

FEB. '22

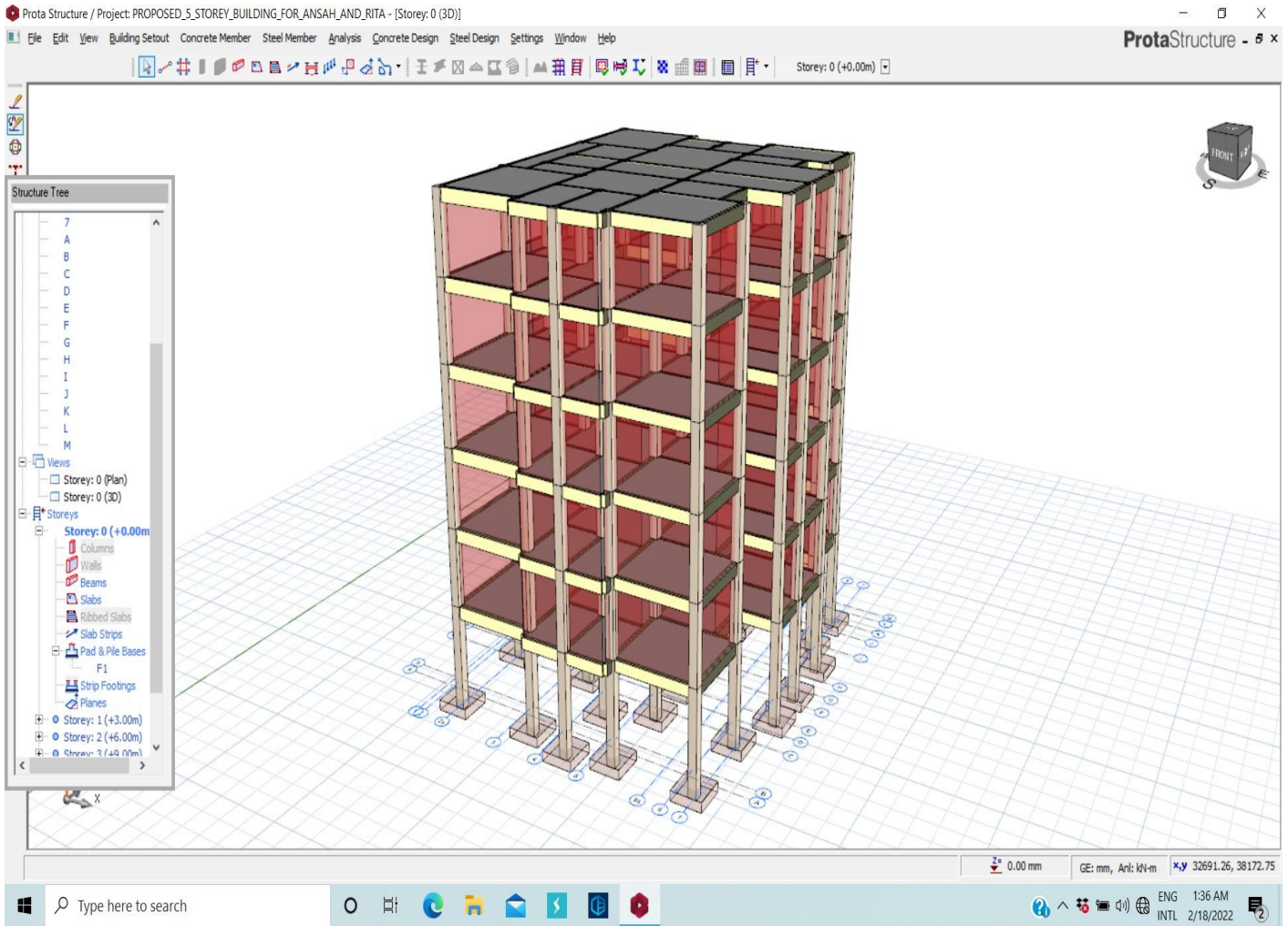
STRUCTURAL DESIGN REPORT

JABEZ PROJECTS, INC. dba BRASS

AT

ADWEMADOR

STRUCTURAL MODEL



| | |
|---|---|
| PROPOSED 5-STOREY ADMINISTRATION BLOCK | Fenerbahçe Kadikoy (0001907) |
| Column Reinforcement Design 1 15/02/2021 Rev: 1 | Calc. By: SAMORA Checked By: MICHAEL |

d/h = Slab Effective/Total Depths
 $(d=h-cover)$ g/q = Dead/Live
 Loads (not factored)
 $L1$ = Width of the Slab Along the Strip Direction
 $L2$ = Width of the Slab Perpendicular to the Strip Direction
 C = Moment Coefficient $M=C p / L^2$
 $M-span$ = Ultimate Span Moment
 $M-sup$ = Ultimate Support Moment M_c
 = Balanced
 Support Moment
 A_s = Steel Area (Required/Supplied)

Slab Strip: X1 -- Storey: 1

Materials: C25/30 / Grade 250 (Plain)

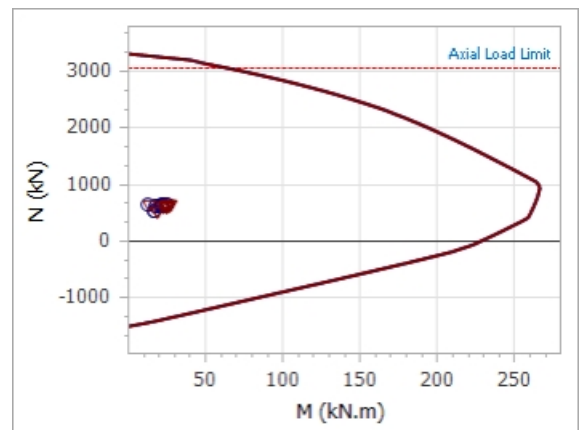
| Slab | Type | g | $L1$ | $C-sup$ | $C-span$ | A_s | |
|------|-------|----------------------|------|---------|----------|--------------------|---------------|
| | d/h | q | $L2$ | $M-sup$ | $M-span$ | Req/Sup | S T E E L B A |
| | (mm) | (kN/m ²) | (mm) | (kN.m) | (kN.m) | (mm ²) | |

Support $M_c = 0.7$ Support $A_s = 322.78/251.33$ (X)
 SupTop: R8-

Column Reinforcement Design

1C1 (B-2) (400/400)
 (C25/30 / Grade 460 (Type 2))

| No | $N_{Top/Bot}$ (kN) | $M_{11 Top/Bot}$ (kN.m) | $M_{22 Top/Bot}$ (kN.m) |
|----|--------------------|-------------------------|-------------------------|
| 1 | 636.8, 636.8 | 22.5, -10.8 | 18.7, -9.0 |
| 2 | 616.8, 616.8 | 22.3, -10.7 | 18.4, -8.9 |
| 3 | 537.1, 537.1 | 16.9, -8.1 | 14.1, -6.8 |
| 4 | 623.2, 623.2 | 22.7, -11.0 | 15.4, -2.6 |
| 5 | 650.4, 650.4 | 22.4, -10.6 | 22.1, -15.4 |
| 6 | 630.3, 630.3 | 20.3, -6.5 | 18.8, -9.1 |
| 7 | 643.3, 643.3 | 24.8, -15.2 | 18.6, -8.9 |

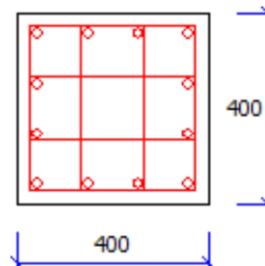


Critical Loading: 1 - (G*F)

| | min | Design |
|----------|-------|----------------|
| N | 678.6 | - 678.6 kN |
| M_{11} | 16.3 | 13.6 19.1 kN.m |
| M_{22} | 13.6 | 13.6 16.5 kN.m |

$N_{max} = 2561.1$
 Concrete Cover = 25.0 mm

Neutral Axis: 224.1 mm / 12.74 °

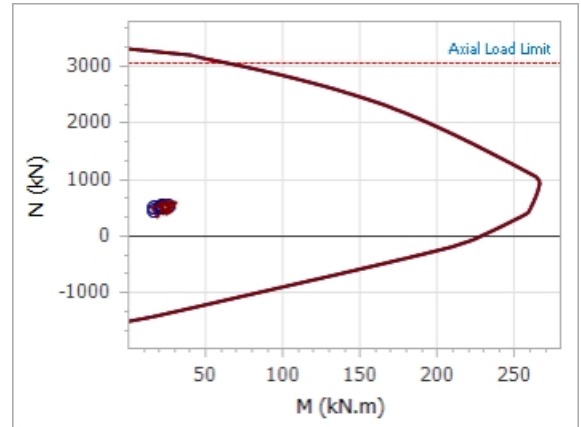


| | | | |
|--|-----------------------------------|--------------------------|-------------------------|
| $V_{Ed(1/2)} = 10.3 / 10.4$ kN | Short Column... | A_s (Req): %0.20 (min) | 320.00 mm ² |
| $V_{Ed} = 0.07 / 0.07$ N/mm ² | $\lambda_1/Lim_1 = 14.8 < 66.0$ ✓ | A_s (Sup): %2.36 | 3769.91 mm ² |
| $V_{Rdc} = 1.18 / 1.18$ N/mm ² | $\lambda_2/Lim_2 = 14.7 < 64.6$ ✓ | | |
| $V_{Rd Max} = 4.86 / 4.86$ N/mm ² | $M_{add(1/2)} = 0.0 / 0.0$ kN.m | | |
| Links = R10-300 | | 12T20 | |

| | |
|---|---|
| PROPOSED 5-STOREY ADMINISTRATION BLOCK | Fenerbahce Kadikoy (0001907) |
| Column Reinforcement Design 1 15/02/2021 Rev: 1 | Calc. By: SAMORA Checked By: MICHAEL |

2C1 (B-2) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 523.2, 523.2 | 22.4, -22.5 | 18.5, -18.7 |
| 2 | 503.6, 503.6 | 22.2, -22.3 | 18.3, -18.4 |
| 3 | 443.8, 443.8 | 16.7, -16.9 | 13.9, -14.1 |
| 4 | 513.4, 513.4 | 22.4, -22.5 | 14.2, -14.4 |
| 5 | 533.1, 533.1 | 22.3, -22.5 | 22.9, -23.1 |
| 6 | 518.5, 518.5 | 20.0, -20.3 | 18.6, -18.7 |
| 7 | 528.0, 528.0 | 24.8, -24.7 | 18.5, -18.7 |

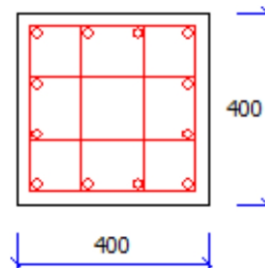


Critical Loading: 1 - (G*F)

| | min | Design |
|------------------|--------|--------|
| N | 566.4 | - |
| M ₁₁ | -24.2 | -11.3 |
| M ₂₂ | -20.1 | -11.3 |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

Neutral Axis: 220.1 mm / 17.46 °



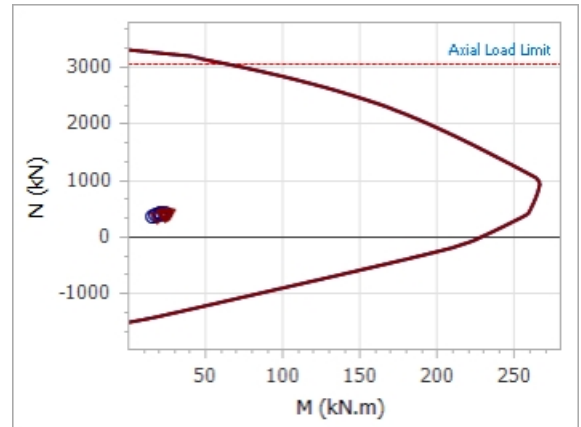
| | | | | | | |
|------------------------|-------------------------------|------------------------------------|----------------|--------------|------------------------|-------------------------|
| V _{Ed(1/2)} = | 15.9 / 17.2 kN | Short Column... | | As (Req): | %0.20 _(min) | 320.00 mm ² |
| V _{Ed} = | 0.10 / 0.10 N/mm ² | λ ₁ /Lim ₁ = | 17.8 < 81.9 ✓ | As (Sup): | %2.36 | 3769.91 mm ² |
| V _{Rdc} = | 1.18 / 1.18 N/mm ² | λ ₂ /Lim ₂ = | 17.6 < 81.8 ✓ | | | |
| V _{Rd Max} = | 4.86 / 4.86 N/mm ² | M _{add(1/2)} = | 0.0 / 0.0 kN.m | 12T20 | | |

| | |
|---|---|
| PROPOSED 5-STOREY ADMINISTRATION BLOCK | Fenerbahce Kadikoy (0001907) |
| Column Reinforcement Design 1 15/02/2021 Rev: 1 | Calc. By: SAMORA Checked By: MICHAEL |

Links = R10-300

3C1 (B-2) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 410.1, 410.1 | 22.1, -22.4 | 18.2, -18.5 |
| 2 | 390.5, 390.5 | 21.9, -22.2 | 18.0, -18.3 |
| 3 | 350.7, 350.7 | 16.5, -16.7 | 13.6, -13.9 |
| 4 | 403.8, 403.8 | 22.2, -22.4 | 14.5, -15.4 |
| 5 | 416.3, 416.3 | 22.1, -22.4 | 21.9, -21.6 |
| 6 | 407.0, 407.0 | 20.1, -20.7 | 18.2, -18.5 |
| 7 | 413.1, 413.1 | 24.2, -24.0 | 18.2, -18.5 |

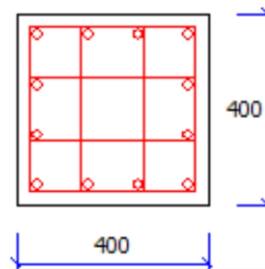


Critical Loading: 1 - (G*F)

| | min | Design |
|------------------|--------|---------------|
| N | 448.0 | - 448.0 kN |
| M ₁₁ | 23.2 | 9.0 25.2 kN.m |
| M ₂₂ | 18.9 | 9.0 20.8 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

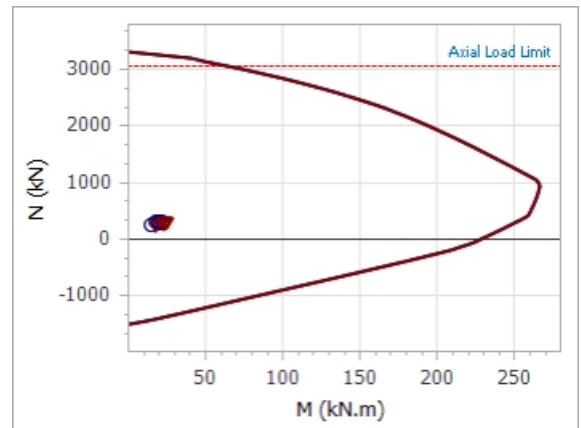
Neutral Axis: 185.1 mm / 15.88 °



| | | |
|---|--|--|
| V _{Ed(1/2)} = 14.7 / 16.7 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.10 / 0.10 N/mm ² | λ ₁ /Lim ₁ = 15.4 < 93.3 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 1.09 / 1.08 N/mm ² | λ ₂ /Lim ₂ = 15.4 < 93.9 ✓ | 12T20 |
| V _{Rd Max} = 4.72 / 4.71 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |
| Links = R10-300 | | |

4C1 (B-2) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 297.5, 297.5 | 21.9, -22.1 | 17.9, -18.2 |
| 2 | 278.0, 278.0 | 21.7, -21.9 | 17.8, -18.0 |
| 3 | 258.2, 258.2 | 16.3, -16.5 | 13.3, -13.6 |
| 4 | 294.1, 294.1 | 21.9, -22.2 | 15.1, -16.1 |
| 5 | 300.9, 300.9 | 21.9, -22.1 | 20.7, -20.3 |
| 6 | 295.7, 295.7 | 20.3, -21.0 | 17.9, -18.2 |
| 7 | 299.2, 299.2 | 23.5, -23.3 | 17.9, -18.2 |

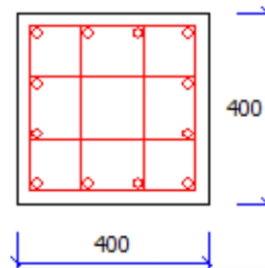


Critical Loading: 1 - (G*F)

| | min | Design |
|------------------|--------|-----------------|
| N | 327.9 | - 327.9 kN |
| M ₁₁ | -24.6 | -6.6 -26.1 kN.m |
| M ₂₂ | 19.8 | 6.6 21.2 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

Neutral Axis: 175.4 mm / 19.60 °



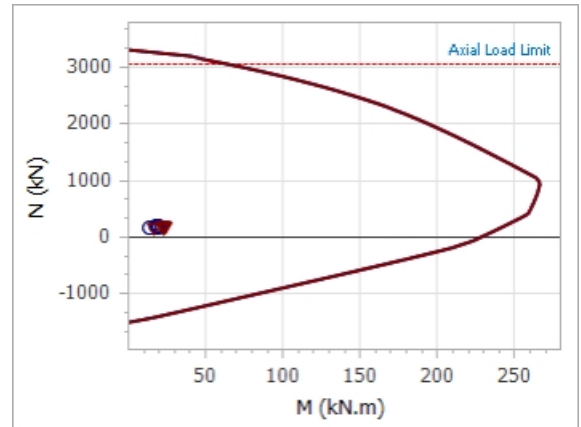
| | | |
|---|---|--|
| V _{Ed(1/2)} = 14.8 / 17.3 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.10 / 0.10 N/mm ² | λ ₁ /Lim ₁ = 15.4 < 109.5 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 0.97 / 0.97 N/mm ² | λ ₂ /Lim ₂ = 15.4 < 109.9 ✓ | 12T20 |
| V _{Rd Max} = 4.53 / 4.53 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |

| | |
|---|---|
| PROPOSED 5-STOREY ADMINISTRATION BLOCK | Fenerbahçe Kadikoy (0001907) |
| Column Reinforcement Design 1 15/02/2021 Rev: 1 | Calc. By: SAMORA Checked By: MICHAEL |

Links = R10-300

5C1 (B-2) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 185.6, 185.6 | 21.6, -21.9 | 17.5, -17.9 |
| 2 | 166.1, 166.1 | 21.4, -21.7 | 17.5, -17.8 |
| 3 | 166.3, 166.3 | 16.1, -16.3 | 13.0, -13.3 |
| 4 | 184.1, 184.1 | 21.6, -21.9 | 15.7, -16.7 |
| 5 | 187.0, 187.0 | 21.6, -21.9 | 19.4, -19.1 |
| 6 | 184.8, 184.8 | 20.5, -21.2 | 17.5, -17.9 |
| 7 | 186.4, 186.4 | 22.7, -22.6 | 17.5, -17.9 |

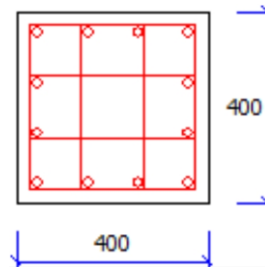


Critical Loading: 1 - (G*F)

| | min | Design |
|------------------|--------|-----------------|
| N | 206.8 | - 206.8 kN |
| M ₁₁ | -24.8 | -4.1 -25.7 kN.m |
| M ₂₂ | -19.5 | -4.1 -20.4 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

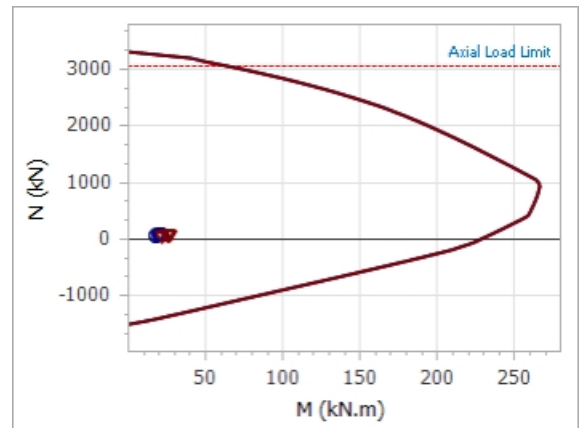
Neutral Axis: 128.6 mm / 15.81 °



| | | |
|---|---|--|
| V _{Ed(1/2)} = 13.8 / 16.9 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.09 / 0.09 N/mm ² | λ ₁ /Lim ₁ = 15.4 < 137.1 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 0.86 / 0.86 N/mm ² | λ ₂ /Lim ₂ = 15.4 < 136.8 ✓ | 12T20 |
| V _{Rd Max} = 4.34 / 4.34 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |
| Links = R10-300 | | |

6C1 (B-2) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 74.3, 74.3 | 25.7, -21.6 | 20.3, -17.5 |
| 2 | 54.9, 54.9 | 16.6, -21.4 | 13.2, -17.5 |
| 3 | 75.0, 75.0 | 25.7, -16.1 | 20.3, -13.0 |
| 4 | 73.9, 73.9 | 25.7, -21.6 | 19.4, -17.2 |
| 5 | 74.8, 74.8 | 25.6, -21.6 | 21.1, -17.9 |
| 6 | 74.1, 74.1 | 25.1, -21.4 | 20.3, -17.5 |
| 7 | 74.6, 74.6 | 26.2, -21.8 | 20.3, -17.5 |

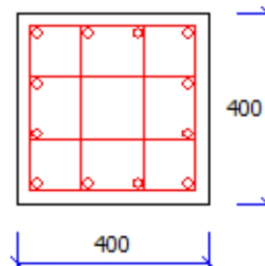


Critical Loading: 7 - (G+Q-Nx)

| | min | Design |
|------------------|--------|---------------|
| N | 84.8 | - 84.8 kN |
| M ₁₁ | 32.2 | 1.7 32.6 kN.m |
| M ₂₂ | 25.0 | 1.7 25.4 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

Neutral Axis: 146.5 mm / 28.55 °



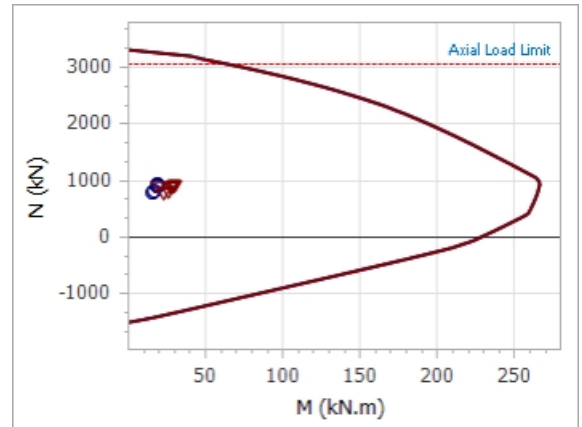
| | | |
|---|---|--|
| V _{Ed(1/2)} = 16.0 / 19.9 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.11 / 0.11 N/mm ² | λ ₁ /Lim ₁ = 15.4 < 227.0 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 0.74 / 0.74 N/mm ² | λ ₂ /Lim ₂ = 15.4 < 225.4 ✓ | 12T20 |
| V _{Rd Max} = 4.16 / 4.16 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |

| | |
|---|---|
| PROPOSED 5-STOREY ADMINISTRATION BLOCK | Fenerbahce Kadikoy (0001907) |
| Column Reinforcement Design 1 15/02/2021 Rev: 1 | Calc. By: SAMORA Checked By: MICHAEL |

Links = R10-300

1C2 (B-3) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 914.6, 914.6 | 24.8, -11.9 | -11.8, 5.7 |
| 2 | 829.2, 829.2 | 22.4, -10.8 | -12.6, 6.1 |
| 3 | 794.3, 794.3 | 19.1, -9.2 | -8.1, 3.9 |
| 4 | 918.3, 918.3 | 24.9, -12.0 | -15.1, 12.0 |
| 5 | 911.0, 911.0 | 24.7, -11.8 | -8.4, -0.7 |
| 6 | 911.2, 911.2 | 23.2, -7.9 | -11.6, 5.5 |
| 7 | 918.1, 918.1 | 26.4, -16.0 | -11.9, 5.8 |

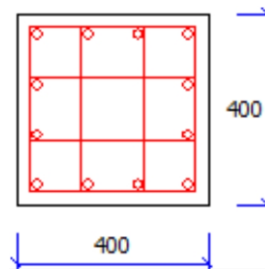


Critical Loading: 1 - (G*F)

| | min | Design |
|------------------|--------|------------------|
| N | 853.9 | - 853.9 kN |
| M ₁₁ | 20.9 | 17.1 24.5 kN.m |
| M ₂₂ | -11.3 | -17.1 -17.1 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

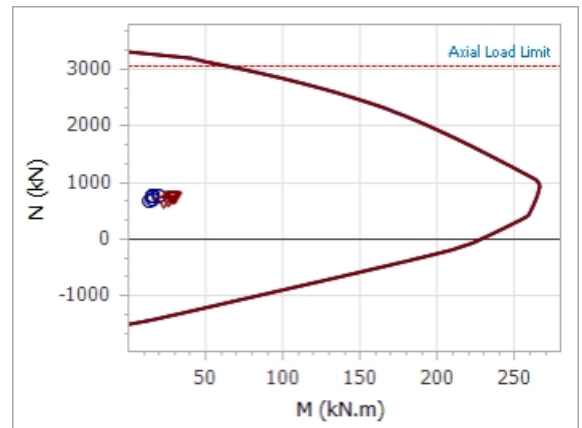
Neutral Axis: 291.7 mm / 18.54 °



| | | |
|---|--|--|
| V _{Ed(1/2)} = 8.5 / 12.4 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.06 / 0.06 N/mm ² | λ ₁ /Lim ₁ = 13.0 < 56.2 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 1.18 / 1.18 N/mm ² | λ ₂ /Lim ₂ = 15.0 < 57.5 ✓ | 12T20 |
| V _{Rd Max} = 4.86 / 4.86 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |
| Links = R10-300 | | |

2C2 (B-3) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 762.3, 762.3 | 24.5, -24.8 | -11.9, 11.8 |
| 2 | 689.3, 689.3 | 22.2, -22.4 | -12.7, 12.6 |
| 3 | 662.6, 662.6 | 18.9, -19.1 | -8.2, 8.1 |
| 4 | 764.7, 764.7 | 24.7, -24.9 | -16.2, 16.1 |
| 5 | 759.8, 759.8 | 24.4, -24.7 | -7.5, 7.4 |
| 6 | 759.6, 759.6 | 22.8, -23.3 | -11.8, 11.8 |
| 7 | 764.9, 764.9 | 26.2, -26.3 | -11.9, 11.7 |

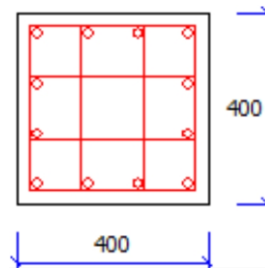


Critical Loading: 1 - (G*F)

| | min | Design |
|------------------|--------|------------------|
| N | 705.2 | - 705.2 kN |
| M ₁₁ | -30.0 | -14.1 -33.6 kN.m |
| M ₂₂ | 14.4 | 14.1 17.6 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

Neutral Axis: 288.2 mm / 24.68 °



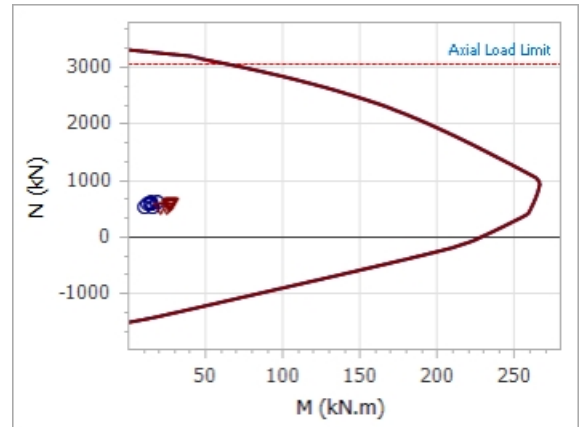
| | | |
|---|--|--|
| V _{Ed(1/2)} = 12.1 / 20.3 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.08 / 0.08 N/mm ² | λ ₁ /Lim ₁ = 15.6 < 72.9 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 1.18 / 1.18 N/mm ² | λ ₂ /Lim ₂ = 17.6 < 72.9 ✓ | 12T20 |
| V _{Rd Max} = 4.86 / 4.86 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |

| | |
|---|---|
| PROPOSED 5-STOREY ADMINISTRATION BLOCK | Fenerbahçe Kadikoy (0001907) |
| Column Reinforcement Design 1 15/02/2021 Rev: 1 | Calc. By: SAMORA Checked By: MICHAEL |

Links = R10-300

3C2 (B-3) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 603.6, 603.6 | 24.3, -24.5 | -11.8, 11.9 |
| 2 | 543.1, 543.1 | 22.0, -22.2 | -12.6, 12.7 |
| 3 | 525.1, 525.1 | 18.7, -18.9 | -8.3, 8.2 |
| 4 | 604.9, 604.9 | 24.4, -24.6 | -15.5, 15.0 |
| 5 | 602.3, 602.3 | 24.2, -24.4 | -8.1, 8.8 |
| 6 | 601.7, 601.7 | 22.8, -23.4 | -11.8, 11.9 |
| 7 | 605.4, 605.4 | 25.8, -25.6 | -11.8, 11.9 |

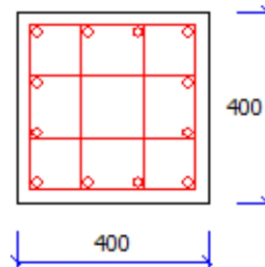


Critical Loading: 1 - (G*F)

| | min | Design |
|------------------|--------|------------|
| N | 553.4 | 553.4 kN |
| M ₁₁ | 27.1 | 29.5 kN.m |
| M ₂₂ | -11.7 | -14.2 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

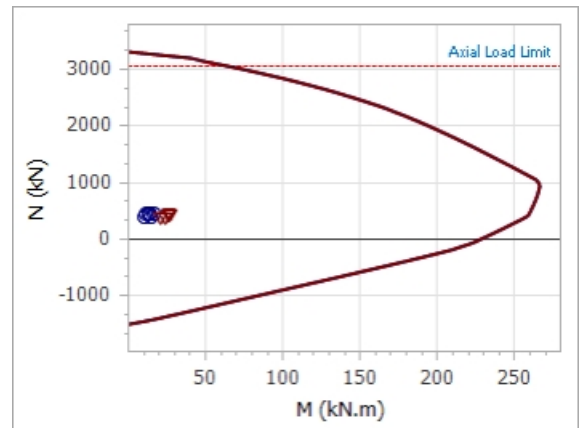
Neutral Axis: 239.6 mm / 22.02 °



| | | |
|---|--|--|
| V _{Ed(1/2)} = 10.1 / 18.9 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.07 / 0.07 N/mm ² | λ ₁ /Lim ₁ = 15.4 < 84.5 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 1.18 / 1.18 N/mm ² | λ ₂ /Lim ₂ = 15.4 < 84.4 ✓ | 12T20 |
| V _{Rd Max} = 4.86 / 4.86 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |
| Links = R10-300 | | |

4C2 (B-3) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 443.4, 443.4 | 24.0, -24.3 | -11.8, 11.8 |
| 2 | 395.4, 395.4 | 21.8, -22.0 | -12.5, 12.6 |
| 3 | 386.3, 386.3 | 18.5, -18.7 | -8.3, 8.3 |
| 4 | 444.0, 444.0 | 24.1, -24.4 | -14.6, 14.0 |
| 5 | 442.9, 442.9 | 24.0, -24.2 | -9.0, 9.7 |
| 6 | 442.3, 442.3 | 22.8, -23.5 | -11.8, 11.8 |
| 7 | 444.6, 444.6 | 25.3, -25.0 | -11.8, 11.8 |

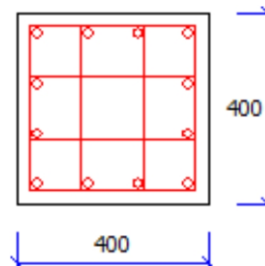


Critical Loading: 1 - (G*F)

| | min | Design |
|------------------|--------|-----------|
| N | 402.8 | 402.8 kN |
| M ₁₁ | 28.5 | 30.3 kN.m |
| M ₂₂ | 11.5 | 13.3 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

Neutral Axis: 148.6 mm / 10.20 °



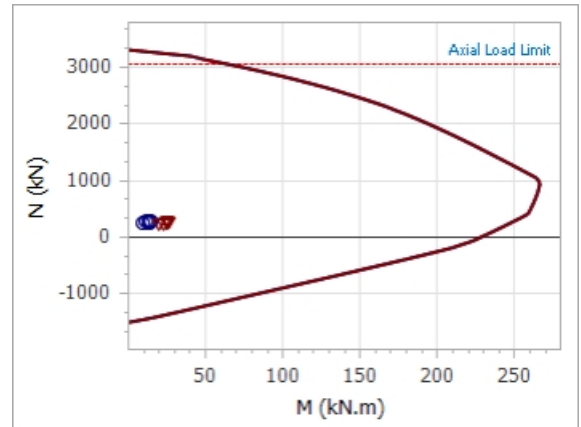
| | | |
|---|--|--|
| V _{Ed(1/2)} = 9.3 / 19.6 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.06 / 0.06 N/mm ² | λ ₁ /Lim ₁ = 15.4 < 98.8 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 1.04 / 1.04 N/mm ² | λ ₂ /Lim ₂ = 15.4 < 99.1 ✓ | 12T20 |
| V _{Rd Max} = 4.64 / 4.64 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |

| | |
|---|---|
| PROPOSED 5-STOREY ADMINISTRATION BLOCK | Fenerbahce Kadikoy (0001907) |
| Column Reinforcement Design 1 15/02/2021 Rev: 1 | Calc. By: SAMORA Checked By: MICHAEL |

Links = R10-300

5C2 (B-3) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 281.7, 281.7 | 23.8, -24.0 | -11.7, 11.8 |
| 2 | 246.2, 246.2 | 21.6, -21.8 | -12.4, 12.5 |
| 3 | 246.4, 246.4 | 18.2, -18.5 | -8.3, 8.3 |
| 4 | 281.8, 281.8 | 23.8, -24.1 | -13.6, 13.0 |
| 5 | 281.6, 281.6 | 23.7, -24.0 | -9.8, 10.6 |
| 6 | 281.0, 281.0 | 22.9, -23.6 | -11.7, 11.8 |
| 7 | 282.3, 282.3 | 24.7, -24.5 | -11.7, 11.8 |

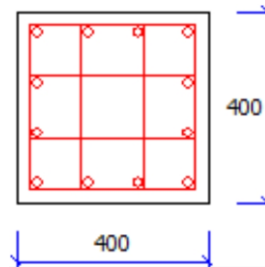


Critical Loading: 1 - (G*F)

| | min | Design |
|------------------|--------|-----------------|
| N | 253.1 | - 253.1 kN |
| M ₁₁ | -27.8 | -5.1 -29.0 kN.m |
| M ₂₂ | 11.0 | 5.1 12.1 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

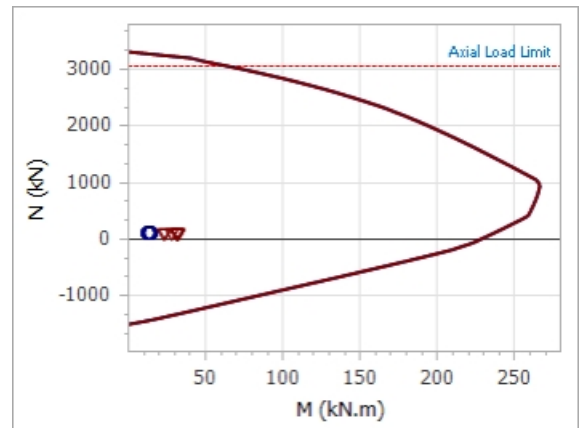
Neutral Axis: 175.7 mm / 24.11 °



| | | |
|---|---|--|
| V _{Ed(1/2)} = 8.1 / 18.5 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.05 / 0.05 N/mm ² | λ ₁ /Lim ₁ = 15.4 < 124.0 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 0.87 / 0.90 N/mm ² | λ ₂ /Lim ₂ = 15.4 < 122.6 ✓ | 12T20 |
| V _{Rd Max} = 4.36 / 4.41 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |
| Links = R10-300 | | |

6C2 (B-3) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 118.3, 118.3 | 31.2, -23.8 | -12.7, 11.7 |
| 2 | 95.2, 95.2 | 22.4, -21.6 | -7.4, 12.4 |
| 3 | 105.3, 105.3 | 28.1, -18.2 | -13.8, 8.3 |
| 4 | 118.2, 118.2 | 31.3, -23.8 | -13.6, 12.0 |
| 5 | 118.3, 118.3 | 31.2, -23.7 | -11.9, 11.4 |
| 6 | 118.0, 118.0 | 30.7, -23.7 | -12.7, 11.7 |
| 7 | 118.5, 118.5 | 31.7, -23.9 | -12.7, 11.7 |

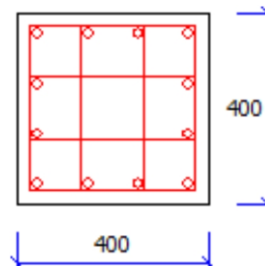


Critical Loading: 7 - (G+Q-Nx)

| | min | Design |
|------------------|--------|-----------------|
| N | 104.2 | - 104.2 kN |
| M ₁₁ | 40.5 | 2.1 41.0 kN.m |
| M ₂₂ | -11.7 | -2.1 -12.1 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

Neutral Axis: 543.5 mm / 81.32 °



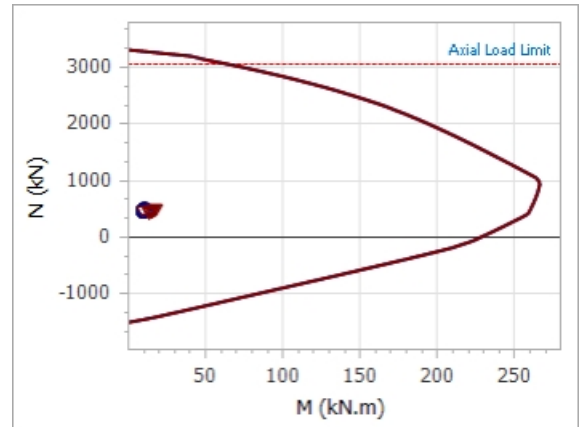
| | | |
|---|---|---|
| V _{Ed(1/2)} = 8.9 / 24.2 kN | Short Column... | As (Req): %0.21 329.98 mm ² |
| V _{Ed} = 0.06 / 0.06 N/mm ² | λ ₁ /Lim ₁ = 15.4 < 210.0 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 0.74 / 0.76 N/mm ² | λ ₂ /Lim ₂ = 15.4 < 198.7 ✓ | 12T20 |
| V _{Rd Max} = 4.16 / 4.19 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |

| | |
|---|---|
| PROPOSED 5-STOREY ADMINISTRATION BLOCK | Fenerbahçe Kadikoy (0001907) |
| Column Reinforcement Design 1 15/02/2021 Rev: 1 | Calc. By: SAMORA Checked By: MICHAEL |

Links = R10-300

1C3 (A-4) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 489.6, 489.6 | 13.3, -6.4 | -0.5, 0.2 |
| 2 | 444.7, 444.7 | 11.4, -5.5 | 0.5, -0.2 |
| 3 | 453.3, 453.3 | 11.3, -5.4 | -1.4, 0.7 |
| 4 | 489.4, 489.4 | 13.3, -6.4 | -4.1, 6.8 |
| 5 | 489.8, 489.8 | 13.3, -6.4 | 3.1, -6.3 |
| 6 | 479.5, 479.5 | 11.3, -2.2 | -0.4, 0.1 |
| 7 | 499.7, 499.7 | 15.2, -10.6 | -0.6, 0.4 |

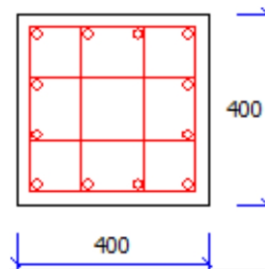


Critical Loading: 1 - (G*F)

| | min | Design |
|------------------|--------|------------------|
| N | 631.7 | - 631.7 kN |
| M ₁₁ | 11.0 | 12.6 13.6 kN.m |
| M ₂₂ | -1.1 | -12.6 -12.6 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

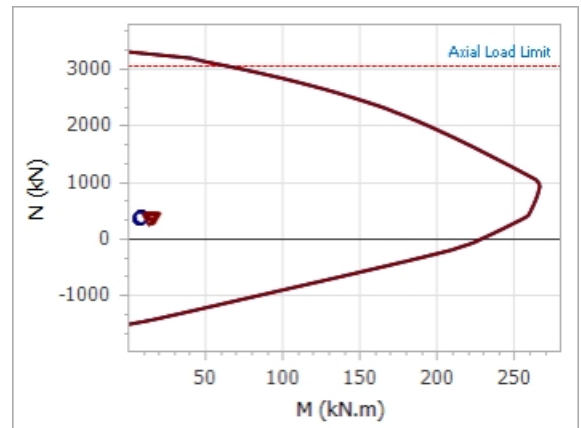
Neutral Axis: 203.1 mm / 10.49 °



| | | |
|---|--|--|
| V _{Ed(1/2)} = 3.8 / 7.7 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.03 / 0.03 N/mm ² | λ ₁ /Lim ₁ = 15.3 < 20.5 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 1.18 / 1.18 N/mm ² | λ ₂ /Lim ₂ = 14.0 < 68.1 ✓ | 12T20 |
| V _{Rd Max} = 4.86 / 4.86 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |
| Links = R10-300 | | |

2C3 (A-4) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 397.2, 397.2 | 12.8, -13.3 | -0.4, 0.5 |
| 2 | 360.4, 360.4 | 11.0, -11.4 | 0.5, -0.5 |
| 3 | 368.6, 368.6 | 10.8, -11.3 | -1.3, 1.4 |
| 4 | 397.1, 397.1 | 12.8, -13.3 | -5.1, 5.2 |
| 5 | 397.3, 397.3 | 12.8, -13.3 | 4.3, -4.2 |
| 6 | 390.2, 390.2 | 10.7, -11.4 | -0.4, 0.6 |
| 7 | 404.1, 404.1 | 14.9, -15.2 | -0.4, 0.5 |

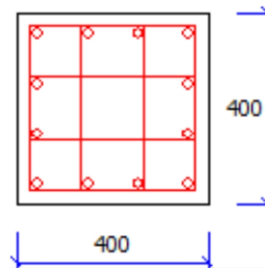


Critical Loading: 1 - (G*F)

| | min | Design |
|------------------|--------|------------------|
| N | 531.7 | - 531.7 kN |
| M ₁₁ | -16.7 | -10.6 -19.3 kN.m |
| M ₂₂ | -1.1 | -10.6 -10.6 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

Neutral Axis: 170.3 mm / 8.35 °



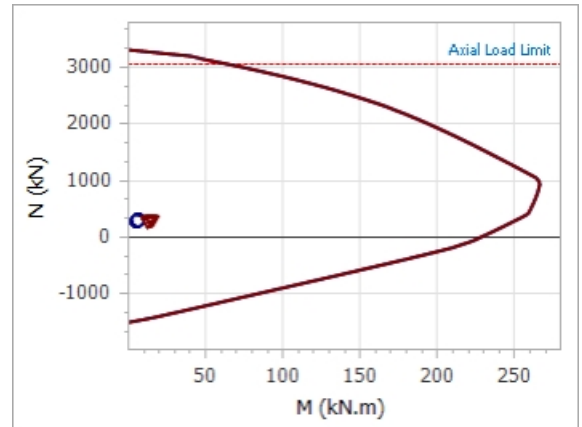
| | | |
|---|--|--|
| V _{Ed(1/2)} = 3.7 / 12.1 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.02 / 0.02 N/mm ² | λ ₁ /Lim ₁ = 18.0 < 22.4 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 1.16 / 1.17 N/mm ² | λ ₂ /Lim ₂ = 16.5 < 84.5 ✓ | 12T20 |
| V _{Rd Max} = 4.84 / 4.85 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |

| | |
|---|---|
| PROPOSED 5-STOREY ADMINISTRATION BLOCK | Fenerbahçe Kadikoy (0001907) |
| Column Reinforcement Design 1 15/02/2021 Rev: 1 | Calc. By: SAMORA Checked By: MICHAEL |

Links = R10-300

3C3 (A-4) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 305.2, 305.2 | 12.2, -12.8 | -0.3, 0.4 |
| 2 | 276.4, 276.4 | 10.6, -11.0 | 0.6, -0.5 |
| 3 | 283.6, 283.6 | 10.4, -10.8 | -1.1, 1.3 |
| 4 | 305.1, 305.1 | 12.2, -12.8 | -4.4, 3.9 |
| 5 | 305.2, 305.2 | 12.2, -12.8 | 3.8, -3.1 |
| 6 | 300.9, 300.9 | 10.5, -11.4 | -0.3, 0.5 |
| 7 | 309.4, 309.4 | 14.0, -14.2 | -0.2, 0.3 |

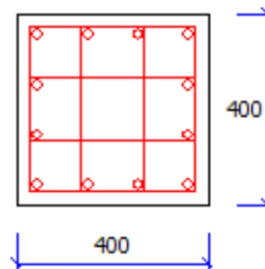


Critical Loading: 1 - (G*F)

| | min | Design |
|------------------|--------|----------------|
| N | 422.1 | - 422.1 kN |
| M ₁₁ | 16.5 | 8.4 18.3 kN.m |
| M ₂₂ | -0.3 | -8.4 -8.4 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

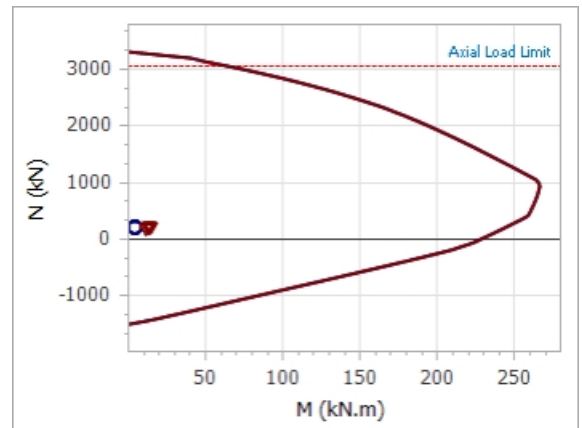
Neutral Axis: 170.8 mm / 14.08 °



| | | |
|---|--|--|
| V _{Ed(1/2)} = 2.7 / 12.0 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.02 / 0.02 N/mm ² | λ ₁ /Lim ₁ = 15.4 < 25.1 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 1.06 / 1.06 N/mm ² | λ ₂ /Lim ₂ = 15.4 < 96.5 ✓ | 12T20 |
| V _{Rd Max} = 4.67 / 4.68 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |
| Links = R10-300 | | |

4C3 (A-4) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 215.7, 215.7 | 11.6, -12.2 | -0.1, 0.3 |
| 2 | 195.0, 195.0 | 10.1, -10.6 | 0.6, -0.6 |
| 3 | 200.5, 200.5 | 9.9, -10.4 | -0.9, 1.1 |
| 4 | 215.7, 215.7 | 11.7, -12.2 | -3.3, 2.8 |
| 5 | 215.7, 215.7 | 11.6, -12.2 | 3.1, -2.3 |
| 6 | 213.5, 213.5 | 10.3, -11.3 | -0.2, 0.3 |
| 7 | 217.9, 217.9 | 13.0, -13.1 | -0.1, 0.2 |

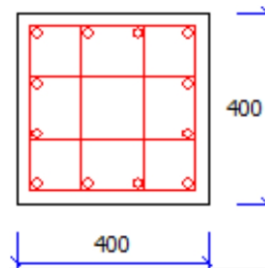


Critical Loading: 1 - (G*F)

| | min | Design |
|------------------|--------|----------------|
| N | 309.3 | - 309.3 kN |
| M ₁₁ | 17.9 | 6.2 19.3 kN.m |
| M ₂₂ | -0.1 | -6.2 -6.2 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

Neutral Axis: 147.3 mm / 14.61 °



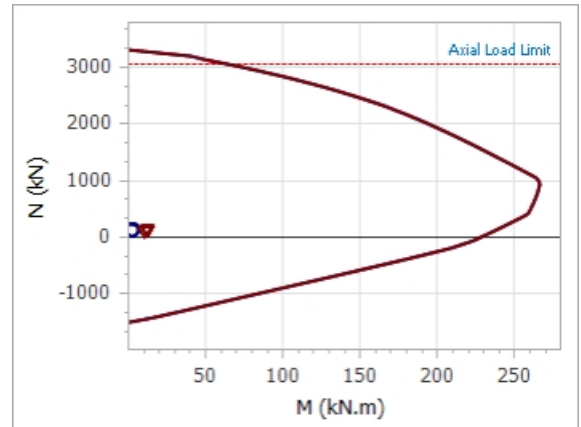
| | | |
|---|---|--|
| V _{Ed(1/2)} = 2.0 / 12.6 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.01 / 0.01 N/mm ² | λ ₁ /Lim ₁ = 15.4 < 29.3 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 0.95 / 0.95 N/mm ² | λ ₂ /Lim ₂ = 15.4 < 112.9 ✓ | 12T20 |
| V _{Rd Max} = 4.50 / 4.50 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |

| | |
|---|---|
| PROPOSED 5-STOREY ADMINISTRATION BLOCK | Fenerbahce Kadikoy (0001907) |
| Column Reinforcement Design 1 15/02/2021 Rev: 1 | Calc. By: SAMORA Checked By: MICHAEL |

Links = R10-300

5C3 (A-4) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 129.0, 129.0 | 11.0, -11.6 | 0.0, 0.1 |
| 2 | 116.3, 116.3 | 9.6, -10.1 | 0.7, -0.6 |
| 3 | 119.4, 119.4 | 9.3, -9.9 | -0.7, 0.9 |
| 4 | 129.0, 129.0 | 11.0, -11.6 | -2.2, 1.7 |
| 5 | 128.9, 128.9 | 11.0, -11.6 | 2.2, -1.4 |
| 6 | 128.1, 128.1 | 10.1, -11.2 | -0.1, 0.2 |
| 7 | 129.8, 129.8 | 12.0, -12.1 | 0.1, 0.0 |

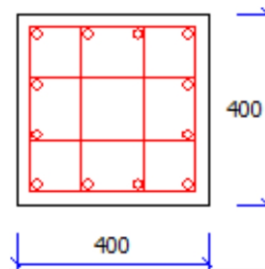


Critical Loading: 1 - (G*F)

| | min | Design |
|------------------|--------|-----------------|
| N | 194.5 | - 194.5 kN |
| M ₁₁ | -18.0 | -3.9 -18.9 kN.m |
| M ₂₂ | -0.4 | -3.9 -3.9 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

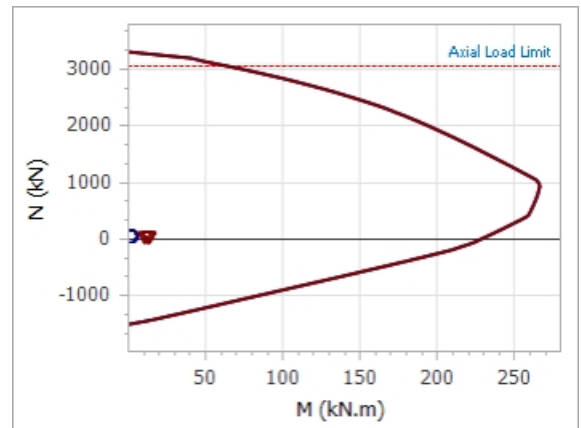
Neutral Axis: 68.8 mm / 2.94 °



| | | |
|---|---|--|
| V _{Ed(1/2)} = 1.5 / 12.2 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.01 / 0.01 N/mm ² | λ ₁ /Lim ₁ = 15.4 < 37.0 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 0.84 / 0.84 N/mm ² | λ ₂ /Lim ₂ = 15.4 < 140.5 ✓ | 12T20 |
| V _{Rd Max} = 4.32 / 4.32 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |
| Links = R10-300 | | |

6C3 (A-4) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 45.2, 45.2 | 12.9, -11.0 | 0.5, 0.0 |
| 2 | 40.5, 40.5 | 10.3, -9.6 | -1.0, -0.7 |
| 3 | 40.3, 40.3 | 10.7, -9.3 | 1.9, 0.7 |
| 4 | 45.2, 45.2 | 12.9, -11.0 | -0.8, 0.7 |
| 5 | 45.1, 45.1 | 12.9, -11.0 | 1.9, -0.7 |
| 6 | 45.0, 45.0 | 12.6, -11.0 | 0.4, 0.1 |
| 7 | 45.3, 45.3 | 13.3, -11.1 | 0.7, -0.1 |

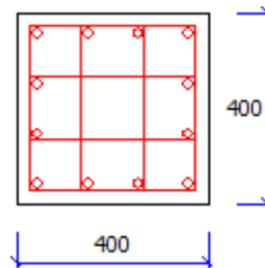


Critical Loading: 1 - (G*F)

| | min | Design |
|------------------|--------|---------------|
| N | 77.5 | - 77.5 kN |
| M ₁₁ | 25.4 | 1.6 25.8 kN.m |
| M ₂₂ | 0.1 | 1.6 1.6 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

Neutral Axis: 36.3 mm / 1.08 °



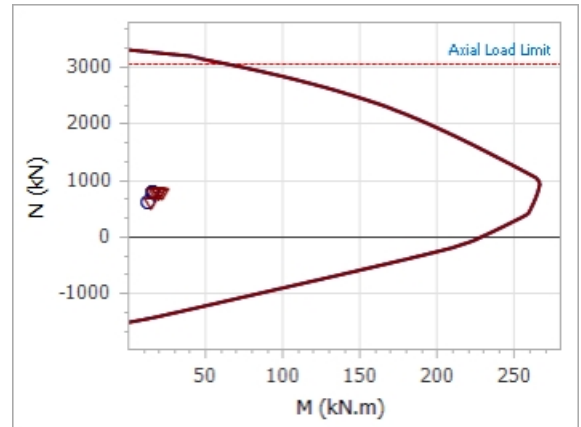
| | | |
|---|---|--|
| V _{Ed(1/2)} = 0.7 / 15.5 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.00 / 0.00 N/mm ² | λ ₁ /Lim ₁ = 15.4 < 58.6 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 0.73 / 0.73 N/mm ² | λ ₂ /Lim ₂ = 15.4 < 210.5 ✓ | 12T20 |
| V _{Rd Max} = 4.15 / 4.15 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |

| | |
|---|---|
| PROPOSED 5-STOREY ADMINISTRATION BLOCK | Fenerbahçe Kadikoy (0001907) |
| Column Reinforcement Design 1 15/02/2021 Rev: 1 | Calc. By: SAMORA Checked By: MICHAEL |

Links = R10-300

1C4 (B-5) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 783.0, 783.0 | 16.4, -7.9 | 10.7, -5.1 |
| 2 | 774.4, 774.4 | 15.9, -7.7 | 10.9, -5.3 |
| 3 | 622.8, 622.8 | 11.5, -5.5 | 7.9, -3.8 |
| 4 | 782.7, 782.7 | 16.1, -7.7 | 8.3, 0.8 |
| 5 | 783.2, 783.2 | 16.6, -8.0 | 13.0, -11.0 |
| 6 | 778.0, 778.0 | 14.6, -3.8 | 10.7, -5.2 |
| 7 | 788.0, 788.0 | 18.2, -12.0 | 10.6, -5.0 |

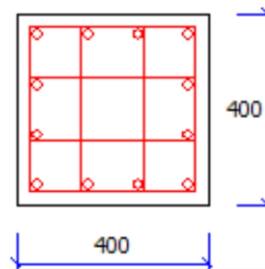


Critical Loading: 1 - (G*F)

| | min | Design |
|------------------|--------|-----------|
| N | 751.8 | 751.8 kN |
| M ₁₁ | 12.1 | 15.5 kN.m |
| M ₂₂ | 12.4 | 15.2 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

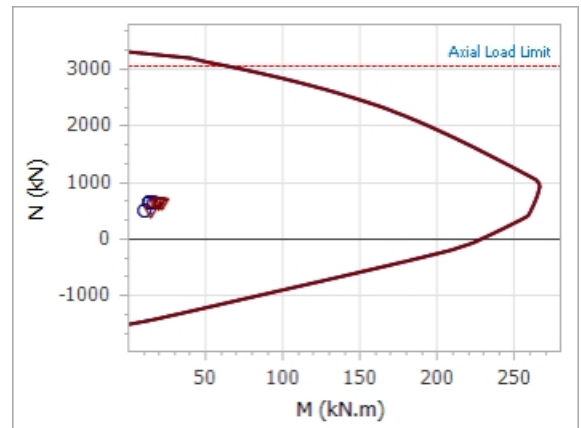
Neutral Axis: 237.3 mm / 11.87 °



| | | |
|---|--|--|
| V _{Ed(1/2)} = 9.2 / 8.2 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.06 / 0.06 N/mm ² | λ ₁ /Lim ₁ = 13.2 < 63.0 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 1.18 / 1.18 N/mm ² | λ ₂ /Lim ₂ = 15.6 < 62.7 ✓ | 12T20 |
| V _{Rd Max} = 4.86 / 4.86 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |
| Links = R10-300 | | |

2C4 (B-5) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 650.8, 650.8 | 15.8, -16.4 | 10.6, -10.7 |
| 2 | 642.4, 642.4 | 15.5, -15.9 | 10.9, -10.9 |
| 3 | 517.9, 517.9 | 10.9, -11.5 | 8.0, -7.9 |
| 4 | 650.7, 650.7 | 15.5, -16.1 | 7.5, -7.7 |
| 5 | 650.9, 650.9 | 16.1, -16.7 | 13.7, -13.7 |
| 6 | 647.1, 647.1 | 13.8, -14.6 | 10.6, -10.6 |
| 7 | 654.5, 654.5 | 17.8, -18.1 | 10.6, -10.7 |

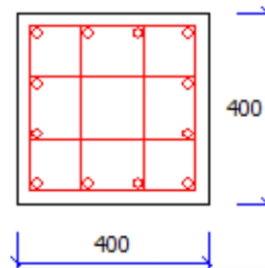


Critical Loading: 1 - (G*F)

| | min | Design |
|------------------|--------|------------|
| N | 622.9 | 622.9 kN |
| M ₁₁ | -18.2 | -21.5 kN.m |
| M ₂₂ | -17.7 | -20.5 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

Neutral Axis: 224.8 mm / 15.65 °



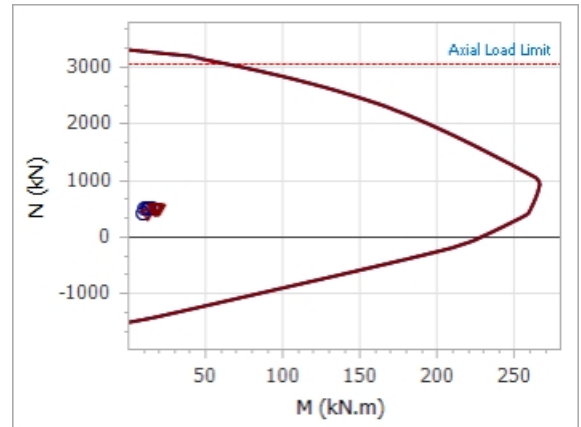
| | | |
|---|--|--|
| V _{Ed(1/2)} = 13.2 / 13.0 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.09 / 0.09 N/mm ² | λ ₁ /Lim ₁ = 15.5 < 77.0 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 1.18 / 1.18 N/mm ² | λ ₂ /Lim ₂ = 18.3 < 78.1 ✓ | 12T20 |
| V _{Rd Max} = 4.86 / 4.86 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |

| | |
|---|---|
| PROPOSED 5-STOREY ADMINISTRATION BLOCK | Fenerbahce Kadikoy (0001907) |
| Column Reinforcement Design 1 15/02/2021 Rev: 1 | Calc. By: SAMORA Checked By: MICHAEL |

Links = R10-300

3C4 (B-5) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 514.3, 514.3 | 15.4, -15.8 | 10.6, -10.6 |
| 2 | 505.7, 505.7 | 15.2, -15.5 | 10.7, -10.9 |
| 3 | 409.2, 409.2 | 10.5, -10.9 | 8.0, -8.0 |
| 4 | 514.2, 514.2 | 15.2, -15.5 | 7.9, -8.6 |
| 5 | 514.3, 514.3 | 15.7, -16.1 | 13.3, -12.7 |
| 6 | 511.8, 511.8 | 13.7, -14.5 | 10.6, -10.6 |
| 7 | 516.8, 516.8 | 17.2, -17.1 | 10.6, -10.7 |

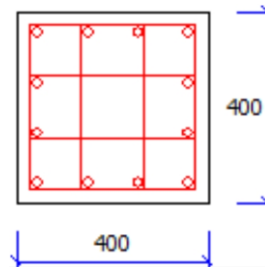


Critical Loading: 1 - (G*F)

| | min | Design |
|------------------|--------|---------------|
| N | 489.4 | - 489.4 kN |
| M ₁₁ | 17.6 | 9.8 19.8 kN.m |
| M ₂₂ | 14.5 | 9.8 16.7 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

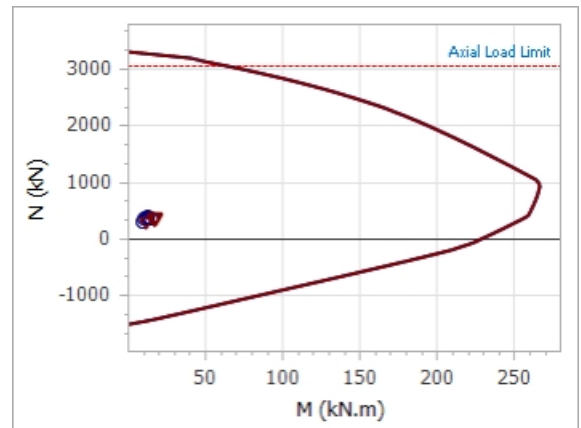
Neutral Axis: 180.7 mm / 12.87 °



| | | |
|---|--|--|
| V _{Ed(1/2)} = 11.2 / 12.7 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.07 / 0.07 N/mm ² | λ ₁ /Lim ₁ = 15.4 < 89.8 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 1.12 / 1.12 N/mm ² | λ ₂ /Lim ₂ = 15.4 < 89.7 ✓ | 12T20 |
| V _{Rd Max} = 4.77 / 4.78 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |
| Links = R10-300 | | |

4C4 (B-5) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 376.8, 376.8 | 15.1, -15.4 | 10.5, -10.6 |
| 2 | 367.8, 367.8 | 15.0, -15.2 | 10.6, -10.7 |
| 3 | 300.1, 300.1 | 10.2, -10.5 | 8.0, -8.0 |
| 4 | 376.8, 376.8 | 14.9, -15.2 | 8.4, -9.2 |
| 5 | 376.8, 376.8 | 15.3, -15.7 | 12.6, -11.9 |
| 6 | 375.3, 375.3 | 13.7, -14.5 | 10.5, -10.5 |
| 7 | 378.3, 378.3 | 16.4, -16.4 | 10.5, -10.6 |

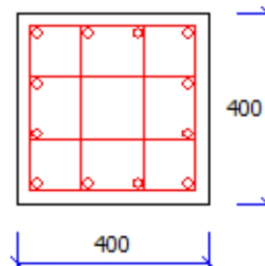


Critical Loading: 1 - (G*F)

| | min | Design |
|------------------|--------|-----------------|
| N | 356.2 | - 356.2 kN |
| M ₁₁ | 18.9 | 7.1 20.5 kN.m |
| M ₂₂ | -14.7 | -7.1 -16.3 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

Neutral Axis: 162.7 mm / 15.57 °



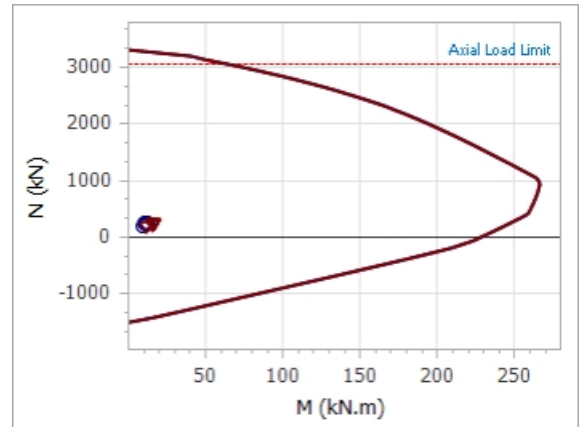
| | | |
|---|---|--|
| V _{Ed(1/2)} = 10.5 / 13.3 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.07 / 0.07 N/mm ² | λ ₁ /Lim ₁ = 15.4 < 105.2 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 0.95 / 1.00 N/mm ² | λ ₂ /Lim ₂ = 15.4 < 105.2 ✓ | 12T20 |
| V _{Rd Max} = 4.50 / 4.57 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |

| | |
|---|---|
| PROPOSED 5-STOREY ADMINISTRATION BLOCK | Fenerbahce Kadikoy (0001907) |
| Column Reinforcement Design 1 15/02/2021 Rev: 1 | Calc. By: SAMORA Checked By: MICHAEL |

Links = R10-300

5C4 (B-5) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 238.4, 238.4 | 14.7, -15.1 | 10.4, -10.5 |
| 2 | 228.4, 228.4 | 14.8, -15.0 | 10.5, -10.6 |
| 3 | 190.6, 190.6 | 9.8, -10.2 | 8.0, -8.0 |
| 4 | 238.4, 238.4 | 14.6, -14.9 | 8.9, -9.8 |
| 5 | 238.3, 238.3 | 14.8, -15.2 | 11.9, -11.2 |
| 6 | 237.6, 237.6 | 13.7, -14.6 | 10.4, -10.5 |
| 7 | 239.1, 239.1 | 15.7, -15.6 | 10.5, -10.6 |

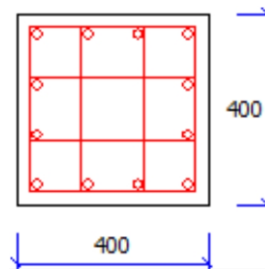


Critical Loading: 1 - (G*F)

| | min | Design |
|------------------|--------|-----------------|
| N | 223.2 | - 223.2 kN |
| M ₁₁ | -18.8 | -4.5 -19.8 kN.m |
| M ₂₂ | -14.0 | -4.5 -15.0 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

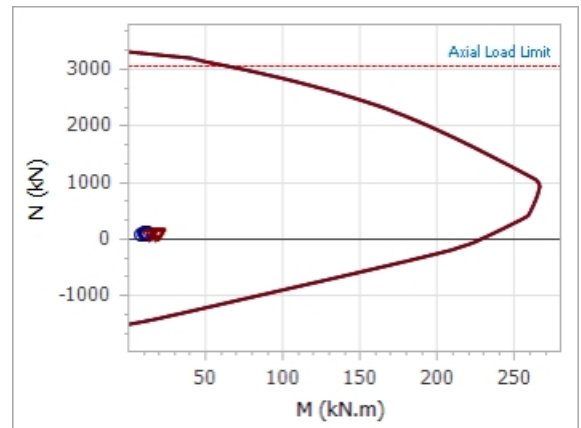
Neutral Axis: 112.9 mm / 11.45 °



| | | |
|---|---|--|
| V _{Ed(1/2)} = 9.9 / 12.8 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.07 / 0.07 N/mm ² | λ ₁ /Lim ₁ = 15.4 < 131.4 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 0.84 / 0.87 N/mm ² | λ ₂ /Lim ₂ = 15.4 < 131.2 ✓ | 12T20 |
| V _{Rd Max} = 4.32 / 4.37 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |
| Links = R10-300 | | |

6C4 (B-5) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 98.8, 98.8 | 18.9, -14.7 | 11.0, -10.4 |
| 2 | 87.6, 87.6 | 16.9, -14.8 | 12.1, -10.5 |
| 3 | 80.6, 80.6 | 13.6, -9.8 | 6.0, -8.0 |
| 4 | 98.8, 98.8 | 18.8, -14.6 | 10.3, -10.3 |
| 5 | 98.8, 98.8 | 19.0, -14.8 | 11.7, -10.6 |
| 6 | 98.5, 98.5 | 18.4, -14.5 | 10.9, -10.4 |
| 7 | 99.0, 99.0 | 19.4, -14.9 | 11.0, -10.5 |

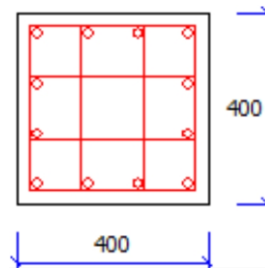


Critical Loading: 7 - (G+Q-Nx)

| | min | Design |
|------------------|--------|---------------|
| N | 90.3 | - 90.3 kN |
| M ₁₁ | 27.5 | 1.8 27.9 kN.m |
| M ₂₂ | 16.8 | 1.8 17.2 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

Neutral Axis: 102.1 mm / 16.97 °



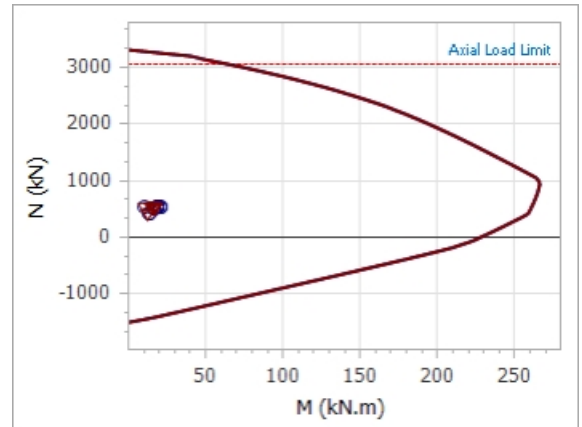
| | | |
|---|---|--|
| V _{Ed(1/2)} = 11.7 / 16.5 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.08 / 0.08 N/mm ² | λ ₁ /Lim ₁ = 15.4 < 221.8 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 0.73 / 0.75 N/mm ² | λ ₂ /Lim ₂ = 15.4 < 213.8 ✓ | 12T20 |
| V _{Rd Max} = 4.14 / 4.17 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |

| | |
|---|---|
| PROPOSED 5-STOREY ADMINISTRATION BLOCK | Fenerbahce Kadikoy (0001907) |
| Column Reinforcement Design 1 15/02/2021 Rev: 1 | Calc. By: SAMORA Checked By: MICHAEL |

Links = R10-300

1C5 (B-6) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 526.7, 526.7 | 13.9, -6.7 | -16.2, 7.8 |
| 2 | 528.6, 528.6 | 13.9, -6.7 | -16.2, 7.8 |
| 3 | 430.0, 430.0 | 10.4, -5.0 | -12.1, 5.8 |
| 4 | 536.4, 536.4 | 13.8, -6.5 | -18.6, 13.7 |
| 5 | 517.0, 517.0 | 14.0, -6.8 | -13.9, 1.9 |
| 6 | 520.1, 520.1 | 12.1, -2.6 | -16.2, 7.7 |
| 7 | 533.3, 533.3 | 15.7, -10.7 | -16.3, 7.9 |

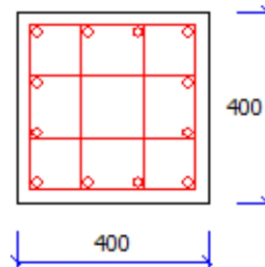


Critical Loading: 1 - (G*F)

| | min | Design |
|------------------|--------|------------------|
| N | 566.4 | - 566.4 kN |
| M ₁₁ | 10.9 | 11.3 13.4 kN.m |
| M ₂₂ | -13.0 | -11.3 -15.5 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

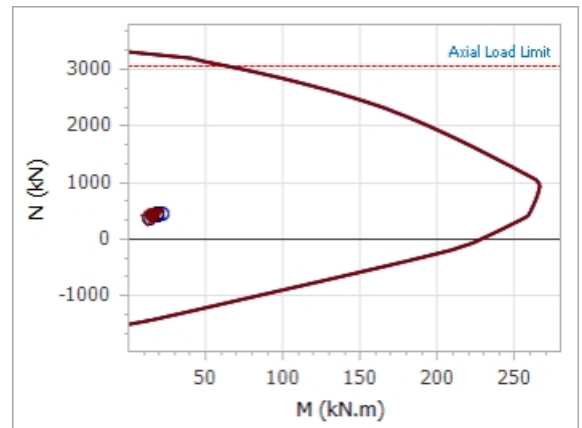
Neutral Axis: 187.3 mm / 10.40 °



| | | |
|---|--|--|
| V _{Ed(1/2)} = 8.9 / 7.5 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.06 / 0.06 N/mm ² | λ ₁ /Lim ₁ = 15.5 < 68.2 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 1.18 / 1.18 N/mm ² | λ ₂ /Lim ₂ = 15.6 < 72.2 ✓ | 12T20 |
| V _{Rd Max} = 4.86 / 4.86 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |
| Links = R10-300 | | |

2C5 (B-6) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 435.4, 435.4 | 13.8, -13.9 | -16.2, 16.2 |
| 2 | 436.9, 436.9 | 13.8, -13.9 | -16.2, 16.2 |
| 3 | 355.0, 355.0 | 10.3, -10.4 | -12.2, 12.1 |
| 4 | 442.5, 442.5 | 13.8, -13.9 | -19.3, 19.2 |
| 5 | 428.3, 428.3 | 13.8, -13.9 | -13.2, 13.3 |
| 6 | 430.7, 430.7 | 11.8, -12.1 | -16.2, 16.3 |
| 7 | 440.0, 440.0 | 15.7, -15.7 | -16.2, 16.2 |

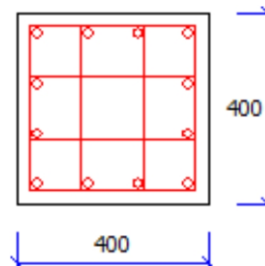


Critical Loading: 1 - (G*F)

| | min | Design |
|------------------|--------|-----------------|
| N | 471.4 | - 471.4 kN |
| M ₁₁ | -16.1 | -9.4 -18.6 kN.m |
| M ₂₂ | 17.3 | 9.4 19.7 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

Neutral Axis: 183.0 mm / 14.27 °



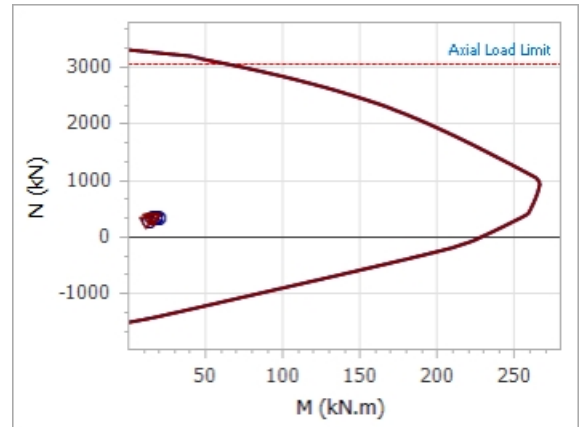
| | | |
|---|--|--|
| V _{Ed(1/2)} = 13.2 / 11.5 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.09 / 0.09 N/mm ² | λ ₁ /Lim ₁ = 18.2 < 90.1 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 1.11 / 1.11 N/mm ² | λ ₂ /Lim ₂ = 18.3 < 89.1 ✓ | 12T20 |
| V _{Rd Max} = 4.75 / 4.75 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |

| | |
|---|---|
| PROPOSED 5-STOREY ADMINISTRATION BLOCK | Fenerbahce Kadikoy (0001907) |
| Column Reinforcement Design 1 15/02/2021 Rev: 1 | Calc. By: SAMORA Checked By: MICHAEL |

Links = R10-300

3C5 (B-6) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 341.1, 341.1 | 13.6, -13.8 | -16.0, 16.2 |
| 2 | 342.4, 342.4 | 13.6, -13.8 | -16.0, 16.2 |
| 3 | 277.1, 277.1 | 10.1, -10.3 | -12.0, 12.2 |
| 4 | 345.6, 345.6 | 13.6, -13.8 | -18.7, 18.3 |
| 5 | 336.5, 336.5 | 13.6, -13.8 | -13.3, 14.2 |
| 6 | 338.1, 338.1 | 11.9, -12.5 | -16.0, 16.3 |
| 7 | 344.0, 344.0 | 15.3, -15.1 | -16.0, 16.2 |

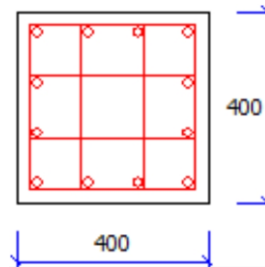


Critical Loading: 1 - (G*F)

| | min | Design |
|------------------|--------|-----------------|
| N | 372.0 | - 372.0 kN |
| M ₁₁ | 14.7 | 7.4 16.4 kN.m |
| M ₂₂ | -16.1 | -7.4 -17.7 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

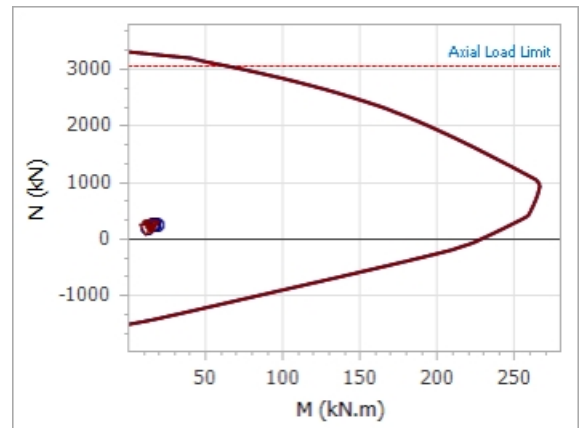
Neutral Axis: 151.9 mm / 12.48 °



| | | |
|---|---|--|
| V _{Ed(1/2)} = 12.2 / 10.8 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.08 / 0.08 N/mm ² | λ ₁ /Lim ₁ = 15.4 < 102.1 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 1.01 / 1.01 N/mm ² | λ ₂ /Lim ₂ = 15.4 < 102.9 ✓ | 12T20 |
| V _{Rd Max} = 4.60 / 4.60 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |
| Links = R10-300 | | |

4C5 (B-6) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 247.2, 247.2 | 13.4, -13.6 | -15.8, 16.0 |
| 2 | 248.2, 248.2 | 13.5, -13.6 | -15.8, 16.0 |
| 3 | 199.4, 199.4 | 10.0, -10.1 | -11.9, 12.0 |
| 4 | 249.8, 249.8 | 13.4, -13.6 | -17.9, 17.4 |
| 5 | 244.6, 244.6 | 13.4, -13.6 | -13.7, 14.7 |
| 6 | 245.6, 245.6 | 12.1, -12.7 | -15.8, 16.1 |
| 7 | 248.8, 248.8 | 14.7, -14.5 | -15.8, 16.0 |

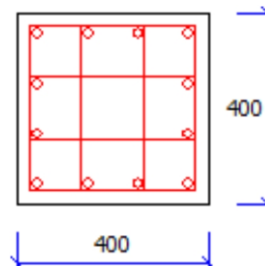


Critical Loading: 1 - (G*F)

| | min | Design |
|------------------|--------|-----------------|
| N | 271.6 | - 271.6 kN |
| M ₁₁ | -15.5 | -5.4 -16.7 kN.m |
| M ₂₂ | -16.8 | -5.4 -18.0 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

Neutral Axis: 134.1 mm / 13.65 °



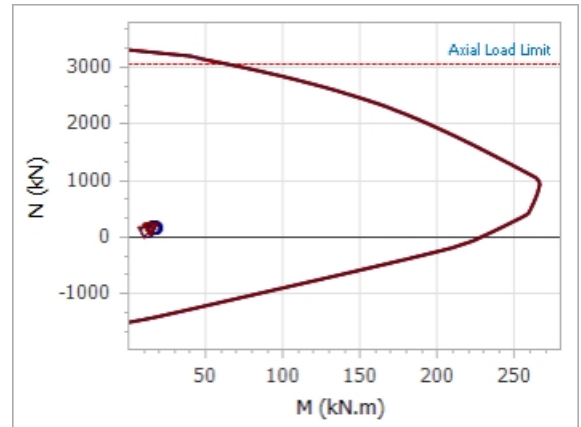
| | | |
|---|---|--|
| V _{Ed(1/2)} = 12.3 / 11.0 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.08 / 0.08 N/mm ² | λ ₁ /Lim ₁ = 15.4 < 120.3 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 0.92 / 0.92 N/mm ² | λ ₂ /Lim ₂ = 15.4 < 120.7 ✓ | 12T20 |
| V _{Rd Max} = 4.44 / 4.44 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |

| | |
|---|---|
| PROPOSED 5-STOREY ADMINISTRATION BLOCK | Fenerbahce Kadikoy (0001907) |
| Column Reinforcement Design 1 15/02/2021 Rev: 1 | Calc. By: SAMORA Checked By: MICHAEL |

Links = R10-300

5C5 (B-6) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 153.8, 153.8 | 13.2, -13.4 | -15.6, 15.8 |
| 2 | 154.5, 154.5 | 13.3, -13.5 | -15.5, 15.8 |
| 3 | 122.1, 122.1 | 9.8, -10.0 | -11.7, 11.9 |
| 4 | 154.9, 154.9 | 13.2, -13.4 | -17.0, 16.5 |
| 5 | 152.6, 152.6 | 13.2, -13.4 | -14.1, 15.1 |
| 6 | 153.0, 153.0 | 12.3, -13.0 | -15.6, 15.8 |
| 7 | 154.5, 154.5 | 14.2, -13.9 | -15.5, 15.7 |

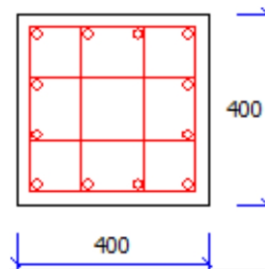


Critical Loading: 1 - (G*F)

| | min | Design |
|------------------|--------|-----------------|
| N | 170.5 | - 170.5 kN |
| M ₁₁ | -15.4 | -3.4 -16.1 kN.m |
| M ₂₂ | 16.5 | 3.4 17.3 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

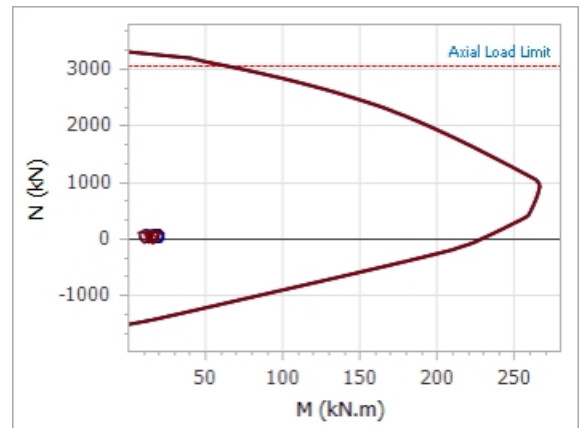
Neutral Axis: 105.6 mm / 12.46 °



| | | |
|---|---|--|
| V _{Ed(1/2)} = 11.6 / 10.6 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.08 / 0.08 N/mm ² | λ ₁ /Lim ₁ = 15.4 < 150.7 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 0.82 / 0.82 N/mm ² | λ ₂ /Lim ₂ = 15.4 < 150.7 ✓ | 12T20 |
| V _{Rd Max} = 4.29 / 4.29 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |
| Links = R10-300 | | |

6C5 (B-6) (400/400)
(C25/30 / Grade 460 (Type 2))

| No | N _{Top/Bot} (kN) | M _{11 Top/Bot} (kN.m) | M _{22 Top/Bot} (kN.m) |
|----|---------------------------|--------------------------------|--------------------------------|
| 1 | 60.7, 60.7 | 15.8, -13.2 | -18.2, 15.6 |
| 2 | 61.2, 61.2 | 15.8, -13.3 | -18.2, 15.5 |
| 3 | 45.1, 45.1 | 10.2, -9.8 | -11.7, 11.7 |
| 4 | 61.1, 61.1 | 15.8, -13.3 | -18.9, 15.7 |
| 5 | 60.4, 60.4 | 15.8, -13.2 | -17.5, 15.4 |
| 6 | 60.5, 60.5 | 15.3, -13.1 | -18.3, 15.6 |
| 7 | 60.9, 60.9 | 16.2, -13.3 | -18.1, 15.5 |

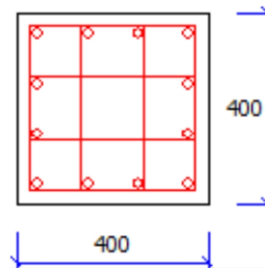


Critical Loading: 4 - (G+QP1 *F)

| | min | Design |
|------------------|--------|-----------------|
| N | 69.3 | - 69.3 kN |
| M ₁₁ | 19.5 | 1.4 19.8 kN.m |
| M ₂₂ | -21.8 | -1.4 -22.1 kN.m |
| N _{max} | 2561.1 | |

Concrete Cover = 25.0 mm

Neutral Axis: 142.9 mm / 35.08 °



| | | |
|---|---|--|
| V _{Ed(1/2)} = 13.3 / 12.3 kN | Short Column... | As (Req): %0.20 (min) 320.00 mm ² |
| V _{Ed} = 0.09 / 0.09 N/mm ² | λ ₁ /Lim ₁ = 15.4 < 247.8 ✓ | As (Sup): %2.36 3769.91 mm ² |
| V _{Rdc} = 0.73 / 0.73 N/mm ² | λ ₂ /Lim ₂ = 15.4 < 249.6 ✓ | 12T20 |
| V _{Rd Max} = 4.13 / 4.13 N/mm ² | M _{add(1/2)} = 0.0 / 0.0 kN.m | |

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Project **PROPOSED 5-STOREY ADMINISTRATION**



REINFORCED CONCRETE COUNCIL

Client **ANSAH AND RITA AGYEMANG BARIMAH**

Location **Level -1 Base F1**

PAD FOUNDATION DESIGN to BS 8110:1997

Single column base

Originated from **RCC81.xls** on CD

© 1999 BCA for RCC

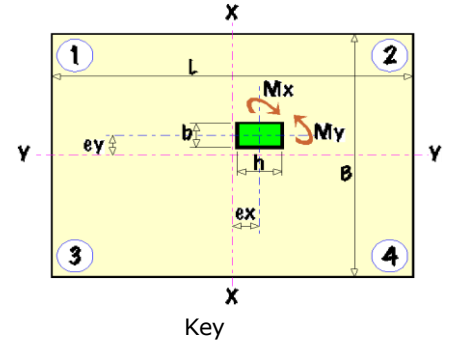
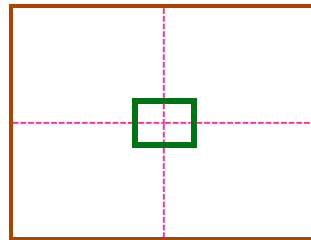
| | | |
|---------------------------|---------------------------|--------------------|
| Made by SAM | Date 15/02/2022 | Page |
| Checked MICHAEL | Revision | Job No - |

MATERIALS

| | | | | | | | | |
|----------------------|------------|--|-------|-----------|-------------------|----------------|-------------|----------|
| fcu | 25 | N/mm ² | h agg | 19 | mm | γ _c | 1.5 | concrete |
| fy | 460 | N/mm ² | cover | 25 | mm | γ _s | 1.05 | steel |
| Densities - Concrete | 25 | kN/m ³ | Soil | 18 | kN/m ³ | | | |
| Bearing pressure | 490 | kN/m ² (net allowable increase) | | | | | | |

DIMENSIONS mm

| | |
|----------------------|----------------|
| BASE | COLUMN |
| L = 2100 | h = 400 |
| B = 2100 | b = 400 |
| depth H = 400 | |
| ex = 0 | ey = 0 |



COLUMN REACTIONS kN, kNm characteristic

| | DEAD | IMPOSED | WIND |
|------------|--------------|--------------|------|
| Axial (kN) | 215.0 | 341.0 | |
| Mx (kNm) | 118.0 | 186.0 | |
| My (kNm) | | | |
| Hx (kN) | | | |
| Hy (kN) | | | |

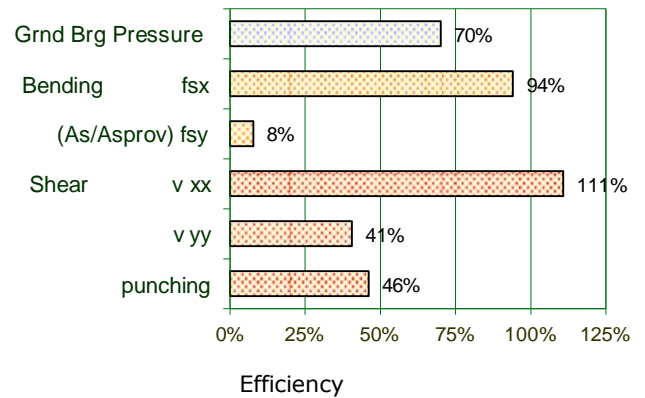
Plot (to scale)

Key

STATUS VALID DESIGN

BEARING PRESSURES kN/m² characteristic

| CORNER | 1 | 2 | 3 | 4 |
|-----------|-----|-------|-----|-------|
| no wind | 0.0 | 343.4 | 0.0 | 343.4 |
| with wind | 0.0 | 343.4 | 0.0 | 343.4 |



REINFORCEMENT

M_{xx} = 259.2 kNm
 b = 2100 mm
 d = 355 mm
 A_s = 1754 mm²

M_{yy} = 145.6 kNm
 b = 2100 mm
 d = 329 mm
 A_s = 1064 mm²

PROVIDE 18 T40 @ 125 B1

PROVIDE 10 T12 @ 200 & 200 B2

As prov = 22619 mm²

As prov = 1131 mm²

Asx increased 1,175% for shear

BEAM SHEAR

V_{xx} = 432.0 kN at d from col face
 v = 0.579 N/mm²
 or V_{xx} = 775.3 kN at 2d from col face
 v = 1.040 N/mm²
 vc = 0.939 N/mm²

V_{yy} = 203.6 kN at d from col face
 v = 0.295 N/mm²
 or V_{yy} = 64.5 kN at 2d from col face
 v = 0.093 N/mm²
 vc = 0.363 N/mm²

PUNCHING SHEAR

d ave = 342 mm
 As prov = 1.599 %
 v = 0.354 N/mm²

u crit = 4200 mm
 v max = 1.621 N/mm² at col face
 vc = 0.769 N/mm²

Detail to 3.11.3.2

CALCULATIONS - SINGLE BASE

Gross base wt 44.10

L= 2.1

B= 2.1

CHARACTERISTIC PRESSURES

| | | G + Q | G + Q + W | G + W |
|-----------|-------------------|--------|-----------|--------|
| P | kN | 600.10 | 600.10 | 259.10 |
| Mx | kNm | 304.00 | 304.00 | 118.00 |
| My | kNm | 0.00 | 0.00 | 0.00 |
| ex | m | 0.507 | 0.507 | 0.455 |
| ey | m | 0.000 | 0.000 | 0.000 |
| 6ex/L | | 1.4474 | 1.4474 | 1.3012 |
| if ex>L/6 | | 2.5763 | 2.5763 | 2.3546 |
| k 2-4 | | 2.5763 | 2.5763 | 2.3546 |
| k 1-3 | | 0.0000 | 0.0000 | 0.0000 |
| 6ey/B | | 0.0000 | 0.0000 | 0.0000 |
| if ey>B/6 | | 1.3333 | 1.3333 | 1.3333 |
| k 1-2 | | 1.0000 | 1.0000 | 1.0000 |
| k 3-4 | | 1.0000 | 1.0000 | 1.0000 |
| P/A | kN/m ² | 136.08 | 136.08 | 58.75 |
| corner 1 | kN/m ² | 0.00 | 0.00 | 0.00 |
| corner 2 | kN/m ² | 350.57 | 350.57 | 138.34 |
| corner 3 | kN/m ² | 0.00 | 0.00 | 0.00 |
| corner 4 | kN/m ² | 350.57 | 350.57 | 138.34 |

Text Asx increased
Asy increased

F/S OVERTURNING <1.5
OVERTURNS at ULTIMATE

FS o'turn 2.072714
FS o'turn 100

Rebar ares

| Area | Dia |
|--------|-----|
| 50.3 | 8 |
| 78.5 | 10 |
| 113.1 | 12 |
| 201.1 | 16 |
| 314.2 | 20 |
| 490.9 | 25 |
| 804.2 | 32 |
| 1256.6 | 40 |

Gross
Gross
Gross
Gross

ULTIMATE PRESSURES

| | | 1.4G+1.6Q | 1.2(G+Q+W) | 1.0G+1.4W |
|-----------|------|-----------|------------|-----------|
| N | kN | 908.34 | 720.12 | 276.74 |
| Mx | kNm | 462.80 | 364.80 | 118.00 |
| My | kNm | 0.00 | 0.00 | 0.00 |
| ex | m | 0.510 | 0.507 | 0.426 |
| ey | m | 0.000 | 0.000 | 0.000 |
| 6ex/L | | 1.4557 | 1.4474 | 1.2183 |
| if ex>L/6 | | 2.5902 | 2.5763 | 2.2450 |
| k 2-4 | | 2.5902 | 2.5763 | 2.2450 |
| k 1-3 | | 0.0000 | 0.0000 | 0.0000 |
| 6ey/B | | 0.0000 | 0.0000 | 0.0000 |
| if ey>B/6 | | 1.3333 | 1.3333 | 1.3333 |
| k 1-2 | | 1.0000 | 1.0000 | 1.0000 |
| k 3-4 | | 1.0000 | 1.0000 | 1.0000 |
| N/L | kN/m | 432.54 | 342.91 | 131.78 |
| edge 2-4 | kN/m | 1120.37 | 883.45 | 295.85 |
| edge 1-3 | kN/m | 0.00 | 0.00 | 0.00 |
| N/B | kN/m | 432.54 | 342.91 | 131.78 |
| edge 1-2 | kN/m | 432.54 | 342.91 | 131.78 |
| edge 3-4 | kN/m | 432.54 | 342.91 | 131.78 |
| 3(L/2-ex) | m | 1.621 | 1.630 | 1.871 |
| 3(B/2-ey) | m | 3.150 | 3.150 | 3.150 |

FS o'turn 2.060841
FS o'turn 100

XX MOMENTS

| | | 1.4G+1.6Q | | 1.2(G+Q+W) | | 1.0G+1.4W | |
|---------------|------|-----------|-------|------------|-------|-----------|-------|
| | | LEFT | RIGHT | LEFT | RIGHT | LEFT | RIGHT |
| from right | m | 1.250 | 0.850 | | | | |
| from left | m | 0.850 | 1.250 | | | | |
| to zero press | m | 0.371 | 0.371 | 0.380 | 0.380 | 0.621 | 0.621 |
| local press | kN/m | 256.69 | 0.00 | 206.06 | 0.00 | 98.18 | 0.00 |
| M1 | kNm | 30.9 | 269.8 | 24.8 | 212.8 | 11.8 | 71.3 |
| M2 | kNm | 25.5 | 0.0 | 20.9 | 0.0 | 17.1 | 0.0 |
| choose M | kNm | 14.8 | 259.2 | 11.8 | 203.7 | 9.5 | 63.7 |
| Design Mxx | kNm | 259.2 | | | | | |

3.11.2.2
3.11.2.2

XX SHEARS @ d from col face

| | | | | | | | |
|---------------|------|--------|-------|--------|-------|--------|-------|
| from right | m | 1.615 | 0.485 | | | | |
| from left | m | 0.485 | 1.615 | | | | |
| to zero press | m | 1.136 | 0.006 | 1.145 | 0.015 | 1.386 | 0.256 |
| local press | kN/m | 785.26 | 4.49 | 620.62 | 8.27 | 219.15 | 40.46 |
| V1 | kN | 190.4 | 272.8 | 150.5 | 216.2 | 53.1 | 81.6 |
| V2 | kN | 446.2 | 2.6 | 355.4 | 4.7 | 151.9 | 28.0 |
| choose V | kN | 432.0 | 258.5 | 343.2 | 204.0 | 141.7 | 71.4 |
| Design Vxx | kN | 432.0 | | | | | |

3.4.5.10
3.4.5.8

XX SHEARS @ 2d from col face

| | | | | | | | |
|---------------|------|---------|---------|--------|---------|--------|--------|
| from right | m | 1.980 | 0.120 | | | | |
| from left | m | 0.120 | 1.980 | | | | |
| to zero press | m | 1.501 | -0.359 | 1.510 | -0.350 | 1.751 | -0.109 |
| local press | kN/m | 1037.46 | -247.71 | 818.42 | -189.53 | 276.87 | -17.27 |
| V1 | kN | 908.3 | 52.4 | 720.1 | 41.6 | 276.7 | 16.7 |
| V2 | kN | 778.9 | -186.0 | 618.0 | -143.1 | 242.4 | -15.1 |
| choose V | kN | 775.3 | 48.8 | 615.0 | 38.6 | 239.9 | 14.2 |
| Design Vxx | kN | 775.3 | | | | | |

3.4.5.10
3.4.5.8

| | | | | | | | | | | |
|---------------|------|--------|--------|--------|--------|--------|--------|--|--|----------|
| YY MOMENTS | | | | | | | | | | |
| from top | m | 1.250 | 0.850 | | | | | | | 3.11.2.2 |
| from btm | m | 0.850 | 1.250 | | | | | | | 3.11.2.2 |
| to zero press | m | 2.300 | 2.300 | 2.300 | 2.300 | 2.300 | 2.300 | | | |
| local press | kN/m | 432.54 | 432.54 | 342.91 | 342.91 | 131.78 | 131.78 | | | |
| M1 | kNm | 156.3 | 156.3 | 123.9 | 123.9 | 47.6 | 47.6 | | | |
| M2 | kNm | 381.4 | 381.4 | 302.3 | 302.3 | 116.2 | 116.2 | | | |
| choose M | kNm | 145.6 | 145.6 | 114.8 | 114.8 | 40.0 | 40.0 | | | |
| Design Myy | kNm | 145.6 | | | | | | | | |

| | | | | | | | | | | |
|-----------------------------|------|--------|--------|--------|--------|--------|--------|--|--|----------|
| YY SHEARS @ d from col face | | | | | | | | | | |
| from top | m | 1.595 | 0.505 | | | | | | | 3.4.5.10 |
| from btm | m | 0.505 | 1.595 | | | | | | | 3.4.5.8 |
| to zero press | m | 2.645 | 2.645 | 2.645 | 2.645 | 2.645 | 2.645 | | | |
| local press | kN/m | 432.54 | 432.54 | 342.91 | 342.91 | 131.78 | 131.78 | | | |
| V1 | kN | 218.4 | 218.4 | 173.2 | 173.2 | 66.5 | 66.5 | | | |
| V2 | kN | 572.0 | 572.0 | 453.5 | 453.5 | 174.3 | 174.3 | | | |
| choose V | kN | 203.6 | 203.6 | 160.4 | 160.4 | 55.9 | 55.9 | | | |
| Design Vyy | kN | 203.6 | | | | | | | | |

| | | | | | | | | | | |
|--------------------|------|--------|--------|--------|--------|--------|--------|--|--|----------|
| @ 2d from col face | | | | | | | | | | |
| from top | m | 1.940 | 0.160 | | | | | | | 3.4.5.10 |
| from btm | m | 0.160 | 1.940 | | | | | | | 3.4.5.8 |
| to zero press | m | 2.990 | 2.990 | 2.990 | 2.990 | 2.990 | 2.990 | | | |
| local press | kN/m | 432.54 | 432.54 | 342.91 | 342.91 | 131.78 | 131.78 | | | |
| V1 | kN | 69.2 | 69.2 | 54.9 | 54.9 | 21.1 | 21.1 | | | |
| V2 | kN | 646.7 | 646.7 | 512.7 | 512.7 | 197.0 | 197.0 | | | |
| choose V | kN | 64.5 | 64.5 | 50.8 | 50.8 | 17.7 | 17.7 | | | |
| Design Vyy | kN | 64.5 | | | | | | | | |

| | | | | | | | | | |
|----------------------------|-----------------|--------|------------|-----------|------------|--|--|--|--|
| REINFORCEMENT min As 0.13% | | | | | | | | | |
| | | X-X | | Y-Y | | | | | |
| b | mm | 2100 | choose dia | 2100 | choose dia | | | | |
| dia | mm | 40 | 20 | 12 | 20 | | | | |
| d | mm | 355 | 365 | 329 | 345 | | | | |
| K' | | 0.1558 | | 0.1558 | | | | | |
| K | | 0.0392 | 0.0371 | 0.0256 | 0.0233 | | | | |
| z | mm | 337.3 | 346.8 | 312.6 | 327.8 | | | | |
| As | mm ² | 1754 | 1706 | 1064 | 1014 | | | | |
| As shear | mm ² | 22365 | 22995 | 815 | 522 | | | | |
| required | mm ² | 22365 | 22995 | 1092 | 1092 | | | | |
| No | | 18 | 7.09 | 10 | 6.85 | | | | |
| ave centres | mm | 125 | 325 | 225 | 325 | | | | |
| As prov | mm ² | 22619 | | 1131 | | | | | |
| = | % | 3.034 | | 0.164 | | | | | |
| Lc | mm | 1050 | | 1050 | | | | | |
| Lc max | mm | 1099 | > 1,050 | 1040 | < 1,050 | | | | |
| b central | mm | 1465 | | 1387 | | | | | |
| Final centres | mm | 125 | | 200 & 200 | | | | | |

| | | | |
|----------|---------|---------|--|
| Punching | | | |
| ave p | 0.00097 | 0.81252 | |
| As X | 930 | 0.48299 | |
| As Y | 522 | 1.29551 | |
| ave p | 0.00156 | 0.83541 | |
| As X | 1450 | 0.50648 | |
| As Y | 815 | 1.34188 | |

| | | | | | | | | | |
|-------------|-------------------|--------|----------|--------|--------|--|--|--|--|
| BEAM SHEAR | | | | | | | | | |
| v @ d | N/mm ² | 0.5794 | 0.5636 | 0.2947 | 0.2810 | | | | |
| v @ 2d | N/mm ² | 1.0400 | 1.0115 | 0.0934 | 0.0890 | | | | |
| vc | N/mm ² | 0.9391 | FAILS | 0.3630 | OK | | | | |
| As enhanced | % | ##### | 1247.66% | 0.00% | 0.00% | | | | |

| | | | | | | | | | | |
|---|-------------------|-----------|------------|-----------|------|--------|--------|--------|-------|-------|
| PUNCHING SHEAR | | | | | | | | | | |
| d ave | mm | 342 | 1.5 x d | ave 513 | | | | | | |
| | | L | R | B | T | | | | | |
| to edges | mm | 1050 | 1050 | 1050 | 1050 | 1426 | | | | |
| to 1.5d per | mm | 713 | 713 | 713 | 713 | 2100 | | | | |
| tandard perimeter? | Y,N | 0 | 0 | 0 | 0 | 0 | | | | |
| U | mm | 0 | 0 | 0 | 0 | | | | | |
| within base? | Y,N | 1 | 1 | 1 | 1 | 1 | 4200 | 1 | 732.5 | 732.5 |
| <i>perimeter falls within base and on 2 sides</i> | | | | | | | | | | |
| U crit | mm | 4200 | | | | 5860 | | | | |
| Area | m ² | 2.995 | | | | 2.146 | | | | |
| As prov | % | 1.599 | | | | | | | | |
| vc | N/mm ² | 0.7685 | | | | | | | | |
| | | 1.4G+1.6Q | 1.2(G+Q+W) | 1.0G+1.4W | | | | | | |
| N | kN | 908.3 | 720.1 | 276.7 | | | | | | |
| v max | N/mm ² | 1.621 | 1.285 | 0.493 | OK | 2 | 1 | 0 | | |
| ave press | kN/m ² | 133.54 | 106.18 | 43.06 | | | | | | |
| V | kN | 508.4 | 402.2 | 147.8 | | | | | | |
| v | N/mm ² | 0.3540 | 0.2800 | 0.1029 | OK | 0.2989 | 0.2366 | 0.0886 | | |

| |
|--|
| |
| |
| |
| |

SIZING TIPS

Net press = 487.2

| | | G + Q | G + Q + W | G + W | |
|---------------------|----------------|-------|-----------|-------|-----------------------|
| N | kN | 556.0 | 556.0 | 215.0 | |
| Mx | kNm | 304.0 | 304.0 | 118.0 | |
| My | kNm | 0.0 | 0.0 | 0.0 | |
| ex | m | 547 | 547 | 549 | |
| ey | m | 0 | 0 | 0 | |
| min A | m ² | 1.14 | 0.91 | 0.35 | |
| min L | mm | 400 | | | |
| min B | mm | 400 | | | |
| sq base iteration 0 | | 1.068 | 1.068 | 0.664 | |
| | | 0 | 0 | 0 | |
| | | -1824 | -1824 | -708 | |
| sq base iteration 1 | | 2.137 | 2.137 | 1.329 | |
| | | 3564 | 3564 | 857 | |
| | | 1740 | 1740 | 149 | |
| sq base iteration 2 | | 1.693 | 1.693 | 1.235 | |
| | | 1424 | 1424 | 651 | |
| | | -400 | -400 | -57 | |
| sq base iteration 3 | | 1.830 | 1.830 | 1.274 | |
| | | 1969 | 1969 | 733 | |
| | | 145 | 145 | 25 | |
| SQUARE SIZE | | | | | |
| L & B | mm | 1785 | 1785 | 1257 | 1785 SQ |
| if L = | 2100 | | | | |
| | | 678 | 678 | 263 | |
| B | mm | 1392 | 1114 | 432 | or 2100 x 1395 |
| if B = | 2100 | | | | |
| | | 265 | 265 | 102 | |
| L | mm | 1634 | 1431 | 833 | or 1635 x 2100 |