

Calcular la armadura longitudinal y transversal del pilar de hormigón armado *ij* determinado en la primera columna de la tabla 1, conociendo las secciones de los elementos resistentes (tabla 1) y las solicitaciones siguientes: Esfuerzo axil: 500 kN; Momento en cabeza: 25 m·kN; Momento en la base: 50 m·kN; Esfuerzo cortante (constante): 25 kN.

El pórtico es translacional y está sometido a la acción del viento. El axil de carga permanente es menor que el 70 por ciento del axil total.

Las características de los materiales, así como la Clase de Exposición, deberás tomarlos de la tabla 2. Para ello, emplearás los datos de la fila que coincide con el último dígito del problema que se te ha encargado.

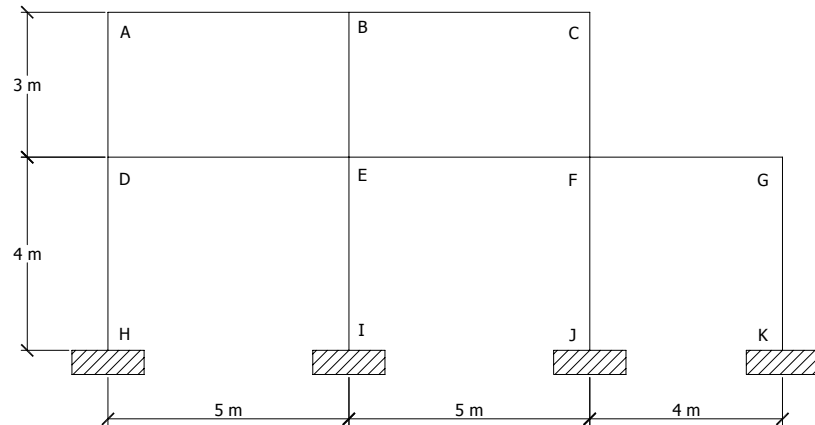


Tabla 1.
Soporte a calcular y Secciones b x h

| | <i>ij</i> | pilar planta baja | pilar planta alta | viga planta baja | viga planta alta |
|----|-----------|--------------------------|--------------------------|-------------------------|-------------------------|
| 1 | AD | 400 x 400 | 400 x 400 | 500 x 300 | 500 x 300 |
| 2 | AD | 400 x 400 | 400 x 400 | 450 x 300 | 450 x 300 |
| 3 | AD | 400 x 400 | 400 x 400 | 400 x 300 | 400 x 300 |
| 4 | AD | 400 x 400 | 400 x 400 | 350 x 300 | 350 x 300 |
| 5 | AD | 400 x 400 | 400 x 400 | 300 x 300 | 300 x 300 |
| 6 | AD | 400 x 400 | 350 x 350 | 500 x 300 | 500 x 300 |
| 7 | AD | 400 x 400 | 350 x 350 | 450 x 300 | 450 x 300 |
| 8 | AD | 400 x 400 | 350 x 350 | 400 x 300 | 400 x 300 |
| 9 | AD | 400 x 400 | 350 x 350 | 350 x 300 | 350 x 300 |
| 10 | AD | 400 x 400 | 350 x 350 | 300 x 300 | 300 x 300 |
| 11 | AD | 400 x 400 | 300 x 300 | 500 x 300 | 500 x 300 |

| | | | | | |
|----|----|-----------|-----------|-----------|-----------|
| 12 | AD | 400 x 400 | 300 x 300 | 450 x 300 | 450 x 300 |
| 13 | AD | 400 x 400 | 300 x 300 | 400 x 300 | 400 x 300 |
| 14 | AD | 400 x 400 | 300 x 300 | 350 x 300 | 350 x 300 |
| 15 | AD | 400 x 400 | 300 x 300 | 300 x 300 | 300 x 300 |
| 16 | AD | 400 x 400 | 400 x 400 | 500 x 300 | 500 x 260 |
| 17 | AD | 400 x 400 | 400 x 400 | 450 x 300 | 450 x 260 |
| 18 | AD | 400 x 400 | 400 x 400 | 400 x 300 | 400 x 260 |
| 19 | AD | 400 x 400 | 400 x 400 | 350 x 300 | 350 x 260 |
| 20 | AD | 400 x 400 | 400 x 400 | 300 x 300 | 300 x 260 |
| 21 | AD | 400 x 400 | 350 x 350 | 500 x 300 | 500 x 260 |
| 22 | AD | 400 x 400 | 350 x 350 | 450 x 300 | 450 x 260 |
| 23 | AD | 400 x 400 | 350 x 350 | 400 x 300 | 400 x 260 |
| 24 | AD | 400 x 400 | 350 x 350 | 350 x 300 | 350 x 260 |
| 25 | AD | 400 x 400 | 350 x 350 | 300 x 300 | 300 x 260 |
| 26 | AD | 400 x 400 | 300 x 300 | 500 x 300 | 500 x 260 |
| 27 | AD | 400 x 400 | 300 x 300 | 450 x 300 | 450 x 260 |
| 28 | AD | 400 x 400 | 300 x 300 | 400 x 300 | 400 x 260 |
| 29 | AD | 400 x 400 | 300 x 300 | 350 x 300 | 350 x 260 |
| 30 | AD | 400 x 400 | 300 x 300 | 300 x 300 | 300 x 260 |
| 31 | BE | 350 x 350 | 350 x 350 | 500 x 300 | 500 x 300 |
| 32 | BE | 350 x 350 | 350 x 350 | 450 x 300 | 450 x 300 |
| 33 | BE | 350 x 350 | 350 x 350 | 400 x 300 | 400 x 300 |
| 34 | BE | 350 x 350 | 350 x 350 | 350 x 300 | 350 x 300 |
| 35 | BE | 350 x 350 | 350 x 350 | 300 x 300 | 300 x 300 |
| 36 | BE | 350 x 350 | 300 x 300 | 500 x 300 | 500 x 300 |
| 37 | BE | 350 x 350 | 300 x 300 | 450 x 300 | 450 x 300 |
| 38 | BE | 350 x 350 | 300 x 300 | 400 x 300 | 400 x 300 |
| 39 | BE | 350 x 350 | 300 x 300 | 350 x 300 | 350 x 300 |
| 40 | BE | 350 x 350 | 350 x 350 | 500 x 300 | 500 x 260 |
| 41 | BE | 350 x 350 | 350 x 350 | 450 x 300 | 450 x 260 |
| 42 | BE | 350 x 350 | 350 x 350 | 400 x 300 | 400 x 260 |
| 43 | BE | 350 x 350 | 350 x 350 | 350 x 300 | 350 x 260 |
| 44 | BE | 350 x 350 | 350 x 350 | 300 x 300 | 300 x 260 |
| 45 | BE | 350 x 350 | 300 x 300 | 500 x 300 | 500 x 260 |
| 46 | BE | 350 x 350 | 300 x 300 | 450 x 300 | 450 x 260 |
| 47 | BE | 350 x 350 | 300 x 300 | 400 x 300 | 400 x 260 |
| 48 | BE | 350 x 350 | 300 x 300 | 350 x 300 | 350 x 260 |
| 49 | BE | 350 x 350 | 300 x 300 | 350 x 300 | 300 x 260 |

| | | | | | |
|----|----|-----------|-----------|-----------|-----------|
| 50 | BE | 350 x 350 | 350 x 350 | 500 x 260 | 500 x 260 |
| 51 | BE | 350 x 350 | 350 x 350 | 450 x 260 | 450 x 260 |
| 52 | BE | 350 x 350 | 350 x 350 | 400 x 260 | 400 x 260 |
| 53 | BE | 350 x 350 | 350 x 350 | 350 x 260 | 350 x 260 |
| 54 | BE | 350 x 350 | 350 x 350 | 300 x 260 | 300 x 260 |
| 55 | BE | 350 x 350 | 300 x 300 | 500 x 260 | 500 x 260 |
| 56 | BE | 350 x 350 | 300 x 300 | 450 x 260 | 450 x 260 |
| 57 | BE | 350 x 350 | 300 x 300 | 400 x 260 | 400 x 260 |
| 58 | BE | 350 x 350 | 300 x 300 | 350 x 260 | 350 x 260 |
| 59 | BE | 350 x 350 | 300 x 300 | 300 x 260 | 300 x 260 |
| 60 | CF | 300 x 300 | 300 x 300 | 500 x 300 | 500 x 300 |
| 61 | CF | 300 x 300 | 300 x 300 | 450 x 300 | 450 x 300 |
| 62 | CF | 300 x 300 | 300 x 300 | 400 x 300 | 400 x 300 |
| 63 | CF | 300 x 300 | 300 x 300 | 350 x 300 | 350 x 300 |
| 64 | CF | 300 x 300 | 300 x 300 | 500 x 300 | 500 x 260 |
| 65 | CF | 300 x 300 | 300 x 300 | 450 x 300 | 450 x 260 |
| 66 | CF | 300 x 300 | 300 x 300 | 400 x 300 | 400 x 260 |
| 67 | CF | 300 x 300 | 300 x 300 | 350 x 300 | 350 x 260 |
| 68 | CF | 300 x 300 | 300 x 300 | 300 x 300 | 300 x 260 |
| 69 | CF | 300 x 300 | 300 x 300 | 500 x 260 | 500 x 260 |
| 70 | CF | 300 x 300 | 300 x 300 | 450 x 260 | 450 x 260 |
| 71 | CF | 300 x 300 | 300 x 300 | 400 x 260 | 400 x 260 |
| 72 | CF | 300 x 300 | 300 x 300 | 350 x 260 | 350 x 260 |
| 73 | CF | 300 x 300 | 300 x 300 | 300 x 260 | 300 x 260 |
| 74 | DH | 400 x 400 | 400 x 400 | 500 x 300 | 500 x 300 |
| 75 | DH | 400 x 400 | 400 x 400 | 450 x 300 | 450 x 300 |
| 76 | DH | 400 x 400 | 400 x 400 | 400 x 300 | 400 x 300 |
| 77 | DH | 400 x 400 | 400 x 400 | 350 x 300 | 350 x 300 |
| 78 | DH | 400 x 400 | 400 x 400 | 300 x 300 | 300 x 300 |
| 79 | DH | 400 x 400 | 350 x 350 | 500 x 300 | 500 x 300 |
| 80 | DH | 400 x 400 | 350 x 350 | 450 x 300 | 450 x 300 |
| 81 | DH | 400 x 400 | 350 x 350 | 400 x 300 | 400 x 300 |
| 82 | DH | 400 x 400 | 350 x 350 | 350 x 300 | 350 x 300 |
| 83 | DH | 400 x 400 | 350 x 350 | 300 x 300 | 300 x 300 |
| 84 | DH | 400 x 400 | 300 x 300 | 500 x 300 | 500 x 300 |
| 85 | DH | 400 x 400 | 300 x 300 | 450 x 300 | 450 x 300 |
| 86 | DH | 400 x 400 | 300 x 300 | 400 x 300 | 400 x 300 |
| 87 | DH | 400 x 400 | 300 x 300 | 350 x 300 | 350 x 300 |

| | | | | | |
|-----|----|-----------|-----------|-----------|-----------|
| 88 | DH | 400 x 400 | 300 x 300 | 300 x 300 | 300 x 300 |
| 89 | DH | 400 x 400 | 400 x 400 | 500 x 300 | 500 x 260 |
| 90 | DH | 400 x 400 | 400 x 400 | 450 x 300 | 450 x 260 |
| 91 | DH | 400 x 400 | 400 x 400 | 400 x 300 | 400 x 260 |
| 92 | DH | 400 x 400 | 400 x 400 | 350 x 300 | 350 x 260 |
| 93 | DH | 400 x 400 | 400 x 400 | 300 x 300 | 300 x 260 |
| 94 | DH | 400 x 400 | 350 x 350 | 500 x 300 | 500 x 260 |
| 95 | DH | 400 x 400 | 350 x 350 | 450 x 300 | 450 x 260 |
| 96 | DH | 400 x 400 | 350 x 350 | 400 x 300 | 400 x 260 |
| 97 | DH | 400 x 400 | 350 x 350 | 350 x 300 | 350 x 260 |
| 98 | DH | 400 x 400 | 350 x 350 | 300 x 300 | 300 x 260 |
| 99 | DH | 400 x 400 | 300 x 300 | 500 x 300 | 500 x 260 |
| 100 | DH | 400 x 400 | 300 x 300 | 450 x 300 | 450 x 260 |
| 101 | DH | 400 x 400 | 300 x 300 | 400 x 300 | 400 x 260 |
| 102 | DH | 400 x 400 | 300 x 300 | 350 x 300 | 350 x 260 |
| 103 | DH | 400 x 400 | 300 x 300 | 300 x 300 | 300 x 260 |
| 104 | EI | 350 x 350 | 350 x 350 | 500 x 300 | 500 x 300 |
| 105 | EI | 350 x 350 | 350 x 350 | 450 x 300 | 450 x 300 |
| 106 | EI | 350 x 350 | 350 x 350 | 400 x 300 | 400 x 300 |
| 107 | EI | 350 x 350 | 350 x 350 | 350 x 300 | 350 x 300 |
| 108 | EI | 350 x 350 | 350 x 350 | 300 x 300 | 300 x 300 |
| 109 | EI | 350 x 350 | 300 x 300 | 500 x 300 | 500 x 300 |
| 110 | EI | 350 x 350 | 300 x 300 | 450 x 300 | 450 x 300 |
| 111 | EI | 350 x 350 | 300 x 300 | 400 x 300 | 400 x 300 |
| 112 | EI | 350 x 350 | 300 x 300 | 350 x 300 | 350 x 300 |
| 113 | EI | 350 x 350 | 350 x 350 | 500 x 300 | 500 x 260 |
| 114 | EI | 350 x 350 | 350 x 350 | 450 x 300 | 450 x 260 |
| 115 | EI | 350 x 350 | 350 x 350 | 400 x 300 | 400 x 260 |
| 116 | EI | 350 x 350 | 350 x 350 | 350 x 300 | 350 x 260 |
| 117 | EI | 350 x 350 | 350 x 350 | 300 x 300 | 300 x 260 |
| 118 | EI | 350 x 350 | 300 x 300 | 500 x 300 | 500 x 260 |
| 119 | EI | 350 x 350 | 300 x 300 | 450 x 300 | 450 x 260 |
| 120 | EI | 350 x 350 | 300 x 300 | 400 x 300 | 400 x 260 |
| 121 | EI | 350 x 350 | 300 x 300 | 350 x 300 | 350 x 260 |
| 122 | EI | 350 x 350 | 300 x 300 | 350 x 300 | 300 x 260 |
| 123 | EI | 350 x 350 | 350 x 350 | 500 x 260 | 500 x 260 |
| 124 | EI | 350 x 350 | 350 x 350 | 450 x 260 | 450 x 260 |
| 125 | EI | 350 x 350 | 350 x 350 | 400 x 260 | 400 x 260 |

| | | | | | |
|-----|----|-----------|-----------|-----------|-----------|
| 126 | EI | 350 x 350 | 350 x 350 | 350 x 260 | 350 x 260 |
| 127 | EI | 350 x 350 | 350 x 350 | 300 x 260 | 300 x 260 |
| 128 | EI | 350 x 350 | 300 x 300 | 500 x 260 | 500 x 260 |
| 129 | EI | 350 x 350 | 300 x 300 | 450 x 260 | 450 x 260 |
| 130 | EI | 350 x 350 | 300 x 300 | 400 x 260 | 400 x 260 |
| 131 | EI | 350 x 350 | 300 x 300 | 350 x 260 | 350 x 260 |
| 132 | EI | 350 x 350 | 300 x 300 | 300 x 260 | 300 x 260 |
| 133 | FJ | 300 x 300 | 300 x 300 | 500 x 300 | 500 x 300 |
| 134 | FJ | 300 x 300 | 300 x 300 | 450 x 300 | 450 x 300 |
| 135 | FJ | 300 x 300 | 300 x 300 | 400 x 300 | 400 x 300 |
| 136 | FJ | 300 x 300 | 300 x 300 | 350 x 300 | 350 x 300 |
| 137 | FJ | 300 x 300 | 300 x 300 | 500 x 300 | 500 x 260 |
| 138 | FJ | 300 x 300 | 300 x 300 | 450 x 300 | 450 x 260 |
| 139 | FJ | 300 x 300 | 300 x 300 | 400 x 300 | 400 x 260 |
| 140 | FJ | 300 x 300 | 300 x 300 | 350 x 300 | 350 x 260 |
| 141 | FJ | 300 x 300 | 300 x 300 | 300 x 300 | 300 x 260 |
| 142 | FJ | 300 x 300 | 300 x 300 | 500 x 260 | 500 x 260 |
| 143 | FJ | 300 x 300 | 300 x 300 | 450 x 260 | 450 x 260 |
| 144 | FJ | 300 x 300 | 300 x 300 | 400 x 260 | 400 x 260 |
| 145 | FJ | 300 x 300 | 300 x 300 | 350 x 260 | 350 x 260 |
| 146 | FJ | 300 x 300 | 300 x 300 | 300 x 260 | 300 x 260 |

| Tabla 2. | | | |
|---|----------|----------|--------------|
| Resistencias y clase de exposición | | | |
| | f_{ck} | f_{yk} | Clase |
| 1 | 25 | 400 | I |
| 2 | 25 | 400 | IIa |
| 3 | 25 | 400 | IIb |
| 4 | 25 | 500 | I |
| 5 | 25 | 500 | IIa |
| 6 | 25 | 500 | IIb |
| 7 | 30 | 400 | I |
| 8 | 30 | 400 | IIa |
| 9 | 30 | 400 | IIb |
| 0 | 30 | 500 | I |