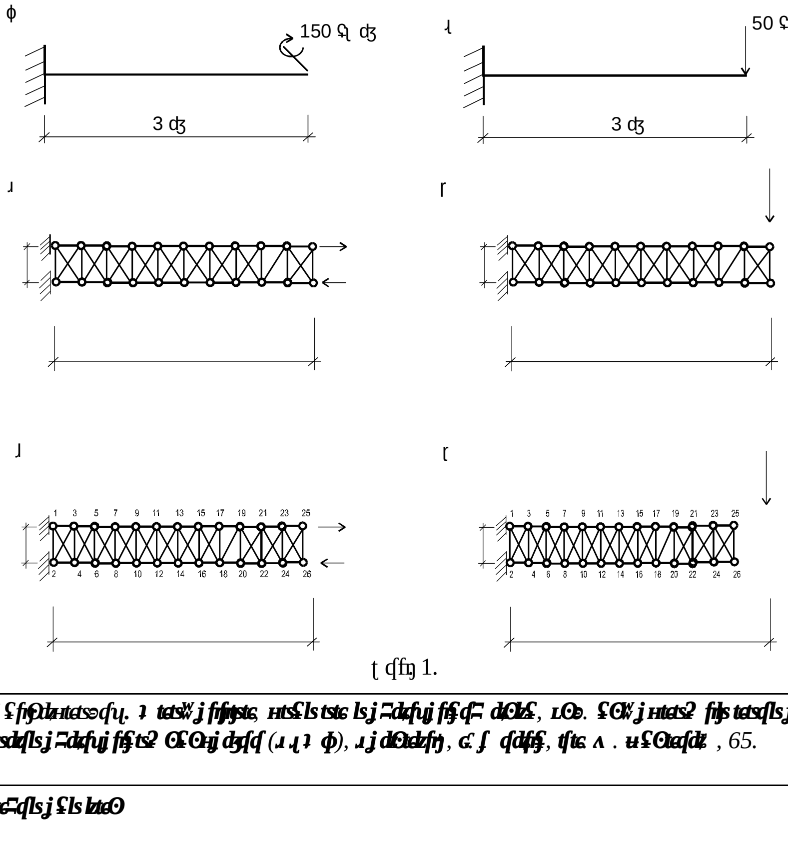
[illegible] 624.04

[illegible]

[illegible]

[illegible] z [illegible] $\varepsilon = \kappa \cdot z$, [illegible] $\kappa = 1/\rho$ [illegible] $\sigma = f(\varepsilon)$ [illegible] $\sigma = f(\kappa \cdot z)$. [illegible] $M = \eta(\kappa)$ [illegible] κ, [illegible] κ [illegible]



[illegible] 1.

[illegible], 65.

[illegible] (1), [illegible]

[illegible]

$$\sigma = C \cdot \varepsilon^{k} ,$$

[illegible] C [illegible]; k [illegible], $0 < k < 1$.

[illegible] $\sigma - \varepsilon$.

[illegible]

$$\frac{1}{\rho} = \left(\frac{M}{C \cdot I_{k+1}} \right)^{1/k} ,$$

[illegible] $I_{k+1} = \int\limits_{A} z^{k+1} \cdot dA$ [illegible] $(k+1)$ [illegible]

[illegible] $\varepsilon = \pm \frac{h_f}{2 \cdot \rho}$ [illegible]

$$\frac{1}{\rho} = \frac{2}{h_f} \cdot \left(\frac{N_1}{C \cdot A_1} \right)^{1/k} ,$$

[illegible] N_1 [illegible]; A_1 [illegible]; h_f [illegible].

[illegible] $M = N_1 \cdot h_f$, [illegible]

$$A_1 = \left(\frac{2}{h_f} \right)^{k} \cdot \frac{I_{k+1}}{h_f} .$$

[illegible]

$$A_1 = \frac{2}{h_f^2} \cdot I_2 .$$

[illegible] σ_2 [illegible] σ_1 [illegible] $|\sigma_2| = \gamma \cdot |\sigma_1|$. [illegible] γ [illegible] $\gamma < 1$. [illegible] $\sigma_2 << \sigma_1$. [illegible] $N = N_1 (1 + 0.5 \cdot \gamma)$. [illegible]

$$\frac{1}{\rho} = \left[\frac{N_1 (1 + 0.5 \cdot \gamma) h_f}{C \cdot I_{k+1}} \right]^{1/k} .$$

[illegible]

$$\left[\frac{N_1 (1 + 0.5 \cdot \gamma) h_f}{C \cdot I_{k+1}} \right]^{1/k} = \frac{2}{h_f} \left(\frac{N_1}{C \cdot A_1} \right)^{1/k} ,$$

$$A_1 = \left(\frac{2}{h_f} \right)^{k} \cdot \frac{I_{k+1}}{(1 + 0.5 \cdot \gamma) h_f} .$$

[illegible]

$$A_1 = \frac{2}{h_f} \cdot \frac{I_2}{(1 + 0.5 \cdot \gamma) h_f} .$$

[illegible] $\gamma = 0$ [illegible] A_1 [illegible]

[illegible] $\sigma \approx \varepsilon$ [illegible]

$$\sigma = E \cdot \varepsilon - H \cdot \varepsilon^{3}$$

[illegible] H [illegible] $H = \frac{E}{3 \cdot \varepsilon_{PP}^{2}}$, [illegible]

$$\left(\frac{d\sigma}{d\varepsilon} \right)_{\varepsilon = \varepsilon_{PP}} = 0 .$$

[illegible] ε_{pp} [illegible] σ_{pp}.

[illegible]

$$M = \frac{E \cdot I_2}{\rho} - \frac{H \cdot I_4}{\rho^3} .$$

[illegible] M [illegible] ρ, [illegible] $M = N \cdot h_f$ [illegible] σ_{pp} [illegible] $\frac{1}{\rho} = \frac{2}{h_B} \cdot \sqrt{\frac{E}{3 \cdot H}}$.

[illegible]

$$A_1 = \frac{A_P \cdot h_B \cdot \left[E \cdot \kappa \cdot \frac{h_B}{2} - H \cdot \kappa^3 \cdot \left(\frac{h_B}{2} \right)^3 \right]}{(1 + 0.5 \gamma) \cdot h_f \cdot \sigma_1} ,$$

[illegible] A_p [illegible]; h_B [illegible]; σ_1 [illegible].

[illegible] A_1. [illegible] κ [illegible]

$$\sigma = \frac{E}{\rho} \cdot \frac{h_B}{2} - \frac{H}{\rho^3} \left(\frac{h_B}{2} \right)^3 .$$

[illegible] A_1, [illegible]

[illegible] 1, 2 [illegible]

[illegible] A_1, [illegible] $A_2 = A_1 / \sqrt{2}$. [illegible] $\sigma \approx \varepsilon$ [illegible] 10^{20} [illegible]

[illegible] 1

[illegible]	[illegible] $\sigma = 10^5 \cdot \varepsilon^{0.5}$		
	[illegible], [illegible]^2	[illegible] B, [illegible]	[illegible], [illegible]$H/$[illegible]^2
[illegible] 1,[illegible]	$0.2 \div 0.5$	0,405	$\max\sigma = 15000$ ($\varepsilon = 2.25 \cdot 10^{-2}$)
[illegible] 1,[illegible]	$\phi_1 = 4.3033 \cdot 10^{-2}$; $\phi_2 = 2.043 \cdot 10^{-2}$	0,395	$\sigma_{1-3} = \sigma_{2-4} = 0.116 \cdot 10^5$; $\sigma_{1-4} = \sigma_{2-3} = -0.8 \cdot 10^{-5}$
[illegible] 1,[illegible]	$\phi_1 = 5.657 \cdot 10^{-2}$; $\phi_2 = 4.0 \cdot 10^{-2}$	0,395	$\sigma_{1-3} = \sigma_{2-4} = 0.106 \cdot 10^5$; $\sigma_{1-4} = \sigma_{2-3} = -0.12 \cdot 10^{-3}$
[illegible] 1,[illegible]	$0.2 \div 0.5$	0,2025	$\max\sigma = 15000$ ($\varepsilon = 2.25 \cdot 10^{-2}$)
[illegible] 1,[illegible]	$\phi_1 = 4.0984 \cdot 10^{-2}$; $\phi_2 = 2.898 \cdot 10^{-2}$	0,217	$\sigma_{1-3} = \sigma_{2-4} = 0.116 \cdot 10^5$; $\sigma_{1-4} = \sigma_{2-3} = 0.122 \cdot 10^4$
[illegible] 1,[illegible]	$\phi_1 = 5.387 \cdot 10^{-2}$; $\phi_2 = 3.81 \cdot 10^{-2}$	0,217	$\sigma_{1-3} = \sigma_{2-4} = 0.107 \cdot 10^5$; $\sigma_{1-4} = \sigma_{2-3} = 0.928 \cdot 10^3$

[illegible] 2

[illegible]	[illegible] $\sigma = 10^6 \cdot \varepsilon$		
	[illegible], [illegible]^2	[illegible] B, [illegible]	[illegible] [illegible]$H/$[illegible]^2
[illegible] 1,[illegible]	$0.2 \div 0.5$	0,324	18000
[illegible] 1,[illegible]	$\phi_1 = 4.63 \cdot 10^{-2}$; $\phi_2 = 3.273 \cdot 10^{-2}$	0,324	$\sigma_{1-3} = \sigma_{2-4} = 0.108 \cdot 10^5$; $\sigma_{1-4} = \sigma_{2-3} = -0.79 \cdot 10^{-10}$
[illegible] 1,[illegible]	$\phi_1 = 6.667 \cdot 10^{-2}$; $\phi_2 = 4.714 \cdot 10^{-2}$	0,324	$\sigma_{1-3} = \sigma_{2-4} = 0.9 \cdot 10^4$; $\sigma_{1-4} = \sigma_{2-3} = -0.303 \cdot 10^{-3}$
[illegible] 1,[illegible]	$0.2 \div 0.5$	0,216	18000
[illegible] 1,[illegible]	$\phi_1 = 4.409 \cdot 10^{-2}$; $\phi_2 = 3.118 \cdot 10^{-2}$	0,233	$\sigma_{1-3} = \sigma_{2-4} = 0.108 \cdot 10^5$; $\sigma_{1-4} = \sigma_{2-3} = 0.113 \cdot 10^4$
[illegible] 1,[illegible]	$\phi_1 = 6.349 \cdot 10^{-2}$; $\phi_2 = 4.49 \cdot 10^{-2}$	0,231	$\sigma_{1-3} = \sigma_{2-4} = 0.906 \cdot 10^4$; $\sigma_{1-4} = \sigma_{2-3} = 0.787 \cdot 10^3$

[illegible]

[illegible] $\sigma = C \cdot (\kappa \cdot z)^k$, [illegible] $\sum \sigma$ [illegible]

$$z_c = \frac{\int_0^{h_B/2} z \cdot \kappa^k z^k \, dz}{\int_0^{h_B/2} \kappa^k z^k \, dz} = \frac{k+1}{k+2} \cdot \frac{h_B}{2} .$$

[illegible]

$$M = \left(\sum \sigma\right) \cdot 2 \cdot \frac{k+1}{k+2} \cdot \frac{h_B}{2} = 2 \cdot C \cdot b \left(\frac{h_B}{2}\right)^{k+2} \cdot \frac{1}{k+2} \cdot \kappa^k$$

$$\text{[illegible]} \; M = B \cdot \kappa^k ,$$

[illegible] $B = 2 \cdot C \cdot b \cdot \left(\frac{h_B}{2}\right)^{k+2} \cdot \frac{1}{k+2}$.

[illegible] σ [illegible]

$$\sigma = \left(\frac{h_B}{h_f}\right)^k \cdot \sigma_1 .$$

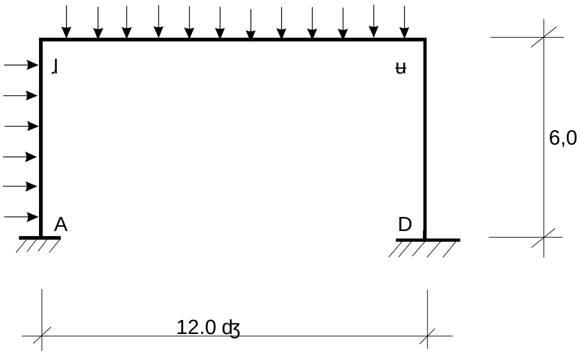
[illegible] $M - \kappa$ [illegible] $\sigma - \varepsilon$.

[illegible] $\sigma = E \cdot \varepsilon - H \cdot \varepsilon^3$ z_c [illegible]

$$z_c = \frac{10 \cdot E \cdot h_B - 12 \cdot H \cdot \kappa^2 \cdot (h_B / 2)^3}{30 \cdot E - 15 \cdot H \cdot \kappa^2 \cdot (h_B / 2)^2} .$$

[illegible] A_1, [illegible] A_1, M [illegible] σ [illegible]

[illegible] $\sigma - \varepsilon$ [illegible].



[illegible] 2.

[illegible]:

1. [illegible] .

1.1. [illegible] A.

1.2. [illegible] A [illegible] A_0 [illegible] A_x ([illegible]). [illegible] $det\ A_0 \neq 0$.

1.3. [illegible] F.

1.4. [illegible]

$$L_x = -A_0^{-1} \cdot A_x\ ,\ S_F^0 = A_0^{-1} \cdot \Delta F\ .$$

2. [illegible] σ [illegible] ε [illegible] .

3. [illegible] B_0 [illegible] B_x. [illegible].

4. [illegible] :

$$F' \cdot \Delta\vec{x} + \Delta\vec{f}_p = 0\ ,$$

[illegible] $\Delta\vec{f}_p = L_x^T \cdot B_0 \cdot A_0^{-1} \cdot \Delta F$ [illegible] ([illegible]) [illegible] ΔF; $\Delta\vec{x}$ [illegible],

$$F' = \frac{\partial f}{\partial x} = \left[L_x^T \cdot B_0 \cdot L_x + B_x\right].$$

[illegible] N, σ [illegible] ε [illegible] .

5. [illegible] $[A]$ [illegible].

6. [illegible] .

7. [illegible] $\Delta\psi$ [illegible].

8. [illegible] $\dfrac{\partial\psi}{\partial x}$, $\dfrac{\partial\psi}{\partial A}$, $\dfrac{\partial h}{\partial A}$.

9. [illegible].

10. [illegible] ΔA [illegible]

11. [illegible]

12. [illegible] 3.

[illegible]

[illegible] (2) [illegible] 3. [illegible] σ [illegible] ε [illegible] $\sigma = 10^5 \cdot \varepsilon^{0.5}$. [illegible] 19-20, 19-21, 20-21 [illegible] B [illegible] 45-46, 44-46, 44-45 [illegible] C. [illegible] $E = 10^{20}$ [illegible] [illegible]

$$\sigma = \frac{c_1 \varepsilon}{\sqrt{1 + c_2 \cdot \varepsilon^2}}\ ,$$

[illegible] $\sigma \to \sigma_T$ [illegible] $\varepsilon \to \infty$ $(c_1 = E$ [illegible] $c_2 = (E / \sigma_{PP})^2$). [illegible] 3.

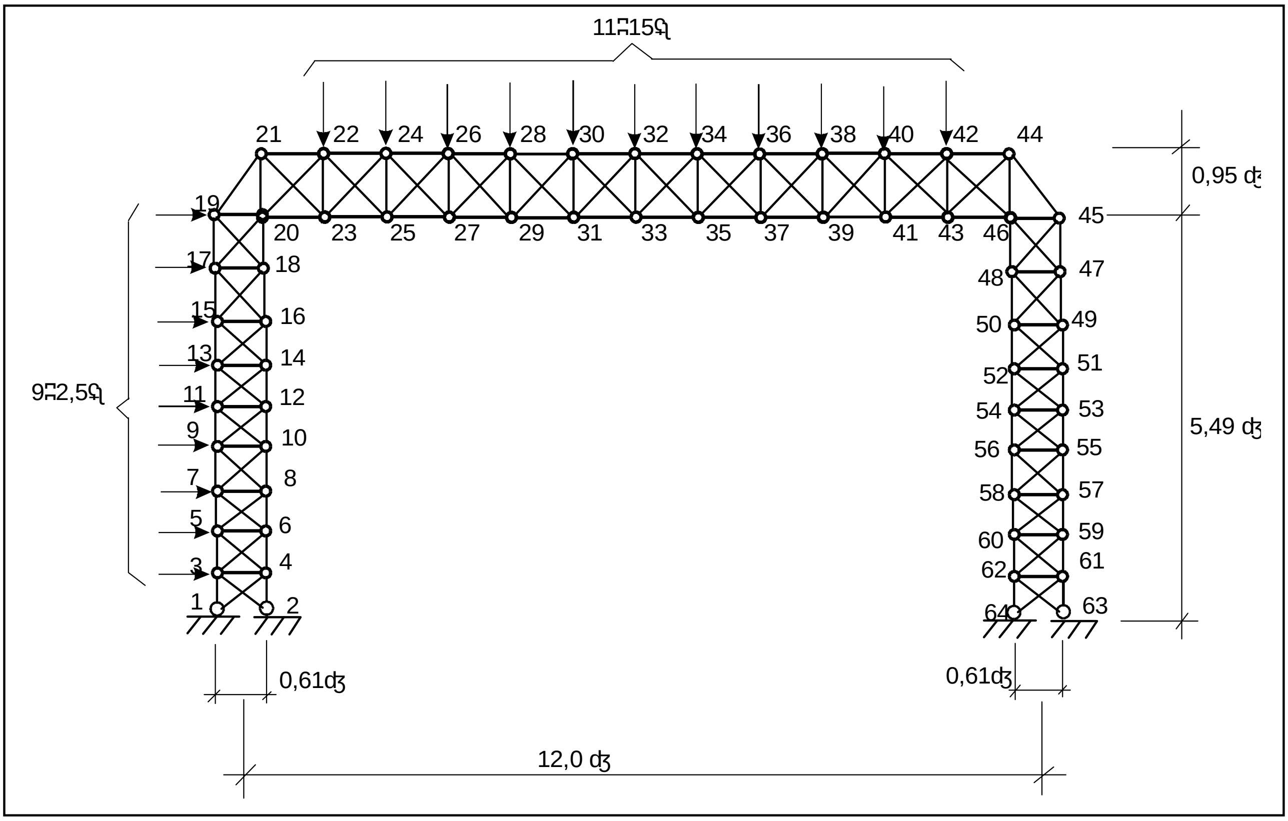
[illegible] h_f [illegible] 0,61 [illegible] 0,95 [illegible] A_1^B, [illegible] A_1^A), [illegible] $A_2 = A_1 / \sqrt{2}$. [illegible] $A_1^B = 0{,}088$ [illegible], $A_1^A = 0{,}154$ [illegible] $0{,}29 \times 0{,}58$ [illegible] $0{,}65 \times 1{,}31$ [illegible] 11500 [illegible] .

[illegible] h_B [illegible] h_f [illegible] .

[illegible] A_1, [illegible] σ_1 [illegible].

[illegible] .

[illegible] 13,039 [illegible], [illegible] -2,112 [illegible]. [illegible] σ [illegible]



ţ qfiŋ 3.

ʊƟɞdʑʃɥƟ3

ʅ tsdʒj tɕƟ fljsj tɕɤ dʑ ʔ	ʅ j dʑʃdʑ ʔdʑ ʔ ɘƟɕʃƟdʑ tɕƟfnɥj lsƟ $\sigma = 10^5\cdot\varepsilon^{0.5}$				
	ɟ dʑsʱ ƟɦI fljuj dʑʃʷ, $dʒ^2$	ʅ Ɵʃtɕʷɣj dʑʃj ɘ fljsj tɕɤ - dʑʷ⁻ ʷʷj tɕdʒ , ʕɿ /$dʒ^2$	ɟ j tɕj dʒj ʱ j dʑʃʷ ɮʟdʑsɘ		
			dʑsdʒj tɕ ɮʟdʑƟ	Z^{ctstc}, ʤ	$Z^{\text{ɘj tds}}$, ʤ
30ï 32	$0.242\cdot10^{ï1}$	$ï0.7618\cdot10^{4}$	***30***	$0.3826\cdot10^{ï1}$	***ï 0.1403***
31ï 33	$0.242\cdot10^{ï1}$	$ï0.7338\cdot10^{4}$	***31***	$0.282\cdot10^{ï1}$	***ï 0.1403***
31ï 32	$0.171\cdot10^{ï1}$	$ï0.1155\cdot10^{4}$	***32***	$0.3288\cdot10^{ï1}$	***ï 0.1453***
30ï 33	$0.171\cdot10^{ï1}$	$ï0.6590\cdot10^{3}$	***33***	$0.3319\cdot10^{ï1}$	***ï 0.1453***
46ï 48	$0.141\cdot10^{ï1}$	$ï0.1131\cdot10^{5}$	***45***	$0.45\cdot10^{ï1}$	$ï0.8868\cdot10^{ï3}$
47ï 45	$0.141\cdot10^{ï1}$	$0.8397\cdot10^{4}$	***46***	$0.45\cdot10^{ï1}$	$ï0.1803\cdot10^{ï1}$
46ï 47	$0.994\cdot10^{ï2}$	$ï0.4947\cdot10^{3}$	***47***	$0.5504\cdot10^{ï1}$	$ï0.5081\cdot10^{ï2}$
48ï 45	$0.994\cdot10^{ï2}$	$ï0.8565\cdot10^{3}$	***48***	$0.5462\cdot10^{ï1}$	$ï0.1042\cdot10^{ï1}$

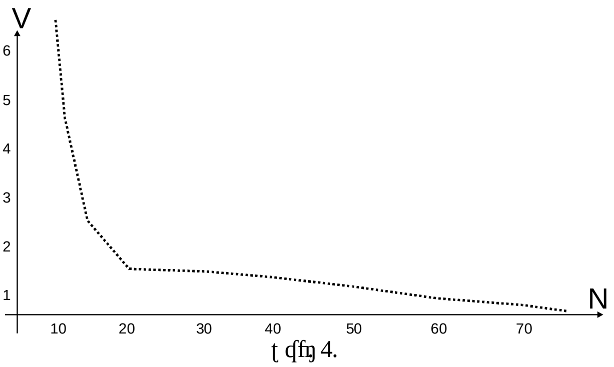
ʊƟɞdʑʃɥƟ4

ʅ tsdʒj tɕƟ fljsj tɕɤ dʑ ʔ	ʅ j dʑʃdʑ ʔdʑ ʔ ɘƟɕʃƟdʑ tɕƟfnɥj lsƟ $\sigma = 0.7\cdot10^8\cdot\varepsilon ï\ 3.65\cdot10^9\cdot\varepsilon^3$				
	ɟ dʑsʱ ƟɦI fljuj dʑʃʷ, $dʒ^2$	ʅ Ɵʃtɕʷɣj dʑʃj ɘ fljsj tɕɤ - dʑʷ⁻ ʷʷj tɕdʒ , ʕɿ /$dʒ^2$	ɟ j tɕj dʒj ʱ j dʑʃʷ ɮʟdʑsɘ		
			dʑsdʒj tɕ ɮʟdʑƟ	Z^{ctstc}, ʤ	$Z^{\text{ɘj tds}}$, ʤ
43ï 46	$0.400\cdot10^{ï4}$	$ï0.362\cdot10^{7}$	***32***	$0.264\cdot10^{ï1}$	***ï 0.709***
42ï 44	$0.400\cdot10^{ï4}$	$0.291\cdot10^{7}$	***33***	$0.273\cdot10^{ï1}$	***ï 0.801***
42ï 46	$0.28\cdot10^{ï4}$	$ï0.173\cdot10^{7}$	***34***	$ï0.148\cdot10^{ï1}$	***ï 0.760***
43ï 44	$0.28\cdot10^{ï4}$	$0.118\cdot10^{7}$	***35***	$0.551\cdot10^{ï1}$	***ï 0.761***
45ï 47	$0.871\cdot10^{ï3}$	$0.250\cdot10^{6}$	***45***	$ï0.17\cdot10^{ï2}$	$0.37\cdot10^{ï2}$
46ï 48	$0.871\cdot10^{ï3}$	$ï0.329\cdot10^{6}$	***46***	$ï0.17\cdot10^{ï2}$	$ï0.101\cdot10^{ï1}$
45ï 48	$0.615\cdot10^{ï3}$	$0.343\cdot10^{5}$	***47***	$0.879\cdot10^{ï2}$	$0.157\cdot10^{ï2}$
46ï 47	$0.615\cdot10^{ï3}$	$ï0.664\cdot10^{5}$	***48***	$0.866\cdot10^{ï2}$	$ï0.722\cdot10^{ï2}$

[illegible] $\sigma = 10^5 \cdot \varepsilon^{0.5}$ [illegible] 3. [illegible] σ [illegible] (0.4·10⁻⁴ м²). [illegible] $0,0854 \times 0,17$ м², [illegible] $0,19 \times 0,38$ м². [illegible] h/b [illegible]. [illegible] 33-[illegible] 0,2 [illegible] $A_1^B = 0,0141$ м², $A_1^t = 0,0242$ м², [illegible] 2,112 м³.

[illegible] (3) [illegible] $\sigma = 0.7 \cdot 10^8 \cdot \varepsilon - 3.65 \cdot 10^9 \cdot \varepsilon^3$, $R = 3.63 \cdot 10^6$ кН/м². [illegible] (min $A_1 = 0.4 \cdot 10^{-4}$ м²) [illegible] 4.

[illegible] $\frac{\partial h}{\partial A}$ [illegible] A_1^B, [illegible] A_1^t), [illegible]



[illegible] 4.

[illegible] (33×2) [illegible] 4 [illegible] (V – [illegible], N – [illegible]). [illegible] α, [illegible] $\Delta\psi$ [illegible] $\Delta\psi / \frac{\partial \psi}{\partial A}$. [illegible]

$h = 0.38$ [illegible] A_p [illegible] $1.021 \cdot 10^{-4}$ м². [illegible] 0.17 [illegible] $A_p = 5.06 \cdot 10^{-4}$ м². [illegible] 33 [illegible] 0,2 [illegible] $A_1^B = 0,00097$ м², $A_1^t = 0,000097$ м², [illegible] 0,0574 м³.

УДК 624.012

[illegible]

[illegible]

[illegible] 30..40 % [illegible] [1, 2, 3] [illegible]

[illegible] 65.
[illegible] 267.
[illegible] 267.