

ОРАЗМЕРЯВАНЕ .. НА .. ДЪРВЕНИТЕ .. КОНСТРУКТИВНИ .. ЕЛЕМЕНТИ

$$hr := 12 \quad \text{cm} \quad br := 6 \quad \text{стъпка .. ребра} \quad Br := 60 \quad \text{cm}$$

$$\text{Наклон .. на .. покрива} \quad \alpha_1 := 17 \quad \alpha := \frac{\alpha_1 \cdot \pi}{180} \quad \alpha = 0.297$$

$$E := 1000 \quad \frac{\text{kN}}{\text{cm}^2} \quad bo := \cos(\alpha) \quad bo = 0.956$$

$$Rb := 1.3 \quad \frac{\text{kN}}{\text{cm}^2} \quad \text{иглолистна .. дървесина .. II .. категори}$$

$$L_{\max} := 3.00 \quad \text{m} \quad \text{--максимален .. размер .. на .. ребро .. в .. проекция}$$

$$\gamma_{bc} := 1$$

--Натоварване

$$\text{-- керемиди} \quad k := 0.2 \cdot 1.1 \quad k = 0.22$$

$$\text{-- дъщчена .. обшивка .. 20мм} \quad o := 0.02 \cdot 7 \cdot 1.1 \quad o = 0.154$$

$$\text{-- покривни .. ребра .. през .. 60см} \quad r := 7 \cdot 1.1 \cdot \frac{\frac{hr \cdot br}{100^2}}{\frac{Br}{100}} \quad r = 0.092$$

$$\text{-- вата .. 20} \quad \frac{\text{кг}}{\text{м}^2} \quad w := 0.2 \cdot 1.1$$

$$gn1 := \frac{k + o + r + w}{1.1} \quad g1 := k + o + r + w$$

$$gn1 = 0.624 \quad \frac{\text{kN}}{\text{м}^2} \quad g1 = 0.686 \quad \frac{\text{kN}}{\text{м}^2}$$

$$gn2 := gn1 \cdot \cos(\alpha) \quad g2 := g1 \cdot \cos(\alpha) \quad gn2 = 0.597 \quad g2 = 0.656$$

$$gn := gn2 \cdot \frac{Br}{100} \quad g := g2 \cdot \frac{Br}{100}$$

$$gn = 0.358 \quad \frac{\text{kN}}{\text{m}} \quad g = 0.394 \quad \frac{\text{kN}}{\text{m}}$$

--НАТОВАРВАНЕ .. ОТ .. СНЯГ

$$Sn1 := 1.2 \cdot \cos(\alpha) \quad S1 := Sn1 \cdot 1.4 \cdot \cos(\alpha)$$

$$S_n := S_{n1} \cdot \frac{Br}{100} \quad S := S1 \cdot \frac{Br}{100}$$

$$S_n = 0.689 \frac{kN}{m} \quad S = 0.922 \frac{kN}{m}$$

$$W_r := \frac{hr^2 \cdot br}{6} \quad W_r = 144 \text{ cm}^3 \quad q_n := g_n + 0.95 \cdot S_n$$

$$I_r := \frac{hr^3 \cdot br}{12} \quad I_r = 864 \text{ cm}^4 \quad q_n = 1.012 \frac{kN}{m}$$

$$q := g + 0.95 \cdot S$$

$$q = 1.27 \frac{kN}{m}$$

$$M_{max} := \frac{q \cdot L_{max}^2}{8 \cdot \cos(\alpha) \cdot \cos(\alpha)} \quad M_{max} = 1.562 \text{ kN} \cdot m$$

—Максимален .. момент .. в .. монтажно .. състояние

$$F_m := 1 \text{ kN}$$

$$M_{max2} := \frac{g \cdot L_{max}^2}{8 \cdot \cos(\alpha) \cdot \cos(\alpha)} + \frac{F_m \cdot \cos(\alpha) \cdot L_{max}}{4 \cos(\alpha)} \quad M_{max2} = 1.234 \text{ kN} \cdot m$$

—Оразмеряване

$$M := \mathbf{1.562} \text{ kN} \cdot m$$

$$W_x := \frac{M \cdot 100}{\gamma_{bc} \cdot R_b} \quad W_x = 120.154 \text{ cm}^3$$

$$W_r = 144 \text{ cm}^3$$

$$W_r \geq W_x = 1$$

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—Проверка .. на .. якост .. и .. устойчивост .. (само .. нормални .. напрежения)

$$\max \sigma := \frac{M \cdot 100}{W_r} \quad \max \sigma = 1.085 \frac{kN}{cm^2}$$

$$\gamma_{bc} \cdot R_b = 1.3$$

$$\max \sigma \leq \gamma_{bc} \cdot R_b = 1$$

–Проверка .. на .. провисания

$$f_m := \frac{5 \cdot 100 \cdot (g_n + S_n) \cdot L_{\max}^4}{384 \cdot (\cos(\alpha))^4 \cdot E \cdot \frac{I_r}{100^2}} \quad f_m = 1.528 \quad \text{cm}$$

$$f_u := \frac{L_{\max} \cdot 100}{150} \quad f_u = 2 \quad \text{cm}$$

$$f_{\max} := \frac{f_m \cdot \left[1 + 19.2 \cdot \left(\frac{h_r}{L_{\max} \cdot 100} \right)^2 \right]}{1} \quad f_{\max} = 1.574 \quad \text{cm}$$

$$f_{\max} < f_u = 1$$

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