

525-Block Shear.mcd

kip := 1000·lb

db := 0.75·in

Fy := 36· $\frac{\text{kip}}{\text{in}^2}$

Fu := 58· $\frac{\text{kip}}{\text{in}^2}$

hlsz := (db + 0.125·in)

Fv_blt := 21· $\frac{\text{kip}}{\text{in}^2}$

k := 2..10

nk := k

first_hl := 3·in

blt_spa := 3·in

l := 0..4

tw := 1·in

Number of rows of bolts

nk
2
3
4
5
6
7
8
9
10

cd_l := (0.75 + l·0.25)

cd_l
0.75
1
1.25
1.5
1.75

lv_l := first_hl - cd_l·in

lh := 2·in

$$Rbs_{k,l} := \left[(0.30 \cdot lv_l + 0.50 \cdot lh) + 0.30 \cdot \left[(n_k - 1) \cdot (blt_spa - hlsz) - \frac{hlsz}{2} \right] - \frac{hlsz}{4} \right] \cdot Fu \cdot tw$$

RESISTANCE TO BLOCK SHEAR TABLE (tw = 1")

lv_l
0.187·ft
0.167·ft
0.146·ft
0.125·ft
0.104·ft

	0	1	2	3	4
0	0	0	0	0	0
1	0	0	0	0	0
2	113.825	109.475	105.125	100.775	96.425
3	150.8	146.45	142.1	137.75	133.4
4	187.775	183.425	179.075	174.725	170.375
5	224.75	220.4	216.05	211.7	207.35
6	261.725	257.375	253.025	248.675	244.325
7	298.7	294.35	290	285.65	281.3
8	335.675	331.325	326.975	322.625	318.275
9	372.65	368.3	363.95	359.6	355.25
10	409.625	405.275	400.925	396.575	392.225
	2 1/4"	2"	1 3/4"	1 1/2"	1 1/4"

Rbs = ·kip

$$R_k := \frac{(2 \cdot n)_k \cdot Fv_blt \cdot \left(\frac{db}{2}\right)^2 \cdot \pi}{kip}$$

$$tw_min_{k,l} := \frac{R_k \cdot kip}{Rbs_{k,l}}$$

R_k
37.11
55.665
74.22
92.775
111.33
129.885
148.44
166.995
185.55

	0	1	2	3	4
0	0	0	0	0	0
1	0	0	0	0	0
2	0.326	0.339	0.353	0.368	0.385
3	0.369	0.38	0.392	0.404	0.417
4	0.395	0.405	0.414	0.425	0.436
5	0.413	0.421	0.429	0.438	0.447
6	0.425	0.433	0.44	0.448	0.456
7	0.435	0.441	0.448	0.455	0.462
8	0.442	0.448	0.454	0.46	0.466
9	0.448	0.453	0.459	0.464	0.47
10	0.453	0.458	0.463	0.468	0.473

tw_min =