DESIGHN OF PILE SYSTEM FOR HIGH BUILDING

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introduction

- Possible construction of pile foundation soils should be avoided unless the situation of soil is very bad or very tall buildings.
  Thus, this paper assumes that the mat foundation was not followed and all required parameters of soil mechanics, give us by soil mechanics laboratory .
  Finally in an example for the design of pile foundations have been clear everything.
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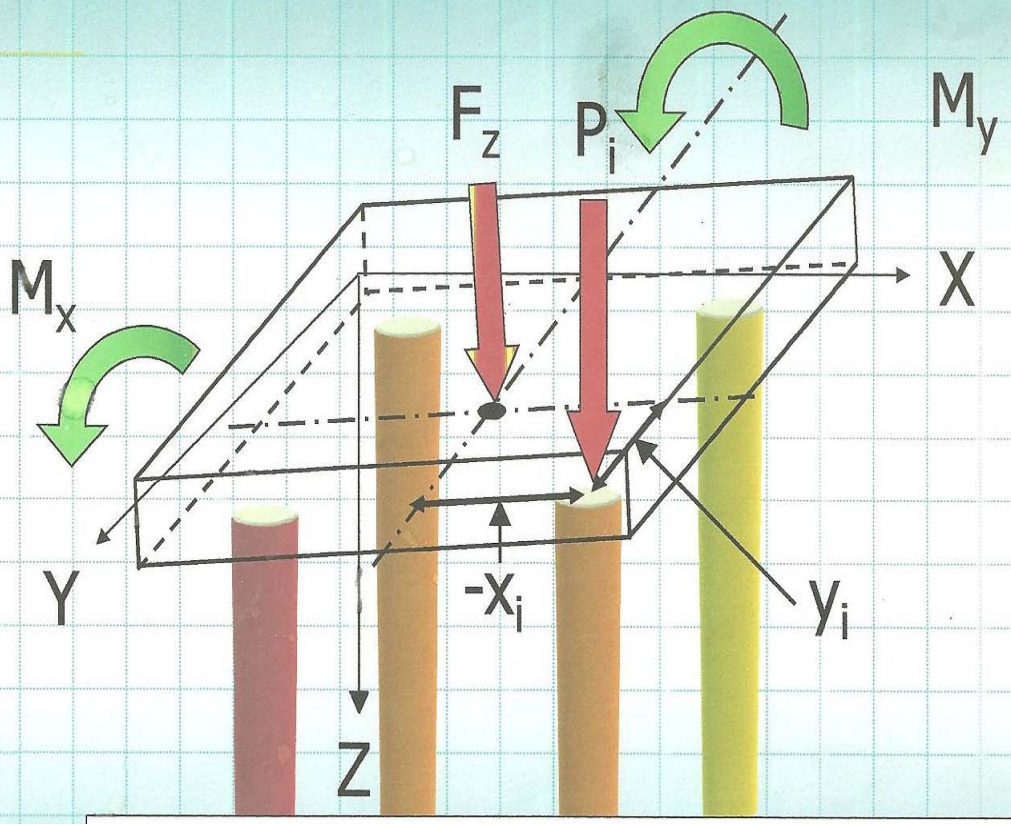
Distribution of Axial Loads



$$P_i = \frac{F_z}{n} + \frac{M_x y_i}{\sum_{i=1}^{n} y_i^2} + \frac{M_y x_i}{\sum_{i=1}^{n} x_i^2}$$

Prucedure of desighn

- **١.SYSTEM DEFINITION**
- Fx,Fy,Fz,Mx,My,Mz at all support
- For load combination max value (usuallyEQX orEQY)
- Check q<qa
- Assume d,s,n,h& symmetric arrange piles
- d=diameter piles,n=number,s=distance piles≥٣d,h=hight piles cap=s/٢
- kx and ky is stifness of spring

- **<u>٢.PILE LOADING</u>**
  - Fx,Fy,Fz,Mx,My,Mz at center of bottom level cap
    - Pt=Fz+Wcap
    - Fxt=Fx+Vxs(secmic cap)-Epx(passive soil pressure)
    - Fyt=Fy+Vys(secmic cap)-Epy(passive soil pressure)
  - Mxt=Mx+Mxs(secmic cap)-Epx(٢/٣*H) (passive soil pressure)
  - Myt=My+Mys(secmic cap)-Epy(٢/٣*H) (passive soil pressure)
    - If we have significant tortion(Mz)
      - Vxt=Fxt+Mz*yi/(∑yi^٢)
      - Vyt=Fyt+Mz*xi/(∑xi^٢)
    - (Pp=A(Pt/A+Mx*Yi/Ixx+My*Xi/Iyy))
    - If EQX in ١. Is critical: Pp=Pt/n+Mxt*Yi/(∑Yi^٢)+My*Xi/(∑Xi^٢)
    - If EQY in ١. Is critical: Pp=Pt/n+Mx*Yi/(∑Yi^٢)+Myt*Xi/(∑Xi^٢)
    - If EQX in ١. Is critical: Vxp=Vxt/n&Vyp=Fy/n
    - If EQX in ١. Is critical: Vyp=Vyt/n&Vxp=Fx/n

- **٣.CHOOSING LENGTH OF PILE**
  - Pp<Ppa no =>GO TO ١
    - YES
    - CONTINUE

- **<u>٤.STRUCTURAL DESIGN OF PILE</u>**
  - Limit state metod YES=> GO TO ١ calculate by factor forces
    - NO
  - CONTINUE(working stress metod unfactor forces)
    - Ksv,Ksh(spring stiffness)
    - (IF IS NOT OK GO TO ١)
    - CONTINUE

- **٥. STRUCTURAL DESIGN OF RAFT FOUNDATION**
  - Columns or wall forces(factored) is loaded
    - Support at pile spring Ks=Ksv+(Ep*Ap/Lp)
    - (IF IS NOT OK GO TO ١)