* MEMBER NAME : F01
  1. General Information
     1. Design Code : ACI318-11
     2. Unit System : lbf, in
  2. Material
     1. : 3,481psi
     2. : 58,015psi
  3. Design Load
     1. Service Load
        + : 450kip
        + : 443kip·in
        + : 443kip·in
     2. Factored Load
        + : 225kip
        + : 443kip·in
        + : 885kip·in
     3. Surcharge Load
        + Surface Load : 0.0313kip/ft²
        + Weight Density : 0.115kip/ft³
        + Soil Height : 1.312ft
     4. Self weight is considered.
  4. Section
     1. Section Size
        + Depth : 27.56in
        + Cover : 3.150in
     2. Column Section
        + Shape of Column : Circle
        + Section : ø21.65in
        + Eccentricity (X) : 4.724in
        + Eccentricity (Y) : 0.000in
  5. Rebar
     1. Direction Y
        + Layer 1 : #7@11.81
     2. Direction X
        + Layer 1 : #7@11.81
  6. Foundation
     1. Foundation Size
        + : 9.022ft
        + : 9.022ft
        + No. of pile : 4-ø19.69
        + Space of pile : 59.06in
        + : 202kip/EA
        + : 0.000kip/EA



* 1. Check Pile Capacity

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Index** | **X(in)** | **Y(in)** | **(kip)** | **(kip)** | **(kip)** | **(kip)** |  |
| 1 | -29.53 | 29.53 | 105 | 55.71 | 55.71 | 354 | 0.157 |
| 2 | 29.53 | 29.53 | 148 | 92.28 | 92.28 | 354 | 0.260 |
| 3 | -29.53 | -29.53 | 97.40 | 48.22 | 48.22 | 354 | 0.136 |
| 4 | 29.53 | -29.53 | 141 | 84.79 | 84.79 | 354 | 0.239 |

: Pile Punching

* + 1. Calculate actual pile stress (kip/EA)
       - 148kip/EA

0.733 → O.K

* + - * 0.000kip/EA

0.000 → O.K

* + 1. Calculate factored pile stress (kip/EA)
       - 92.28kip/EA
       - 48.22kip/EA
  1. Check Shear
     1. Calculate one-way shear
        + ø = 0.750
        + 25.95kip 230kip

0.113 → O.K

* + - * 33.36kip 221kip

0.151 → O.K

* + 1. Calculate two-way shear

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **-** | **(in)** | **(kip)** | **(kip)** | **(kip)** | **(kip)** | **(kip)** | **(kip)** | **Ratio** |
| Interior | 143 | 1,216 | 1,762 | 811 | 811 | 234 | 608 | 0.385 |
| Edge(X) | 170 | 1,447 | 1,499 | 964 | 964 | 217 | 723 | 0.299 |
| Edge(Y) | 180 | 1,527 | 1,526 | 1,018 | 1,018 | 218 | 763 | 0.286 |
| Corner | 139 | 1,183 | 1,072 | 789 | 789 | 128 | 591 | 0.216 |



* + - * ø = 0.750
      * d = 0.000in
      * 234kip

0.385 → O.K

* 1. Check Moment Capacity
     1. Calculate moment capacity (Direction X)
        + ø = 0.900
        + 367kip·in 747kip·in

0.491 → O.K

* + 1. Calculate moment capacity (Direction Y)
       - ø = 0.900
       - 307kip·in 719kip·in

0.426 → O.K

* 1. Check Rebar
     1. Calculate minimum rebar area required
        + 0.595in²
     2. Calculate minimum rebar space required (Direction X)
        + 0.600in² (#7@11.81)
        + 12.10in
     3. Calculate minimum rebar space required (Direction Y)
        + 0.600in² (#7@11.81)
        + 12.10in