
Discussion Forum

INDUSTRIAL STRUCTURES: A critical review of IS 1893 (Part 4):2005 in relation to cement plant structures

To the Editor, ICJ

Dear Sir,

This has reference to the paper titled 'INDUSTRIAL STRUCTURES: A critical review of IS 1893 (Part 4):2005 in relation to cement plant structures' by Er. B.G.K. Murthy and Er. Kiran K. Madane, published in the September 2010 issue of The Indian Concrete Journal. I wish to inform you the following.

Before publishing a code, BIS circulates its draft among eminent engineers eliciting comments. A committee examines objections and suggestions received from those consulted before finalising the draft. Hence I feel that, if the authors had initiated action at the time of circulation of the draft code, BIS might have considered their suggestion. Now it is too late. In IS 1893 Part I itself, it is mentioned about Part 4 with remarks as under preparation.

Cement plants in our country have coal mill, coat storage yard, hot clinker etc., which are prone to fire hazards. Manufacturing cement is a continuous process

industry. Suppose, an earthquake strikes, structures housing fire hazard processes are likely to be damaged heavily. I think that is why BIS has given more than 1 as Importance factor.

For comparison, I request the authors to provide the following quantities both under earlier code and the revised code for a typical pre-heater tower

1. Volume of cement concrete [RCC]
2. Total tonnage of reinforcement rods
3. Total shuttering area

Thanking you,

Yours faithfully,

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The authors' reply

Dear Sir,

The authors thank the commentator for the interest shown in the paper. As desired, we would like to clarify as follows.

We agree that the Draft of Part-4 IS 1893 must have been circulated for comments. But as the Authors were fully engaged in designs of International projects, as per the International codes, there was no opportunity to use Part-4. Nevertheless, this Part-4 of the Code IS 1893 needs a review to have a practical approach for design of Industrial structures.

The Basic issue is that each type of structure serves different Industries; some are of hazardous nature and some non-hazardous. The process criticality and its importance depend on the particular process meant to be carried out by the concerned equipment, supported by a particular structure.

For example, material conveyors ($I = 1.75$ as per the code) are used in different Industries. But all materials are not of hazardous and dangerous nature. It would be uneconomical, if increased safety margins are kept uniformly for all the conveyor structures. Hence, instead of a global factor for all the conveyors structures, it would be more prudent to specify the factors as per the degree of Hazardousness of the materials being handled by the conveyors or in any type of structure. This is what all the International Codes recommend.

In cement plants, coal is being used as one of the fuel s. Any amount of safety factor will not help if explosions occur, as it would be difficult to specify one factor for

this. Accordingly, the equipment suppliers provide explosion vents etc. as a part of safety measures. Similarly, fire hazards are tackled in different ways which are already prevailing in the Industry. However, these do not warrant that higher factors are to be used for structural design, which lead to expensive structures.

Regarding construction quantities for different types of structures, these depend on the natural conditions of the site, Equipment suppliers' process design to suit the particular type of raw materials, production capacity, general arrangement, future requirements like installation of Hot discs, heat recovery system, etc. (Hot disc is an equipment used in cement plants to facilitate use of waste materials as fuel). Though a general trend can be given but actual quantities depend on many influencing parameters as mentioned.

Quantities of Concrete and reinforcement for a Preheater tower are already given in page 87 of the ICJ, September 2010. Shuttering varies from 2.4 to 2.9 m²/ m³ of concrete.

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