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_t	d	A_t 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) = $\Sigma (A_t * d) / \Sigma (A_t)$ = 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'	$A_t * (d')^2$	I.	I / n		I_t
Cross Bar 1	1.05769231	1.67806953	0.16666667	0.16666667	3	0.50000000
Cross Bar 2	0.05769231	0.00000000	0.00000000	0.00000000	1.2	0.00000000
Concrete	-0.19230769	0.30510355	166.37500000	20.79687500	1	20.79687500
Bottom Round	3.69729231	0.00000000	0.00000000	0.00000000	1.5	0.00000000
Σ		1.983173077				21.29687500

I_g = Moment of Inertia for Composite Section = $\Sigma (A_T * (d')^2) + \Sigma (I_t)$ = 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

STATE OF NEW HAMPSHIRE
MICHAEL P. REINA
No. 10369
LICENSED
PROFESSIONAL ENGINEER
11/4/10

175 PRE FAB DECK PANELS