V. 17, n.º 3(2587-2608)	10.1007/s12145-024-01300-y	WoS AND SCOPUS		Q2	Q2
Mirkhorli P.; Ghaderi A.; Alizadeh Sanami F.; Mohammadi M.; Kuriqi A.; Kisi O.	An Investigation on Hydraulic Aspects of Rectangular Labyrinth Pool and Weir Fishway Using FLOW-3D	Arabian Journal for Science and Engineering	V. 49, n.º 4(6061-6087)	10.1007/s13369-023-08537-7	WoS AND SCOPUS		Q1	Q2
Mohammed, AS; Abdalla, AA; Kurda, R; Qadir, WS; Mahmood, W; Ghafor, K	Investigation of Hybrid Intelligence Models to Optimize Cement Kiln Content Based on the Failure Stress, Chemical Composition, and Loss on Ignition of Mortar	Journal of Materials in Civil Engineering	V. 36, n.º 3 (4023613)	10.1061/JMCEE7.MTENG-16718	WoS AND SCOPUS		Q1	Q2
Molari M.; Dominici L.; Manso M.; Silva C.M.; Comino E.	A socio-ecological approach to investigate the perception of green walls in cities: A comparative analysis of case studies in Turin and Lisbon	Nature-Based Solutions	V. 6, n.º (100175)	10.1016/j.nbsj.2024.100175	Non WoS OR non SCOPUS			

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Moldovan I.D.; Almukashfi A.; Gomes Correia A.	A Computational Platform for Automatic Signal Processing for Bender Element Sensors †	Algorithms	V. 17, n.º 4 (131)	10.3390/a17040131	WoS AND SCOPUS		Q2	Q2
Monteiro G.P.; Marvila M.T.; Pedroti L.G.; de Brito J.; de Azevedo A.R.G.	Evaluation of coating mortars with addition of açaí seed (Euterpe oleracea Mart.) in different processing conditions	Journal of Building Engineering	V. 83 (108459)	10.1016/j.jobe.2024.108459	WoS AND SCOPUS		Q1	Q1
Monteiro S.; Pimenta R.; Nunes F.; Cunha M.V.; Santos R.	Detection of dengue virus and chikungunya virus in wastewater in Portugal: an exploratory surveillance study	The Lancet Microbe	V. 5, n.º 11(100911)	10.1016/S2666-5247(24)00150-2	WoS AND SCOPUS		Q1	Q1
Moreira G.; Marreiros R.; Marchão C.; Reguengo R.	Evaluation of the rotational stiffness of precast reinforced concrete beam-column connections	Engineering Structures	V. 308 (117933)	10.1016/j.engstruct.2024.117933	WoS AND SCOPUS		Q1	Q1
Morgado J.; Rosales J.; de Brito J.; Mendes M.P.; Machini B.; Bravo M.	Performance of concrete with treated wastewater and recycled aggregates	Journal of Building Engineering	V. 98 (111343)	10.1016/j.jobe.2024.111343	WoS AND SCOPUS		Q1	Q1
Motta Queiroz M.; Roque C.; Moura F.; Marôco J.	Understanding the expectations of parents regarding their children's school commuting by public transport using latent Dirichlet Allocation	Transportation Research Part A: Policy and Practice	V. 181 (103986)	10.1016/j.tra.2024.103986	WoS AND SCOPUS	6.3	Q1	Q1
Mouraz C.P.; Ferreira T.M.; Silva J.M.	Building rehabilitation, sustainable development, and rural settlements: a contribution to the state of the art	Environment, Development and Sustainability	V. 26, n.º 10(24937-24956)	10.1007/s10668-023-03664-5	WoS AND SCOPUS		Q1	Q2
Nabais, M; Bogas, J; Coelho, C.	Matrizes cimentícias de reduzido factor de clínquer visando a produção de betão de baixo carbono para construção modular	Construção Magazine	n.º 124, pp. 16-18		Non WoS AND non SCOPUS			

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Nasiri Khiavi A.; Tavoosi M.; Kamari Yekdangi F.; Sadikhani M.; Kuriqi A.	Conjunct applicability of MCDM-based machine learning algorithms in mapping the sediment formation potential	Environment, Development and Sustainability	V. , n.º (-)	10.1007/s10668-024-05285-y	WoS AND SCOPUS		Q1	Q2
Nasiri Khiavi A.; Tavoosi M.; Khodamoradi H.; Kuriqi A.	Integration of Watershed eco-physical health through Algorithmic game theory and supervised machine learning	Groundwater for Sustainable Development	V. 26 (101216)	10.1016/j.gsd.2024.101216	WoS AND SCOPUS		Q1	Q1
Neves J.; Moutinho J.; Freire A.C.; Paixão A.; Monteiro B.; Parente M.; Cristelo N.; Correia A.G.	Geotechnics in the eco-digital transition of transport infrastructures; [A GEOTECNIA NA TRANSIÇÃO ECO-DIGITAL DAS INFRAESTRUTURAS DE TRANSPORTE]	Geotecnia	V. 2024 (41-78)	10.14195/2184-8394_extra2024_1_3	Non WoS OR non SCOPUS		Q4	
Neves M.; Basaglia C.; Camotim D.; Araujo H.	Improving the local and distortional resistance of CFS trapezoidal self-supporting roof members	Thin-Walled Structures	V. 201 (112054)	10.1016/j.tws.2024.112054	WoS AND SCOPUS		Q1	Q1
Novaes, C; Marques, RC	Policy, Institutions and Regulation in Stormwater Management: A Hybrid Literature Review	Water (Switzerland)	V. 16, n.º 1 (186)	10.3390/w16010186	WoS AND SCOPUS		Q2	Q2
Novais H.C.; da Silva S.; Figueiredo E.	Co-Kriging strategy for structural health monitoring of bridges	Structural Health Monitoring	V. , n.º (-)	10.1177/14759217241265375	WoS AND SCOPUS		Q1	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Nyembwe J.-P.K.B.; Munanga J.K.; Simões N.; da Silva M.G.	Ventilation Strategies to Mitigate Air Pollution Impact on Hospital Professionals in Intensive Care Units in the Democratic Republic of Congo	Buildings	V. 14, n.º 7(1996)	10.3390/buildings14071996	WoS AND SCOPUS		Q2	Q2
Oliveira C.S.; Ferreira M.A.; O'Neill H.	The Role of Video Cameras and Emerging Technologies in Disaster Response to Increase Sustainability of Societies: Insights on the 2023 Türkiye–Syria Earthquake	Sustainability (Switzerland)	V. 16, n.º 17(7618)	10.3390/su16177618	WoS AND SCOPUS		Q2	Q2
Oliveira L.; Gomes R.C.; Amoroso S.; Pagliaroli A.; Teves-Costa P.	Seismic site effects in Lisbon: the role of complex geological and morphological conditions	Bulletin of Earthquake Engineering	V. 22, n.º 10(4915-4958)	10.1007/s10518-024-01926-9	WoS AND SCOPUS		Q1	Q1
Oliveira L.K.D.; Araújo G.G.F.D.; Colaço R.; de Abreu e Silva J.	What drives warehouse prices? Estimating a spatial hedonic warehouse pricing model in Belo Horizonte, Brazil	Transportation Planning and Technology	V. , n.º (-)	10.1080/03081060.2024.2445651	WoS AND SCOPUS		Q2	Q3
Oliveira M.A.; António J.	Animal-based waste for building acoustic applications: A review	Journal of Building Engineering	V. 84 (108430)	10.1016/j.jobe.2023.108430	WoS AND SCOPUS		Q1	Q1
Oliveira Pedro J.J.; Biscaya A.; Nascimento S.; Kuhlmann U.	Buckling resistance of transversally stiffened steel plate girders considering M-V interaction with high compression forces	Structures	V. 70 (107714)	10.1016/j.istruc.2024.107714	WoS AND SCOPUS		Q1	Q1
Oliveira, A.; Brito, J. de; Bravo, M.	Comportamento de Betões Produzidos com Água Residual após Tratamento Terciário e Agregados Reciclados de Resíduos de Construção e Demolição	Construção Magazine	n.º 123, pp. 28-34		Non WoS AND non SCOPUS			
Oliveira, R.P.	Gestão Integrada de recursos hídricos: o mapa da adaptação às alterações climáticas	Indústria e Ambiente	nº 144, janeiro/fevereiro 2024		Non WoS AND non SCOPUS			

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Oliveira, S.; Alegre, A. ; Ramos, R.; Jorge Proença, J.; Mendes, P.	Resposta sísmica não-linear de uma barragem abóbada com 300m de altura. Avaliação da segurança estrutural (SBP e SMP) para diferentes cotas de água	Revista Portuguesa de Engenharia de Estruturas	Série III, n.º 26, pp 101-112, Novembro 2024		Non WoS AND non SCOPUS			
Omer, B; Jaf, DKI; Abdalla, A; Mohammed, AS; Abdulrahman, PI; Kurda, R	Advanced modeling for predicting compressive strength in fly ash-modified recycled aggregate concrete: XGboost, MEP, MARS, and ANN approaches	Innovative Infrastructure Solutions	V. 9, n.º 3 (61)	10.1007/s41062-024-01365-0	WoS AND SCOPUS		Q2	Q2
Omer, B; Jaf, DKI; Malla, SK; Abdulrahman, PI; Mohammed, AS; Kurda, R; Abdalla, A	Exploring the potential of soft computing for predicting compressive strength and slump flow diameter in fly ash-modified self-compacting concrete	Archives of Civil and Mechanical Engineering	V. 24, n.º 2 (95)	10.1007/s43452-024-00910-z	WoS AND SCOPUS	4.4	Q1	Q1
Orozco-Fontalvo M.; Soares Lopes A.; Vale D.; Moura F.	IMPReSS: A comprehensive method to classify MaaS systems	Transport Policy	V. 155 (234-241)	10.1016/j.tranpol.2024.07.005	WoS AND SCOPUS	6.3	Q1	Q1
Ostetto L.; Batalha N.; Sousa R.; Fernandes P.; Rodrigues H.	Influence of retrofitting in the seismic behaviour of precast reinforced concrete industrial buildings	Innovative Infrastructure Solutions	V. 9, n.º 12(469)	10.1007/s41062-024-01786-x	WoS AND SCOPUS		Q2	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Ouallali A.; Kader S.; Bammou Y.; Aqnouy M.; Courba S.; Beroho M.; Briak H.; Spalevic V.; Kuriqi A.; Hysa A.	Assessment of the Erosion and Outflow Intensity in the Rif Region under Different Land Use and Land Cover Scenarios	Land	V. 13, n.º 2(141)	10.3390/land13020141	WoS AND SCOPUS		Q1	Q2
Pachamama R.N.; Faria P.; Rezende M.A.P.; Moraes P.M.	Cow Dung Biostabilized Earth Mortars: Reusability and Influence of Cow Dung Processing and Cow Diet	Buildings	V. 14, n.º 11(3414)	10.3390/buildings14113414	WoS AND SCOPUS		Q2	Q2
Pachamama R.N.; Faria P.; Rezende M.A.P.; Santos Silva A.	Effect of Cow Dung Additions on Tropical and Mediterranean Earth Mortars-Mechanical Performance and Water Resistance	Materials	V. 17, n.º 12(2885)	10.3390/ma17122885	WoS AND SCOPUS		Q2	Q2
Palma, J.; Costa,A.A.	Edifícios Modulares Pré-fabricados em Betão: Building Information Modelling	Construção Magazine	n.º 124, pp. 18-19		Non WoS AND non SCOPUS			
Parracha J.L.; Veiga R.; Gomes M.G.; Flores-Colen I.; Nunes L.	Hygrothermal behaviour of external thermal insulation composite systems (ETICS) to withstand biological colonisation	Journal of Building Engineering	V. 86 (108932)	10.1016/j.jobe.2024.108932	WoS AND SCOPUS		Q1	Q1
Parracha J.L.; Veiga R.; Nunes L.; Flores-Colen I.	Effects of hygrothermal and natural aging on the durability of multilayer insulation systems incorporating thermal mortars with EPS and aerogel	Cement and Concrete Composites	V. 148 (105483)	10.1016/j.cemconcomp.2024.105483	WoS AND SCOPUS		Q1	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Paternina-Verona D.A.; Coronado-Hernández O.E.; Espinoza-Román H.G.; Arrieta-Pastrana A.; Tasca E.; Fuertes-Miquel V.S.; Ramos H.M.	Attenuation of pipeline filling over-pressures through trapped air	Urban Water Journal	V. 21, n.º 6(698-710)	10.1080/1573062X.2024.2346727	WoS AND SCOPUS		Q2	Q3
Paternina-Verona D.A.; Coronado-Hernández O.E.; Pérez-Sánchez M.; Ramos H.M.	Real-Time Analysis and Digital Twin Modeling for CFD-Based Air Valve Control During Filling Procedures	Water (Switzerland)	V. 16, n.º 21(3015)	10.3390/w16213015	WoS AND SCOPUS		Q2	Q2
Pedreño-Rojas M.A.; Porras-Amores C.; Villoria-Sáez P.; Morales-Conde M.J.; Flores-Colen I.	Characterization and performance of building composites made from gypsum and woody-biomass ash waste: A product development and application study	Construction and Building Materials	V. 419 (135435)	10.1016/j.conbuildmat.2024.135435	WoS AND SCOPUS		Q1	Q1
Pedro J.J.O.; Nascimento S.; Hendy C.	Shear buckling resistance models for plate girders – Review and improvements	Engineering Structures	V. 307 (117857)	10.1016/j.engstruct.2024.117857	WoS AND SCOPUS		Q1	Q1
Pedro K.; Flores-Colen I.; Ferreira C.; Silva A.	A Comparative Analysis of Time- and Condition-Based Approaches for Imperfect Maintenance of Natural Stone Claddings	Journal of Performance of Constructed Facilities	V. 38, n.º 5(04024025)	10.1061/JPCFEV.CFENG-4764	WoS AND SCOPUS		Q2	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Pedroso P.F.; Correia J.R.; Silvestre J.D.; Firmo J.P.; Garrido M.	Environmental and Economic LCA Comparison of Flexural Strengthening Solutions for a Reinforced Concrete Beam	Materials	V. 17, n.º 23(5879)	10.3390/ma17235879	WoS AND SCOPUS		Q2	Q2
Pereira A.; Marmelo I.; Dias M.; Silva A.C.; Grade A.C.; Barata M.; Pousão-Ferreira P.; Dias J.; Anacleto P.; Marques A.; Diniz M.S.; Maulvault A.L.	Asparagopsis taxiformis as a Novel Antioxidant Ingredient for Climate-Smart Aquaculture: Antioxidant, Metabolic and Digestive Modulation in Juvenile White Seabream (Diplodus sargus) Exposed to a Marine Heatwave	Antioxidants	V. 13, n.º 8(949)	10.3390/antiox13080949	WoS AND SCOPUS	6.0	Q2	Q1
Pereira B.B.; Marrafa M.; Cruz C.; Rodrigues L.; Nunes F.; Monteiro S.; Santos R.; Carneiro R.N.; Neto C.; Aguilar J.; Ferreiro N.R.; Passanha M.; Candeias G.; Fernandes A.; Paixão P.; Chasqueira M.J.	Antimicrobial Resistance Genes in Legionella from Artificial Water Systems: Findings from a Two-Year Study	Antibiotics	V. 13, n.º 12(1121)	10.3390/antibiotics13121121	WoS AND SCOPUS		Q1	Q1
Pereira C.; Flores-Colen I.; Mendes M.P.	Guidelines to reduce the effects of urban heat in a changing climate: Green infrastructures and design measures	Sustainable Development	V. 32, n.º 1(57-83)	10.1002/sd.2646	WoS AND SCOPUS		Q1	Q1
Pereira C.; Silva A.	Operationalisation of Building Inspections and Repair: Systematisation-Based Approach	Applied Sciences (Switzerland)	V. 14, n.º 16(6947)	10.3390/app14166947	WoS AND SCOPUS		Q2	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Pereira J.L.; Lopes A.S.; Silva J.; Vidal T.; Abrantes N.; Santos D.; Brito M.; Ferreira R.M.L.; Gonçalves F.J.M.; Ricardo A.M.	Horizontal migration of zooplankton in lake–wetland interfaces. Can temperature-driven surface exchange flows modulate its patterns?	Aquatic Sciences	V. 86, n.º 2(29)	10.1007/s00027-024-01046-1	WoS AND SCOPUS		Q1	Q2
Pérez-Sánchez M.; Sánchez-Romero F.-J.; Zapata F.A.; López-Jiménez P.A.; Ramos H.M.	Zero discharge: An optimized strategy to improve the hydric deficit in the Mediterranean area by pumped hydro storage. Case study of Alicante, Spain	Agricultural Water Management	V. 292 (108684)	10.1016/j.agwat.2024.108684	WoS AND SCOPUS		Q1	Q1
Pérez-Sánchez M.; Sánchez-Romero F.-J.; Zapata F.A.; Ramos H.M.	A new optimized procedure for circular WasteWater sustainability: Coastal cities supporting agricultural rural communities	Journal of Water Process Engineering	V. 68 (106351)	10.1016/j.jwpe.2024.106351	WoS AND SCOPUS		Q1	Q1
Philo S.E.; Monteiro S.; Fuhrmeister E.R.; Santos R.; Meschke J.S.	Wastewater surveillance for antibiotic resistance genes during the late 2020 SARS-CoV-2 peak in two different populations	Journal of Water and Health	V. 22, n.º 9(1683-1694)	10.2166/wh.2024.161	WoS AND SCOPUS		Q2	Q3
Piccinini Scolaro T.; Ghisi E.; Silva C.M.	Assessing the impact of evapotranspiration from green roofs on reducing surface temperatures	Journal of Building Engineering	V. 95 (110095)	10.1016/j.jobe.2024.110095	WoS AND SCOPUS		Q1	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Pimienta P.; McNamee R.; Robert F.; Boström L.; Huang S.-S.; Mróz K.; Davie C.; Mohaine S.; Alonso M.C.; Bodnarova L.; Bosnjak J.; Dal Pont S.; Dao V.; Dauti D.; Dehn F.; Felicetti R.; Hager I.; Hela R.; Hozjan T.; Juknat M.; Jumppanen U.-M.; Kirnbauer J.; Kolsek J.; Korzen M.; Lakhani H.; Lion M.; Lo Monte F.; Maluk C.; Meftah F.; Miah M.J.; Millard A.; Mindeguia J.-C.; Moreau B.; Msaad Y.; Ozawa M.; Pesavento F.; Pham D.T.; Pistol K.; Rickard I.; Rodrigues J.P.C.; Roosefid M.; Schneider M.; Sharma U.K.; Sideris K.; Stelzner L.; Weber B.; Weise F.	Recommendation of RILEM TC 256-SPF on fire spalling assessment during standardised fire resistance tests: complementary guidance and requirements	Materials and Structures/Materiaux et Constructions	V. 57, n.º 1(3)	10.1617/s11527-023-02248-z	WoS AND SCOPUS		Q1	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Pinchard L.; Parracha J.L.; Veiga R.; Matias L.; Santos Silva A.; Duarte S.; Nunes L.	Weather ageing effects on the long-term thermal conductivity and biological colonisation of thermal insulating mortars with EPS, cork and aerogel	Energy and Buildings	V. 317 (114403)	10.1016/j.enbuild.2024.114403	WoS AND SCOPUS		Q1	Q1
Poggi, F; Amado, M	The spatial dimension of energy consumption in cities	ENERGY POLICY	V. 187, n.º (114023)	10.1016/j.enpol.2024.114023	WoS AND SCOPUS		Q1	Q1
Ponte, M., Guerrini, G. Penna, A., Bento, R.,	Modelação de interações num agregado histórico com o método de pórticos equivalentes	Revista Portuguesa de Engenharia de Estruturas	Série III, nº 26, 69-79	10.34638/rpee-sIII-n26-006	Non WoS AND non SCOPUS			
Ponzoni E.; Cardoso R.; Jommi C.	Numerical Thermo-Hydraulic Simulation of Infiltration and Evaporation of Small-Scale Replica of Typical Dike Covers	Applied Sciences (Switzerland)	V. 14, n.º 22(10170)	10.3390/app142210170	WoS AND SCOPUS		Q2	Q1
Pretelli M.G.; Baladrón A.V.	Copulation behaviour in the Southern Lapwing (Vanellus chilensis)	Acta Ethologica	V. 27, n.º 3(205-212)	10.1007/s10211-024-00442-y	WoS AND SCOPUS	1.1	Q3	Q3
Pretelli M.G.; Baladrón A.V.	Correction to: Copulation behaviour in the Southern Lapwing (Vanellus chilensis) (acta ethologica, (2024), 27, 3, (205-212), 10.1007/s10211-024-00442-y)	Acta Ethologica	V. 27, n.º 3(213-214)	10.1007/s10211-024-00443-x	WoS AND SCOPUS	1.1	Q3	Q3
Proença J.M.; Ferreira R.; Gago A.S.	Seismic Retrofit of Pilotis Buildings by Novel Aluminium Buckling-Restrained Braces (Al-BRBs). Application to a Modernist Architecture Building in Lisbon	International Journal of Architectural Heritage	V. 18, n.º 4(669-690)	10.1080/15583058.2023.2204821	WoS AND SCOPUS		Q1	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Proença M.; Garrido M.; Correia J.R.; Sena-Cruz J.	Experimental study on the fire resistance of all-composite and hybrid web-core sandwich panels for building floors	Composite Structures	V. 337 (118071)	10.1016/j.compstruct.2024.118071	WoS AND SCOPUS		Q1	Q1
Proença M.; Santos P.; Godinho L.; Neves e Sousa A.; Correia J.R.; Garrido M.; Sena-Cruz J.	Acoustic behaviour of GFRP-PUR web-core composite sandwich panels	Construction and Building Materials	V. 438 (137195)	10.1016/j.conbuildmat.2024.137195	WoS AND SCOPUS		Q1	Q1
Radica F.; Casarin A.; Iezzi G.; Bravo M.; de Brito J.; Galderisi A.; Brando G.; Nazzari M.; Scarlato P.	Cement vs aggregates and textures of aggregates in a mortar: Comparative image analysis methods and analytical protocols	Construction and Building Materials	V. 453 (139033)	10.1016/j.conbuildmat.2024.139033	WoS AND SCOPUS		Q1	Q1
Radica F.; Iezzi G.; Trotta O.; Bonifazi G.; Serranti S.; de Brito J.	Characterization of CDW types by NIR spectroscopy: Towards an automatic selection of recycled aggregates	Journal of Building Engineering	V. 88 (109005)	10.1016/j.jobe.2024.109005	WoS AND SCOPUS		Q1	Q1
Rafeiro J.; Tomé A.; Nazário M.	Immersive Learning for Lost Architectural Heritage: Interweaving the Past and Present, Physical and Digital in the Monastery of Madre de Deus	Sustainability (Switzerland)	V. 16, n.º 3(1156)	10.3390/su16031156	WoS AND SCOPUS		Q2	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Ramos A.; Marchão C.; Pacheco J.N.; Enfedaque A.; Coronelli D.; Faria D.; de Brito J.; Ruiz M.F.; Marreiros R.	A review of punching behavior of slab–column connections with recycled coarse aggregate concrete	Structural Concrete	V. , n.º (-)	10.1002/suco.202400435	WoS AND SCOPUS		Q1	Q2
Ramos B.; Lourenço A.B.; Monteiro S.; Santos R.; Cunha M.V.	Metagenomic profiling of raw wastewater in Portugal highlights microbiota and resistome signatures of public health interest beyond the usual suspects	Science of the Total Environment	V. 946 (174272)	10.1016/j.scitotenv.2024.174272	WoS AND SCOPUS		Q1	Q1
Ramos H.M.; Kuriqi A.; Coronado-Hernández O.E.; López-Jiménez P.A.; Pérez-Sánchez M.	Are digital twins improving urban-water systems efficiency and sustainable development goals?	Urban Water Journal	V. 21, n.º 10(1164-1175)	10.1080/1573062X.2023.2180396	WoS AND SCOPUS		Q2	Q3
Ramos H.M.; Pérez-Sánchez M.; Guruprasad P.S.M.; Carravetta A.; Kuriqi A.; Coronado-Hernández O.E.; Fernandes J.F.P.; Branco P.J.C.; López-Jiménez P.A.	Energy Transition in Urban Water Infrastructures towards Sustainable Cities	Water (Switzerland)	V. 16, n.º 3(504)	10.3390/w16030504	WoS AND SCOPUS		Q2	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Ramos H.M.; Pina J.; Coronado-Hernández O.E.; Pérez-Sánchez M.; McNabola A.	Conceptual hybrid energy model for different power potential scales: Technical and economic approaches	Renewable Energy	V. 237 (121486)	10.1016/j.renene.2024.121486	WoS AND SCOPUS		Q1	Q1
Ramos H.M.; Sintong J.E.; Kuriqi A.	Optimal integration of hybrid pumped storage hydropower toward energy transition	Renewable Energy	V. 221 (119732)	10.1016/j.renene.2023.119732	WoS AND SCOPUS		Q1	Q1
Ranesi A.; Faria P.; Freire M.T.; Gonçalves M.; Veiga M.R.	Eco-efficient plastering mortars for improved indoor comfort – The influence of A. dealbata bark addition	Construction and Building Materials	V. 421 (135572)	10.1016/j.conbuildmat.2024.135572	WoS AND SCOPUS		Q1	Q1
Ranesi A.; Faria P.; Veiga M.R.; Gall E.T.	Eco-efficient coatings for healthy indoors: Ozone deposition velocities, primary and secondary emissions	Building and Environment	V. 254 (111306)	10.1016/j.buildenv.2024.111306	WoS AND SCOPUS		Q1	Q1
Ranesi A.; Veiga R.; Rodrigues P.; Faria P.	The different effect of two paint systems on moisture buffer capacity of traditional and modern plasters	Journal of Building Engineering	V. 91 (109701)	10.1016/j.jobe.2024.109701	WoS AND SCOPUS		Q1	Q1
Raposo J.M.; Cavaco E.; Neves L.C.; Júlio E.	A novel roughness parameter for more precise estimation of the shear strength of concrete-to-concrete interfaces	Construction and Building Materials	V. 410 (134146)	10.1016/j.conbuildmat.2023.134146	WoS AND SCOPUS		Q1	Q1
Rappisi, F; Witek, M; Faccenda, M; Ferreira, AMG; Chang, SJ	Artificial age-independent seismic anisotropy, slab thickening and shallowing due to limited resolving power of (an)isotropic tomography	Geophysical Journal International	V. 237, n.º 1 (217-234)	10.1093/gji/ggae042	WoS AND SCOPUS	2.8	Q1	Q2
Real S.; Bogas J.A.; Cruz R.; Gomes M.G.	Eco-recycled cement's effect on the microstructure and hygroscopic behaviour of compressed stabilised earth blocks	Journal of Building Engineering	V. 95 (110227)	10.1016/j.jobe.2024.110227	WoS AND SCOPUS		Q1	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Real S.; Bogas J.A.; Cruz R.; Gomes M.G.; Nabais M.	Thermal performance of compressed earth blocks stabilised with thermoactivated recycled cement	Energy and Buildings	V. 314 (114288)	10.1016/j.enbuild.2024.114288	WoS AND SCOPUS		Q1	Q1
Reis A.C.; Pinto D.; Monteiro S.; Santos R.; Martins J.V.; Sousa A.; Páscoa R.; Lourinho R.; Cunha M.V.	Systematic SARS-CoV-2 S-gene sequencing in wastewater samples enables early lineage detection and uncovers rare mutations in Portugal	Science of the Total Environment	V. 921 (170961)	10.1016/j.scitotenv.2024.170961	WoS AND SCOPUS		Q1	Q1
Reis C.; Barbosa A.R.; Baptista M.A.; Lopes M.; Clain S.	A numerical methodology for estimating site-specific cascading earthquake and tsunami dynamic loading on critical infrastructure	International Journal of Disaster Risk Reduction	V. 100 (104163)	10.1016/j.ijdrr.2023.104163	WoS AND SCOPUS		Q1	Q1
Reis, RA; Fortes, CJEM; Rodrigues, JA; Hu, Z; Suzuki, T	Experimental study on drag coefficient of flexible vegetation under non-breaking waves	Ocean Engineering	V. 296, n.º (117002)	10.1016/j.oceaneng.2024.117002	WoS AND SCOPUS	4.6	Q1	Q1
Remache A.; Pérez-Sánchez M.; Hidalgo V.H.; Ramos H.M.; Sánchez-Romero F.-J.	Towards Sustainability in Hydraulic Machinery Manufacturing by 3D Printing	Processes	V. 12, n.º 12(2664)	10.3390/pr12122664	WoS AND SCOPUS		Q2-Q3	Q2
Ren Q.; Pacheco J.; de Brito J.	3D mesoscale modelling of recycled aggregate concrete	Construction and Building Materials	V. 411 (134430)	10.1016/j.conbuildmat.2023.134430	WoS AND SCOPUS		Q1	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Ren Q.; Pacheco J.; de Brito J.	Mesoscale modelling of recycled aggregate concrete: A parametric analysis of properties of mesoscopic phases of RAC	Journal of Cleaner Production	V. 478 (143967)	10.1016/j.jclepro.2024.143967	WoS AND SCOPUS		Q1	Q1
Ren Q.; Pacheco J.; de Brito J.	Mesoscale modeling of recycled aggregate concrete: A parametric analysis of the quality and shape of aggregate	Structural Concrete	V. , n.º (-)	10.1002/suco.202400743	WoS AND SCOPUS		Q1	Q2
Ren Q.; Pacheco J.; de Brito J.; Hu J.	Analysis of the influence of the attached mortar's geometry on the mechanical behaviour of recycled aggregate concrete through mesoscale modelling	Engineering Fracture Mechanics	V. 297 (109876)	10.1016/j.engfracmech.2024.109876	WoS AND SCOPUS		Q1	Q1
Rey-Álvarez B.; Silvestre J.; García-Martínez A.; Sánchez-Montañés B.	A comparative approach to evaluate the toxicity of building materials through life cycle assessment	Science of the Total Environment	V. 912 (168897)	10.1016/j.scitotenv.2023.168897	WoS AND SCOPUS		Q1	Q1
Rezvani S.M.; Gonçalves A.; Silva M.J.F.; de Almeida N.M.	Smart hotspot detection using geospatial artificial intelligence: A machine learning approach to reduce flood risk	Sustainable Cities and Society	V. 115 (105873)	10.1016/j.scs.2024.105873	WoS AND SCOPUS		Q1	Q1
Rezvani S.M.H.S.; Falcão Silva M.J.; de Almeida N.M.	The Risk-Informed Asset-Centric (RIACT) Urban Resilience Enhancement Process: An Outline and Pilot-Case Demonstrator for Earthquake Risk Mitigation in Portuguese Municipalities	Applied Sciences (Switzerland)	V. 14, n.º 2(634)	10.3390/app14020634	WoS AND SCOPUS		Q2	Q1
Rezvani S.M.H.S.; Silva M.J.F.; Almeida N.M.D.	Mapping Geospatial AI Flood Risk in National Road Networks	ISPRS International Journal of Geo-Information	V. 13, n.º 9(323)	10.3390/ijgi13090323	WoS AND SCOPUS		Q1	Q2
Rezvani S.M.H.S.; Silva M.J.F.; de Almeida N.M.	Urban Resilience Index for Critical Infrastructure: A Scenario-Based Approach to Disaster Risk Reduction in Road Networks	Sustainability (Switzerland)	V. 16, n.º 10(4143)	10.3390/su16104143	WoS AND SCOPUS		Q2	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Ribeiro C.; Flores-Colen I.; Valentim Lopes N.; Ramos N.M.M.	The balconies as an archetype of well-being: a critical literature review	Archnet-IJAR: International Journal of Architectural Research	V. , n.º (-)	10.1108/ARCH-02-2024-0052	WoS AND SCOPUS	1.8	Q1	Q1
Ribeiro C.; Pereira P.F.; Ramos N.M.M.; Flores-Colen I.; Valentim N.	Assessment of the impacts of balconies on indoor environmental quality in mild climate conditions, Portugal	Building Research and Information	V. 52, n.º 3(292-310)	10.1080/09613218.2023.2229451	WoS AND SCOPUS		Q1	Q1
Ricardo A.M.; Ferreira R.M.L.; Rodrigues Da Silva A.; Estima J.; Marques J.; Gamito I.; Serra A.	Flood simulation with the RiverCure approach: The open dataset of the 2016 Águeda flood event	Earth System Science Data	V. 16, n.º 1(375-385)	10.5194/essd-16-375-2024	WoS AND SCOPUS		Q1	Q1
Rocha D.; Faria P.; Lucas S.S.	Additive Manufacturing of Earth-Based Materials: A Literature Review on Mortar Composition, Extrusion, and Processing Earth	Materials	V. 17, n.º 1(202)	10.3390/ma17010202	WoS AND SCOPUS		Q2	Q2
Rocha M.; Faria P.; Gago A.S.	Conservation of Defensive Military Structures Built with Rammed Earth	Buildings	V. 14, n.º 1(238)	10.3390/buildings14010238	WoS AND SCOPUS		Q2	Q2
Rocha, B.T.; Melo, P.C.; Afonso, N.; de Abreu e Silva, J.	Motorways, local economic activity and commuting	Regional Studies	V. 58, n.º 1(164-177)	10.1080/00343404.2023.2187768	WoS AND SCOPUS		Q1	Q1

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Rodrigues H.; Batalha N.; Furtado A.; Arêde A.; Sousa R.; Varum H.	Retrofitting solution for beam-to-column connections of precast reinforced concrete industrial buildings	Engineering Structures	V. 302 (117424)	10.1016/j.engstruct.2023.117424	WoS AND SCOPUS		Q1	Q1
Rodrigues M.C.M.; Oliveira C.S.	A simple use of OR techniques to complete seismic records without magnitude value	International Journal of Operational Research	V. 51, n.º 3(349-366)	10.1504/IJOR.2024.142374	Non WoS OR non SCOPUS		Q3	
Rodrigues P.; Teixeira P.F.	Influence of ballast and railway substructure on the degradation of local geometry defects	Proceedings of the Institution of Mechanical Engineers, Part F: Journal of Rail and Rapid Transit	V. 238, n.º 7(814-826)	10.1177/09544097241232553	WoS AND SCOPUS		Q2	Q3
Rodrigues P.; Teixeira P.F.	Modelling tamping effectiveness for track geometry longitudinal levelling defects	Proceedings of the Institution of Mechanical Engineers, Part F: Journal of Rail and Rapid Transit	V. 238, n.º 6(662-674)	10.1177/09544097231219827	WoS AND SCOPUS		Q2	Q3
Rodrigues P.; Teixeira P.F.	Modelling degradation rates of track geometry local defects: Lisbon-Porto line case study	Structure and Infrastructure Engineering	V. 20, n.º 6(867-882)	10.1080/15732479.2022.2127793	WoS AND SCOPUS		Q1	Q2
Rodrigues P.M.; Gonçalves J.; Marques R.C.	Public policies on human rights to water in informal settlements: a bibliometric analysis	Water Policy	V. 26, n.º 7(718-740)	10.2166/wp.2024.102	WoS AND SCOPUS	1.5	Q2	Q4
Rodrigues P.M.; Pinto F.S.; Marques R.C.	A framework for enabling conditions for wastewater reuse	Sustainable Production and Consumption	V. 46 (355-366)	10.1016/j.spc.2024.02.022	WoS AND SCOPUS	10.9	Q1	Q1
Rogério F.; Guerra N.; Antão A.; Vicente da Silva M.	Soil Strength Parameters for the Sustainable Design of Unsupported Cuts Under Drained Conditions Using Reliability Analysis	Sustainability (Switzerland)	V. 16, n.º 23(10596)	10.3390/su162310596	WoS AND SCOPUS		Q2	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Romão F.; Quaresma A.L.; Simão J.; Bravo-Córdoba F.J.; Viseu T.; Santos J.M.; Sanz-Ronda F.J.; Pinheiro A.N.	Debating the Rules: An Experimental Approach to Assess Cyprinid Passage Performance Thresholds in Vertical Slot Fishways	Water (Switzerland)	V. 16, n.º 3(439)	10.3390/w16030439	WoS AND SCOPUS		Q2	Q2
Rosa I.C.; Castelo A.; Sousa J.M.; Garrido M.; Correia J.R.; Cabral-Fonseca S.; De Brito J.	Natural Weathering of GFRP Structures: Case Studies, Data Survey, and Proposal of a Moisture Conversion Factor for Durability Design	Journal of Composites for Construction	V. 28, n.º 6(04024063)	10.1061/JCCOF2.CCENG-4869	WoS AND SCOPUS		Q1	Q2
Sá Marques T.; Dias da Silva V.; Júlio E.N.B.S.	Geometric and structural optimization of concrete shells	Structural Concrete	V. , n.º (-)	10.1002/suco.202400632	WoS AND SCOPUS		Q1	Q2
Sampaio, A. Z.; Sarmento,R. S.; Gomes, A.	Criação colaborativa de ativos construídos com projecto BIM multidisciplinar: modelos 3D, 4D e 5D	Revista de Activos de Engenharia	V. 2, n.º 2		Non WoS AND non SCOPUS			
Sánchez-Calvillo A.; Rincón L.; Hamard E.; Faria P.	Bibliometric Analysis on Earthen Building: Approaches from the Scientific Literature and Future Trends	Buildings	V. 14, n.º 12(3870)	10.3390/buildings14123870	WoS AND SCOPUS		Q2	Q2
Santos J.M.; Leite R.; Costa M.J.; Godinho F.; Portela M.M.; Pinheiro A.N.; Boavida I.	Seasonal and Size-Related Fish Microhabitat Use Upstream and Downstream from Small Hydropower Plants	Water (Switzerland)	V. 16, n.º 1(37)	10.3390/w16010037	WoS AND SCOPUS		Q2	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Santos K.F.D.; Santos S.; Vieira M.; Santos Silva A.; Pederneiras C.M.	Promoting Sustainability in the Cement Industry: Evaluating the Potential of Portuguese Calcined Clays as Clinker Substitutes for Sustainable Cement Production	Sustainability (Switzerland)	V. 16, n.º 23(10365)	10.3390/su162310365	WoS AND SCOPUS		Q2	Q2
Santos T.; Faria P.; Sotomayor J.; Silvestre J.D.; Santos Silva A.	Effect of Different Surface Treatments on the Performance of Earth Plasters	Coatings	V. 14, n.º 12(1537)	10.3390/coatings14121537	WoS AND SCOPUS		Q2	Q2
Santos T.; Luijten N.W.; Santos Silva A.; Silvestre J.D.; Faria P.	Earthen plasters hygrothermal and mechanical performance: Effect of adding recycled gypsum from plasterboards and raw hemihydrate	Journal of Building Engineering	V. 98 (111407)	10.1016/j.jobe.2024.111407	WoS AND SCOPUS		Q1	Q1
Santos, B; Ferreira, S; Lucena, P	Automated Geographic Information System Multi-Criteria Decision Tool to Assess Urban Road Suitability for Active Mobility	Urban Science	V. 8, n.º 4 (206)	10.3390/urbansci8040206	WoS AND SCOPUS		Q1	Q2
Santos, M., Matos, R., Alves, L., Saldanha Matos, J.	Soluções e tecnologias de saneamento a seco - uma ferramenta simplificada de apoio à decisão	Águas & Resíduos	Série V, n.º 02	102218/aer.2024.0204	Non WoS AND non SCOPUS			
Sarmento R.; Posani M.; Fernandes P.; Rodrigues A.M.; Gomes M.G.	Energy efficiency in modular emergency shelters: Impact of envelope finishings and shadowing	Journal of Building Engineering	V. 94 (110029)	10.1016/j.jobe.2024.110029	WoS AND SCOPUS		Q1	Q1
Scolaro T.P.; Ghisi E.; Silva C.M.	Effectiveness of Cool and Green Roofs Inside and Outside Buildings in the Brazilian Context	Sustainability (Switzerland)	V. 16, n.º 18(8104)	10.3390/su16188104	WoS AND SCOPUS		Q2	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Sena da Fonseca B.; Ferreira Pinto A.P.; Piçarra S.; Mègre S.; Rucha M.; Montemor M.F.	New water-based hybrid materials for the protection against water and consolidation of stone monuments	Progress in Organic Coatings	V. 194 (108599)	10.1016/j.porgcoat.2024.108599	WoS AND SCOPUS	6.5	Q1	Q1
Sena da Fonseca B.; Ferreira Pinto A.P.; Piçarra S.; Rucha M.; Montemor M.F.	Sonocatalysis: Eco-design strategy for developing novel inorganic sonogels for the conservation of stone heritage	Journal of Cultural Heritage	V. 67 (214-225)	10.1016/j.culher.2024.03.007	WoS AND SCOPUS	3.5	Q2	Q2
Shahid A.T.; Silvestre J.D.; Hofmann M.; Garrido M.; Correia J.R.	Life cycle assessment of an innovative bio-based unsaturated polyester resin and its use in glass fibre reinforced bio-composites produced by vacuum infusion	Journal of Cleaner Production	V. 441 (140906)	10.1016/j.jclepro.2024.140906	WoS AND SCOPUS		Q1	Q1
Shen J.; Arruda M.R.T.; Pagani A.; Carrera E.	A regularized higher-order beam elements for damage analysis of reinforced concrete beams	Mechanics of Advanced Materials and Structures	V. 31, n.º 1(79-91)	10.1080/15376494.2023.2245825	WoS AND SCOPUS	3.6	Q2	Q1
Shen J.; Arruda M.R.T.; Pagani A.; Petrolo M.	Mesh objective characteristic element length for higher-order finite beam elements	Advances in Engineering Software	V. 195 (103709)	10.1016/j.advengsoft.2024.103709	WoS AND SCOPUS	4.0	Q1	Q2
Shen J.; Tiago Arruda M.R.; Pagani A.	A consistent crack bandwidth for higher-order beam theories: Application to concrete	International Journal of Damage Mechanics	V. 33, n.º 4(269-292)	10.1177/10567895231215557	WoS AND SCOPUS	4.0	Q1	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Sikora, P., Federowicz, K., Skibicki, S., Techman, M., Hoffmann, M. Ludwiczak-Sarzała, A. Chougan, M., Pacheco, J.	The first step towards standardization of additively manufactured (3D printed) structures using concrete (in polish: Pierwszy krok w kierunku normalizacji konstrukcji betonowych wykonywanych w technologii druku 3D)	Journal of the Polish Association of Engineers & Construction Technicians (Czasopismo Polskiego Zwiazku Inzynierow & Techników Budownictw)	V. 5, pp. 146-152	10.5604/01.3001.0054.7216	Non WoS AND non SCOPUS			
Silva A.	Standing at water edges: Ecohydrological interactions between coastal groundwater discharge and intertidal community dynamics	Marine Environmental Research	V. 202 (106762)	10.1016/j.marenvres.2024.106762	WoS AND SCOPUS		Q1	Q1
Silva A.; Evangelista L.; Ferreira C.; Valença J.; Mendes M.P.	Towards resilient pipeline infrastructure: lessons learned from failure analysis	Discover Applied Sciences	V. 6, n.º 11(585)	10.1007/s42452-024-06273-7	WoS AND SCOPUS			
Silva A.; Nogueira R.; Bogas J.A.	Strategies for OPC Paste Carbonation: Relationship between Microstructure, Performance and Net CO2 Balance	Sustainability (Switzerland)	V. 16, n.º 1(361)	10.3390/su16010361	WoS AND SCOPUS		Q2	Q2
Silvestre H.C.; Marques R.C.; Dollery B.; Correia A.M.	An institutional and transaction cost analysis for the efficiency of water service in Brazilian local government consortia	Local Government Studies	V. 50, n.º 3(475-497)	10.1080/03003930.2023.2234302	WoS AND SCOPUS		Q1	Q2
Silvestre, J. D.; Flores-Colen, I.; Silva, C. M.	Adequabilidade dos isolantes térmicos à aplicação em paredes	Edifícios e Energia	n.º 152, março-abril 2024	https://edificioseenergia.pt/noticias/adequabilidade-dos-isolantes-termicos-a-aplicacao-em-paredes/	Non WoS AND non SCOPUS			
Simões C.; Ribeiro Á.S.; Almeida M.C.; Covas D.	Traceability and measurement uncertainty of non-removable field flowmeters using clamp-on ultrasonic flowmeters as reference	Acta IMEKO	V. 13, n.º 3(1777)	10.21014/actaimeko.v13i3.1777	WoS AND SCOPUS		Q3	

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Simões C.; Ribeiro Á.S.; Almeida M.C.; Covas D.; Dias L.; Coelho G.	Validation of a laboratory method for the traceability of a rainfall weighing gauge	Acta IMEKO	V. 13, n.º 1(1322)	10.21014/ACTAIMEKO.V13I1.1322	WoS AND SCOPUS		Q3	
Skibicki S.; Federowicz K.; Hoffmann M.; Chougan M.; Sibera D.; Cendrowski K.; Techman M.; Pacheco J.N.; Liard M.; Sikora P.	Potential of Reusing 3D Printed Concrete (3DPC) Fine Recycled Aggregates as a Strategy towards Decreasing Cement Content in 3DPC	Materials	V. 17, n.º 11(2580)	10.3390/ma17112580	WoS AND SCOPUS		Q2	Q2
Soares, R; Fialho, R; Gonçalves, J; Sousa, A	Low carbon in the reuse of Portland cement bags: a ten-year review	Environmental Engineering and Management Journal	V. 23, n.º 4 (891-901)	10.30638/eemj.2024.069	WoS AND SCOPUS	0.9	Q3	Q4
Sousa J.M.; Rosa I.C.; Correia J.R.; Cabral-Fonseca S.; Garrido M.	Synergistic effects of different ageing environments and sustained flexural loading on the durability of pultruded GFRP profiles	Journal of Building Engineering	V. 86 (108735)	10.1016/j.jobe.2024.108735	WoS AND SCOPUS		Q1	Q1
Sousa V.; Drumond A.; Meireles I.	Fuel consumption rate and emissions variability in waste collection services routes: case study of Cascais Ambiente	Environmental Science and Pollution Research	V. 31, n.º 12(17732-17747)	10.1007/s11356-023-29045-z	WoS AND SCOPUS		Q1	Q1
Sousa V.; Nogueira R.; Meireles I.; Silva A.	Managing carbon waste in a decarbonized industry: Assessing the potential of concrete mixing storage	Environmental Science and Pollution Research	V. 31, n.º 12(17804-17821)	10.1007/s11356-023-31712-0	Non WoS OR non SCOPUS		Q1	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Sousa V.; Silva A.; Nogueira R.	Assessment of the Carbon Storage Potential of Portuguese Precast Concrete Industry	Buildings	V. 14, n.º 2(384)	10.3390/buildings14020384	WoS AND SCOPUS		Q2	Q2
Sousa, R.; Furtado, A.; do Carmo, R.; Júlio, E.	Inovações na prefabricação modular de betão armado: desempenho estrutural, eficiência e sustentabilidade	Construção Magazine	nº 124, pp. 7-9		Non WoS AND non SCOPUS			
Souza A.R.; Veloso R.C.; Maia J.; Flores-Colen I.; Ramos N.M.M.	Durability and performance of opaque high-reflectance envelope systems: A systematic review	Journal of Building Engineering	V. 98 (111350)	10.1016/j.jobe.2024.111350	WoS AND SCOPUS		Q1	Q1
Souza L.; Yano M.O.; da Silva S.; Figueiredo E.	A Comprehensive Study on Unsupervised Transfer Learning for Structural Health Monitoring of Bridges Using Joint Distribution Adaptation	Infrastructures	V. 9, n.º 8(131)	10.3390/infrastructures9080131	WoS AND SCOPUS		Q2	Q2
Souza W.M.; Correia J.R.; Firmo J.P.; Almeida J.; Rosa I.C.; Correia A.A.	Experimental Study on Seismic Behavior of Concrete Columns Reinforced with Glass Fiber-Reinforced Polymer Bars	ACI Structural Journal	V. 121, n.º 4(131-148)	10.14359/51740714	WoS AND SCOPUS		Q2	Q3
Suárez-Celis J.; Zuluaga-Villermo J.; Rojas-Salgado M.; Suárez-Villanueva M.	Calculation of Average Global Accessibility Conditions for Bicycles Considering the Longitudinal Road Slope: Case Study Ibagué – Colombia	Future Cities and Environment	V. 10, n.º 1(30)	10.5334/fce.309	Non WoS OR non SCOPUS		Q2	
Szczygieł O.; Harbiankova A.; Manso M.	Where Does Energy Poverty End and Where Does It Begin? A Review of Dimensions, Determinants and Impacts on Households	Energies	V. 17, n.º 24(6429)	10.3390/en17246429	WoS AND SCOPUS		Q1	Q3
Szewczyk M.; Tomczyk P.; Wiatkowski M.	Water Management on Drinking Water Reservoirs in the Aspect of Climate Variability: A Case Study of the Dobromierz Dam Reservoir, Poland	Sustainability (Switzerland)	V. 16, n.º 15(6478)	10.3390/su16156478	WoS AND SCOPUS		Q2	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Tadeu A.; Carrilho J.; Cortês A.; Ferreira F.; Almeida J.	Acoustic absorption, scattering, and diffusion provided by green roof systems	Building and Environment	V. 262 (111778)	10.1016/j.buildenv.2024.111778	WoS AND SCOPUS		Q1	Q1
Tadonbou J.; Pliya P.; Beaucour A.-L.; Faria P.; Noumowe A.	Behavior of earth mortars at high temperature	Construction and Building Materials	V. 425 (136093)	10.1016/j.conbuildmat.2024.136093	WoS AND SCOPUS		Q1	Q1
Tang W.; Bai X.; Zhou Y.; Sonne C.; Wu M.; Lam S.S.; Hintelmann H.; Mitchell C.P.J.; Johs A.; Gu B.; Nunes L.; Liu C.; Feng N.; Yang S.; Rinklebe J.; Lin Y.; Chen L.; Zhang Y.; Yang Y.; Wang J.; Li S.; Wu Q.; Ok Y.S.; Xu D.; Li H.; Zhang X.-X.; Ren H.; Jiang G.; Chai Z.; Gao Y.; Zhao J.; Zhong H.	A hidden demethylation pathway removes mercury from rice plants and mitigates mercury flux to food chains	Nature Food	V. 5, n.º 1(72-82)	10.1038/s43016-023-00910-x	WoS AND SCOPUS		Q1	Q1
Tavares M.; Pérez-Sánchez M.; Carravetta A.; Coronado-Hernández O.E.; López-Jiménez P.A.; Ramos H.M.	Smart feasibility optimization of hybrid renewable water supply systems by digital twin technologies: A multicriteria approach applied to isolated cities	Sustainable Cities and Society	V. 115 (105834)	10.1016/j.scs.2024.105834	WoS AND SCOPUS		Q1	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Tavares M.; Pérez-Sánchez M.; Coronado-Hernández O.E.; Kuriqi A.; Ramos H.M.	Defining and Mitigating Flow Instabilities in Open Channels Subjected to Hydropower Operation: Formulations and Experiments	Water (Switzerland)	V. 16, n.º 21(3069)	10.3390/w16213069	WoS AND SCOPUS		Q2	Q2
Teixeira de Freitas J.A.; Tiago C.; Pereira E.M.B.R.	Stabilization and improvement of the convergence of hybrid-Trefftz stress elements for plate bending analysis	Computers and Structures	V. 305 (107519)	10.1016/j.compstruc.2024.107519	WoS AND SCOPUS	4.4	Q1	Q1
Teixeira de Freitas J.A.; Tiago C.; Pereira E.M.B.R.	Modelling the effect of point forces and moments in plate bending with hybrid-Trefftz stress elements	International Journal for Numerical Methods in Engineering	V. 125, n.º 24(e7587)	10.1002/nme.7587	WoS AND SCOPUS		Q1	Q1
Teixeira H.; Gomes M.G.; Moret Rodrigues A.; Aelenei D.	Solar responsive building glazing: Experimental analysis of the impact of photochromic glazing on indoor thermal and luminous conditions	Journal of Building Engineering	V. 92 (109812)	10.1016/j.jobe.2024.109812	WoS AND SCOPUS		Q1	Q1
Teixeira H.; Moret Rodrigues A.; Aelenei D.; Ferreira I.; Gomes M.G.	Solar-optical and thermal behavior of photochromic glazing: Small-scale testing under real sky conditions	Construction and Building Materials	V. 456 (139309)	10.1016/j.conbuildmat.2024.139309	WoS AND SCOPUS		Q1	Q1
Teixeira H.; Moret Rodrigues A.; Aelenei D.; Gomes M.G.	Simulation-Based Evaluation of the Impact of an Electrochromic Glazing on the Energy Use and Indoor Comfort of an Office Room	Energies	V. 17, n.º 9(2110)	10.3390/en17092110	WoS AND SCOPUS		Q1	Q3
Teixeira R.; Flores-Colen I.; Oliveira D.; Silva C.M.	Optimizing Local Materials in Green Roofs Through Citizen Science Activities at a Primary School in Azores	Water (Switzerland)	V. 16, n.º 20(2998)	10.3390/w16202998	WoS AND SCOPUS		Q2	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Teixeira, H.; Gomes, M. Glória; Moret Rodrigues, A.; Aelenei, D.	Impacto de um envidraçado electrocrómico no conforto térmico e visual em Portugal	Edifícios e Energia	n.º 155 (66-74)	https://edificioseenergia.pt/noticias/impacto-de-um-envidracado-eletrocromico-no-conforto-termico-e-visual-em-portugal/	Non WoS AND non SCOPUS			
Terra V.S.; Simões F.M.F.; Cardoso R.	A Bio-Chemo-Hydro-Mechanical Model for the Simulation of Biocementation in Soils: One-Dimensional Finite Element Simulations	Mathematics	V. 12, n.º 20(3267)	10.3390/math12203267	WoS AND SCOPUS		Q2	Q1
Tiago P.; Leal A.I.; Silva C.M.	Assessing Ecological Gains: A Review of How Arthropods, Bats and Birds Benefit from Green Roofs and Walls	Environments	V. 11, n.º 4(76)	10.3390/environments11040076	WoS AND SCOPUS		Q1	Q2
Tomczyk P.; Wdowczyk A.; Wiatkowska B.; Szymańska-Pulikowska A.; Kuriqi A.	Fertility and quality of arable soils in Poland: spatial–temporal analysis of long-term monitoring	Ecological Indicators	V. 166 (112375)	10.1016/j.ecolind.2024.112375	WoS AND SCOPUS		Q1	Q1
Tomczyk P.; Wierzchowski P.S.; Dobrzyński J.; Kulkova I.; Wróbel B.; Wiatkowski M.; Kuriqi A.; Skorulski W.; Kabat T.; Prycik M.; Gruss Ł.; Drobnik J.	Effective microorganism water treatment method for rapid eutrophic reservoir restoration	Environmental Science and Pollution Research	V. 31, n.º 2(2377-2393)	10.1007/s11356-023-31354-2	WoS AND SCOPUS		Q1	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Torcato, J.; Gaspar, D.; Vieira, J.; Coelho dos Santos, F.; Marques Almeida, N.	Perspetiva das comunidades técnica e científica sobre o corpo de conhecimento da gestão de ativos	Revista de Activos de Engenharia	2(1), 22–34	10.29073/rae.v2i1.794	Non WoS AND non SCOPUS			
Torres-González M.; Blasco-López F.J.; Alejandre Sánchez F.J.; Alducin-Ochoa J.M.; Moya-Fierro M.	Conservation and Preservation of Historic Plasterwork: The Study of Decorative Pineapples of the Royal Alcazar of Seville	International Journal of Architectural Heritage	V. 18, n.º 9(1411-1420)	10.1080/15583058.2023.2231395	WoS AND SCOPUS		Q1	Q2
Tortorelli C.; Arantes A.	Barriers to Implementing Lean Six Sigma in the Chemical Process Industry: The Case of Brazil	Sustainability (Switzerland)	V. 16, n.º 24(11257)	10.3390/su162411257	WoS AND SCOPUS		Q2	Q2
Travincas R.; Mendes M.P.; Torres I.; Flores-Colen I.	Predicting the Open Porosity of Industrial Mortar Applied on Different Substrates: A Machine Learning Approach	Applied Sciences (Switzerland)	V. 14, n.º 23(10780)	10.3390/app142310780	WoS AND SCOPUS		Q2	Q1
Travincas R.; Silveira D.; Bellei P.; Gouveia J.; Matias G.; Torres I.; Flores-Colen I.	Performance and Accelerated Ageing of an Industrial Hydraulic Lime Mortar Applied on Different Substrates	Coatings	V. 14, n.º 7(819)	10.3390/coatings14070819	WoS AND SCOPUS		Q2	Q2
Trombini M.; Enea M.; Arruda M.R.T.; Pagani A.; Petrolo M.; Carrera E.	1D higher-order theories for quasi-static progressive failure analysis of composites based on a full 3D Hashin orthotropic damage model	Composites Part B: Engineering	V. 270 (111120)	10.1016/j.compositesb.2023.111120	WoS AND SCOPUS		Q1	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Tulla P.S.; Kumar P.; Vishwakarma D.K.; Kumar R.; Kuriqi A.; Kushwaha N.L.; Rajput J.; Srivastava A.; Pham Q.B.; Panda K.C.; Kisi O.	Daily suspended sediment yield estimation using soft-computing algorithms for hilly watersheds in a data-scarce situation: a case study of Bino watershed, Uttarakhand	Theoretical and Applied Climatology	V. 155, n.º 5(4023-4047)	10.1007/s00704-024-04862-5	WoS AND SCOPUS		Q2	Q3

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Useche S.A.; Alonso F.; Boyko A.; Buyvol P.; Castañeda I.; Cendales B.; Cervantes A.; Echiburu T.; Faus M.; Feitosa Z.; Fernandez C.; Gene-Morales J.; de Geus B.; Gnap J.; Ibrahim M.K.; Janstrup K.H.; Lijarcio I.; Makarova I.; Mikusova M.; Møller M.; Ngueuteu-Fouaka S.; O'Hern S.; Orozco-Fontalvo M.; Rojas G.; Shubenkova K.; Siebert F.; Soto J.; Stephens A.N.; Wang Y.; Willberg E.; Wintersberger P.; Yang Y.; Zeuwts L.; Zulkipli Z.H.; McIlroy R.	Using demographic, psychosocial, behavioural and safety-related factors to assess cyclists' behaviour: A comparative approach across 19 countries	Data in Brief	V. 54 (110278)	10.1016/j.dib.2024.110278	WoS AND SCOPUS		Q3	Q3

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Useche S.A.; Alonso F.; Boyko A.; Buyvol P.; Castañeda I.D.; Cendales B.; Cervantes A.; Echiburu T.; Faus M.; Gene-Morales J.; Gnap J.; Gonzalez V.; Ibrahim M.K.A.; Janstrup K.H.; Makarova I.; Mikusova M.; Møller M.; O'Hern S.; Orozco-Fontalvo M.; Shubenkova K.; Siebert F.W.; Soto J.J.; Stephens A.N.; Wang Y.; Willberg E.S.; Wintersberger P.; Zeuwts L.; Zulkipli Z.H.; McIlroy R.C.	Yes, size does matter (for cycling safety)! Comparing behavioral and safety outcomes in S, M, L, and XL cities from 18 countries	Journal of Transport Geography	V. 114 (103754)	10.1016/j.jtrangeo.2023.103754	WoS AND SCOPUS		Q1	Q1
Useche S.A.; Robayo S.; Orozco-Fontalvo M.	The hidden cost of your 'too fast food': stress-related factors and fatigue predict food delivery riders' occupational crashes	International Journal of Occupational Safety and Ergonomics	V. 30, n.º 3(825-834)	10.1080/10803548.2024.2356997	WoS AND SCOPUS	1.6	Q3	Q3
Valença G.; Moura F.; Morais de Sá A.	Where is it complex to reallocate road space?	Environment and Planning B: Urban Analytics and City Science	V. 51, n.º 6(1290-1307)	10.1177/23998083231217770	WoS AND SCOPUS		Q1	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Valença G.; Moura F.; Morais de Sá A.	Exploring criteria for reallocating road space dynamically: lessons from a workshop with experts	Journal of Urban Design	V. 29, n.º 3(301-317)	10.1080/13574809.2023.2240245	WoS AND SCOPUS	1.4	Q1	Q3
Valença J.; Brandão M.; Júlio E.	Vision-based monitoring system for in-plan seismic tests conducted on a shaking table: The case study of prefabricated concrete shells	Structural Concrete	V. , n.º (-)	10.1002/suco.202400624	WoS AND SCOPUS		Q1	Q2
Valença J.; Morin K.; Jouen N.; Olivo N.; Torres-Gonzalez M.; Mendes M.P.; Silva A.	Feeling-BIM: A digital model to support maintenance decisions, based on automatic inspection and dwellers' feelings	Journal of Building Engineering	V. 87 (108937)	10.1016/j.jobe.2024.108937	WoS AND SCOPUS		Q1	Q1
Valença, J; Qin, XQ; Chang, L; Dong, J; Shi, XG; Casas, JR	Remote Sensing-Based Structural Health Monitoring and Damage Assessment	Remote Sensing	V. 16, n.º 7 (1146)	10.3390/rs16071146	WoS AND SCOPUS		Q1	Q1
Vara G.M.; Gomes M.C.; Ferreira D.C.	Assessing the performance of Portuguese public hospitals before and during COVID-19 outbreak, with optimistic and pessimistic benchmarking approaches	Health Care Management Science	V. , n.º (-)	10.1007/s10729-024-09693-4	WoS AND SCOPUS		Q1	Q2
Vazquez V.; Tomé A.; Vizotto I.	A spatial–functional analysis methodology of ultra-thin free-form shells	Structural Concrete	V. , n.º (-)	10.1002/suco.202400332	WoS AND SCOPUS		Q1	Q2
Vicente Da Silva M.; Antão A.N.	Computational Upper- and Lower-Bound 3D Limit Analysis Using the Hoek-Brown Yield Criterion	International Journal of Geomechanics	V. 24, n.º 4(04024036)	10.1061/IJGNAI.GMENG-9081	WoS AND SCOPUS		Q1	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Victorel C.; Miglioranza K.S.B.; Cavalli M.; Quadri-Adrogué A.; Bó M.S.; Baladrón A.V.	Agricultural pesticides in feathers of the burrowing owl (Athene cunicularia) and its relationship to land-use in the argentinean pampas	Environmental Research	V. 263 (120097)	10.1016/j.envres.2024.120097	WoS AND SCOPUS		Q1	Q1
Vieira J.; Almeida N.M.D.; Poças Martins J.; Patrício H.; Morgado J.G.	Analysing the Value of Digital Twinning Opportunities in Infrastructure Asset Management	Infrastructures	V. 9, n.º 9(158)	10.3390/infrastructures9090158	WoS AND SCOPUS		Q2	Q2
Villalba-Barrios A.F.; Coronado Hernández O.E.; Fuertes-Miquel V.S.; Arrieta-Pastrana A.; Ramos H.M.	Assessing Extreme Drought Events and Their Temporal Impact: Before and after the Operation of a Hydropower Plant	Applied Sciences (Switzerland)	V. 14, n.º 5(1692)	10.3390/app14051692	WoS AND SCOPUS		Q2	Q1
Vishwakarma D.K.; Kumar P.; Yadav K.K.; Ali R.; Markuna S.; Chauhan S.; Heddam S.; Kuriqi A.; Srivastava A.; Alam M.; Vinayak V.	Evaluation of CatBoost Method for Predicting Weekly Pan Evaporation in Subtropical and Sub-Humid Regions	Pure and Applied Geophysics	V. 181, n.º 2(719-747)	10.1007/s00024-023-03426-4	WoS AND SCOPUS		Q2	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Vishwakarma D.K.; Yadav D.; Kumar R.; Kumar R.; Bhat S.A.; Mirzania E.; Kuriqi A.	Assessing the performance of various infiltration models to improve water management practices	Paddy and Water Environment	V. 23, n.º 1 (77–93)	10.1007/s10333-024-01000-9	WoS AND SCOPUS		Q2	Q2
Wang C.; Song J.; Nunes L.M.; Zhao H.; Wang P.; Liang Z.; Arp H.P.H.; Li G.; Xing B.	Global microplastic fiber pollution from domestic laundry	Journal of Hazardous Materials	V. 477 (135290)	10.1016/j.jhazmat.2024.135290	WoS AND SCOPUS		Q1	Q1
Wang Y.; Ren Q.; de Brito J.	A variable-node element model and its application to damage analysis of RAC using the 2D base force element method	Engineering Fracture Mechanics	V. 306 (110268)	10.1016/j.engfracmech.2024.110268	WoS AND SCOPUS		Q1	Q1
Yu, Y; Fang, GH; Kurda, R; Sabuj, AR; Zhao, XY	An agile, intelligent and scalable framework for mix design optimization of green concrete incorporating recycled aggregates from precast rejects	Case Studies in Construction Materials	V. 20, n.º (e03156)	10.1016/j.cscm.2024.e03156	WoS AND SCOPUS		Q1	Q1
Zacchei E.; Esteves M.; Azevedo A.; Martins S.; Almeida J.; Tadeu A.; Silva S.	Analytical modelling and experimental assessment of metal pallets. Mechanical behaviour and durability performance under microbiological, chemical and environmental attacks	Case Studies in Construction Materials	V. 20 (e02735)	10.1016/j.cscm.2023.e02735	WoS AND SCOPUS		Q1	Q1
Zacchei E.; Gorla Nogueira C.	Scenarios of Progressive Pancake/Bending Collapse Considering Elastic/Plastic Reinforced Concrete Buildings	Buildings	V. 14, n.º 7(1948)	10.3390/buildings14071948	WoS AND SCOPUS		Q2	Q2

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Zerouali B.; Ayek A.A.E.; Bailek N.; Kuriqi A.; Wong Y.J.; Srivastava A.; Islam A.R.M.T.; Ouadja A.; Santos C.A.G.	RUSLE model insights for soil conservation and sustainable land use in semiarid environments	Euro-Mediterranean Journal for Environmental Integration	V. 10 , n.º (853–876)	10.1007/s41207-024-00664-3	WoS AND SCOPUS		Q3	Q3
Zerouali B.; Bailek N.; Tariq A.; Kuriqi A.; Guermoui M.; Alharbi A.H.; Khafaga D.S.; El-kenawy E.-S.M.	Enhancing deep learning-based slope stability classification using a novel metaheuristic optimization algorithm for feature selection	Scientific Reports	V. 14, n.º 1(21812)	10.1038/s41598-024-72588-5	WoS AND SCOPUS		Q1	Q1
Zerouali, B; Bailek, N; Bouchouich, K; Mawloud, G; Kuriqi, A; Khafaga, DS; Alharbi, AH; El-kenawy, EM	Enhancing water security through advanced modeling: integrating deep learning and a novel metaheuristic optimization algorithm for accurate pan evaporation prediction	Aqua Water Infrastructure, Ecosystems and Society	V. 74, n.º 1 (18-35)	10.2166/aqua.2024.128	WoS AND SCOPUS	2.1	Q2	Q2
Zhao Z.; Liu Y.; Lu Y.; Ji C.; Lin C.; Yao L.; Pu Z.; de Brito J.	Prediction of properties of recycled aggregate concrete using machine learning models: A critical review	Journal of Building Engineering	V. 90 (109516)	10.1016/j.jobe.2024.109516	WoS AND SCOPUS		Q1	Q1
Zhong H.; Su Y.; Wu X.; Nunes L.; Li C.; Hao Y.; Liu Y.-R.; Tang W.	Mercury supply limits methylmercury production in paddy soils	Science of the Total Environment	V. 927 (172335)	10.1016/j.scitotenv.2024.172335	WoS AND SCOPUS		Q1	Q1

Authors	Title of paper	Journal	Vol, Number (Pages)	DOI	Type of journal	Impact Factor Clar. Analytics (2023)	Quartile Scopus	Quartile WoS
Zhong H.; Tang W.; Li Z.; Sonne C.; Lam S.S.; Zhang X.; Kwon S.Y.; Rinklebe J.; Nunes L.M.; Yu R.-Q.; Gu B.; Hintelmann H.; Tsui M.T.-K.; Zhao J.; Zhou X.-Q.; Wu M.; Liu B.; Hao Y.; Chen L.; Zhang B.; Tan W.; Zhang X.-X.; Ren H.; Liu Y.-R.	Soil Geobacteraceae are the key predictors of neurotoxic methylmercury bioaccumulation in rice	Nature Food	V. 5, n.º 4(301-311)	10.1038/s43016-024-00954-7	WoS AND SCOPUS		Q1	Q1
Zitouni M.; Kada A.; Lamri B.; Arruda M.R.	Numerical Analysis of Combined Effect Hybrid Fibres and FirInsulation on the Fire Resistance Performance of SCC Beams	Periodica Polytechnica Civil Engineering	V. 68, n.º 4(1255-1267)	10.3311/PPci.36548	WoS AND SCOPUS	1.4	Q3	Q3

ANNEXE C–RESEARCH GROUP ACTIVITIES IN 2024

RESEARCH GROUP 1 - Hydraulics

RESEARCH GROUP COORDINATOR – Helena Ramos

PART I - RESOURCES

I.1 Budget

BUDGET (euros)						
FCT		Other Funding				
STRATEGIC Funding	FCT Projects	Other Research Funding		Consultancy		TOTAL
		National	International	National	International	
15 304,85	60 678,12	9 663,50	0,00	45 560,00		131 206,47

I.2 Personnel

PERSONNEL					
Name	Category	Member	Collaborator		
			with PhD	without PhD	
				PhD student	Other
António Heleno Cardoso	Full Professor	x			
António Alberto do Nascimento Pinheiro	Full Professor	x			
Dídia Isabel Cameira Covas	Full Professor	x			
Helena Margarida Machado da Silva Ramos	Full Professor	x			
Jorge de Saldanha Gonçalves Matos	Associate Professor	x			
Rui Miguel Lage Ferreira	Associate Professor	x			
Diogo Silva Mendes	Assistant Professor		x		
Marta Sofia Ferreira Cabral	Assistant Professor	x			
Maria da Graça Reis e Silva de Oliveira Neves (CERIS NOVA)	Associate Professor		x		

PERSONNEL					
Name	**Category**	**Member**	**Collaborator**		
			with PhD	**without PhD**	
				PhD student	**Other**
Hilda de Pablo	Assistant Professor	x			
António Betâmio de Almeida	Emeritus Professor		x		
Carlos Daniel Borges Coelho (CERIS Aveiro)	Assistant Professor	x			
Sérgio António Neves Lousada (CERIS Aveiro)	Assistant Professor	x			
Alban Kuriqi	Assistant Researcher	x			
Ana Isabel da Rocha e Sá Lopes Quaresma	Assistant Researcher		x		
Ana Margarida da Costa Ricardo	Assistant Researcher	x			
Filipe Alexandre da Silva Romão	Assistant Researcher		x		
Isabel Maria Bento de Matos Boavida	Assistant Researcher	x			
Márcia Lima (CERIS Aveiro)	Researcher	x			
Nuno Miguel da Conceição Martins	Assistant Researcher	x			
Alejandro Baladrón Julian (concluded 2024)	PhD Student			x	
António Maria de Afonseca Portela Roseira Muralha	PhD Student			x	
Catarina Isabel Ferreira Simões	PhD Student			x	
Dora Patrícia Valente Salgueiro	PhD Student			x	
Francisco Bernardo	PhD Student			x	
James Green	PhD Student			x	
Joana Raquel J. Carneiro (concluded 2025)	PhD Student			x	
João Paulo Cavaleiro de Ferreira (concluded 2025)	PhD Student			x	
João Pedro Gaspar Caetano	PhD Student			x	
Leila Alizadeh	PhD Student			x	
Luís Palma N. Mendes (concluded 2024))	PhD Student			x	
Pedro Manuel Saraiva Cardoso	PhD Student			x	
Renan S. Leite de Andrade	PhD Student			x	
Ricardo Jorge Lourenço Jónatas	PhD Student			x	
Solange Valente Mendes	PhD Student			x	

PERSONNEL					
Name	**Category**	**Member**	**Collaborator**		
			with PhD	**without PhD**	
				PhD student	**Other**
Teresa P. A. Alvarez (concluded 2024)	PhD Student			x	
Steven Andrei Restrepo Velasquez	PhD Student			x	
Tiago Correia	scolarship				x
Afonso Alves	scolarship				x
João Coelho	scolarship				x
Miguel Tavares	scolarship				x

The summary table is shown below.

Type	**Permanent**	**Non-permanent**		**Total**
		Contract	**Scholarship**	
Members	11	4		15
Collaborators with PhD	3	2		5
Collaborators without PhD			21	21
Technical staff	0.5			0.5
Administrative Staff	1			1
Others				0

PART II - DESCRIPTION

Leadership

Professor Helena M. Ramos has held the position of Coordinator of the Hydraulics Research Group (RG) since 2025. In this capacity, she acts as the official representative of the group in regular meetings with the Executive Board and with other research group coordinators, as well as in formal institutional engagements. Additionally, she is responsible for the management and oversight of the portion of the FCT funding allocated to the research group by the Executive Board.

Description of the Research Group

The Hydraulics research group develops R&D activities involving around 48 researchers: 15 members, 11 permanent staff, and 5 collaborators, which include an IST Emeritus Professor and 17 PhD students. Research cuts across several areas like the safety of hydrosystems, assessment, and enhancement of water use and energy efficiency in water supply systems, experimental and numerical modeling of hydraulic conveyance systems and structures, sediment transport, local scour, hydropower and hybrid energy production, eco-hydraulics and river rehabilitation and restoration, wind-generated waves, storm surges and coastal flooding and inundation, coastal morphodynamics and coastal and port structures.

The main research activities have been focused on the following major topics: i) pressurised water systems; ii) fluvial hydraulic structures; iii) river restoration and management; iv) environmental fluid mechanics; v) sediment transport and river morphodynamics; vi) coastal engineering.

The most recently published research shows group skills in experimental and numerical research. Recently improved laboratory facilities are expected to foster experimental research programmes, which usually have a strong numerical modelling component.

One of the group members (António Cardoso) is the Programme Director of the FCT PhD programme on Environmental Hydraulics and Hydrology (H2Doc), and another one (António Pinheiro) is the IST co-coordinator of the FCT PhD programme on River Restoration and Management (FLUVIO). This leadership of PhD programmes has allowed the group to pursue new research topics.

The researchers within this group have actively engaged in interdisciplinary collaboration with colleagues from various scientific domains, including hydrology, water resources management, ecology, pollution control, geology, oceanography, and sociology. These interactions have fostered integrated approaches to research and strengthened the group's overall scientific contribution.

A key strength of the group lies in its high level of internationalisation. Several members hold prominent editorial roles in internationally recognised scientific journals indexed in the Web of Science and Scopus databases, serving as editors, associate editors, guest editors, or members of editorial boards. These roles underscore the group’s academic visibility and influence within the global research community.

Furthermore, the majority of the group's eleven permanent researchers possess substantial experience in industry collaboration, particularly in the design of hydraulic structures and in providing specialised consultancy services. Their expertise has been instrumental in the development of contract-based studies and the preparation of expert technical reports addressing complex issues related to both existing infrastructures and projects under construction.

General Objectives

The group **research objectives** include different cross-cutting issues across the four thematic strands of CERIS. However, the group's main activities are focused on the thematic strands of Risk and Safety in Natural and Built Environments (RS) and Rehabilitation of Natural and Built Environments (RNBE). Nevertheless, some contributions are expected to the other two thematic strands.

The safety and design of pressurised pipe systems (RS), Digital Twin technology enhancing decision-making, operational efficiency, and asset management across water networks, hydraulic pumping and hydropower solutions within hydraulic engineering domains allow to create a bridge between physical infrastructure and intelligent data systems, as well as the development of new energy concepts and converters, including pumped storage, hydropower, and water hammer, are crucial for safer and more flexible and reliable solutions to attain the objective of decarbonisation of energy production in 2050 (RNBE). The development of digital water (real-time data to provide recommendations to users) and digital twins (combinations of models and real-time data) concepts and energy transition solutions allow to control and assure the system's operationality, namely burst detection, energy efficiency improvement, hybridization of energy solutions, and hydro-energy recovery on existing infrastructures.

The safety of river structures (RS) is closely connected with studying long-term channel morphology. These phenomena are progressively solved with numerical modelling. Its application to dam-break flows and overland tsunami propagation was considered. Risk management is closely related to these aspects, either in the valleys downstream of dams or in reducing the ecological impacts of the uses of water, like, for instance, hydropower production.

Climate changes or major alterations in the catchment basins advise developing innovative hydraulic structures and circuits. CFD modeling of hydraulic structures and circuits contributes to a better knowledge of the behaviour of these hydraulic systems and to the development of measures to reduce accident probability (RS).

Assessing the vulnerability to flooding of the built environments on low-lying estuaries due to extreme storm wave events and storm surges or rising sea levels caused by climate change were also research objectives of this group (RS). Moreover, understanding how wind-generated waves interact with coastal structures and how they change coastal morphology, both in short- and long-term time scales, has been driving the research interests of the RS group.

Concerning RNBE, the ecohydraulics line included improving fish passes design guidelines, improving ecological connectivity along regulated rivers, and providing mitigation strategies and shelters for fish downstream of powerhouses with the hydropeaking operation (RS) as the improvement of the river's

physical and chemical features. In this scope, studying the transport of sediment, pollutants, and nutrients in rivers and estuaries, the elaboration of guidelines for the rehabilitation of river confluences, and the development of stabilisation techniques for river meanders were under concern.

Some of the mentioned R&D objectives included aspects related to the **response to natural and societal changes** thematic strand. Managing regulated rivers and improving ecological conditions, maintaining river and seashore recreational and economic uses, more and more associated with tourism activities, are major societal challenges. Additionally, within the same line, the social and economic analysis of small dams and weirs removal to improve ecological conditions downstream is a cross-cutting issue that the group is still pursuing.

Group Governance

A simple organisational structure was set up to guarantee the coordination of the members' actions while keeping individual scientific freedom so that each one may continue to promote the initiatives necessary to foster the research activity.

The Directive Board of CERIS appointed the Group Coordinator (Professor Helena M. Ramos). The Coordinator participated in the meetings promoted by the heads of the four thematic strands and promoted group meetings whenever necessary. When adequate, the meetings are extended to other researchers and external collaborators, such as post-doctoral and PhD students enrolled in research projects conducted by group members.

The Group Coordinator elaborated, with the contributions of the group members, the annual report and activity plan. The Group Coordinator was also responsible for fostering joint initiatives between group members and trying to boost the collaboration between groups across the thematic strands, supporting cross-cutting R&D projects that the members may be willing to promote.

Facilities

The experimental research of RG1 is supported by several facilities assembled at the Laboratory of Hydraulics and Environment (LHE). This laboratory is located on the IST campus, is shared with other research groups, and is also used for teaching activities. The main facilities installed in the LHE are:

- Didactic flume: It is 5.0 m long, 0.30 m wide, and 0.40 m high, a tilting flume made from acrylic and aluminium. It is equipped with several experimental apparatuses for generating different backwater profiles.
- Blue flume: It's 6.0 m long, 0.395 m wide, and 0.40 m high, a tilting flume made of acrylic and steel. It includes a recirculating water circuit with a frequency-controlled pump.
- Multipurpose free surface hydraulics flume: 8 m long, 0.70 m wide, and 0.80 m high horizontal flume, made of a steel frame and glass side walls, equipped with flap gates immediately up and downstream the flume. This flume is part of the bioterium where we perform experiments with live animals (fish) in compliance with national and EU regulations.

- Wave flume: This is a 20 m long, 0.70 m wide, and 1.00 m high wave channel equipped with a wave generator able to produce regular and irregular waves with frequencies between 0.05 Hz and 1.5 Hz, equipped with resistive probes and a wave absorbing system.
- CRIV - recirculating and tilting hydraulics flume: CRIV is a 12.5 m long, 0.41 m wide, and 0.50 m high prismatic glassed walls channel with adjustable slope. It includes a water and sediment recirculation circuit.
- Confluence flume includes the main channel (MC) and a tributary channel (TC). The MC is 10.0 m long, 1.00 m wide, and 0.70 m high. The TC is 4.0 m long, 0.50 m high, and has adjustable width. It is equipped with conveyors for sand feeding and an automated transverse system.
- Pool-type fishway flume: This is a 1/2.5 scaled model of a real fishway. The channel is 5.70 m long, 0.40 m wide, and 0.50 m high; it is a tilting flume made of a steel frame and glass side walls and includes a recirculating water circuit.
- Steep-slopes flume: This is a 3.50 m long, 0.50 m wide, and 0.50 m high steel flume with an adjustable slope up to 26.5%. It includes a recirculating water circuit equipped with a hopper and a conveyor belt for coarse sediment feeding.
- Test-Hydro: Test-Hydro is an innovative pipe rig for testing small-power reaction turbomachines in both transient and steady-state conditions, being fully instrumented and equipped with a state-of-the-art data acquisition system. The rig is a closed reversible circuit composed of steel pipes with diameters between 50 and 200 mm for testing small-power turbomachines. The instrumentation includes sensors for measuring discharge, pressure, torque, electric power, rotational speed, and temperature. A software application has been developed in LabView for acquiring, treating, and analyzing collected data and determining the efficiency of tested turbomachines.
- Water hammer test-rig I: This rig is composed of a copper pipe coil with 103 m and 20 mm diameter, with a centrifugal pump and control valves. It has been developed for measuring transient pressures generated by pump trip-off and valve maneuvers. It is equipped to acquire high-frequency pressure variations.
- Water hammer test-rig II: This rig is composed of a straight pipe, 15 m long, 20 mm diameter, for measuring transient pressures generated by valve maneuvers. It is equipped to acquire high-frequency pressure variations.
- Water hammer test-rig III: This rig consists of polyethylene (PE) pipe coils 200 m in length and 50 mm in diameter, with a hydro-pneumatic vessel upstream and valves downstream for analyzing transients generated by valve maneuvers in viscoelastic pipes and with leaks.
- PAT systems: two pumps as turbines (PAT) can be tested isolated or installed in parallel and series. The system is composed of an air vessel, a pipe rig of metal and HDPE and PVC pipe

branches, with a flowmeter and transducers installed. In the recirculating, there are also two pumps to operate also in single, parallel, and series modes.

- TP5B - Five-blade tubular propeller: TP5B was designed at LH to study the efficiency of micro-energy production with a maximum turbine flow of 12 l/s.
- Compressed air volume system (CAV): this is used to study the behavior of entrapped air during pipe filling and under transient conditions. This system comprises two hydro-pneumatic vessels, one CAV, a pump with a maximum nominal head of 28.2 m and a nominal power of 4 kW, and control valves.
- Energy converter facility, based on centrifugal turbines and wells pumps, and TI-CAES for energy storage induced by hydraulic transient conditions.
- Filling and emptying processes in pipe systems (DN=45 mm) with air valves or orifices in the higher point of the pipe profile for the upsurge control.
- A small-scale model of water storage tanks with two cross-sections (circular and rectangular), different inlet and outlet pipe configurations, and with/without baffles and multiple nozzles to study the water mixing conditions and renewal time.
- A small-scale model of an undershot water wheel with plane blades installed in a horizontal flume with a recirculating flow circuit to study the mechanical power and efficiency of the water wheel for different flow rates and rotational speeds.

There is also an extension of the LHE in IG energy labs, developed under CERIS supervision and for operating conditions not available at LHE:

- Development of a new low-head propeller turbine, with 120º upstream connection and long downstream draftube.
- Development of a waterwheel cross-flow type and a siphon turbine.

Research carried out in these facilities uses advanced instrumentation, namely:

- PIV – Particle Image Velocimetry: PIV is a laser-based technique to acquire 2D instantaneous velocity fields at a maximum frequency of 15 Hz, composed of a 1600x1200 CCD camera synchronized with a 30 mJ, 532 nm laser.
- ADV – Acoustic Doppler Velocimetry: ADV for pointwise measurement of 3D velocity; composed of down-looking and side-looking probe (200 Hz max; control vol 1.5-7 mm) and a VCM for field applications (8 Hz max; control vol 15 mm).
- UVP – Ultrasonic Velocity Profiler: Acoustic probes for measuring velocity profiles and water and bottom levels; composed of 1 UVP system with two probes of 2 MHz and 4 MHz.

- Limnimeter: 10 ultrasonic distance measuring sensors UNDK30U6103/S14 with sensing range 100-700 mm, repeatability < 3 mm, and response time <5 ms. Used to measure bed and water surface levels.
- Mini-Echo-Sounder: Two Mini-Echo-Sounders (UltraLab UWS) to measure bathymetry, erosion, and sedimentation without emptying the model. It measures distances in water from 2 cm up to 15 m with 1mm accuracy and 1MHz acquisition rate.
- 3D Automated Transverse System: this equipment moves longitudinally, transversely, and vertically to the channel, allowing automatic measurements. Conflume, a specifically developed software, controls it.
- Pumped-storage Hydropower: equipment supported by Hydropneumatic reservoirs and a closed metal and HDPE pipe rig with pressure transducers and flowmeter installed.
- RTK GNSS – Real-Time Kinematic Global Navigation Satellite System: RTK GNSS is a system capable of carrying out xyz field measurements with a sampling rate of up to 2 Hz and with vertical and horizontal accuracies smaller than 0.05 m and 0.10 m, respectively. The RTK GNSS is used to study beach erosion during coastal storms, beach accretion and beach changes induced by coastal engineering interventions, such as beach nourishments.

The group's activities are also supported by a computational server acquired by a research project, which features 16 CPUs and 8 GPU boards specific for computation.

PART III – ACTIVITY

III.1 Activity indicators - Summary table for 2024

ACTIVITIES			Number
PhD Theses		Concluded	3
		To be concluded after 2024	15
Publications	Papers in peer-reviewed journals	International peer-reviewed journals (WoS AND Scopus)	91
		Peer-reviewed journals (non-WOS OR non-Scopus)	5
		Peer-reviewed journals (non-WOS AND non-Scopus)	1
	Papers in proceedings	International	27
		National	1
	Books	Entire	0
		Chapters	0
		As editor	0
Reports		Scientific	0
		Consultancy/others	5
Collective guidance in scientific work	Editor-in-Chief	WoS/Scopus-indexed Journals	0
		Other journals	0
	Associate Editor	WoS/Scopus-indexed Journals	3
		Other journals	0
	Issue Editor/Guest editor/Membership Editorial Boards	WoS/Scopus-indexed Journals	7
		Other journals	0
	Membership in Scientific Committees	International	9
		National	1
	Drafting of codes, Recommendations	International	0
		National	0
Organization of scientific events		International	0
		National	0

ACTIVITIES			Number
Competitive research projects	International research grants	Started in 2024	1
		Active in 2024	6
	National research grants	Started in 2024	0
		Active in 2024	4
Competitive individual research grants (PhD, Post-doc, sabbatical, etc)		Started in 2024	0
		Active in 2024	4
Awards		International	0
		National	0
Refereeing for funding agencies		International	0
		National	0
Invited lectures		Keynote lectures at international conferences	0
		Other	1
Models			0
Software applications			0
Pilot plants			0
Prototypes			0
Patents		International	0
		National	0
Other actions (*e.g.,* scientific dissemination to a broad audience, social media)			4

III.2 Highlights of main achievements

The activities carried out by the research group have enabled the achievement—and in some cases, surpassing—of the quantitative objectives initially established. Notably, the group produced a total of 97 peer-reviewed articles published in international scientific journals and presented 27 papers at international conferences. These accomplishments are closely linked to the group's robust academic structure, which in 2024 included 17 active PhD students. The adoption of the thesis-by-publication model, along with a strong emphasis on international collaboration with leading research institutions, has significantly contributed to the dissemination of research outcomes in high-impact forums.

Equally important is the role played by the group’s advanced laboratory facilities, which have supported a wide range of experimental and applied research activities across multiple domains of hydraulics and environmental engineering.

The group's international standing remained strong throughout the year. One member served as Editor-in-Chief of a Q1 journal indexed in SCOPUS, while six members held positions as Associate Editors. Additionally, fifteen members were part of editorial boards of indexed scientific journals, reflecting the group's ongoing engagement with the global scientific community. Moreover, group members participated in the scientific committees of four international events, further reinforcing their visibility and influence.

In 2024, the group continued to maintain a high level of consultancy activity. These engagements not only underscored the practical relevance of the group’s expertise but also led to broader public and professional recognition in the fields of hydraulic and environmental engineering.

PART IV – FUTURE ACTIVITY (2025)

The RG activities in 2025 will be a natural follow-up of the research carried out in 2024. These activities will cover research objectives that include different cross-cutting issues with branches in the four thematic strands: Product development in Civil Engineering industries (PD); Risk and safety in natural and built environments (RS); Rehabilitation of natural and built environments (RNBE); Response to natural and societal changes (RNSC).

The RG activities for 2025 will be organized according to major research topics as follows:

Pressurized water systems

- Numerical and experimental analysis of hydraulic transients in pressurized pipe systems (RS).
- Energy recovery in water services systems, using pumps as turbines, and developing new low-cost energy-harvesting technologies (e.g. propellers, centrifugal micro-turbine, water wheels) (PD), towards the digital and energy transition in the water sector.
- Anomalous events (e.g., bursts) detection, location, and quantification in water supply systems using machine learning techniques (RS).
- Modeling rapid pipe filling events in intermittent water supply systems (RS).
- Analysis and improvement of the resilience of drinking water systems for demand increase and pipe failure (RS).
- Multicriteria analysis for scheduling rehabilitation interventions in water distribution networks (RS).
- New energy converters, hybrid pumped hydropower, and energy storage solutions in renewables integration (RS).
- Digital twin modeling in the context of water networks, hydropower design, and hydraulic transients refers to the creation of real-time, data-driven virtual models that replicate physical systems to improve performance, monitoring, and decision-making such as: Leak detection and predictive maintenance; Real-time system monitoring and control; Scenario analysis for operational decisions and emergency responses; Optimization of pump schedules and energy use; Real-time detection and analysis of pressure surges; Prediction of transient impacts on pipelines and valves; Design and testing of mitigation measures (e.g., surge tanks, air valves); Improved safety and reliability of water conveyance systems; Simulate water flow, turbine performance, and energy generation; Analyse structural and mechanical behaviour under different operating conditions; Support design optimization and operational efficiency; Integrate environmental and hydrological data for sustainable hydraulic design.
- Hybrid energy solutions with pumped storage combine renewable sources (like solar or wind) with pumped hydro systems to store excess energy and stabilize the grid. This enhances reliability, enables energy shifting, and supports the integration of intermittent renewables.

Fluvial hydraulic structures

- Development of mitigation strategies and pre-cast shelters for fish downstream of powerhouses with a hydropeaking operation (RS).

- Numerical and experimental modelling of flood releases and related hydraulic structures (RS; RNBE).
- Study the hydraulics of PKW weirs combined with spillways (RS, RNBE).
- Study the pressure field and slab stability in a plunge pool lined with concrete slabs (RS).

River restoration and management

- Risk management in the valleys downstream of dams (RS; RNSC).
- Environmental flow determination procedures and hydropower station operation rules to reduce ecological risk downstream of dams (RS, RNBE).
- River restoration and development of eco-efficient fish pass solutions to improve ecological connectivity in regulated rivers (PD; RNBE; RNSC).
- Assessment and development of selective fish passes to prevent the spread of invasive fish species (RS, RNBE).
- Development of innovative dam removal impact assessment monitoring tools (RS, RNBE).
- River Digital Twins for prediction of hydro-morphological outcomes of river interventions (PD; RNBE; RNSC).

Environmental fluid mechanics

- Laboratory investigation of rough-wall open-channel turbulence (RNBE).
- CFD simulation of solid-fluid interactions in turbulent flows (RNBE).
- Laboratory investigation and mathematical simulation of the transport of dissolved substances (RS, RNBE).
- Heat and mass transport in wetlands (RNBE).

Sediment transport and river morphodynamics

- Hydrodynamics of river diversions in equilibrium (RS; RNBE).
- Mathematical modelling of shallow flows with mobile beds. Application to long-term channel morphology evolution, dam-breaching, dam-break flows, and overland tsunami propagation (RS).
- Development of stabilization techniques for river meanders in equilibrium (RNBE).

Maritime hydraulics, coastal engineering and coastal morphodynamics

- Characterisation of offshore wave climate and storm wave events (RS).
- Analysis of wave-structure interaction (RS).
- Morphodynamic modelling and field observations of beaches and tidal inlets hydro-sedimentary dynamics, including engineering interventions (RS).
- Development of Nature-Based Solutions for Coastal Engineering (RNBE).
- Medium- and long-term shoreline evolution associated with coastal engineering interventions.
- Benefit-cost analysis of coastal engineering interventions for coastal management and planning.

RESEARCH GROUP 2 - Environment and water resources

RESEARCH GROUP COORDINATOR – Maria Manuela Portela

PART I - RESOURCES

I.1 Budget

BUDGET (euros)						
FCT		Other Funding				
STRATEGIC Funding	FCT Projects	Other Research Funding		Consultancy		TOTAL
		National	International	National	International	
19 131,07	26 549,08	71 280,38	243 762,24	140 594,00		501 316,77

I.2 Personnel

PERSONNEL					
Name	Category	Member	Collaborators		
			with PhD	without PhD	
				PhD student	Other
Ana Fonseca Galvão	Assistant Professor	x			
Armando B. da Silva Afonso (CERIS Aveiro)	Full Professor	x			
Carla Andreia Pimentel Rodrigues (CERIS Aveiro)	Coordinator Professor	x			
Filipa Maria Santos Ferreira	Associate Professor	x			
Inês Osório de Castro Meireles (CERIS Aveiro)	Assistant Professor	x			
José Manuel de Saldanha Gonçalves Matos	Full Professor	x			
José Paulo Patrício Geraldes Monteiro	Assistant Professor	x			
José Pedro Gamito de Saldanha Calado Matos	Assistant Professor	x			
Luís Miguel de Amorim Ferreira Fernandes Nunes	Associate Professor with Habilitation	x			

PERSONNEL					
Name	Category	Member	Collaborators		
			with PhD	without PhD	
				PhD student	Other
Manuel Guilherme Caras Altas Duarte Pinheiro	Full Professor	x			
Maria Manuela Portela Correia dos Santos Ramos da Silva	Full Professor	x			
Maria Teresa Condesso de Melo	Assistant Professor	x			
Rodrigo de Almada Cardoso Proença de Oliveira	Associate Professor	x			
Ana Catarina Ferreira da Silva	Research fellow	x			
Sílvia Patrícia Nunes Monteiro	Research fellow	x			
Ricardo Jaime Pereira Rosário dos Santos	Research fellow	x			
Ricardo Daniel Oliveira Mendes Martins (CERIS Aveiro)	Research fellow	x			
João Nuno da Palma Nascimento	Researcher		x		
Luis Angel Espinosa Villalpando	Researcher	x			
Melissa Nogueira Sondermann	Researcher		x		
Nuno Miguel de Jesus Barreiras	Researcher		x		
Romeu Gerardo Jorge	Researcher	x			
Amir Gholipour (concluded 2024)	PhD Student			x	
Ana Luísa de Carvalho Quaresma	PhD Student			x	
Ana Rita Vieira de Castro	PhD Student			x	
Ana Rosária Oliveira Gonçalves	PhD Student			x	
Armen Chilingaryan	PhD Student			x	
Aura María Bustillo Mendoza	PhD Student			x	
Carla Larissa Fonseca da Silva	PhD Student			x	
Carmen Sofia Murilhas Cardoso de Lima Sousa	PhD Student			x	
Daniela Patrícia França Pinto de Andrade	PhD Student			x	
Edilson Holanda Costa Filho	PhD Student			x	
Efraim Tchissingui Soma	PhD Student			x	
Filipa Catarina Camisão Saraiva Nunes	PhD Student			x	

PERSONNEL					
Name	Category	Member	Collaborators		
			with PhD	without PhD	
				PhD student	Other
Filomena das Dores Cardoso do Espírito Santo Carvalho	PhD Student			x	
Francisco Miguel Cid Bispo Pereira	PhD Student			x	
Issa Saket Oskoui	PhD Student			x	
Joana Ferraz Contente	PhD Student			x	
João André Antunes Matos Lopes	PhD Student			x	
João Pedro Lopes Barreiro (concluded 2024)	PhD Student			x	
Joaquim José Vasques Condeça	PhD Student			x	
Laura Ocaranza	PhD Student			x	
Lili Minasyan	PhD Student			x	
Maria Luiza da Cunha Oliveira Santos	PhD Student			x	
Mariana Campista Chagas	PhD Student			x	
Mariana La Pasta Cordeiro	PhD Student			x	
Pedro Gabriel Condelipes Monteiro (concluded 2024)	PhD Student			x	
Rafael da Silva Francisco	PhD Student			x	
Rita Monteiro Garcia Couto	PhD Student			x	
Rui Manuel Fernandes Silva Cordeiro Marinheiro	PhD Student			x	
Silvia Cabrita	PhD Student			x	
Sofia Rita Machado Bicha Castelo	PhD Student			x	
Tiago André Nunes Martins	PhD Student			x	
Vera Filomena Silva Garcia Chaves	PhD Student			x	
João Pedro Gonçalves Pegas	Scholarship				x
Rui Marinheiro	Scholarship				x
Daniela Silva	Scholarship				x

The summary table can be seen below.

Type	Permanent	Non-permanent		Total
		Contract	Scholarship	
Members	16	3	0	19
Collaborators with PhD	1	2	0	3
Collaborators without PhD			35	35
Technical staff	0.5			0.5
Administrative Staff	1			1
Others				

PART II - DESCRIPTION

Leadership

The coordinator serves as the group's representative in regular meetings with the Executive Board, other group coordinators, and official gatherings. They are also responsible for managing the portion of the FCT funding assigned to the Group. Since 2025, Professor Maria Manuela Portela has held this role.

Description of the Research Group

At E&WR, research has been undertaken to establish methodologies and tools that cut across several areas of hydrology, and water resources management, including various fields of hydrogeology, urban water services, and broader environmental and sustainability issues, improving knowledge and capability to manage natural and built environments sustainably. Water and environmental policies and governance have also been addressed. R&D activities have been mostly developed with the involvement of 55 researchers of the research group (22 researchers with Ph.D., 33 Ph.D. students, and 4 scholarship), with interactions with colleagues of other areas of engineering and science, namely in construction, urban and regional planning, social sciences, ecology, information and design support systems, chemistry, and biochemistry.

Internationalization activities are a major characteristic of most of the members of the E&WR group, including serving on editorial boards of international journals, as members of scientific committees, and drafts of international codes.

The E&WR group presents a wide variety of specific expertise that covers many scientific sub-topics within the vast area of hydrology, water resources, urban water and environment, where most group members have a scientific background and are involved in teaching and research activities.

Its members are involved in many national and international research projects, Ph.D. courses, and related activities. Most have extensive experience in consultancy for the water industry and public institutions. Three full professors and one associate professor with habilitation have been coordinating the research on environment and water resources and urban water and wastewater services, deciding on the most relevant topics to be addressed in these areas, considering the excellent background knowledge of the members of the group and state of the art at the international level, orientating the strategy of the group and the objectives.

A professor of the group is a member of the Scientific Committee of the Ph.D. on Climate Change and Development Policies jointly organized by Schools of the University of Lisbon (UL) and the New University of Lisbon (UNL) and of the Ph.D. on Environmental Engineering (IST-UL).

A professor of the group is one of the coordinators of the specialization on Tropical Health of the new PhD programme on Planetary Health of the University of Lisbon (UL).

Three professors of the are members of the Tropical College (CTROP) of the University of Lisbon, which is a cross-sectional unit that engages teachers, researchers and students from several faculties aiming to

develop transdisciplinary knowledge in tropical regions, prioritizing the aspects of research, education and cooperation, in conjunction with innovation and technology transfer and reinforcing ULisboa's role in scientific diplomacy.

A professor of the group is a member of the EU Common Implementation Strategy (CIS) Working Group on Water Scarcity and Droughts. He is also a member of the Scientific Committee of National Adaptation Strategy. He also serves as secretary-general of the Tagus River Basin.

General Objectives

E&WR group (RG2) develops research in the following areas: 1- Water resources modelling and integrated water resources management and planning; 2-Water and wastewater/stormwater systems and services 3-Groundwater and environment; and 4-Sustainability assessment and management.

RG2 is involved in the four thematic strands of CERIS and has the following main objectives:

- To promote adequate water resources management through policy formulation and governance;
- To promote integrated water resources management, including the development of advanced knowledge on hydrologic processes and groundwater assessment tools and modelling;
- To promote the application of new technologies (AI) to water resources modelling
- To promote circular economy and resilience of urban water services, including valorisation of sub-products and promotion of nature based solutions;
- To promote sustainable water supply and dry sanitation approaches and solutions for the urban poor (developing countries);
- To develop an environmentally sustainable assessment of the built environment (LiderA system) and new ways of sustainable management.
- To develop methodologies for the identification of groundwater-dependent ecosystems and effective methods for risk-based environmental decision-making;
- To develop advanced potentialities in hydrogeology and groundwater research.
- To develop a digital twin framework that supports the monitoring, simulation, and optimization of groundwater systems to improve resilience against environmental and anthropogenic stressors.

Group Governance

A simple organizational structure is defined to ensure the coordination of E&WR activities. The Group Leader, elected by its members and nominated by the Executive Board of CERIS, participates in regular meetings promoted by the Coordinators of the four thematic strands. Group meetings are promoted regularly with Ph.D. researchers to discuss the results and budget issues and monitor the group activity's progress. External collaborators, such as post-doctorate and Ph.D. students, may be invited to participate in these meetings, depending on their involvement in the agenda items.

The group coordinator will be responsible for stimulating joint activities among group members and for promoting collaboration and cross-cutting initiatives with other groups of CERIS and other research units of IST-UL.

Facilities

A simple organizational structure is defined to ensure the coordination of E&WR activities. The Group Leader, elected by its members and nominated by the Executive Board of CERIS, participates in regular meetings promoted by the Coordinators of the four thematic strands. Group meetings are promoted regularly with Ph.D. researchers to discuss the results and budget issues and monitor the group activity's progress. External collaborators, such as post-doctorate and Ph.D. students, may be invited to participate in these meetings, depending on their involvement in the agenda items.

The group coordinator will be responsible for stimulating joint activities among group members and for promoting collaboration and cross-cutting initiatives with other groups of CERIS and other research units of IST-UL.

PART III - ACTIVITY

III.1 Activity indicators - Summary table for 2024

ACTIVITIES			
PhD Theses		Concluded	3
		To be concluded after 2024	30
Publications	Papers in peer-reviewed journals	International peer-reviewed journals (WoS AND Scopus)	39
		Peer-reviewed journals (non-WOS OR non-Scopus)	2
		Peer-reviewed journals (non-WOS AND non-Scopus)	8
	Papers in proceedings	International	23
		National	12
	Books	Entire	3
		Chapters	2
		As editor	0
Reports		Scientific	3
		Consultancy/others	3
Collective guidance in scientific work	Editor-in-Chief	WoS/Scopus-indexed Journals	0
		Other journals	0
	Associate Editor	WoS/Scopus-indexed Journals	0
		Other journals	0
	Issue Editor/Guest editor/Membership Editorial Boards	WoS/Scopus-indexed Journals	10
		Other journals	0
	Membership in Scientific Committees	International	6
		National	0
	Drafting of codes, Recommendations	International	4
		National	1
Organization of scientific events		International	0
		National	0
Competitive research projects	International research grants	Started in 2024	2
		Active in 2024	11
	National research grants	Started in 2024	0
		Active in 2024	8
Competitive individual research grants (PhD, Post-doc, sabbatical, etc)		Started in 2024	1
		Active in 2024	3
Awards		International	1
		National	1
Refereeing for funding agencies		International	0
		National	0

ACTIVITIES		
Invited lectures	Keynote lectures at international conferences	0
	Other	0
Models		0
Software applications		0
Pilot plants		0
Prototypes		0
Patents	International	0
	National	0
Other actions (e.g., scientific dissemination to a broad audience, social media)		8

III.2 Highlight of main achievements

Members of the E&WR group were involved in a large number of research contracts funded by the water industry, the European Commission, the Portuguese Science and Technology Foundation (FCT), and other public institutions, with the main achievements contributing to the advance of science in terms of understanding the complexity of natural and built environments and enhancing approaches and tools to respond to natural and societal changes, in particular affecting water services, water resources, and the environment, including the climate change issues.

In the area of hydrology and water resources, relevant results were achieved in terms of validation of alternative datasets and modelling over large areas based on those datasets, trend detection in hydrologic time series and modelling; drought, heat wave, and flood analysis, including non-stationary approaches; development of rainfall-runoff models; artificial intelligence techniques applied to hydrologic modelling including artificial neuronal network; development of daily runoff modelling in very large watersheds based on reanalysis data; development of regionalised impact scenarios for the water sector and climate change impact assessments; and risk assessment studies. The intense and profitable collaboration with national stakeholders in water resources management continued, namely public administration, water and power utilities and irrigation associations. Building on the work done in previous years, collaboration is currently underway for the critical evaluation of the financial instruments used to manage water resources in Brazil.

In the area of water services, covering water supply, sanitation, and water pollution control, the following themes were investigated: performance of urban green roofs on adapting to climate change; urban stormwater performance indicators; organic and microbiological processes in constructed wetlands, both in a full-scale laboratory and in scaled installations; faecal sludge management, including research on multicriteria decision tools for selection the sludge chain of services and associated business models (collection, storage, transport, sludge treatment and final disposal of biosolids), nature-based solutions for wastewater and stormwater management and water reuse, in Mediterranean and tropical climates.

The research on environmental issues covered the themes of assessment and analysis of climate change impacts on natural and man-made water resource systems, sustainable governance, and the

environmental management applied to sustainable construction. Life cycle analysis in civil engineering practices, particularly in urban, building, and infrastructure construction, and the governance dimensions of environmental policies were also addressed.

The topics, with relevant results, addressed under the specific area of hydrogeology and groundwater services were the following ones: groundwater pollution and risk assessment; groundwater and ecosystems; aquifer recharge and discharge; water and climate change; decision support systems for water catchment management and development of effective methods for risk-based environmental decision-making. International scientific collaboration on groundwater resources research has been established with Brazil, Guatemala, Chile, Angola, and Cape Verde.

Another important achievement was the funding renewal of the Joint Master Programme in Groundwater and Global Change – Impacts and Adaptation (acronym: GroundwatCh) in the framework of the Erasmus Mundus Programme (http://www.groundwatermaster.eu/)

Special effort has been put into the collaboration with agrobusiness to potentiate the sustainable use of groundwater and to increase the awareness for the urban water cycle sustainability by developing new creative cultural attractions and integrating new scientific knowledge with public participation.

The following indicators were accomplished by E&WR group members: 33 PhD theses concluded or in progress in 2024 supervised by members/collaborators of the group (22); papers published in WOS peer-reviewed journals (39); papers in national and international proceedings (34).

In the sustainability assessment and management area, the main achievement is the new version of environmentally sustainable assessment (LiderA system model version 4), which was developed to achieve sustainability through structural impact reduction, factorial improvement in social housing, and new ways of building environments, design, and management. It has been applied to more than 40 social housing designs and constructions, achieving lower energy and carbon emissions, as well as promoting reuse and recycling of materials, and contributing to social benefits.

PART IV – FUTURE ACTIVITY (2025)

The E&WR will continue to focus on environmental and water resources research activities to develop approaches, methodologies, and tools that cut across these areas, improving knowledge and capabilities to manage natural and built environments sustainably.

The research objectives will cover different cross-cutting issues related to the thematic strands defined for CERIS. The main activities will focus on “Natural and Societal Changes” and “Risk and Safety in Natural and Built Environments," with more limited contributions to the other two thematic strands.

The E&WR will continue concentrating its activities on the following major topics:

- Hydrology and water resources: characterisation and modelling of hydrologic variables and processes, including extreme event analysis, with emphasis on heatwaves, a topic that is still pioneering in Portugal, planning and management of water resources, and water policy formulation;
- Integrated water resources management, including the joint management of water supply from surface and groundwater sources, controlling water uses and demand, and managing water quality and ecological requirements, specialising in transboundary river basins.
- Assessment and analysis of climate change impacts on natural and man-made systems, with special emphasis on water resource systems, including the formulation of measures and policies for promoting adaptation and mitigation;
- Coastal urban wastewater systems, including adaptation actions to climate change given sea level rise and risks of saline water inflows;
- Non-sewer solutions and faecal sludge management options and techniques for in low-income countries;
- Water asset management, performance indicators, and urban resilience related to urban water/wastewater/stormwater systems;
- Integrated sustainable wastewater solutions, including the hydraulic and environmental performance of nature-based solutions for mitigation and adaptation to climate change, such as constructed wetlands, green roofs, and detention ponds;
- Environmentally sustainable assessment (LiderA system) and management of built environments;
- Approaches to the transition to the carbon-neutral and circular economy, including sustainable buildings, infrastructures, and urban areas with a focus on water, energy, and materials cycles, with special emphasis on life-cycle framework;
- Implement monitoring, aquifer and geophysical testing and groundwater quality assessment to identify groundwater pollution sources (saline intrusion, agriculture, industry, mining), to quantify surface-groundwater exchange and to delineate groundwater-dependent ecosystems accurately;

- Employ advanced numerical and stochastic groundwater modeling techniques along with decision support systems (DSS) to improve groundwater management practices;
- Implement nature-based solutions and climate change mitigation measures to enhance groundwater quality and quantity, to minimize groundwater contamination and strengthen integrated water management approaches effectively;
- Utilize cutting-edge technology such as satellite-based remote sensors and drone-based sensors to enhance monitoring capabilities, including land use evaluation, soil moisture assessment, water availability analysis, and identification of aquifer recharge and discharge zones. Additionally, leverage satellite-based sensors, radar data, and meteorological reanalysis to monitor climate variables comprehensively;
- Investigate the importance of groundwater resources for ensuring water and food security in arid and semi-arid regions facing water scarcity.

RESEARCH GROUP 3 - Systems and Management

RESEARCH GROUP COORDINATOR – António Aguiar da Costa

PART I - RESOURCES

I.1 Budget

BUDGET (euros)						
FCT		Other Funding				
STRATEGIC Funding	FCT Projects	Other Research Funding		Consultancy		TOTAL
		National	International	National	International	
11 474,64	10 400,00	303 846,05	57 165,00	43 760,00		11 474,64

I.2 Personnel

PERSONNEL					
Name	Category	Member	Collaborator		
			with PhD	without PhD	
				PhD student	Other
Alcínia Zita de Almeida Sampaio	Assistant Professor	x			
Alexandre Bacelar Gonçalves	Associate professor	x			
Amílcar José Martins Arantes	Assistant Professor	x			
Ana Paula Martins Falcão Flor	Assistant Professor	x			
António Morais Aguiar da Costa	Associate professor	x			
Cristina Marta Castilho Pereira Santos Gomes	Assistant Professor		x		
Hugo Marco Consciência Silvestre	External Researcher		x		
Maria Fernanda da Silva Rodrigues (CERIS Aveiro)	Assistant Professor with Habillitation	x			
Maria Susana Semião Neto	External Researcher	x			
Nuno Gonçalo Cordeiro Marques de Almeida	Assistant Professor	x			

PERSONNEL					
Name	Category	Member	Collaborator		
			with PhD	without PhD	
				PhD student	Other
Raquel Valente de Pinho Ramos (CERIS Aveiro)		x			
Atiyeh Rezvani Befrouei	PhD Student			x	
Charles Chukwudi Okonyia Okeyia	PhD Student			x	
Felisberto Lopes da Veiga Cortês	PhD Student			x	
Francisco Diogo Pascoal	PhD Student			x	
Ítalo Pereira Fernandes (concluded 2024)	PhD Student			x	
Jaime Gabriel Silva	PhD Student			x	
Jean Marlo Pepino de Paula	PhD Student			x	
João Manuel Amor Perianes Palma	PhD Student			x	
João Pedro Cardoso Vieira	PhD Student			x	
Jonatan Yeraj Villavicencio Moreno	PhD Student			x	
Luís Guilherme Pinto Afonso	PhD Student			x	
Manuel Pedro Rodrigues Pacheco	PhD Student			x	
Maria Teresa Henriques Alves Ferreira	PhD Student			x	
Mariana Isaura de Moura Ormeche	PhD Student			x	
Maryam Salati	PhD Student			x	
Paulo Marco Calinas Rodrigues	PhD Student			x	
Pedro Szwarc dos Santos	PhD Student			x	
Pedro Emanuel Frazão Pedroso	PhD Student			x	
Rita Freire Machete	PhD Student			x	
Rodrigo da Silva Varela Pedral Sampaio	PhD Student			x	
Saikat Maiti	PhD Student			x	
Seyed Hossein Seyedi Rezvani	PhD Student			x	
Sílvia Helena de Freitas Barbosa Sá	PhD Student			x	
Wagner Carvalho	PhD Student			x	

The summary table can be seen below.

Type	Permanent	Non-permanent		Total
		Contract	Scholarship	
Members	8	1		9
Collaborators with PhD		2		2
Collaborators without PhD			24	24
Technical staff				0
Administrative Staff	1			1
Others				0

PART II - DESCRIPTION

Leadership

Professor António Aguiar da Costa has been the Systems and Management Group coordinator since 2023. The coordinator represents the group in regular meetings with the Executive Board (and with other group coordinators) and official meetings. The coordinator also manages the part of the FCT fund allocated to Group 3 by the Executive Board.

Description of the Research Group

The Group 3 Scientific Board comprises all Group 11 PhD members and meets formally once a year to discuss administrative and scientific subjects. In these meetings, the coordinator reports the guidelines of the Executive Board and other administrative issues the members discuss. The research interests of the group are often discussed in these formal meetings. Still, the knowledge exchange and collaborations mainly result from informal daily meetings between group members.

General Objectives

RG3 develops research in the following general domains:

1. Decision support systems, operations and project management;
2. Information modelling and digital technologies;
3. Asset management and digital representation of the built environment.

RG3 is mostly involved in these three thematic strands and has the following main objectives:

- To develop and apply methods for simulation, optimisation, and assessment aimed at improving the efficiency of processes and the effectiveness of decision support systems;
- To investigate the causes of inefficiencies in project management and support the development of strategies for delay mitigation based on professional feedback;
- To study strategic challenges in construction operations, including modular construction, lean approaches, reverse logistics, and procurement planning;
- To advance the use of information modelling in the built environment, including the development of digital workflows and the integration of real-time data to support asset management and emergency planning;
- To explore and apply GIS-based analysis for spatial planning, environmental monitoring, and risk assessment, incorporating long-term sustainability indicators and future climate scenarios;
- To promote the digital transformation of the construction sector by contributing to the development of tools, methodologies, and standards that foster interoperability and support circular and sustainable practices;
- To contribute to the integration of digital representations of physical assets and infrastructures, enabling lifecycle-based management supported by data-driven insights and real-time monitoring.

The S&M group has a long tradition of engagement in applied research and innovative services provided for private and public organizations, and we intend to reinforce these industrial links. It is also our objective to consolidate our reputation as one of the leading groups in the areas of Operational Research and Engineering Systems and Information in the Civil Engineering field in Portugal and abroad in particular areas, aiming at strengthening our international collaborative ties and recognition. Providing contributions to the literature and increasing the number of published papers in leading international journals, in parallel with active participation in international forums and projects, is also a means to promote international visibility and recognition.

- The research development strategy is based on three fundamental pillars:
- Existing skills and capacities to capture the essence of each problem and to devise appropriate frameworks that fit the decision context;
- Societal and industrial relevance of the issues to be addressed and capability to attract and engage partners that provide case studies and funding;
- Internationalisation and networking of their members, ability to attract young researchers and involvement in international project teams.

Structure of the Research Group

Group Governance

Facilities

The facilities of Research Group 3 include the following:

- Laboratory of Geographical Information Systems (software and hardware), used by MSc students for the GIS-related applications in their theses;
- Laboratory of BIM and virtual reality (software and hardware), used by MSc and PhD students;
- Geodetic and surveying equipment used in regular teaching and research;
- Various software for GIS, CAD, BIM, Revit, remote sensing and image processing, geometric modelling and virtual reality, and surveying equipment used by MSc students.

PART III - ACTIVITY

III.1 Activity indicators - Summary table for 2024

ACTIVITIES			
PhD Theses		Concluded	1
		To be concluded after 2024	32
Publications	Papers in peer-reviewed journals	International peer-reviewed journals (WoS AND Scopus)	19
		Peer-reviewed journals (non-WOS OR non-Scopus)	1
		Peer-reviewed journals (non-WOS AND non-Scopus)	3
	Papers in proceedings	International	15
		National	5
	Books	Entire	0
		Chapters	3
		As editor	0
Reports		Scientific	1
		Consultancy/others	1
Collective guidance in scientific work	Editor-in-Chief	WoS/Scopus-indexed Journals	0
		Other journals	1
	Associate Editor	WoS/Scopus-indexed Journals	0
		Other journals	0
	Issue Editor/Guest Editor/Membership Editorial Boards	WoS/Scopus-indexed Journals	2
		Other journals	0
	Membership in Scientific Committees	International	1
		National	0
	Drafting of codes, Recommendations	International	1
		National	3
Organisation of scientific events		International	0
		National	3
Competitive research projects	International research grants	Started in 2024	0
		Active in 2024	3
	National research grants	Started in 2024	0
		Active in 2024	2
Competitive individual research grants (PhD, Post-doc, sabbatical, etc)		Started in 2024	2
		Active in 2024	7
Awards		International	0
		National	0
Refereeing for funding agencies		International	0
		National	0
Invited lectures		Keynote lectures at international conferences	0
		Other	0
Models			0
Software applications			0

ACTIVITIES		
Pilot plants		0
Prototypes		0
Patents	International	0
	National	0
Other actions (e.g., scientific dissemination to a broad audience, social media)		6

III.2 Highlight of main achievements

The research activities of the RG on Systems and Management within CERIS have been strategically directed toward the following domains:

1. Decision support systems, operations and project management;
2. Information modelling and digital technologies;
3. Digital Twinning and Asset Management.

RG3 has relevant results in specific topics such as:

1a) Efficiency and productivity of public services and infrastructure

1b) Regulatory governance and substance

1c) Governance models in local government

1d) Decision-aiding and MCDA methods

1e) Logistics and supply chain management

1f) Systems modeling and optimization

1g) Procurement models of PPPs

1h) Infrastructure contract management

1i) Risk assessment and management

2a) Ground deformation measure with advanced SAR interferometric methods;

2b) 3D city information models and their application;

2c) Spatial analysis problems;

2d) Building information modeling and systems interoperability;

2e) Construction innovation and information management;

2f) E-business and e-procurement in construction;

3a) Digital Transition;

3b) Information management and Interoperability;

3c) Business Process modelling;

3d) Asset Management.

These lines of research were followed during 2024 and the objectives set were fulfilled. Consequently, major outputs were obtained this year, and this RG is now an international reference of excellence in some of its research areas. In 2024, 18 articles were published in international journals indexed in Web of Science and Scopus, 3 book chapters, and 15 papers in international proceedings. In 2024, the RG researchers continued to publish in the most reputable journals in their areas, such as Production Planning and Control, Infrastructures, and Utilities Policy.

One (1) Ph.D. thesis was concluded, and 32 were continued.

The involvement and cooperation of the research group members with internationally reputed universities were sped up. One RG member is the Editor in Chief of two international journals, 1 RG member is guest editor of 1 international journal and 1 RG member is review editor and member of topical advisory panel of 2 international journals

The most reputed meetings concerning the interest areas of the RG counted on the active participation of its members and, as usual, the collaboration of its members with international institutions. There was also a great involvement in international research projects. In 2024, 1 national conference and 3 seminars were organized by the Systems and Management Group.

PART IV – FUTURE ACTIVITY (2025)

In the future, the group will continue to grow on the following areas of development:

1. Digital Built Environment and Twin Transition
2. Digital Twin and Asset Management

Digital Built Environment and Twin Transition

Our research group has made groundbreaking strides in the field of the digital built environment. One of our significant achievements is the innovative use of BIM, particularly for heritage management. We have tailored scan-to-BIM workflows at UNESCO World Heritage sites in Sintra, which have pioneered the integration of seismic assessment with BIM. We have also optimised emergency response routes and developed advanced sensor data integration, which has significantly enhanced heritage protection and facility management.

Using other information technologies, such as GIS, we conducted GIS-based data processing in various applications, including optimising crop distribution in Portugal in collaboration with the National Institute of Agricultural and Veterinary Research (INIAV). We have also mapped and monitored urban green roofs to assess their biodiversity potential and incorporated future global climate scenarios in risk evaluation for several natural hazards in Portugal.

Complementarily, our research group coordinated several projects that revolutionised the construction industry through digital transformation. Under the REV@Construction project, we have developed several digital tools for construction, influencing significant updates to standards and laws and promoting interoperability. Recently, our research group has been given support to the development of a National Strategy for BIM implementation in Portugal, which will start to be implemented in 2025.

Focusing on the Twin Transition, several initiatives have been conducted, such as the Circular ECO BIM project, which allowed the development of tools that can evaluate circularity and sustainability. One of these is the SmartLCA tool, which is a BIM-based LCA digital tool that has been developed and is now being deployed within the industry. Recently, a team of PhDs has been formed, constituting the TwinLab research group, which is conducting innovative research in digital and climate transition, always with a strong emphasis on industry connections.

Digital Twin and Asset Management

Understanding the importance of asset management for the built environment, the group conducted several works on this topic. Notably, it firmly pushed the standardisation ecosystem around this matter, coordinating the respective standardisation technical committee. Specialising in asset management, our research group has also embraced the challenges of integrating Digital Twin (DT), especially within the demanding context of complex infrastructures. We have made significant strides in advancing asset management through the deployment of DTs, which serve as dynamic, real-time replicas of physical assets. This transformative approach facilitates data-driven management across the asset's lifecycle,

enhancing operational efficiency and decision-making. Central to our efforts was the DT4Health project, which has established a comprehensive framework for DT application in hospital settings.

Furthermore, closer coordination with the CERIS strategy and the general orientations stemming from its thematic strands will be promoted. The horizontal character of the S&M group skills and competencies creates opportunities for synergetic cooperation and interactions with other CERIS research groups and to make relevant contributions closely linked to the thematic strands' objectives.

RESEARCH GROUP 4 - Transportation Systems

RESEARCH GROUP COORDINATOR – Luís Picado Santos

PART I - RESOURCES

I.1 Budget

BUDGET (euros)						
FCT		Other Funding				
STRATEGIC Funding	FCT Projects	Other Research Funding		Consultancy		TOTAL
		National	International	National	International	
12 754,04	332 344,60	11 966,42	100 737,84	110 226,48		568 029,38

I.2 Personnel

PERSONNEL					
Name	Category	Member	Collaborator		
			with PhD	without PhD	
				PhD student	Other
Filipe Vilaça Moura	Associate Professor with Habilitation	x			
Gabriel da Costa Valença	Researcher	x			
Iran Gomes da Rocha Segundo	Researcher		x		
João de Abreu e Silva	Associate Professor with Habilitation	x			
Joaquim Miguel Gonçalves Macedo (CERIS Aveiro)	Assistant Professor	x			
José Manuel Neves	Assistant Professor	x			
Luís Guilherme de Picado Santos	Full Professor	x			
Patrícia Dinis Ferreira	Assistant Professor	x			
Paulo Fonseca Teixeira	Assistant Professor	x			
Rosa Félix	Researcher	x			
Rui Micaelo (CERIS NOVA)	Associate Professor	x			

PERSONNEL					
Name	Category	Member	Collaborator		
			with PhD	without PhD	
				PhD student	Other
Rui Manuel Cordeiro Colaço	Researcher		x		
Silvino Capitão	Coordinator Professor	x			
Ana Karina de Barros Christ	PhD Student			x	
André Guerreiro Duarte	PhD Student			x	
Babak Rahimi	PhD Student			x	
Carlos Miguel Canhoto Franco Antunes	PhD Student			x	
Cristian Adorean	PhD Student			x	
Daniel António Patel dos Santos	PhD Student			x	
Duarte Amorim da Cunha	PhD Student			x	
Ewerton Chaves Moreira Torres	PhD Student			x	
Fabiana Peixoto de Mello	PhD Student			x	
Fesseha Fentahun Belay	PhD Student			x	
Filipe Miguel Martins da Silva	PhD Student			x	
Freddy Paiva Nogueira	PhD Student			x	
Gustavo Filipe Medeiros Câmara (concluded 2024)	PhD Student			x	
Inês dos Santos Balinho do Ó	PhD Student			x	
Javier Rueda	PhD Student			x	
Joana Félix Ribeiro da Cunha	PhD Student			x	
Julianno de Menezes Amorim	PhD Student			x	
Laísa Braga Kappler	PhD Student			x	
Laura Khammash	PhD Student			x	
Marco Antônio Silva	PhD Student			x	
Maria Ana Benoliel Nunes Bonito	PhD Student			x	
Mauricio Orozco Fontalvo	PhD Student			x	
Miguel Nobre da Costa (concluded 2024)	PhD Student			x	
Mohammad Reza Najd Javadi Pour	PhD Student			x	

PERSONNEL					
Name	Category	Member	Collaborator		
			with PhD	without PhD	
				PhD student	Other
Nuno Filipe da Silva Afonso	PhD Student			x	
Paulo Alexandre Figueiredo Soares	PhD Student			x	
Pedro Miguel Guerreiro Rodrigues (concluded 2024)	PhD Student			x	
Pedro Nuno Valle Marques Vilela	PhD Student			x	
Sandra Isabel da Silva Pinto	PhD Student			x	
Sofia Ribeiro	PhD Student			x	
Telmo Alexandre Farto Fernandes	PhD Student			x	
Webert Brasil Cirilo da Silva	PhD Student			x	

The summary table can be seen below.

Type	Permanent	Non-permanent		Total
		Contract	Scholarship	
Members	11	1	1	12
Collaborators with PhD	0	0	0	0
Collaborators without PhD			33	33
Technical staff				
Administrative Staff	1			1
Others				

PART II - DESCRIPTION

Leadership

Professor Luís Picado Santos has coordinated the Transportation Infrastructure, Systems, and Policy group since 2022. The coordinator is the group's representative in regular meetings with the Executive Board (and other group coordinators) and official meetings. The coordinator manages FCT funds allocated to Group 4 by the Executive Board and ensures that all members follow the approved regulations when integrating them with the group's activities.

Description of the Research Group

General Objectives

The group has five main objectives for the next four/to five-year period:

- To use the best framework to support sustainable policies (regulatory, pricing, and evaluation) for the transportation systems
- To integrate public and private transportation modes and services using a better demand characterization and considering new types of business models
- To enhance innovation and technology in infrastructure planning, design, and maintenance, guaranteeing accessibility and support for mobility
- To improve infrastructure systems development and management under new challenges, such as automated mobility for cargo and passengers.
- To develop and sustain participation in international professional and academic networks and thus increase the formal support of I&D and research, and to enhance the international PhD programmes (in association with UC and UP) and their recognition on a broad international level.

This is happening in close coordination with the general orientations coming from the CERIS thematic strands. This group has connections and will include contributions and achievements that may be closely linked to the objectives of all the thematic strands, but mainly for "Response to natural and societal changes" and "Rehabilitation of natural and built environments."

Under the thematic strand "Response to natural and societal changes," certain developments are going on, such as "New types of integration of public and private transportation modes and services (among each type and across the types) as the modeling and testing of demand response transportation, multi-modal systems, bike-sharing, and freight services supported by new types of business models and by the development of appropriate ITS tools."

Under the thematic strand "Rehabilitation of natural and built environments," aspects are going on: "Methodologies and models to predict degradation and improve maintenance, renewal and investment decisions within the different transport infrastructure systems and across them (integrated asset

management)" and "Retrofitting transport systems: changing and adapting "old to like-new" transport systems to meet new performance standards while extending the existing ones."

Nevertheless, many other subjects are included in the going on or predicted to be developed soon, which could be included in other thematic strands or even in the two main thematic strands where the group feels more conditions to establish its work base. These subjects are "the application of nanotechnology and development of low energy asphalt concrete incorporating industrial by-products, having the same structural efficiency as traditional ones", "new concepts for railway infrastructure design to enhance reliability, availability, maintainability and resilience to natural events", "tools and indicators to infrastructure planning and design and technology development to foster sustainable modes in urban environments (for vulnerable users like pedestrians and cyclists)", "adaptable networks through dynamic regulatory schemes managed by advanced ICT technologies and implemented by ITS innovative solutions for infrastructure", "microscopic and other type of simulation modelling for the estimate of network safety performance for vehicles, freight and vulnerable users", "new life cycle assessment for transportation infrastructures in a low life cycle cost perspective, incorporating material, risk and flexibility and environmental concerns through the use of innovative techniques to survey the necessary indicators and to establish decisions", "to redesign global logistics processes, including the last mile component of the logistics chain, towards enhanced efficiency, reduction of CO2 emissions and enhancement of accessibility", "optimization and simulation of public transport operations under a huge uncertainty for demand and risk analysis to support decision-making in transport system investments".

Group Governance

The coordinator should raise all efforts on the following directions:

- stimulating joint activities among the members of the group;
- trying to increase the collaboration and crosscutting initiatives with other groups of CERIS;
- Encouraging meetings of thematic strand players whenever pertinent for any envisaged interdisciplinary action, acting in cooperation with the coordinator of the thematic strand.

Group meetings are promoted regularly, mainly with permanent members and collaborators, such as Post-doctorate and Ph.D. students, to discuss the results, the group activity, resource management, and to monitor the development of the activities.

Facilities

The research is supported by laboratory facilities of two types: experimental facilities (Laboratory of Transport Infrastructures, LVCT) and two rooms dedicated to developing transport and infrastructure systems applications. LVCT is mainly dedicated to research, teaching, and IR&D about road and airport pavements (materials, structures behavior, and its assessment). It also has worked in traffic surveys to

support traffic management studies. The two mentioned rooms support all the developments for transport planning, services, and operation, in connection with the doctoral programme in transportation systems and all the research and technological transfer made for the industry. Both facilities are located at the IST campus of Alameda and are often shared with other research groups.

PART III - ACTIVITY

III.1 Activity indicators - Summary table for 2024

ACTIVITIES			
PhD Theses		Concluded	3
		To be concluded after 2024	27
Publications	Papers in peer-reviewed journals	International peer-reviewed journals (WoS AND Scopus)	32
		Peer-reviewed journals (non-WOS OR non-Scopus)	3
		Peer-reviewed journals (non-WOS AND non-Scopus)	0
	Papers in proceedings	International	28
		National	0
	Books	Entire	2
		Chapters	0
		As editor	0
Reports		Scientific	0
		Consultancy/others	6
Collective guidance in scientific work	Editor-in-Chief	WoS/Scopus-indexed Journals	0
		Other journals	0
	Associate Editor	WoS/Scopus-indexed Journals	0
		Other journals	0
	Issue Editor/Guest Editor/Membership Editorial Boards	WoS/Scopus-indexed Journals	8
		Other journals	0
	Membership in Scientific Committees	International	6
		National	0
	Drafting of codes, Recommendations	International	2
		National	13
Organization of scientific events		International	1
		National	0
Competitive research projects	International research grants	Started in 2024	2
		Active in 2024	7
	National research grants	Started in 2024	0
		Active in 2024	7
Competitive individual research grants (PhD, Post-doc, sabbatical, etc.)		Started in 2024	4
		Active in 2024	3
Awards		International	0
		National	0
Refereeing for funding agencies		International	0
		National	0
Invited lectures		Keynote lectures at international conferences	0
		Other	0
Models			0
Software applications			0

ACTIVITIES		
Pilot plants		0
Prototypes		0
Patents	International	0
	National	0
Other actions (e.g., scientific dissemination to a broad audience, social media)		8

III.2 Highlight of main achievements

The group's senior members regular participation in the most reputed international organisations, actively working in their committees, such as the OECD committees (International Transport Forum and others), European Commission, Advisors, and Evaluators to Research Programmes (in France, Netherlands, Italy, Brazil and also with the European Commission), as well as with the Independent Evaluation Group of the World Bank Group, World Road Association Committees, UIC committees (International Union of Railways).

Several research and I&D contracts were established and are underway with the main transportation stakeholders in Portugal and abroad, for instance, Infrastructures de Portugal (National Road and Railway Infrastructure Administration), Municipality of Lisbon, Lisbon's public transportation operators (bus, metro, and Tagus river boat transit administration for the Lisbon metropolitan area), the Lisbon Metropolitan Authority and several construction and consultancy companies, acting in and outside Portugal.

Impacts of the group activity are also reflected in publications and research projects undertaken, where this group typically maintains an average of more than nine research projects in parallel. Currently (2024), this group presents an average production of 2.7 peer review scientific papers per year and per member (i.e., 35 papers, 32 of which are WoS and/ or Scopus indexed).

PART IV – FUTURE ACTIVITY (2025)

The RG4 for 2025 will pursue the objectives described in section II.1 using the means and the routes offered by EU (Horizon Europe) and national (Portugal 2030 and FCT) financed research projects, by the research involved in each ongoing Ph.D. works integrated on the doctoral programme in Transportation Systems, by the innovation, the technology and the development transfer to society and industry, by supporting the professional training programmes set with several stakeholders on the transportation and infrastructure systems, and by the improvement of the results achieved within the international networks already established and the ones to enhance if the opportunity comes.

RESEARCH GROUP 5 – Studies on construction

RESEARCH GROUP COORDINATOR – Jorge de Brito

PART I - RESOURCES

I.1 Budget

BUDGET (euros)						
FCT		Other Funding				
STRATEGIC Funding	FCT Projects	Other Research Funding		Consultancy		TOTAL
		National	International	National	International	
40 812,94	274 945,29	153 807,21	119 918,67	326 038,96		915 523,07

I.2 Personnel

PERSONNEL					
Name	Category	Member	Collaborator		
			with PhD	without PhD	
				PhD student	Other
Alessandra Ranesi (CERIS NOVA)	Researcher		x		
Ana Filipa Ferreira da Silva Cigarro Matos	Researcher	x			
Ana Luísa Pinheiro Lomelino Velosa (CERIS Aveiro)	Associate Professor with Habilitation	x			
Ana Paula Filipe Tomé	Assistant Professor	x			
Ana Paula Patrício Teixeira Ferreira Pinto França de Santana	Associate Professor	x			
António Heleno Domingues Moret Rodrigues	Associate Professor	x			
António José Barreto Tadeu (CERIS Coimbra)	Full Professor	x			
António José Pereira de Figueiredo (CERIS Aveiro)	Researcher	x			
Augusto Martins Gomes	Associate Professor	x			
Beatriz Rosa de Abreu Pereira Marques (CERIS Coimbra)	Researcher		x		

PERSONNEL					
Name	Category	Member	Collaborator		
			with PhD	without PhD	
				PhD student	Other
Bruna Amarílis da Palma e Silva	Researcher		x		
Carlos Paulo Novais Oliveira da Silva Cruz	Full Professor	x			
Catarina Lopes Serra (CERIS Coimbra)	Researcher	x			
Cinthia Maia Pederneiras	Researcher		x		
Clara Isabel Fernandes Pereira	Researcher		x		
Cláudia Alexandra Rocha Ferreira	Researcher	x			
Evelina Brigite Pires da Moura Rodrigues	Researcher		x		
Fernando António Baptista Branco	Full Professor/retired	x			
Fernando Farinha da Silva Pinho (CERIS NOVA)	Assistant Professor	x			
Fernando Henriques (CERIS NOVA)	Full Professor	x			
Gina Maria Lourenço Matias (CERIS Coimbra)	Researcher	x			
Giovanni Borsoi	Researcher	x			
Guilherme António dos Santos Calado Marianito da Ascensão (CERIS Aveiro)	Researcher	x			
Helena Maria da Costa Paiva (CERIS Aveiro)	Researcher		x		
Hugo Entradas Silva (CERIS NOVA)	Researcher		x		
Inês Cruz Mina Rosa	Researcher	x			
Inês dos Santos Flores Barbosa Colen	Full Professor	x			
Joana de Sousa Dias Prata (CERIS Coimbra)	Researcher		x		
João António Soares de Almeida (CERIS Coimbra)	Researcher	x			
João Diogo Fragoso Januário	Researcher	x			
João Paulo Correia Rodrigues (CERIS Coimbra)	Associate Professor	x			
João Paulo Janeiro Gomes Ferreira	Associate Professor	x			
João Pedro Ramôa Ribeiro Correia	Full Professor	x			
João Rafael Cardoso de Brito Oliveira Abrantes (CERIS Coimbra)	Researcher		x		
Jorge Manuel Caliço Lopes de Brito	Full Professor	x			
José Alexandre de Brito Aleixo Bogas	Associate Professor with Habilitation	x			
José António Raimundo Mendes da Silva (CERIS Coimbra)	Associate Professor	x			

PERSONNEL					
Name	Category	Member	Collaborator		
			with PhD	without PhD	
				PhD student	Other
José Dinis Silvestre	Associate Professor	x			
Julieta Maria Pires António (CERIS Coimbra)	Associate Professor	x			
Luís Manuel Faria da Rocha Evangelista	Associate Professor	x			
Márcio Paulo Ferreira Gonçalves (CERIS Coimbra)	Researcher	x			
Maria Cristina de Oliveira Matos Silva	Assistant Professor with Habilitation	x			
Maria da Glória de Almeida Gomes	Associate Professor	x			
Maria de Castro Fonseca Mourão Manso	Researcher	x			
Maria Dulce e Silva Franco Henriques	Professor Adj	x			
Maria Idália da Silva Gomes (CERIS NOVA)	Assistant Professor		x		
Maria Inês Vieira Simões (CERIS Coimbra)	Researcher	x			
Maria Isabel Morais Torres (CERIS Coimbra)	Assistant Professor	x			
Maria Paulina Santos Forte de Faria Rodrigues (CERIS NOVA)	Associate Professor	x			
Maria Teresa de Almeida Gouveia Geraldes Freire (CERIS NOVA)	Researcher	x			
Mário Alexandre de Jesus Garrido	Researcher	x			
Mário José Loureiro de Figueiredo e Sá	Researcher		x		
Michael Alexander de Oliveira Brett (CERIS NOVA)	Researcher	x			
Miguel Alberto Pereira Esteves	Researcher	x			
Miguel José Pereira das Dores Santos de Oliveira (CERIS Coimbra)	Professor Adj	x			
Miguel Nuno Caneiras Bravo	Researcher	x			
Nuno Albino Vieira Simões (CERIS Coimbra)	Associate Professor	x			
Paulo Barreto Cachim (CERIS Aveiro)	Associate Professor with Habilitation	x			
Pedro Miguel Soares Raposeiro da Silva	Assistant Professor		x		
Rita Maria Vilela Nogueira	Assistant Professor	x			
Rita Pinheiro Garcia (CERIS Coimbra)	Researcher	x			
Romeu da Silva Vicente (CERIS Aveiro)	Full Professor	x			
Rui Miguel Sendas Jerónimo (CERIS Coimbra)	Researcher		x		

PERSONNEL					
Name	Category	Member	Collaborator		
			with PhD	without PhD	
				PhD student	Other
Rui Vasco Pacheco Santos da Silva	Researcher	x			
Sara Maria Santos Soares Dias (CERIS Coimbra)	Researcher	x			
Victor Miguel Carneiro de Sousa Ferreira (CERIS Aveiro)	Full Professor	x			
Vitor Faria e Sousa	Assistant Professor	x			
Wesley Bruno da Silva Machini	Researcher		x		
Admir Jeremias Silva Tavares	PhD Student			x	
Adnan Abdulghani Ali Al-ganad	PhD Student			x	
Adriana Melo Baio Dias	PhD Student			x	
Adriana Sofia Rodrigues Boaventura de Azevedo	PhD Student			x	
Ali Shoaei	PhD Student			x	
Ana Chambel da Silva Carriço (concluded 2024)	PhD Student			x	
Ana Cristina de Santana Inglês	PhD Student			x	
Ana Margarida Gaspar de Oliveira Braga Maia	PhD Student			x	
Ana Sofia Santos Ferreira Leonardo	PhD Student			x	
André Filipe Rosário Marcelino Silva	PhD Student			x	
André Petersen	PhD Student			x	
Andrea Ferre Balboa	PhD Student			x	
António Braz Leiras	PhD Student			x	
António Renato Albuquerque Bicelli	PhD Student			x	
Arpan Joshi	PhD Student			x	
Bahareh Ramezani	PhD Student			x	
Bernardete de Lourdes Ferreira Minervino (concluded 2024)	PhD Student			x	
Bruno Carvalho Lima de Alencar Matos	PhD Student			x	
Bruno Jorge Santos de Carvalho Matos	PhD Student			x	
Carlos Alexandre Seruti	PhD Student			x	
Carlos Miguel Rocha	PhD Student			x	

PERSONNEL					
Name	Category	Member	Collaborator		
			with PhD	without PhD	
				PhD student	Other
Catarina Faria Lopes	PhD Student			x	
Catarina Pinto Mouraz	PhD Student			x	
Catarina Sofia Freitas Teixeira Ribeiro (concluded 2024)	PhD Student			x	
Charles Severo Cenci	PhD Student			x	
Dany Azad Kareem Kassim	PhD Student			x	
David Eduardo Nunes Bastos	PhD Student			x	
Deives Junior de Paula	PhD Student			x	
Douglas Rocha	PhD Student			x	
Eduarda da Conceição Nepomuceno	PhD Student			x	
Eleonora Cintura (concluded 2024)	PhD Student			x	
Eloísa Maria Castilho dos Santos	PhD Student			x	
Elżbieta Jadwiga Hamadyk	PhD Student			x	
Fernanda Caroline Rodrigues Magalhães	PhD Student			x	
Filomena das Dores Cardoso do Espírito Santo Carvalho	PhD Student			x	
Ghandy Diaa Eddine Lamaa	PhD Student			x	
Giovanna Schäfer Bartels	PhD Student			x	
Gonçalo Roque Araújo	PhD Student			x	
Gustavo Silva da Rocha (concluded 2024)	PhD Student			x	
Henriqueta Sofia de Almeida Teixeira (concluded 2024)	PhD Student			x	
Ilídio dos Santos Dias	PhD Student			x	
Inês Almeida	PhD Student			x	
Inês Rodrigues Rita	PhD Student			x	
Isequiel José Soares Alcolete	PhD Student			x	
Ivan Kristiadi Damanik	PhD Student			x	
Jéssica Deise Bersch	PhD Student			x	
Joana Alexandra Mirante Barrelas (concluded 2024)	PhD Student			x	

PERSONNEL					
Name	Category	Member	Collaborator		
			with PhD	without PhD	
				PhD student	Other
João Alfredo de Lazzari	PhD Student			x	
João Carlos Iria Filipe	PhD Student			x	
João Luís Carreiras Ribeiro Parracha (concluded 2024)	PhD Student			x	
João Paulo Melo Dâmaso Moniz	PhD Student			x	
João Pedro de Freitas Saraiva dos Santos	PhD Student			x	
Jonathan Edet Uno	PhD Student			x	
Jordan Loïc Dongmo Tadonbou	PhD Student			x	
Jorge Miguel Pires do Nascimento Pontes	PhD Student			x	
José Miguel Paulo de Lima Ferreira	PhD Student			x	
Kátia Maria Pereira Soares	PhD Student			x	
Laura Ocaranza	PhD Student			x	
Lucas Xavier Ribeiro Rodrigues Sequeira	PhD Student			x	
Madalena Fava Lopes Rucha	PhD Student			x	
Maria Ana Benoliel Nunes Bonito	PhD Student			x	
Maria Inês Sardinha Gomes	PhD Student			x	
Maria Teresa Henriques Alves Ferreira	PhD Student			x	
Mariana Marques Gonçalves	PhD Student			x	
Marina Machado Leal dos Santos	PhD Student			x	
Marta Isabel Silva Rodrigues da Costa	PhD Student			x	
Martim Henrique dos Santos Vicente Alves Nabais	PhD Student			x	
Maryam Salati	PhD Student			x	
Mayara Di Castro Silva	PhD Student			x	
Md Abu Toyob Shahid	PhD Student			x	
Mohammed Hameed Ali Saleh Hafeeth	PhD Student			x	
Mehdi Mellef	PhD Student			x	
Muhammad Rubel	PhD Student			x	
Mustafa Bahjat Ibrahim	PhD Student			x	

PERSONNEL					
Name	Category	Member	Collaborator		
			with PhD	without PhD	
				PhD student	Other
Nada Abdulla Ibrahim Ibrahim Mowafy	PhD Student			x	
Patrícia Alexandre Pereira Marques Marchante	PhD Student			x	
Paulo Jorge Dias de Carvalho	PhD Student			x	
Pedro de Andrade Quirino Rosa	PhD Student			x	
Pedro Emanuel Frazao Pedroso	PhD Student			x	
Pedro Enrique Cantor Cortes	PhD Student			x	
Poliana Bellei	PhD Student			x	
Qifan Ren (concluded 2024)	PhD Student			x	
Rafaela Caetano de Almeida	PhD Student			x	
Raphael Augusto Vasconcelos Carneiro Nascimento Pachamama (concluded 2024)	PhD Student			x	
Raquel dos Santos Sarmento	PhD Student			x	
Renato Jorge Fernandes Neves	PhD Student			x	
Ricardo Infante Gomes	PhD Student			x	
Ricardo Jorge Tomé Cruz	PhD Student			x	
Rita Freire Machete	PhD Student			x	
Rita Silva Andrade Santos	PhD Student			x	
Roberto Rosa de Santana	PhD Student			x	
Rodrigo Almeida Freitas	PhD Student			x	
Rodrigo da Silva Varela Pedral Sampaio	PhD Student			x	
Rúben Filipe Rosa Lopes	PhD Student			x	
Rui Miguel Silva de Craveira Neves	PhD Student			x	
Salem Alnezami (concluded 2024)	PhD Student			x	
Saman Abolghasemi Moghaddam	PhD Student			x	
Sara de Brito Coimbra (concluded 2024)	PhD Student			x	
Sérgio Roberto Oberhauser Quintanilha Braga	PhD Student			x	
Seyedsajjad Hosseini	PhD Student			x	

PERSONNEL					
Name	Category	Member	Collaborator		
			with PhD	without PhD	
				PhD student	Other
Shahriar Modaresi	PhD Student			x	
Sofia Rita Machado Bicha Castelo	PhD Student			x	
Sónia Pereira Marques da Silva	PhD Student			x	
Tânia Raquel Alves dos Santos	PhD Student			x	
Tarikul Hasan	PhD Student			x	
Teerdad Mirdjalali	PhD Student			x	
Tiago Liberalesso (concluded 2024)	PhD Student			x	
Tomás João Fernando	PhD Student			x	
Valdomiro Ceolin Neto	PhD Student			x	
Vitor Dacol	PhD Student			x	
Wilamy Valadares de Castro	PhD Student			x	
Xiwen Fu	PhD Student			x	
Yoleimy del Carmen Avila Pereira	PhD Student			x	
Yuyi Ye	PhD Student			x	

The summary table is shown below.

Type	Permanent	Non-permanent		Total
		Contract	Scholarship	
Members	47	6	0	53
Collaborators with PhD	12	3		15
Collaborators without PhD	1		114	114
Technical staff				1
Administrative Staff	1			1
Others				0

PART II - DESCRIPTION
Leadership

The coordinator represents the group in regular meetings with the Executive Board, other group coordinators, and official meetings. The coordinator also manages the part of the FCT fund allocated to the Group. Jorge de Brito began coordinating this research group in 2025.

Description of the Research Group

The group RG5 is organized into four research domains, following the most representative research guidelines in which it is involved:

- Construction Materials, Technology, and Management Innovation;
- Sustainable Construction;
- Monitoring, Rehabilitation, and Conservation of the Built Heritage;
- Fire Behaviour of Materials and Structures.

General Objectives

The research activities aim at developing research projects in the following domains:

- Construction Materials, Technology, and Management Innovation: advanced materials (GFRP, CFRP); waterproofing systems; concrete and mortars technology; construction quality, safety, environmental, and health management; virtual reality applications in construction;
- Sustainable Construction: sustainability and deconstruction strategies; sustainable traditional materials; demolition and recycling; recycled aggregates; building physics and passive design; building acclimatization and mechanical systems;
- Monitoring, Rehabilitation, and Conservation of the Built Heritage: Inspection, diagnosis, maintenance, and rehabilitation systems; maintenance of buildings envelope; conservation of historical building heritage; sensors, technological innovation, and structural assessment;
- Fire Design: fire resistance and risk evaluation of cultural heritage.

Other objectives are:

1. To participate in national and international technical and scientific committees;
2. To participate/organize national and international conferences;
3. To teach in Graduation and Post-Graduation courses in the field of construction and participate in academic events;
4. To perform consultancy work to fund research and provide practical applications to research results.

Group Governance

The group governance, promoted by the coordinator, aims at:

- Promoting application to research funding (projects, scholarships, advanced consultancy, etc.);
- Stimulating joint activities among the members of the group;
- Increasing the collaboration with other groups of CERIS in the frame of transversal initiatives, namely in the context of the thematic strands;
- Organizing CERIS seminars.

Facilities

Laboratory of Structures (LERM) and Laboratory of Construction (LC):

- One-compartment climatic chamber and several pieces of equipment to study hygrothermal behaviour of a real scale prototype of walls and products and to assess indoor air quality; also including water spray, temperature, and humidity control devices; infrared cameras; moisture meter; pyranometer, lux meter, Multi-gas Monitor (Bruel & Kjaer) to measure the concentration up to 5 components of a gaseous mixture;
- Two accelerated carbonation climatic chambers;
- Wet/dry curing chambers, temperature/humidity control chamber for creep/shrinkage;
- Five ovens for pre-conditioning and drying of solid samples;
- One electric bottom-loading furnace and one three-zone split furnace, both electrically heated and controlled by computer for fire resistance tests;
- One electrical, environmental chamber (Tinius Olsen) attachable to a universal testing machine;
- One video-extensometer;
- One intermediate scale gas furnace controlled by computer for fire resistance tests;
- Data loggers for data acquisition;
- Personal computers;
- Sensors such as displacement transducers, load cells, strain gauges, temperature transducers, pressure gauges, inclinometers, etc.;
- Load application systems, including hydraulic jacks (up to 5.000 kN capacity), electronic, electric, and manual hydraulic pumps (shared with other Groups);
- Universal testing machine Instron (tension/compression tests, 250 kN capacity, 100 mm stroke) (shared with other Groups);

- Universal testing machine for monotonic or cyclic tests in tension or compression, 50 KN capacity;
- Hydraulic Press for compression and modulus of elasticity tests (3.000 kN capacity) associated with a press for flexural tests;
- Hydraulic Press for compression and flexural tests of mortar, paste, and grout samples;
- Reaction wall equipped with 1.000 kN screw jack (shared with other Groups);
- Steel reaction frames (shared with other Groups);
- Various mortar and concrete mixers of different capacities, namely: 2 litres; 5 litres; 40 litres; 60 litres; 80 litres;
- Equipment to measure the fresh properties of concrete, mortar, and grout (Marsh flow cone, flow-table, slump cone, U-box, L-box, V-funnel, V-B apparatus, concrete air content meter - pressure method, Vicat needle-setting time, etc.);
- Equipment for aggregate characterization, such as High-capacity sieve shakers, Los Angeles machines, sieves for flakiness index determination, and dry powder pycnometers;
- Equipment for abrasion resistance tests of stone and ceramic materials;
- Rapid chloride migration test for mortar and concrete samples;
- Set for construction condition evaluation including Schmidt hammers, pendulum hammers, steel bars detectors, phenolphthalein kit, chloride kit, crack microscope, crack rulers, strain gauges, core drilling machine, PH meter, Conductivity meter, moisture meter, hygrometers, impact test devices for renders and screeds, etc.;
- Measuring equipment for elastic properties of a wide range of materials based on the “impulse excitation technique” to measure dynamic elastic moduli over a range extending from 50 MPa to over 1000 GPa (Grindsonic); ultrasonic pulse velocity (Pundit) that measures transit time and pulse velocity, path length, perpendicular crack depth, and surface velocity; transducers with different shapes (contact; exponential) and frequencies (54 kHz; 150 kHz);
- Workshop for metallic and timber parts fabrication (drills, saws, welding machines, etc.) (shared with other Groups);
- Thermal conductivity meter equipment (Holometrix Rapid-K and portable hand-held Isomet with surface and inner probes and different ranges) for direct measurement of heat transfer properties of a wide range of isotropic materials; measurement of Thermal Conductivity, Thermal Diffusivity, Volume Heat Capacity, and Temperature;
- Water permeability tests for low to moderately permeable materials;
- Air/gas permeability tester for concrete samples;
- Handheld Digital Microscope for materials analysis

- High-capacity sieve shaker;
- Viscosimeter for grouts, pastes, and mortars produced with fine sand;
- One B&K Building Acoustics system for laboratory and in-situ tests;
- Life cycle assessment database of construction materials and building assemblies "from cradle to cradle." Software for Environmental and Economic Life cycle assessment of buildings and for modeling the building energy;
- Solar Cooling Laboratory (LSAS). It is being used to test solar-assisted absorption systems for building acclimatization;
- Controlled (temperature and mass flow rate) hot and cooled water circuits, ventilation;
- A modular single-effect absorption machine that allows the testing of specific components;
- Hot and cold-water circuits to run the machine;
- A data acquisition system based on a digital multimeter and a real bank;
- Thermogravimetric analysis Hitachi STA200;
- PCE-PGM 100 brightness meter, up to 1000 GU, angle: 20º, 60º, 85º;
- Emissivity measuring instrument TIR 100-2;
- Konica Minolta Spectrophotometer, CM-26d;
- Retsch planetary mill, PM 100;
- Gas pycnometer Accupyc 1350 – 10 CC;
- Retsch automatic sample divider PT 100;
- Personal computers;
- Measurement equipment includes PT100 sensors (4wire), pressure sensors, turbines, and electromagnetic flowmeters.

Laboratory of Computational Mechanics (LMC):

- Facilities in the use of computers and printers shared with other Groups. The experiments are carried out by the individual members of the Group or by PhD or MSc students. Sometimes the staff charged with the maintenance of LERM and LC gives some help, but the Group does not dispose of qualified experimental personnel to attend to all the research areas. When the global needs of the users of LERM and LC coincide in a certain period, delays in the research progress have occurred in the past. The maintenance and repair (or installation of new equipment) of equipment are normally done by staff from LERM, LC, or by specialised firms.

PART III - ACTIVITY

III.1 Activity indicators - Summary table for 2024

ACTIVITIES			
PhD Theses		Concluded	14
		To be concluded after 2024	91
Publications	Papers in peer-reviewed journals	International peer-reviewed journals (WoS AND Scopus)	175
		Peer-reviewed journals (non-WOS OR non-Scopus)	7
		Peer-reviewed journals (non-WOS AND non-Scopus)	0
	Papers in proceedings	International	157
		National	25
	Books	Entire	0
		Chapters	7
		As editor	5
Reports		Scientific	24
		Consultancy/others	19
Collective guidance in scientific work	Editor-in-Chief	WoS/Scopus-indexed Journals	0
		Other journals	0
	Associate Editor	WoS/Scopus-indexed Journals	7
		Other journals	0
	Issue Editor/Guest Editor/Membership Editorial Boards	WoS/Scopus-indexed Journals	46
		Other journals	0
	Membership in Scientific Committees	International	67
		National	23
	Drafting of codes, Recommendations	International	27
		National	25
Organization of scientific events		International	30
		National	18
Competitive research projects	International research grants	Started in 2024	3
		Active in 2024	18
	National research grants	Started in 2024	6
		Active in 2024	24
Competitive individual research grants (PhD, Post-doc, sabbatical, etc)		Started in 2024	8
		Active in 2024	16
Awards		International	22
		National	11
Refereeing for funding agencies		International	0
		National	0
Invited lectures		Keynote lectures at international conferences	4
		Other	11
Models			0

ACTIVITIES		
Software applications		0
Pilot plants		0
Prototypes		0
Patents	International	0
	National	2
Other actions (e.g., scientific dissemination to a broad audience, social media)		13

III.2 Highlight of main achievements

Various research programmes were completed or initiated during this period and will provide results in the near future. Many were developed within national, European and international research projects and scientific network collaborations. The main achievements are summarised in the table above.

The main fields of research are:

- Innovative applications of materials such as GFRP and CFRP were studied in depth, experimentally, and analytically; most Portuguese research on waterproofing systems was performed within the group; breakthroughs in concrete and mortars technology were experimentally validated, namely using various types of by-products and wastes; mortars and concrete formulations with nanomaterials were performed; studies on the energy efficiency and hygrothermal comfort of different materials, building components and construction systems such as active and glazing facades, shading devices and green roofs and walls were conducted; risk-informed quality, safety and environmental management in construction related research was included in various national and international actions, including normative work;
- New theories on sustainability and construction were put forward, such as the use of vernacular and traditional techniques and materials (earth, wood, natural fibres, stone, brick), often including innovative processes of application, to produce innovative building products (e.g. thermal-acoustic insulation boards), the use of various types of by-products and wastes used as supplementary cementitious materials and aggregates, the implementation of selective demolition and recycling maximisation (namely recycled aggregates in concrete and mortars production), the use of recycled and natural materials (e.g. hemp; wood fibre, cellular glass, compressed earth blocks, etc.) to develop low carbon materials, and strategies of passive design and acclimatisation, including numerical hygrothermal simulation and experimental durability tests;
- Life-cycle assessment of many innovative building products, and comparison to commercial ones; life-cycle costing analysis of new building products/systems; life-cycle management systems (inspection, diagnosis, maintenance, and rehabilitation); conservation of historical building heritage; monitoring of indoor environmental quality by sensors; sensors for monitoring

the structural performance of constructions, technological innovation, and assessment of complex structures;

- Seismic rehabilitation of masonry buildings; experimental and numerical analysis of timber-framed masonry walls subjected to monotonic and cyclic loading; reinforcement of timber-framed masonry walls with elastoplastic dampers, reinforced render, or steel plates. Experimental and numerical analysis of ordinary masonry walls subjected to in-plane and out-of-plane loading. Seismic reinforcement of ordinary masonry walls with carbon fibre reinforced render or transverse hinge connectors;
- Implementation of innovative testing methods to assess the performance and durability of construction materials, such as resistance to microbiological growth, hygrothermal performance and mechanical resistance under extreme weather events.

PART IV – FUTURE ACTIVITY (2025)

The RG activities in 2025 will be a natural follow-up of the research carried out in 2024. These activities will cover research objectives that include different cross-cutting issues with branches in the four thematic strands: Product development in Civil Engineering industries (PD); Risk and safety in natural and built environments (RS); Rehabilitation of natural and built environments (RNBE); Response to natural and societal changes (RNSC).

The RG activities for 2025 will be organized according to major research topics as follows:

- To develop research projects in Construction Materials, Building Technology, and Management Innovation; Sustainable Construction Practices; Monitoring, Rehabilitation, and Conservation of the Built Heritage;
- An effort will be made to concentrate on increasingly less wide and more specific fields to produce relevant results in national and international forums (measured in a significant increase in the number and impact factor of papers in peer-reviewed international journals, the supervision of PhD theses, the approval of national and international research grants and the engagement in international research networks):
    - Advanced materials and technologies also focusing on nanomaterials - establish international cooperation and be a national leader in the field of composites (GFRP and CFRP);
    - Concrete and mortars technology - increase the number of PhD and MSc studies under way (in strong collaboration with LNEC and foreign universities) and improve the Mortars Section of the Construction Laboratory at IST;
    - Sustainable and functional bio-based construction products and building elements - research and development of innovative materials through international collaboration;
    - Risk informed quality, safety and environmental management in construction - increase the already large international cooperation via technical committees and international conferences;
    - Sustainability and deconstruction strategies and technology - increase the number of PhD and MSc studies under way and continue to be a national and international reference in the field of recycled aggregates and supplementary cementitious materials for concrete and mortars production;
    - Building physics and passive design - continue the very good results in the near past and expand its potential through studies on indoor environmental comfort, energy efficiency, energy storage systems and acoustics, anchored on the development, multi-scale testing and real-scale application of innovative materials, products, components and construction systems;

- Building acclimatization and mechanical systems - continue collaboration with the Mechanics and Physics Departments of IST and with universities from other countries, strategically important in terms of sustainable construction in terms of energy-saving; inspection, diagnosis, maintenance and rehabilitation systems - increase the number of PhD and MSc studies under way and be a national and international reference in the field of inspection and diagnosis systems;
- Conservation of historical building heritage - continue and strengthen national and international cooperation projects, namely within technical/scientific national/international networks;

- To continue participating in national and international scientific committees, participating/organizing national and international conferences, publishing scientific articles, books and book chapters, editorial activities, teaching in Graduation and Post-Graduation courses in the field of construction, and participating in academic events and performing consultancy work.

RESEARCH GROUP 6 - Structural Design and Geotechnics

RESEARCH GROUP COORDINATOR – Rafaela Cardoso

PART I - RESOURCES

I.1 Budget

BUDGET (euros)						
FCT		Other Funding				
STRATEGIC Funding	FCT Projects	Other Research Funding		Consultancy		TOTAL
		National	International	National	International	
30 609,70	136 098,29	918 858,73	61 068,94	142 187,88	0,00	1 288 823,54

I.2 Personnel

PERSONNEL					
Name	Category	Member	Collaborator		
			with PhD	without PhD	
				PhD student	Other
Alfredo Manuel Balacó de Morais (CERIS Aveiro)	Associate Professor	x			
André Filipe Castanheira Alves Furtado	Assistant Professor	x			
Aníbal Guimarães da Costa (CERIS Aveiro)	Full Professor Retired	x			
António Manuel Candeias de Sousa Gago	Associate Professor	x			
António Manuel Pinho Ramos (CERIS NOVA)	Associate Professor with Habilitation	x			
Armando Manuel Sequeira Nunes Antão (CERIS NOVA)	Associate Professor	x			
Carla Alexandra da Cruz Marchão (CERIS NOVA)	Assistant Professor	x			
Carlos Alberto Ferreira de Sousa Oliveira	Full Professor Retired	x			
Carlos Manuel Tiago Tavares Fernandes	Assistant Professor	x			
Carlos Manuel Chastre Rodrigues (CERIS NOVA)	Associate Professor	x			

PERSONNEL					
Name	Category	Member	Collaborator		
			with PhD	without PhD	
				PhD student	Other
Corneliu Cismasiu (CERIS NOVA)	Associate Professor		x		
Dinar Reis Zamith Camotim	Full Professor Retired	x			
Eduardo Nuno Brito Santos Júlio	Full Professor	x			
Elói João Faria Figueiredo	Full Professor	x			
Fernando Manuel Fernandes Simões	Associate Professor with Habilitation		x		
Fernando Pedro Simões da Silva Dias Simão (CERIS Coimbra)	Assistant Professor		x		
Filipe Pimentel Amarante dos Santos (CERIS NOVA)	Assistant Professor	x			
Guilherme Barreto Arez Coelho (CERIS NOVA)	Assistant Professor	x			
Hugo Filipe Pinheiro Rodrigues (CERIS Aveiro)	Associate Professor with Habilitation	x			
Hugo Miguel Bento Rebelo (CERIS NOVA)	Assistant Professor		x		
Hugo Sérgio Sousa Costa	Adj. Professor	x			
Ildi Cismasiu (CERIS NOVA)	Assistant Professor		x		
Ionut Dragos Moldovan	Assistant Professor	x			
João Carlos de Oliveira Fernandes de Almeida	Full Professor		x		
João Nuno Noronha Ramos Vigário Pacheco	Researcher	x			
João Pedro Lage da Costa Firmo	Assistant Professor	x			
Jorge Miguel Silveira Filipe Mascarenhas Proença	Associate Professor	x			
José Joaquim Costa Branco de Oliveira Pedro	Assistant Professor	x			
José Nuno Varandas da Silva Ferreira (CERIS NOVA)	Assistant Professor		x		
Luís Manuel Coelho Guerreiro	Associate Professor with Habilitation	x			
Luís Manuel Calado de Oliveira Martins	Full Professor	x			
Margarida João Fernandes de Pinho Lopes (CERIS Aveiro)	Assistant Professor	x			
Maria Rafaela Pinheiro Cardoso	Full Professor	x			
Mário Jorge Vicente da Silva (CERIS NOVA)	Assistant Professor	x			
Mário Manuel Paisana dos Santos Lopes	Assistant Professor	x			

PERSONNEL					
Name	Category	Member	Collaborator		
			with PhD	without PhD	
				PhD student	Other
Nuno Filipe Ferreira Soares Borges Lopes (CERIS Aveiro)	Associate Professor with Habilitation	x			
Nuno Rafael da Silva Peres	Assistant Professor	x			
Paulo Alexandre Lopes Fernandes	Coordinator Professor	x			
Paulo Jorge de Melo Matias Faria de Vila Real (CERIS Aveiro)	Full Professor	x			
Pedro Manuel de Castro Borges Dinis	Assistant Professor		x		
Peter John Bourne-Webb	Assistant Professor	x			
Ricardo Nuno Francisco do Carmo	Assistant Professor	x			
Rita Maria do Pranto Nogueira Leite Pereira Bento	Full Professor	x			
Rodrigo de Moura Gonçalves (CERIS NOVA)	Full Professor	x			
Rui Pedro Carrilho Gomes	Assistant Professor	x			
Rui Pedro César Marreiros (CERIS NOVA)	Assistant Professor	x			
Teresa Maria Bodas de Araújo Freitas	Assistant Professor		x		
Válter José da Guia Lúcio (CERIS NOVA)	Associate Professor	x			
Vítor Emanuel Marta da Silva (CERIS Aveiro)	Associate Professor	x			
André Rafael Dias Martins	Researcher	x			
António Pedro Carones Duarte	Researcher		x		
Brisid Isufi	Researcher	x			
Carlos André Soares Couto (CERIS Aveiro)	Researcher	x			
Flávio Alexandre Matias Arrais (CERIS Aveiro)	Researcher		x		
Hugo Manuel Mendes Vitorino (CERIS Aveiro)	Researcher		x		
Mónica Maria Sequeira Amaral Ferreira	Researcher		x		
Romain Ribeiro de Sousa	Researcher		x		
Abdalla Mustafa Abdalla Almukashfi	PhD Student			x	
Ali Asghar Nemati	PhD Student			x	
Amaro António Feliciano Catumbaiala	PhD Student			x	

PERSONNEL					
Name	Category	Member	Collaborator		
			with PhD	without PhD	
				PhD student	Other
Ana Célia Henriques Antunes	PhD Student			x	
Ana Maria Paes de Vasconcelos Caixinhas	PhD Student			x	
Ana Raquel Rodrigues de Paula	PhD Student			x	
André Filipe Bento Guedes Quinhones	PhD Student			x	
António Maria Matos Lopes Simões	PhD Student			x	
António Renato Albuquerque Bicelli	PhD Student			x	
Arianna Lupattelli (concluded 2024)	PhD Student			x	
Bárbara Cardoso Gomes	PhD Student			x	
Bruno José Oliveira Santos	PhD Student			x	
Carlos Miguel de Araújo Rocha	PhD Student			x	
Catherine Souto Costa Coelho da Silva	PhD Student			x	
Deodato Bongo Manuel	PhD Student			x	
Eduardo Menayame Kielo Madekanga	PhD Student			x	
Elisson Bilheiro Ferreira Filho (concluded 2024)	PhD Student			x	
Eliana Augusta Clemente Soldado	PhD Student			x	
Ellon Bernardes de Assis	PhD Student			x	
Emad Janghorban	PhD Student			x	
Fábio Moutinho Paiva (concluded 2024)	PhD Student			x	
Fernando Rocha Sarquis	PhD Student			x	
Gabriel de Jesus Gomes (concluded 2024)	PhD Student			x	
Ghandy Lamaa	PhD Student			x	
Inês Costa Feijão Borges	PhD Student			x	
Ionel-Daniel Craiu	PhD Student			x	
João Carlos Iria Filipe	PhD Student			x	
João Carlos Martins Rei	PhD Student			x	
João Manuel Alves Serra	PhD Student			x	

PERSONNEL					
Name	Category	Member	Collaborator		
			with PhD	without PhD	
				PhD student	Other
João Pedro Baião Grilo	PhD Student			x	
João Rodrigo da Silva Baptista	PhD Student			x	
José Pedro Pais Fernandes Basto	PhD Student			x	
Laís Viana	PhD Student			x	
Laura Salime Hage de Souza	PhD Student			x	
Layla Ferraz	PhD Student			x	
Liana Sombrio Ostetto	PhD Student			x	
Liliana Caria Oliveira (concluded 2024)	PhD Student			x	
Luís João Ferreira Vieira	PhD Student			x	
Luís Miguel Varela Maneta	PhD Student			x	
Maria Madalena de Oliveira da Ponte concluded 2024)	PhD Student			x	
Mariana Cirila Sousa Jesus	PhD Student			x	
Mariana Isaura de Moura Ormeche	PhD Student			x	
Mariana Margarida Mateus Pinto	PhD Student			x	
Martim Nabais	PhD Student			x	
Mehdi Mellef	PhD Student			x	
Miguel Ângelo da Silva Rodrigues	PhD Student			x	
Mihai Adrian Bud	PhD Student			x	
Natan Sian das Neves	PhD Student			x	
Nima Tabarestani	PhD Student			x	
Patrícia Alexandra Rodrigues de Freitas	PhD Student			x	
Peiman Ghaderi	PhD Student			x	
Pouneh Bourang	PhD Student			x	
Rafael Andrés Sanabria Díaz	PhD Student			x	
Rafael Manuel da Silva Ramos	PhD Student			x	
Rafaela Caetano de Almeida	PhD Student			x	

PERSONNEL					
Name	Category	Member	Collaborator		
			with PhD	without PhD	
				PhD student	Other
Ricardo André das Neves Martins	PhD Student			x	
Rita Freire Machete	PhD Student			x	
Rita Monteiro Garcia Couto	PhD Student			x	
Salar Khaiiatali	PhD Student			x	
Sandra Isabel da Silva Pinto	PhD Student			x	
Sérgio Marcelo de Deus Nascimento	PhD Student			x	
Sérgio Roberto Oberhauser Quintanilha Braga	PhD Student			x	
Sérgio Sunley	PhD Student			x	
Seyedsajjad Hosseini	PhD Student			x	
Shahriar Modaresi	PhD Student			x	
Tatiana Costa Ferreira de Sá Marques	PhD Student			x	
Tomás João Fernando	PhD Student			x	
Victor Scartezini Terra	PhD Student			x	

The summary table is below.

Type	Permanent	Non-permanent		Total
		Contract	Scholarship	
Members	39	5		44
Collaborators with PhD	9	4		13
Collaborators without PhD			75	75
Technical staff	1.5			1.5
Administrative Staff	2			2
Others				

PART II - DESCRIPTION

Leadership

In 2024, Professor Eduardo Júlio served as the coordinator of Research Group RG6. In 2025, the position was assumed by Professor Rafaela Cardoso. All PhD members of the group hold a formal annual meeting to define and plan the group's joint activities.

Description of the Research Group

General Objectives

The research activity of RG6 is planned to focus on six major research areas:

1. Mechanics, Modelling, and Analysis of Structures;
2. Earthquake Engineering and Seismology;
3. Structural Concrete;
4. Steel and Composite Structures;
5. Bridge Design;
6. Geotechnics.

In general terms and as transversal objectives, it was intended to:

- Develop new products with enhanced performance, durability, and eco-efficiency;
- Reduce risk and improve the safety of infrastructures, namely regarding seismic hazard characterization and seismic vulnerability assessment;
- Increase the efficiency of structural systems and the incorporation of innovative materials and devices;
- Develop more powerful and friendly models for structural and geotechnical analysis, directly linking to code standards;
- Develop alternative solutions for the rehabilitation of existing structures, in particular of historical buildings;
- Use the above to address specific societal challenges.

On the subject field of Mechanics, Modelling, and Analysis of Structures, the activity of the group was centred on the analysis of nonlinear, coupled structural problems using conventional and hybrid finite element formulations, focusing on the following topics:

1. Dynamic instabilities and algorithms for the numerical analysis of the mechanical behaviour of non-smooth structures with frictional or elastoplastic components;
2. Modelling of moving loads on beams on nonlinear foundations;

3. Numerical simulation of the wildfire effects in dwellings located in forest areas using computational fluid dynamics by solving the Navier-Stokes equations for low-speed, thermally-driven flows, including smoke and heat transport from fires.
4. Developing of hybrid-Trefftz stress plate elements for Reissner-Mindlin plates with an exact Kirchhoff limit.
5. Development and application of finite element formulations for limit analysis.
6. Numerical modelling of old stone masonry walls using particle models.
7. Feasibility study of automatic generation of structural meshes and effects of explosions.

On the subject field of Earthquake Engineering and Seismology, the activity of the group kept focused on the following topics:

1. History of construction and structural behaviour and construction techniques of traditional masonry tile vaults.
2. Assessment of existing structures (e.g., dynamic characterization, seismic vulnerability, and seismic risk assessment).
3. Update and improve a model for quick evaluation of the potential seismic performance of masonry and reinforced concrete buildings based on its application to existing buildings.
4. Structural rehabilitation (e.g., seismic strengthening techniques, passive protection).
5. Development of tools to improve preparedness and community resilience, aiming to reduce the seismic risk through non-structural elements.
6. Seismic design of new masonry constructions.

On the subject of Structural Concrete, the activity aimed to deepen the work developed in previous years and kept focused on the following topics:

1. Advanced cementitious materials.
2. High-performance ordinary and prestress reinforcement.
3. Enhanced durability.
4. Sustainable and eco-efficient solutions.
5. Modelling and design models (e.g., stress-fields models, FEM-based software with strongly embedded discontinuities, concrete reinforced with embedded fibres).
6. Assessment of existing structures (e.g., reliability, structural robustness, monitoring, seismic vulnerability).
7. Structural rehabilitation (e.g., repairing and strengthening techniques, seismic strengthening, passive protection).

8. Study on the use of recycled aggregate concrete in slab-column connections subjected to centred vertical loads.
9. Study of anchorage zones for prestressing cables.
10. Prefabrication and innovation.

On the subject field of Steel and Composite Structures, the activity of the group was planned to develop in-house expertise in the following topics:

1. GBT formulations to perform buckling, post-buckling, and vibration analyses of isolated members and structural systems (e.g., continuous beams or simple frames) prone to local, distortional, and global deformations.
2. In-depth investigations on the non-linear behaviour, ultimate strength, and design of cold-formed steel open-section and tubular members experiencing coupling phenomena involving local and/or distortional buckling.
3. Novel rational approaches for the design of cold-formed and hot-rolled steel angle columns.
4. Development and implementation of (a) a displacement-based finite element for the linear analysis of curved members (circular axis), (b) a finite element formulation for the bifurcation analysis of composite steel-concrete beams.
5. In-depth investigations on steel sub-assemblages with bolted and welded dissipative fuses.
6. Proposal of design rules for composite structural members and parts.
7. Applications to steel and composite bridges.
8. Development of formulations of the Generalised Beam Theory for polygonal tubes of variable cross-section.
9. Study of the resistance to lateral buckling of steel profiles subjected to deviated bending.

In the field of Bridge Design, the activity was planned to deepen the work developed in previous years, focusing mainly on the following:

1. Buckling resistance of steel-plated girders considering M-V interaction with high compression forces (application to cable-stayed bridges).
2. Curved steel plates on bridge deck beam: Post buckling behaviour and ultimate strength.
3. The use of high-strength steels in the bridge deck.
4. Fatigue assessment of composite steel-concrete cable-stayed bridge decks.
5. Higher order beam theory (developments and applications to steel structures and bridges analysis).
6. Analysis of the distortion effect on the dynamic behaviour of high-speed railway bridges.

7. Analysis of substructures of offshore wind turbines.

In the field of Geotechnics, the activity the group focused mainly on the following topics:

1. Dynamic characterization of soils from small to large strains, including liquefaction.
2. Studies on the elastic response measured in resonant columns and using bender elements.
3. Characterisation of the chemo-hydro-mechanical behaviour of clayey and treated soils considering their structure and degree of saturation.
4. Characterisation of soils treated with lime, cement, and bacteria.
5. Numerical analysis of geotechnical structures involving strong soil structure interaction (e.g., tunnels, retaining structures, piles, and thermoactivated structures).
6. Studies on soil decontamination techniques (e.g., electro-osmosis).
7. Study and development of failure criteria for rock materials.
8. Reliability analysis of geotechnical structures in undrained conditions - development of techniques for determining collapse loads with the introduction of spatial variability of soils.
9. Numerical simulation of gas migration and temperature and solute transport in soils

Group Governance

Facilities

The main laboratory facilities used by CERIS RG6 include: (i) the Laboratory of Structures and Strength of Materials (LERM), (ii) the Laboratory of Computational Mechanics (LMC), and (iii) the Laboratory of Geotechnics (LabGeo), all located at IST Alameda campus, (iv) the Seismology Laboratory (SeismLab) that belongs to the National Geophysical Network and, since 2025, (v) the laboratories of Civil Engineering at the University of Aveiro, for Structures and Fire resistance (LERF). A more detailed description of each laboratory is presented ahead.

LERM: Regarding the laboratory components available at LERM, the following equipment should be mentioned: Travelling crane, Steel frames; Reaction wall (able to apply horizontal forces up to 1000 kN, 4m above floor level); Universal testing machine; Hydraulic Press for compression testing; Wind tunnel; Static and dynamic actuators; Automatic data acquisition systems; Accelerometers and displacement transducers; The equipment mentioned above allows the realization of full-scale tests of structural components or assemblage of structural elements up to one story frames.

LMC: Regarding the available computational equipment, the connection to a European electronic mail network should be emphasized, as well as the Computational Mechanics laboratories equipped with RISC technology graphic workstations, PCs, and Macs served by a cluster that includes a machine with parallel processing. All the necessary support equipment was also available, such as printers, plotters, scanners, and software for developing numerical models and experimental data processing.

LabGeo: The facilities of the Laboratory of Geotechnics have been used for teaching, research, and consultancy projects. It provides the experimental means necessary for developing fundamental research on the stress-strain behaviour of soils from very small deformation to failure conditions under monotonic and cyclic loading. It also provides the possibility to obtain high-quality soil parameters for applied research on numerical modelling of soil-structure interaction problems. Several MSc and PhD theses were developed using the available equipment resources to perform advanced physical, mechanical, hydraulic, and electrical characterization of geomaterials in saturated and in unsaturated conditions. Moreover, existing equipment allows for field tests such as quality control, dynamic load tests on piles, and seismic tests for site characterization.

SeismLab: The seismology laboratory and the seismic networks are mainly used for research. CERIS operates a seismological laboratory belonging to the National Geophysical Network. The Network comprises 61 stations to monitor moderate to strong seismic activity in the Portuguese mainland and the Azores. These are accelerometric stations with common universal timing, implanted in the basement of small-size constructions such as fire brigade headquarters or schools. Soon, all the accelerometric stations will belong to a National Accelerometric Network close to the Accelerometric Stations of the Institute for the Sea and Atmosphere (IPMA). This connection was strongly supported and promoted by FCT.

LERF: regarding the laboratories of Civil Engineering at the University of Aveiro, the Laboratory for Structures and Fire Resistance is equipped with a vertical furnace with a free opening of 3.10 m x 3.10 m, capable of carrying out standardized fire resistance tests on construction elements and products in accordance with European regulations. This allows the determination of fire resistance according to the functions performed by the construction elements, namely load bearing (criterion R), tightness to flames and hot gases (criterion E) or thermal insulation (criterion I).

PART III - ACTIVITY

III.1 Activity indicators - Summary table for 2024

ACTIVITIES			
PhD Theses		Concluded	8
		To be concluded after 2024	68
Publications	Papers in peer-reviewed journals	International peer-reviewed journals (WoS AND Scopus)	102
		Peer-reviewed journals (non-WOS OR non-Scopus)	3
		Peer-reviewed journals (non-WOS AND non-Scopus)	7
	Papers in proceedings	International	80
		National	19
	Books	Entire	0
		Chapters	3
		As editor	2
Reports		Scientific	6
		Consultancy/others	10
Collective guidance in scientific work	Editor-in-Chief	WoS/Scopus-indexed Journals	0
		Other journals	0
	Associate Editor	WoS/Scopus-indexed Journals	8
		Other journals	0
	Issue Editor/Guest Editor/Membership Editorial Boards	WoS/Scopus-indexed Journals	43
		Other journals	1
	Membership in Scientific Committees	International	19
		National	10
	Drafting of codes, Recommendations	International	48
		National	23
Organization of scientific events		International	4
		National	1
Competitive research projects	International research grants	Started in 2024	1
		Active in 2024	8
	National research grants	Started in 2024	0
		Active in 2024	17
Competitive individual research grants (PhD, Post-doc, sabbatical, etc)		Started in 2024	14
		Active in 2024	13
Awards		International	12
		National	0
Refereeing for funding agencies		International	0
		National	0
Invited lectures		Keynote lectures at international conferences	4
		Other	2
Models			0
Software applications			0

ACTIVITIES		
Pilot plants		0
Prototypes		0
Patents	International	0
	National	0
Other actions (e.g., scientific dissemination to a broad audience, social media)		6

III.2 Highlight of main achievements

In 2024, the following main achievements of Group RG6 can be highlighted:

(i) 8 PhD Theses concluded, and 68 are in progress;

(ii) 105 papers published in international journals (102 in journals-indexed in WOS);

(iii) 80 papers published in international conference proceedings;

(iv) 19 papers published in national conference proceedings;

(v) 3 chapter books authored;

(vi) 21 international research projects were awarded, and 8 are ongoing;

(vii) 17 ongoing national research projects.

(viii) 12 international and two national awards.

Group members organised or are in the process of organising two International Conferences, one special session in an International Conference and one National Conference.

Group members serve as associate editors of 8 WOS-indexed journals, and the group was involved in 59 editorial boards of scientific journals.

Group members were also elected as members of scientific organizations at international and national levels, involved in funded research projects, in scientific committees of international events, and invited to deliver lectures at scientific events.

PART IV – FUTURE ACTIVITY (2025)

In 2025, it is planned that the members of the RG6 continue working on the most relevant research topics of the area, according to reference international organizations and current priorities of the country.

A renewed effort will be made to promote deeper and more effective collaboration between RG members and internationally renowned researchers, aiming to deliver relevant contributions to the sector and increase participation in European Union-funded research projects. The main general purpose is to improve the construction sector's competitiveness, reduce risk and improve the safety of infrastructures, supporting the development of economical and eco-efficient materials and products and new technologies to design, build and maintain high-quality and long-lasting structures. This embraces the development of (i) sustainable materials and products, (ii) innovative construction methods, addressing, particularly prefabrication, as well as rehabilitation, (iii) advanced computational tools for structural and geotechnical analysis, (iv) contributions to standards and design guidelines for both new and existing structures, including their foundations, (v) novel health monitoring and life-cycle assessment tools for structural and geotechnics use, (vi) study of the effects of explosions in urban environments, (vii) evaluation and rehabilitation of structures damaged by fire, and (vii) steel industrial research and innovation in line with the European Green Deal.

Other more general objectives are the increase of the group internationalisation and the links to industry, namely through:

- improvement of the competitive funding capacity in international and national research projects calls
- participation in national and international standardization committees,
- organization of academic national and international events,
- participation in national and international Graduation and Post-Graduation courses (namely ERASMUS and FCT Doctoral Programmes) in the field of Structures and Geotechnics,
- expert consultancy work to partially fund research and provide practical applications to the results of research,
- cooperation with design offices and private companies,
- partnership with the industry for the optimisation of resources and industrial efficiency upgrading.