

ADOPT #5 @ 12" ON CENTER ($A_s = 0.31 \text{ SQ.IN/FT}$).

MAX SPACING: $\text{MIN}(3 \times 12, 18) = 18 \text{ IN}$. 12" O.C. IS SATISFACTORY.

STEP 4: SHEAR CHECKS

A) ONE-WAY SHEAR

AT $D = 8.69 \text{ IN} = 0.724 \text{ FT}$ FROM COLUMN FACE:

$$V_u = 1473.3 \times (1 \times 0.276) \sim 406.6 \text{ LB/FT}$$

$$\phi V_c = 0.75 \times 2 \times \text{SQRT}(3000) \times 12 \times 8.69 \sim 8560.5 \text{ LB}$$

$8560.5 > 406.6$ (SATISFACTORY)

B) PUNCHING SHEAR

AT $D/2 = 4.345 \text{ IN}$, PERIMETER $B_o = 2 \times (3.5 + 8.69) + 2 \times (6 + 8.69) = 53.76 \text{ IN}$:

$$V_u = 1473.3 \times (6.25 - 1.244) \sim 7377.3 \text{ LB}$$

$$\phi V_c = 0.75 \times 4 \times \text{SQRT}(3000) \times 53.76 \times 8.69 \sim 76792.7 \text{ LB}$$

$76792.7 > 7377.3$ (SATISFACTORY)

STEP 5: REINFORCEMENT

REINFORCEMENT: 4 #5 BARS @ 12" ON CENTER EACH WAY (BOTTOM MAT, TOTAL 8 BARS)

COVER: 3" CLEAR AT BOTTOM

CONCLUSION: THE 30"X30"X12" FOOTING IS ADEQUATE FOR THE 3.5" X 6" COLUMN.

PROVIDE 4 #5 BARS @ 12" ON CENTER IN BOTH DIRECTIONS.