[補充]

PCA for Highways

(Huang Textbook. P 235)

(1) Fatigue Equation recommended by PCA (Packard and Tayabji, 1985)

For $\sigma/S_c \geq 0.55$, $\log N_f = 11.737 - 12.077\left(\frac{\sigma}{S_c}\right)$

For $0.45 < \sigma/S_c < 0.55$, $N_f = \left(\frac{4.2577}{\sigma/S_c - 0.4325}\right)^{3.268}$

For $\sigma/S_c \leq 0.45$, N_f = unlimited.

(S: 36 ~ 5)

(2). Fatigue Analysis (Huang Textbook. p 608.–609)

(a) Warping & Curling are excluded (∵ higher at the bottom ⇒ combined effect subtractive from load)

(b) edge stress (loading only)

(c) Truck load Placement ⇒ ① considering edge loading only and placing 6% of the total load repetitions at point edge

or ② use total number of repetitions for design but reduce edge stress to obtain same fatigue.

(※ Figure 12.10)

(d) 6% Truck encroachment ⇒ adjusting factor = 0.894

(3) Design Procedure (Huang Textbook. P 614)

(a) Design Tables and charts (equivalent stress)

Table 12.6 12.7 = edge stresses × 0.894 ※

(W/. or W/o concrete shoulder)

(b) axle load = ? to generate the stresses

18-kip load for single axles and 36-kip load for Tandem

(c) Concrete Modulus of Rupture

– reduced by 15% (one coefficient of variation)

– the increase in the modulus of rupture with age also incorporated.

(d) ~~the~~ dual and Tandem spacings as well as the tire contact pressure assumed by PCA is not known ~~~ (p615)

(e) It is not known how much gain in strength was assumed by PCA (p616)