

12. ВЕННА -1-

P=5

$$R = 500 \text{ m}$$

$$M = 9,67 \text{ m}$$

$$K = 3 \cdot 10^{-4} \frac{\text{m}}{\text{s}}$$

$$L_1 = 45 \text{ m}$$

$$L_2 = 25 \text{ m}$$

$$S_c = 7 \text{ m}$$

R - радиус действия сваго бунара

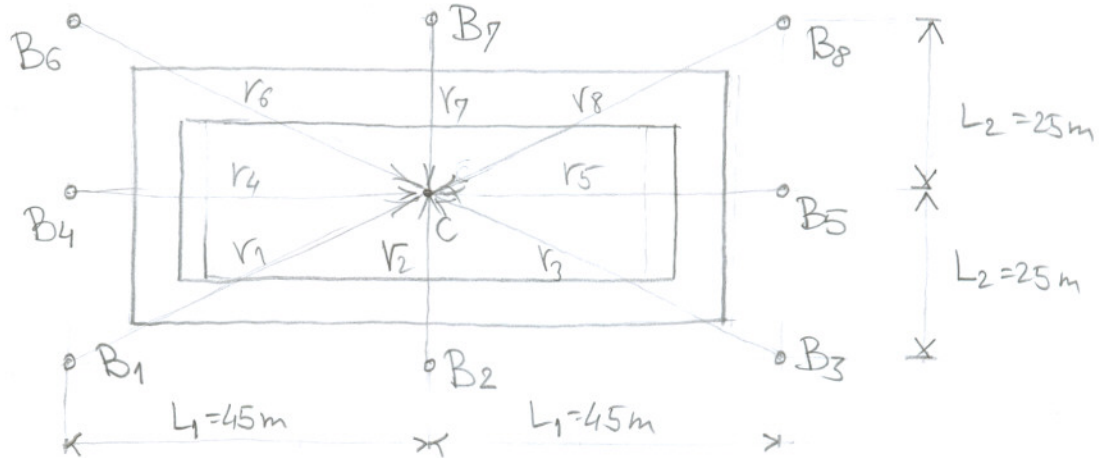
M - дебљина водоносног слоја

K - коеф. филтрације водоносног слоја

L₁ - густина

L₂ - густина

S_c - ширина жива појасења воде



$$1) \quad r_1 = r_3 = r_6 = r_8 = 51,48 \text{ m}$$

$$r_4 = r_5 = 45 \text{ m}$$

$$r_2 = r_7 = 25 \text{ m}$$

B	r_i^c	$\ln \frac{R}{r_i}$
1	51,48	2,273
2	25	2,995
3	51,48	2,273
4	45	2,408
5	45	2,408
6	51,48	2,273
7	25	2,995
8	51,48	2,273
Σ		19,898

$$S_c = \frac{Q}{2\pi K M} \sum_{i=1}^8 \ln \frac{R}{r_i} \Rightarrow Q$$

$$Q \sum_{i=1}^8 \ln \frac{R}{r_i} = S_c 2\pi K M$$

$$Q = \frac{S_c 2\pi K M}{\sum_{i=1}^8 \ln \frac{R}{r_i}} = \frac{7 \cdot 2\pi \cdot 3 \cdot 10^{-4} \cdot 9,67}{19,898}$$

$$Q = 6,412 \cdot 10^{-3} \frac{\text{m}^3}{\text{s}}$$

$$\frac{\text{m} \cdot \frac{\text{m}^3}{\text{s}} \cdot \text{m}}{[1]} = \frac{\text{m}^3}{\text{s}}$$

$$2) D_{15}^+ \geq 4 D_{15}^S$$

$$D_{15}^F \leq 4 D_{15}^S$$

по Аспрансву $\Rightarrow \boxed{V_{\max} \frac{\sqrt{K}}{30} = \frac{\sqrt{3 \cdot 10^{-4}}}{30} = 5,773 \cdot 10^{-4} \frac{m}{s}}$
(сформулиру критерий)

$$\frac{Q}{D_{B \text{ TLM}}} \leq V_{\max} \Rightarrow D_B \geq \frac{Q}{V_{\max} \text{ TLM}}$$

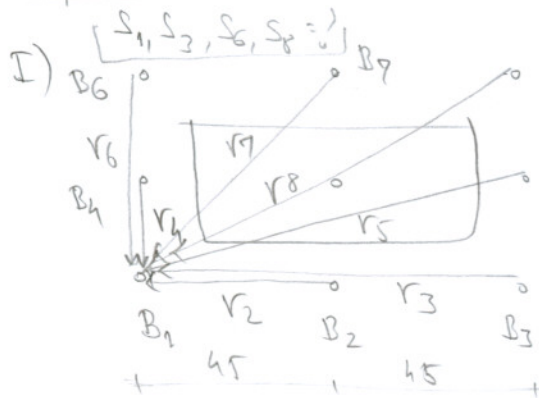
$$D_B \geq \frac{6,412 \cdot 10^{-3}}{5,773 \cdot 10^{-4} \cdot \pi \cdot 9,67} \Rightarrow \boxed{D_B \geq 0,366 \text{ m}}$$

$$3) S_1, S_2, S_3, S_4, S_5, S_6, S_7, S_8 = ?$$

$$\text{I) } \boxed{S_1 = S_3 = S_6 = S_8}$$

$$\text{II) } \boxed{S_4 = S_5}$$

$$\text{III) } \boxed{S_2 = S_7}$$



$$r_1 = \frac{D_B}{2} = 0,183 \text{ m} \quad r_5 = 93,41 \text{ m}$$

$$r_2 = 45 \text{ m}$$

$$r_6 = 50 \text{ m}$$

$$r_3 = 90 \text{ m}$$

$$r_7 = 67,27 \text{ m}$$

$$r_4 = 25 \text{ m}$$

$$r_8 = 102,96 \text{ m}$$

$$S_1 = \sum_{i=1}^8 S_i$$

$$\boxed{S_1^{S_1}} = \frac{Q}{2\pi K M} \ln \frac{R}{\frac{D_B}{2}} = \frac{6,412 \cdot 10^{-3}}{2\pi \cdot 3 \cdot 10^{-4} \cdot 3,57} \ln \frac{500}{0,183} = \boxed{2,78 \text{ m}}$$

$$\boxed{S_1^{S_2}} = \frac{Q}{2\pi K M} \cdot \ln \frac{R}{r_2} = -11 - \ln \frac{500}{45} = \boxed{0,85 \text{ m}}$$

$$\boxed{S_1^{S_3}} = -11 - \ln \frac{500}{30} = \boxed{0,6 \text{ m}}$$

$$\boxed{S_1^{S_7}} = -11 - \ln \frac{500}{67,27} = \boxed{0,71 \text{ m}}$$

$$\boxed{S_1^{S_4}} = -11 - \ln \frac{500}{25} = \boxed{1,05 \text{ m}}$$

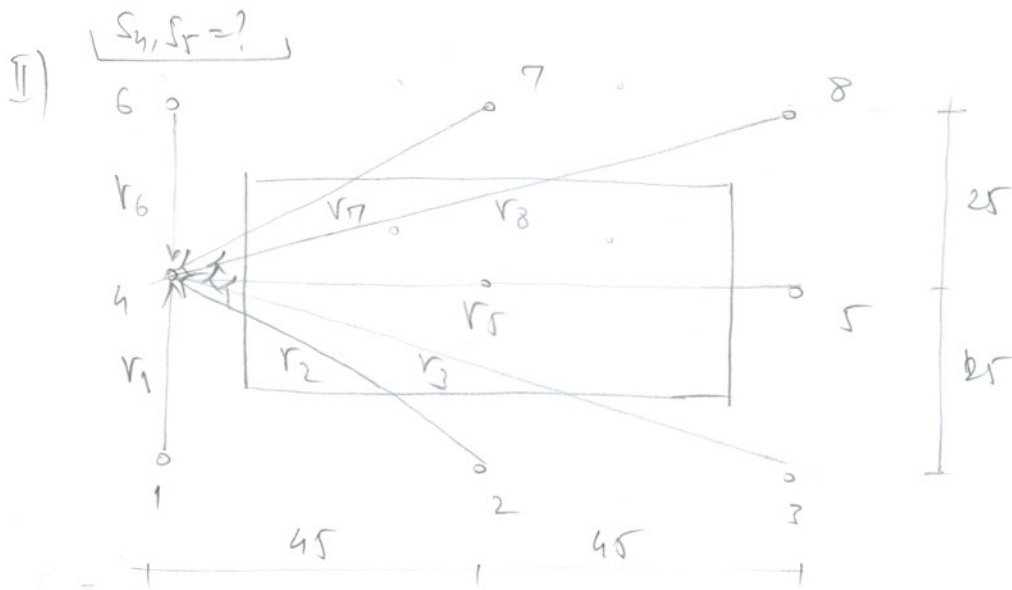
$$\boxed{S_1^{S_8}} = -11 - \ln \frac{500}{102,96} = \boxed{0,56 \text{ m}}$$

$$\boxed{S_1^{S_5}} = -11 - \ln \frac{500}{93,41} = \boxed{0,59 \text{ m}}$$

$$\boxed{S_1^{S_6}} = -11 - \ln \frac{500}{50} = \boxed{0,81 \text{ m}}$$

$$S_1 = 2,78 + 0,85 + 0,6 + 1,05 + 0,59 + 0,81 + 0,71 + 0,56 \Rightarrow \boxed{S_1 = 7,95 \text{ m}}$$

$$\Rightarrow \boxed{S_1 = S_3 = S_6 = S_8 = 7,95 \text{ m}}$$



$$r_1 = 25 \text{ m} \quad r_5 = 90 \text{ m}$$

$$r_2 = 51,48 \text{ m} \quad r_6 = 25 \text{ m}$$

$$r_3 = 93,41 \text{ m} \quad r_7 = 51,48 \text{ m}$$

$$r_4 = \frac{D_0}{2} = 0,183 \text{ m} \quad r_8 = 93,41 \text{ m}$$

$$\left[\frac{S_1}{S_4} \right] = \frac{Q}{2\pi k M} \ln \frac{R}{r_1} = \frac{6,412 \cdot 10^{-3}}{2\pi \cdot 3 \cdot 10^{-4} \cdot 9,67} \cdot \ln \frac{500}{25} = \boxed{1,05 \text{ m}}$$

$$\left[\frac{S_2}{S_4} \right] = -11 - \ln \frac{500}{51,48} = \boxed{0,8 \text{ m}}$$

$$\left[\frac{S_3}{S_4} \right] = -11 - \ln \frac{500}{93,41} = \boxed{0,59 \text{ m}}$$

$$\left[\frac{S_4}{S_4} \right] = -11 - \ln \frac{500}{0,183} = \boxed{2,78 \text{ m}}$$

$$\left[\frac{S_5}{S_4} \right] = -11 - \ln \frac{500}{90} = \boxed{0,6 \text{ m}}$$

$$\left[\frac{S_6}{S_4} \right] = -11 - \ln \frac{500}{25} = \boxed{1,05 \text{ m}}$$

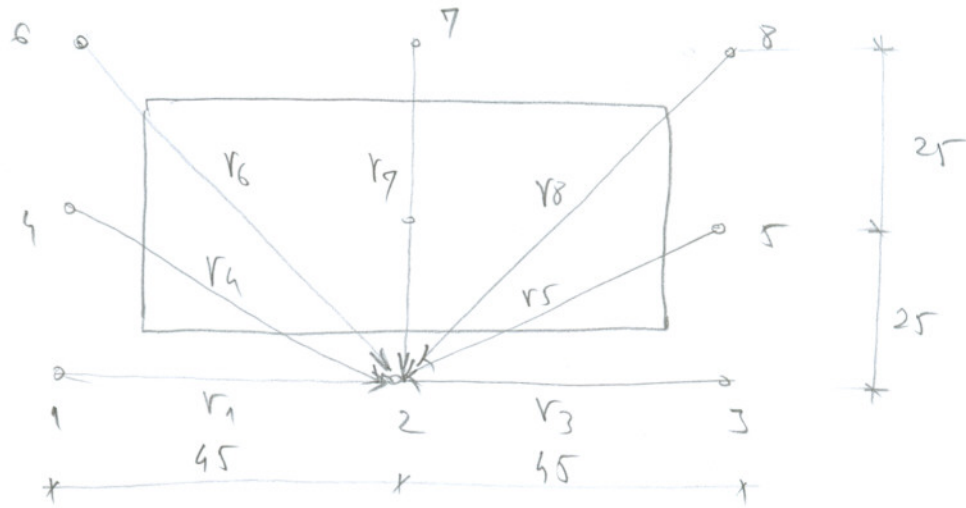
$$\left[\frac{S_7}{S_4} \right] = -11 - \ln \frac{500}{51,48} = \boxed{0,8 \text{ m}}$$

$$\left[\frac{S_8}{S_4} \right] = -11 - \ln \frac{500}{93,41} = \boxed{0,59 \text{ m}}$$

$$\left[S_4 \right] = 1,05 + 0,8 + 0,59 + 2,78 + 0,6 + 1,05 + 0,8 + 0,59 = \boxed{8,26 \text{ m}}$$

$$\left[S_4 = S_5 = 8,26 \text{ m} \right]$$

ii) $\boxed{S_2, S_7 = ?}$



$$\begin{aligned} r_1 &= 45 \text{ m} & r_5 &= 51,48 \text{ m} \\ r_2 &= \frac{D_R}{2} = 9,183 \text{ m} & r_6 &= 67,27 \text{ m} \\ r_3 &= 45 \text{ m} & r_7 &= 50 \text{ m} \\ r_4 &= 51,48 \text{ m} & r_8 &= 67,27 \text{ m} \end{aligned}$$

$$\boxed{S_2^1} = \frac{Q}{2\pi \cdot K \cdot M} \ln \frac{R}{r_1} = \frac{6,412 \cdot 10^{-3}}{2\pi \cdot 3 \cdot 10^{-4} \cdot 9,67} \ln \frac{500}{45} = \boxed{0,85 \text{ m}}$$

$$\boxed{S_2^2} = -11 - \ln \frac{500}{9,183} = \boxed{2,78 \text{ m}}$$

$$\boxed{S_2^6} = -11 - \ln \frac{500}{67,27} = \boxed{0,71 \text{ m}}$$

$$\boxed{S_2^3} = -11 - \ln \frac{500}{45} = \boxed{0,85 \text{ m}}$$

$$\boxed{S_2^7} = -11 - \ln \frac{500}{50} = \boxed{0,81 \text{ m}}$$

$$\boxed{S_2^4} = -11 - \ln \frac{500}{51,48} = \boxed{0,8 \text{ m}}$$

$$\boxed{S_2^8} = -11 - \ln \frac{500}{67,27} = \boxed{0,71 \text{ m}}$$

$$\boxed{S_2^5} = -11 - \ln \frac{500}{51,48} = \boxed{0,8 \text{ m}}$$

$$\boxed{S_2} = 0,85 + 2,78 + 0,85 + 0,8 + 0,8 + 0,71 + 0,81 + 0,71 = \boxed{8,31 \text{ m}}$$

$$\boxed{S_2 = S_7 = 8,31 \text{ m}}$$

$$\Rightarrow \begin{cases} S_1 = S_3 = S_6 = S_8 = 7,95 \text{ m} \\ S_4 = S_5 = 8,26 \text{ m} \\ S_2 = S_7 = 8,31 \text{ m} \end{cases}$$