Calculation of Watering Efficiency

With reference to Cowherd et al., "Control of Open Fugitive Dust Sources, EPA-450/3-88-008, U.S. Environmental Protection Agency, Research Triangle Park, NC, percentage of dust mitigation efficiency is calculated from Equation (3-2) :

$$C = 100 - \frac{0.8\,pdt}{i}$$

where

p = Potential average hourly daytime evaporation rate, mm/hour = 0.25916 [1]

d = Average hourly daytime traffic rate per hour = 60 per hour [2]

I = Application intensity = 1.6 L/m2 [3]

Note:

[1] p = 0.0049 x 52.8898 inch, where 52.8898inch is equivalent to the total evaoporation of 1343.4mm obtained from Hong Kong Observatory (http://www.weather.gov.hk/cis/normal/1971_2000/normals_e.htm)

[2] Estimated by Engineer

[3] The assumptions provided are for the purpose of assessment predictions only. Actual figures would be defined in the detailed design stage.

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

Dust suppression efficiency = 100 – 0.8 x (0.25916 x 60 x t) / 1.6 [t = time between application, hr]

Therefore,

For watering once per hour (i.e. t =1 hour), the estimated dust suppression efficiency is 92.1%.