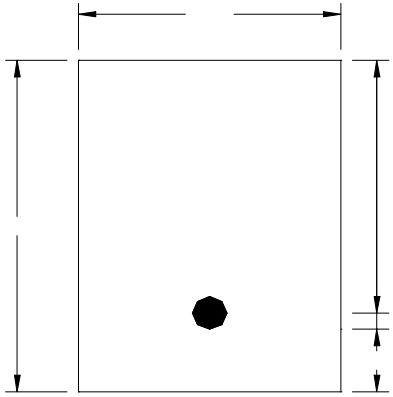
6"x8" LINTELS

Design Data

f'_c = 3,000 psi (minimum)

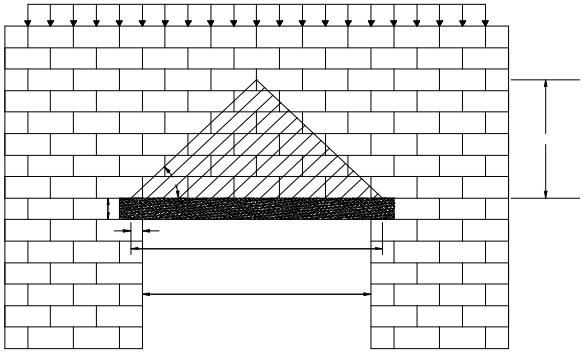
f_y = 60,000 psi (per ASTM-A615)

Average weight per linear foot of beam - 41 lbs.



Load Calculation

As a minimum, the lintels carry the apex area above the span. For example:



Given:

6" block weight = 32 psf (Hollow)

Equivalent load of apex area = .33WL

Effective span "L_2" of lintel (centerline of bearing to centerline of bearing).

Example:

Equivalent apex load for 6"x8" lintel with an effective span of 48"

Apex Load = (.33) (W) (L) = .33 (32 psf) (48")(1'/12") = 42.2 lbs./ft.

W_u = (Apex Load + Lintel Weight)(1.4) = (42.2+41)(1.4) = 116.48 lbs./ft.

Capacity of 6"x8" lintel with an effective span of 48" (from load table) = 788 lbs./ft.

Therefore, the lintel has significant excess capacity. If superimposed loads are located within the apex area, then refer to the load tables to ensure sufficient capacity.

Reinforcement	Top	Not Required						1#3																					
	Bottom	1#3					1#4	1#3										1#4		1#5									
Nominal Lintel Length	(inches)	32	36	40	42	44	48	54	56	60	64	66	72	78	80	84	88	90	96	102	104	108	112	114	120	128	132	136	144
Masonry Opening L_1	(inches)	16	20	24	26	28	32	38	40	44	48	50	56	62	64	68	72	74	80	86	88	92	96	98	104	112	116	120	128
Effective Span L_2	(inches)	24	28	32	34	36	40	46	48	52	56	58	64	70	72	76	80	82	88	94	96	100	104	106	112	120	124	128	136
Maximum Load W_u**	(lbs./ft.)	1555	1333	1166	1098	1037	923	811	778	718	666	643	583	533	518	491	467	450	420	389	381	365	351	345	326	289	268	248	215
Shear Strength V_u	(lbs.)	1555	1555	1555	1555	1555	1539	1555	1555	1555	1555	1555	1555	1555	1555	1555	1555	1539	1539	1522	1522	1522	1522	1522	1522	1522	1522	1522	1522
Bending Moment M_u	(ft.-lbs.)	2825	2825	2825	2825	2825	4911	2825	2825	2825	2825	2825	2825	2825	2825	2825	2825	4911	4911	7204	7204	7204	7204	7204	7204	7204	7204	7204	7204
Long-Term Deflection	(Inches)	0.001	0.002	0.003	0.003	0.004	0.005	0.008	0.009	0.011	0.014	0.016	0.021	0.027	0.030	0.035	0.041	0.043	0.054	0.069	0.077	0.095	0.115	0.126	0.165	0.198	0.206	0.211	0.224
Length / Deflection Ratio		24000	14000	10667	11333	9000	8000	5750	5333	4727	4000	3625	3048	2593	2400	2171	1951	1907	1630	1362	1247	1053	904	841	679	606	602	607	607

Design formulas per ACI 318-99

M_u = Maximum bending moment governed by ultimate strength = $\phi(A_s)(f_y)(d-a/2)$

V_u = Shear force governed by ultimate strength $\leqq$ 1/2 ϕ (2 `f'_c bd)

M_n = Moment generated by factored live and dead loads = 1/8 W_u $(L_2)^2$

V_n = Shear force generated by factored live and dead loads = 1/2 W_u L_2

Δmax = Maximum allowable deflection = L_2/600

** Maximum uniformly distributed factored load.

Design Notation per ACI 318-99

W_u = Factored load per unit length of beam

A_s = Area of tension reinforcement

d = Distance from extreme compression fiber to centroid of tension reinforcement

a = Depth of equivalent rectangular stress block as defined in 10.2.7.1

b = Beam width

ϕ = Strength reduction factor as defined in 9.3