Report on Specifying Concrete to EN 206 For Sustainability

by Ir. Chong Chee Meng

Ir. Chong Chee Meng obtained his Bachelors Degree in Civil Engineering from the University Science of Malaysia. He has over 10 years of experience in the design and construction of infrastructure, structure and geotechnical works in Malaysia and Vietnam. He is a committee member of CSETD.

The Civil and Structural Engineering Technical Division (CSETD) organized a half day seminar on 'Specifying Concrete to EN 206 for Sustainability – Constituent Materials, Strength, Consistence and Durability', held on 12 September 2015 at Armada Hotel. The speaker was Prof. Ir. Dr. Tam Chat Tim, who has published over 150 papers in international and regional journals and conferences, and conducted seminars and workshops annually in the past 45 years.

Ir. Hooi Wing Chuen of CSETD chaired the seminar which was attended by 35 participants from engineering consultants, contracting firms, government agencies, local authorities, and faculty members of local institutions of higher learning.

The seminar was divided into two sessions.

Session 1

In session 1, Prof. Tam briefly explained the history of the concrete design codes covering the older CP114, CP115 and CP116 to the current Eurocode 2. He then introduced the various code specifications governing the cementitious material. For cement, the governing codes are BS EN 197 Part 1-4. He reminded that other than cement, cementitious materials such as ground granulated blast furnace (GGBS), fly ash and silica fume could also be used to make concrete. The usage of these cementitious materials is specified in BS EN 15167, BS EN 450 and BS EN 13263 respectively.

"There are 27 products in the family of common cements specified in the Eurocode which can be divided into 5 main types: CEM I (Portland cement); CEM II (Portland-composite cement); CEM III (Blastfurnace cement); CEM IV (Pozzolanic cement); and CEM V (Composite cement)", Prof. Tam added. The code specifications for aggregate and water were later discussed.

Session 2

In session 2, Prof. Tam focused his talk on specifying concrete to EN 206 for strength, consistence, and durability. A host of elements to be considered when specifying concrete: the type of concrete; general requirements for design concrete; additional requirements for

design concrete; strength classes; consistence classes and exposure classes; conformity test; requirements for compressive strength; initial test; and finally identity test.

Specifically on the type of concrete (not provided for in EN 206), one should consider designed concrete, prescribed concrete, standardized prescribed concrete, self-compacting concrete and proprietary concrete. All in there are 16 concrete strength classes specified in EN 206, ranging from C8/10 to C100/115. As for consistence classes, he talked about the concrete slump, degree of compactability, flow and slump flow and viscosity. The concrete exposure classes preventing the corrosion induced by carbonation, chlorites from sea water, freeze/thaw attack and chemical attack were also discussed.

To ensure compliance of concrete compressive strength, the correct sampling and conformity testing need to be carried out. Before the talk ended, Prof. Tam briefly explained the difference between concrete initial testing and identity testing. (445 words)

Figure 1: The participants paying full attention to Prof. Tam lecture

Figure 2: Presentation of memento by Ir. W. C. Wooi to Prof. Tam