

**General Specification for Civil Engineering Works****2020 Edition****AMENDMENT NO. 1/2021****VOLUME 1****SECTION 9 CARRIAGEWAYS: SUB-BASE MATERIAL AND BITUMINOUS MATERIALS****DESIGN OF SUB-BASE MATERIAL AND BITUMINOUS MATERIALS**

- (a) Clause 9.09 **Replace** “Subject to the approval of the Engineer, the” **with** “The”, “may” **with** “shall” **and** “for” **with** “in” **in the first sentence of sub-clause (3).**

**Add** “Failure in designing and manufacturing a mix satisfying such requirements shall not be accepted as a valid reason for not incorporating RAP in bituminous roadbase material.” **after the last sentence of sub-clause (3)(a):**

**Add** “type of” **before** “bituminous” **and delete** “roadbase” **after** “bituminous” **in the last sentence of sub-clause (3)(b)(i).**

**Delete** “maximum” **before** “amount of RAP” **and add** “in the range of 10% to” **before** “15% by mass” **in sub-clause (3)(b)(iv).**

**Add the following new sub-clauses after sub-clause (3)(b)(iv):**

- (c) Notwithstanding the above clauses, the Contractor may propose for the Engineer’s approval for using bituminous roadbase material without RAP when there is a shortage of supply of RAP in the market.

(4) The Contractor shall appoint a Production Manager employed by the supplier as approved by the Engineer, certifying that the specified amount of RAP is added to the bituminous material according to the mix design. All certified documents shall be submitted bi-weekly to the Engineer for verification and record. The Production Manager shall be personally responsible to certify that RAP is added for the production of the recycled bituminous materials. He shall be an experienced person with at least seven years of experience in bituminous material production or having a recognized professional qualification such as MHKIE or equivalent. The bituminous materials incorporating RAP supplied by the supplier shall not be used if the Contractor fails to appoint the Production Manager.

(5) The Contractor shall work out and submit to the Engineer for approval a method statement to ensure that the RAP generated from existing pavements are delivered, stored and used with no contamination and minimum wastage in order to produce the bituminous materials incorporated with RAP as specified. The Contractor shall at all times facilitate the inspection by the Engineer on the production of recycled bituminous materials, storage and sorting facilities for RAP.

(b) Clause 9.10

**Replace sub-clause (2) with the following:**

(2) The Contractor shall use bituminous wearing course and base course materials incorporating reclaimed asphalt pavement (RAP) for carriageway works. The RAP and production of bituminous materials incorporating RAP shall comply with Clauses 9.09 (4) and (5). The specific requirements are as follows:-

- (a) Wearing course and base course materials incorporating RAP shall be designed, manufactured, laid and tested in accordance with the requirements for these materials using non-recycled materials or otherwise specified by the Engineer. Failure in designing and manufacturing a mix satisfying such requirements shall not be accepted as a valid reason for not incorporating RAP in bituminous wearing course and base course materials.
- (b) The RAP shall comply with the following:
  - (i) RAP shall be obtained from milling or excavation of existing bituminous pavements, and return loads from site and offcuts from bituminous layer joint preparation. Return load can include bituminous materials rejected from site. RAP shall be crushed and screened as necessary such that the maximum particle size is not greater than the nominal maximum aggregate size of the type of bituminous materials being produced and a reasonably well-graded and consistent mixture can be produced.
  - (ii) RAP shall be free of foreign materials such as unbound granular sub-base, broken concrete, or other contaminants.
  - (iii) RAP shall be stored in separate stockpiles before use. RAP that has been stockpiled for some time shall be reprocessed, where necessary, to ensure that it is in a free-flowing state at the time of use.
  - (iv) The amount of RAP allowable in the bituminous wearing course or base course materials shall be in the range of 20% to 30% by mass of the total mix. Separate mix designs shall be required for these materials incorporating RAP.
- (c) Notwithstanding the above clauses, the Contractor may propose for the Engineer's approval for using bituminous wearing course or base course materials without RAP when there is a shortage of supply of RAP in the market.

**Replace** “For design of bituminous wearing course and base course materials, the” **with** “The” **in the second sentence of sub-clause (4).**

**Delete** “The maximum amount of RAP allowable in the bituminous wearing course and base course materials shall be 15% by mass of the total mix. Separate mix designs shall be required for these materials incorporating RAP.” **in sub-clause (4).**

**Replace** “material” **with** “materials” **in the fourth sentence of sub-clause (4).**

**Quality Management & Standards Unit  
Civil Engineering and Development Department  
10 June 2021**