

$$A_{net} \times \sigma_y = N$$

SSSS

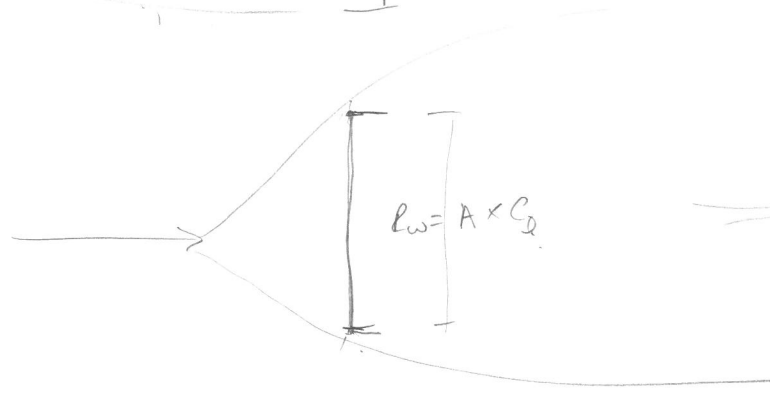
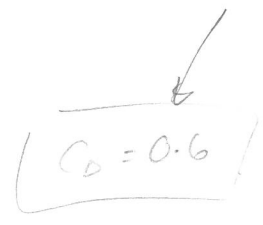
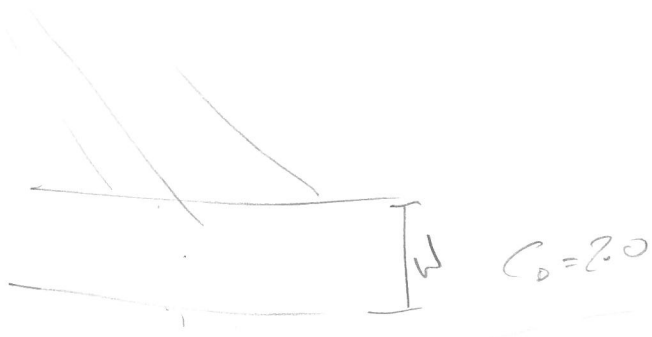
$$\sigma_y = 355 \text{ N/mm}^2$$

355 MPa

$$T_{max} = A_{net} \sigma_y$$

$$A_{net} = \frac{T}{\sigma_y}$$

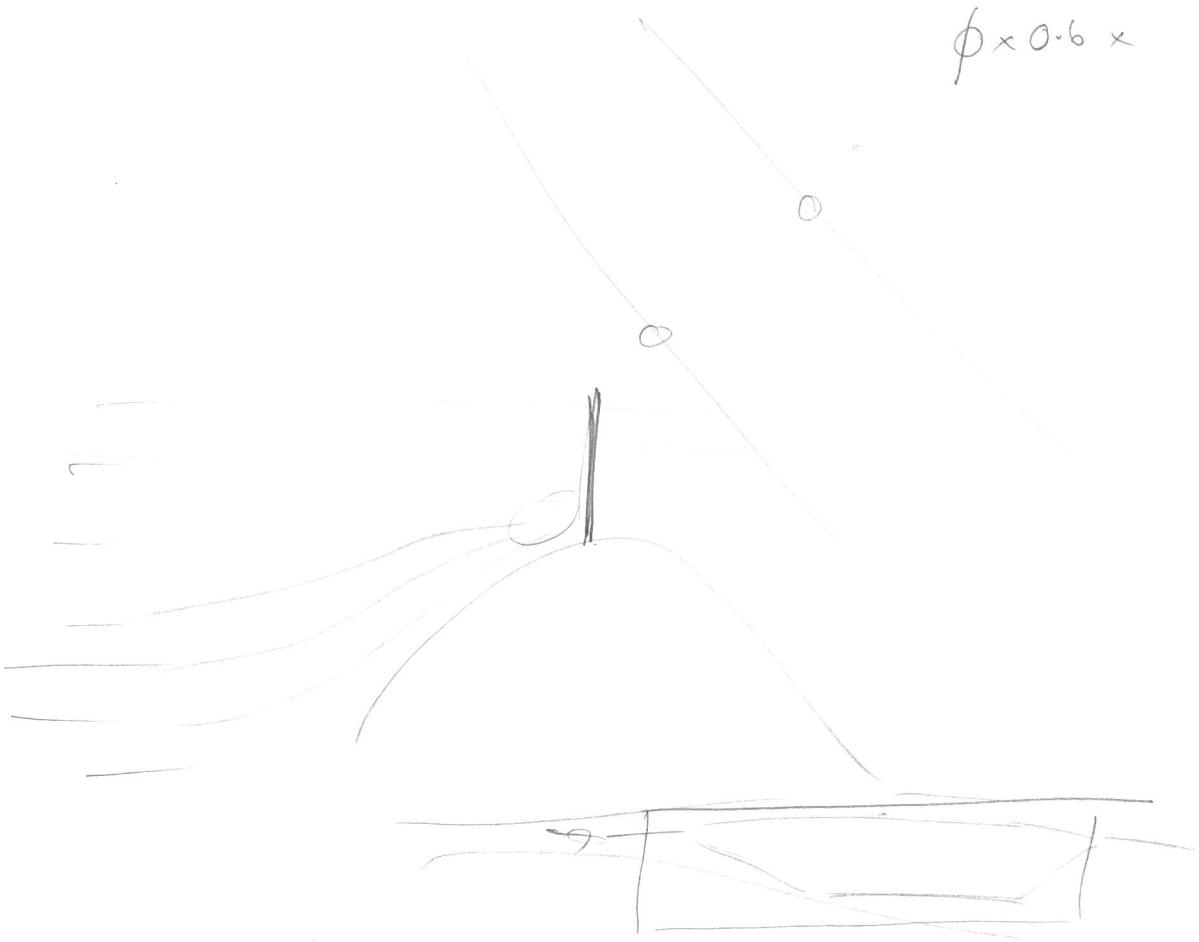
ϕ



$$F_{WIND} = 0.613 \times V_z^2 \times R_{wi} \quad (N)$$

$V_z = 21 \text{ m/s}$

$\phi \times 0.6 \times$



Wind Load

← Section 12 Sectioning →

Cables: $\phi = 142 \text{ mm} = 0.142 \text{ m}$

~~$0.6 \times 0.142 \times 24 = 2.0448$~~

~~$F_{\text{wind on cables}} = 2.0448 \times 0.613 \times 21 = 26.3229 \text{ kN}$~~

Deck

$400 \times 1 \times 2 = 800$

$F_{\text{wind on deck}} = 800 \times 21 \times 0.613 = 10298.4 \text{ N}$

Tower (Simplified as column).

205.5
 1109.7

~~$602 \times 9 \times 0.6 = 550.8$~~

$F_{\text{wind on tower}} = 550.8 \times 0.613 \times 21 = 7090.4484 \text{ N}$
 14295.1681 N

Cables

$x = \sin 45 \times \frac{195.5}{\sin 45}$

$x = 195.5$

$y = 276.4787514 \text{ m}$



$2613 \times 0.6 \times 0.142 = 222.6276$

$F_{\text{wind on cables}} = 222.6276 \times 0.613 \times 21 = 2865.885095$

Cable lengths:

277	
253	
229	
205	
181	
157	
133	⊗ 399
109	⊗ 327
85	⊗ 255
61	⊗ 183
36	⊗ 108
13	⊗ 39

Total $F_{\text{wind}} = 27449.45319 \text{ N}$

2613 m of cable.

with

Dead load

Deck

$$\begin{aligned}400m \times 8 \times 1 &= 3200m^3 \text{ Deck} \\ &= 7680000 \text{ kg} \\ &= 75264000 \text{ N}\end{aligned}$$

Tower

$$\begin{aligned}\text{Area} &= \pi r^2 = 63.61725124m^2 \\ V &= 64 \times (205.5710) = 13709.51764m^3 \\ &= 106934237.6 \text{ kg} \\ &= 104795528 \text{ N}\end{aligned}$$

Cables

$$\begin{aligned}\text{Area} &= 0.06m^2 \\ V &= 165.5m^3 \\ &= 1291102.059 \text{ kg} \\ &= 12652500.18 \text{ N}\end{aligned}$$

$$\text{Total dead load} = 1135872328 \text{ N}$$

$$\text{With safety factor} = 1590221259 \text{ N}$$

Live load

$$\text{Area of deck} = 3200 \text{ m}^2$$

$$3200 \times 5 \text{ kN} = 16000 \text{ kN}$$

$$\begin{aligned} \text{With Safety Factor} &= 25600 \text{ kN} \\ &= 25600000 \text{ N} \end{aligned}$$

Highest loading 5

With live load

$$25600000 + 1590221259 + (27449.45319 \times 0.9) = 1615845964 \text{ N}$$

Without live load

$$1590221259 + (27449.45319 \times 1.4) = 1590259688 \text{ N}$$