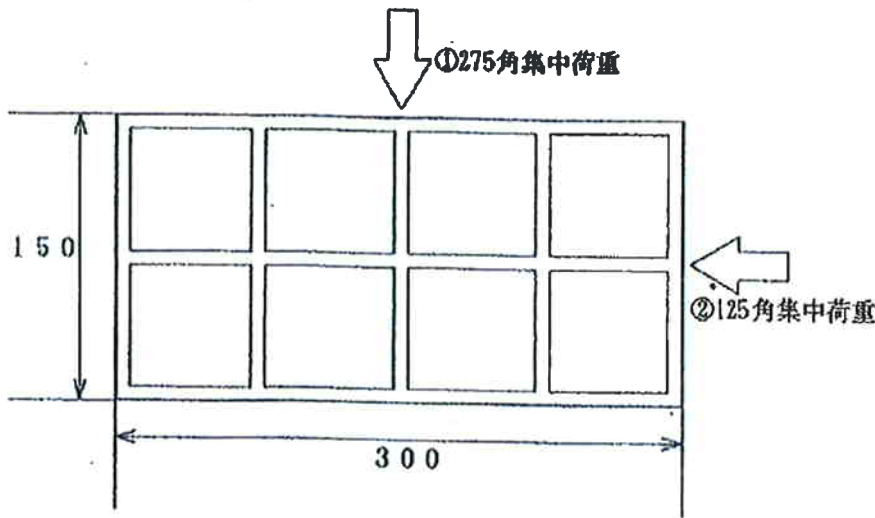


{ALSLeeper}  
{アル スリーパー}

強度計算書

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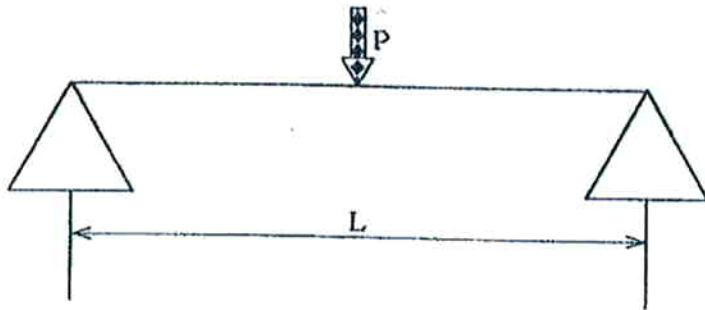


t 5

A6N01S-T5

耐力  $F = 2100 \text{ kgw/cm}^2$

☆ 単純指示梁として使用の場合



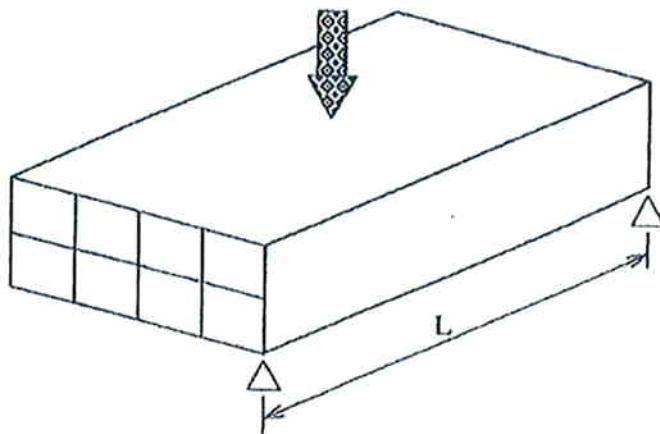
$$M = \frac{1}{4} P L$$

$$\sigma = \frac{M}{Z} \quad \sigma = F \text{ とすると}$$

$$F = \frac{1}{4Z} P_{\text{max}} L$$

$$P_{\text{max}} = \frac{4 F Z}{L}$$

① 横にして使用の場合 (弱軸側)



$$L = 1^{\text{m}} \quad P_{\text{MAX}} = \frac{4 \times 2100 \times 286.5}{100} = 24066 \text{ (kg)}$$

$$L = 2^{\text{m}} \quad P_{\text{MAX}} = \frac{4 \times 2100 \times 286.5}{200} = 12033 \text{ (kg)}$$

$$L = 3^{\text{m}} \quad P_{\text{MAX}} = \frac{4 \times 2100 \times 286.5}{300} = 8022 \text{ (kg)}$$

$$L = 4^{\text{m}} \quad P_{\text{MAX}} = \frac{4 \times 2100 \times 286.5}{400} = 6017 \text{ (kg)}$$

$$L = 5^{\text{m}} \quad P_{\text{MAX}} = \frac{4 \times 2100 \times 286.5}{500} = 4813 \text{ (kg)}$$

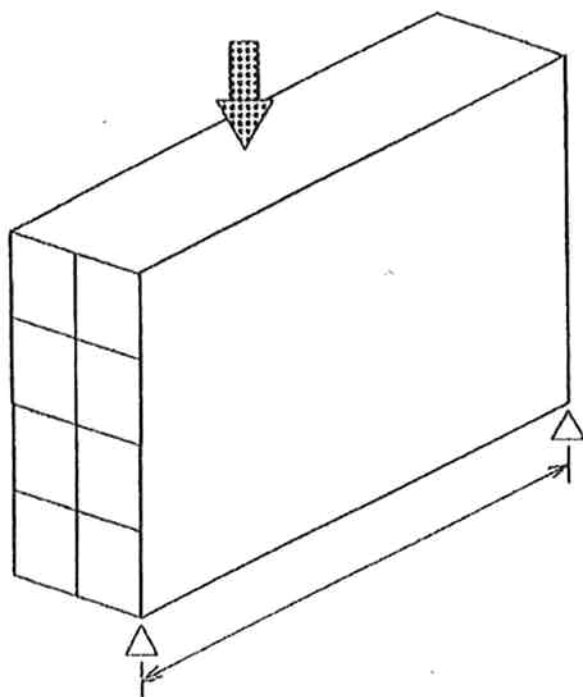
$$L = 6^{\text{m}} \quad P_{\text{MAX}} = \frac{4 \times 2100 \times 286.5}{600} = 4011 \text{ (kg)}$$

$$I = 2149 \text{ cm}^4 \quad Z = 286.5 \text{ cm}^3$$

安全率を5とすると

スパン(M)	1	2	3	4	5	6
許容荷重(kg)	4800	2400	1600	1200	900	800

② 縦にして使用の場合(強軸側)



$$L=1^m \quad P_{MAX} = \frac{4 \times 2100 \times 469.8}{100} = 39463 \text{ (kg)}$$

$$L=2^m \quad P_{MAX} = \frac{4 \times 2100 \times 469.8}{200} = 19731 \text{ (kg)}$$

$$L=3^m \quad P_{MAX} = \frac{4 \times 2100 \times 469.8}{300} = 13154 \text{ (kg)}$$

$$L=4^m \quad P_{MAX} = \frac{4 \times 2100 \times 469.8}{400} = 9865 \text{ (kg)}$$

$$L=5^m \quad P_{MAX} = \frac{4 \times 2100 \times 469.8}{500} = 7892 \text{ (kg)}$$

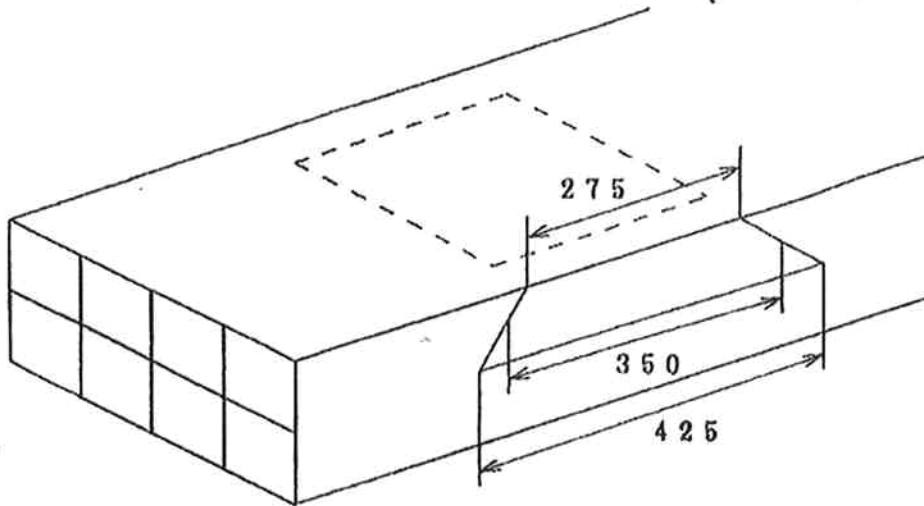
$$L=6^m \quad P_{MAX} = \frac{4 \times 2100 \times 469.8}{600} = 6577 \text{ (kg)}$$

$$I = 7047 \text{ cm}^4 \quad Z = 469.8 \text{ cm}^3$$

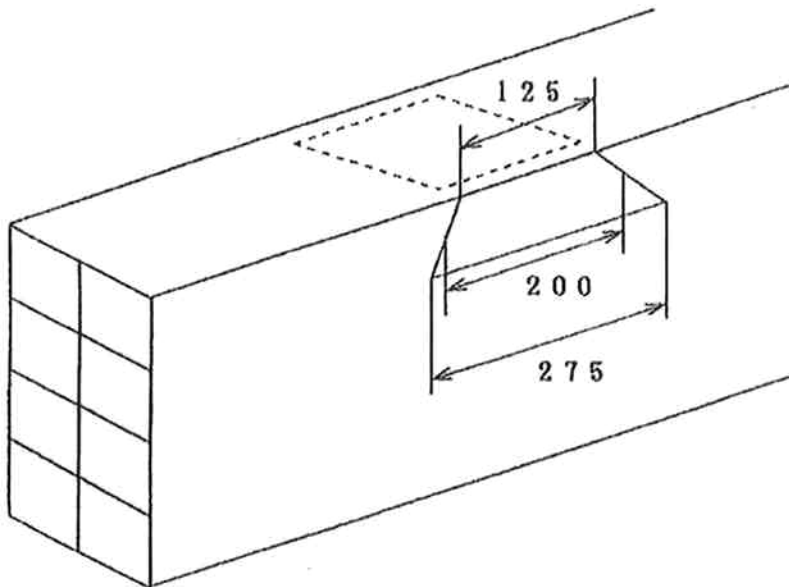
安全率を5とすると

スパン(M)	1	2	3	4	5	6
許容荷重(kg)	7800	3900	2600	1900	1500	1300

耐荷重  
①



②



角度計算

①

断面二次モーメント  $I = \frac{1}{12} (35 \times 0.5^3) = 0.365 \text{ cm}^4$

断面積  $A = 35 \times 0.5 = 17.5 \text{ cm}^2$

断面二次半径  $i = \sqrt{\frac{I}{A}} = \sqrt{\frac{0.365}{17.5}} = 0.144 \text{ cm}$

細長比  $\lambda = \frac{lc}{i} = \frac{7.5}{0.144} = 52$

$20 < \lambda \leq \Lambda$   $\langle A6061SS-T6 : \Lambda = 80 \rangle$   $\alpha = 0.5$

$\nu = 1.5 (0.9 + 0.6 \frac{\lambda}{\Lambda}) = 1.5 (0.9 + 0.6 \times \frac{52}{80}) = 1.935$

$F = 2250 \text{ kg/cm}^2$

$f_c = \frac{\left\{ 1 - \alpha \left( \frac{\lambda}{\Lambda} \right)^2 \right\}}{\nu} F = \frac{\left\{ 1 - 0.5 \left( \frac{52}{80} \right)^2 \right\}}{1.935} \times 2250 = 917 \text{ kg/cm}^2$

$P = 5 \times 35 \times 0.5 \times 917 = 80238 \text{ (kg)} = 80.2 \text{ (TON)}$

②

断面二次モーメント  $I = \frac{1}{12} (20 \times 0.5^3) = 0.208 \text{ cm}^4$

断面積  $A = 20 \times 0.5 = 10 \text{ cm}^2$

断面二次半径  $i = \sqrt{\frac{I}{A}} = \sqrt{\frac{0.208}{10}} = 0.144$

細長比  $\lambda = \frac{lc}{i} = \frac{7.5}{0.144} = 52$

$20 < \lambda \leq \Lambda$   $\langle A6061SS-T6 : \Lambda = 80 \rangle$   $\alpha = 0.5$

$\nu = 1.5 (0.9 + 0.6 \frac{\lambda}{\Lambda}) = 1.5 (0.9 + 0.6 \times \frac{52}{80}) = 1.935$

$F = 2250 \text{ kg/cm}^2$

$f_c = \frac{\left\{ 1 - \alpha \left( \frac{\lambda}{\Lambda} \right)^2 \right\}}{\nu} F = \frac{\left\{ 1 - 0.5 \left( \frac{52}{80} \right)^2 \right\}}{1.935} \times 2250 = 917 \text{ kg/cm}^2$

$P = 3 \times 20 \times 0.5 \times 917 = 27510 \text{ (kg)} = 27.5 \text{ (TON)}$