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Highways Department Technical Circular No. 2/2016

**Approval of Mix Design for Bituminous Materials for Roads
Maintained or to be Maintained by Highways Department**

This Circular updates and supersedes HyD TC No. 22/97 which is hereby cancelled.

2. For government road projects and road maintenance works that involve paving of bituminous materials for roads that are maintained or to be maintained by Highways Department (HyD), the Engineer for the Contract¹ shall ensure that the proposed mix designs of the bituminous materials for the Contract are in the list of provisionally approved mix designs for bituminous materials published on HyD website, before the Engineer carries out in-situ trials and approves the mix designs. Details of the approval process are given in the attached document.

3. Any query or request for clarification shall be directed to the Chief Highway Engineer/Research and Development.

(Original Signed)
(K. K. LAU)
Director of Highways

¹ "the Engineer for the Contract" shall be taken to include "the Project Manager for the NEC Contract" and "the Supervising Officer for the Design and Build Contract".

The Mix Design Approval Processes of Bituminous Materials for Roads Maintained or to be Maintained by Highways Department

Introduction

1. Bituminous materials are produced primarily from aggregates, bitumen and fillers. Unlike concrete used in construction for which the design essentially targets at the compressive strength, the design for bituminous materials for roads looks for a balance of performance in properties including deformation resilience, fatigue resistance, moisture damage resistance, durability and low temperature cracking resistance. This is done via mix design processes in which the amounts of their composition are manipulated, and the performance of mix designs is then tested by in-situ field trials:
2. For the mix design processes, Highways Department (HyD) implemented the Centralised Mix Design Vetting System since 1989 to achieve better quality assurance. With the System, the R&D Division of the Department together with the Public Works Laboratories organizes, witnesses and checks the mix designs of all the bituminous materials for roads that are maintained or to be maintained by HyD.
3. Before the Engineer approves a mix design for a bituminous material under his/her Contract for roads that are maintained or to be maintained by HyD, the Engineer shall ensure that the proposed mix design has gone through the mix design processes and has been provisionally approved by the R&D Division according to paragraphs 4 to 6 below.

Laboratory Testing and Provisional Approval of Mix Designs for Bituminous Materials for Roads

4. Bituminous material suppliers shall produce mix designs for bituminous materials for pavements, such as roadbase, base course, wearing course, polymer modified friction course, polymer modified stone mastic asphalt, etc. of roads that are maintained or to be maintained by HyD in accordance with their specifications.
5. As a part of the mix design processes, the bituminous material supplier shall carry out laboratory testing which shall be witnessed by the R&D Division or the Public Works Laboratories. The supplier shall then submit the report for the mix design to the R&D Division for checking on data correctness and compliance against the specification requirements. The R&D Division will consider including the mix design into the list of “Provisionally Approved Mix Designs for Bituminous Materials for Roads Maintained or to be Maintained by Highways Department” accessible on HyD website provided that the mix design satisfies all relevant requirements.

6. If the mix design does not comply with the specification requirements, all the steps specified in paragraph 5 above shall be repeated until full compliance is achieved.
7. To cater for possible change in properties of its raw materials with time, the validity period of a provisionally approved mix design is 3 years.

Approval of Mix Designs for Bituminous Materials for Roads

8. When the Contractor proposes to the Engineer a mix design for a bituminous material for roads maintained or to be maintained by HyD for approval, the Engineer shall check against the list of “Provisionally Approved Mix Designs for Bituminous Materials for Roads Maintained or to be Maintained by Highways Department” on HyD website to ensure that the proposed mix design has been provisionally approved by the R&D Division. If affirmative, the Contractor shall carry out in-situ trials to demonstrate to the Engineer satisfactory performance of the bituminous material produced according to the mix design. If these in-situ trials are satisfactory, the proposed mix design shall be deemed satisfactory.
9. If the mix design proposed by the Contractor in paragraph 8 above has not been provisionally approved by the R&D Division, the Engineer shall require the Contractor to follow the procedures specified in paragraphs 5 to 6 above to obtain provisional approval first.
10. When the Engineer is not satisfied with the performance of the bituminous material produced according to a provisionally approved mix design, the Engineer may seek technical advice from the R&D Division on the possible causes of the unsatisfactory performance and suitable modification to the mix design.