The Issues and Discussion of Modern Concrete Science
Foreword

“Assuming boldly and proving cautiously” is a viewpoint of Mr. Hu Shi. The statement was once rather controversial in a political context. However, ‘assuming’ and ‘proving’ are just like Gan Jiang and Mo Xit which defend truth, they supplement each other and either one is dispensable. The author of this book—Mr. Wenke Yang, who has sought for truth and standard of concrete application science by means of lots of assuming and proving, has proposed queries on some traditional theories and common views of concrete application within the academia with 12 chapters. His insights into modern concrete theory are expounded later.

Concrete, which is called “Tong” in Chinese and proposed by structural expert Prof. Cai Fang-yin, implies man-made stone. At the present time, this kind of high effective artificial building material has been the foundation of city civilization and witnessed flourish and development of human society. Especially, for these years, with rapid social economy development of our country, consumption of concrete in China has accounted for half of the worldwide gross (estimated according to cement output all over the world). As a result, improvements in applicable and technological levels of concrete not only are beneficial to promoting industry innovation, but also contribute to defending disaster, saving energy and protecting environment, benefiting the broad masses of the people as well as serving for national strategy.

Though concrete has appeared for nearly 200 years, it still belongs to experimental science so far and has not entered a science stage yet. Certainly, as continuous advance of scientific level and theoretical cognition, we have reasonable ground to believe that this branch of learning will become better, approaching perfection day by day. It is the emerging of scholars like Wenke Yang that makes people have full confidence in the future of this applied science. In my humble opinion, whether the views listed in this book are right or wrong, partial cognition and practical exploration therein can provide a bull’s-eye for the concrete industry at least, so as to stimulate public discussion and let all flowers blossom together.

Of course, except for extremely valuable “assuming boldly” in this book, it is the spirit of proving cautiously of the author that moves me. After skimming through the whole text, readers may discover that profound theoretical foundation and
abundant practical experience are contained in this book. Just as he had narrated, ‘For 20 years, I have been experiencing in studying engineering technique during practice, and concrete, and have published academic papers in national influential magazines such as……’. This book mainly summarizes the author’s in-depth research on concrete scientific technology. Even if it cannot be regarded as a life work, it takes up most part of his life. The author has sharpened a sword for 20 years, how can this ideal, passion, achievement not move you?

In a noisy world nowadays, if a person can devote so much passion to icy and boring reinforced concrete for decades, the spirit is much more worth commending than content of this book. Hereby, it is earnestly requested that readers sincerely read the words in the book which are placed with massive painstaking efforts and enthusiasms.

Hong Shang-yuan
Preface

I would like to first thank Canadian ethnic Chinese Engineer Mr. Liu Songqing, who recommended the book to authoritative Springer Company passionately and suggested publishing the English edition of the book after reading. I wish to thank Mr. Chen Yinzhou (Prof. with Wuhan University of Technology) for his diligent efforts in translating the Chinese edition of the book into English. In particular, I would like to thank Miss Shen Li, who is a professional editor of Springer Company. It is her professional and careful work that makes this book to be published as early as possible.

Since concrete has been applied for nearly 200 years, research and innovations on concrete have been unceasing. Especially, in the recent two decades, world-shaking technical revolution has emerged in concrete technology. Cement production, application of admixture, mix proportion designed method, utilization of fly ash, and variation of construction technology, have changed greatly. However, theoretical research and summary on engineering technical experience are always hysteretic. This book comprises summaries on practice experiences in engineering, exploration on theoretical problems encountered while working across the whole of China, and personal experiences in more than 20 different projects located from East to West China and South to North China during over 20 years. The author hopes it can provide certain help and illusion to every readers.

Since this book was published by the well-known Tsinghua University Press in 2012, great interest has been aroused among concrete academic field at home and international Chinese-speaking world. A great number of professors and experts proposed enthusiastic opinions and suggestions, and the author accepted many of their excellent opinions and suggestions in the English edition of this book. I would like to express my deep appreciation to them.

Beijing
August 2013

Wenke Yang
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About the Author

Wenke Yang, male, senior engineer, vice manager of International Engineering Department of China Airport Construction Group Corporation. Majored in Civil Engineering, he graduated from Department of Architecture in Northern Jiaotong University. For over 20 years, he has been working in the construction field and has implemented many projects on house, bridge, tunnel, airport, pier in the field of railway, highway, civil aviation, and water conservancy. From Xinjiang to Shanghai and Hainan Island to Harbin, he has implemented various projects in over 30 provinces, cities, and autonomous regions in China.

During this period, he served as surveyor, technician, engineer, chief engineer, supervising engineer, chief supervising engineer, project manager, and project chief engineer. He also served as vice manager and manager of project management department, from the experiences of which he had accumulated a wealth of experiences in construction.

He has been interested in researching engineering technology especially concrete for 20 years. From 2003, he has contributed more than 20 articles in national influential magazines such as Concrete, Cement and so on, which win attention from the concrete scientific community in China.