

To the editors of JSCE Concrete Committee Newsletter

The Japan Society of Civil Engineers is well known for its advanced outlook on the use of innovative materials, design and construction of Civil Engineering Structures. The JSCE Newsletters are therefore very valuable and informative on the Society's current thinking on concrete structures. The Newsletter No. 11 of October 2007 is particularly important in this respect as it deals with three very important topics.

Firstly, the use of repair materials is now very widespread in almost all parts of the world because of the growing deterioration and number of failures of concrete structures. The successful use of repair materials very much depends on clearly evaluating their strength and protective qualities as well as their limitations when exposed to real life environments. The "JSCE Standards on Test Methods of Repairing Materials for Concrete Structures" is therefore a very welcome document so that the test methods can be standardised, and indeed, critically assessed over a period of time to ensure their adequacy and appropriateness to screen repair materials.

The report of the Sub-Committee on Seismic Design of Concrete Structures (JSCE 329) is also very valuable as it is now certain that we need to design for seismic forces not only for new structures but also for repaired and strengthened structures. There is a paucity of performance data on the structural behaviour of repaired and/or strengthened structures when subjected to seismic forces, and this is a subject area that needs, in my view, some urgent attention from engineers.

Perhaps the most significant aspect of the Newsletter No. 11 is the Report on the JSCE Concrete Committee Forum on Concrete and Environment, held at Hiroshima University on 12 September 2007. Both Professor Koji Sakai, the co-ordinator of the Forum, and the Panelists are to be congratulated for focussing the environmental challenges faced by concrete and the construction industry. The Report emphasizes the need for Sustainable Development, Strategic Environment Assessment and Life Cycle Assessment at every stage in public project planning. Reports of this nature should be brought to the notice of everyone involved in the construction industry from the site labourer to the material scientist, design engineer and architect.

We all now recognise that we live in a troubled and difficult world – and in a rapidly changing world. All the present indications are that the 21st century will be the most challenging, in almost all aspects of human life on this planet, and to humanity as a whole. This Challenge will be especially formidable to the construction industry and to engineers, because we have the tools to eradicate poverty, and provide a decent Quality of Life to all mankind through the

provision of basic infrastructure to sustain life. The Challenges of Global Warming, Climate Change, Material and Energy Resources, Environment and Sustainable Living/Society will also demand fundamental changes to the education and training of civil/structural engineers, material scientists and architects in the 21st century.

It is in this context of the Report of the JSCE Concrete Committee Forum on Concrete and Environment that I would like to share, in all humility, some of my thoughts and ideas in the development of new technologies and systems towards a Sustainable and Durable Environmental Management of Concrete Materials and the Concrete Construction Industry.

The first of these two papers critically examines the background to the present world scenario of the concrete construction industry, and advocates a HOLISTIC approach to design and construction, integrating all aspects from conceptual design to completion and maintenance during service life. **The second paper** advocates a HOLISTIC DURABILITY DESIGN PHILOSOPHY – an integrated material and structural design strategy of “Strength through Durability” rather than of “Durability through Strength”, where materials are manufactured for “Durability” rather than for “Strength”, and structures are designed for “Ductility” and “Structural Integrity”. “Holistic Design” thus envisages a global approach to all aspects of concrete and construction technology from material selection, design, construction and maintenance to service life, integrating material characteristics and structural behaviour with in-situ field performance.

I hope that these two papers will provide the basis for future discussion and debate to charter the way forward for the concrete industry.

It will be wrong of me not to identify the Invited paper of Professor K Sakai titled “Environmental Design for Concrete Structures” published in the Journal of Advanced Concrete Technology of February 2005. I trust that this paper would also have received the wide circulation that it richly deserves.

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