NAME OF WORK :- ESTIMATE FOR STRENGTHENING & WIDENING FROM (3.75 MTR TO 7 MTR) ROAD FROM JAGAT JHAMESHWAR ROAD KM 67/0 TO 80/0 SH 32 A

Design of Cement Concrete Pavement

(As per IRC:SP:62-2004)

1 *Design Parameters*

(a) Location of Pavement : Rajasthan
(b) Design Period : 20 Years
(c) Design wheel load : 51 kN
(d) Soaked CBR value of existing soil of Subgrade : 5.00%
(e) Modulus of Subgrade reaction (k) : 28.00×10^{-3} $N/mm^2/mm$

(iv) Heavy Commercial Vehicle
(A) Trucks
Loaded

(g) Grade of CC Pavement : M 30 Grade Controlled Concrete

(h) Flexural strength (f_f) for 28 days : $0.70\sqrt{f_c}$
$0.7\sqrt{30}$
3.834 Mpa

(i) Flexural strength (f_f) for 90 days : 1.20x3.834=4.60 Mpa

(j) Modulus of elasticity for concrete (E) : $3.0x10^4$ MPa

(k) Poisson's ratio (μ) : 0.15

2 *Joint Spacing & Lane width*

(a) Slab length, or spacing between consecutive contraction joints (L) : 3.75 Mtr.
(b) Slab width, or spacing between longitudional joints (W) : 5.50 Mtr.

3 *Thickness of pavement*

(A) Taking 200 mm Trial thickness

(a) Edge Load Stress : From Fig. 4 of IRC : SP : 62-2004 Edge Load Stress for
$k = 0.0336\ N/mm^3$
= 2.90 Mpa

(b) Temperature Stress : (1) Temperature differential for Rajasthan for 150 mm slab is $12.5^{O}C$

(2) Radius of relative stiffness (l) '=

$$= \sqrt[4]{\frac{Eh^3}{12(1-\mu^2)k}}$$

$$= \sqrt[4]{\frac{3x10^4 \times 200^3 \times 10^3}{12(1-0.15^2)\ 33.60}}$$

= 780.00 mm

(3) L / l = 3750 / 780
= 4.80

(4) Bradbury's coefficient (C) = 0.834

(5) Temperature Stress (σt_e) = 1.60 Mpa

(C) Total Stress = Edge load stress + Temperature stress
= 2.90 + 1.60 = 4.50 Mpa
This is Less than the allowable flexural strength of concrete (4.60 Mpa)
So the thickness of 200 mm assumed is adequate

(अशोक कुमार उपाध्याय)
अधिशाषी अभियन्ता
सा.नि.वि. जिला खण्ड-प्रथम
उदयपुर

(ASHOK UPADHYAY)
EXECUTIVE ENGINNER
P.W.D. DISTT. DN. I UDAIPUR