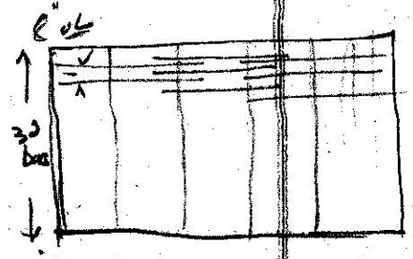
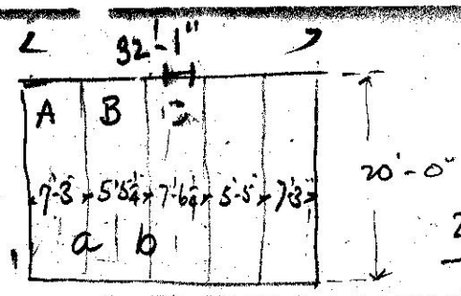
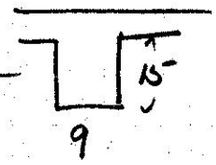




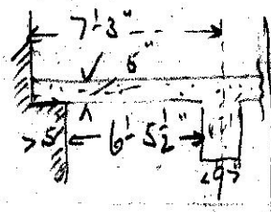
DAIRY FLOOR

20' 11" × 32' 11"



7-3
9
6-5½

Slab A



5" slab

Dead load - 63#

Live - 100

Total - 163# □'

Steel on hand

6	1¼"φ	23'-4"
4	½"φ	22'-0"
134	½"φ	12'-4"
30	⅜"φ	22'-0"

$M = \frac{wl^2}{10}$

$= \frac{163 \times 6.46 \times 6.46}{10} = 680'\#$

$A = \frac{680 \times 12}{16000 \times 3.5} = .1456$ □" steel per ft width.

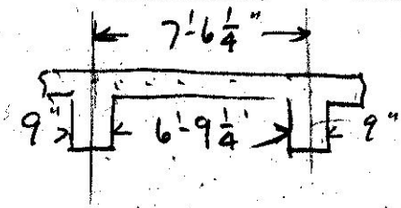
~~use ⅜"φ 8" oc~~

~~½"φ 7" o.c.~~

OK.

7-3
5 5¼
12-8¼

Slab C



7-6¼
-9
6-9¼

$M = \frac{wl^2}{12}$

$J = 3.5"$

$M = \frac{163 \times 6.77 \times 6.77}{12} = 623'\#$

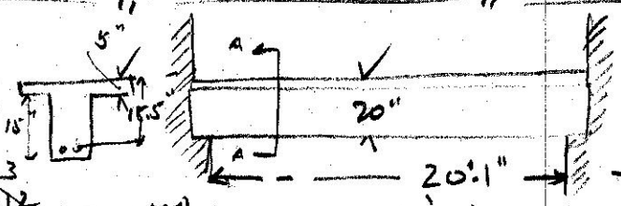
$A = \frac{623 \times 12}{16000 \times 3.5} = .134$ □"

~~use ⅜"φ 8" oc~~ ½"φ - 7" o.c.

12-4
7-6
4 10

2-.5

Beam "a"



188# per ft linear

3-7½
2 8½
6-4"

$M'' = \frac{\overset{10800}{\cancel{23,600}} \times 20.08 \times \overset{3}{\cancel{12}}}{\underset{2}{\cancel{8}}} = 712,000$

Dead load - wt of steel Beam = 1.25 × .75 × 20 × 150# = 2,820#

$A = \frac{712,000}{16000 \times 16.2} = 2.75$ □" reqd

Load imparted from slab

= 6.33 × 20.08 × 163 20,750

Total load = 23,570

use - 2 - 1¼"φ = 2.45 □"

" 2 - ½"φ = .39

Total = 2.84 OK.

$J^d = 18.5 \times .875 = 16.2$

Stirrups

Reaction =

$\frac{23,600}{2} = 11800$

20 × 9 × 50 = 9000

2,800

Shear in 1 double stirrup = 3,136 OK

6
7
-1
+2
+1

Beam "b"

$\frac{\overset{3000}{\cancel{24,000}} \times 20.08 \times \overset{3}{\cancel{12}}}{\underset{4000}{\cancel{8 \times 16000}} \times 16.2} = 279$ □" steel

6.47 × 20.08 × 163 = 21,200

use 1 - 1¼"φ = 1.227

10 ½"φ = 1.57

2.79 □" steel

use - 1 - 1¼"φ

6 - ½"φ

2675
456
23575
24,02