PERENCANAAN GORDING

Data teknik :

- Jarak antar kuda-kuda (l) = 6,00 m
- Jarak antar gording = 1,25 m
- Sudut kemiringan atap = 11 ^{o}
- Berat atap asbes = 25,00 kg/m2
- Ukuran gording = CNP 125.50.20.3,2

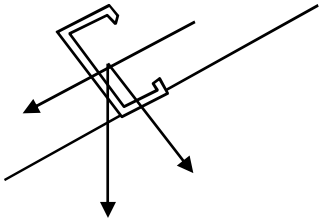
Ix = 181 cm4 ; Wx = 29 cm3
Iy = 26,6 cm4 ; Wy = 8,02 cm3

Beban gording :

- Berat sendiri gording		=	6,31 kg/m'
- Berat atap asbes	: 11.3 x 1,25	=	14,13 kg/m'
- Berat air hujan = 0,02x1000x1,25		=	25 kg/m'
			45,44 kg/m'

- Beban pekerja P = 100 kg ditengah bentang

Momen pada gording :



qx = q cos α
qy = q sin α

akibat beban mati :

panjang bentang gording lx = 6,00 m'
qx = 45,44 cos11 = 44,60 kg/m
qy = 45,44 sin 11 = 8,67 kg/m
Mx = 1/8 (qx) . lx^2 = 200,70 kg.m

untuk arah y, dipasang 2 bh penggantung gording, sehingga bentang gording
ly = 2,00 m'
My = 1/8 (qy) . ly^2 = 4,33 kg.m

akibat beban hidup :

Mx = 1/4 (100 cos α) lx = 147,24 kg.m
My = 1/4 (100 sin α) ly = 9,54 kg.m

Mx total =	200,70	+	147,24	=	347,95	kg.m
My total =	4,33	+	9,54	=	13,88	kg.m

Cek Tegangan

$$\sigma = \frac{Mx}{Wx} + \frac{My}{Wy}$$

$$= \frac{34794,51174}{29} + \frac{1387,5153}{8,02}$$

$$= 1.199,81 + 173,01$$

$$= 1.372,82 < 1,600 \text{ -----> OK}$$

Cek Lendutan

$$\delta x = \frac{5 \; qx \; l^4}{384 \; Elx} + \frac{1 \; Px \; l^3}{48 \; Elx}$$

$$= \frac{289.009.497.398,04}{145.958.400.000,00} + \frac{21.203.147.162,47}{18.244.800.000,00}$$

$$= 1,9801 + 1,1621$$

$$= 3,1422 \text{ cm}$$

$$\delta y = \frac{5 \; qy \; l^4}{384 \; Ely} + \frac{1 \; Py \; l^3}{48 \; Ely}$$

$$= \frac{693.552.536,39}{21.450.240.000,00} + \frac{152.647.196,30}{2.681.280.000,00}$$

$$= 0,0323 + 0,0569$$

$$= 0,0893 \text{ cm}$$

$$\delta = \sqrt{\delta x + \delta y}$$

$$= \sqrt{(3,1422 + 0,0893)}$$

$$= 1,798 \text{ cm}$$

$$\overline{\delta} = 1/250 \; (600) = 2,4 \text{ cm}$$

$$\delta_{total} < \overline{\delta} \text{ ------> OK}$$