

ISAB-2010 Foreword

Youshi Hong^{a*}, Federico M. Mazzolani^b, Fuping Gao^c

^a*LNM, Institute of Mechanics, Chinese Academy of Sciences, Beijing 100190, China*

^b*DIST – Department of Structural Engineering, University of Naples Federico II, P. le Tecchio 80, 80125, Naples, Italy*

^c*LHO, Institute of Mechanics, Chinese Academy of Sciences, Beijing 100190, China*

Archimedes Bridge (AB) i.e. submerged floating tunnel (SFT), is a kind of floating transportation passage which is submerged underwater to bridge water banks. As an innovative transportation technology, AB will become attractive in competing with traditional bridges and tunnels due to its economical and environmental advantages. However at the present time, there is still not an actual AB being built in the world.

The concept of AB was proposed for more than a century, and the researches and conceptual designs of AB with respect to several strait and lake areas were sporadically reported in the second half of past century. Due to scientific, technological and/or administrative uncertainties, such design projects were ceased or postponed.

In the promotion towards the realization of AB in the world, scientifically and technically, there are two essential aspects should be implemented. One is the performance of numerical simulations and experimental investigations in laboratory, which will provide useful premise for the design and the preparation of construction. Another is to build a full-scale AB prototype to show its feasibility for the world.

The progresses in such two aspects are deserved to be exchanged and disseminated world wide, such that the First International Symposium on Archimedes Bridge (ISAB-2010) was initiated to be held in Qiandao Lake, China during October 17-20, 2010. The location selection for the Symposium is due to the fact that the first Archimedes Bridge Prototype has been designed to be built in Qiandao Lake area. The initiation process of ISAB-2010 may be described somehow in detail.

On December 6, 2004, an agreement was signed between Institute of Mechanics, Chinese Academy of Sciences (IMECH) and Ponte di Archimede International S.p.A, Italy (PDA) to establish a Sino – Italian Joint Laboratory of Archimedes Bridge (SIJLAB) with the research teams from IMECH in Beijing and from “Federico II” University in Naples and Polytechnic of Milan. The symbolic output of this cooperation was the completion of the structure design of Archimedes Bridge Prototype (ABP) in Qiandao Lake, which was presented in the two reports by the Chinese team [1] and by the Italian team [2].

During the design cooperation and seminar exchanges between the two teams of SIJLAB, it was discussed and considered, from time to time, that to initiate and organize an international symposium on AB issues would be very helpful to promote the advances for the research and design of AB. This idea was reaffirmed by the representatives of the two teams in June last year in Trondheim at the 5th Symposium on Strait Crossings. We tentatively released this initiative at the SFT Workshop of the Symposium and received very positive response.

After further consideration and relevant arrangement, the information of ISAB-2010 was formally announced on the website (www.ISAB2010.com), clearly expressing that the aim of ISAB-2010 is to provide a global forum for

* Corresponding author. Tel.: +86-10-82543966; fax: +86-10-62561284.
E-mail address: hongys@imech.ac.cn

scientists, engineers and technicians around the world, who are involved or interested in researches and developments on the innovative technologies of AB, to share their research progresses and conceptual design advances, so that to discuss and improve the challenging issues of AB.

We notice that, when people are talking about AB, the following questions are frequently asked. What is the history of AB concept and related researches? Why there is still not a real AB being built in the world? Whether an AB solution is competitive? What are the new scientific and/or technologic problems involved in AB research and design? What are the essential factors dominating the stability and reliability of AB? ...

We are confident that the above questions will be answered, to some extent, from the presentations of ISAB-2010 and from the proceedings of ISAB-2010 as this issue of *Procedia Engineering*.

Finally, we would like to express our sincere appreciation to President Yongxiang Lu (Chinese Academy of Sciences) for his insightful idea of selecting Qiandao Lake as the location of AB and his great promotion towards the ABP project. We are also very grateful to President Elio Maticena (Ponte di Archimede International S.p.A, Italy) for his persistent stimulation towards the ABP project.

References

- [1] Fiorentino A, Mazzolani FM, Perotti F, et al. (Italian Team of SIJLAB). *Design Report of the Archimede's Bridge Prototype in Qiandao Lake (P.R. of China). Italy*. 2007.
- [2] Hong Y, Li J, Liang N, Ge F, Huang G, Gao F, Lin M, Chen W, Zhang S, Wu Y, et al. (Chinese Team of SIJLAB). *Report of Research and Design for Archimede's Bridge Prototype at Qiandao Lake, Institute of Mechanics, CAS*. 2007.