

BULLETIN

March 2025

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Message from the President

The Annual General Meeting (AGM) of ISCARSAH is to be held in Lausanne, on Sunday, September 14, just before the conference SAHC 2025 (sahc2025.epfl.ch). A big thank you in advance to our host, Savvas Saloustros. We are looking forward to a great event, technically and socially. Note that September 13-14 are also the European Heritage Days and many historical buildings in Lausanne will be open to the public, together with other activities. The European Heritage Days are the most widely celebrated participatory cultural event shared by the people of Europe, launched 40 years ago.

In the Bulletin you will find information about the amazing AGM last year in Romania. Thanks so much to Radu Cazamir and the team of Structural Engineering & Technology. Working Groups, of ISCARSAH remain working actively and detailed information of the ISCARSAH 4th Masonry Work Group Meeting - Hybrid Workshop - Padova, on December 4, 2024, is also provided here.

In the Bulletin, you will also find information about a recent completed national research project led by one of our members in Croatia on Assessment and Rehabilitation of Existing Structures, and a panel discussion to remember the 2023 Kahramanmaraş Earthquake Sequence (see <https://www.youtube.com/watch?v=kWGQskWP2H0&t=56s>) on Lessons from Lost City Antioch to Istanbul, with active involvement of our local members.

Please join the upcoming APT PETC - ISCARSAH webinar "Structural Interventions in Heritage – Case studies through the lens of Iscarsah Principles" is scheduled for March 6, 2025, at 12 pm E.S.T. (6 pm Paris Time). Registration at <https://shorturl.at/PrCho>.

Finally, on Saturday, December 7, 2024, Notre-Dame de Paris Cathedral re-opened the doors after a five-year closure. The disaster was featured in our webinar on fire protection of heritage structures (see <https://www.youtube.com/watch?v=uB4gFr92Xpw&t=1042s>).

Perhaps the first important aspect is why did the fire happened? Because the disaster should never have happened, and the results indicate that there was insufficient preparation. It would be important to reflect on this for our monuments and for the different dangers, namely fire and earthquakes, given their destructive potential. How much risk are we able to accept for our monuments as a society?

A second aspect is what to do in the event of an unexpected loss of built heritage. The answer is not always clear-cut, with various approaches coexisting, such as the Carmo Convent in Lisbon (which remains a ruin), the Mostar Bridge in Bosnia-Herzegovina (rebuilt) or the twin towers in New York (replaced). In view of the Cathedral's importance, it was possible to find private donors who fully covered the huge reconstruction costs. But what to do when we lose heritage other than Notre Dame? Then the limited financing that may exist will certainly be public or, in other words, from our taxes. How much are we willing to invest to have an acceptable risk? Let us all hope that this newly restored monument will now live a long life.

As I started, make soon your plans for the upcoming AGM in Lausanne. It will be great to meet you all there.

Paulo B. Lourenco

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ISCARSAH 4th Masonry Work Group Meeting - Hybrid Workshop - Padova, 5th December 2024

PRESENTERS

Dr. Filippo Casarin
Prof. Maria Rosa Valluzzi
Prof. Vintzileou
Prof. Miltiadou-Fezans
Dr. Savvas Saloustros
Prof. Mislav Stepinac
Prof. Luca Pelà
Eng. Ziba Sharafi-Roumi
Dr. Julian Thamboo
Eng. Murat Alaboz
Dr. Bruno Quelhas da Silva
Prof. Arun Menon

The 4th meeting of the Masonry Workgroup took place in Padova the last 5th of December 2024. The meeting – held in hybrid mode with eight speakers in person and three online, with an attendance of more than 40 people - was a much-appreciated occasion of sharing international experiences on the topic of the ISCARSAH work group dedicated to a critical review of international standards and guidelines on existing masonry structures.

The meeting started with an introduction of Dr. Filippo Casarin & Prof. Maria Rosa Valluzzi on the general aspects of the group. The outcome of the WG will ideally be Deliverable #1: Methodology for the classification of masonry types per mechanically relevant features, and Deliverable #2: Methodology for masonry laboratory and onsite testing for deriving reliable mechanical features, taking advantage of the relevant experience of members in the field, from an academic and professional point of view.

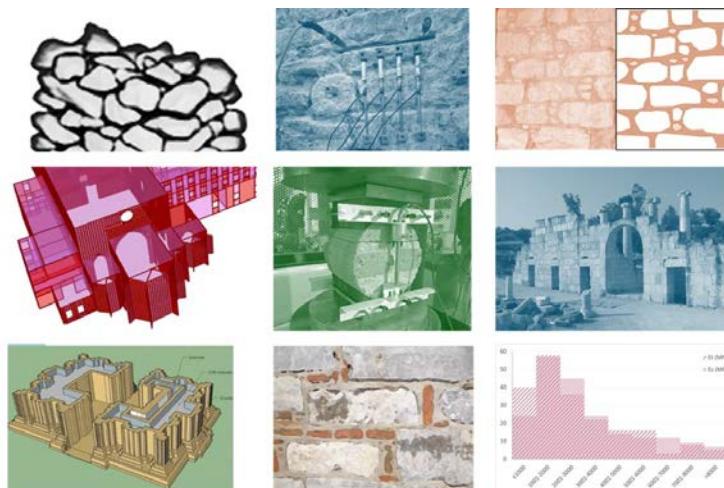
Prof. Vintzileou and Prof. Miltiadou-Fezans introduced the Greek methodology for the estimation of the mechanical properties pertaining to historical masonry walls in Greece. They explained the basic provisions of the Greek Code for the assessment and structural intervention of masonry structures (KADET). Greek academics and professional experts have created semi-empirical formulae for estimating masonry compressive strength for single and double-leaf walls and for three-leaf walls, separately. They have defined factors and coefficients based on the volume of mortar to the entire volume of the masonry wall, the joint thickness to unit height ratio, the stone shape, the stone-mortar bond in addition to the mean compressive strengths of units and mortar in single and double-leaf walls. Dr. Savvas Saloustros subsequently presented the Swiss approach to the characterization of stone masonry, introduced by the Swiss Code (SIA 266/2). The Swiss Code takes into consideration the cross-bonding between different layers of multi-leaf walls and assigns various masonry typologies accordingly. Prof. Mislav Stepinac described then the experimental testing of URM buildings in Croatia, which specifically started after the 2020 earthquakes in Zagreb and Petrinja. They carried out extensive damage classification of multiple building blocks in Zagreb and assigned each block an average damage index.



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Prof. Luca Pelà presented cases of on-site and laboratory studies of two buildings in Barcelona: The Can Batlló textile factory and Xifré's Rooftop "Floating" Wild Garden. He compared the advantages and disadvantages of NDT, MDT, and DT methods. Dr. Pelà explained their research regarding in-lab DT on small, non-standard specimens, their results of on-site NDT and MDT via portable devices, and the challenges involved. Eng. Ziba Sharafi-Roumi, PhD student at UNIPD introduced some results of her research activities, related to the creation of a database of DFJ test results, comparing such results with an MQI classification, for cross-comparison purposes. Dr. Julian Thamboo stressed the need of integrating different approaches for gaining optimal solutions in characterizing historical masonry as a construction material. He pointed out the existing challenges, for instance proper classification, suitable testing techniques, and appropriate assessment methods, in addition to the available opportunities. Eng. Murat Alaboz briefly presented the Turkish regulation (TBEC-2018) regarding the characterization of masonry and compared some aspects of the Turkish regulation with the Eurocode 6 (EC 6). He also presented the Turkish guideline for the mitigation of earthquake risks on historical buildings (TBDY-2018), which is comparable to Eurocode 8. Dr. Bruno Quelhas da Silva introduced the Portuguese workgroup that was recently established within the sub-commission 8 of the Portuguese Technical Commission for Standardization of Structural Eurocodes (CT115). Participants of the workgroup are from various sectors including universities, laboratories, industry (conservation and diagnostics), as well as professional engineering companies.

Prof. Arun Menon discussed the field and experimental test data on prevalent masonry typologies in India, with a view of the normative framework for the assessment of existing masonry, state-of-the-practice, and cases of field and laboratory tests.



Finally, Eng. Yaacov Schaffer described their efforts in process of characterization and definition of existing Israeli masonry typologies by performing double flat jacks testing since 2008, which has enabled them to create a database of the characterized typologies.

A fruitful discussion took place in the afternoon, considering the different aspects introduced during the morning session presentations. The continuation of the activities of the WG will consist in merging and summarizing the different approaches for drafting a shared document on best practices for the definition of reliable characteristics of existing masonry worldwide, for the purposes of an improved structural modelling finalized at the safeguard of the masonry heritage.

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ISCARSAH 2024: A Landmark Event in Romania

The **ISCARSAH 2024** meeting took place in Romania for the first time and was a resounding success from **September 25-27**. This remarkable three-day gathering brought together more than **120 participants**, including **over 30 heritage specialists** from **more than 20 countries across 5 continents**. Members of ISCARSAH from around the world were present, reinforcing the event's global significance.

The highlight of the gathering was the **Historical Structures Worldwide Conference**, held in **Bucharest**. The conference attracted a full audience of professionals, including **architects and engineers specializing in historic monuments**. The sessions featured engaging and **insightful presentations** by ISCARSAH members, emphasizing the latest advancements and global cooperation in heritage conservation and restoration.

Throughout the three days, participants experienced the event in some of Romania's most important historical venues, including **Peleş Castle, The Palace of the Chamber of Commerce and Industry Bucharest, The Marmorosch Hotel by Marriott, The Village Museum, and Hanul lui Manuc**. These locations were carefully selected to showcase the **beauty and historical richness of Romania**, providing a unique setting for both professional discussions and cultural exchange.

ISCARSAH Meeting - 2024 was a **unique event for Romania** and not only highlighted Romania's impressive cultural heritage but also fostered lasting connections among leading experts in the field. This event played a key role in strengthening international collaboration in the preservation of historical structures, reinforcing the commitment to safeguarding global heritage.

Radu Casamir



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ARES PROJECT: Assessment and Rehabilitation of Existing Structures – Development of Contemporary Methods for Masonry and Timber Structures

ARES (Assessment and Rehabilitation of Existing Structures – Development of Contemporary Methods for Masonry and Timber Structures) project was funded by the Croatian Science Foundation and was done at the Faculty of Civil Engineering, University of Zagreb, Croatia. The project began on January 9, 2020, and concluded on January 8, 2025. The project was led by Mislav Stepinac, Associate Professor at the Faculty of Civil Engineering, University of Zagreb. The proposal for this project was written before the 2020 earthquakes in Croatia, and we take this opportunity to express our gratitude to the Croatian Science Foundation for recognizing the potential of this research topic, which gained immense relevance in the aftermath of the seismic events.

The primary goal of the ARES project was to explore the role of structural assessment in the reliability analysis of existing structures. The research focused on masonry and timber structures, aiming to evaluate how structural assessment contributes to both economic efficiency and safety. A key objective was to gain insight into material and structural properties obtained through assessments and structural analyses. Furthermore, the project worked on creating a database of material properties specifically for masonry and timber structures. A major aspect of the research involved quantifying material characteristics and time-dependent behavior, which are crucial for analyzing existing structures and optimizing predictive models for structural performance.

Throughout the project, significant efforts were made in conducting detailed inspections, visual assessments, non-destructive and semi-destructive testing, and continuous monitoring of structural elements and systems. These investigations provided valuable data for evaluating the mechanical properties of materials and understanding their impact on overall structural behavior.

ARES proved to be an exceptionally successful research project, surpassing all expectations. A total of 23 scientific journal papers were published, an achievement that far exceeded the original projections. The project was presented on three continents through numerous conference presentations and lectures. One doctoral dissertation has already been defended, while another is expected to be defended in May 2025. Additionally, the project contributed to the completion of 20 master's theses, highlighting its strong academic impact.



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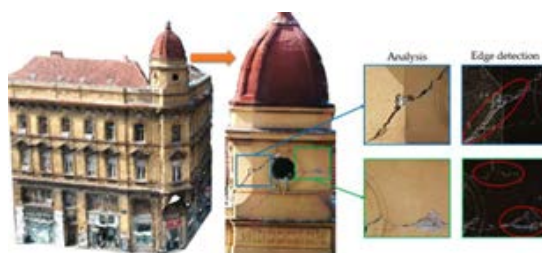
ARES PROJECT: Assessment and Rehabilitation of Existing Structures – Development of Contemporary Methods for Masonry and Timber Structures

Collaboration played a significant role in the project's success. Extensive partnerships and international mobility programs were established with leading global experts in earthquake engineering, masonry, and timber structures. Several new research projects were submitted, and numerous awards were received as a result of the team's efforts. ARES also facilitated three training schools featuring renowned international lecturers, further contributing to knowledge dissemination. In terms of resources, the project enabled the acquisition of valuable research equipment, enhancing future studies in the field. Additionally, a strong collaboration with engineering firms and industry professionals was fostered, bridging the gap between academic research and practical application.

The success of ARES was primarily driven by the dedication of an exceptionally talented and motivated team. A key factor was the strong engagement with students, who played an active role in scientific and professional research. The support of the home institution, combined with a close connection to the engineering industry, was instrumental in ensuring the project's impact. Civil engineering is an applied science, and without a strong link to professional practice, meaningful progress would be difficult to achieve.

All scientific papers resulting from the ARES project are available at:

<https://www.grad.hr/ares/index.php/scientific-papers/>.



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Istanbul Metropolitan Municipality – Miras Department Panel Lessons from Lost City Antioch to Istanbul

On February 8th, 2025, following the anniversary of the February 6th Kahramanmaraş Earthquakes, the Istanbul Metropolitan Municipality's Miras Department (Department of Cultural Assets), in collaboration with **the Istanbul Chamber of Civil Engineers**, organized a panel discussion. The panel focused on the structural damages observed in historical masonry buildings in Antioch and explored measures to prevent similar damages in Istanbul, a city anticipating a major earthquake.

The panel was divided into two sessions. In the first session, Dr. Haluk Sesigur (Professor at ITU), Oktay Özel (Head of Cultural Heritage Department), and Oktay Kargül (Director of Istanbul Management Agency) presented on the principles of assessing masonry buildings, strengthening approaches, and Istanbul's preparedness for an earthquake. The second session featured presentations by Murat Alaboz (MSc. Civil Eng.), Meltem Vatan (Prof. Dr. at BAU), Gökçer Okumuş (Director at IMM, Urban Planner), and Ömer Faruk Sert (MSc. Civil Eng., Directorate General of Foundations). They discussed engineering aspects of assessment and strengthening, post-earthquake damage assessment, Istanbul's earthquake mobilization plan, and strengthening works for historical masonry structures in Istanbul.

Many of the participants were members of ISCARSAH Turkey. Dr. Haluk Sesigur shared examples of restoration and strengthening works on historical structures. Oktay Özel discussed the revitalization and strengthening projects carried out by his department on historical buildings in Istanbul. He emphasized that these projects align with the **"Guideline for Managing Earthquake Risks in Historical Buildings"**, published in 2017 by the Istanbul Governorship and the General Directorate of Foundations. Oktay Kargül elaborated on Istanbul's earthquake strengthening strategies.



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Istanbul Metropolitan Municipality – Miras Department Panel Lessons from Lost City Antioch to Istanbul

During the Q&A session, Murat Alaboz presented a comparative analysis of post-earthquake statistics from two historical city centers that experienced similar devastating earthquakes (Australia and Italy). He discussed the effectiveness of strengthening measures in reducing the vulnerability of historical structures and compared the guidelines or specifications for strengthening historical buildings.

Meltem Vatan highlighted the use of rapid structural assessment forms before and after earthquakes. She shared examples from post-earthquake rapid assessment studies in the Antioch region and emphasized the importance of integrating these forms into pre-earthquake planning and assessment efforts.

Following presentations by Gökçer Okumuş and Ömer Faruk Sert on Istanbul's earthquake disaster plan and strengthening projects, a lively Q&A session took place. The need to update the guideline referenced for the analysis of historical buildings in Turkey was emphasized.

In addition to the panel, ISCARSAH Turkey supported international working groups on masonry characterization. Murat Alaboz participated in the workshop held in Padova. In parallel, the local commission continues its work on identifying masonry wall typologies in Turkey and creating a database by correlating them with mechanical test results.

Murat Alaboz



The presentation of Murat Alaboz

