

## DATES & VENUE

The Workshop will commence at 9.30 hrs on 26 February 2014 in the Gulmohar Hall, India Habitat Centre, Lodhi Road, New Delhi - 110 003

## OFFICIAL LANGUAGE

The official language of the workshop will be English.

## REGISTRATION FEE

The registration fee for participation in the workshop is Rs.5,000/- plus service tax 12.36% per participant by cash / cheque at par / demand draft drawn in favour of 'Central Board of Irrigation and Power', payable at New Delhi. There would be 10% discount applicable to Members of CBIP & TAI. The registration fee includes working lunch, tea during the workshop. Registration fee does not include payment for hotel accommodation or meals except those specifically indicated in the Workshop Programme. The participants will have to make their own arrangement for boarding and lodging, transport, etc. at New Delhi. Registration fee once paid will not be refunded.

## SPONSORSHIP

Scope exists for organizations to be the Golden Sponsor or Silver Sponsor on lumpsum payment with following attendant benefits:

### Golden Sponsor – Rs. 2,00,000/-

- Name of the organization in the list of Sponsors
- Organization may nominate ten delegates
- Time slot for making presentation
- One full-page black & white advertisement in the proceeding volume
- Distribution of literature/brochures

### Silver Sponsor – Rs. 1,00,000/-

- Name of the organization in the list of Sponsors
- Organization may nominate Five delegates
- One full-page black & white advertisement in the proceeding volume
- Distribution of literature/brochures

## ADVERTISEMENT OPPORTUNITIES

A limited space will be made available on first-come-first-served basis, for coloured advertisement to the organizations, involved in the concerned field, in the proceedings volume of the workshop. The interested organizations are required to send the CD of the advertisement material, in A4 size i.e., Art Work / Negative/ Positive along with payments as detailed below by 10th September 2013.

- Inner Pages US\$ 500 / INR 30,000
- 2nd & 3rd Cover US\$ 1000 / INR 50,000
- Back Cover US\$ 1500 / INR 75,000

\* Service tax extra @ 12.36%. Service Tax Registration No : AAAJC0237FST001

## PAYMENT

All payments are to be made by the following methods. No other methods of payment are acceptable.

Registrations/ Sponsorships/ Advertisements

- Cash
- Banker's Cheque payable to : Central Board of Irrigation and Power, New Delhi
- Bank Transfer : Name of Bank : HDFC Bank Ltd., G-3/4, Suryakiran Building, 19 K.G. Marg, New Delhi - 1

**Beneficiary Details** – Organization : Central Board of Irrigation and Power

**Account No. :** 00031110004411 **MICR Code No. :** 110240001

**Swift Code :** HDFCINBBDEL **IFSC :** HDFC0000003

Bank charges if any, must be borne by the participants and should not be deducted from the amount remitted to the Conference Secretariat.

## SECRETARIAT

Central Board of Irrigation and Power, Malcha Marg, Chanakyapuri, New Delhi-110 021

Phone : 91-11-26115984 / 26116567; Fax : 91-11-26116347 E-Mail: sunil@cbip.org; cbip@cbip.org;

Web : <http://www.cbip.org>

## CONTACT PERSONS

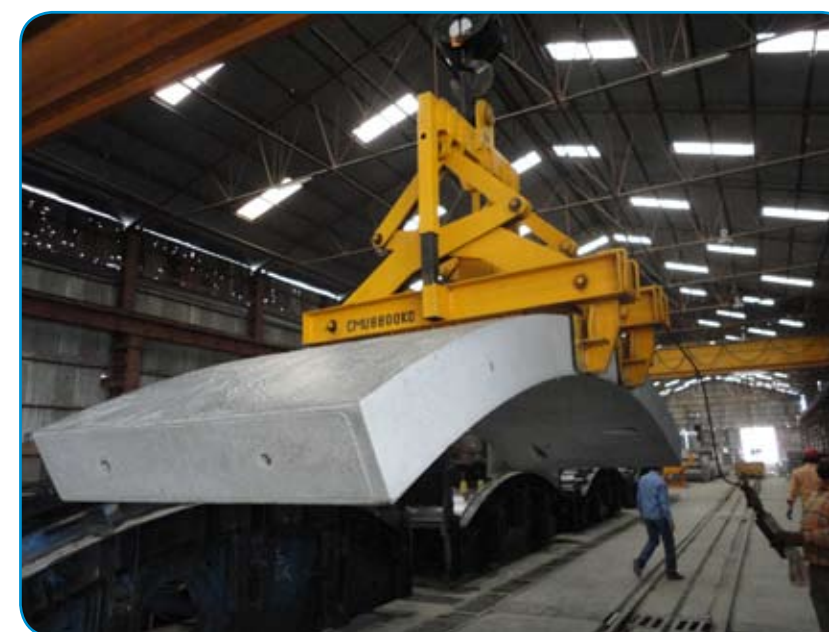
**A.C. Gupta, Director – Water Resources (M: 9871995996)**

**Sunil Sharma, Senior Manager – Technical (M : 9811299136)**

# Workshop Segmental Lining – Issues and Challenges

**26 February 2014**

**Gulmohar Hall, India Habitat Centre, New Delhi**



*Organised by*



CENTRAL BOARD OF IRRIGATION & POWER



INDIAN COMMITTEE ON LARGE DAMS



TUNNELLING ASSOCIATION OF INDIA

*Sponsored by*



## INTRODUCTION

Precast segmental tunnel linings are used in circular tunnels that are drilled using a Tunnel Boring Machine (TBM). They can be used in both soft and hard ground. Precast segmental linings can be used as initial ground support followed by a cast-in-place concrete lining (the “two-pass” system) or can serve as both the initial ground support and final lining (the “one-pass” system) straight out of the tail end of the TBM.

Over the last few years, there has been a considerable advancement in the use TBM and other related technologies in these tunneling methods. Most of the metro tunnelling projects and some prestigious hydro projects in India are going for Precast segmental tunnel linings. Some of the important challenges to be considered for precast segmental tunnel linings include:

- Design of segmetal lining for roof imposed loads during devices lifting and erecting of the segments.
- Segmental lining to cater to the loads due to Grouting pressure. Grouting pressures should be limited to reduce the possibility of damage to the ring by these loads.
- To investigate the quality of ground water to ensure that the concrete lining is safe against chemical attack.
- To protect against fire. Both external and internal protection can be provided.

Keeping the above in view, Tunnelling Association of India, Central Board of Irrigation and Power and Indian Committee on Large Dams (INCOLD) are organizing one day workshop on Segmental Lining – Issues and Challenges on 26th February 2014 in Gulmohar Hall, India Habitat Centre, Lodi Road, New Delhi, to create awareness about the State of the art in segmental lining in tunnels.

## TOPICS

The following topics will be deliberated during the workshop:

- Introduction, overview and applications of segmental lining
- Design aspects of segmental lining (Including lifting, handling, erection, stacking, grouting, jacking, gaskets etc.)
- Construction aspects of segmental lining (Including placement, alignment, grouting, jacking, gasket, drainage etc.)
- Quality assurance for segmental lining (Including quality plans, testing methods, frequency of sampling etc.)

## WHO SHOULD ATTEND

The Workshop programme is designed for professionals working in public or private sector organizations dealing with the design and construction of tunnel and underground works. The workshop will be of interest to tunnel designer and operators, construction and project managers, engineers (both field and design office), construction supervisory personnel, construction cost estimators, geotechnical engineers in the construction industry geologists, regulatory bodies, Government departments, Tunnel Building Contractors & Consultants, Suppliers of Products & Services for Tunnelling Construction, Fire Authorities dealing with Infrastructure Tunnels, Technical and Research Institutes, Universities dealing with Tunnelling, Organization & associations active in the Tunnelling World and Funding Agencies.

## RESOURCE SPEAKERS



**Jörg Riechers, Product Manager of Herrenknecht Formwork**, Jörg Riechers is presently working as a Product Manager at Herrenknecht Formwork Technology GmbH, a 100 % subsidiary of the Herrenknecht AG. Riechers obtained M. Sc. in Civil Engineering with focus on drilling technologies in sensitive soil structures and demanding rock formations. In additon to his international master’s reseach project, implemented in collaboration between LKAB, Wassara AB and Sweco Infrastructure AB, he has worked as a Project Engineer focusing on dissemination of sustainable technologies.



**Dr.-Ing. Werner Grabe**, associated with M/s. ES Rubber : offers a wide range of sealing solution for Tunnelling Projects around the worls, and is Manager of the company M/s. WGD Werner Grabe Development, Duellmen, Germany. Dr. Grabe is a civil engineer, Experience in construction has and development of rubber profiles and frames since 1984. Dr. Grabe has the development departments of the following companies - Phoenix AG, Hamburg - Steinhoff GmbH, Nottuln - Meteor rubber plants, Bockenem - Daetwyler AG, Schattdorf, Switzerland. Dr. Grabe was involved in the preparation of publications “Manhole joint sealing and load transfer and STUVA recommendation for the use of sealing frame in segmental linings”



**Mr. Benoit de Rivaz** is Civil Engineer from University Paris VI and Post Graduate of “Center of higher studies on reinforced and prestressed concrete” presently he is working as Global Tunneling Manager - Building Products, NV Bekaert

Since more than 10 years he is working with Bekaert in the Research and Development of Dramix in tunneling application. Before that for almost ten years he worked for a Main French Contractors as job site engineer for tunneling project in different international project.

He is Member of various international comitee as AITES (WG12 on spray concrete), ITA-CET foundation, AFTES (working group on precast segment), Efnarc (executive committee), Asquapro (spray concrete committee), ITA-TECH AG leader on precast segment. Benoit de Rivaz has published many technical papers in different international conference.



**Dr. Ravindra Gettu** is a Professor of Civil Engineering at the Indian Institute of Technology Madras, Chennai since 2004. He graduated from the Government College of Technology, Coimbatore, with B.E. (Honours) degree in Civil Engineering from the University of Madras. He later studied in the USA and obtained an M.S. degree in Civil Engineering from Marquette University, Milwaukee, and a Ph.D. degree in Structural Engineering from Northwestern University, Evanston. In 1990 he moved to Barcelona, Spain, and became the Director of the Structural Technology Laboratory of the Universitat Politècnica de Catalunya in the School of Civil Engng. of Barcelona. He was recognised as Doctor Ingeniero de Caminos, Canales y Puertos (equivalent to Doctor of Civil Engng.) by the Spanish Ministry of Education in 1998. The areas of research of Dr. Gettu have been fracture mechanics of concrete and rock, nonlinear behaviour of cement-based materials, high strength concrete, fibre reinforced concrete, self compacting concrete, and the effective use of chemical admixtures. In these and related areas, he has co-authored more than 350 publications, of which about 60 are peer-reviewed journal papers. Some of the awards that he has received are the Outstanding Concrete Technologist Award of the Indian Concrete Institute, 2010; José Torán Award of the Spanish National Committee on Large Dams, 2002; Japan Concrete Institute JCI-OWICS (Our World in Concrete & Structures) Award, 2002; School of Civil Engineering (Barcelona) Award for Outstanding Achievements, 2003; and the Gaspar de Portolà Fellowship awarded by the Generalitat de Catalunya in collaboration with the University of California, 2004. He has been active in RILEM, the International Union of Laboratories and Experts in Construction Materials, Structures and Systems based in France, and is currently the Chair of its Technical Activities Committee. He is also an Associate Editor of the ASCE Journal of Materials in Civil Engineering and the Materials and Structures Journal, and is on the editorial boards of several other journals.



**Mr. Navneet Narayan** is the Technical Manager at Bekaert responsible for application and design related functions of the product portfolio of Building Products business unit of Bekaert, the largest steel wire manufacturing company in the World. An expert in Fibre Reinforced Concrete Technology, he currently oversees this function in India, Srilanka and Bangladesh. Prior to joining Bekaert, Mr. Navneet worked in Gilsanz Murray Stefick at Los Angeles as a structural designer. He holds a Master’s Degree in Civil Engineering from California Institute of Technology, USA and a Bachelor’s Degree in Civil Engineering from Indian Institute of Technology Madras, Chennai. Professionally, his interests include structural design and analysis, innovation, application development and research on fibre technology.