



Tailor-made Recycled Aggregate Concrete (TRAC)

By

Project Partners

*University of Plymouth, United Kingdom
Chalmers University of Technology, Sweden
Phranakhon Rajabhat University, Thailand
Ton Duc Thang University, Viet Nam
Shenzhen University, China*

Organized by
Shenzhen University

Date: Friday, 27 December 2019
Time: 9:00AM to 17.30PM
Venue: C501, Seminar Room
College of Civil and Transportation
Engineering, Shenzhen University

Abstract

Tailor-made Recycled Aggregate Concrete (TRAC) is funded by the European Union's Horizon 2020 research and innovation program under grant agreement NO.777823. The project lasts over four years (July 2018-June 2022), with the aim to tailor the properties of recycled aggregate concrete (RAC) for structural applications to promote the increased use of recycled aggregate concrete in civil infrastructure projects, particularly in marine environment which is currently restricted.

Workshop Agenda

Morning Session	
09:00-09:10	Introduction
09:10-10:00	Presentation 1: Chloride diffusion in recycled aggregate concrete (Professor Long-yuan Li, University of Plymouth, UK)
10:00-10:50	Presentation 2: New technologies applicable to recycled aggregate concrete and its structures (Professor Yu-fei Wu, Shenzhen University, China)
10:50-11:40	Presentation 3: Valorisation of in-situ soils and wastes from thermal power plants for manufacturing of construction materials (Dr. BUI Quoc-Bao, Ton Duc Thang University, Vietnam)
11:40-14:00	Lunch and rest
Afternoon Session	
14:00-14:50	Presentation 4: Improvement of ITZ in concrete with RCA by chemical activation agents (Professor Lu-ping Tang, Chalmers University of Technology, Sweden)
14:50-15:40	Presentation 5: Carbonation treatment for properties enhancement of recycled concrete aggregates (Dr. Bao-jian Zhan, Hong Kong Polytechnic University, Hong Kong, China)
15:40-16:30	Presentation 6: The present situation of the resourcefulization of the construction and demolition waste in Shenzhen (Dr. Tong Huang, Shenzhen University, China)
16:30-17:30	Open discussion

Presentation 1: Chloride diffusion in recycled aggregate concrete

Abstract – Chloride induced reinforcing steel corrosion is a worldwide problem. In order to prevent steel from corrosion one has to know how chlorides transport in concrete and what factors affect the chloride transportation in concrete. In his talk, Prof Li will show the recent progress in the research related to chloride transport in recycled aggregate concrete. Contents include the theoretical models to understand the mechanism of chloride diffusion, the experimental methods to obtain the diffusion and migration coefficients of chloride ions, and the micro- and macro-models of numerical simulations to investigate the factors influence chloride diffusion in recycled aggregate concrete.



Professor Long-yuan Li, University of Plymouth, UK

Bibliography - Professor Long-yuan Li (BEng, MSc, PhD, CEng, FIStructE) received his BEng, MSc and PhD degrees in 1982, 1984 and 1987 in China. After completed his PhD study, Professor Li worked as postdoctoral research fellow in Washington University, USA; Ruhr University, Germany; University College London, University of Liverpool, and University of Newcastle in UK. He started his academic career in Aston University in 1996 as Lecturer and then Senior Lecturer. He moved into University of Birmingham in 2008 and then University of Plymouth in 2011 where he was appointed as a Chair Professor of Structural Engineering. Professor Li's research interests cover cold-formed steel sections, durability of RC structures, new concrete materials, and fire safety of concrete structures. Professor Li was the Director of Research Centre for Advanced Engineering Systems and Interactions from 2012 to 2017, and the Research Coordinator for Engineering in the School of Engineering since 2013. Professor Li is the member of EPSRC Peer Review College, member of subcommittee of UK EPC (Engineering Professors Council) for Research, Innovation and Knowledge Transfer, and member of editorial board of "Magazine of Concrete Research" and "Cement and Concrete Composites" journals. Professor Li has published over 165 technical papers in research journals.

Presentation 2: New technologies applicable to recycled aggregate concrete and its structures

Professor Yu-fei Wu



Yu-Fei is currently a Professor in College of Civil and Transportation Engineering, Shenzhen University. He obtained his BSc in 1983 and MSc in 1986 from Zhejiang University, China. He received MEng from National University of Singapore in 1994 and completed his PhD in 2002 at the University of Adelaide, Australia. He has more than ten years of industry working experience in structural engineering as a professional engineer in consulting firms in China, Singapore and Australia and is a chartered professional engineer of New Zealand and Australia (FIEAust, CPEng, NER, MIPENZ). He worked in Shanghai Jiao Tong University from 1989 to 1992 as a lecturer, and Associate Professor in the Department of Architecture and Civil Engineering at City University of Hong Kong (2004-2015). Prior to joining Shenzhen University, he was Professor in Infrastructure Engineering in the School of Engineering at RMIT University in Australia. His research interests lie in the broad field of structural engineering, including concrete structures, structural design, composite structures, FRP structures and structural rehabilitation. Professor Wu has published more than 250 technical works, including 134 SCI indexed journal papers with an H index of 36 (Google Scholar) and 30 (ISI Web of Science). Professor Wu has received numerous research awards including the prestigious Moisseiff Award from American Society of Civil Engineers. Professor Wu is the sole or 1st named inventor of six US patents and numerous new structural theories and technologies, such as (1) the theorems for flexural design of reinforced concrete, (2) the experimental method that can directly measure shear strength components in RC member tests, (3) the compression yielding structural design approach to increase the ductility of RC members, (4) the experimental facility for concrete testing under passive 3-dimensional confinement stresses, and 5) the technology that can significantly increase the strength of rubberized concrete which facilitates the structural use of this material.

Presentation 3: Valorisation of in-situ soils and wastes from thermal power plants for manufacturing of construction materials

BUI Quoc-Bao

Sustainable Developments in Civil Engineering Research Group, Faculty of Civil Engineering, Ton Duc Thang University, Ho Chi Minh City, Vietnam



Dr. BUI Quoc-Bao received his PhD in 2008 at ENTPE (Ecole Nationale des Travaux Publics de l'Etat) Lyon, France. From 2008 to 2011, he continued at ENTPE as Posdoc researcher funded by Filiaterre company. From 2011 to 2016, he worked as Associate Professor at Polytech Annecy-Chambery, University Savoie Mont-Blanc, France. Since 2016, he has joined Ton Duc Thang University (Vietnam) as Associate Professor and Head Sustainable Developments in Civil Engineering Research Group. Dr. Bui's research interests cover non-conventional materials, soil-based materials, dynamic of structures. In the past recent years, he has been involved in several research activities related to chemical activations. He has published more than 50 research articles in international journals.

Presentation 4: Improvement of ITZ in concrete with RCA by chemical activation agents

Luping Tang, Chalmers University of Technology, Gothenburg, Sweden



Prof Tang received his PhD in 1996 at Chalmers University of Technology, Gothenburg, Sweden. Since then he has worked at SP Technical Research Institute of Sweden for 12 years and rejoined Chalmers since 2008 as professor and leader of research group for building materials. His main research interest is new types of cementitious materials and durability of concrete, especially chloride transport mechanisms and chloride induced corrosion of steel in concrete. In the past years he has been involved in several research projects dealing with greener cementitious materials including nano-technology and

chemical activations.

Presentation 5: Carbonation treatment for properties enhancement of recycled concrete aggregates

Dr. Bao-jian Zhan, Hong Kong Polytechnic University, Hong Kong, China



Dr. Zhan Baojian is currently a research fellow of the Department of Civil and Environmental Engineering at the Hong Kong Polytechnic University. He received his B.Eng and M. Eng in Material Science from Wuhan University of Technology, Wuhan, China and his Ph.D in Civil Engineering from the Hong Kong Polytechnic University. His research interests primarily include characterization and re-utilization of industrial by-products and solid wastes, design and testing of cement-based composites, and development of low-carbon building materials. So far, Dr Zhan has authored over 30 refereed journal papers (h-index = 15) and one book. He was invited to serve as reviewer for more than 10 leading international journals including Cement and Concrete Composites, Construction and Building Materials, Environmental Science and Technology, Journal of Cleaner Production, Journal of CO2 Utilization, etc. His research activities have been recognized by several awards, including Outstanding Paper Award at the 3rd International Conference on Sustainable Construction Materials and Technologies (2013, Kyoto, JAPAN), GE Foundation TECH Award (2013, by GE China Technology Center), CIC Innovation Award (2015, by Hong Kong Construction Industry Council), Bronze Award of Hong Kong Green Innovations Awards (2017, by Hong Kong Environment and Conservation Fund Committee).

Presentation 6: The present situation of the resourcfulization of the construction and demolition waste in Shenzhen

Mr. Tong Huang, Shenzhen University and China Earthquake Administration, China



Mr. Tong Huang is a joint PhD candidate from China Earthquake Administration and Shenzhen University. His research interest includes resourcfulization of the construction and demolition waste and structural application of recycled concrete.