

DURABLE TRANSPORT INFRASTRUCTURES IN THE ATLANTIC AREA NETWORK

ACCESSIBILITY & TRANSPORTS
PROJECT 2008-1/049



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PROJECT CONTEXT

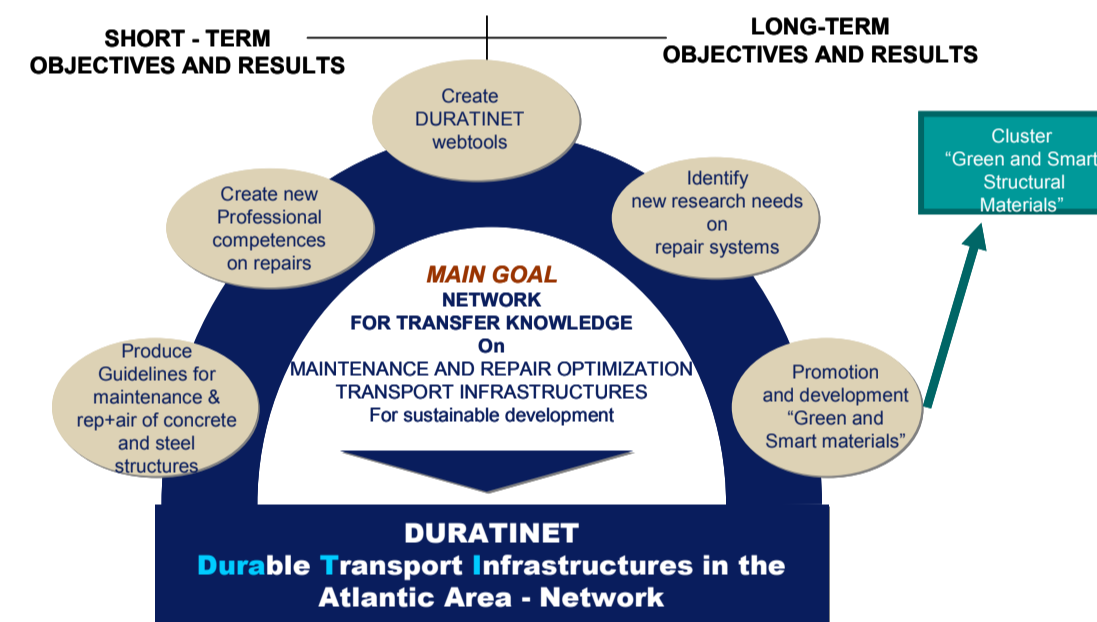
The main goal of this project is to create the DURATINET network to facilitate an efficient exchange and transfer of knowledge between R&D centres, infrastructure owners and managers, the various bodies responsible for commissioning maintenance works, repair contractors, as well as the manufacturers that are developing products. It is only through cooperation between these stakeholders that the durability, sustainability and safety of transport infrastructure could be achieved.

Economic and social development is placing increasing demands on Europe's infrastructure, yet there are resource and budgetary limits to how much new construction can take place. Considerations of environmental sustainability is also encouraging the extension of the infrastructure life. Remediation and refurbishment of existing structures is critical to maintaining effective operational infrastructure assets, being estimated that over 50% of Europe's annual construction budget is spent on the remediation of existing structures. Owners and managers of ports, highways and railway infrastructures in marine environments, both public and private, are faced with increasing maintenance costs for their structures due to the aggressiveness of the marine environment found throughout the Atlantic Area, which results in many problems related with the degradation of structural materials.

It is also recognised that construction and maintenance activities are associated with intensive use of natural resources. In particular, the production of cement and steel is responsible for producing high levels of CO₂. Actions must be taken to raise awareness and to encourage more sustainable construction. This can be achieved by improving the technical and scientific development of structural materials and repair techniques, with a view to reducing the energy and environmental impacts associated with both construction and maintenance activities. The use of "green and smart structural materials" is a very relevant subject for R&D cooperation projects in the European framework. These include, for example, concrete and new repair materials incorporating by-products, recycled aggregates, and industrial waste materials (from power, waste and quarry activities), and the use of nanotechnologies to design new materials and protection systems with specific improved durability properties.

OBJECTIVES

1. To produce guidelines on methodologies for optimising structures maintenance assuring the durability requirements for structural steel and reinforced concrete, structures condition assessment, namely, testing methods for inspection and diagnosis of damage, and repair systems of materials.
2. To give a contribution to the creation of new competencies at the level of infrastructure maintenance for agents with different skills, through the creation of knowledge dissemination actions, and the organisation of courses and transnational workshops in the scope of the project.
3. To stimulate the application of harmonised European standards on repair and mapping new RTD activities, in particular as it concerns the quality control of new repair products and systems.
4. To promote the development and use of "green and smart" structural materials and repair products incorporating waste, recycled materials and by-products, with reduced energy needs during production and application, and with increased long-life performance without being hazardous for application technicians or users.
5. To create different web tools to facilitate the exchange of information in these fields within the technical and scientific community.



PROJECT DEVELOPMENT

The project has 17 partners from across the EU Atlantic Area: Portugal, Spain, France, Ireland and United Kingdom. The backgrounds of partners range from 2 National Research Institutes and 5 Universities to Infrastructure Owners and Managers, such as the Irish National Roads Authority, Portuguese Road, Rail and Port Authorities, and Spanish Road and Port Authorities and a Portuguese SME. Several other Institutions and SME's from the different countries are also project stakeholders.



To reach the project objectives eight working groups work in the development of the technical activities planned in the Project:

- Maintenance decision tools and optimization of repairs in structures
- Reinforced concrete repair and rehabilitation on concrete structures
- Steel rehabilitation and protection on metallic structures
- Quality control of repair products and systems
- Smart and green structural and repair materials
- Performance evaluation of repair systems and products
- Database and Web platform for internal communication and project results dissemination
- Organization of the project events for promotion and project dissemination and communication

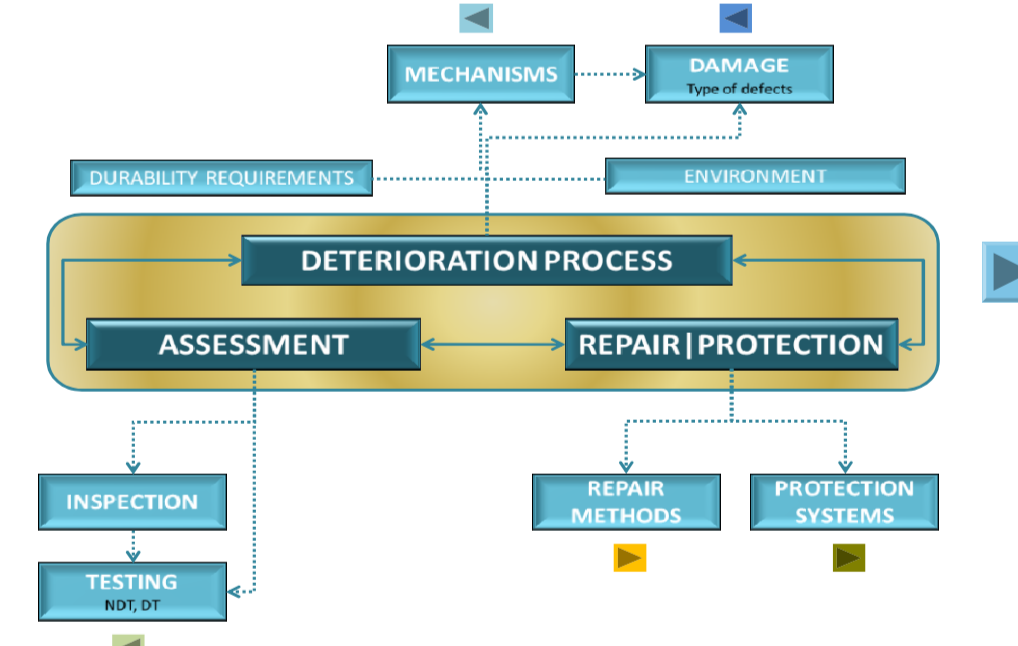
RESULTS & DELIVERABLES

Main Project Deliverables

1. Semester project newsletters that can be downloaded from the Project website (www.duratinet.org).
2. Technical reports with detailed information on the different themes developed in the project and progress of research in new materials, and poster or oral presentations at international conferences.
3. Guidance Manual on maintenance & repair of steel and reinforced concrete structures. A printed version, with extended information about the different relevant subjects, and an interactive web-version for friendly access to all the users are being prepared.
4. Database DB-DURATI containing information on the performance of materials collected from existing structures are in construction and will be open to stakeholders for introduction data from their infrastructures. These kind of information will be useful for the benchmarking of service life models, and for aiding decision-making relating to the selection of reliable structural maintenance and repair strategies in marine environment.
5. Atlantic Area "Green and Smart Materials" a cluster to promote and strengthen new synergies on repair and rehabilitation of structures and new exigencies on energy efficiency, carbon reduction, and environmental protection. The focus will be on the development of new materials, and on the promotion of recycled and waste materials use for protection and repair of structures, materials with specific properties designed at nanoscale, "smart materials" and new repair and protection product with increased service life. The participation is open to all interested in these new fields and in new solutions contributing to the sustainability of construction.
6. Organization of technical workshops on repair and an International Conference on 2012.

Guidance Manual for maintenance & repair of steel and reinforced concrete structures

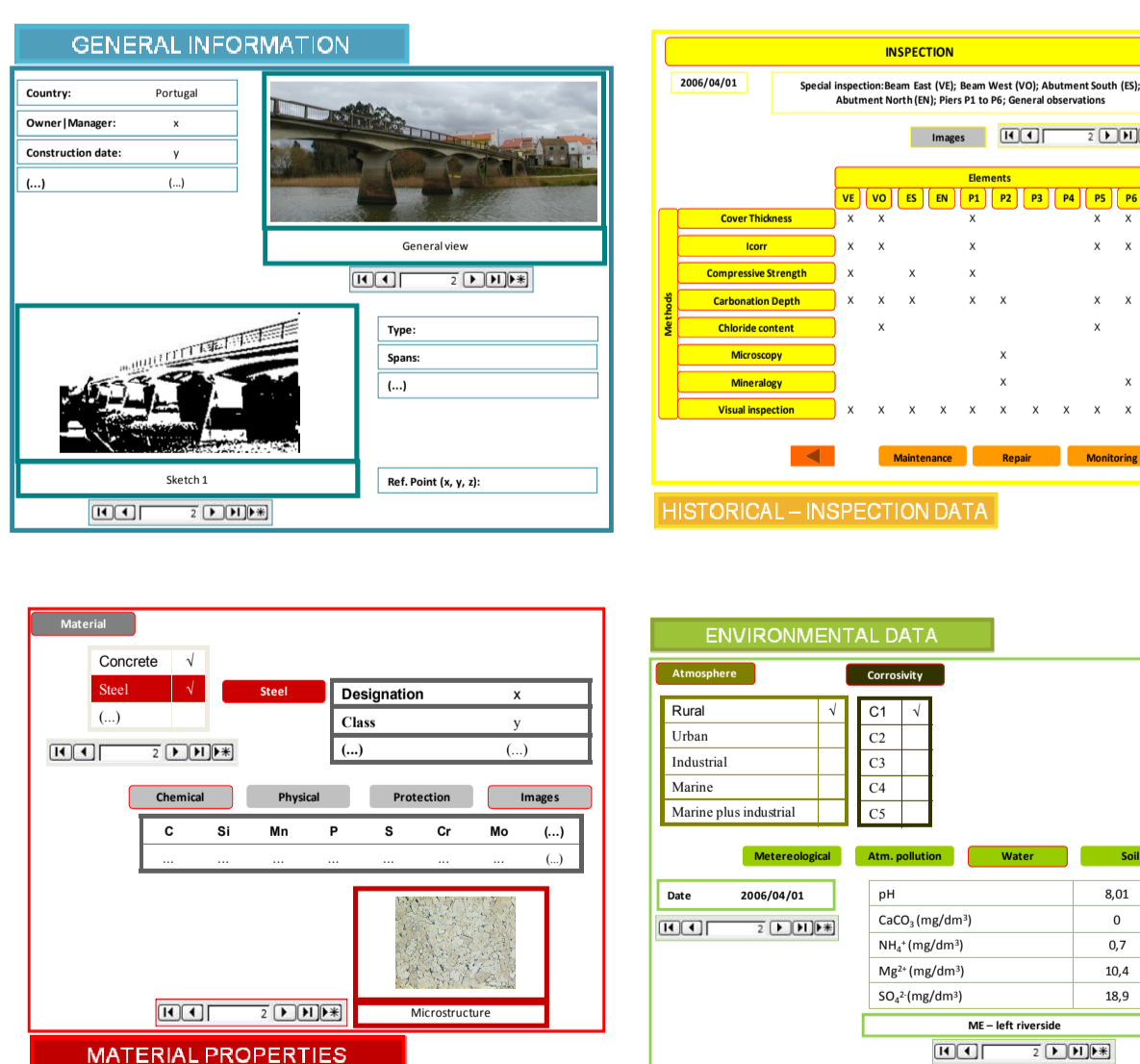
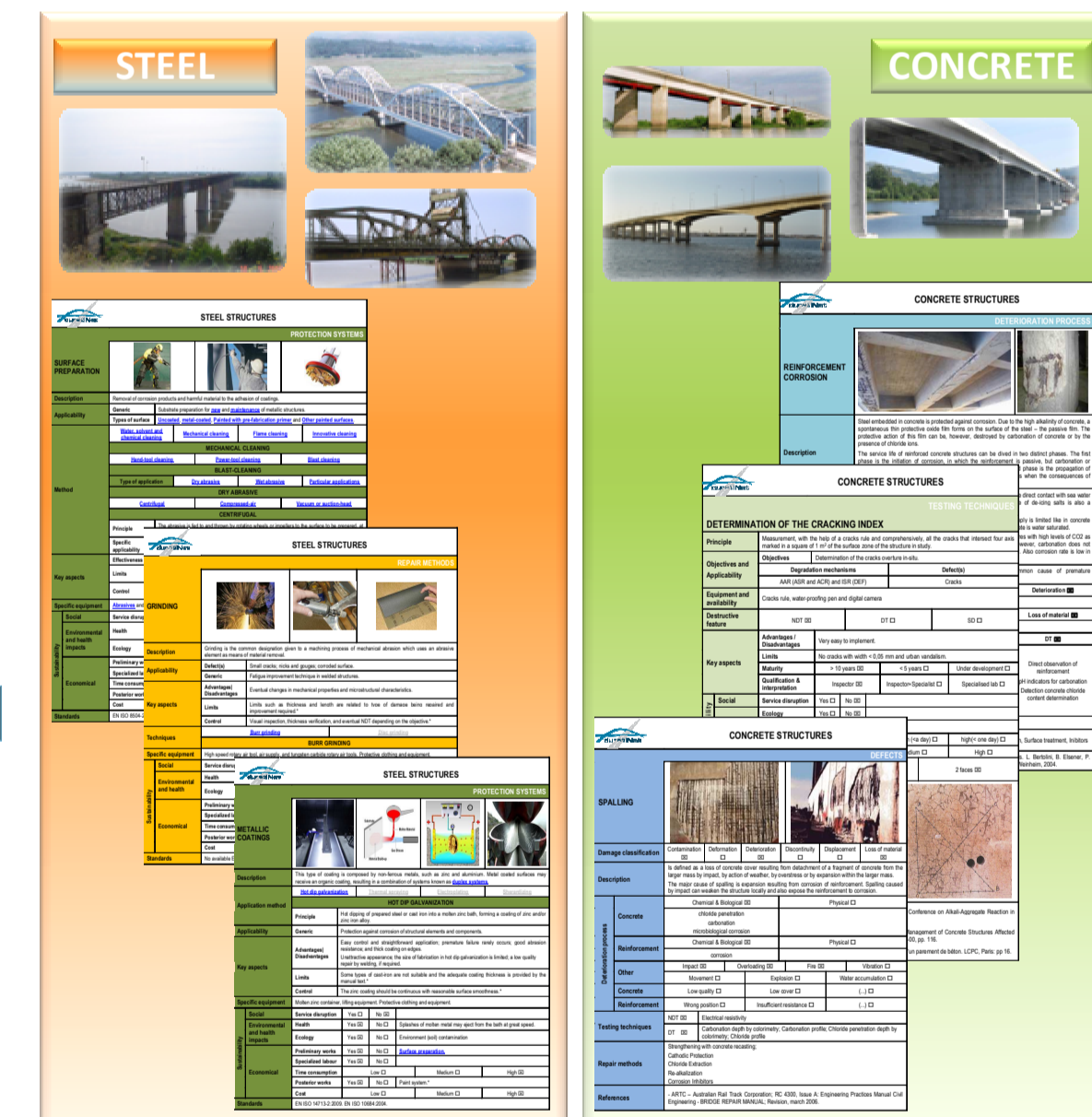
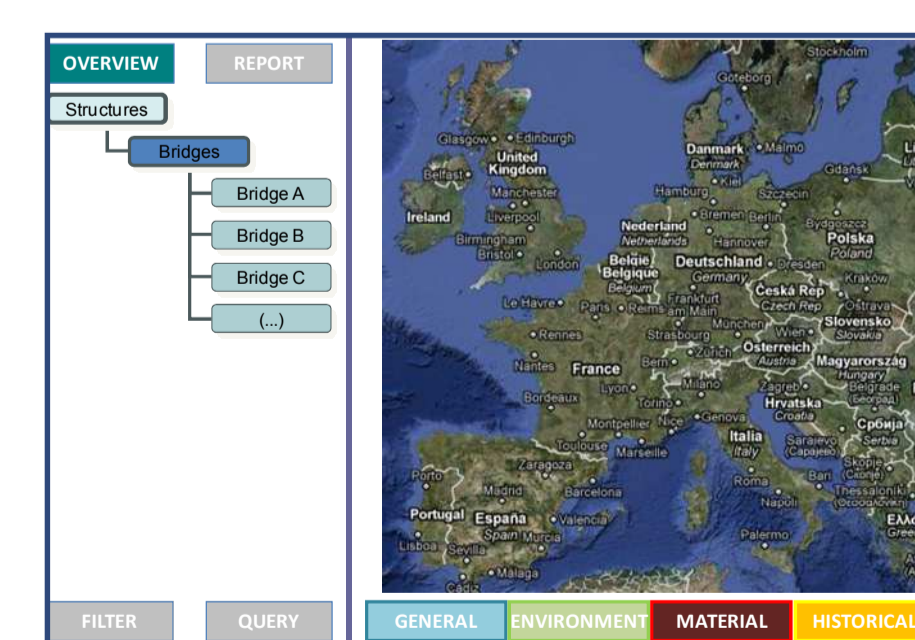
It contains the methodologies for optimising the maintenance of infrastructure, main topics on durability requirements, inspection and diagnosis of damage causes, and the options on repair procedures to restore the original integrity of a structure or to compensate the defects induced by the deterioration mechanism and to avoid its recurrence. For a friendly use, the information in the web application is mainly given in toolboxes format.



DATABASE DB-DURATI

The database collate and display reliable and useful data on the performance of structural and repair materials in existing structures.

It also includes general information on the structure, environment characteristics and exposure corrosivity classification, inspections and evaluation tests results, repairs, and materials performance during service life of structures. This performance data is useful for the benchmarking of structures service life models.



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ATLANTIC AREA Transnational Programme
ESPACIO ATLÁNTICO Programa Transnacional
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Investing in our common future



European Union
European Regional Development Fund