International Council on Monuments and Sites
ICOMOS-UK National Scientific Committee

Analysis and Restoration of Structures of Architectural Heritage (ISCARSAH-UK)

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Introduction

We are delighted to announce the revival of the ISCARSAH-UK scientific committee of ICOMOS-UK which aims to address issues related to the "**Analysis and Restoration of Structures of Architectural Heritage**". We hope that this initiative appeals to you and that you will join us in this venture. We welcome new members and active participation.

The International Council of Monuments and Sites (ICOMOS) was formed just over 50 years ago, and in the same year our national committee was set up. Since then ICOMOS-UK has played a major role in preserving and celebrating cultural heritage worldwide.

Today, we have more than 20 national scientific committees, most are also in the family of corresponding international committees. Looking forward to the next 50 years, it is important to address the use of structural analysis and restoration of historical constructions in the cultural heritage agenda, where the UK has an outstanding international reputation.

The Scientific Committees (SCs) are the vehicles through which ICOMOS brings together, develops and serves its worldwide membership according to fields of specialized interest. ICOMOS expects the SCs to be at the heart of scientific inquiry and exchange in their domains and to share knowledge amongst them to foster a multi-disciplinary approach to heritage protection and management. This fulfils the original goals of ICOMOS: "*to collect, study and disseminate information concerning principles, techniques and policies related to heritage protection*."

The Analysis and Restoration of Structures of Architectural Heritage Committee (ISCARSAH-UK)

The Committee on the *Analysis and Restoration of Structures of Architectural Heritage* (ISCARSAH-UK) aims to provide a multidisciplinary forum and network for engineers, architects, teachers, planners and managers involved in the restoration and care of building heritage. The committee deals with all the steps of a restoration process as identified by ICOMOS[1] including: a) Anamnesis; b) Diagnosis; c) Therapy; and d) Controls and obtain a thorough understanding of the structural behaviour of built cultural heritage. The committee will be a key conduit to collaboration and knowledge sharing with our other national and international scientific committees. In particular, topics to be covered include:

1. **Traditional and innovative construction materials and techniques**: How well do we know traditional materials through modern science and technologies? How does the development of innovative materials and techniques influence the restoration process? Which alterations have materials and techniques, developed at the end of the 20th century, undergone? Have we learned from past successes and failures?

2. **Inspection and documentation:** How are engineers currently inspecting built heritage especially with emerging new technologies? What approaches are being used for their documentation? Would it be possible to store their metrical and graphical data in an efficient and easy to use way, perhaps via BIM? Are we able to handle, manage and archive big data?

3. **Non-destructive testing and structural monitoring**: Are we allowed to perform non-destructive testing in heritage structures? What methods currently exist? How can we monitor heritage structures? What approaches are available today? Would new technology (e.g. internet of things, artificial intelligence etc) and innovation change the way we monitor structures in the future?

4. **In-situ and laboratory experimental tests and results:** How do materials deteriorate over time? What experimental tests have been undertaken in heritage structures? Any material testing? Can we develop an open access database of material variable in historic constructions?

5. **Analytical and numerical approaches**: What are the advantages and disadvantages of computational strategies for heritage structures? How do we attune the simplifications within finite element modelling to the multi-scale complexity of heritage structures? Has our approach changed in the past 20 years? With the

[1] ICOMOS CHARTER- PRINCIPLES FOR THE ANALYSIS, CONSERVATION AND STRUCTURAL RESTORATION OF ARCHITECTURAL HERITAGE (2003). Ratified by the ICOMOS 14th General Assembly in Victoria Falls, Zimbabwe, in 2003. Available at: https://www.icomos.org/charters/structures_e.pdf

technological advancements and increase of computer power, how might the assessment approaches change in the future?

6. **Preventive conservation**: How is preventive conservation understood in this field? What is the role and contribution of monitoring and quality management in preventive conservation? How effective is preventive conservation in dealing with resolving risks related to structural safety in the field of built heritage?

7. **Sustainable repair and strengthening techniques**: How and why are novel developed materials adopted in restoration practice? What is the compatibility and durability of different strengthening systems, applied on historic masonry? How can we ascertain and monitor long-term efficiency of the strengthening intervention?

8. **Man-made threats**: How do anthropogenic ground movements (caused by tunnelling, excavation, gas exploitation, mining, etc.) affect the structural integrity of built cultural heritage? How can the risk of terrorist attacks and vandalism against cultural monuments and built heritage be prevented? What about the risk of fire in structures of architectural heritage? Can we predict, model, prevent, monitor or retrofit damage?

9. **Impact of Climate Change**: How could extreme weather conditions (such as heatwaves, ice and snow, coastal flooding) impact the condition of structures of architectural heritage? What information can we provide to the operators and users?

10. **Impact of natural disasters:** What risk analysis, adaptation measures and strategies need to be developed to enable minimum impact of natural events (e.g. earthquakes, landslides, flooding, heavy rainfall events) on structures of architectural heritage? Can we predict the impact? What can we do to stop or reduce the impact of such events?

11. **Values and sustainability**: Which is the impact of restoration and conservation practice on economy, government and society? How do we integrate heritage values, authenticity and sustainability into conservation and restoration practice?

Why a Committee on the Analysis and Restoration of Structures of Architectural Heritage?

With Sustainable Development Goal 11 (SDG 11), countries have pledged to “make cities and human settlements inclusive, safe, resilient and sustainable”. Within this goal, Target 11.4 aims to “strengthen efforts to protect and safeguard the world’s cultural and natural heritage”.

In UK and other parts of the world, cathedrals, church buildings, masonry arch bridges, castles and towers are among the most well recognised and loved structures of our national heritage. However, structures of architectural heritage, by their very nature and history (material and assembly), present a number of challenges in diagnosis and restoration.

Therefore, there is an imperative need to ensure that these outstanding structures continue to be an integral part of local life given the increasing level of support and expertise required to maintain them at a time when the limited resources in communities are becoming ever more stretched.

Expertise, educational and multi-disciplinary actions are essential to ensure that structures of architectural heritage avoid erroneous or defective treatment leading to over-strengthening, unnecessary loss in terms of original material and cultural value, or to insufficient intervention, and hence generate unacceptable risks to peoples’ cultures and their heritage.

What will ISCARSAH-UK do?

The Scientific Committee of **ICOMOS-ISCARSAH-UK** will:

- Be aligned with the scopes and objectives of ICOMOS;
- Coordinate with other national cultural heritage organisations and committees, including the ICOMOS National Committee for digital heritage and the National Scientific Committee on Risk Preparedness (ICORP-UK), committee on 20th century architectural/engineering heritage;
- Collaborate with the ICOMOS International Scientific Committee on the Analysis and Restoration of Structures of Architectural Heritage (ISCARSAH-UK);
- Collaborate with national, governmental, and non-governmental organisations for better protection of all types of cultural heritage structures, specifically built heritage and monuments against deterioration as well as natural and man-made disasters;
- Contribute to build a culture of structural assessment, advanced engineering modelling and monitoring at UK World Heritage structures;

- Create new links with academia, industries, heritage professionals and practitioners, as well as private and public sectors for the effective maintenance and management of structures of architectural heritage;
- Better relate ICOMOS-UK to national and international organisations who work towards cultural heritage protection;
- Have our own prioritised project agenda and hopefully professional commission based on the topics and opportunities described above
- Develop knowledge, deliver training and build capacity to reduce the loss of cultural heritage places.
- Identify, undertake and reviews scientific research on conservation and assessment of structures of architectural heritage and disseminate best practices; and
- Raise awareness among the public, and integrate the assessment and monitoring of cultural heritage into national and local management plans.

Membership

The Committee is open to membership from all existing members of ICOMOS-UK, and others, these who are then required to join ICOMOS-UK and the committee on the ***Analysis and Restoration of Structures of Architectural Heritage (ISCARSAH-UK)***.

New membership and participation is specifically encouraged from Further Education and Higher Education institutions, research institutes and centres, humanitarian agencies and emergency response agencies, heritage NGOs, and industries.

The Committee thus gains strength from the breadth of its membership covering all aspects of risk preparedness for cultural heritage, representing both the public and private sectors in the different countries and regions of the UK; and, all linked to matching membership and interests overseas.