

"Sustainability ... is a worldwide concern"

ICJ: Dear President*, we extend a hearty welcome to you on your visit to India during the second week of February 2003. For the readers of this Journal, can you briefly highlight the recent important trends in the USA in the design of construction of concrete structures?

TH: I think that there are two trends that are significant: First, some owners are starting to realise that funding is limited and that structures must last longer. Life-cycle costing is beginning to be seen as a critical step in the design process. Structures with extended warranties are becoming more common. Second, there has been a tremendous effort to market supplementary cementitious materials (silica fume, fly ash, GGBFS, and others) for a variety of reasons such as economics and durability.

ICJ: The phenomena of premature deterioration of concrete structures – which we understand, has assumed a serious proportion in the USA – has been a matter of concern for us too, especially in the coastal and other ag-

gressive environments in India. Can you please tell us how do you tackle this problem in the USA and what preventive steps are usually taken?

HS: The first step is to make owners realise that technology is available today to help extend the life of concrete structures in aggressive environments. The next step is con-

vince the owners that these technologies, while typically more expensive initially than current practices, can lead to a longer life for their structures. Finally, the contractors must be made to understand that construction practices may need to be changed. If you spend money for new ingredients for the concrete but use the same outdated construction practices, the money is wasted.

Mr Terence Holland



Mr Terence Holland is the President of American Concrete Institute (ACI). Previously, he was the vice president for the year 2000-2002. He has had a rich and varied experience in the fields of concrete and construction. After a long career with Corps of Engineers which he served in various capacities between 1968 to 1983, he joined Elkem Chemicals for a short stint and later was the director of engineering with Master Builders Inc. for nearly a decade. He was a consulting editor of *The Concrete Producer* and executive director of the Silica Fume Association. Mr Holland has been member / chairman of various Technical Activities Committees of ACI, for example, committees for silica fume, repair of concrete, measuring, mixing, transporting and placing. His special interest is in concrete construction and concrete materials. He has received a number of distinguished awards. In 1995, he received the Asbjorn Markestad award at the fifth CANMET/ACI international conference on the use of fly ash, silica fume, slag and natural pozzolans in concrete, for outstanding contribution to the use of condensed silica fume in portland cement concrete. In 1996, he was the recipient of the G. Brooks Earnest Lecture Award, presented by the Cleveland Section, ASCE, for outstanding contributions to civil engineering. In 1997, he has received the Delmar L. Bloem Distinguished Service Award, ACI for significant contributions and remarkable service as a technical committee member and chairman of ACI Committee 234.

*Mr Terence Holland has informed us that the views expressed here are his own personal views and not necessarily those of the ACI.

Ultimately, the key to extended service life is to reduce the permeability of the concrete. I see the use of individual supplementary cementitious materials or combinations of these materials as one of the primary approaches in this arena. Finally, the use of very low water content along with the appropriate water-reducing admixture plays a very important role.

ICJ: Isn't sustainability a critical issue for the concrete industry world over? What is ACI's policy in this regard and what steps has the organisation taken or is envisaging to take to achieve the objectives?

TH.: I have given talks on sustainability along the lines of my paper** in *Concrete International* in several countries. No one has yet said to me that the conditions that I am describing do not apply in their country. I conclude that sustainability, under the very broad definition that I use, is a world-wide concern.

ACI is just beginning to become involved in the area of sustainability. We have formed a Board Task Group under the leadership of Dr Mohan Malhotra. So far, the Task Group has organised one technical session at the most recent ACI convention in Phoenix. We also solicited papers for the issue of *Concrete International* that was devoted to sustainability. Personally, I'm not entirely sure what the role of ACI should be in the area of sustainability and have asked the members of the Institute, through my paper and presentations, what they think that we should be doing. Unfortunately, the response has been extremely limited.

**HOLLAND, TERENCE C., Sustainability of the concrete industry — What should be ACI's role? *Concrete International*, July 2002, Vol. 24. No. 7, pp. 35-40.

ICJ: We understand that you will be the main speaker in the two one-day seminars – one in Mumbai and the other in Delhi – on the theme of "High Performance Concrete and Life 365". Can you briefly tell us what is Life 365?

TH.: Life 365 is a computer program that tries to model the corrosion process in reinforced concrete. It allows a life-cycle determination of the cost and effectiveness of the

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various approaches for preventing corrosion. The program was developed by a consortium of the Silica Fume Association, Master Builders, W. R. Grace, and the Portland Cement Association. We have offered the program to ACI Committee 365 to become an industry model.

ICJ: Can the Life 365 program be applicable to conditions in India? What modifications are needed in the same for making it adaptable here?

TH.: The program does basic diffusion calculations, and this portion would not have to be changed. Most of the parameters in the various op-

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tions can be changed by the user, so they would be applicable to India. The location database that includes anticipated chloride loadings and annual temperature variations would have to be modified. However, these parameters

can also be entered manually, but this is a somewhat tedious process. If the members of the consortium agreed, the source code could possibly be made available to the appropriate industry group for use in India.

ICJ: You have been consistently saying that you would like to make ACI truly an international organisation. What steps are being initiated to achieve this goal?

TH.: ACI has recently reorganised our Board level committee that is responsible for our international activities. We have also contacted several other concrete organisations including Japan, New Zealand, Australia, China, Korea, Brazil, and Spain in an attempt to begin discussions on how we can all work together to share knowledge and reduce duplication of effort. It is ACI's position that we are willing to make almost any agreement with another organisation that will help the concrete industry. We are also examining our other Institute activities to determine how we can finance an expanded international role. After all, the funding must come from somewhere to do the types of things that we and our international partners would like to do.

One step that we have taken has been to change the requirements for participation on ACI technical committees as a voting member. Traditionally, the requirement has been that voting members must attend one meeting per year. The cost of international travel prohibits many capable individuals from joining our committees. This requirement has been relaxed such that attendance is no longer required. Voting members must participate by returning ballots and must take a role in document development. Participation can be accomplished through the internet. I hope that this change opens up our committees to much greater international participation.

ICJ: As in the USA, the concrete industry in India is unable to attract young talented engineers and supervisors. Any suggestions on this that we can follow here?

TH.: This is a particularly difficult question. For a number of reasons, civil engineering is not currently seen as an attractive field. The concrete industry is seeing the adverse results of this trend. One thing that we are trying in ACI is to establish a program of fellowships for college students interested in the area of concrete. These are competitive, substantial fellowships that include funding as well as travel to ACI conventions and mentoring. Past ACI President Dan Baker originated this program. So far, we have awarded fellowships to several students and we are currently raising money to make this a large, self-sustaining program. Obviously, this is a long term project.

As far as I am aware, there has not been any significant effort to try to understand why our industry is not attractive. Perhaps this area ought to be investigated.

ICJ: Today, India is the second largest cement producer in the world and with the speedy infrastructure growth program that is already under way, the concrete construction activity is bound to get a boost in coming years. Under such circumstances, what kind of mutually beneficial co-operations our two countries can have in this field? What role can the ACI play in this regard?

TH.: ACI has traditionally been the world-wide leader in defining concrete technology. I would hope and expect that India will take advantage of the technology that has been developed and that is re-

ported in the various ACI committee reports and other documents. Further, the members of ACI are usually more than willing to share their knowledge. This is a huge resource that you should not overlook.

ICJ: ICJ has been in the forefront in India during the last 75 years in the dissemination of knowledge in the fields of concrete, construction and civil engineering. This objective of ours matches well with that of the ACI. What kind of co-operation ICJ and ACI can have in the future to achieve this shared objective?

TH.: As I noted above, ACI is willing to consider almost any type of cooperative agreement that benefits the industry.

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