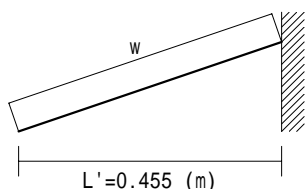


5 - 3 垂木の設計

軒先 小屋 X4Y10 ~ X2Y10
45.0 (mm) × 45.0 (mm) @ 360.0 (mm) 米松



A=2025 (mm²) Z=15188 (mm³) I=341719 (mm⁴)
屋根勾配 4.50 寸 (24.23 度) cos =0.91
Fb=28.20 (N/mm²) Fs=2.40 (N/mm²) E=9.800 × 10³ (N/mm²)
Fsys=1.15 L=L'/cos =0.500 (m)
Wg=300 (N/m²)
q=837 (N/m²) Cpe=0.50 Kz=0.968
Ww=q × (Cpe+0.8Kz)=1067 (N/m²)

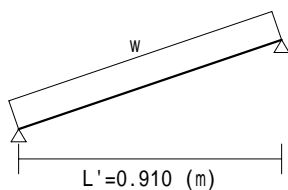
[長期]

$w=(Wg \times \cos) \times 0.360=98.3$ (N/m)
 $M=1/2 \times (w \times L^2)=12.29$ (N·m)
 $Q=w \times L=49.2$ (N)
 $fb=1.1 \times Fb/3 \times Fsys=11.89$ (N/mm²)
 $fs=1.1 \times Fs/3=0.88$ (N/mm²)
 $/fb=(M/Z)/fb=0.81/11.89=0.07$ 1.0 ----- OK
 $/fs=(1.5 \times Q/A)/fs=0.04/0.88=0.05$ 1.0 ----- OK
 $=1/8 \times (w \times L^4)/(E \times I) \times 2.0=0.459$ L/200=2.500 (mm) ----- OK

[短期風圧時]

$w=(Wg \times \cos - Ww) \times 0.360=-285.8$ (N/m)
 $M=1/2 \times (w \times L^2)=35.73$ (N·m)
 $Q=w \times L=142.9$ (N)
 $fb=2 \times Fb/3 \times Fsys=21.62$ (N/mm²)
 $fs=2 \times Fs/3=1.60$ (N/mm²)
 $/fb=(M/Z)/fb=2.35/21.62=0.11$ 1.0 ----- OK
 $/fs=(1.5 \times Q/A)/fs=0.11/1.60=0.07$ 1.0 ----- OK

一般 小屋 X4Y10 ~ X2Y10
45.0 (mm) × 45.0 (mm) @ 360.0 (mm) 米松



A=2025 (mm²) Z=15188 (mm³) I=341719 (mm⁴)
屋根勾配 4.50 寸 (24.23 度) cos =0.91
Fb=28.20 (N/mm²) Fs=2.40 (N/mm²) E=9.800 × 10³ (N/mm²)
Fsys=1.15 L=L'/cos =1.000 (m)
Wg=800 (N/m²)

[長期]

$w=(Wg \times \cos) \times 0.360=262.1$ (N/m)
 $M=1/8 \times (w \times L^2)=32.76$ (N·m)
 $Q=1/2 \times (w \times L)=131.1$ (N)
 $fb=1.1 \times Fb/3 \times Fsys=11.89$ (N/mm²)
 $fs=1.1 \times Fs/3=0.88$ (N/mm²)
 $/fb=(M/Z)/fb=2.16/11.89=0.18$ 1.0 ----- OK
 $/fs=(1.5 \times Q/A)/fs=0.10/0.88=0.11$ 1.0 ----- OK
 $=5/384 \times (w \times L^4)/(E \times I) \times 2.0=2.039$ L/200=5.000 (mm) ----- OK