

Summary of Decisions of the Structural Engineering Committee
SEC HD-01/2010 held on 30.03.2010

(a) Case HD-01/2010

Issue: The use of Ground Granulated Blastfurnace Slag (GGBS) to partially replace cement in C45 concrete for the production of precast concrete

Recommendation: The use of Ground Granulated Blastfurnace Slag (GGBS) to partially replace cement, at a proportion of 35% of the total cementitious content, in C45 concrete for the production of precast concrete façade of a proposed pilot project.

Decision: Members endorsed the recommendation subject to the following conditions:-

1. GGBS shall be transported and stored in total enclosure in the precast factory
2. Production of precast façade shall subject to the following quality assurance/monitoring measures:-
 - (a) Purchaser's acceptance tests of GGBS at delivery in accordance with clause 13 of BS 6699 for verifying the physical and chemical properties before the production;
 - (b) Production Quality Control of GGBS before delivery to Chinese National standard GB/T 18046:2000 which is generally more stringent than BS 6699;
 - (c) An on-site trial mix to verify the attainment of 18-hour strength of 15MPa at demoulding in addition to the normal trial mix for each concrete grade as follows:
 - (i) Six test cubes will be prepared from a separate batch on each day for 3 days;
 - (ii) The workability of fresh concrete from each separate batch will be verified such that the variation of measured slump value shall be within 25% of the designed slump;
 - (iii) The 28-day compressive strengths of the 18 test cubes will be examined such that each individual cube shall be at least 7 MPa in excess of the grade strength and the average of all the test cubes shall be at least 14 MPa in excess of the grade strength;

3. Qualified supervision for precast concrete to include the use of GGBS at all stages, such as the use of steam curing at ambient temperature as agreed with the precast concrete manufacturer, checking the attainment of 18-hour strength of 15 MPa at demoulding etc., in the production of precast facades;
4. Continuous verification on the strength of the GGBS concrete by 28-day cube tests at the sampling rate as stipulated in the Code of Practice for Structural Use of Concrete 2004;
5. A quarterly verification on the limit of 3 kg/m³ for the total alkali content of the GGBS concrete;
6. Requirements stipulated in PNAP APP-143 (formerly PNAP 299).