* MEMBER NAME : C01
  1. General Information
     1. Design Code : ACI318M-14
     2. Unit System : N, mm
  2. Material
     1. : 24.00MPa
     2. : 400MPa
     3. : 400MPa
  3. Section
     1. Section Size : 500 x 500mm
     2. : 3.500m
     3. : 3.500m
     4. : 1.000
     5. : 1.000
     6. Splicing Limit : 50%
     7. Frame Type : Braced Frame



* 1. Forces
     1. : 0.000kN
     2. : 0.000kN·m
     3. : 0.000kN·m
     4. : 0.000kN
     5. : 0.000kN
     6. : 0.000kN
     7. : 0.000kN
  2. Factors
     1. : 0.850
     2. : 0.850
     3. : 0.600
  3. Rebar
     1. Main Bar
        + Layer-1 : 10-2-#8 (62.23mm, 5,097mm²)
        + Layer-2 : -
        + Layer-3 : -
        + Layer-4 : -
        + 5,097mm²
     2. Hoop Bar
        + End : #3@150
        + Middle : #3@300
     3. Tie Bar
        + Apply Tie Bar to Shear Check : Yes
        + Tie Bar :
  4. Check Slenderness Ratio
     1. Calculate radii of gyration
        + 150mm
        + 150mm
     2. Calculate slenderness ratio
        + 0.625
        + 0.625
        + 23.33 < 26.50 → Not Slender
        + 23.33 < 26.50 → Not Slender
  5. Check Magnified Moment
     1. Calculate moment magnification factor
        + 1.000
        + 1.000
  6. Check Minimum Moment
     1. Calculate minimum eccentricity
        + 30.00mm
        + 30.00mm
     2. Calculate minimum moment
        + 0.000kN·m
        + 0.000kN·m
  7. Check Design Moment
     1. Calculate design moment
        + 0.000kN·m
        + 0.000kN·m
        + 0.000kN·m
  8. Check Design Parameter
     1. Calculate rebar ratio
        + 250,000mm² 5,097mm²
        + 0.0100 0.0800
        + 0.0204
     2. Calculate eccentricity
        + 179,605mm
        + 179,605mm
        + 254,000mm
        + Rotation angle of neutral axis = 56.25°
     3. Calculate concentric axial load capacity
        + 7,035kN
        + 5,628kN
        + -2,039kN
  9. Check Moment Capacity ( Balanced axis )
     1. Calculate capacity of compression stress block
        + 0.850
        + 364mm 310mm
        + 102,699mm²
        + 125mm 67.77mm
        + 2,095kN
        + 142kN·m
        + 261kN·m
     2. Calculate capacity of rebar

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **i** | **(mm)** |  | **(MPa)** | **(mm²)** | **(kN)** | **(mm)** | **(kN)** | **(mm)** | **(kN)** |
| 1 | 607 | -0.002000 | -400 | 510 | -204 | -188 | 38.28 | -188 | 38.28 |
| 2 | 399 | -0.000282 | -56.39 | 510 | -28.74 | 188 | -5.397 | -188 | 5.397 |
| 3 | 321 | 0.000361 | 72.17 | 510 | 36.78 | 188 | 6.906 | -93.89 | -3.453 |
| 4 | 242 | 0.001004 | 201 | 510 | 102 | 188 | 19.21 | 0.000 | 0.000 |
| 5 | 164 | 0.001646 | 329 | 510 | 168 | 188 | 31.51 | 93.89 | 15.76 |
| 6 | 86.32 | 0.002289 | 400 | 510 | 204 | 188 | 38.28 | 188 | 38.28 |
| 7 | 295 | 0.000571 | 114 | 510 | 58.23 | -188 | -10.93 | 188 | 10.93 |
| 8 | 373 | -0.000072 | -14.32 | 510 | -7.298 | -188 | 1.370 | 93.89 | -0.685 |
| 9 | 451 | -0.000714 | -143 | 510 | -72.82 | -188 | 13.67 | 0.000 | 0.000 |
| 10 | 529 | -0.001357 | -271 | 510 | -138 | -188 | 25.98 | -93.89 | 12.99 |

* + - * 118kN
      * 159kN·m
      * 117kN·m
    1. Calculate nominal capacity for neutral axis
       - 2,213kN
       - 301kN·m
       - 379kN·m
       - 484kN·m
  1. Check Moment Capacity ( Neutral axis )
     1. Calculate capacity of compression stress block
        + 0.850
        + 237mm 201mm
        + 43,875mm²
        + 169mm 129mm
        + 895kN
        + 116kN·m
        + 152kN·m
     2. Calculate capacity of rebar

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **i** | **(mm)** |  | **(MPa)** | **(mm²)** | **(kN)** | **(mm)** | **(kN)** | **(mm)** | **(kN)** |
| 1 | 607 | -0.004691 | -400 | 510 | -204 | -188 | 38.28 | -188 | 38.28 |
| 2 | 399 | -0.002048 | -400 | 510 | -204 | 188 | -38.28 | -188 | 38.28 |
| 3 | 321 | -0.001059 | -212 | 510 | -108 | 188 | -20.28 | -93.89 | 10.14 |
| 4 | 242 | -0.000071 | -14.13 | 510 | -7.202 | 188 | -1.352 | 0.000 | 0.000 |
| 5 | 164 | 0.000918 | 184 | 510 | 93.58 | 188 | 17.57 | 93.89 | 8.786 |
| 6 | 86.32 | 0.001907 | 381 | 510 | 194 | 188 | 36.50 | 188 | 36.50 |
| 7 | 295 | -0.000736 | -147 | 510 | -75.00 | -188 | 14.08 | 188 | -14.08 |
| 8 | 373 | -0.001724 | -345 | 510 | -176 | -188 | 33.01 | 93.89 | -16.50 |
| 9 | 451 | -0.002713 | -400 | 510 | -204 | -188 | 38.28 | 0.000 | 0.000 |
| 10 | 529 | -0.003702 | -400 | 510 | -204 | -188 | 38.28 | -93.89 | 19.14 |

* + - * -894kN
      * 156kN·m
      * 121kN·m
    1. Calculate nominal capacity for neutral axis
       - 1.533kN
       - 272kN·m
       - 272kN·m
       - 385kN·m
    2. Calculate strength reduction factor
       - 0.0020 0.0050
       - 0.004691
       - ø = 0.874
    3. Calculate axial load and moment capacities
       - 1.340kN
       - 238kN·m
       - 238kN·m
       - 336kN·m



* 1. Check Shear Capacity
     1. Calculate maximum space
        + ø = 0.750
        + 406mm
     2. Skipped by Zero Force.
     3. Skipped by Zero Force.