

Fatigue and Deflection only

Calculate Composite Centroid In Weak Direction - Positive Bending

Element	Actual Height of Element	Effective Height of Element **, **	Width of Element	Spacing of Elements IN C/C	Number of Elements per Foot	Actual Area	Transformed Area	Distance from Top of Section to Centroid of Element	
						A	A <sub>t</sub>	d	A <sub>t</sub> x d
Cross Bar 1	2.00	2.00	1/4	4	3	1.50000000	1.50000000	4.00000000	6.00000000
Cross Bar 2	0.00	0.00	0	10	1.2	0.00000000	0.00000000	3.00000000	0.00000000
Concrete**	5.50	5.500	12	12	1	66.00000000	8.25000000	2.75000000	22.68750000
Bottom Round	0.00	0.00	0	8	1.5	0.00000000	0.00000000	6.63960000	0.00000000
						0.00000000	0.00000000		
Σ							9.75000		28.6875

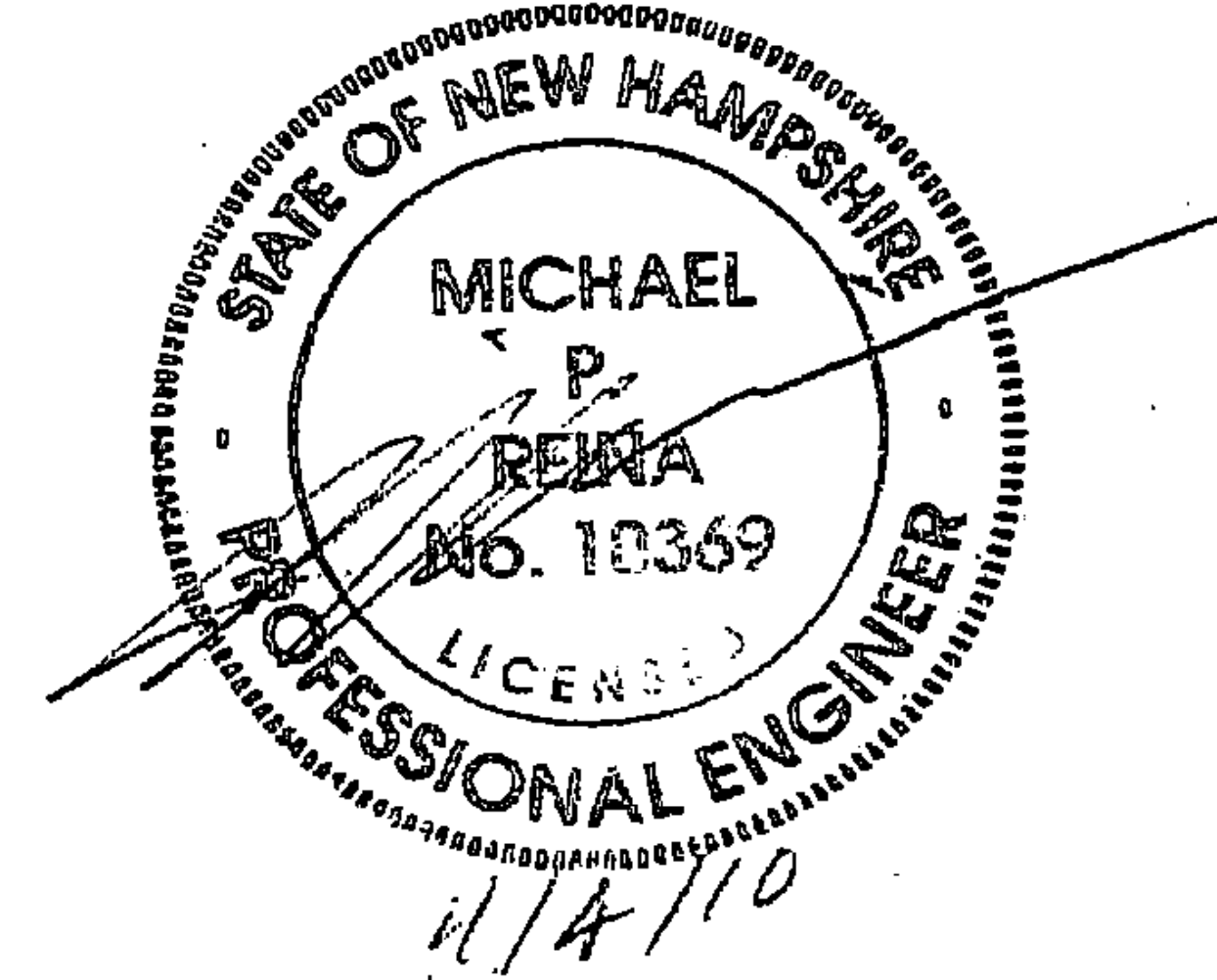
Centroid of Composite Section = y (measured from Top of Section) =  $\Sigma (A_t \cdot d) / \Sigma (A_t) =$  2.942307692 Taken as 2.94

\*\*Note : Effective Height of Concrete for fatigue and deflection per AASHTO 10.38.1.6

Calculate Composite Moment of Inertia - Positive Bending

Element	Distance from Centroid of Element to Composite Centroid (y)	Moment of Inertia of Element taken by itself	Transformed Moment of Inertia	Times Number of Elements (per ft.)	Transformed Moment of Inertia (per ft.)
	d'				A <sub>t</sub> * (d') <sup>2</sup>
Cross Bar 1	1.05769231	0.16666667	0.16666667	3	0.50000000
Cross Bar 2	0.05769231	0.00000000	0.00000000	1.2	0.00000000
Concrete	-0.19230769	166.37500000	20.79687500	1	20.79687500
Bottom Round	3.69729231	0.00000000	0.00000000	1.5	0.00000000
Σ					21.29687500

I<sub>g</sub> = Moment of Inertia for Composite Section =  $\Sigma (A_t \cdot (d')^2) + \Sigma (I_t) =$  23.28004808



Computation of Section Properties

Point of Interest	Location Relative to Top of Grid	Distance from Centroid to Point of Interest	Effective Section Modulus
Top of Concrete	0	2.94230769	63.29738562
Bottom of Grid	-8 3/16	-5.24469231	-4.43878243
Top of Grid	-3	-0.05769231	#####

\*\*Concrete is Transformed to Steel in Compression Areas and Ignored When in Tension

175 PRE FAB DECK PANELS