**Summary of findings of sand compaction pile in soft clay (Katazume book):**

as=As/(Ac+As)

n=σc/σs=3~5

Ultimate Bearing Capacity of sand pile in individual action:

Single Pile Capacity:

P= bearing capacity (kn)

A=Cross Sectional Area of Pile and clay (m2)

As = Cross Sectional Area of Sand Pile

σu=0.7\*qu= 2\*Cu= Upper yield pressure

Cu=Underground Shear Strength of Clay

qu = Unconfined Compressive Strength of clay

For Group Action:

P= qa \* A

= {as\* qas+(1- as)\*qac }\* A

qac = (1/F) \* C \* Nc

qas= (1/2\*Fs)\* B \* γs \* Nγ

C= Shear Strength of clay ground

B= Width of Foundation

A= Cross Sectional Area of Pile and Clay

Nc= Bearing Capacity Factor, Nc= 5 for clay soil with ϕ=0

Nγ= Bearing Capacity Factor for Sand

**Alternate Method:**

Find Bearing Capacity for stone column and reduce it by a factor of 1.9

FAWA stone column design manual (Page 142, Equation 50)

qult = C \* Nc

qult= Ultimate load that a stone column can carry

C= Shear strength of surrounding clay soil

N= Bearing Capacity factor stone column ( 18 <= Nc <= 22)

**Correlation between N value qu for clay soil:**

qu = 12.5\*N (Tarzaghi)

qu =Unconfined Compressive Strength in KPa