

PONDASI SUMURAN

Data-data (nilai merah harus diisikan) :

dimensi kolom bulat (meter)

$$\begin{aligned} d &= 0,750 \\ L &= 5,200 \\ A &= 0,442 \end{aligned}$$

dimensi poer (meter)

$$\begin{aligned} B &= 1,300 \\ l &= 2,900 \\ t &= 0,750 \end{aligned}$$

data lain :

$$\begin{aligned} \gamma_t &= 1500 \text{ kg/m}^3 \\ \gamma_{\text{beton cyclop}} &= 2200 \text{ kg/m}^3 \\ \Sigma G &= 68434,8 \text{ kg} \end{aligned}$$

tegangan tanah pd dasar poer/lapisan pasir :

$$\begin{aligned} \phi &= 20 && \text{dari tabel Terzaghi :} \\ c &= 0 && N_c = 17,7 \\ D_f &= 1 && \text{m, } N_q = 7,43 \\ B &= 1,300 && \text{m, } N_\gamma = 4,6 \\ q_u &= 13836 && \text{sf} = 3 \\ q_a &= 4612 && \text{kg/m}^2 \\ &= 0,461 && \text{kg/cm}^2 \end{aligned}$$

$$\begin{aligned} \text{reaksi pd dasar poer, } G_p &= 12750,75 \text{ kg} \\ \text{kapasitas beban sumuran, } Q &= 81541,78 \text{ kg} \\ \text{berat sendiri sumuran, } G_s &= 11058,41 \text{ kg} \\ \text{berat yg dipikul sumuran, } \Sigma W &= 79041,95 \text{ kg} \Rightarrow W < Q \text{ ok} \end{aligned}$$

$$\text{tegangan tanah yg timbul, } \sigma_t = 78624,48 \text{ kg/m}^2 \text{ sumuran aman ...ok}$$

Penulangan pd sumuran, diambil $A_{\min} = 1\% A$

$$\begin{aligned} \text{luas tulangan minimum, } A_{\min} &= 5026,55 \text{ mm}^2 \\ \text{diambil diameter tulangan, } \phi &= 19 \text{ mm} \\ \text{luas} &= 283,53 \text{ mm}^2 \\ \text{jumlah tulangan diperlukan} &= 17,728532 \text{ buah} \\ \text{ambil jumlah tulangan} &= 18 \text{ buah} \\ A_{\text{ada}} &= 5103,5173 \text{ mm}^2 && A_{\text{ada}} > A_{\min} \text{ ok} \\ \text{dipasang sepanjang } 1/3 L &= 1,67 \text{ m} \\ \text{kontrol penempatan tulangan} &&& \\ \text{tulangan sengkang} &= 8 \text{ mm} \\ \text{selimut beton} &= 50 \text{ mm} \\ \text{diameter sumuran efektif} &= 665 \text{ mm} \\ \text{keliling} &= 2089,16 \text{ mm} \\ \text{keliling tulangan pokok} &= 342 \text{ mm} \\ \text{jarak tulangan} &= 97,06 \text{ mm} \end{aligned}$$

PEMBEBANAN

$$\begin{aligned} \text{b.s. poer} &: && 6786,00 \text{ kg} \\ \text{beban bang. atas} &: && 68434,80 \text{ kg} \\ \text{b.s. kolom} &: && 5513,50 \text{ kg} \\ \Sigma V &= && 80734,30 \text{ kg} \end{aligned}$$

DIMENSI

$$\begin{aligned} \text{luas sumuran yg diperlukan; } A &= 0,995 \text{ m}^2 \\ \text{direncanakan jml sumuran, } n &= 2 \text{ buah} \\ \text{luas per sumuran, } A_i &= 0,498 \text{ m}^2 \\ \text{diameter sumuran terhitung, } d &= 0,796 \text{ m} \\ \text{ambil diameter sumuran, } d &= 0,80 \text{ m} \\ \text{luas sumuran total } A_s &= 1,005 \text{ m}^2 \\ \text{panjang sumuran, } L_s &= 5,000 \text{ m} \\ \text{luas poer, } A_p &= 3,770 \text{ m}^2 \\ \text{luas poer netto, } A_n &= 2,765 \text{ m}^2 \\ &&& \text{luas sumuran mencukupi ...ok} \end{aligned}$$

DATA SONDIR

$$\begin{aligned} \text{qc pd 1.5 D ke atas} &= 15 \text{ kg/cm}^2 \\ \text{qc pd ujung sumuran} &= 28 \text{ kg/cm}^2 \\ \text{qc pd 1.5 D ke bawah} &= 30 \text{ kg/cm}^2 \\ \bar{\sigma}_t &= 8,11111111 \text{ kg/cm}^2 \\ \bar{\sigma}_t &= 81111,111 \text{ kg/m}^2 \end{aligned}$$

elevasi 0.00 m adalah muka tanah
elevasi lantai dasar -300 m
elevasi dasar poer -425 m
elevasi ujung sumuran - 925 m

DATA SPT

N = 15
q_{all} = 26972 kg/cm²