Computation of Section Properties – Exodermic Deck

VT - Richmond Truss

DESIGN PARAMETERS

MAIN BAR TYPE = WT 4 x 5

Element	Height (in.)	Width (in.)	Weight (lbs/lin.ft.)	Area ($in.^2$)	Spacing (in.)	Moment of Inertia	Distance to Centroid from Grid Bottom (in.)
Main Bar	3.945	0.17	5.00	1.480	12	2.15	0.963
Punchout for distr	0.75	0.17			12		1.820
Shear Hole Size	0.75	0.17	0.43	0.128	12		3.320

note: Bottom of shear holes always at bottom of concrete
Ht of main bar embedded in concrete 1 in.

Concrete Component

Concrete thickness (in.) 4.5 after deducting 0.5 in. for future wear or milling
Concrete type Normal weight
Concrete weight 145
Concrete strength (f'_c) 4000
top rebar # 4 @ 4 in. o-c
bottom rebar # 4 @ 8 in. o-c

Determine the Modular Ratio, $n = E_s/E_c$

CASE 1, for all calculations other than for deflection, (AASHTO 8.15.3.4)

look up n in table given in AASHTO 10.38.1.3:
for f'_c = 4,000 psi,
n = 8

CASE 2, only for calculations of deflection (AASHTO 8.15.3.4)
E_s = 29,000,000 AASHTO 8.7.2

$$E_c = w_c^{1.5}\, 33\sqrt{f'_c} \quad \text{AASHTO 8.7.1}$$

E_c = 3,644,147
n = 8

for these calculation, use
n = 8