

duratiNet 5th Trans-national Workshop
Vigo, 21st January 2011

Project CONTEXT

EU strategic and priority action guidelines

- ▶ European Cohesion policy and Lisbon agenda
- ▶ European transport policy (EU Decision 884/2004/CE, 29 April 2004)

Trans-European Transport Networks (TEN-T)

- ▶ Interoperability of European transport Networks
- ▶ Gothenburg (Kyoto protocol) agenda
- ▶ Environmental policy (6th EAP-EU 2002-2012)

Strategic position of Atlantic Area to east-west connections and relevance

- ▶ Relevance of AA on maritime highways
- ▶ Intermodal transportation
- ▶ Reduction of environmental impact and to improve the energetic efficiency
- ▶ Infrastructures repair /rehabilitation needs

ATLANTIC AREA
Transnational Programme

Project CONTEXT



Atlantic Area Transport Infrastructures

- High number of structures with > 30 years
- Most structures needs repair /rehabilitation
- Some structures repaired shown low repair performance
- Sustainability of construction (energy and environment impacts)

DURATINET PROJECT

The main goal of the project is to create the network of excellence DURATINET

➤ to facilitate an efficient exchange and transfer of knowledge on maintenance of concrete and steel structures and new improvements on inspection and repairing

> to promote the durability, safety and sustainability of transport infrastructures in the **Atlantic Area**,

turning these regions more attractive to live in, to work and for competitive business



ATLANTIC AREA 2007-2013
Transnational Programme

PRIORITY 3. Improve the accessibility and internal links

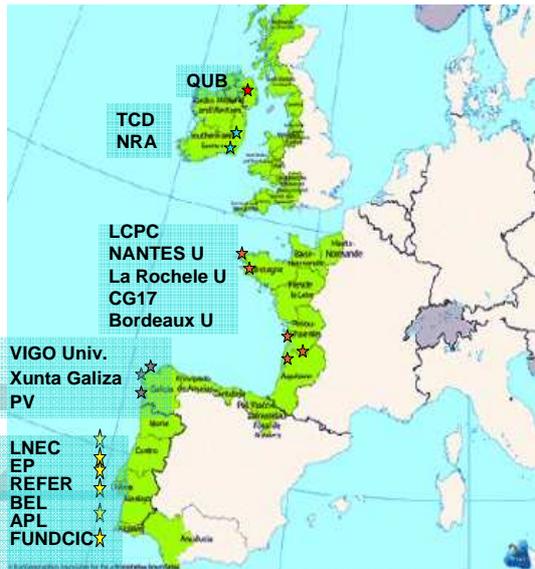
OBJECTIVE 1. promote the interoperability between different transportation

ACCESSIBILITY & TRANSPORTS

Project data:

5 Countries PT, SP, FR, IR, UK
17 Partners

TOTAL PROJECT COST- 2. 570 M€
TOTAL ELLIGIBLE COST-2. 480 M€
ERDF FUND (65%) -1. 612 M€

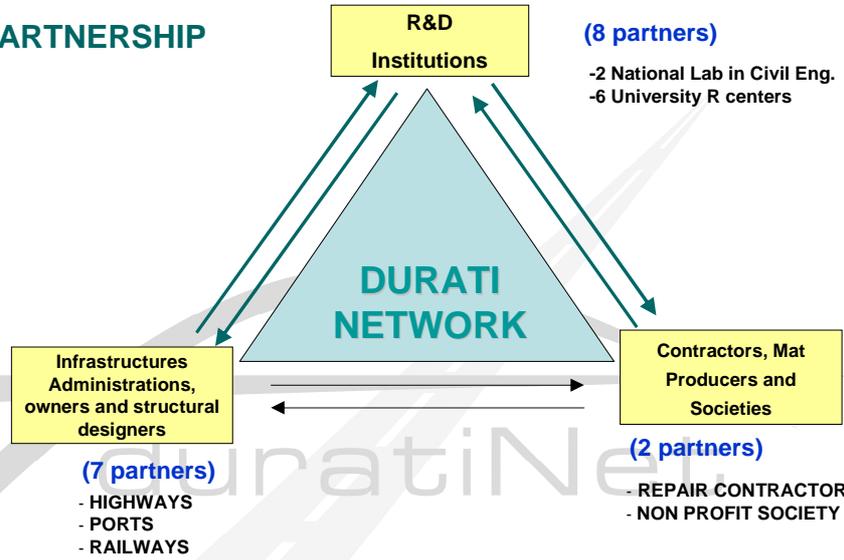


PARTNERSHIP
17 Partners
Portugal (6)
Spain (3)
France (5)
Ireland (2)
United Kingdom (1)

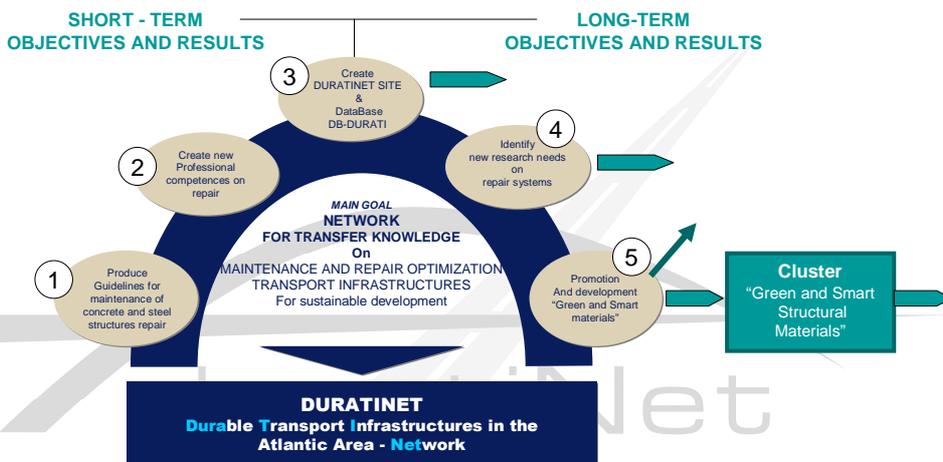




PARTNERSHIP

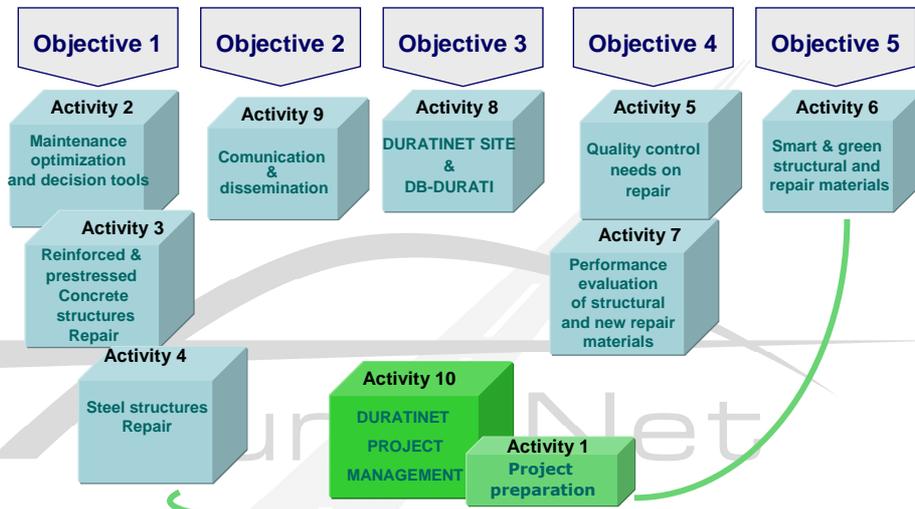


Project Objectives





PROJECT ACTIVITIES



ACTIVITY 2

Maintenance optimization and decision tools

- Requirements for maintenance and repairs optimization
- Methodologies to support repair decisions

End-product

- ✓ Web version
- ✓ Printed version

Guidelines Structures Maintenance Optimization



Activity 3

Reinforced and prestressed concrete structures maintenance/repair

- Durability requirements
- Types and degradation mechanisms
- Inspection and diagnosis
- Prevention and service life modelling
- Repair techniques and
- Performance/cost/environmental impact



End-product



- ✓ Web version
- ✓ Printed version



ACTIVITY 4

Steel structures maintenance

- Durability requirements
- Damage mechanisms of steel
- Inspection and diagnosis, NDT
- Protection/ repairing



End-product



- ✓ Web version
- ✓ Printed version

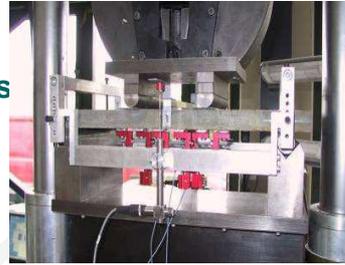




ACTIVITY 5

Quality control needs on repair systems

- Implications of harmonized standards on quality control at level of the contractors
- Implications of harmonized standards on quality control at level of materials producers



End-product:
Technical report



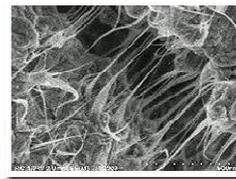
ACTIVITY 6

Smart & green structural and repair materials

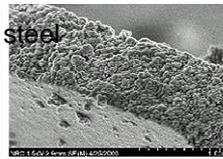
- Concrete with mineral by-products and recycled aggregates
- Water solvents based coatings for steel protection
- Cement with nano particles and nanofibers (Carbon nanotubes)
- Nanomaterials coatings with specific performance properties, easy to clean/Self cleaning and nanoproducts for protection of porous materials
- FRP in new structures and in repairing

End-product:

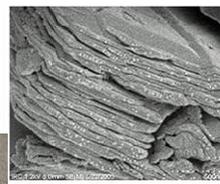
State -of -the- art Reports



CARBON NANOTUBES FILLING THE CRACKS IN A CEMENTITIOUS COMPOSITE



CEMENTING NANOPARTICLES OBTAINED BY THE TECHNIQUE OF "SOFT CHEMISTRY"



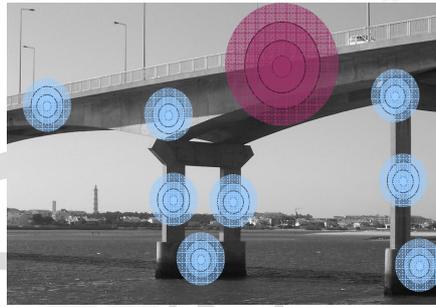
NANOLAYER OF CALCIUM ALUMINATE



ACTIVITY 6

➤ On-line Monitoring wireless systems

SMART STRUCTURES



Wireless sensor network
Wireless data transmission

End-product:

❑ State-of-the-art reports on sensors development

ACTIVITY 7

Performance evaluation of structural and new repair materials

- ❖ In situ application of new repair products and systems
- ❖ Collecting materials data from natural exposure to fill dB-DURATI





- > Estruturas em estudo
- > BARRA
- > Ferry

duratiNet



CREATION WEBTOOLS

WEBPLATFORM

WEBSITE

DB-DURATI & Manual web -version

basecampbbb

www.duratinet.org



OPEN to
Contractors &
material producers
performance systems
technical data

Private domain
for project
partners
Management &
communication

Public Domain
Project activities/results,
project events,
publications final results

Database
Data on materials &
repair performance and
structures inspection

OPEN to
Administrations
for Institutions news
and experiences on
their infrastructures
repair activities

service life
modelling
Data Sheet

Cluster
"Smart and green materials"

Web Forum
on
Infrastructures
Maintenance/repair

ACTIVITY 8

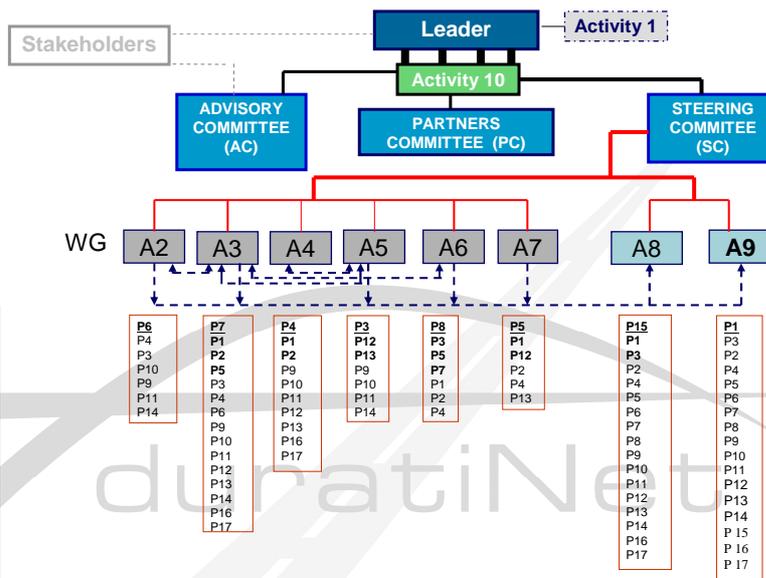


Project promotion , divulgation and dissemination actions

Organization of EVENTS for dissemination of project results and action

- > 6 Trans-national Workshops for stakeholders and end-users
- > International Congress DURATINET – end 2011
- > Course on inspection techniques and diagnosis and demonstration actions on repairs –2nd semester 2011

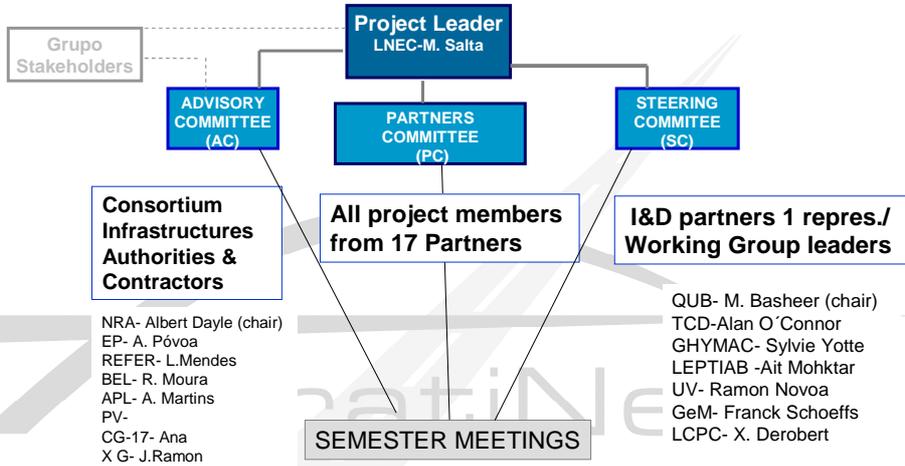
ACTIVITY 9



ACTIVITY 10

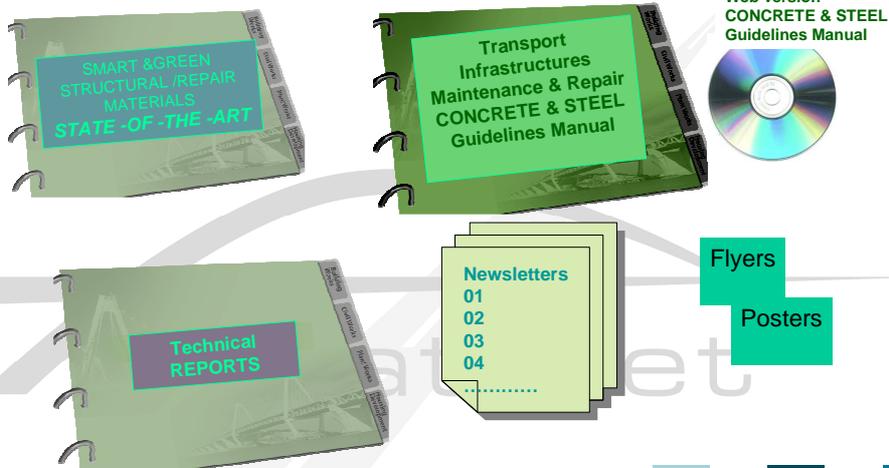


Activity 10



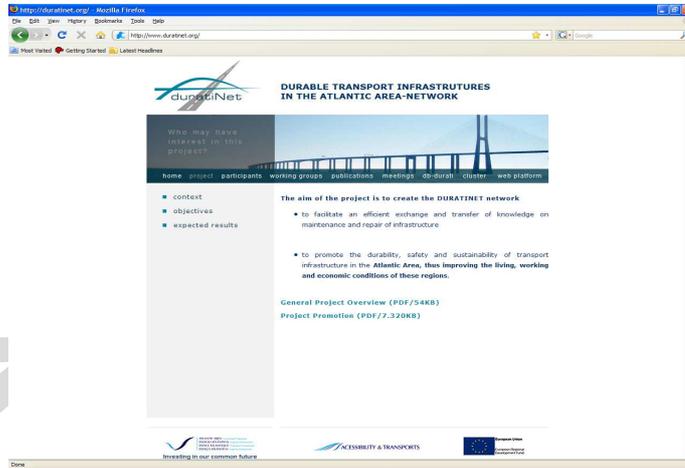
PROJECT RESULTS

>DIFFERENT KIND OF PUBLICATIONS





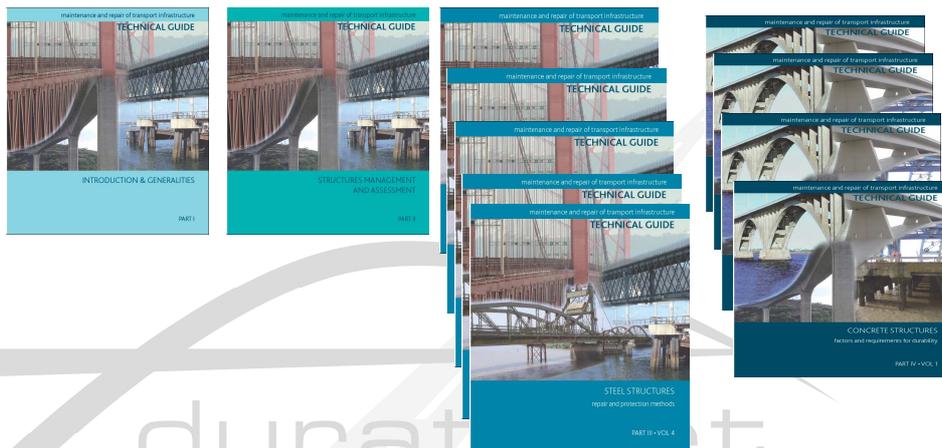
DURATINET WEBSITE



IN ENGLISH, PORTUGUESE, FRENCH, SPANISH

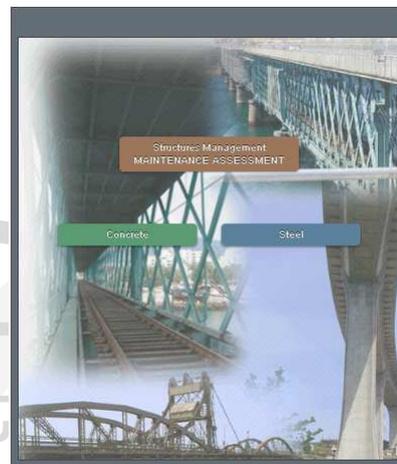
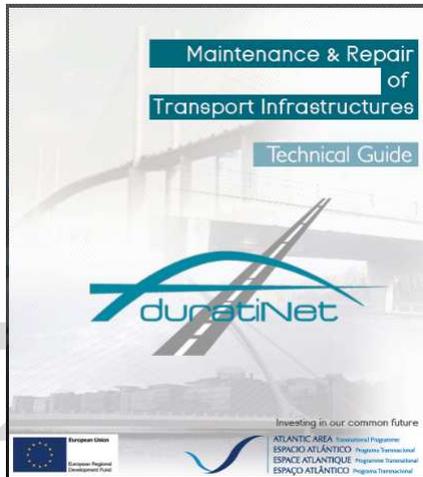


DURATINET TECHNICAL GUIDE





DURATINET TECHNICAL GUIDE - WEB



DURATINET TECHNICAL GUIDE - WEB

STEEL STRUCTURES – REPAIR | PROTECTION SYSTEMS

The repair or protection method to be used, the selection of a repair method or protection system has to account for the substrate processes and their control, and practice mainly based in the established level of performance requirements, using recommended techniques for evaluation of the condition. For protection of steel structures the European standards for protection by coatings, surface preparation, and cathodic protection are the followed.

This section gives information on repair commonly used in steel structures, including description, the adequacy of a repair technique to the type of defect, appropriate testing techniques to control the repair, and other key aspects. Protection systems are also detailed including information of different coating systems and prescriptive criteria techniques.

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Repair techniques

- Grinding
- Planing
- TIG dressing
- Stop noise
- Welding
- Bolting
- Drilling
- Adding steel elements
- Replacement of a member
- Mechanical straightening
- Heat straightening
- Repair with FRP

Protection system

- Surface preparation
- Selection



DURATINET TECHNICAL GUIDE - WEB

DIAGRAMS
VIDEOS
IMAGES



DURATINET TECHNICAL GUIDE - WEB

STEEL STRUCTURES

DEFECTS

DETERIORATION

Damage classification

<input type="checkbox"/> Contamination	<input type="checkbox"/> Deformation	<input checked="" type="checkbox"/> Deterioration	<input type="checkbox"/> Discontinuity	<input type="checkbox"/> Displacement	<input type="checkbox"/> Loss of Material
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Component

<input checked="" type="checkbox"/> Basic Component	<input checked="" type="checkbox"/> Bolted Riveted Connector	<input checked="" type="checkbox"/> Welded Connector	<input type="checkbox"/> Coating System
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Description

Uniform corrosion or other material uniform modifications with eventual reduction of mechanical properties, such as strength, impact resistance, and hardness. Extreme cases of deterioration may result in significant section reduction and loss of material.

Chemical & Biological

Physical