Summary of Decisions of the Structural Engineering Committee
SEC 5/2009 held on 29.07.2009

(a) Case 5/2009

Issue: Use of mechanical couplers as equivalence of full strength welded splices

Recommendation: To accept mechanical couplers be used in any location as per full strength welded splices without being subject to the restrictions for laps and mechanical couplers stipulated in clauses 9.9.1.1(d) and 9.9.2.1(d) of the Code of Practice for Structural Use of Concrete 2004 (the 2004 Code) on the following conditions:

1. The couplers shall be tested in accordance with US standard AC 133 "Acceptance Criteria for Mechanical Connectors for Steel Bar Reinforcement" in local HOKLAS accredited laboratories (or overseas laboratories accredited by other accreditation bodies which have reached mutual recognition agreements with HOKLAS) to establish that the couplers comply with the requirements of Type 2 mechanical splices as specified in US Standard ACI-318 "Building Code Requirements for Structural Concrete";

2. The couplers shall also be tested in local HOKLAS accredited laboratories to establish that the couplers comply with the requirements stated in Clause 3.2.8.2 of the 2004 Code and the criteria that the coupled bar assembly tensile strength should exceed 287.5 N/mm^2 for grade 250 and 529 N/mm^2 for grade 460; and

3. Full test reports and quality assurance schemes from manufacturer and purchaser shall be submitted for BD's acceptance.

Decision:

1. Member considered that the following guidance as stipulated in the Commentary of ACI 318 R21.2.6 should apply:

   "If use of mechanical splices in regions of potential yielding cannot be avoided, the designer should have documentation on the actual strength characteristics of the bars to be spliced, on the force-deformation characteristics of the spliced bar, and on the ability of the Type 2 splice to be used to meet the specified performance requirements".

2. It is noted that the couplers would be used only in inter-storey columns and at 500mm and 900mm (staggering) above structural floor levels; and that zones of high potential plastic regions such as pile cap and transfer plate levels would be avoided;

3. Members noted RSE's interpretation of the commentary mentioned in paragraph 1 above where "couplers will achieve bar break" to comply with the requirements in the commentary;

4. The site sampling rate for cyclic Tension and Compression Tests should comply with the General Specification for Civil Engineering Work 2006 and the relevant provisions in AC85, in accordance with Clause 2.4 of AC133; and

5. Subject to the paragraphs above, Members endorsed the recommendation.