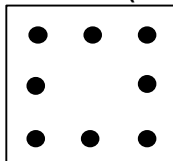


DIAGRAMAS DE FLEXION BIAxIAL

A. Columnas con 8 barras $f_y = 420 \text{ MPa}$ (1 - 16)

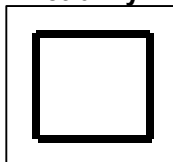
- 1 . $f_c = 20 \text{ MPa}$ $\gamma = 0.8$
- 2 . $f_c = 25 \text{ MPa}$ $\gamma = 0.8$
- 3 . $f_c = 30 \text{ MPa}$ $\gamma = 0.8$
- 4 . $f_c = 35 \text{ MPa}$ $\gamma = 0.8$
- 5 . $f_c = 40 \text{ MPa}$ $\gamma = 0.8$
- 6 . $f_c = 45 \text{ MPa}$ $\gamma = 0.8$
- 7 . $f_c = 50 \text{ MPa}$ $\gamma = 0.8$
- 8 . $f_c = 55 \text{ MPa}$ $\gamma = 0.8$



- 9 . $f_c = 20 \text{ MPa}$ $\gamma = 0.9$
- 10 . $f_c = 25 \text{ MPa}$ $\gamma = 0.9$
- 11 . $f_c = 30 \text{ MPa}$ $\gamma = 0.9$
- 12 . $f_c = 35 \text{ MPa}$ $\gamma = 0.9$
- 13 . $f_c = 40 \text{ MPa}$ $\gamma = 0.9$
- 14 . $f_c = 45 \text{ MPa}$ $\gamma = 0.9$
- 15 . $f_c = 50 \text{ MPa}$ $\gamma = 0.9$
- 16 . $f_c = 55 \text{ MPa}$ $\gamma = 0.9$

B. Columnas con Armadura Perimetral $f_y = 420 \text{ MPa}$ (17 - 32)

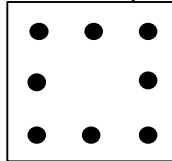
- 17 . $f_c = 20 \text{ MPa}$ $\gamma = 0.8$
- 18 . $f_c = 25 \text{ MPa}$ $\gamma = 0.8$
- 19 . $f_c = 30 \text{ MPa}$ $\gamma = 0.8$
- 20 . $f_c = 35 \text{ MPa}$ $\gamma = 0.8$
- 21 . $f_c = 40 \text{ MPa}$ $\gamma = 0.8$
- 22 . $f_c = 45 \text{ MPa}$ $\gamma = 0.8$
- 23 . $f_c = 50 \text{ MPa}$ $\gamma = 0.8$
- 24 . $f_c = 55 \text{ MPa}$ $\gamma = 0.8$



- 25 . $f_c = 20 \text{ MPa}$ $\gamma = 0.9$
- 26 . $f_c = 25 \text{ MPa}$ $\gamma = 0.9$
- 27 . $f_c = 30 \text{ MPa}$ $\gamma = 0.9$
- 28 . $f_c = 35 \text{ MPa}$ $\gamma = 0.9$
- 29 . $f_c = 40 \text{ MPa}$ $\gamma = 0.9$
- 30 . $f_c = 45 \text{ MPa}$ $\gamma = 0.9$
- 31 . $f_c = 50 \text{ MPa}$ $\gamma = 0.9$
- 32 . $f_c = 55 \text{ MPa}$ $\gamma = 0.9$

C. Columnas con 8 barras $f_y = 280$ MPa (33 - 40)

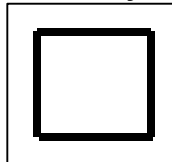
- 33 . $f_c = 20$ MPa $\gamma = 0.8$
34 . $f_c = 25$ MPa $\gamma = 0.8$
35 . $f_c = 30$ MPa $\gamma = 0.8$
36 . $f_c = 35$ MPa $\gamma = 0.8$



- 37 . $f_c = 20$ MPa $\gamma = 0.9$
38 . $f_c = 25$ MPa $\gamma = 0.9$
39 . $f_c = 30$ MPa $\gamma = 0.9$
40 . $f_c = 35$ MPa $\gamma = 0.9$

D. Columnas con Armadura Perimetral $f_y = 280$ MPa (41 - 48)

- 41 . $f_c = 20$ MPa $\gamma = 0.8$
42 . $f_c = 25$ MPa $\gamma = 0.8$
43 . $f_c = 30$ MPa $\gamma = 0.8$
44 . $f_c = 35$ MPa $\gamma = 0.8$



- 45 . $f_c = 20$ MPa $\gamma = 0.9$
46 . $f_c = 25$ MPa $\gamma = 0.9$
47 . $f_c = 30$ MPa $\gamma = 0.9$
48 . $f_c = 35$ MPa $\gamma = 0.9$

1.- FLEXION BIAxIAL EN COLUMNAS ARMADAS CON 8 BARRAS

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

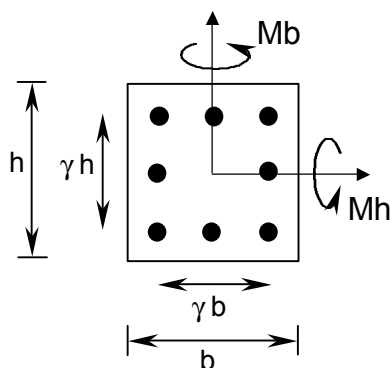
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

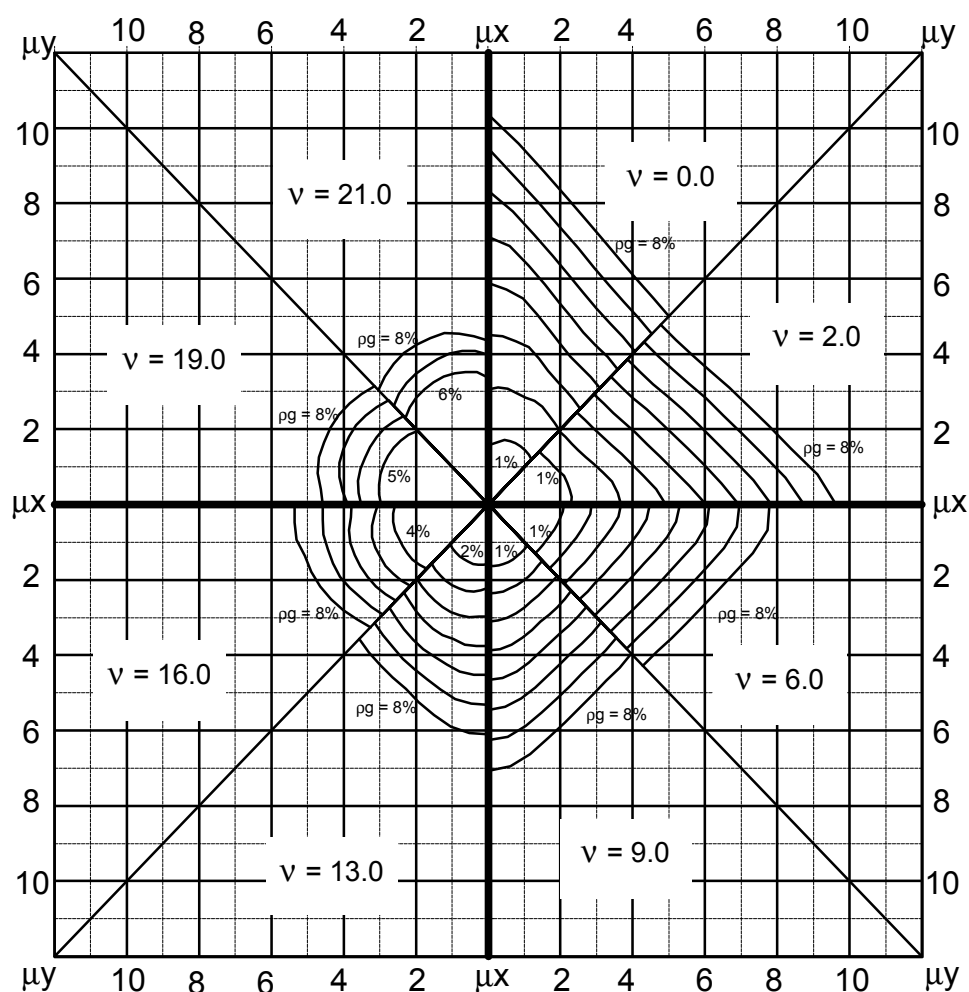


$$f'_c = 20 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.8$$

$$\Delta \rho_g = 1\%$$



2.- FLEXION BIAxIAL EN COLUMNAS ARMADAS CON 8 BARRAS

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

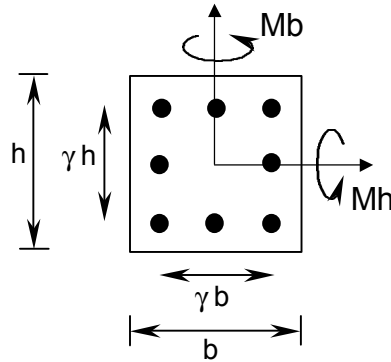
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

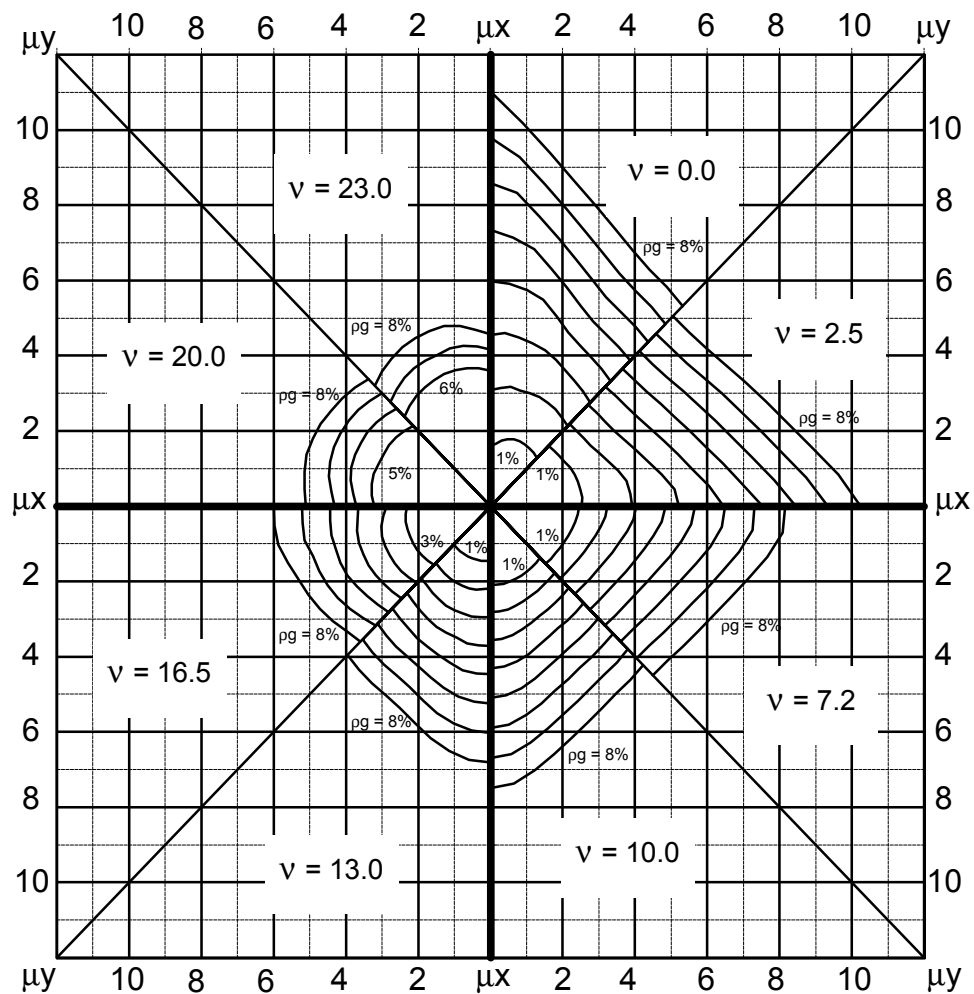


$$f'_c = 25 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.8$$

$$\Delta \rho_g = 1\%$$



3.- FLEXION BIAxIAL EN COLUMNAS ARMADAS CON 8 BARRAS

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

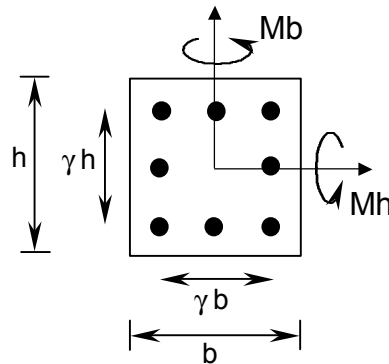
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

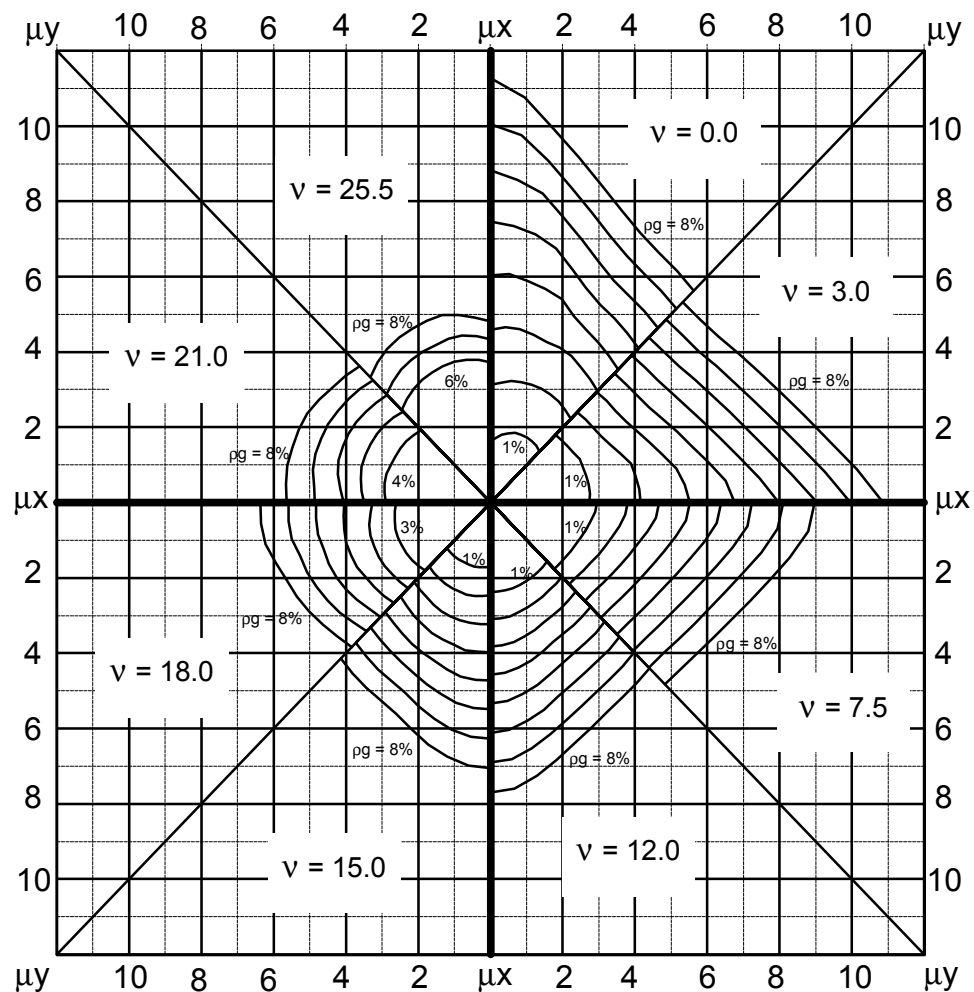


$$f'_c = 30 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.8$$

$$\Delta \rho_g = 1\%$$



4.- FLEXION BIAxIAL EN COLUMNAS ARMADAS CON 8 BARRAS

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

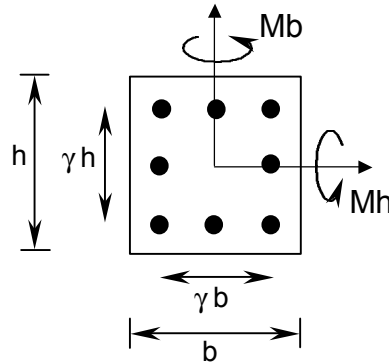
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

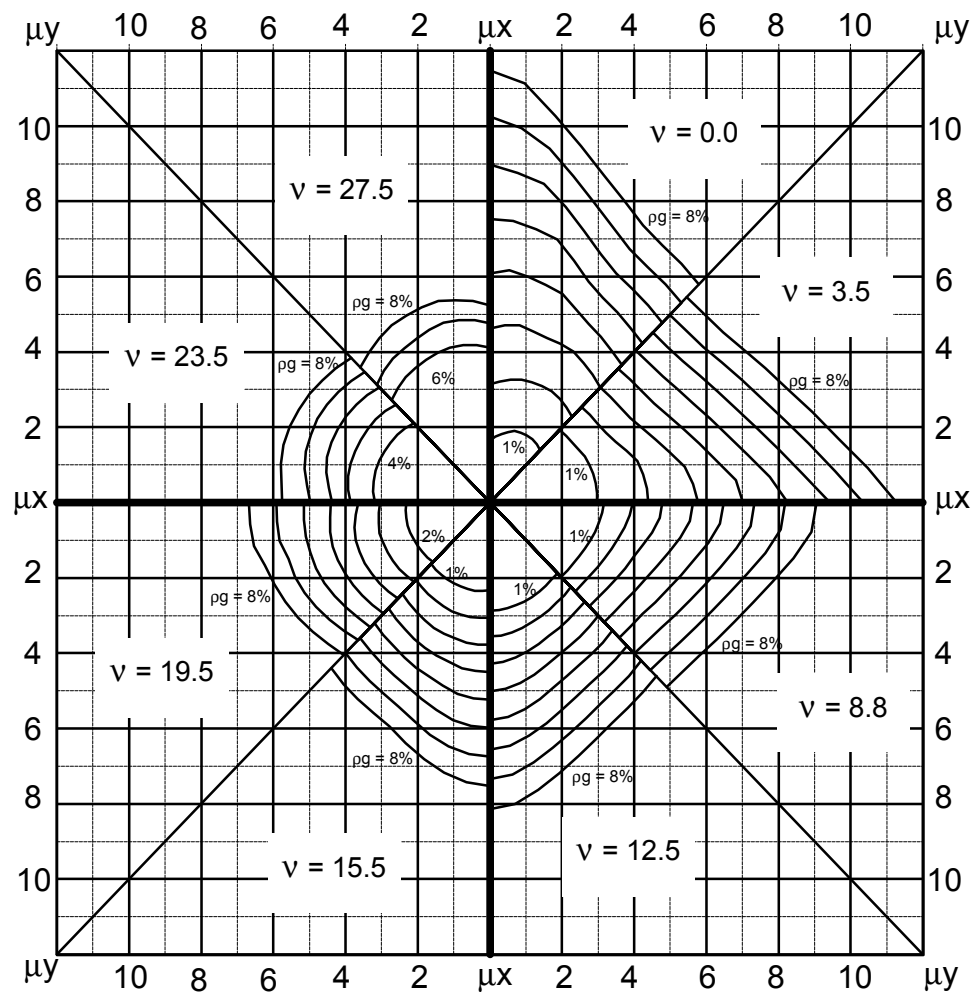


$$f'_c = 35 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.8$$

$$\Delta \rho_g = 1\%$$



5.- FLEXION BIAxIAL EN COLUMNAS ARMADAS CON 8 BARRAS

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

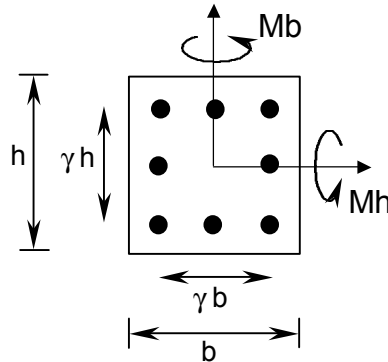
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

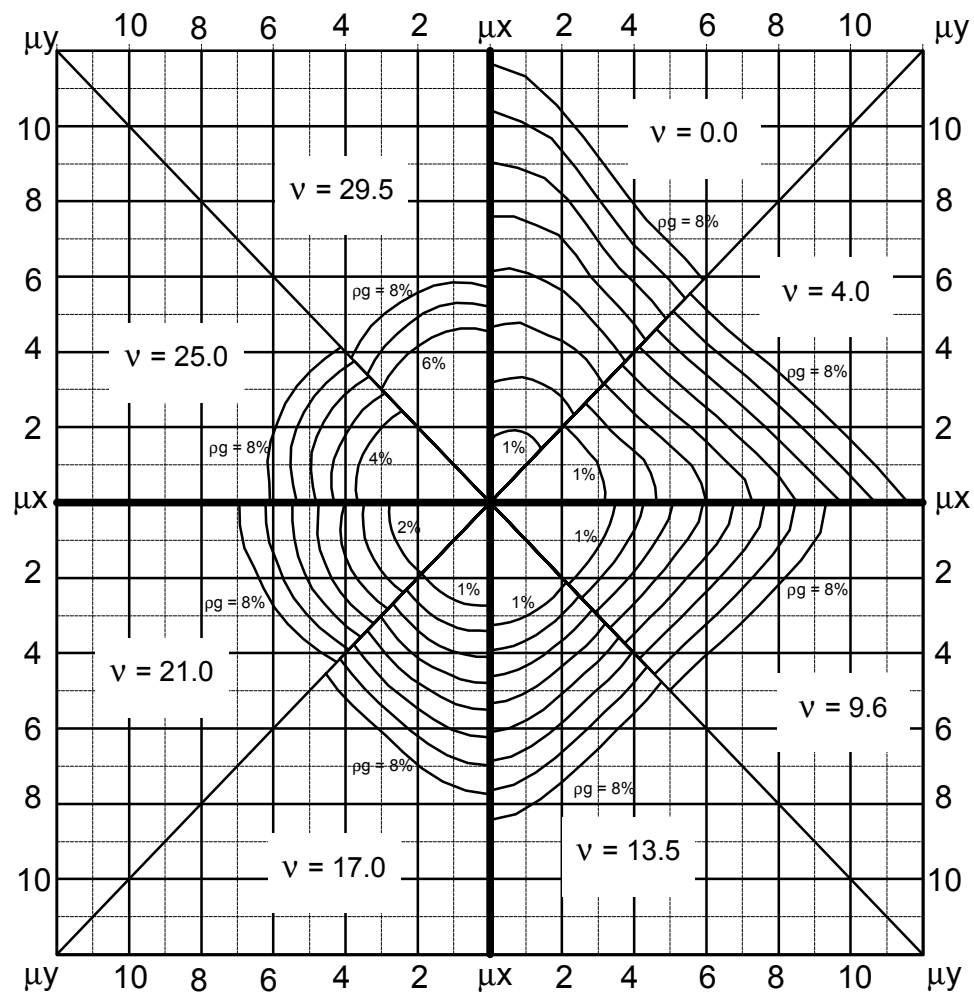


$$f'_c = 40 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.8$$

$$\Delta \rho_g = 1\%$$



6.- FLEXION BIAxIAL EN COLUMNAS ARMADAS CON 8 BARRAS

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

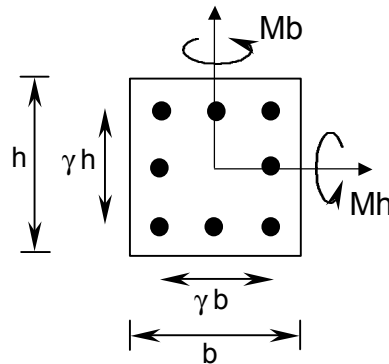
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

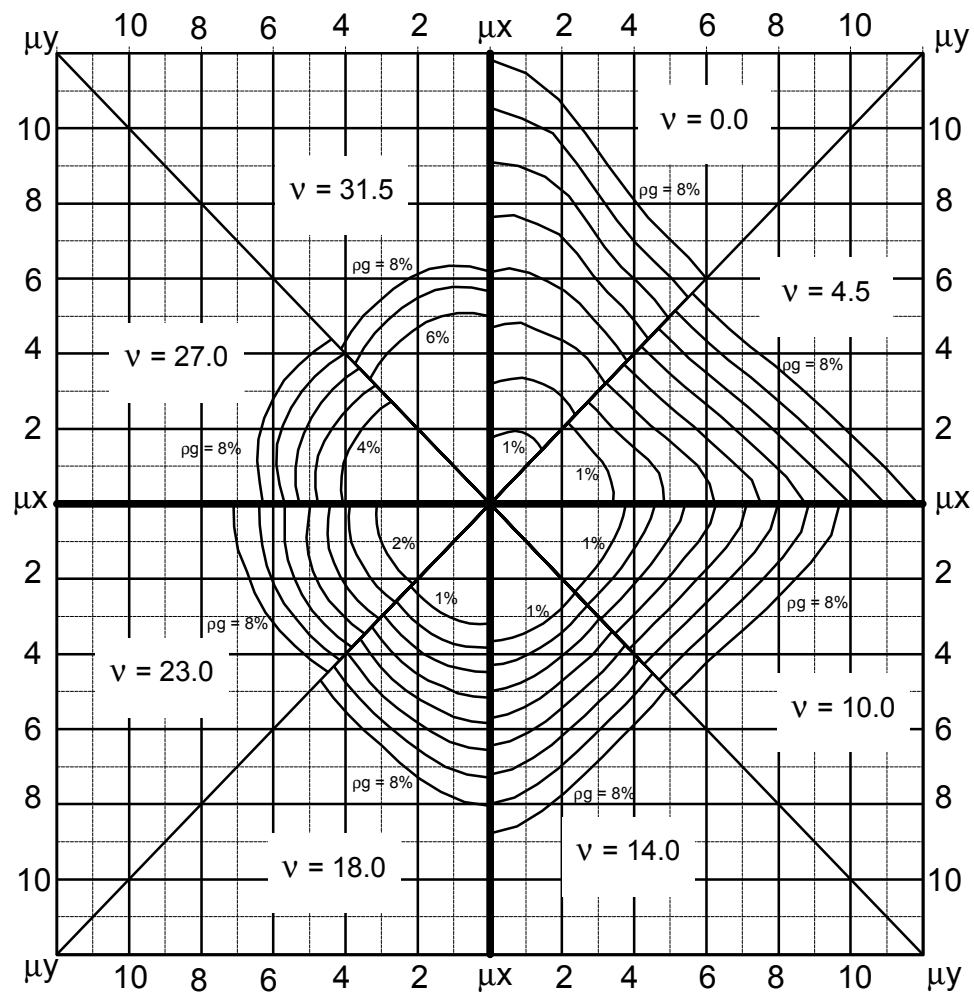


$$f'_c = 45 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.8$$

$$\Delta \rho_g = 1\%$$



7.- FLEXION BIAxIAL EN COLUMNAS ARMADAS CON 8 BARRAS

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

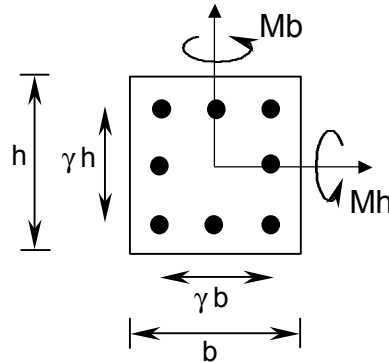
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

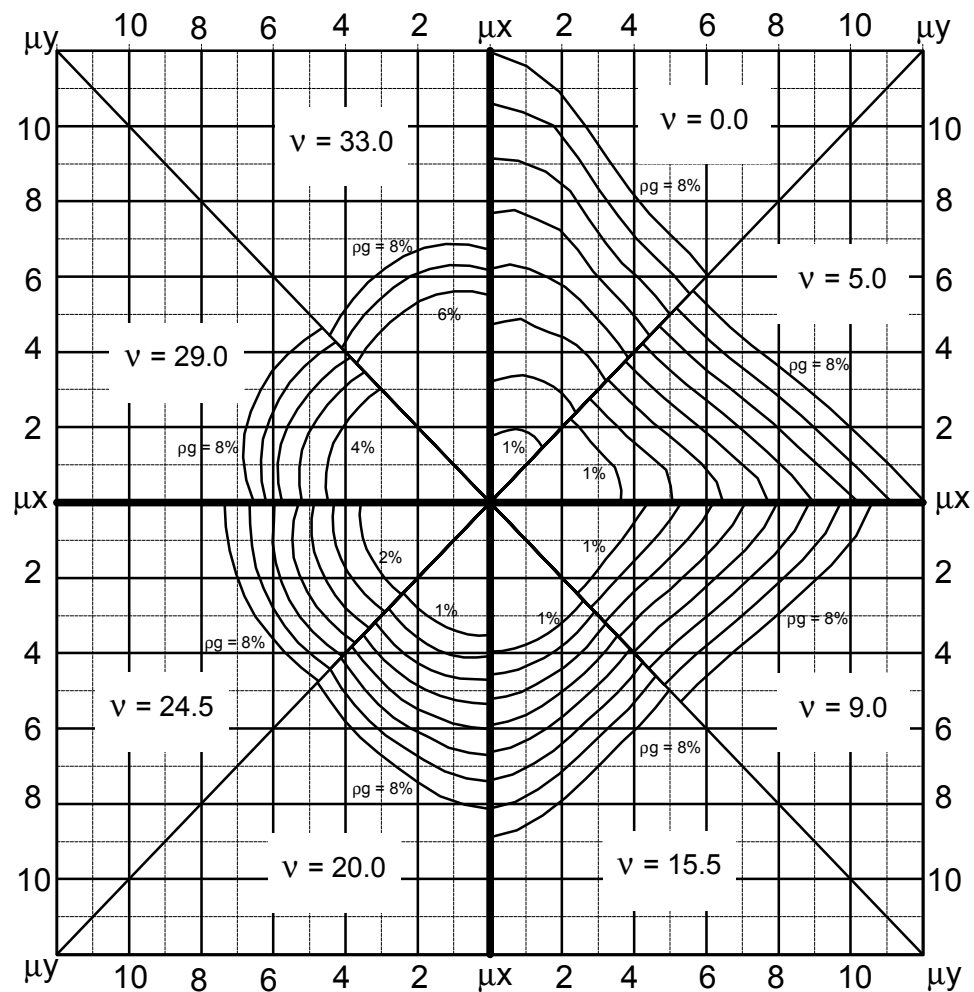


$$f'_c = 50 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.8$$

$$\Delta \rho_g = 1\%$$



8.- FLEXION BIAxIAL EN COLUMNAS ARMADAS CON 8 BARRAS

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

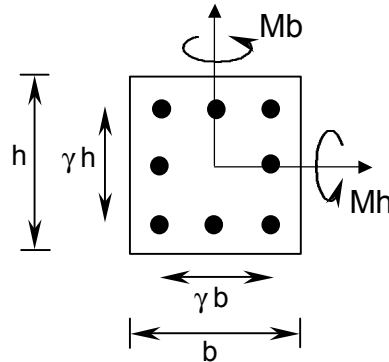
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

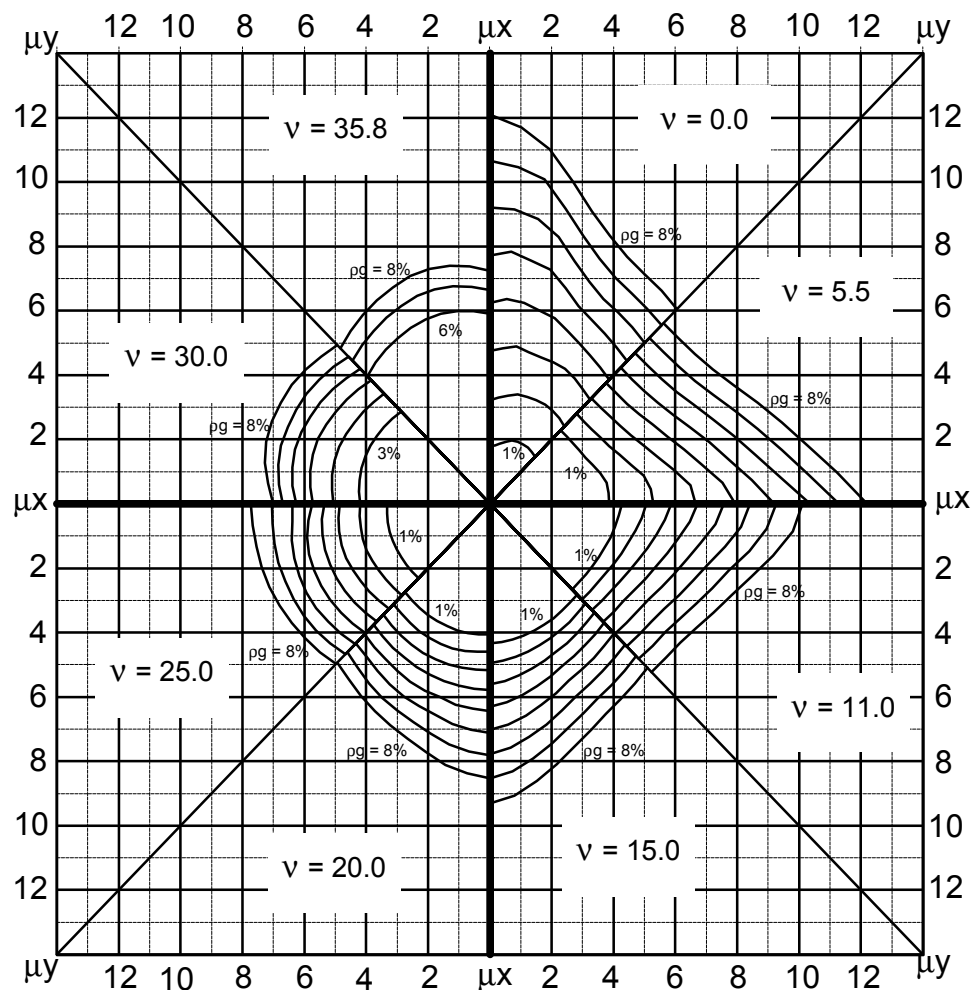


$$f'_c = 55 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.8$$

$$\Delta \rho_g = 1\%$$



9.- FLEXION BIAxIAL EN COLUMNAS ARMADAS CON 8 BARRAS

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

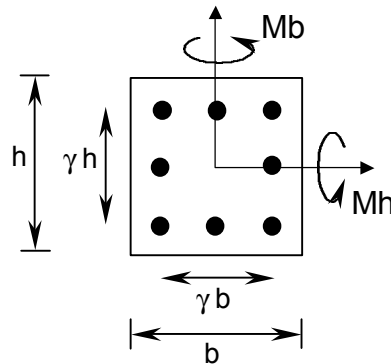
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

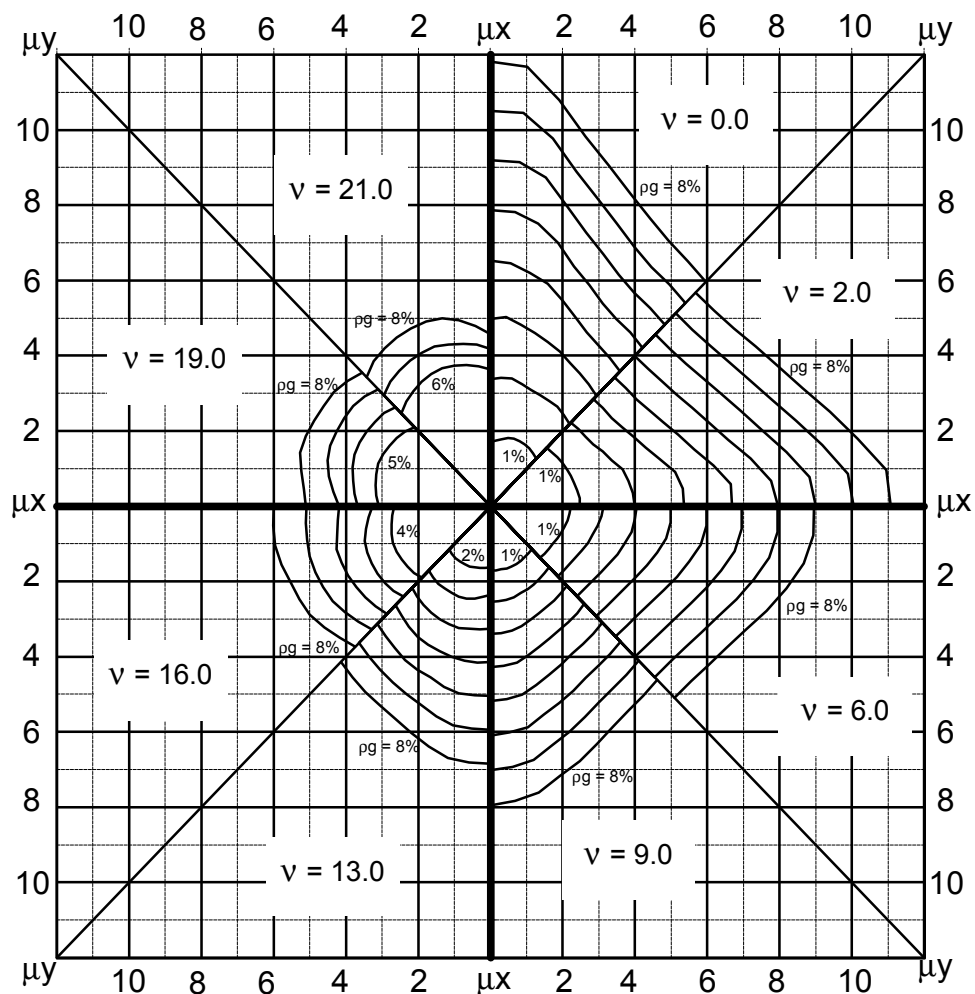


$$f_c = 20 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.9$$

$$\Delta \rho_g = 1\%$$



10.- FLEXION BIAxIAL EN COLUMNAS ARMADAS CON 8 BARRAS

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

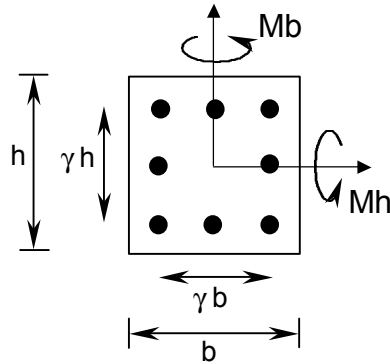
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

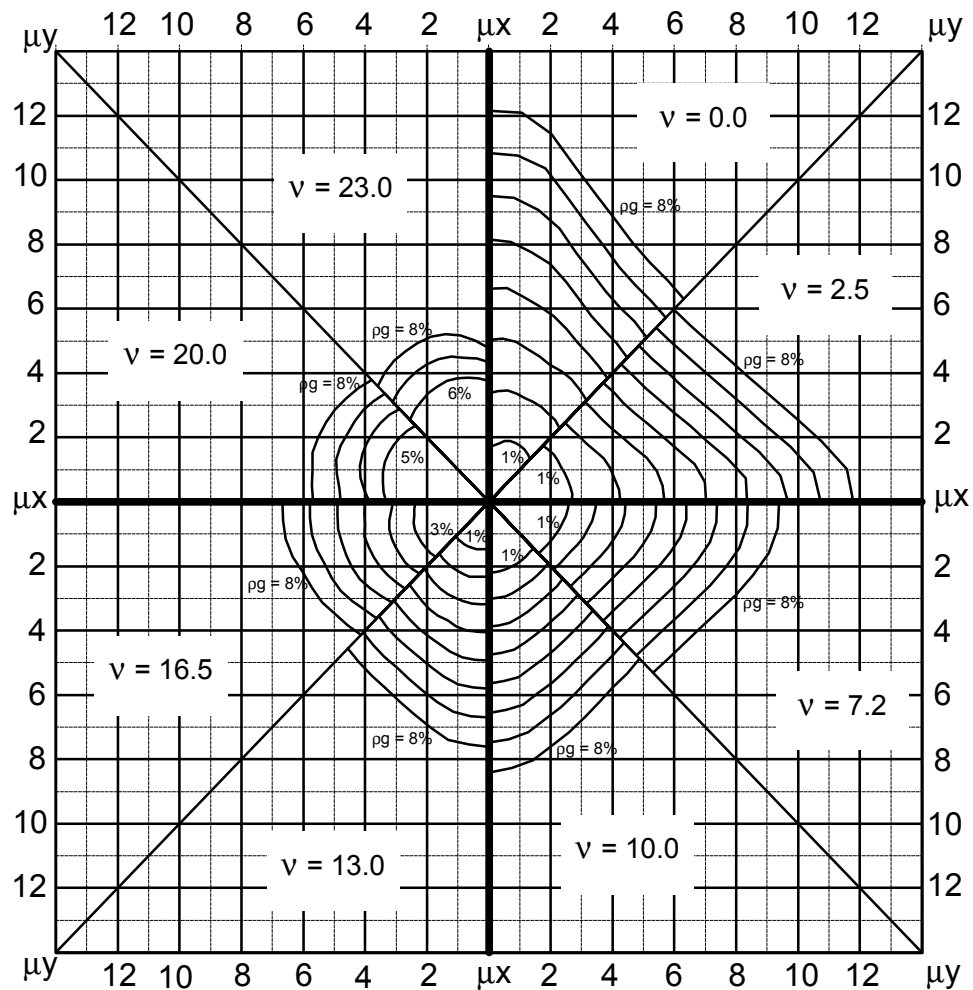


$$f'_c = 25 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.9$$

$$\Delta \rho_g = 1\%$$



11.- FLEXION BIAxIAL EN COLUMNAS ARMADAS CON 8 BARRAS

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

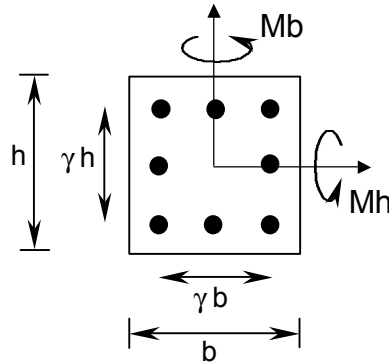
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

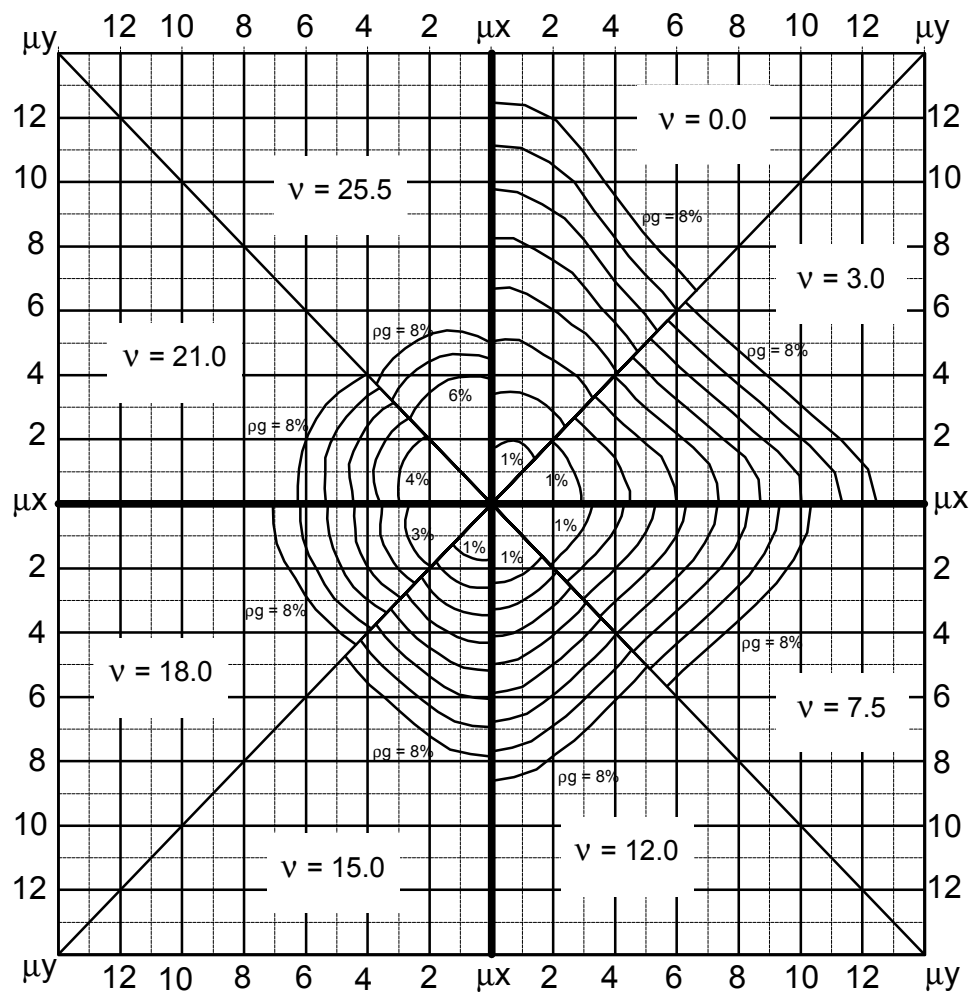


$$f'_c = 30 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.9$$

$$\Delta \rho_g = 1\%$$



12.- FLEXION BIAxIAL EN COLUMNAS ARMADAS CON 8 BARRAS

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

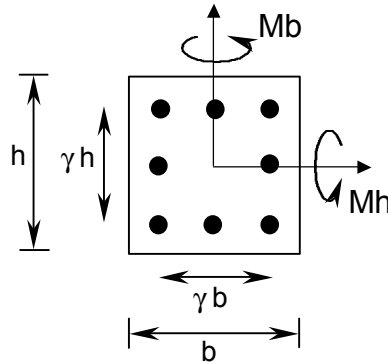
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

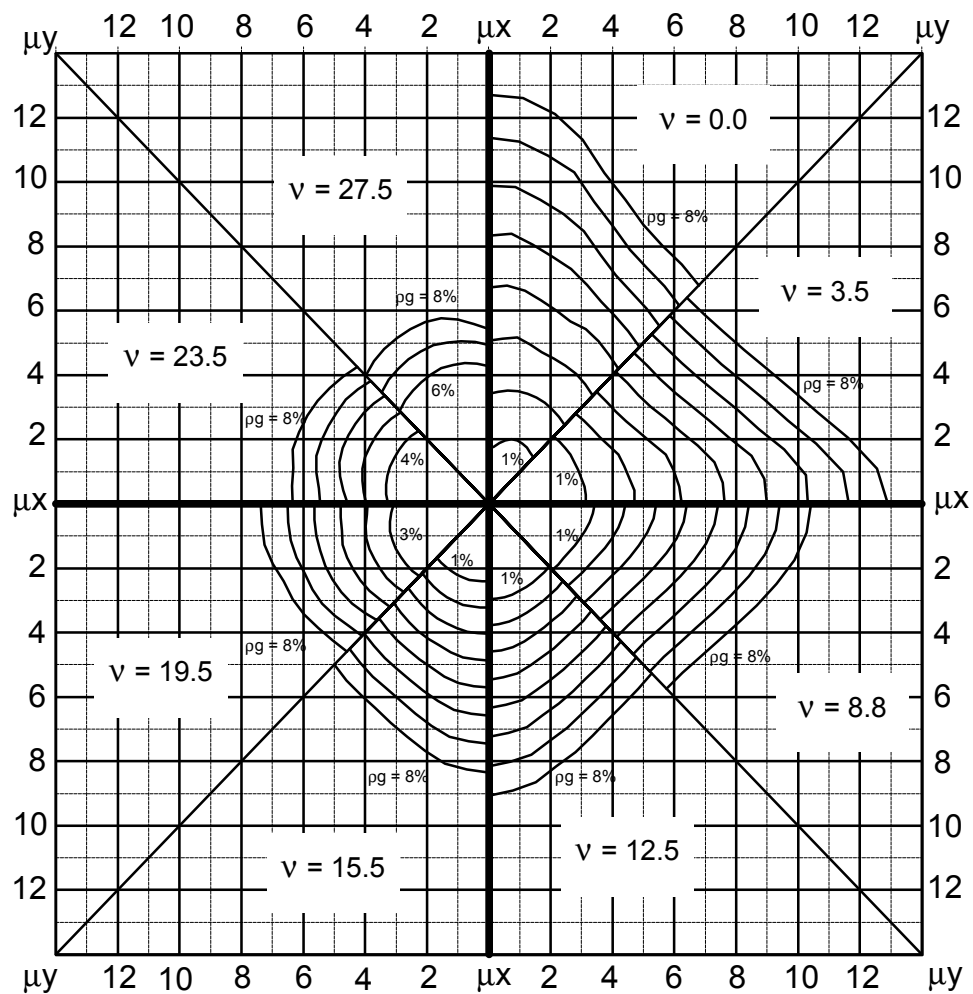


$$f'_c = 35 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.9$$

$$\Delta \rho_g = 1\%$$



13.- FLEXION BIAxIAL EN COLUMNAS ARMADAS CON 8 BARRAS

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

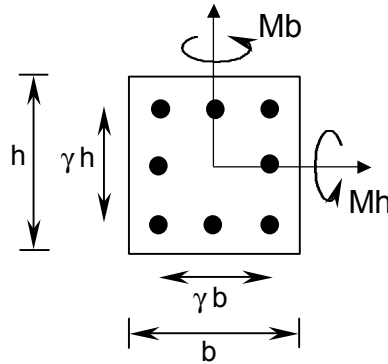
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

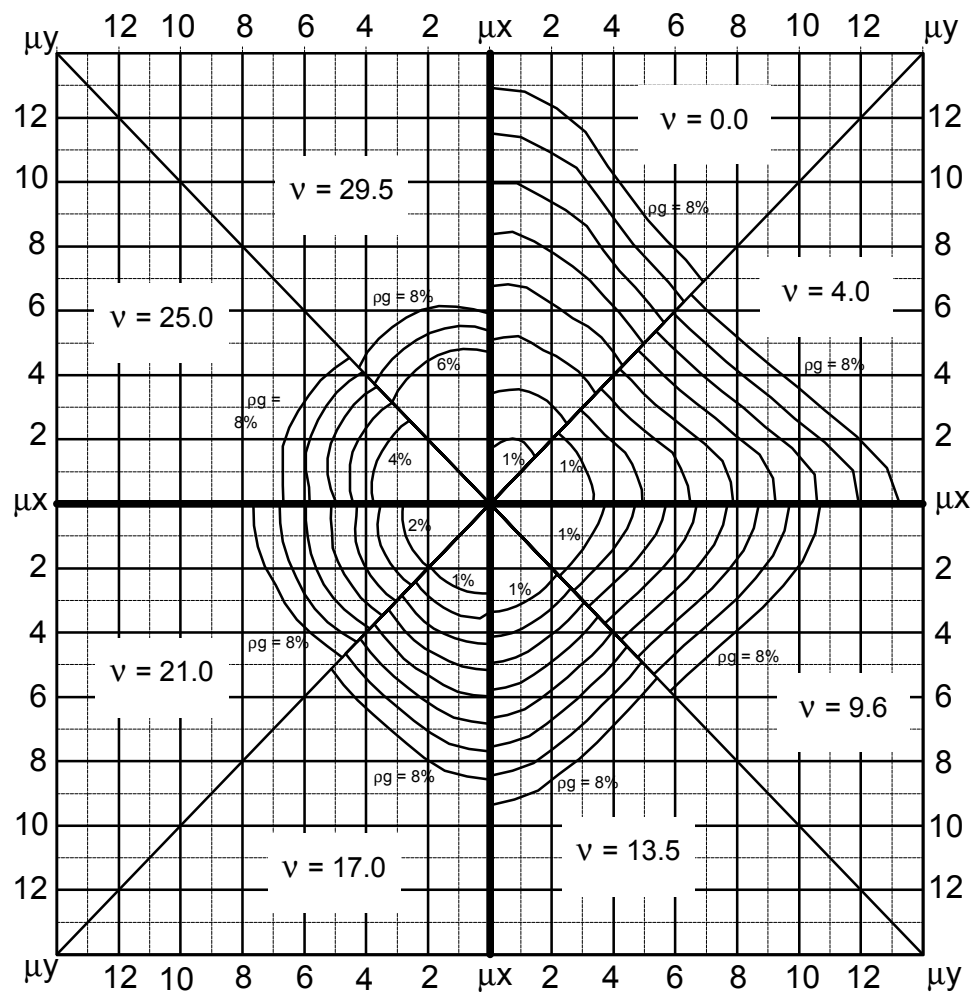


$$f'_c = 40 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.9$$

$$\Delta \rho_g = 1\%$$



14.- FLEXION BIAxIAL EN COLUMNAS ARMADAS CON 8 BARRAS

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

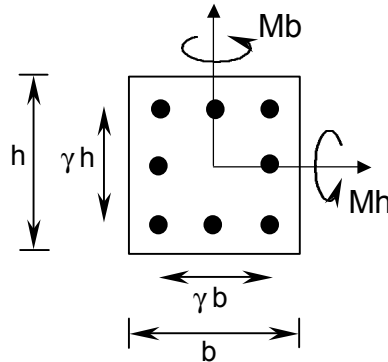
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

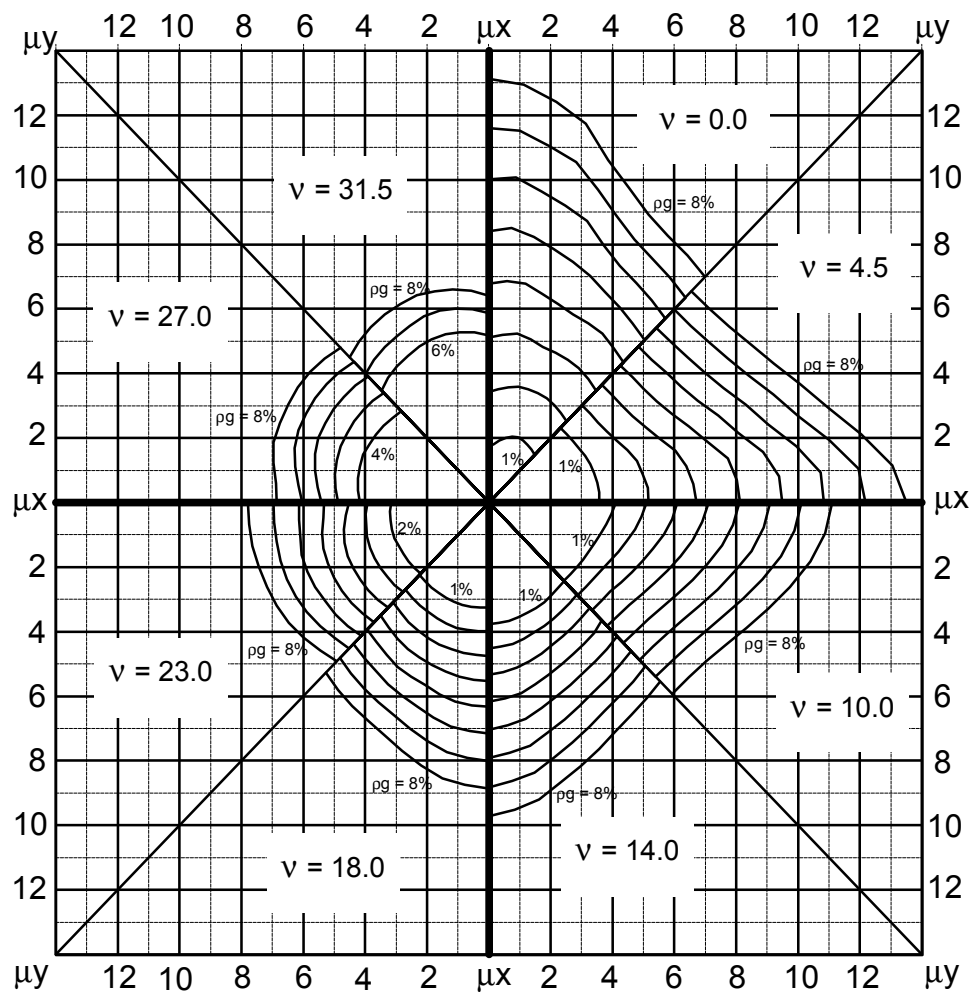


$$f'_c = 45 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.9$$

$$\Delta \rho_g = 1\%$$



15.- FLEXION BIAxIAL EN COLUMNAS ARMADAS CON 8 BARRAS

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

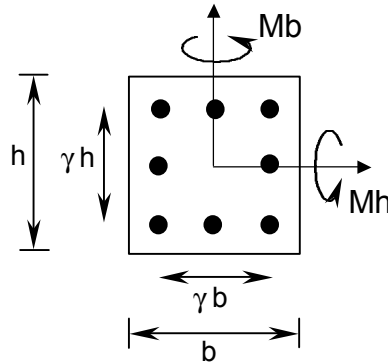
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

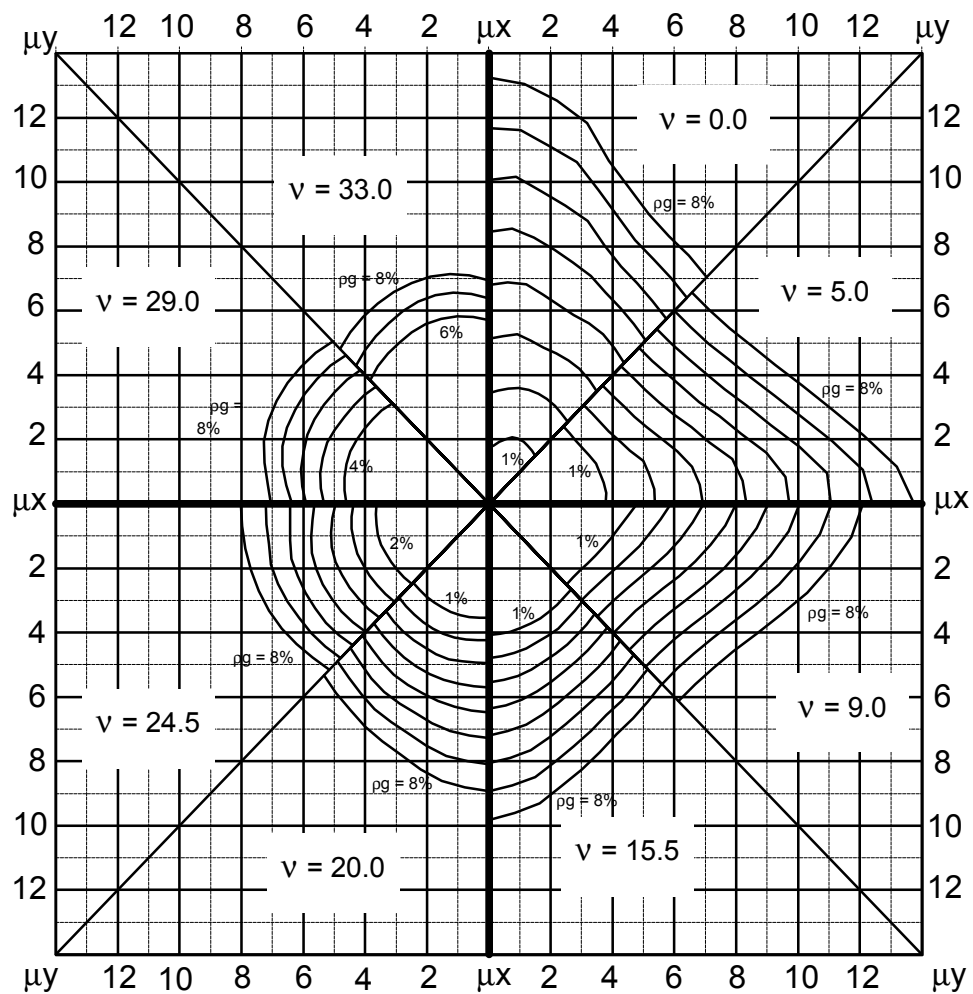


$$f'_c = 50 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.9$$

$$\Delta \rho_g = 1\%$$



16.- FLEXION BIAxIAL EN COLUMNAS ARMADAS CON 8 BARRAS

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

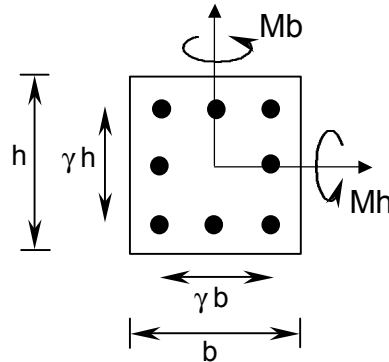
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

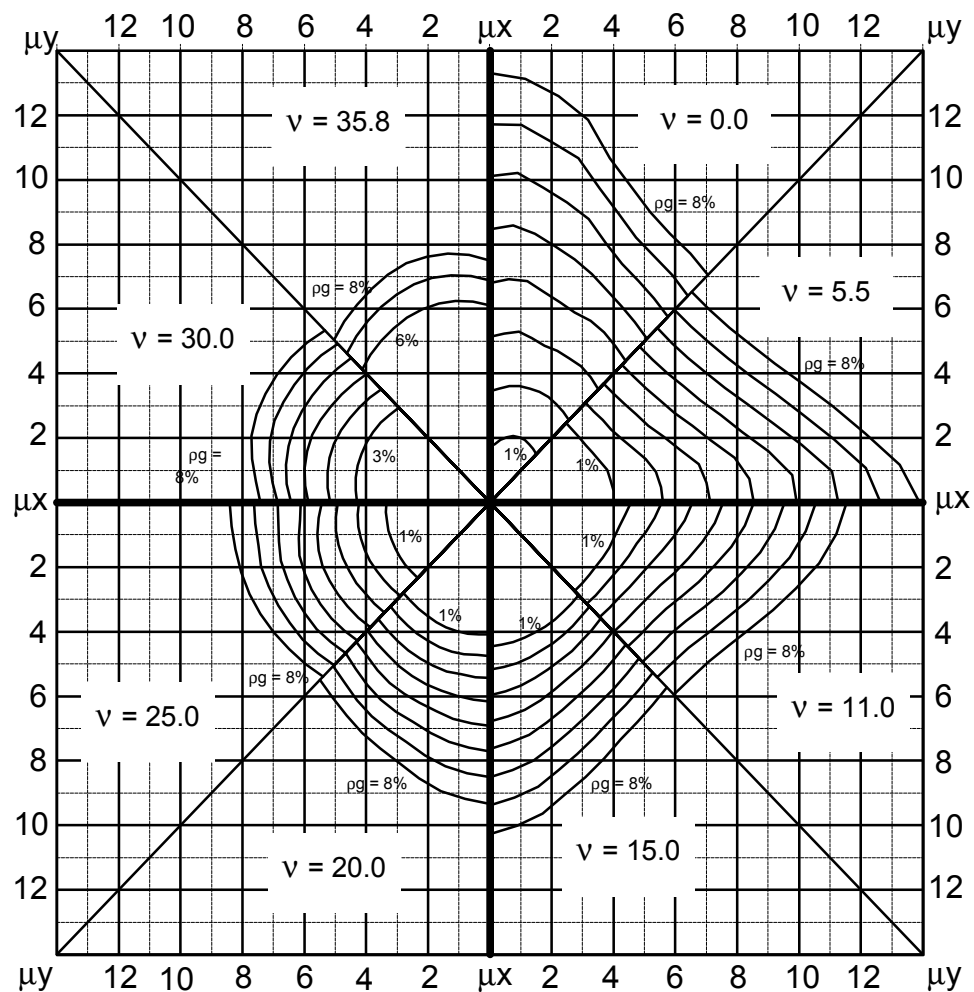


$$f'_c = 55 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.9$$

$$\Delta \rho_g = 1\%$$



17.- FLEXION BIAxIAL EN COLUMNAS CON ARMADURA PERIMETRAL

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

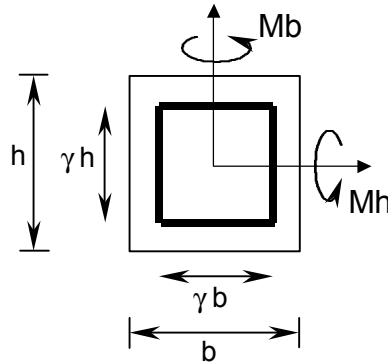
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

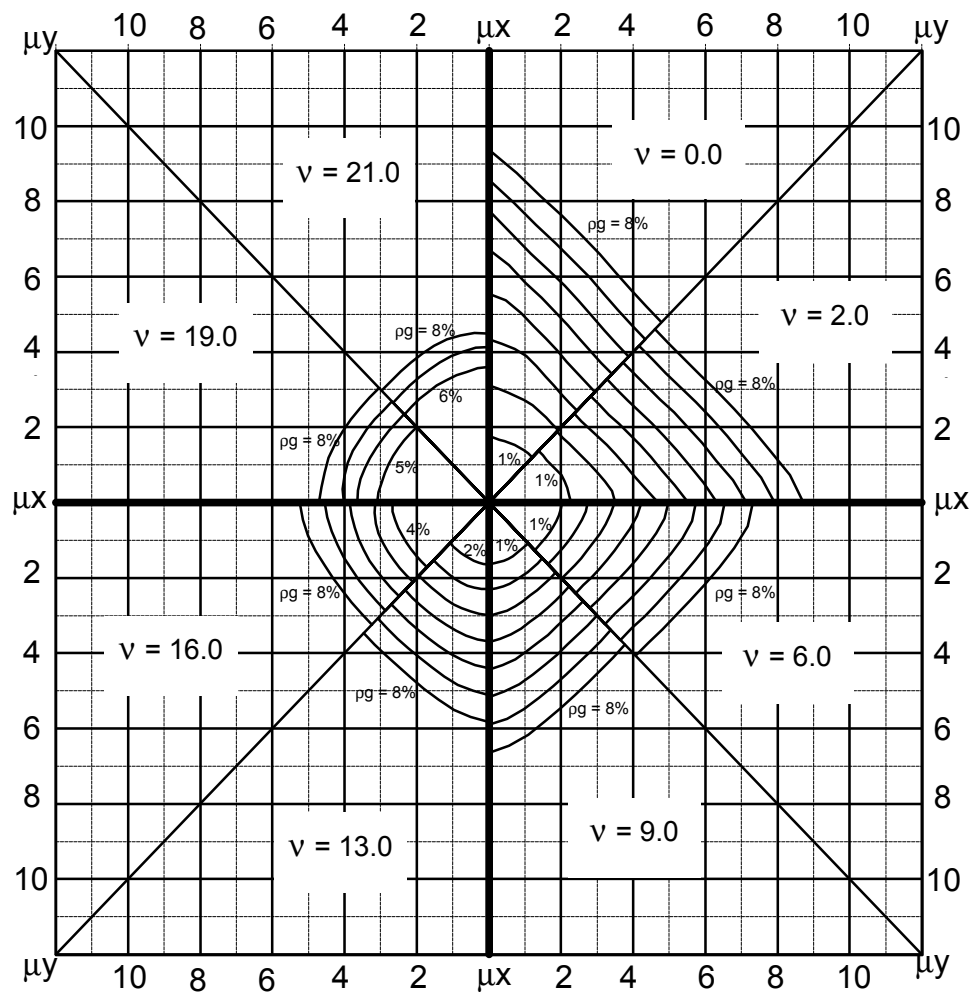


$$f'_c = 20 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.8$$

$$\Delta \rho_g = 1\%$$



18.- FLEXION BIAxIAL EN COLUMNAS CON ARMADURA PERIMETRAL

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

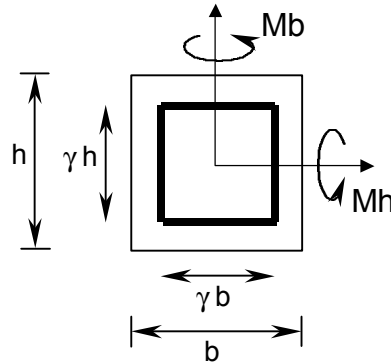
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

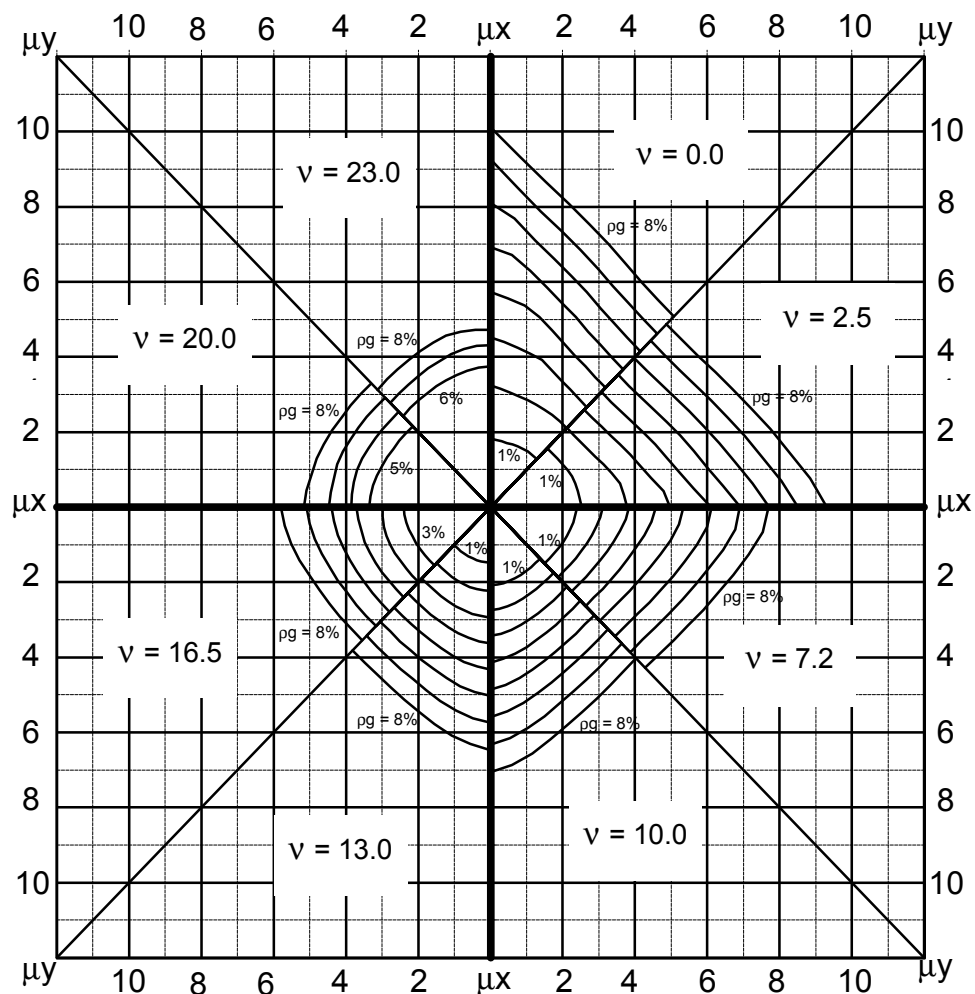


$$f'_c = 25 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.8$$

$$\Delta \rho_g = 1\%$$



19.- FLEXION BIAxIAL EN COLUMNAS CON ARMADURA PERIMETRAL

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

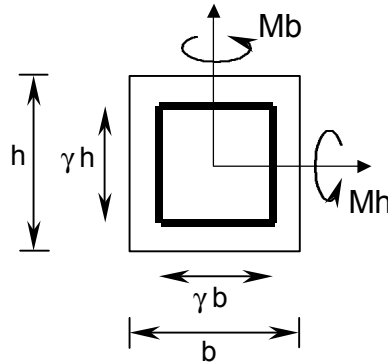
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

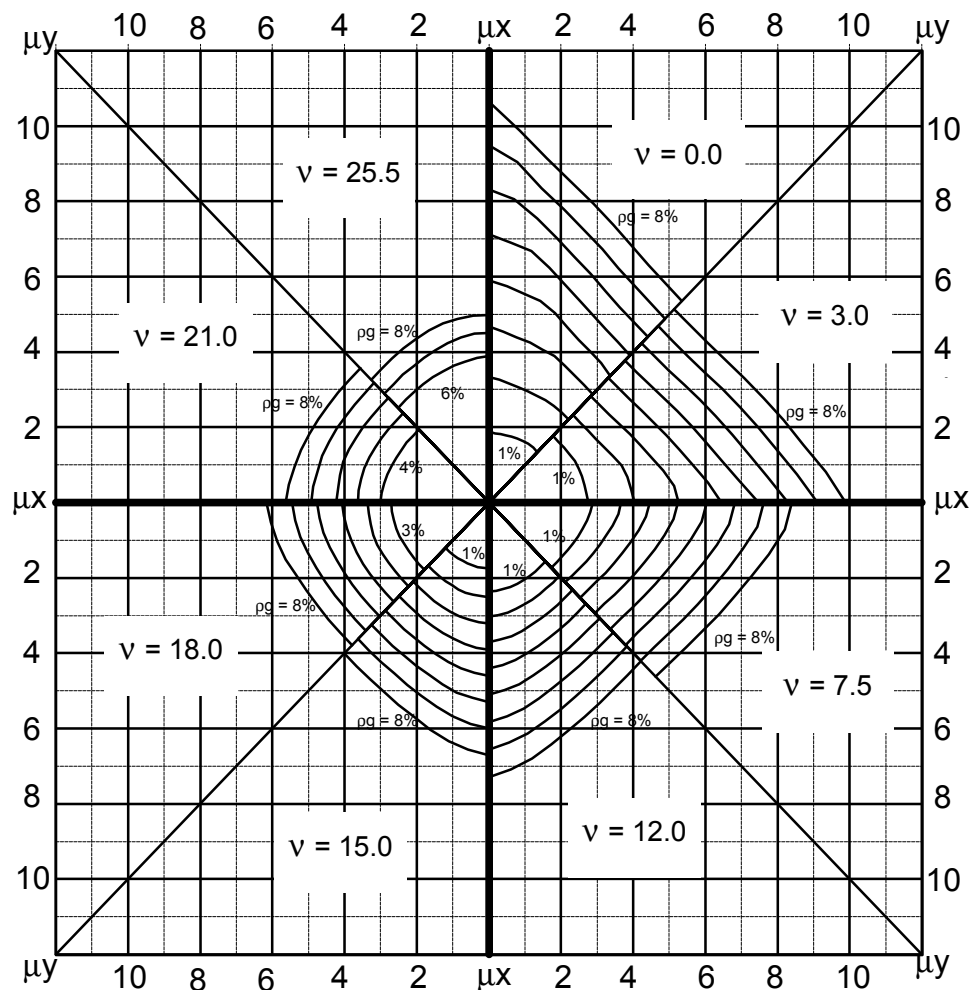


$$f'_c = 30 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.8$$

$$\Delta \rho_g = 1\%$$



20.- FLEXION BIAxIAL EN COLUMNAS CON ARMADURA PERIMETRAL

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

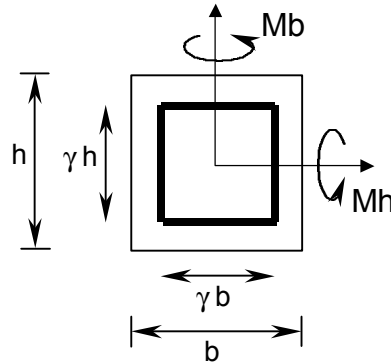
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

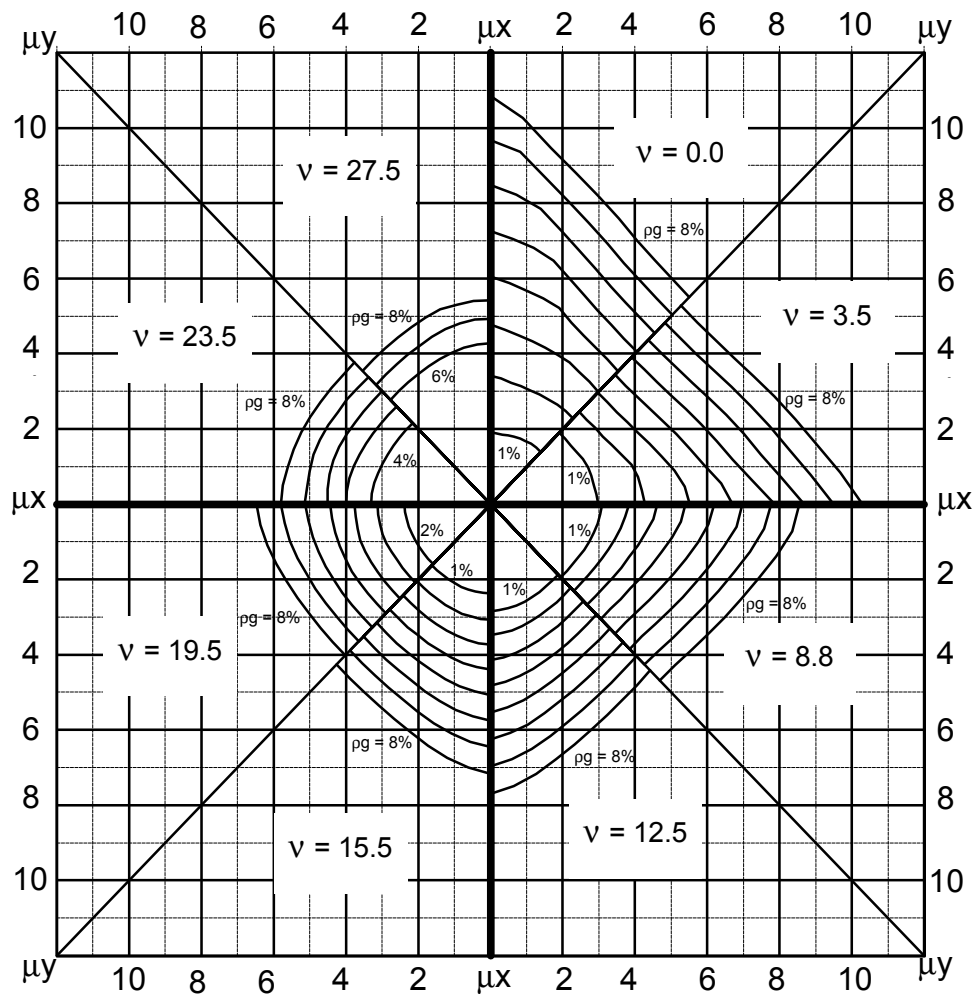


$$f'_c = 35 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.8$$

$$\Delta \rho_g = 1\%$$



21.- FLEXION BIAxIAL EN COLUMNAS CON ARMADURA PERIMETRAL

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

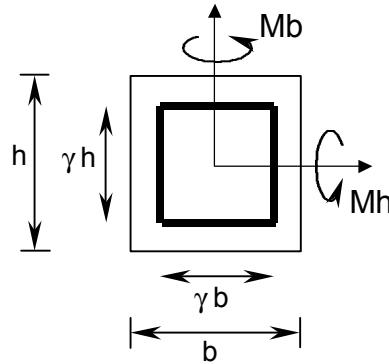
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

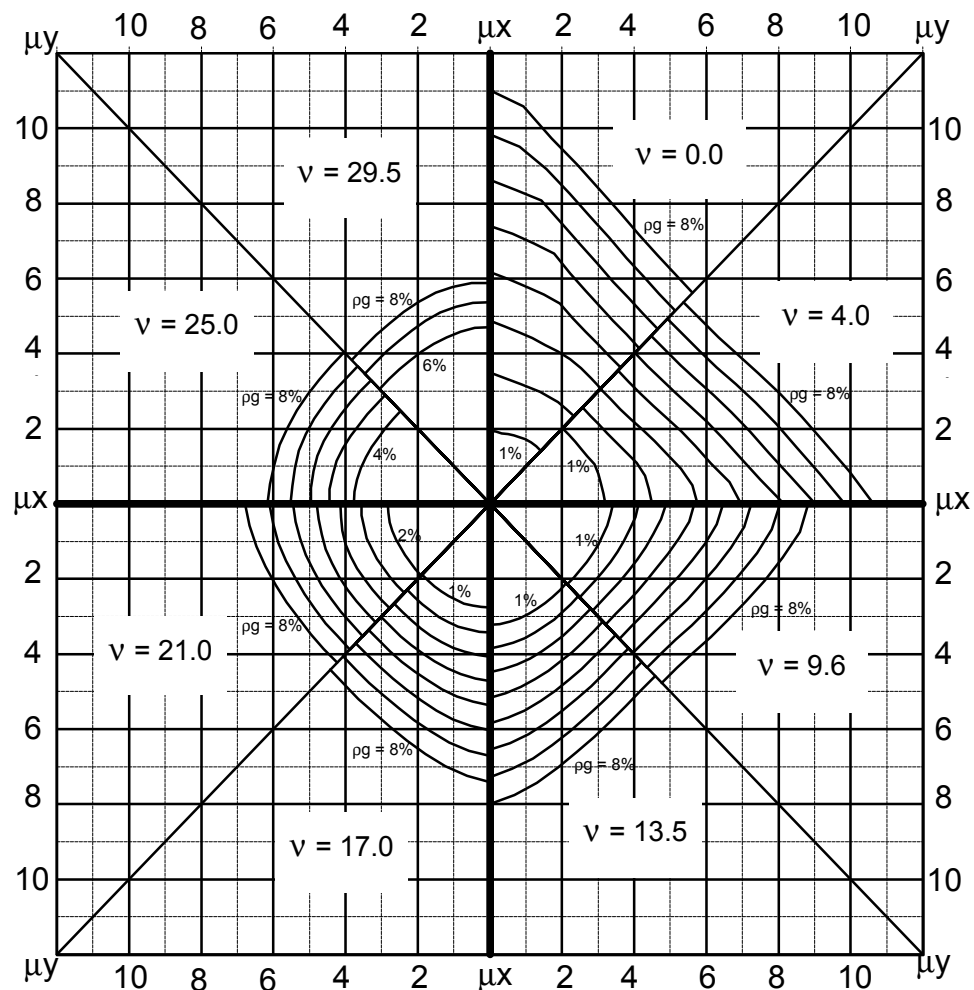


$$f'_c = 40 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.8$$

$$\Delta \rho_g = 1\%$$



22.- FLEXION BIAxIAL EN COLUMNAS CON ARMADURA PERIMETRAL

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

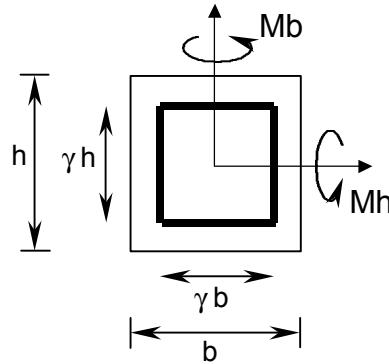
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

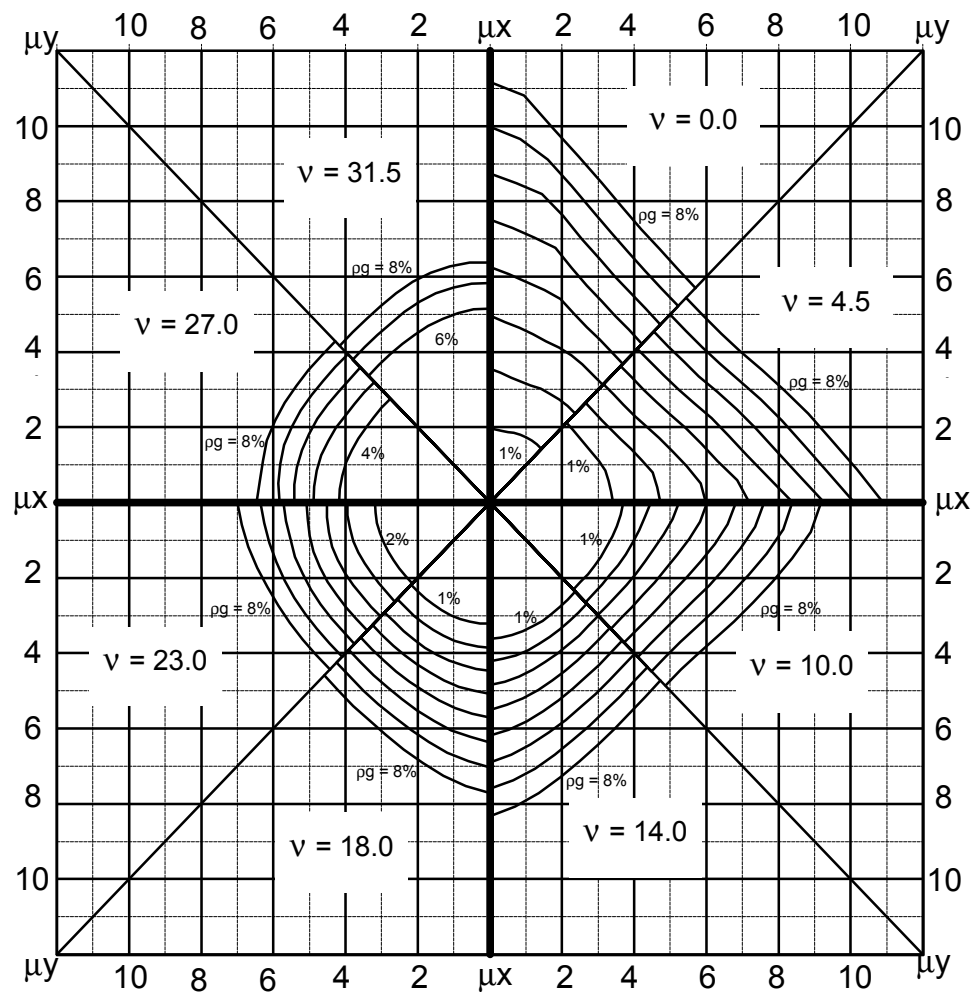


$$f'_c = 45 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.8$$

$$\Delta \rho_g = 1\%$$



23.- FLEXION BIAxIAL EN COLUMNAS CON ARMADURA PERIMETRAL

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

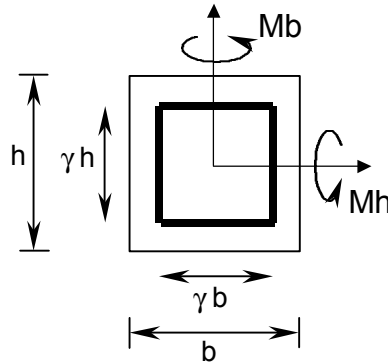
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

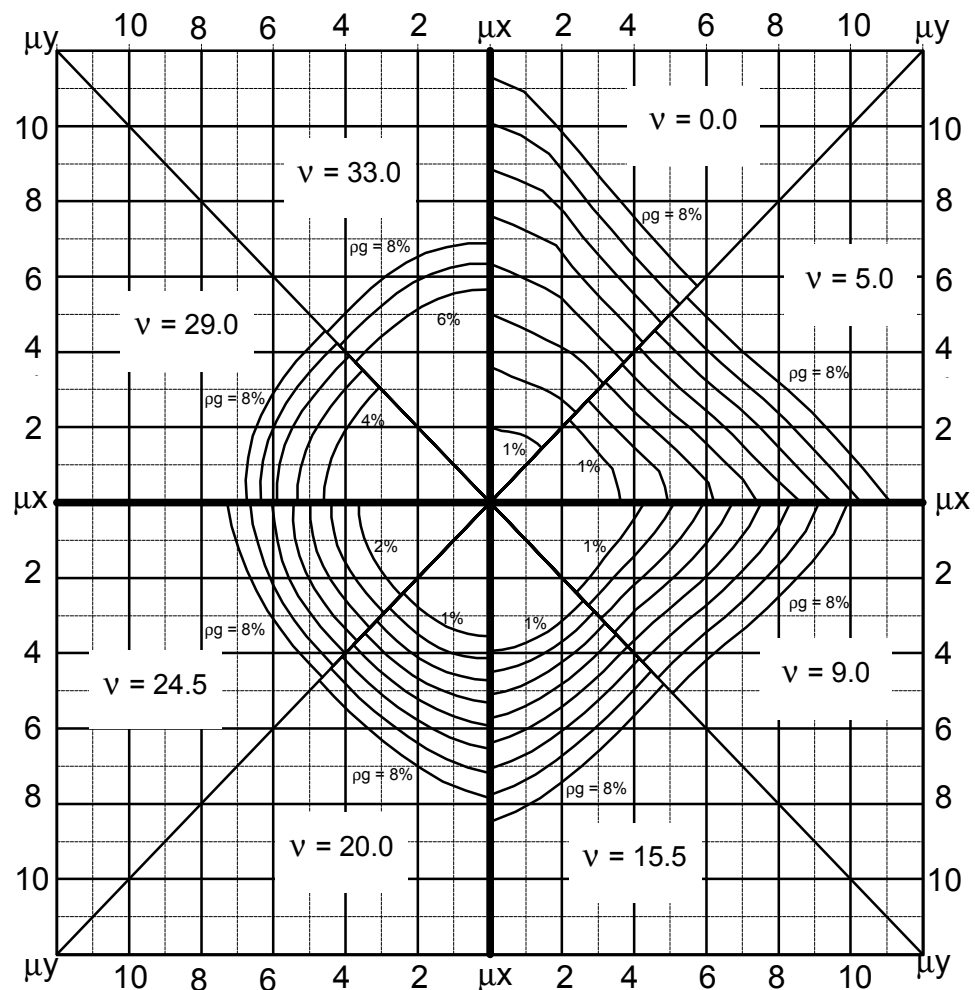


$$f'_c = 50 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.8$$

$$\Delta \rho_g = 1\%$$



24.- FLEXION BIAxIAL EN COLUMNAS CON ARMADURA PERIMETRAL

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

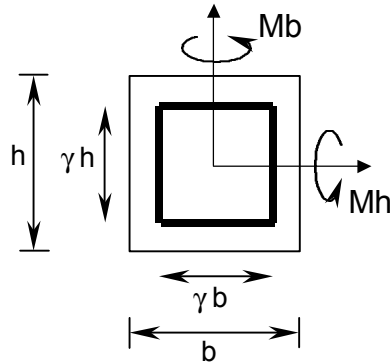
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

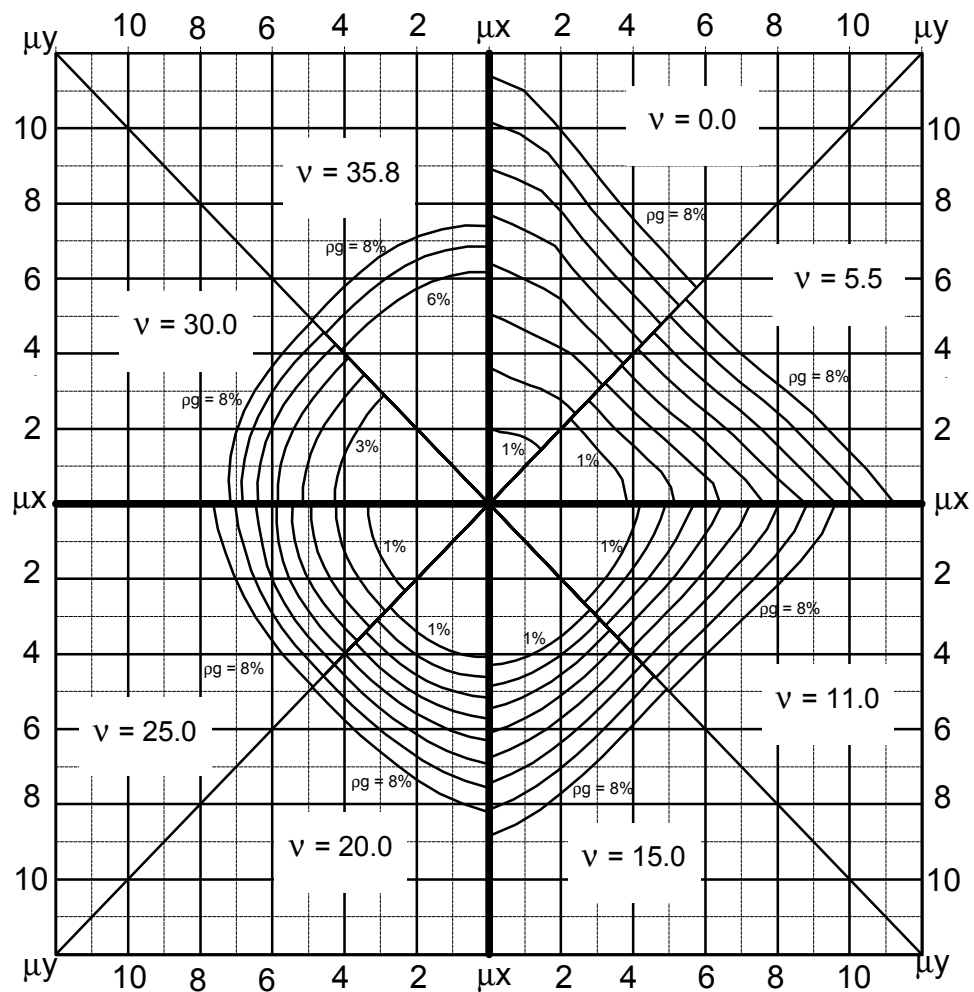


$$f'_c = 55 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.8$$

$$\Delta \rho_g = 1\%$$



25.- FLEXION BIAxIAL EN COLUMNAS CON ARMADURA PERIMETRAL

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

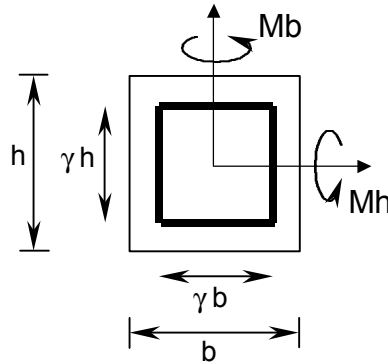
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

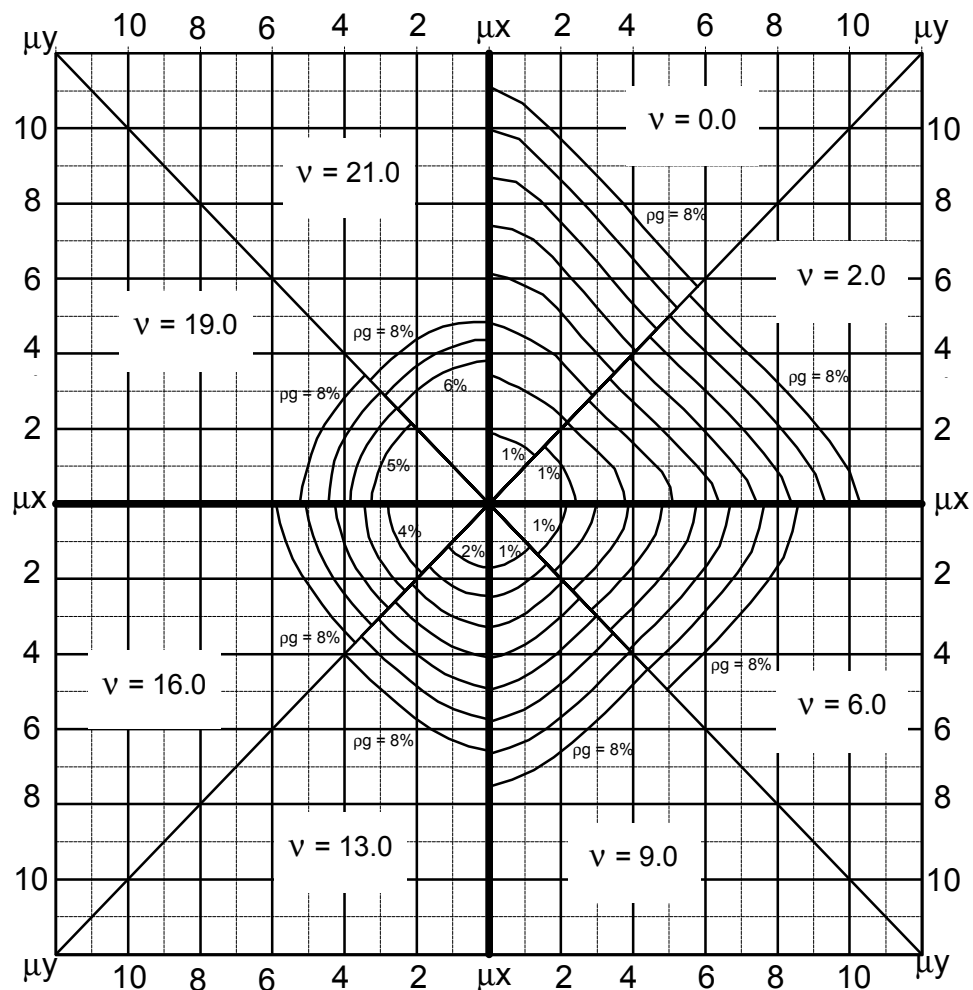


$$f'_c = 20 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.9$$

$$\Delta \rho_g = 1\%$$



26.- FLEXION BIAxIAL EN COLUMNAS CON ARMADURA PERIMETRAL

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

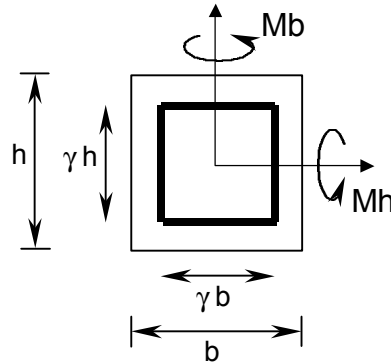
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

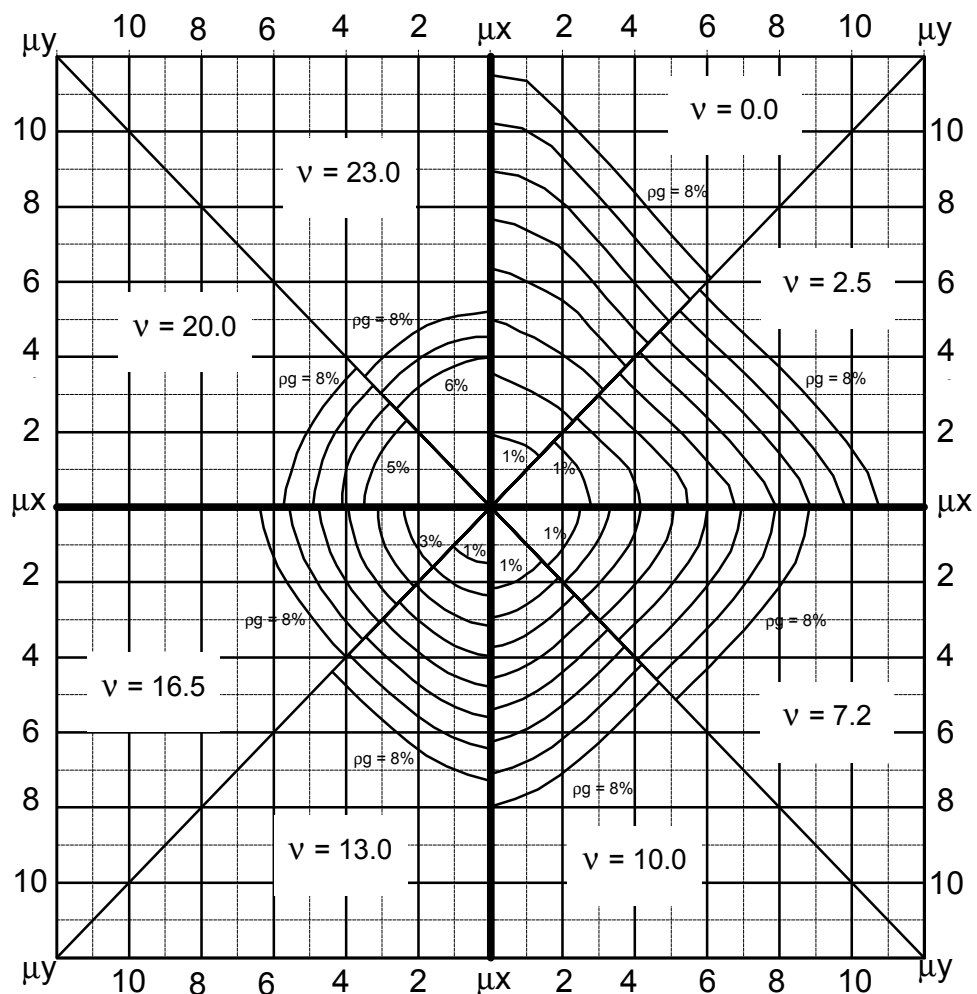


$$f'_c = 25 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.9$$

$$\Delta \rho_g = 1\%$$



27.- FLEXION BIAxIAL EN COLUMNAS CON ARMADURA PERIMETRAL

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

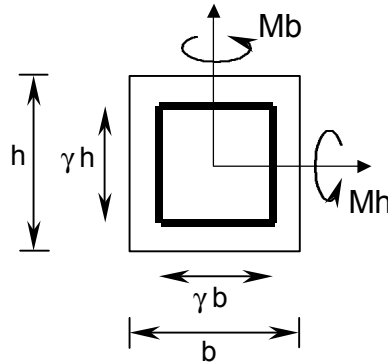
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

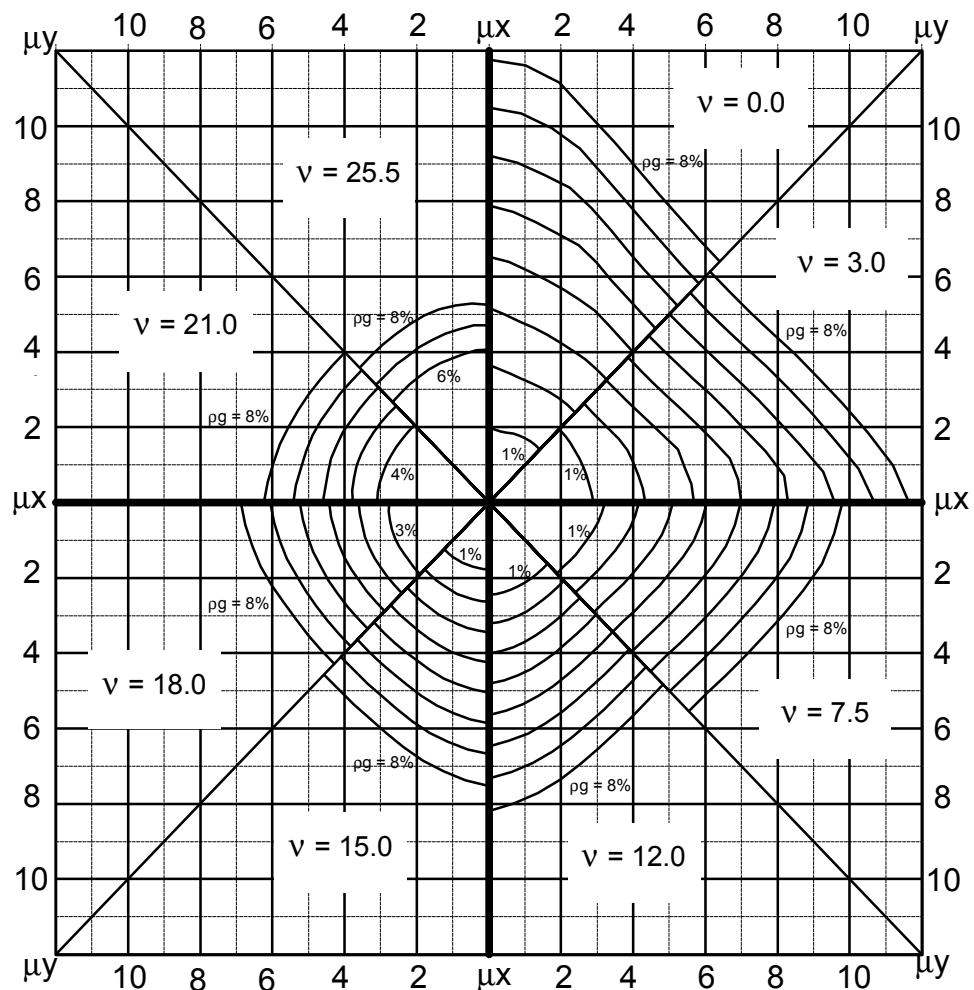


$$f'_c = 30 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.9$$

$$\Delta \rho_g = 1\%$$



28.- FLEXION BIAxIAL EN COLUMNAS CON ARMADURA PERIMETRAL

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

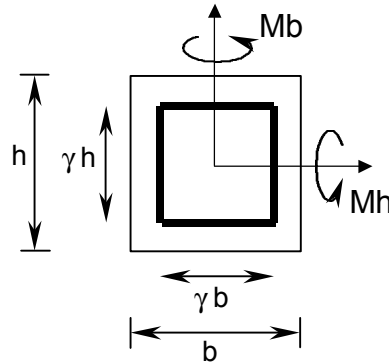
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

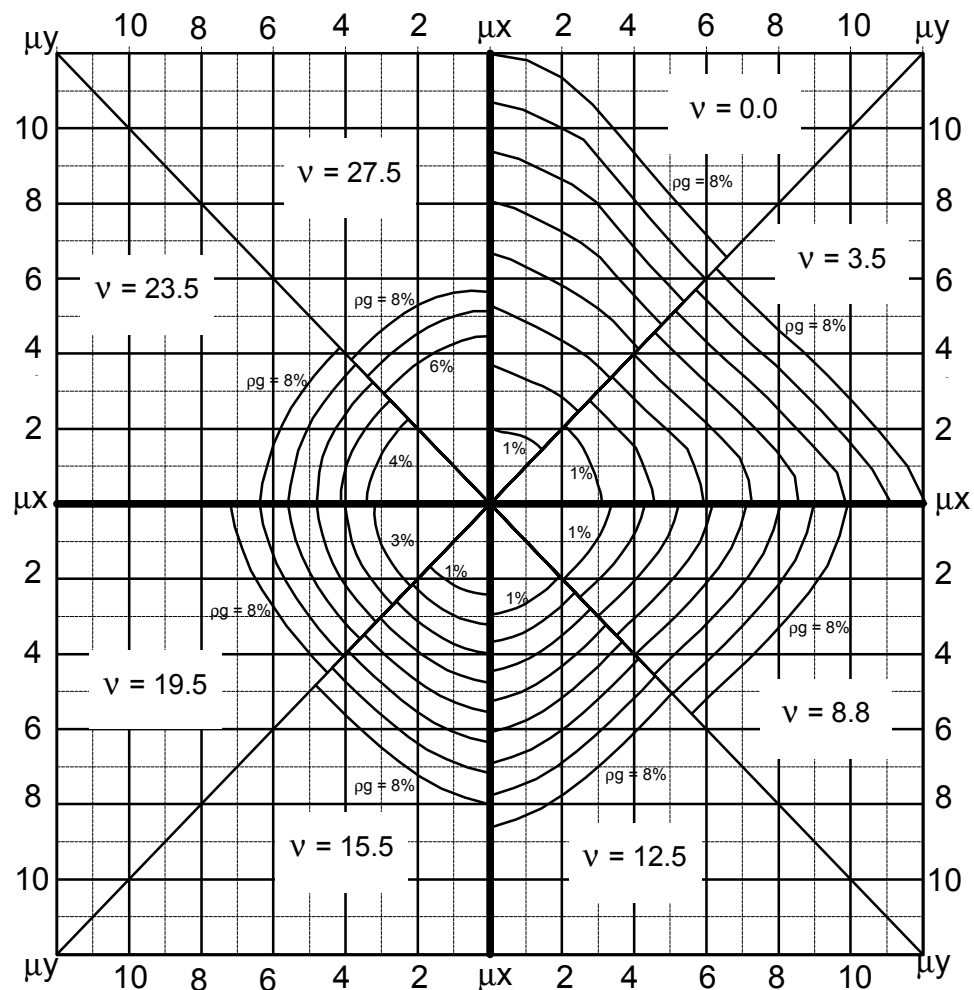


$$f'_c = 35 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.9$$

$$\Delta \rho_g = 1\%$$



29.- FLEXION BIAxIAL EN COLUMNAS CON ARMADURA PERIMETRAL

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

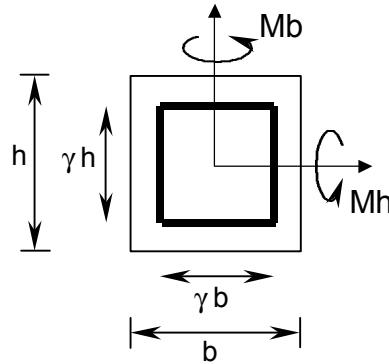
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

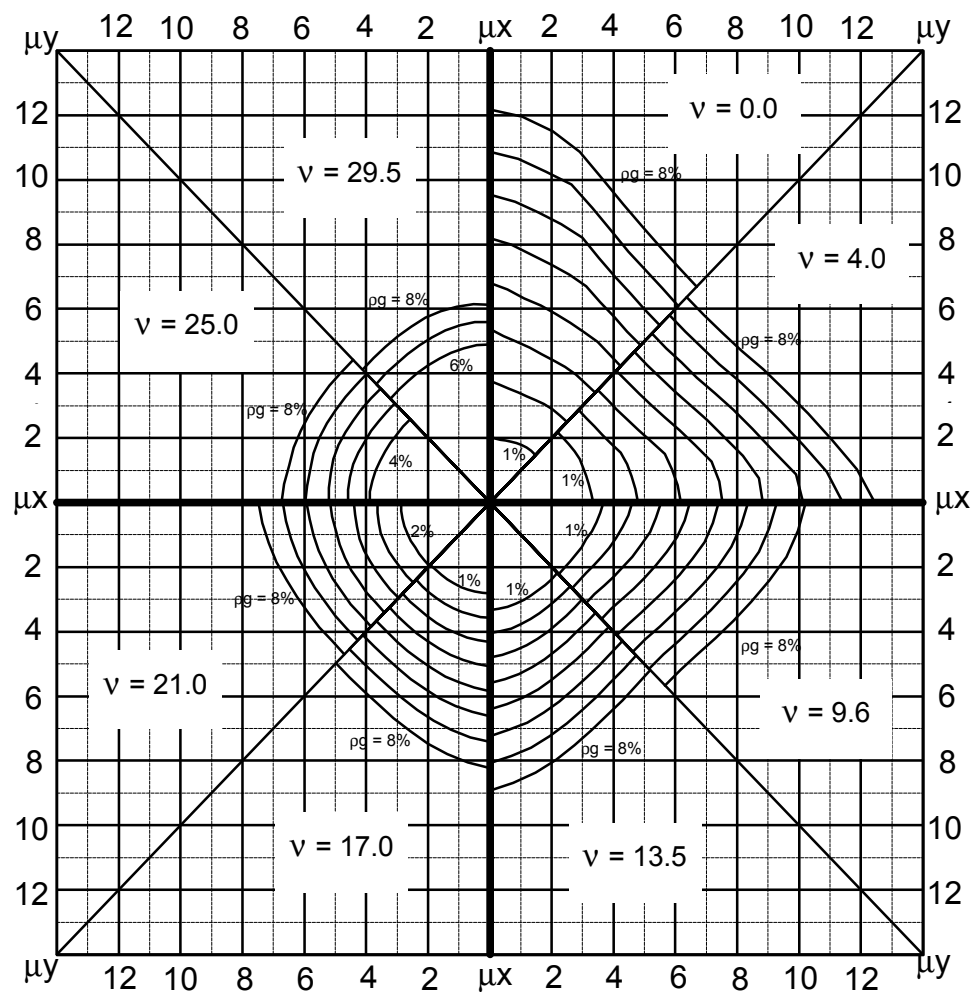


$$f'_c = 40 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.9$$

$$\Delta \rho_g = 1\%$$



30.- FLEXION BIAxIAL EN COLUMNAS CON ARMADURA PERIMETRAL

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

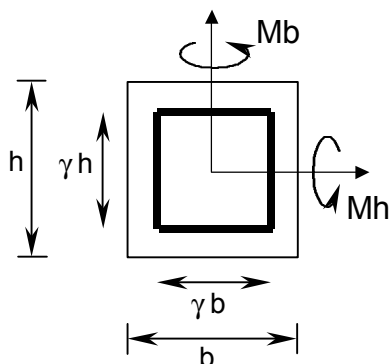
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

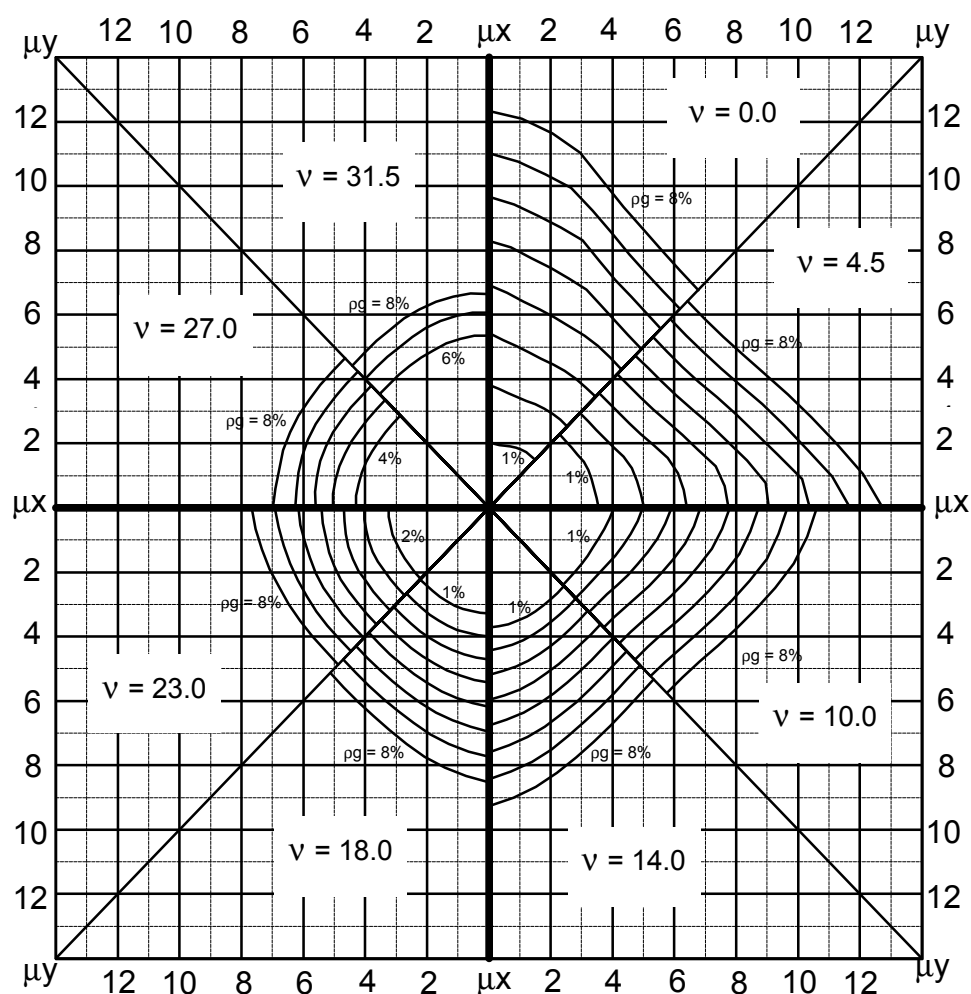


$$f'_c = 45 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.9$$

$$\Delta \rho_g = 1\%$$



31.- FLEXION BIAxIAL EN COLUMNAS CON ARMADURA PERIMETRAL

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

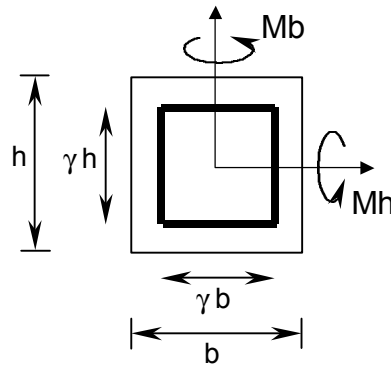
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$

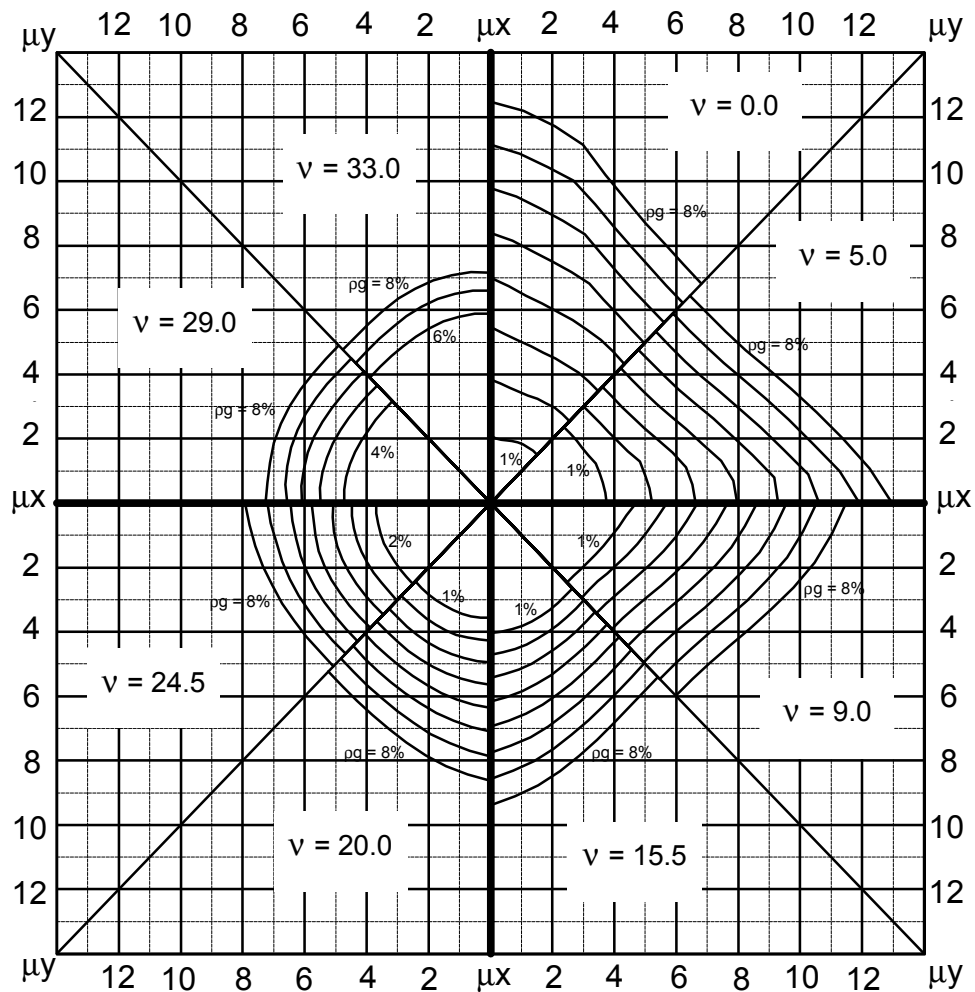


$$f'_c = 50 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.9$$

$$\Delta \rho_g = 1\%$$



32.- FLEXION BIAxIAL EN COLUMNAS CON ARMADURA PERIMETRAL

$$A_g = b \cdot h$$

$$\rho_g = A_s / A_g$$

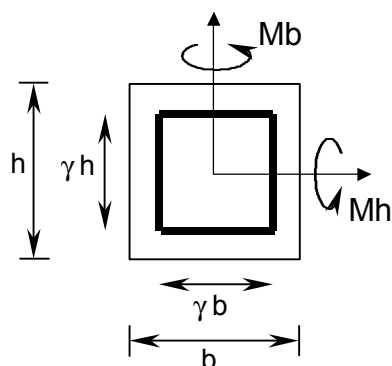
$$\mu_h = M_h / (A_g \cdot h) \text{ [Mpa]}$$

$$\mu_b = M_b / (A_g \cdot b) \text{ [Mpa]}$$

$$v = P_u / A_g \text{ [Mpa]}$$

$$\mu_x = \text{Max} \{ \mu_h, \mu_b \}$$

$$\mu_y = \text{Min} \{ \mu_h, \mu_b \}$$



$$f'_c = 55 \text{ MPa}$$

$$f_y = 420 \text{ MPa}$$

$$\gamma = 0.9$$

$$\Delta \rho_g = 1\%$$

