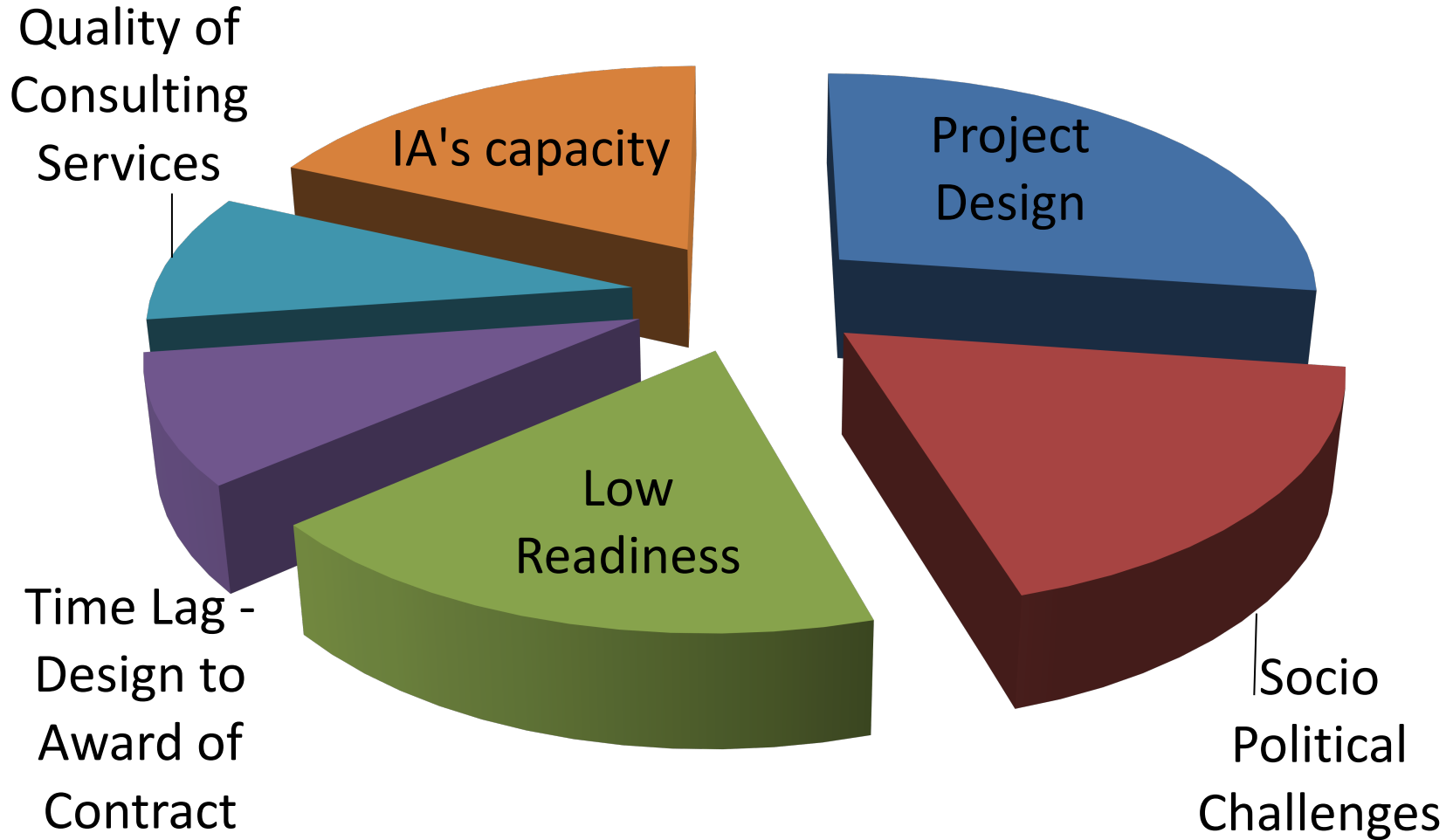


Sharing Learnings – Melamchi Water Supply Project



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Most Delayed Project in ADB - Running in 17 Years – Why?



Project Design–Scope

- (i) infrastructure development,
- (ii) social and environmental support,
- (iii) institutional reforms, and
- (iv) project implementation support.

Sequencing

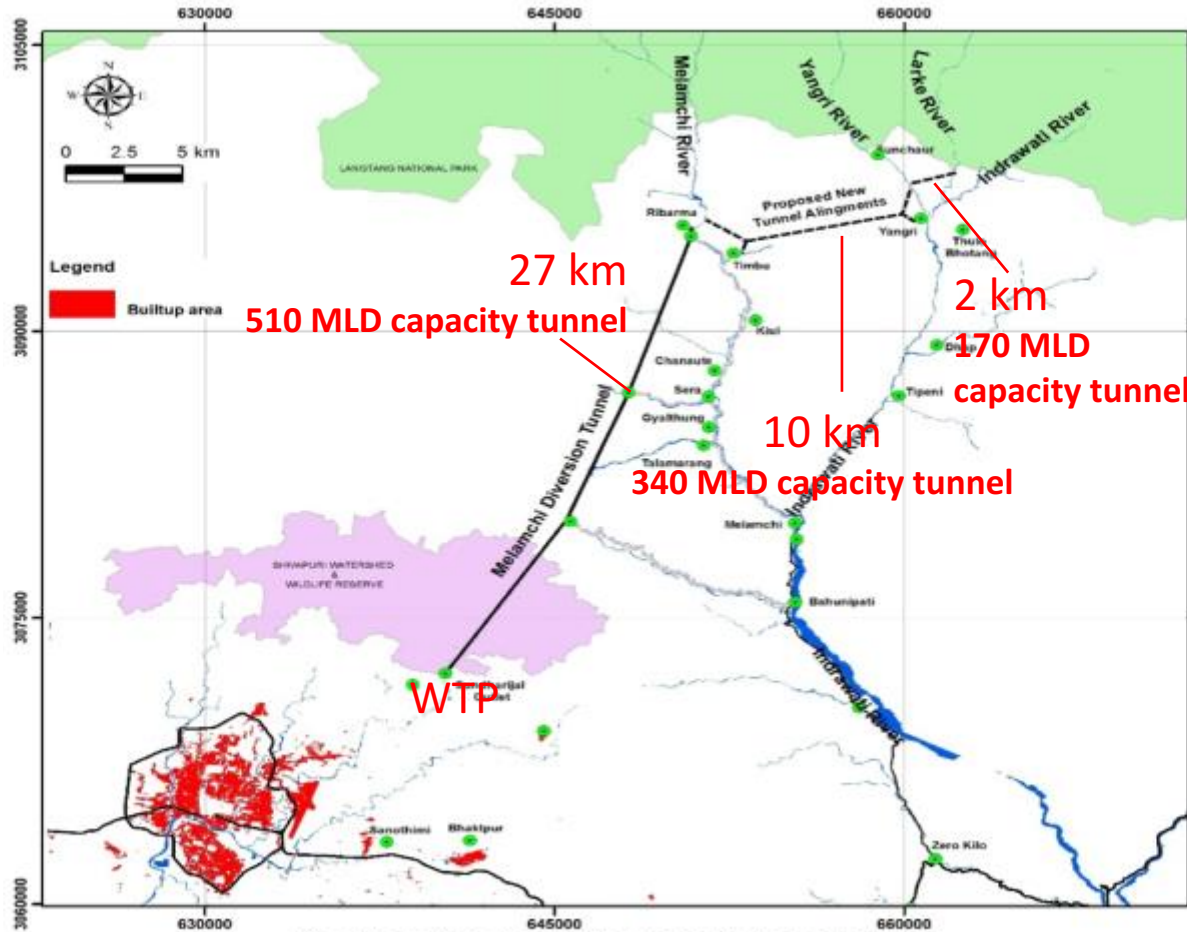
Covenant – why? When? Doable? Analysis of Impact +/-?

The biggest civil works package (water diversion tunnel) - put on hold (9 years) because the loan covenants require completion of the Private Sector Participation contract award as a condition precedent for awarding this civil works package.

Project Restructuring - 2008

- **Reallocation of funds among the project components**
- **Removing the loan covenant requiring PSP contract award**
- **Changing the implementation arrangements by splitting the Project into two distinct subprojects – Subproject 1 and 2**

Subproject 1: Source Development



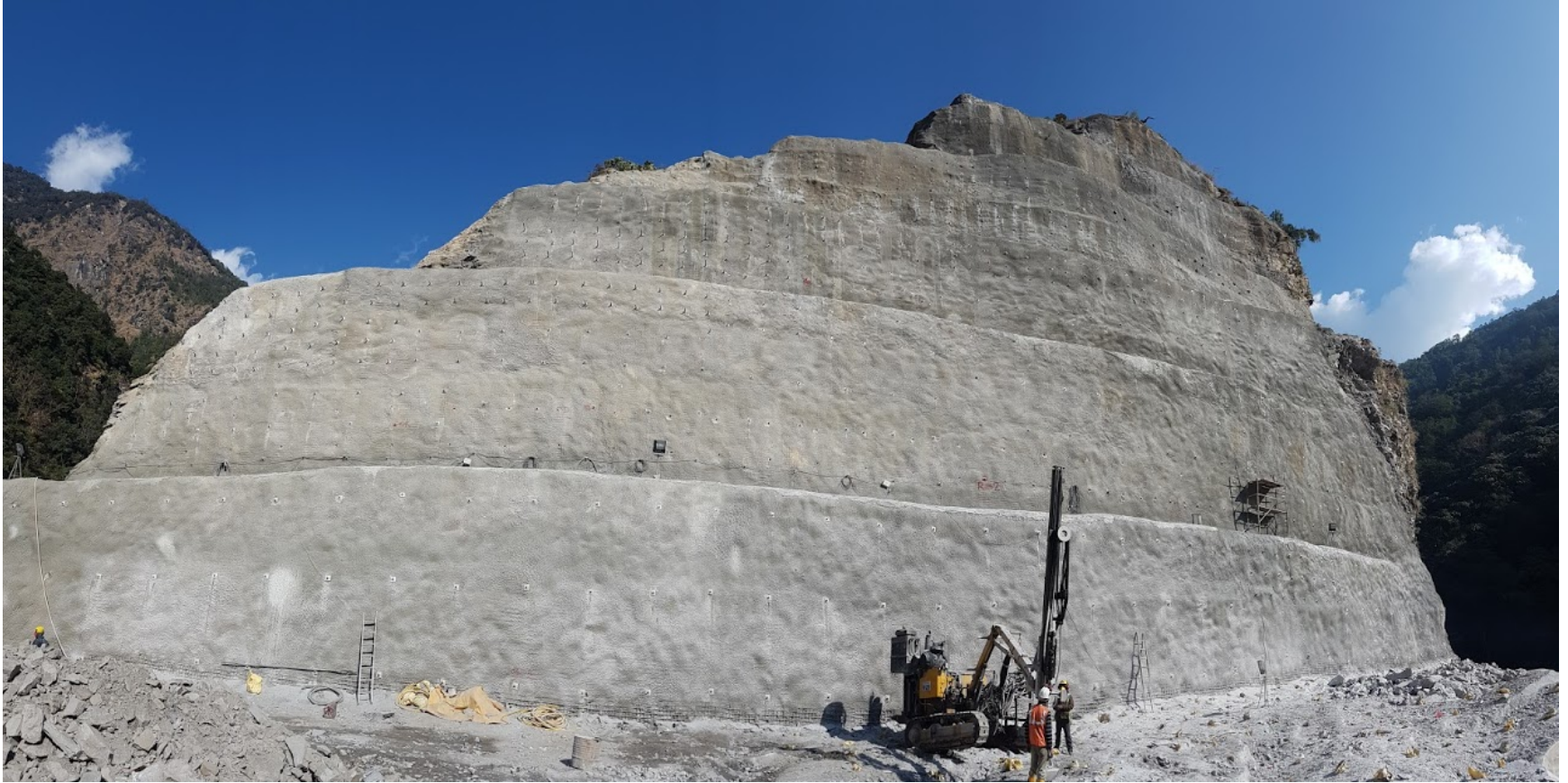
- **Diversion.** 170 MLD from Melamchi and 340 MLD from Yangri & Larke

Tunnel and Headworks



Longest water tunnel 27.5 km

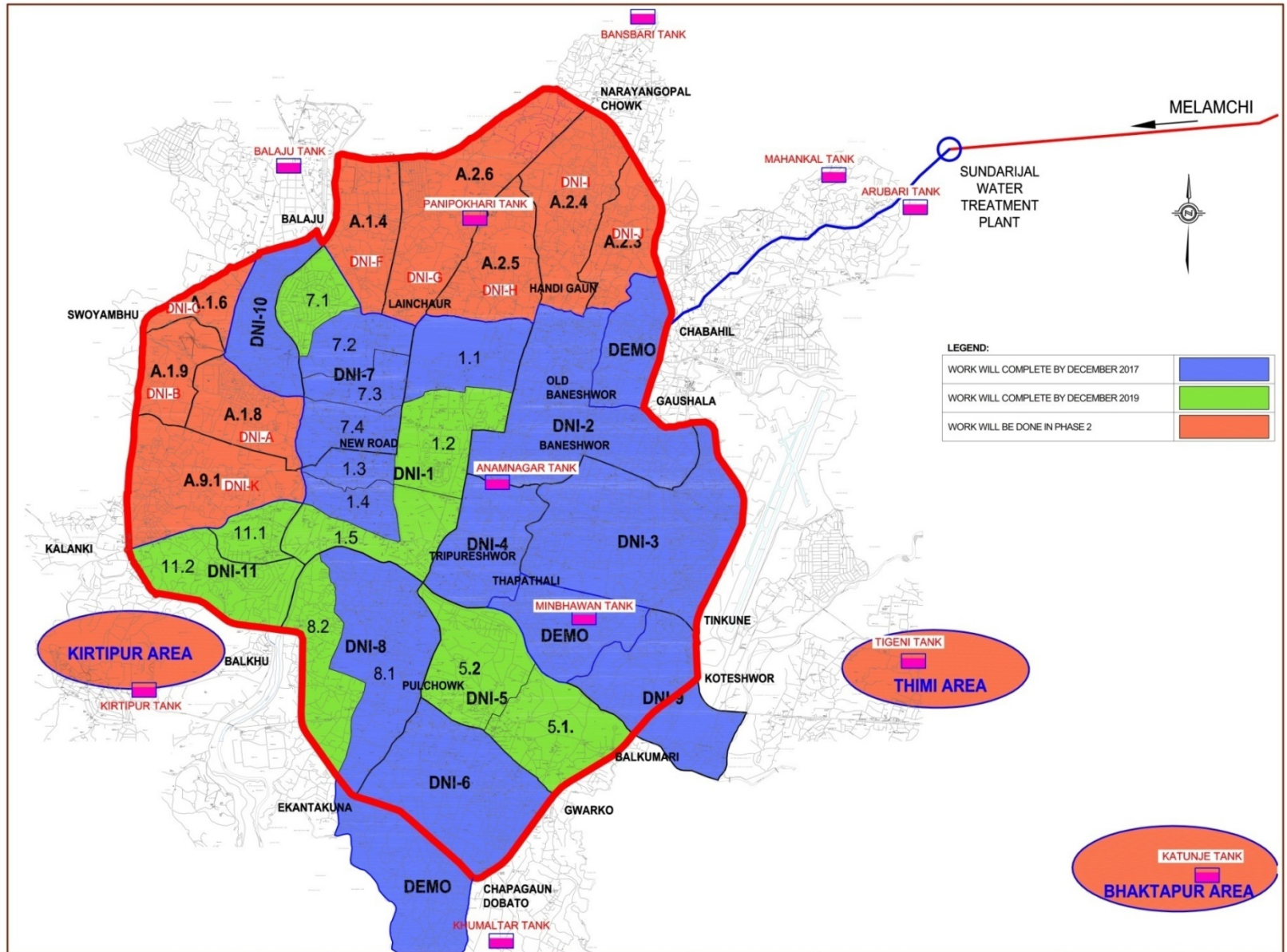
Headworks – Open cut excavation of 100,000 cum



Treatment Plant – 170 MLD Capacity



Subproject 2- Distribution Network Improvement



Chronology – High and low Since 2008

- **Restructuring of Melamchi Board**
- **Formation of Hylmo Valley Development Committee**
- **Award of tunnel contract to CRCC on 19 February 2009**
 - No substantive progress (Dec 2009)
 - Serious Communication Problem among Parties
 - Conflict with Local Residents
 - Difficulty in Importing Explosives
 - Inadequate Equipment and Financial Resources
 - Unfamiliar with FIDIC Contract
 - DSC's performance – less than satisfactory
 - **Problem Analysis matrix by 17 Dec 2009 and to monitor on monthly basis**
 - **Collapse at Gyalthum audit on 17 May 2011**
 - **Non compliance of social and EMP**
- **Termination of CRCC**

Tunnel Contract – Cooperative Muratori & Cementisiti di Ravenna

- Signed on 15 July 2013
- Contract Price ≈ \$84 million inclusive VAT
- Contract completion date is 30 September 2016
- New contract completion date – till 31 December 2017

ISSUES

- **Slow pace of Tunnel Contract Implementation**
- **Decision Overdue about Design and Use of Lattice Girder as a Part of Permanent Support**
- **Poor Cash Flow Situation - Insufficient Construction Material**
- **Blockage of Access Road to Gyalthum, Ambathan and Headworks – Earthquake**
- **Nepal India Boarder closer**

Why ?

- (i) high turnover of project manager of the Contractor – four project managers in two years;
- (ii) problems with subcontractors – start up delays of Ambathan portal, Sindhu Upstream Portal and Headworks;
- (iii) lack of communication among MWSDB, CMC, and outgoing Engineer – creating loss of confidence;
- (iv) contractual, financial and payment problems – contractual provision on payment for support work;
- (v) inadequate resource and work planning by CMC – resource shortage;
- (vi) CMC's disagreement with design and supervision engineer on designs of headwork and tunnel support work; and
- (vii) natural disaster (earthquake and landslides);

Agree on Overall Objective – First

- Strategic thinking - Coordinating strength
- Agree on Issues – Consensus on action to address issues
- Reverse schedule – Physical completion is not the contractual completion date
- Confidence building – can do environment; every one feel part of the accomplishment
- No surprises
- Regular meeting – formal and informal
- Managing EGOs

Water Tunnel – 23.2 km (84%)



Water tunnel – 25.9 km, 12.9 m², Design Discharge – 6 m³/s, overburden max – 1,181.7 m

Rock Class Impacts Cycle Times

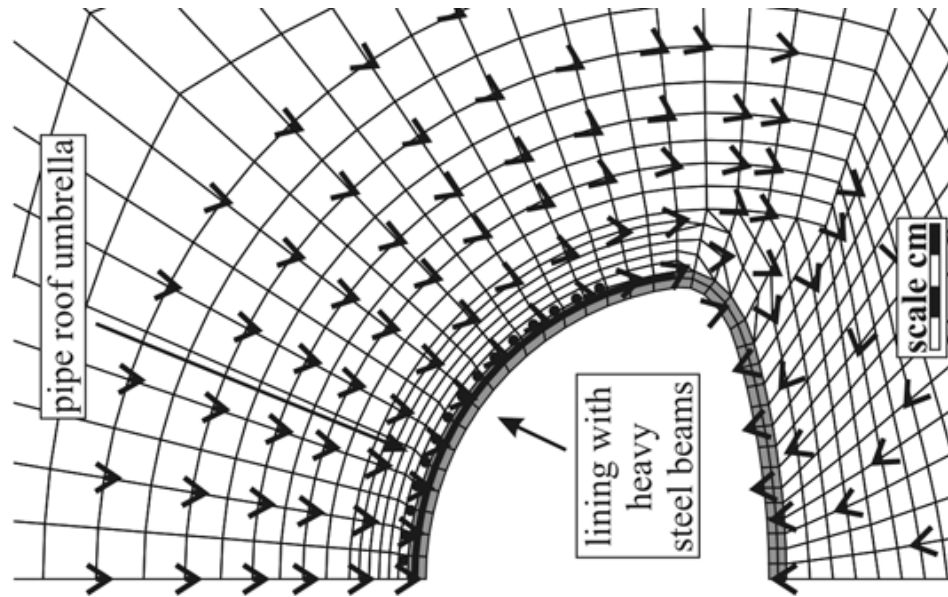


Weak Section of Tunnel - Support



Risk – Tunnel Squeezing, Casualty, Delay

Addressing the weak rock class tunnel section with the provision of Pipe Roof Support System



Challenging Terrain



Probe Drilling



Breakthrough in December 2017



PROJECT MANAGEMENT - Art and Science

Art

Creativity is needed for leading, enabling, motivating and communicating team members especially to those that do not have accountability to you.

Science

Planning, Estimating, Measuring, Controlling, Data Analysis,....





