

Example 29: Influence of *Poisson's* ratio ν_s

1 Description of the problem

In this example (File q_{e1} with $\nu_s = 0$, q_{e2} with $\nu_s = 0.2$ and q_{e3} with $\nu_s = 0.5$), the influence of *Poisson's* ratio ν_s on the settlement S of a rectangular raft 10×10 [m²] is studied. Four concentrated loads in the middle of the raft are chosen, each of $P = 500$ [kN] as shown in Figure 67.

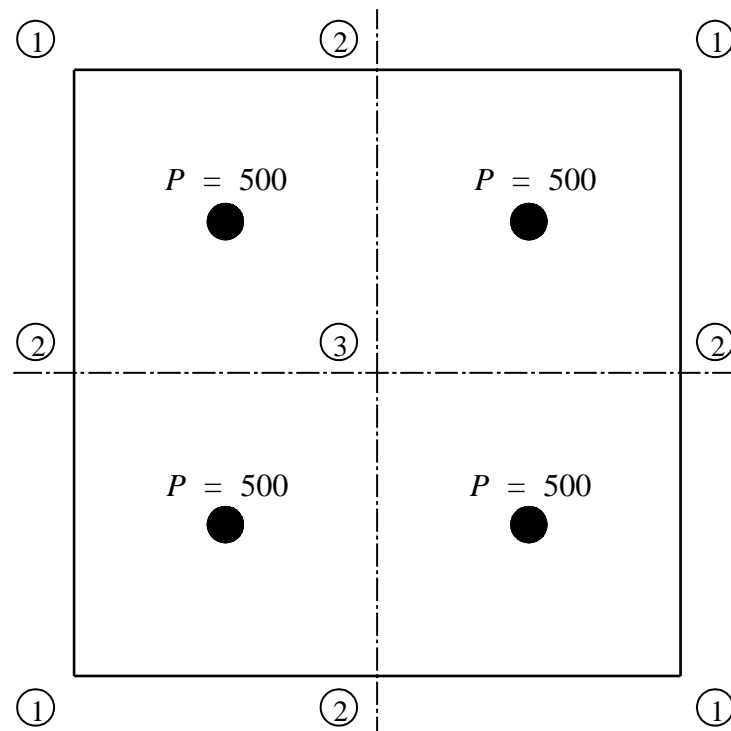


Figure 67 Load locations on the raft

2 Results

Figure 68 shows settlement S [cm] diagram depending on *Poisson's* ratio ν_s . Accordingly, the settlement of $\nu_s = 0.0$ is the greatest (soil material with free lateral strain), while that of $\nu_s = 0.5$ (material with constant volume) is the smallest. It can be seen that the settlement S at the corner point 1 is always the smallest, while that at the raft center (point 3) is the greatest depending on *Poisson's* ratio ν_s .

Reference values of *Poisson's* ratio ν_s for the soil (according to EWB 2003, S. 23):

Material with free lateral strain	$\nu_s = 0.0$
Rock	$\nu_s = 0.1$ to 0.3
Sand	$\nu_s = 0.2$ to 0.35
Clay	$\nu_s = 0.3$ to 0.5
Material with constant volume	$\nu_s = 0.5$

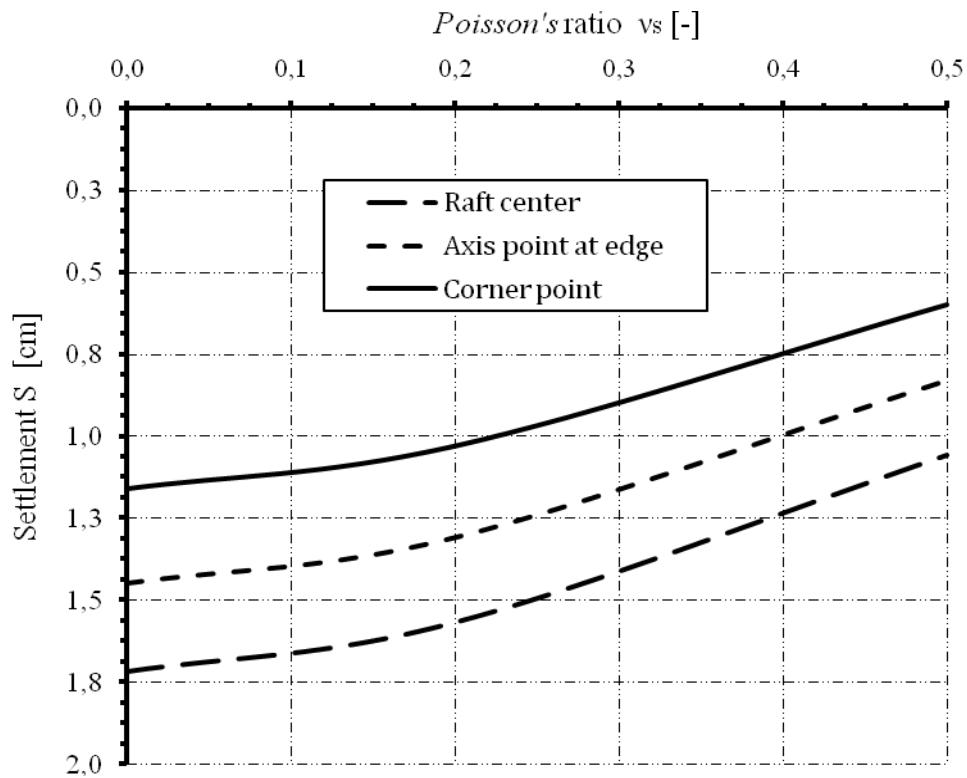


Figure 68 Influence of *Poisson's* ratio ν_s on the calculation result (Settlement S [cm]) for four loads by applying of modulus of compressibility method 7