Appendix 3.3   Calculation of Dust Suppression Efficiency

Appendix 3.3: Calculation of Dust Suppression Efficiency

Equation (3-2) in the attached *Control of Open Fugitive Dust Sources Final Report* was adopted for estimating the dust suppression rates with the following assumptions:

p = Potential average hourly daytime evaporation rate = 0.23676 mm/hr

d = Average hourly daytime traffic rate per hour = 24/hr

i = Application intensity = 1.4 L/m²

Note:

(a)   p = 0.0049 x 48.31875 inch where 48.31875 inch is equivalent to the total evaporation of 1227.3 mm obtained from Hong Kong Observatory's website
(http://www.weather.gov.hk/cis/normal/1981_2010/normals_e.htm).
(b)   engineering estimate of approximately 8 vehicles on site at any one time
(c)   The assumptions provided above are for the purpose of assessment predictions only. Actual figures would be defined by the detailed design stage.

By applying the Equation (3-2) with the above assumptions,

Dust suppression efficiency = 100 – 0.8 x p x d x t / i

Dust suppression efficiency = 100 – 0.8 x 0.23676 x 24 x t / 1.4

where t = time between application, hr

Therefore,

For a water spraying frequency of 4 times per day, t = 10/4 = 2.5hr and therefore the estimated dust suppression efficiency is 91.7%.