NATO Project SfP. 97 1888

Diagnosis of concretes and high performance concretes by structural analysis

February 1999–December 2003 (5ys)

Amount of award: 12.000.000 BEF

appr.297.000 €

Analysis of structure and microstructure of cores and specimens

- Impregnated Reground Plane Sections (RPS) and qualitative analysis in the reflected light
- Quantitative analysis of images (IA) in natural and UV light
- Indentation of specimens (mechanical and by laser beams) and recording of Acoustic Emission (AE) effects
- Mechanical tests of basic properties
- Analysis of all data using methods of Artificial Intelligence (AI)
- Diagnosis: strength and frost durability of concrete

1. Transfer from the NATO partners (Denmark, Belgium, USA) to Poland of the existing knowledge and techniques in the determination of properties of structural concretes: strength and frost resistance as parameters of durability

2. Enrichment and development of the obtained knowledge and techniques by new and original elements:

- **acoustic emission**
- **indentation methods**
- **computational methods (e.g. AI)**

3. Application of the complete methodology in Poland through the End users in various practical cases.

4. Diffusion of knowledge and seminars, publications, etc. techniques through workshops,

5. Reduction of the cost of upgrading and repair of the infrastructure in Poland

6. Improvement of the techniques used in Poland for Quality Control of concrete structures

7. Further diffusion to other countries through seminars, publications, etc.

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SfP Project 97.1888 – Program of tasks

ACTIVITY	Year 1	Year 2	Year 3	Year 4	Year 5
preparation of laboratories, installations					
basic training of young researchers					
specialized training of young researchers					
procurement of equipment for RPS					
procurement of computers & software					
procurement of IA system					
procurement of AE (additional)					
procurement of mechanical indentation equipment					
preliminary tests of specimens for training					
tests and research with IA					
tests and research – indentation & AE					
analysis of results					
application of AI, conclusions					
seminars, contacts with end users					
conclusions, publications					
final report					

THE IDENTITY OF THE END-USERS OF THE PROJECT RESULTS

- **IBDM (Road and Bridge Research Institute),**
  head: Prof. Leszek Rafalski, Prof. Dariusz Sybilski
- **PRM "Mosty - Łódź" (Bridges – Łódź),**
  chairman: Zygmunt Pater, Civ.Engr.
- **Hydrobudowa 1 Betoniarnia - Laboratorium, S.z o.o.**
  chairman: Kazimierz Ładyżyński, Civ.Engr.
- **„Property Project" Kancelarja Inwestycyjna, Sp. z o.o.**
  deputy-chairman: Dr. Andrzej Burakiewicz, Civ.Engr.
- **General Directorate for Public Roads, Dept. North-East in Białystok, Laboratory for Roads,**
  head: Adam Glinicki, Civ.Engr.
- **WARBUD S.A. (the procedure to introduce into the list of End-users is initiated).**