

FOR EDUCATION AND RESEARCH
IN GRADUATE SCHOOL OF ENGINEERING
HIROSHIMA UNIVERSITY

EDUCATION AND RESEARCH REPORT

(COVER Page)

Name : Dr François TOUTLEMONDE

Affiliation: Paris-Est University, IFSTTAR, Materials and Structures Department

Name of Host Scientists: Prof. Ryoichi SATO / Prof. Kenichiro NAKARAI

Period: From June 3, 2014 to June 4, 2014

Title of class which you educated:

Advanced Structural Concrete

Date: June 9, 2014

Signature:



François TOUTLEMONDE



1. Preparation

Following contacts with Prof. Ryoichi Sato dating back CONSEC'10 conference, and the subsequent visit in Paris of Prof. Sato and Prof. Mizobuchi in October, 2010, Dr François Toutlemonde had been invited by the Dean of the Graduate School of Engineering at Hiroshima University, to give 7.5 hours lectures (5 units) within the course “Advanced Structural Concrete” chaired by Prof. Sato in June 2011.

After this first experience, and further cooperation with Prof. R. Sato consisting in the joint organization of ConCrack3 Workshop in March 2012, participation into the JCI TC chaired by Prof. R. Sato on crack control of mass concrete with contributions on DEF risks, and organization of a technical visit in France on DEF-affected bridges for a JCI TC Delegation in March 2013, Dr F. Toutlemonde was invited again to Hiroshima University as a foreign lecturer within the course on Advanced Structural Concrete given by Prof. Kenichiro Nakarai.

The subject of the lectures had been agreed with Prof. R. Sato and Prof. K. Nakarai in an e-mail exchange dated March, 2014, after dates and practical details had been discussed during Dr F. Toutlemonde's visit in Japan for the Workshop on Concrete Sustainability given early in March 2014 at Kagawa University.

Based on Dr Toutlemonde's research experience at IFSTTAR, the lectures were intended to give complementary open-minding information to the students on active research topics, innovation concerning materials and concrete structures advanced design, as well as advanced durability approaches, with an international point of view. Slides were sent as .pdf files some days in advance to Prof. Nakarai's secretariat for preparing prints to facilitate understanding of the talk for students who might be not familiar with technical lessons given in English.

2. Lectures

Tuesday June 3, 2014, 10:30 – 12:00 (for Master & Bachelor – about 50 students)

Performance-based durability design of concrete structures

Tuesday June 3, 2014, 14:00 – 15:30 (for Master – 20 to 25 students)

Deleterious concrete expansive reactions and management of affected structures

Tuesday June 3, 2014, 15:45– 17:15 (for Master – 20 to 25 students)

Fiber reinforcement and improved performance of concrete tunnel lining

Wednesday June 4, 2014, 08:45 – 10:15 (for Master – 20 to 25 students)

A new concept of pre-bent beams using high performance concrete

Wednesday June 4, 2014, 10:30 – 12:00 (for Master – 20 to 25 students)

Ultra-high performance fibre-reinforced concrete: present developments in France



Fig. 1: Announcement of the special course



Fig. 2: First lecture (Master & Bachelor students) Fig. 3: 2nd lecture (Master students)

Announcement of the lectures had been done for students' information (written announcement visible in the corridors of the University, Fig. 1). Copy of the slides has been distributed to attending students so that simultaneous understanding of the lessons, given in English, is favoured. Except for the first lesson mainly due to time reasons and the high number of attendees (Fig. 2), the students were able to ask 5 to 10 questions during a 15 to 30 mn-discussion after the lectures (Fig. 3). Prof. Nakarai was able to translate the responses, given in English, into Japanese, which helped clarifying the main features. This phase has been appreciated. Questions were in general of high

significance with respect to the topic, the questions and answers helped précising ideas and students were in a more active position. From the students' reactions, although the type of lectures may significantly differ from their usual courses, it seems that the connection of the presentations with real issues, projects and innovative achievements has been considered attractive. Especially the presentations related to new materials and techniques stimulated a lot of well-focused questions.

3. Other scientific benefits and items of the visit

The following of the visit of Dr F. Toutlemonde to Japan on June 5-6 concerned a meeting of the JCI TC on mass concrete (revisions of the guidelines, including new provisions for prevention of Delayed Ettringite Formation), of which Dr F. Toutlemonde is a corresponding member, at JCI Headquarters in Tokyo, and participation to a Seminar organized by Prof. Ryoichi Sato (convenor of the JCI TC group) as a mid-term open Seminar of the former TC, with a 50 mn-lecture given by Dr F. Toutlemonde on the French experience in DEF affecting mass concrete structures (conditions of occurrence, performance tests and prevention, lessons from affected structures management). This seminar was attended by about 100 people.

During the visit, fruitful discussions on active innovations in concrete UHPFRC technology in Japan, on concrete structures and ageing (possibly nuclear) infrastructures management, and on international possible synergies to promote science-based provisions relatively to early age cracking control took place especially with Prof. K. Nakarai and Prof. R. Sato. This could result in a further jointly organized workshop (maybe in the series of ConCrack events, either in France or in Japan). Direct contact was also taken with Dr Yuichiro Kawabata from PARI to organize his visiting period at IFSTTAR from September 2014 to August 2016.

4. Impressions and comments

I was warmly welcomed by Prof. Kenichiro Nakarai into Hiroshima Civil Engineering Department and met some colleagues (Prof. K. Kawai) that I had only briefly met before during previous conferences. Although such a visit is demanding time for courses and lectures preparation and energy during the stay, it is a fruitful experience of mutual technical and scientific knowledge and understanding and should favour further cooperation. As an example Japanese visiting researchers have been welcome in IFSTTAR Materials and Structures Department, a discussion with Dr Watanabe was possible to prepare the next IFSTTAR-PWRI Workshop and common approaches could be found for better accepted standardization of good practice in concrete technology.