Project

InnovaConcrete is a innovative and ambitious project that aims at preserving concrete-based momuments, the most significant, tangible, Cultural Heritage (CH) in the 20th Century.

To achieve this goal, we have recruited an interdisciplinary team presenting a strong scientific background in simulation techniques and nanomaterials synthesis, combined with a wide knowledge of CH conservation from Social Sciences & Humanities disciplines and with a sound industrial perspective.

Specifically, a completely innovative approach will be developed based on producing, by impregnation treatments, C-S-H gel, responsible for the engineering properties of cement paste in cracks of decayed concrete monuments, *in situ*.

Complementary, multifunctional treatments combining C-S-H production with additional performances (superhydrophobicity and corrosion inhibition) will also be investigated. In addition, cementitious coatings functionalized with inorganic nanotubes will be validated and their performance compared with those corresponding to the impregnation treatments.

Finally, InnovaConcrete will explore a biotechnology based approach: enzyme-assisted self-healing of damaged surfaces.

The optimization of the proposed solutions will be carried out by the use of theoretical tools (multi-scale modelling approaches) together with experimental tools (laboratory and in situ validation).

Five concrete-based monuments, a clear representation of European CH, have been chosen as case studies to validate the performance of the proposed solutions. They have been selected according to scientific and humanistic criteria and because they will be used to study economic and societal effects of the proposals and to promote citizens' awareness of 20th Century European heritage. Thus, the selection includes monuments with significant numbers of visitors per year, such as the spectacular **Centennial Hall** building, included in the UNESCO world heritage list and **Chillida sculptures**. In addition, other buildings and sites that are hardly recognised by citizens as Cultural Heritage, such as **Concrete Shell Structures,** an important achievement of the post-war modernist movement, and **War Memorial Towers,** symbols of the collective identity of European citizens, have also selected. Fimally, the **Torroja Building** has been chosen as a representative model of interdisciplinary collaboration between architecture and engineering during the 20th Century.

The activities required for the future commercialization of the InnovaConcrete products, including **standardization, certification, and exploitation strategies, and a life cycle assessment,** will be carried out during InnovaConcrete.

A significant participation of SMEs and LEs, including a multinational company leading the concrete technologies market in 100 different counties, guarantee the effective market uptake of the solutions developed in InnovaConcrete.

ICOMOS ISC20C
H2020 - InnovaConcrete
Prospectus

Name	**EU Proposal 760858:** **InnovaConcrete Research Initiative**
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ISC20C Contacts	ICOMOS ISC on Twentieth Century Heritage (ISC20C) Contacts: Gunny Harboe, Kyle Normandin
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ISC20C Advisory Role Objectives	1.) Based on its advisory role, the ISC20C is to promote the awareness of 20th century concrete Cultural Heritage around the world by organizing international conferences, workshops, tours and other activities. 2.) To participate as an advisor all the activities of the project, including: decision making process about the products requirements, their application and validation processes, elaboration of application guidelines (e.g. Guidelines document for concrete conservation sim. to Madrid Document) for use by restorers, owners and practitioners. 3.) To participate in the following tasks of analysis of the expected long-term societal spill-over effects of the project.
InnovaConcrete Main Research Objectives	1.) Use of multi-scale modelling approaches for developing innovate solutions for preserving concrete heritage. 2.) Development of long-lasting, practical and affordable conservation products and techniques specifically designed for preserving concrete, according to the results obtained from the modelling approach. 3.) The production of an identification badge of the significant concrete-based monuments in Europe. 4.) Experimental validation of the developed innovative solutions at laboratory scale and, in situ, on significant 20th Century monuments. 5.) the market uptake of the innovative solutions developed at InnovaConcrete 6.) The development of a simple tool to help in the decision making process during historic concrete conservation. 7.) The promotion of citizen awareness of 20th Century concrete-based CH by using the results and conclusions of InnovaConcrete as a diffusion tool. 8.) The increase of societal-economic impact of concrete heritage. The goal of InnovaConcrete is to generate new provisioning, regulating, supporting and cultural services (i.e. conservation materials manufacturers and tourism activities).
ISC20C/ InnovaConcrete Description of Tasks and Deliverables	**Description of ISC20C Tasks and Deliverables:** Task 3.1: Identification of the most significant concrete-based heritage in Europe (p.50). *Note: 5 sites have been selected however, the program may need to select more sites by month 10.* Task 3.2: Definitive and final selection of case studies. *Note: This will need to be decided. ISC20C will need to assist with this process and provide a report.*

	Task 6.1: Concrete Guidance Document: Benchmark guidance to conserve and manage 20th century based concrete heritage (p.61 Proposal). *Note: Guideline document on concrete conservation (sim. to Madrid Document) should be completed in 3 years (36 months). The document needs to include a general perspective to be completed at final months of the project - must provide guidelines/ rules for conservation of concrete monuments - should be a publication - at least in Spanish and English. Will be complimented with research protocols and tools that will be develop as part of the technical research on best solutions on concrete conservation and interventions.* SubTask 6.1.2: Decision making tool for historic concrete conservation (p.62) Task 6.3 Socioeconomic analyses and long-term societal spill-over effects of the project. *Note: Tasks and events that are part of this task will be decided as part of the research work plan. Activities related to this task will be part of the assigned budget for ISC20C but will be carried out with partners in the research program.* SubTask 6.3.1. Socio-economic Analyses. *Note: Activities related to this task will be part of the assigned budget for ISC20C but will be carried out with partners in the research program.* SubTask 6.3.2 Post-war concrete-based cultural heritage analysis. *Note: Tasks and events that are part of this task will be decided as part of the research work plan. Activities related to this task will be part of the assigned budget for ISC20C but will be carried out with partners in the research program.* **Deliverables known to date:** **All deliverables must meet deadlines set by research team in first part of project.** 1.) General Meetings - Appoint contact for each organization will meet at least once per year (total of 3 meetings, first meeting in Brussels). In addition, teleconferencing meetings will be held every six (6) months. 2.) Workshops - It is assume that there will be one workshop held at each of the case study sites. Note: The workshops should be attended by an appointed person from each research partner. Workshop attendance will come out of each research partner allocated budget. 3.) Dissemination of 20th Century Awareness at ISC20C Annual General Meetings AGMs. The InnovaConcrete 20th Century Awareness Committee will chaired by Sika and ICOMOS and contain one senior person nominated by each of the SSH partners. Note: The dissemination/ exploitation committee will meet as often as required (at least twice per year) either by face-to-face meeting or teleconference. 4.) Reports and Cost Statements/ Reports - Financial milestone for the research consortium will be established at the consortium agreement meeting. Partners will be assisted (if required) in preparing financial plans and budgets. A breakdown of each partners' financial resources will be requested every six (6) months. An Excel template will be sent to each partner at the start of the project to keep track of all financial management proceses. 5.) Report on selected case studies: ISC20C will work with InnovaConcrete research initiative to review and potential select additional sites with research partners (Complete by Month 10). *Note: The case studies will serve as in-situ test sites for application of treatment protocols and will include monitoring and evaluation by the research team. Note 2: It is possible for ISC20C to participate in this process however, there is currently no budget set aside for this activity.*

	6.) Concrete Guidance Document:: Benchmark guidance to conserve and manage historic concrete (Complete by 36 month).
InnovaConcrete Monuments selected as Case Studies in proposal	The ISC20C will be one of the participating partners leading the effort in evaluating current sites listed below. It may be necessary to add sites to this list. Three (3) highlighted sites are fixed are supported by research partners and highlighted below. Ideally, there should be six (6) sites. Additional sites for consideration may be selected from colder climates where exposure during winter undergoes more freeze/ thaw cycles (e.g. could include sites in Germany, Eastern Europe or Scandanavia) ▪ Centennial Hall, Wroclaw, Poland (1923) ▪ Angel Commemorating the fallen War Memorial Tower, Abruzzo, Italy (1922) ▪ Eduardo Torroja Institute, Madrid, Spain (1953) ▪ Arseniusz Romanowicz Station, Wroclaw, Poland (1963) ▪ Open-air Chillida Sculpture, Gijon, Spain (1989)
Research Program Duration	36 Months (3 Years)