

**Objective:** Technical and Practical Aspects on Sprayed Concrete for Underground Structures.

## Tentative Programme

### Day 1

#### Session 1: Introduction and overview

#### *Application and Use of sprayed concrete for Ground Support and Repair/Strengthening of Underground Structures; Main methods of application*

- 09.00 – 09.30: Welcome and Opening: ITA and concerned country representatives
- 09.30 – 10.30: Short overview of case histories for ground support and building / repairing / strengthening underground structures (state of the art)
- 10.30 – 11.00: Coffee break
- 11.00 – 11.45: Main methods of Application: Wet, Dry, Moist
- 11.45 – 12.30: Equipments for Sprayed Concrete
- 12.30 – 14.00: Lunch

#### Session 2: Mix design and Components

- 14.00 – 14.45: Specificities of mix design of Wet-Sprayed Concrete compared to casted concrete
- 14.45 – 15.30: Specificities of mix design of Dry/Moist-Sprayed Concrete
- 15.30 – 16.00: Coffee Break
- 16.00 – 16.45: Main technical specifications on components (requirements to introduce in tender documents)
- 16.45 – 17.30: Structural and other types of Reinforcements (against fire...)
- 17.30 – 18.00: Questions and Answers

### Day 2

#### Session 3: Certification and Control

- 09.00 – 09.45: Why Certify Nozzle Operators? Manual/Robotic application, presentation of existing certifying bodies
- 09.45 – 10.30: Organising Pre-construction Tests, Quality Control, Working Procedures
- 10.30 – 11.00: Coffee break
- 11.00 – 11.45: Specific tests for Sprayed Concrete – part 1: on fresh concrete
- 11.45 – 12.30: Specific tests for Sprayed Concrete – part 2: on hardened concrete
- 12.30 – 14.00: Lunch

#### Session 4: Case histories applied to Himalayan conditions (including Design, Scheduling and Costs Aspects) and future developments

*Numerous case histories must be available. The choice between them will be based on the audience and the available speakers.*

- 14.00 – 14.45: Application of Sprayed Concrete in deep/highly stressed long Tunnels
- 14.45 – 15.30: Sprayed Concrete applied to difficult geological conditions (Himalayan Geology)
- 15.30 – 16.00: Coffee Break
- 16.00 – 16.45: Other Case Histories (*to be decided*)
- 16.45 – 17.30: Future development of Sprayed Concrete lining and associated methods
- 17.30 – 18.00: Discussion and Closing