

**For Strength Design Only**

**Calculate Centroid - Grid Only - Negative Bending**

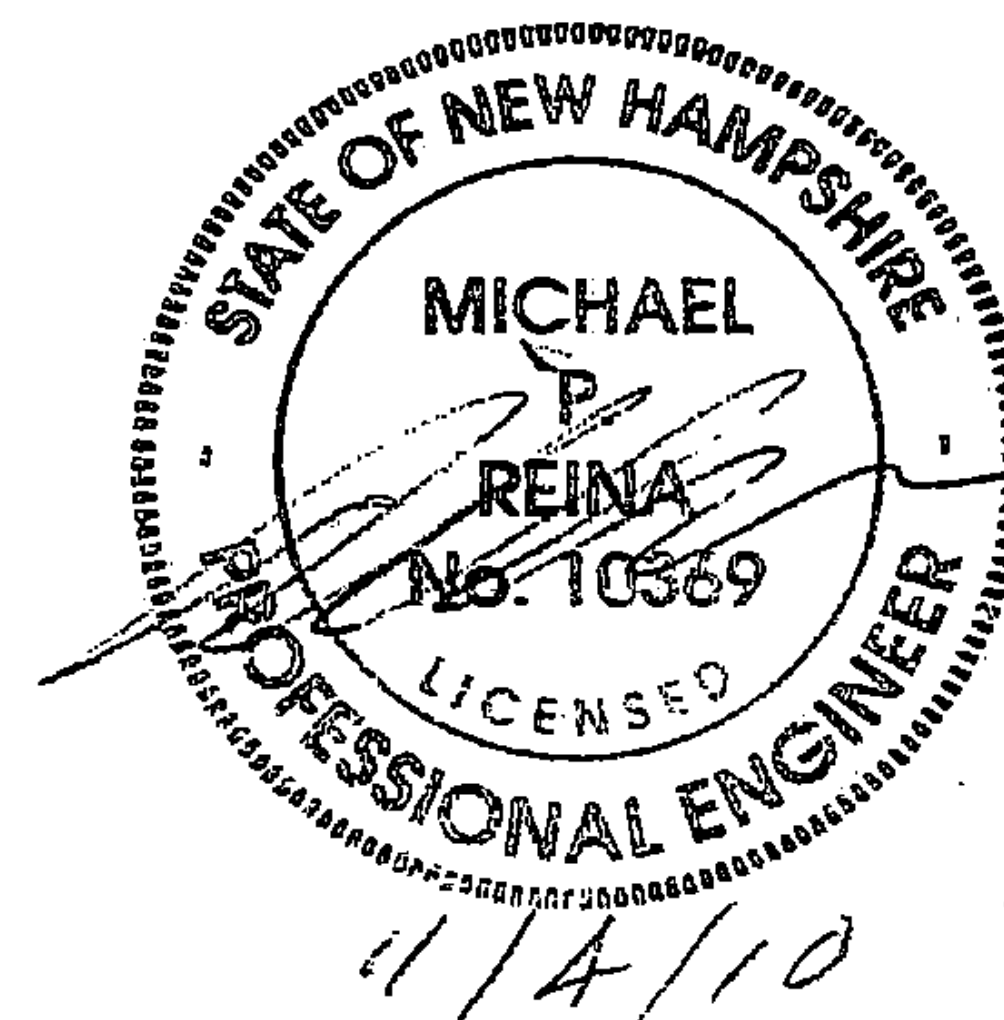
Element	Actual Height of Element	Effective Height of Element <sup>*,**</sup>	Width of Element	Spacing of Elements IN C/C	Number of Elements per Foot	Actual Area	Transformed Area	Distance from Bottom of Grid to Centroid of Element	
						A	A <sub>t</sub>	d	A <sub>t</sub> x d
Main Bar	5.187	5.187	N/A	12	1	1.63925700	1.63925700	2.18002363	3.57361899
Supplemental Bar 1	0.500	0.500	rebar	6	2	0.39269908	0.39269908	4.93700000	1.93875537
Supplemental Bar 2	0.000	0.000	0.000	3	4	0.00000000	0.00000000	5.18700000	0.00000000
						0.00000000	0.00000000	0.00000000	0.00000000
Top Punchout*	1.063	1.063	-0.187	12	1	-0.19868750	-0.19868750	3.71825000	-0.73876980
Bottom Punchout*	0.000	0.000	-0.187	12	1	0.00000000	0.00000000	1.54740000	0.00000000
Σ							1.83327		4.77360456

Centroid of Section = y ( measured from bottom of grid ) =  $\Sigma ( A_t \cdot d ) / \Sigma ( A_t ) = 2.603876272$  Taken As 2.6

**Calculate Moment of Inertia - Negative 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>	I	I / n		I <sub>t</sub>
Main Bars	-0.42385265	0.29449427	5.12489527	5.12489527	1	5.12489527
Supplemental Bar 1	2.33312373	2.13764423	0.00306796	0.00306796	2	0.00613592
Supplemental Bar 2	2.58312373	0.00000000	0	0.00000000	4	0.00000000
Top Punchout*	1.11437373	-0.24673586	-0.01869163	-0.01869163	1	-0.01869163
Bottom Punchout*	-1.05647627	0.00000000	0.00000000	0.00000000	1	0.00000000
Σ		2.185402634				5.11233956

I<sub>g</sub> = Moment of Inertia for Composite Section =  $\Sigma ( A_t \cdot ( d' )^2 ) + \Sigma ( I_t ) = 7.297742195$



**Computation of Section Properties**

Point of Interest	Location Relative to Bottom of Grid	Distance from Centroid to Point of Interest	Effective Section Modulus
Bottom of Grid	0	-2.60387627	2.80264553
Top of Grid	5.187	2.58312373	-2.82516169
Form Pan	2.687	0.08312373	-87.79373039
CB Weld	4.1875	1.58362373	-4.60825515

\*Punchout is Ignored in Compression Areas and Subtracted When in Tension

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

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