

NOTE ON RENOVATION OF FaL-G MANSION

FaL-G is the fly ash-lime-gypsum technology developed in 1990 to replace Portland cement in specified construction applications. In order to elate confidence in consumer segment, the inventors of this technology, Dr N Bhanumathidas and Mr N Kalidas have built their own house in 1991, known as FaL-G Mansion, where FaL-G was used not only as brick, block and mortar, but also as structural concrete. In order to give access to researchers they left the virgin structure free from puttying and paint for all these two decades. Now this structure is refurbished during which some more innovative material and applicational elements are added. No-Aggregate Concrete (NAC) is the predominant development with which a 10-feet dome was cast as a live demonstration.

Old Structure:

The ground floor slab was cast with fly ash-lime-gypsum concrete, without even a gram of OPC, using the mix design of 1.5:2.0:4.0 that had developed M15 to M25 grade concrete at different ages.



FaL-G Mansion using FaL-G as Structural concrete-1991

First floor onwards to the top, including 6 cu.m. overhead water tank, the structure was built with Portland:FaL-G in the ratio of 30:70; using the same as mortar, PCC and RCC.



FaL-G Mansion after expansion with two more floors-1994

Structure under Renovation:



In the refurbishing activity, the basic structure that has put on 20 years of life, made of FaL-G concrete, was not disturbed. During the reorientation of rooms and partitions, walls have been made of interlocking blocks containing 75% fly ash in the cementitious mix.



The mortar and concretes have been prepared containing 50 to 75% fly ash as cement replacement. Many of the beams and columns, including the overhead water tank of 12 cu.m capacity, have been cast with self-leveling concrete rendering M-50 to M-60 grade.

The no-aggregate concrete was prepared that contains no sand and chips. This mix contained 80% fly ash part of which has played the role of pozzolan and the balance worked as micro-aggregate rendering the engineering properties comparable or better than that of conventionally used fine and coarse aggregate. For using special chemical admixtures, the water to cementitious ratio is controlled at 0.18, but still the resultant mix attained pourable state.

As a demonstration for field level application for NAC, a dome of 10 ft. dia and 8.5 ft height was cast in-situ on the eastern face lift.



In another demo, a wall of 10 x 6 ft at 3” thick was cast in-situ using NAC that has given very smooth surface, to show the use of putty as redundant.



Cast in-situ wall with NAC – A field level demonstration



9-ft dia dome with FaL-G interlocking blocks as a demonstration structure

Another 9 ft dia dome was built with FaL-G interlocking blocks over the stair case block on the western elevation.

The renovated structure is expected to be ready by May 2010.