Computation of Section Properties -- GRID ONLY

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
Main Bar	3.945	0.17	5.00	1.480	12	2.15	0.953
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: Shear holes always start 0.25 in. down from top of T
Ht of main bar embedded in concrete 1 in.

Calculate Centroid

Element	Actual Height of Element	Effective Height of Element (Concrete above N.A.) See note.	Width of element	Spacing of Elements c-c (in.)	Number of Elements (per ft)	Actual Area	Trans-formed area (A/n)	Distance from bottom of grid to horiz. centroid of element	
						A	A_t	d	A x d
Main Bars	3.945	3.945		12	1	1.480	1.480	0.953	1.410
Punchout for distr	0.75	0.75	0.17	12	1	-0.128	-0.128	1.820	-0.232
Shear Hole Size	0.75	0.75	0.17	12	1	-0.128	-0.128	3.320	-0.423
Σ:							1.225		0.755

Centroid of composite section = y (measured from bottom of grid) = $\Sigma(A_t{*}d)/\Sigma(A_t)$ = **0.616**

Calculate Moment of Inertia

Element	Distance from centroid of element to composite centroid (y)		Moment of Inertia of element taken by itself	Trans-formed Moment of Inertia	Times Number of elements (per ft.)	Trans-formed Moment of Inertia (per ft.)
	d	$A_t \times (d)^2$	I	I/n		I_t
Main Bars	0.337	0.168	2.150	2.150	1	2.150
less punchout hol	1.204	-0.185	-0.005	-0.006	1	-0.006
less shear hole	2.704	-0.932	-0.006	-0.006	1	-0.006
Sums		-0.949				2.139

I_g=Moment of Inertia for Composite Section= $\Sigma(A_t \times (d)^2) + \Sigma(I_t)$ = **1.189**

Calculate Section Modull

Point of Interest	Location relative to bottom of grid	Distance from centroid to point of interest	Effective Section Modulus
Top of Main Bearing Bar	3.945	3.329	0.36
Bottom of Shear hole	2.945	2.329	0.51
Top of Distribution Bar	2.945	2.329	0.51
Top of Weld	2.945	2.329	0.51
Top of Punchout	2.195	1.579	0.75
Bottom of Steel Grid	0	-0.616	-1.93