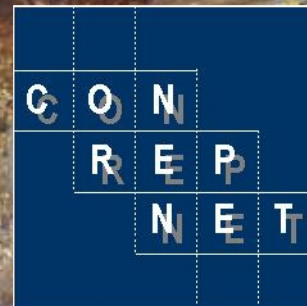


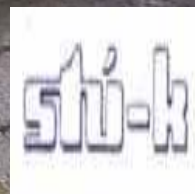
**CON-REP NET**

**Thematic Network on Performance Based  
Rehabilitation of Reinforced Concrete Structures**



# **Overview of Network Launch Meeting Madrid Feb 03**

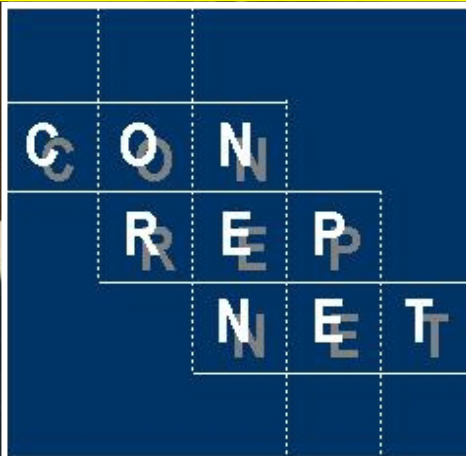
**Dr Stuart Matthews,  
BRE Centre for Concrete Construction**



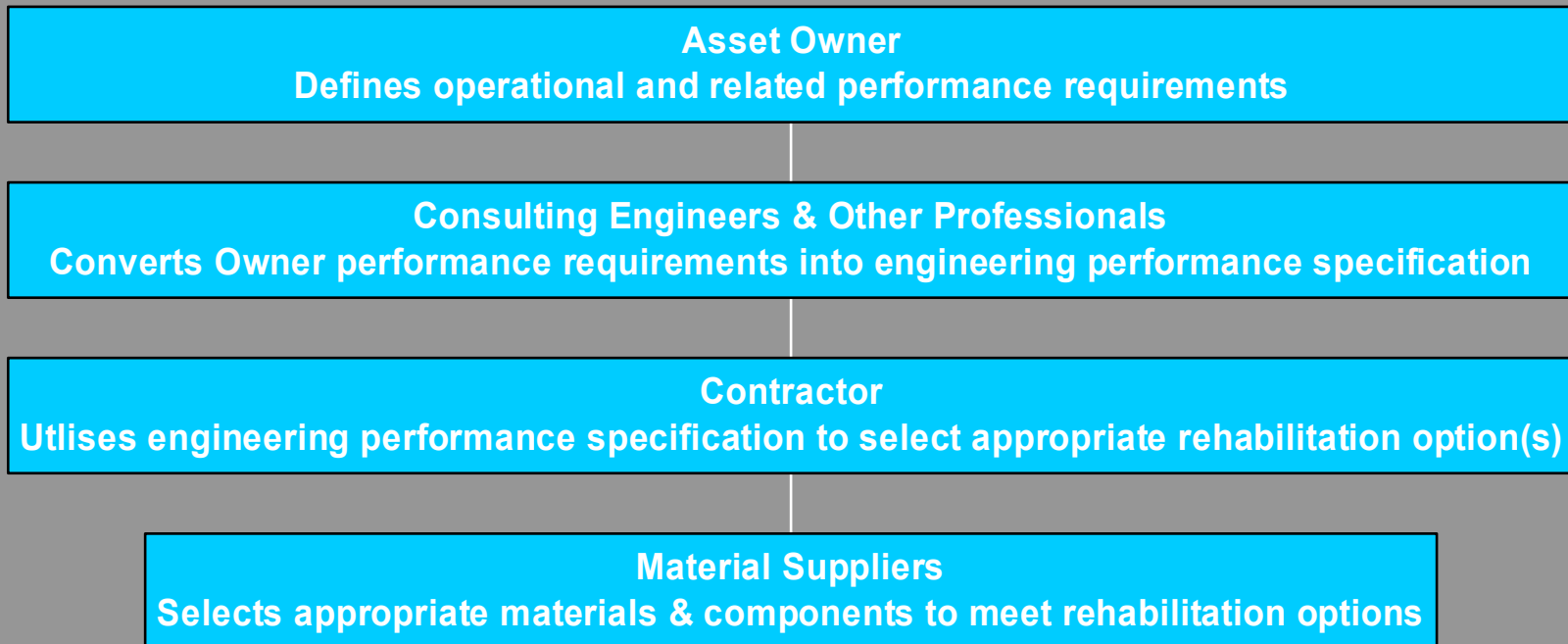
# Network Launch Meeting: Madrid 6 & 7 Feb 2003



# Network Launch Meeting: Madrid 6 & 7 Feb 2003



# Supply Chain Supporting Rehabilitation and Asset Management of Reinforced Concrete Structures



**Researchers**

# CON REP NET Network Launch Meeting, Madrid

Entailed general discussion of :

- Members' expectations
- Past performance
- Current practice
- **Future performance**
- **Dissemination of information**

Previous  
Presentation

# Future performance – Madrid Feb 03

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## Why do repairs go wrong?

- Use of the wrong repair technique
  - Problem was not correctly diagnosed !!
- Many repairs fail because of poor workmanship and poor supervision during their application
- The monitoring of the repair is also important to understand performance

# Future performance – Madrid Feb 03

## Financial considerations

- Why do owners base decisions on financial considerations or first cost alone?
- Some owners have inadequate cash flow, but the repair problems have to be solved in long term.
- Influence of politicians who are interested to see results in their term of office, rather than to minimise life cycle cost.
- Application of some materials is extremely expensive (e. g. stainless steel) but their application guarantees long durability.

# Future performance – Madrid Feb 03

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## For the future

- There is need to achieve an improved performance from rehabilitated concrete structures. It is believed that this can be achieved by:
  - Successful development of performance based concepts
  - Adoption of concepts throughout of the whole supply chain
- Benefits will be gained through the whole supply chain of owners, consulting engineers, contractors/material suppliers, research organisations and the users.

# Dissemination of information

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**Each functional group was asked how best to disseminate the Network's findings to their communities**

**Discussion with :**

- **Owners**
- **Consultants**
- **Repair specialists (contractors), materials suppliers and researchers**

# Dissemination of information

## Madrid Feb 03 - Suggestions

	Requested	Action
● Workshops	✓	✓
● Training courses	✓	✗
● Practical guidance documentation		
• Best practice guidance	✓	✓
• Codes of practice [Avoid]	✗	
● Conference / symposia	?	✓
● <b>Guidance for owners</b>		



# A THEMATIC NETWORK ON PERFORMANCE BASED REHABILITATION OF REINFORCED CON- CRETE STRUCTURES



BRE

Gifford

STU-K

CSTC

CT

CSC

Freysinnet

Building Research Establishment (Co-ordinator)  
Freysinnet International  
Instituto de Construcción Science "Eduardo Torroja"  
CT Centre  
Belgian Building Research Institute  
STU-K  
Gifford & Partners

## CON REP NET NETWORK NEWSLETTER

No.1&2

September 2003

Special Issue: CON REP NET Network Launch Meeting, Madrid, Spain, February 6-7, 2003

### Index

- Introduction
- General discussion on members' expectations
- Past performance
- Current practice
- Future performance
- Dissemination of information
- Review of dissemination activities

# Key Problems

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## Lack of durability of repairs

- **Incorrect design of repair (33%)**
- **Incorrect diagnosis of the underlying problem (18%)**
- **Poor workmanship (18%)**
- **Problems with the repair materials (11%)**
- **Other factors (20%)**

Structural performance

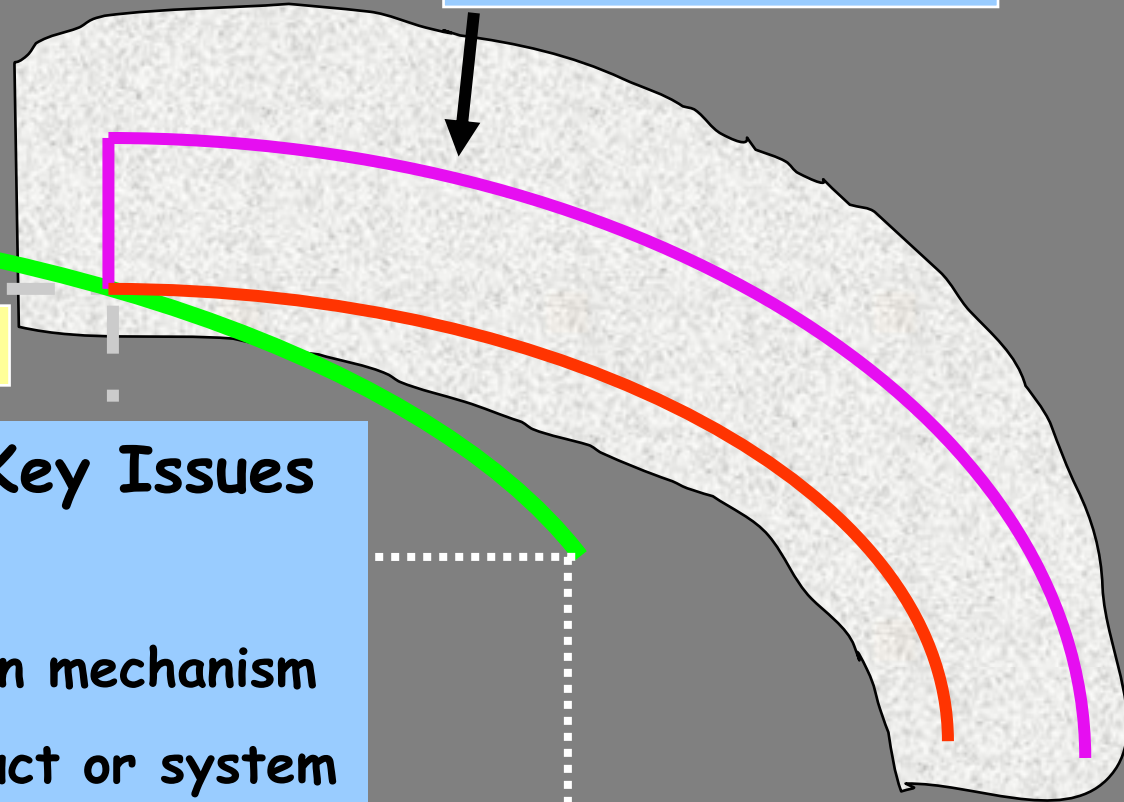
Present performance

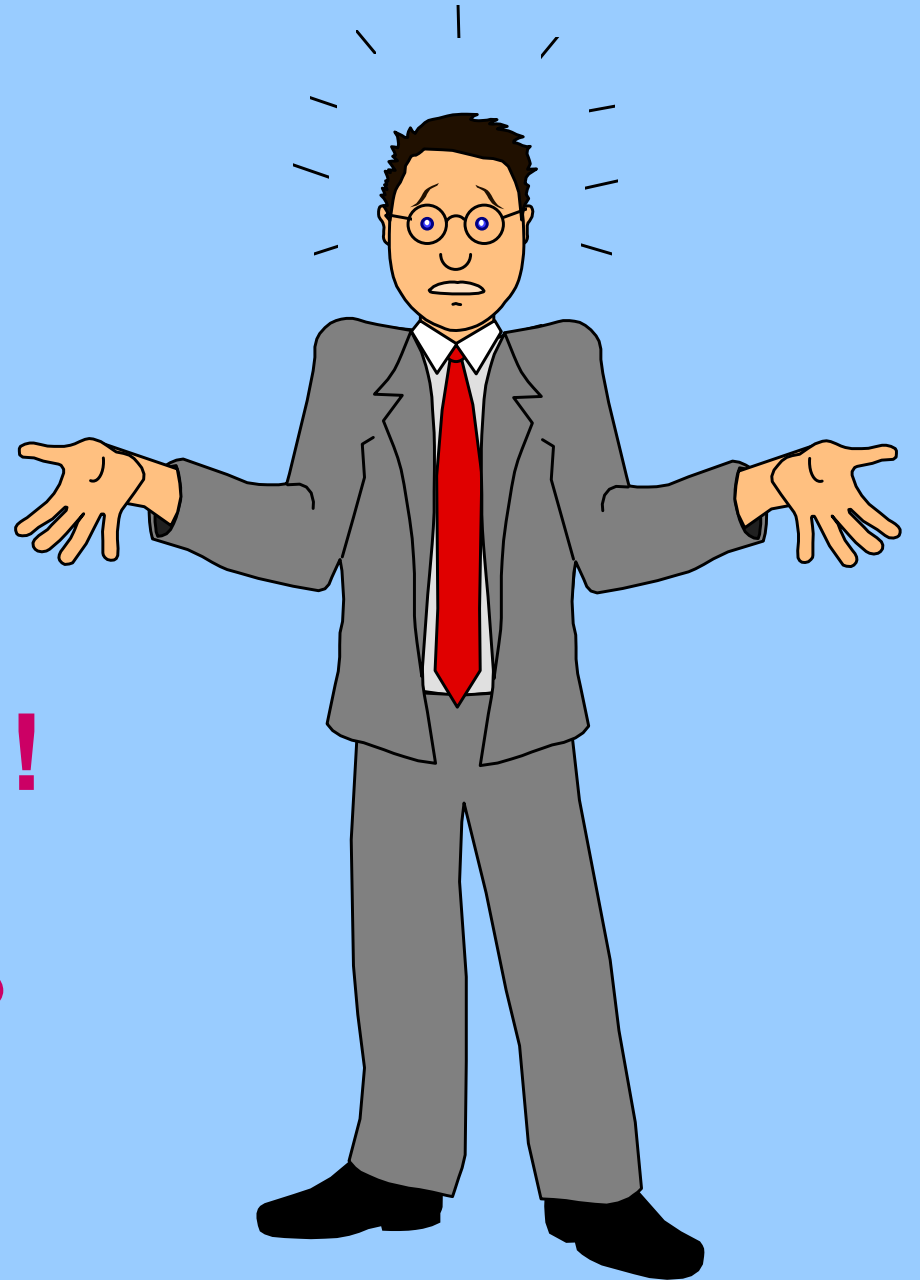
Remediation Options:  
REHABCON

### Workshop Outcomes: Key Issues

- Assessment of condition
- Diagnosis of deterioration mechanism
- Selection of repair product or system
  - Options evaluation / selection
- Workmanship
- Supervision of execution

Time





**So it deteriorates !**

**What can we do ?**

# What Way Forward ?

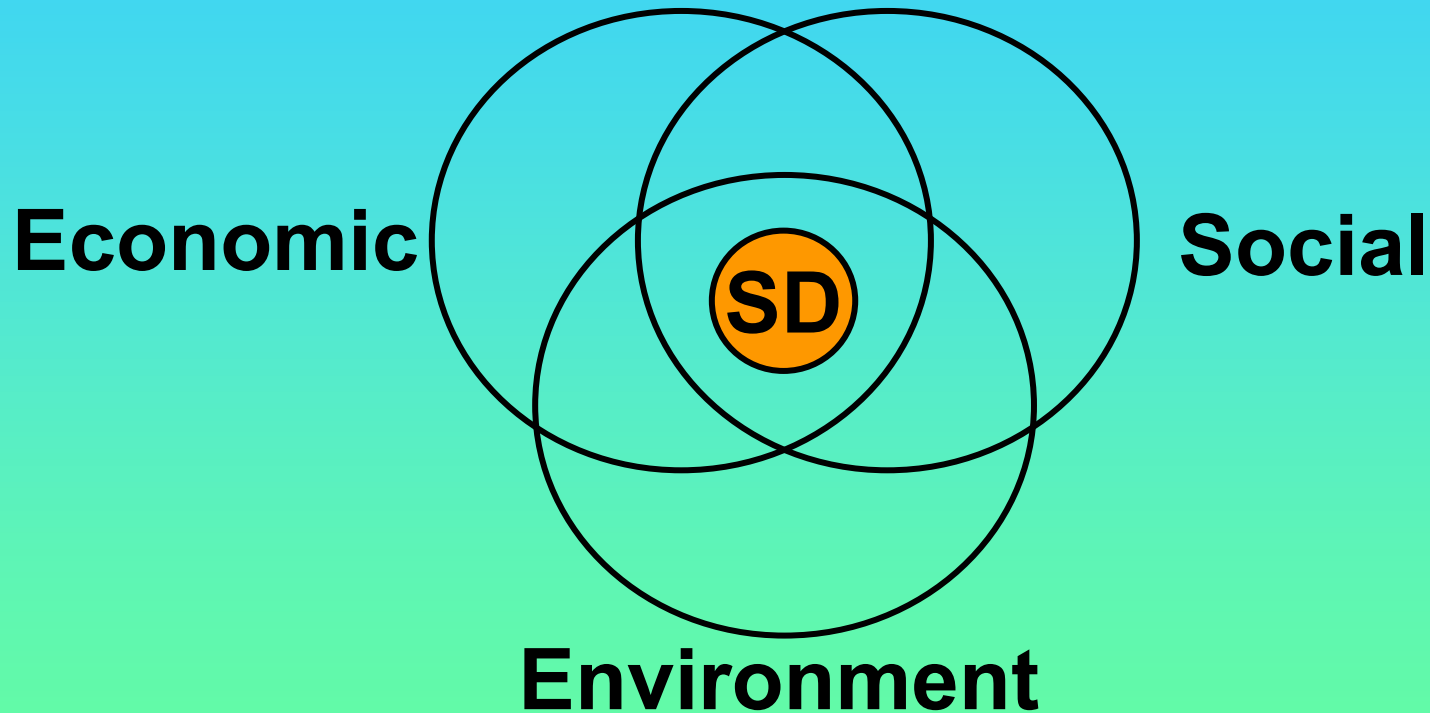
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- **Prescriptive Approach**
- **Performance Based Concepts**
- **Combination of these ?**

## **Many Questions / Discussion Points:**

- **Can PBA improve the overall level of performance and durability of repaired concrete structures?**
- **What changes in culture and mindset are need for PBA?**
- **Can technical innovation improve the performance and durability of repaired concrete structures?**

# Sustainable decision-making



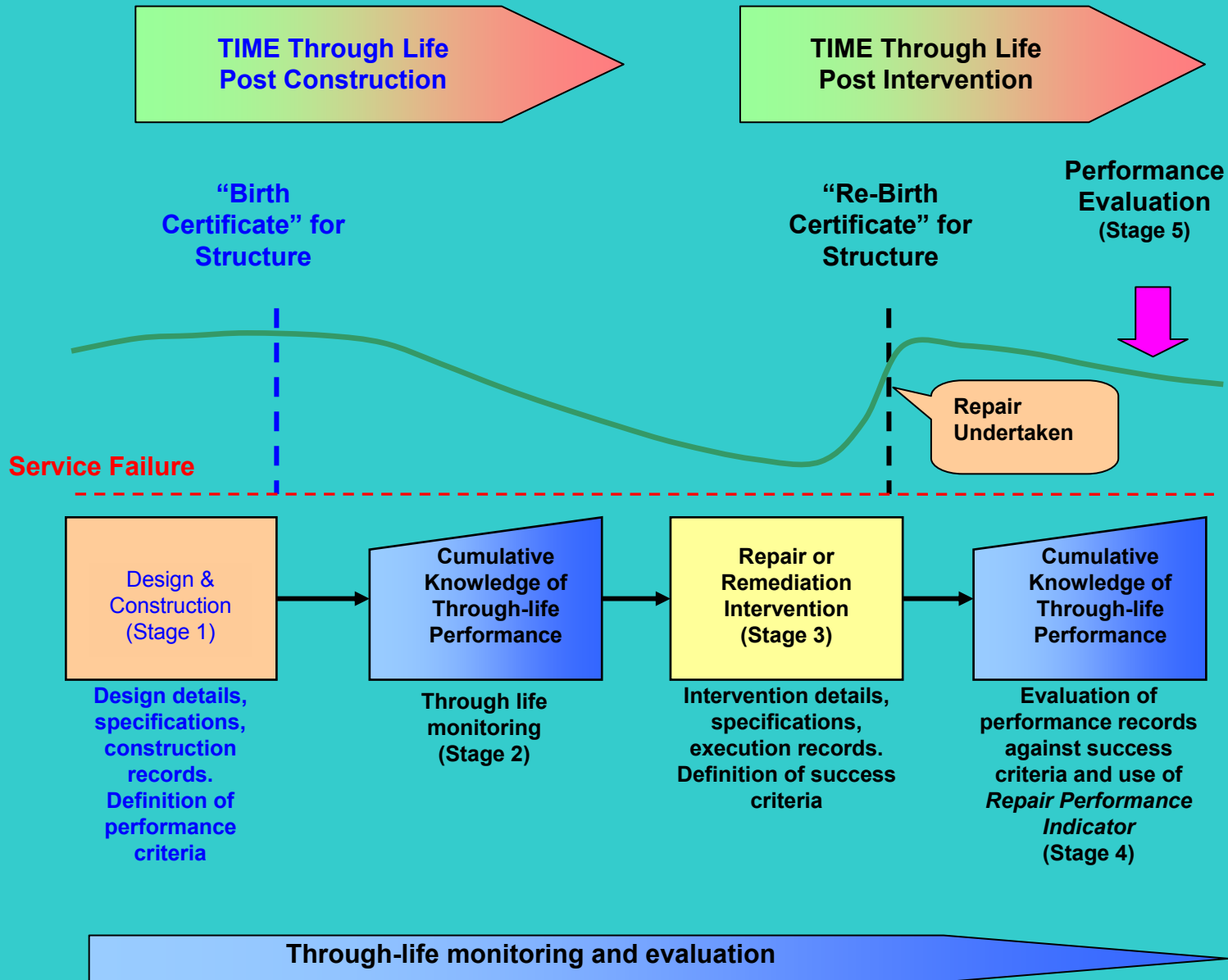
There must be no hierarchy between factors

# PERFORMANCE BASED CONCEPTS

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To explore and develop strategies, techniques and processes for delivering durable and effective rehabilitation of concrete structures by:

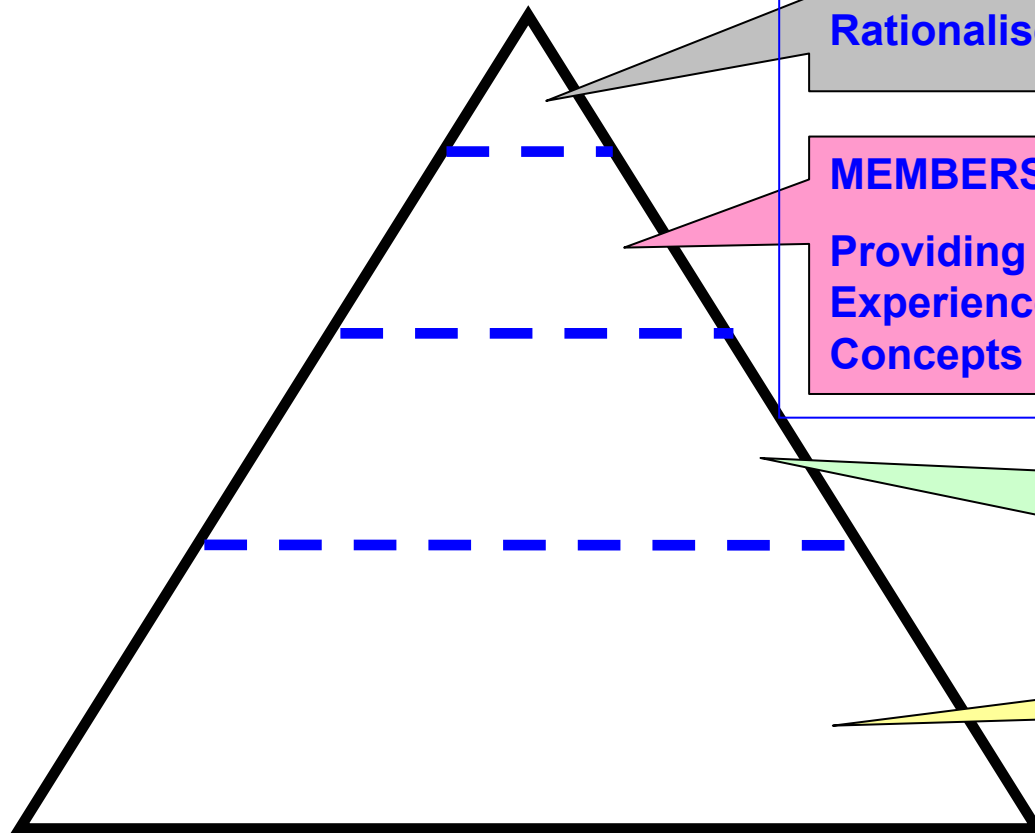
- Understanding client aspirations and needs
- Developing an industry response for achieving them
- Creating a vision for performance concepts to achieve durable rehabilitation of concrete structures
- Performance concepts: from vision to practice.
- Identifying future RTD needs, co-ordinating RTD and other activities
- Examining the implications for European standardisation and Construction Products Directive issues



# Through-life performance monitoring & evaluation

1. Details about the design concepts and construction of the original structure along with the expectations for its performance, ideally including material specifications and information upon the quality on execution.
2. Gathers information upon / monitors through-life environmental and loading influences, as well as performance post construction and prior to the repair or remediation intervention.
3. **As *item1* but for repair or remediation interventions, plus the definition of appropriate success criteria upon which to evaluate the subsequent performance of the intervention.**
4. **Monitoring of through-life performance post repair or remediation intervention, using defined performance indicators and environmental parameters and related factors establishing the context within which this data should be reviewed and evaluated for success or failure.**
5. **Use of a Performance Evaluation methodology to assess the overall condition of the structure by means of an agreed form of Structure Performance Index (Post-construction) or Repair Performance Index (Post-Intervention).**

# CONREPNET Project Participation



## CREATORS & DEFINERS

**PARTNERS: 7No - Core Group**

Gathers & Processes Input, Assembles & Rationalises, Produces Outputs & Reports

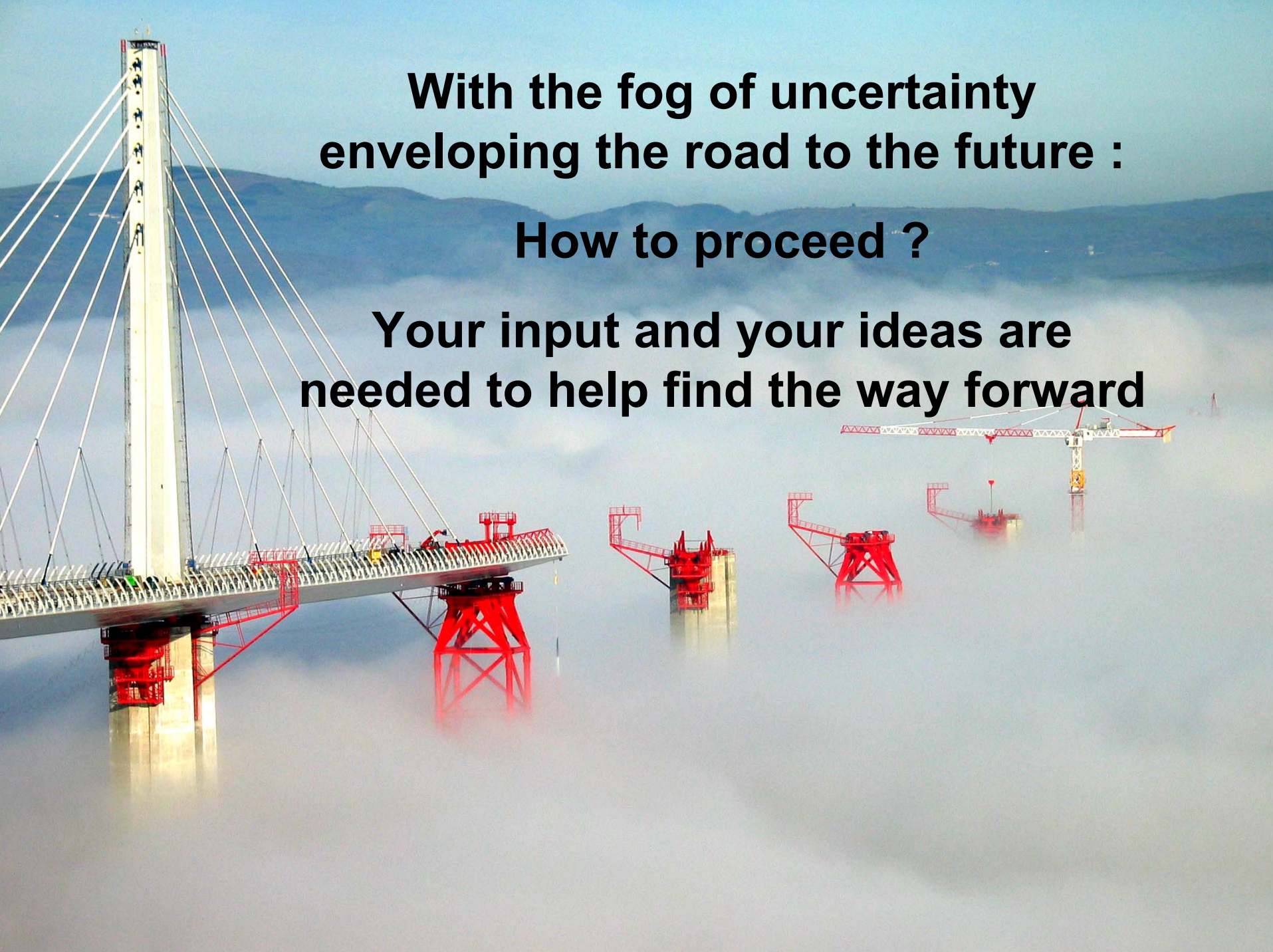
**MEMBERS: Over 40No Supporters**

Providing Intellectual Input, Knowledge, Experience, Expertise, Data, Ideas for PBA Concepts etc

**PARTICIPANTS:**

Open Meeting Attendance at PW1 to PW4

**THE WIDER INDUSTRY & PUBLIC**



**With the fog of uncertainty  
enveloping the road to the future :**

**How to proceed ?**

**Your input and your ideas are  
needed to help find the way forward**



## CONREPNET

### ***AN OVERVIEW OF A THEMATIC NETWORK ON PERFORMANCE BASED REMEDIATION OF REINFORCED CONCRETE STRUCTURES***

For Network Members - June 2005 Edition



# The Work for Today

## **SESSION 2: TOMORROW AND BEYOND FOR CONCRETE REPAIR ?**

**Review of Madrid Start-up Meeting & Breakout Discussion Groups (future performance)**

**Overview of Vision for Performance Concepts (WP4)**

**WP4 - Owner's Perspective**

**WP4 - Industry Response**

**WP4 - Researcher's Perspective**

**Discussion**

**Lunch**

## **SESSION 3: NEXT PRACTICE IN CONCRETE REPAIR - A WAY FORWARD ?**

**Briefing for Afternoon Sessions**

**Workshop 1-Break out Sessions: 'Delivering 'Value'**

**Report back: Overview from Workshop 1 Break out Sessions & Plenary Group Observations**

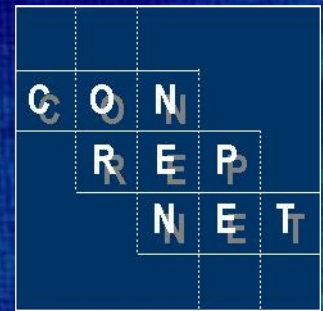
**Break**

**Workshop 2-Break out Sessions: Performance Concepts**

**Report back: Overview from Workshop 2 Break out Sessions & Plenary Group Observations**

# CON REP NET

## Thematic Network on Performance Based Rehabilitation of Reinforced Concrete Structures



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BRE Centre for Concrete Construction

**matthewss@bre.co.uk**    **+44 (0)1923 664559**

**[www.projects.bre.co.uk/conrepnet](http://www.projects.bre.co.uk/conrepnet)**

