Stalemate over cement price focus attention on alternatives for reducing the use of cement without compromising on the strength of the structure, writes G.V. PRASADA SARMA

The stalemate over cement price increase has been continuing with builders and allied sectors forming a joint action committee and calling for a per- chase holiday for the third week in a row and cement manufacturers categorically ruling out rollback of the hike.

This focuses attention on alternatives for reducing the use of cement without compromising on the strength of the structure. Though construction sector dealing with engineering projects continuously tries to innovate, the practices in building construction still appear to be conventional.

For sustainable high performance, high cementitious content rather than high cement is required," says Shanthamathil Dan and N. Kalidas, Director General and Director respectively of Institute of Solid Waste Management and Ecological Balance (ISWERMED). Generally, for 50 MPa strength for cubic meter of concrete 400 kg or more of ordinary Portland cement (OPC) is used. Even if builders prefer 20 MPa strength they use between 250 and 350 kg of cement. But choosing a mix design, using fly ash and 12mm metal, and only 230 kg of OPC the durability can be increased more than three times and strength two times. The use of fly ash and admixtures will improve durability and strength and cost will be the same. However, cost could be reduced if mix design is changed, he points out. On their part builders have to spend time and energy to bring the fly ash. Mixing it properly using the right admixtures and the patience to supervise are essential, says Mr. Kalidas.

It is also important that builders display the work done using low cement and convince public about the benefits of using less cement and how it is an environment-friendly practice and helps in the beneficial use of fly ash, disposal of which has turned out to be a massive problem. Data should be developed for the purpose.

Raft foundation
To demonstrate the use of more cementitious materials and prove it on field, raft foundation of a commercial complex of a CBREDA member Nageshwar Rao was done at Visakhapatnam a few days ago. Mr. Rao was afraid that since a tank was nearby steel in the foundation might be corroded.

The foundation of 40 MPa strength was taken up with dynamic concrete. Mr. and Mrs. Das had spent two days in the laboratory and followed it up at the ready mix plant for the foundation work of the complex. Das also pointed out the reservations in using 12mm metal as aggregate. Many engineers are averse to using lower sizes in spite of advantages, he says, emphasising the need to change the mindset.

The permeability for OPC concrete is 4,000 Coulombs and it will be reduced to 1,000 in the dynamic mix. Dynamic concrete with 12 mm metal, 170 kg of cement, 500 kg of fly ash and admixture achieves strength of 43.9 MPa, Mr. Kalidas says giving an example. Dynamic concrete comes very close to self-compacting concrete.

A new method with foundation
For A. Nageshwar Rao, a builder, and CBREDA member of Visakhapatnam, the dynamic concrete made a case as a solution for the raft foundation of his commercial complex near a tank.

The tank being big sewage of water lowering coro- nel of steel is likely. He first came to know about fly ash bricks when he had attended a workshop organised by LETPC three years ago. However, he could not take any decision on his own hole of colleges
The concept of dynamic concrete has to be spread by Civil Engineering Department in colleges by creating models, Mr. Kalidas opines.