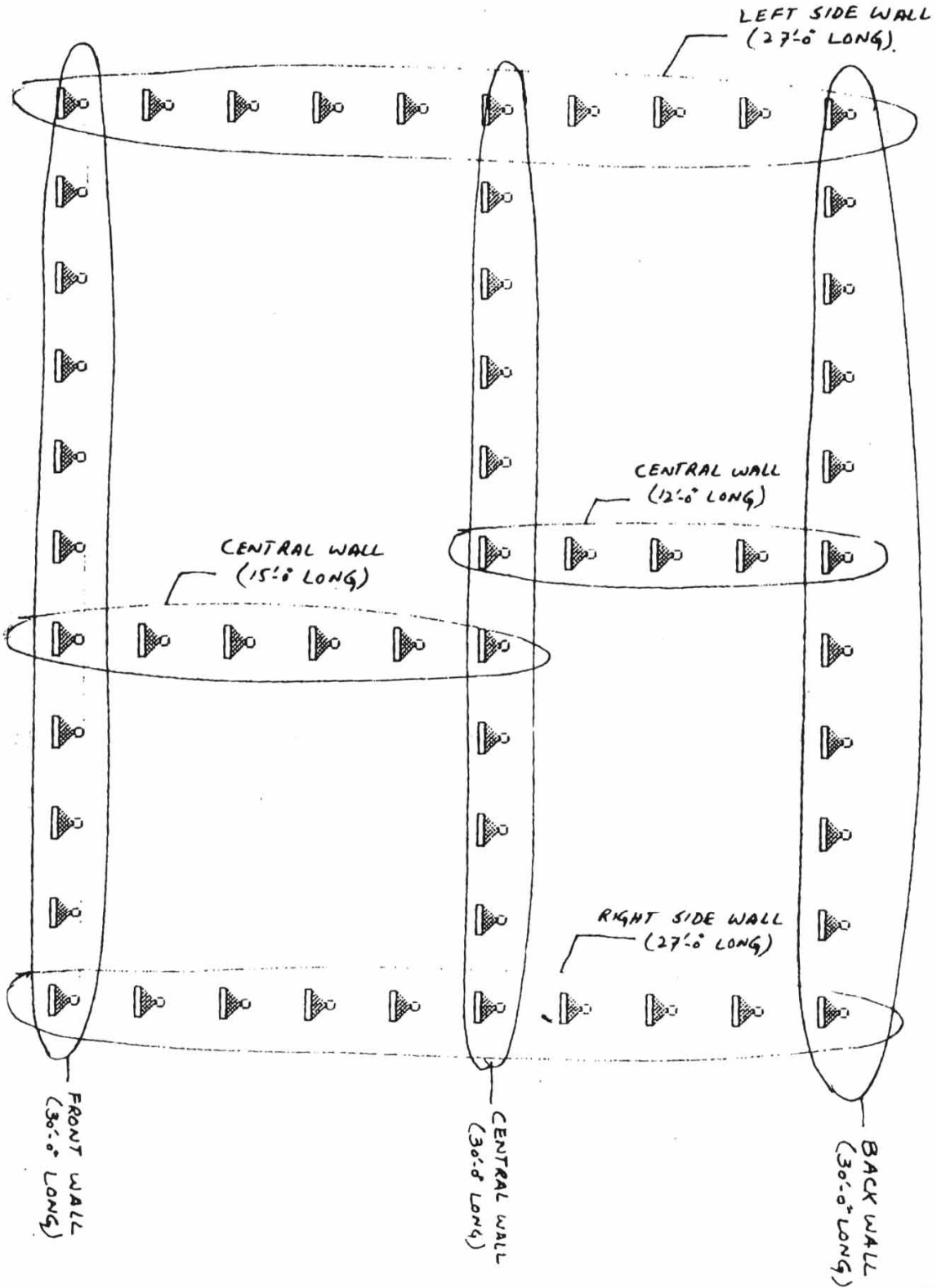


Y  
X



MAXIMUM MOMENTS INDUCED IN THE WALLS

| WALL DESCRIPTION AS PER PLAN      | ELEMENT NOS. | MOMENT-X IN TOP (k-ft./ft.) | MOMENT-X IN BOTTOM (k-ft./ft.) | MOMENT-Z IN TOP (k-ft./ft.) | MOMENT-Z IN BOTTOM (k-ft./ft.) |
|-----------------------------------|--------------|-----------------------------|--------------------------------|-----------------------------|--------------------------------|
| <b>BACK WALL</b>                  |              |                             |                                |                             |                                |
| GROUND FLOOR WALL (18"-THICK)     | 1-50         | 0.21                        | 0.21                           | 0.32                        | 0.05                           |
| FIRST FLOOR WALL (12"-THICK)      | 51-81        | 0.21                        | 0.21                           | 0.07                        | 0.04                           |
| <b>CENTRAL WALL</b>               |              |                             |                                |                             |                                |
| GROUND FLOOR WALL (18"-THICK)     | 81-130       | 0.27                        | 0.23                           | 0.23                        | 0.23                           |
| FIRST FLOOR WALL (12"-THICK)      | 131-160      | 0.29                        | 0.28                           | 0.07                        | 0.10                           |
| <b>FRONT WALL</b>                 |              |                             |                                |                             |                                |
| GROUND FLOOR WALL (18"-THICK)     | 161-210      | 0.29                        | 0.30                           | 0.06                        | 0.34                           |
| FIRST FLOOR WALL (12"-THICK)      | 211-240      | 0.26                        | 0.26                           | 0.05                        | 0.08                           |
| <b>LEFT SIDE WALL</b>             |              |                             |                                |                             |                                |
| GROUND FLOOR WALL (18"-THICK)     | 241-285      | 0.27                        | 0.27                           | 0.34                        | 0.05                           |
| FIRST FLOOR WALL (12"-THICK)      | 286-312      | 0.25                        | 0.26                           | 0.08                        | 0.04                           |
| <b>CENTRAL WALL (12'-0" LONG)</b> |              |                             |                                |                             |                                |
| GROUND FLOOR WALL (18"-THICK)     | 313-332      | 0.10                        | 0.17                           | 0.02                        | 0.02                           |
| FIRST FLOOR WALL (12"-THICK)      | 333-344      | 0.13                        | 0.19                           | 0.05                        | 0.05                           |
| <b>CENTRAL WALL (15'-0" LONG)</b> |              |                             |                                |                             |                                |
| GROUND FLOOR WALL (18"-THICK)     | 345-369      | 0.28                        | 0.24                           | 0.05                        | 0.04                           |
| FIRST FLOOR WALL (12"-THICK)      | 370-384      | 0.31                        | 0.29                           | 0.07                        | 0.07                           |
| <b>RIGHT SIDE WALL</b>            |              |                             |                                |                             |                                |
| GROUND FLOOR WALL (18"-THICK)     | 385-429      | 0.20                        | 0.20                           | 0.05                        | 0.32                           |
| FIRST FLOOR WALL (12"-THICK)      | 430-456      | 0.20                        | 0.20                           | 0.04                        | 0.07                           |

QTY OF STEEL REQUIRED. (GI Galvanised wires of  $f_y = 60 \text{ ksi}$ )

$$A_{st} = \frac{M (\text{k-ft}) \times 12}{f_y (\text{ksi}) \times l_a} \quad l_a = 0.85d$$

$$= \frac{M \times 12}{60 \times 0.85d}$$

$$= \frac{M}{4.25d}$$

FOR BACK, CENTRAL & FRONT WALLS (30' Long)

\* Ground Floor 18" thick wall

$$d = 17''$$

Max. Moment X (top)  $M_x(t) = 0.29 \text{ k'/ft.}$

$$\therefore A_{st} = \frac{0.29}{4.25 \times 17}$$

$$= 0.00401 \text{ in}^2$$

$$= 2.59 \text{ mm}^2 / \text{ft.}$$

Max. Moment X (bot.)  $M_x(b) = 0.30 \text{ k'/ft.}$

$$A_{st} = \frac{0.30}{0.29} \times 2.59 = 2.68 \text{ mm}^2 / \text{ft.}$$

→ Provide 17" wide two wires (2.3 mm dia), Strip at every course (12") with link wires of 2 mm dia fixed at 1'-0" intervals, to provide a binding force between the outer faces of walls. (Area provided ... 4.15 mm<sup>2</sup> on each face)



\* First Floor 12" thick walls

$d = 11''$

Max. Moment X (top)  $M_{x(t)} = 0.29 \text{ k-ft/ft}$

$$\begin{aligned} \therefore A_{st} &= \frac{0.29}{4.25 \times 11} = \\ &= 0.0062 \text{ in}^2/\text{ft} \\ &= 4.0021 \text{ mm}^2/\text{ft} \end{aligned}$$

Max. Moment X (bot)  $M_{x(b)} = 0.28 \text{ k-ft/ft}$

$$\begin{aligned} \therefore A_{st} &= \frac{0.28}{0.29} \times 4.0021 \\ &= 3.864 \text{ mm}^2/\text{ft} \end{aligned}$$

→ Provide 11" wide two wires (2.3mm dia) strip at every course (12") with links wires (2mm dia) fixed at 1'-0" intervals

\* AT Ends / Junctions of walls

B)

- Ground floor (18" thick)  $M_z = 2.14 \text{ k-ft/ft}$   
(Max)

$d = 30'-0" \times 12 - 2" = 358''$

As per table

(from RCC DESIGN HANDBOOK BY FINTEL)

min. free length of 18" thick wall =  $14 \times t = 21'-0"$

$\therefore$  Use  $d = 21 \times 12 - 2" = 250''$

$$A_{st} = \frac{2.14}{4.25 \times 250} = 0.002 \text{ in}^2$$

PROJECT BACIP Home Improvement  
SUBJECT G.I. Wire Mesh

$$= 1.30 \text{ mm}^2 / \text{ft width.}$$

→ Provide two wires (2.3 mm dia) strips at ends and at junctions.

— First Floor (12" thick)  $M_2 = 1.52 \text{ k-ft/ft.}$   
(max)

Max. free length of 12" thick wall =  $14t = 14'-0"$

$$\therefore d = 14 \times 12 - 2 = 166''$$

$$\therefore A_{st} = \frac{1.52}{4.25 \times 166} = 0.0022 \text{ in}^2 / \text{ft.}$$

$$= 1.39 \text{ mm}^2 / \text{ft width.}$$

→ Provide two wires (2.3 mm dia) strips at ends and at junctions.

FOR LEFT SIDE, CENTRAL & RIGHT SIDE WALLS (Lengths 27' / 15' / 12' / 27')

\* Ground floor 18" thick walls  $d = 17''$

$$M_x(t) = 0.28 \text{ k-ft}$$

$$A_{st} = \frac{0.28}{0.29} \times 2.59 = 2.5 \text{ mm}^2 / \text{ft.}$$

$$M_x(b) = 0.27 \text{ k-ft}$$

$$A_{st} = \frac{0.27}{0.29} \times 2.59 = 2.41 \text{ mm}^2 / \text{ft.}$$