

2階建て枠組壁工法住宅構造計算書

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物件名 : 邸新築工事
建設場所 :
建築主 :
建築士資格 : 一級建築士 大臣登録第263508号
構造設計者氏名 : 村越 恒一
建築士事務所 : (株)PANGZI TRUST 一級建築士事務所
郵便番号 :
所在地 :
電話番号 :

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1. 一般事項

1.1. 建物概要

用途	2階	居室
	1階	居室
規模	2階建て	
構造	木造	
屋根形状	切妻	
勾配X	5.50 / 10	
勾配Y	0.00 / 10	
軒出X	0.300 (m)	
軒出Y	0.400 (m)	
軒高	5.827 (m)	
最高高さ	7.791 (m)	
階高	2階	2.462 (m)
	1階	2.750 (m)
1階床高さ	0.615 (m)	
土台天端高さ	0.510 (m)	
基礎天端高さ	0.400 (m)	
床面積	2階	34.99 (m ²)
	1階	32.71 (m ²)
仕上げ	屋根	: 彩色スレート葺き
	外壁2階	: モルタル塗
	外壁1階	: モルタル塗
建設地	一般地域	
地盤種別	2種 (1.0)	
支持力	20.0 (kN/m ²)	
地業	べた基礎	
根入れ	0.130 (m)	

1.2. 設計方針

床は剛な面構造である。

参考図書

1. 建築基準法・同施行令・告示等
2. 建築基礎構造設計指針
3. 木質構造設計規準・同解説
4. 2007年 枠組壁工法建築物設計の手引
5. 2007年 枠組壁工法建築物構造計算指針
6. 小規模建築物基礎設計の手引き

1.3. 使用材料および許容応力度

(1) 木材

土台	Hem-Fir	2級	404 他
1~2階縦枠材	S-P-F	2級	204 他
上・下枠材	S-P-F	2級	204 他
まぐさ	S-P-F	2級	206、210 他
	SPF集成材	E120-F330 対称異等級構成	406以上
まぐさ受け	S-P-F	2級	204 他
根太	S-P-F	2級	210 他
床梁	SPF集成材	E120-F330 対称異等級構成	410以上
垂木	S-P-F	2級	206 他
屋根梁	S-P-F	2級	210 他

(2) 鉄筋, コンクリート

鉄筋	SD295A
コンクリート	$F_c=21\text{N/mm}^2$

(3) 引き寄せ金物

C金物

※仮定外力により計算する。

引き抜き金物の耐力は、安全を考慮し、短期許容耐力の0.9倍とする。

(4) 耐力壁の仕様

外壁	5.0倍 : nobopan STP II 79mm(4.7 大臣認定 TBFC-0038) +石膏ボード (GB-R) 712.5mm(1.0通則認定)
	又は、5.0倍 : 両面 nobopan STP II 79mm(3.0 大臣認定 TBFC-0037)
	4.0倍 : nobopan STP II 79mm(3.0 大臣認定 TBFC-0037) +石膏ボード (GB-R) 712.5mm(1.0通則認定)
	3.0倍 : 片面nobopan STP II 79mm(3.0 大臣認定 TBFC-0037)
内壁	4.0倍 : nobopan STP II 79mm(3.0 大臣認定 TBFC-0037) +石膏ボード (GB-R) 712.5mm(1.0通則認定)
	2.0倍 : 両面石膏ボード (GB-R) 712.5mm (1.0通則認定)
	1.0倍 : 片面石膏ボード (GB-R) 712.5mm (1.0通則認定)
	5.0倍 : 両面タイガーガラスロック 712.5mm ヒース:PS4032W/ソコム<マックス>(3.0 大臣認定 TBFC-0085)

許容応力度表

樹種	基準強度 F (N/mm ²)					ヤング係数 (N/mm ²) Eb
	圧縮 Fc	引張り Ft	曲げ Fb	せん断 Fs	めり込み Fcv	
D Fir-L 2級	19.20	15.00	21.60	2.40	9.00	10700
Hem-Fir 2級	18.60	12.60	20.40	2.10	6.00	9100
S-P-F 2級	17.40	11.40	21.60	1.80	6.00	9600
E120-F330	25.90	22.40	33.00	3.00	6.00	12000
LVL140E 特級	36.00	27.00	45.00	3.60	7.80	14000
LVL120E 特級	31.20	23.40	39.00	3.60	7.80	12000
米桐	19.20	14.70	25.20	2.10	6.00	8000

長期に生ずる力に対する許容応力度 (N/mm ²)				短期に生ずる力に対する許容応力度 (N/mm ²)			
圧縮	引張り	曲げ	せん断	圧縮	引張り	曲げ	せん断
$\frac{1.1F_c}{3}$	$\frac{1.1F_t}{3}$	$\frac{1.1F_b}{3}$	$\frac{1.1F_s}{3}$	$\frac{2F_c}{3}$	$\frac{2F_t}{3}$	$\frac{2F_b}{3}$	$\frac{2F_s}{3}$
3	3	3	3	3	3	3	3

積雪時においては、
 長期：上表数値に 1.3 を乗じて得た数値
 短期：上表数値に 0.8 を乗じて得た数値
 とする。

許容応力度表（鉄筋、コンクリート）（令91条、告示1450号）（令90条、告示2464号）（告示第1024 第15）

材料	長期 (N/mm ²)					短期 (N/mm ²)				
	圧縮 rfc fc	引張り ft	せん断 wft fs	付着 fa		圧縮 rfc fc	引張り ft	せん断 wft fs	付着 fa	
				曲げ材 上端筋	その他				曲げ材 上端筋	その他
SD295A SR235 コンクリート Fc=18	195 155 6	195 155 -	195 155 0.6	1.2 0.72 -	1.8 1.08 -	295 235 12	295 235 -	295 235 0.9	1.8 1.44 -	2.7 2.16 -
SD295A SR235 コンクリート Fc=21	195 155 7	195 155 -	195 155 0.7	1.4 0.84 -	2.1 1.26 -	295 235 14	295 235 -	295 235 1.05	2.1 1.68 -	3.15 2.52 -
SD295A SR235 コンクリート Fc=24	195 155 8	195 155 -	195 155 0.73	1.54 0.9 -	2.31 1.35 -	295 235 16	295 235 -	295 235 1.09	2.31 1.8 -	3.46 2.7 -
SD295A SR235 コンクリート Fc=27	195 155 9	195 155 -	195 155 0.76	1.62 0.9 -	2.43 1.35 -	295 235 18	295 235 -	295 235 1.14	2.43 1.8 -	3.64 2.7 -
SD295A SR235 コンクリート Fc=30	195 155 10	195 155 -	195 155 0.79	1.7 0.9 -	2.55 1.35 -	295 235 20	295 235 -	295 235 1.18	2.55 1.8 -	3.82 2.7 -

コンクリートの短期（せん断・付着）許容応力度は、長期の 1.5 倍

寸法効果係数（寸法形式 104, 203, 204, 404 以外の場合）

寸法形式	応力の種類			
	圧縮	引張り	曲げ	せん断
106 206 406	0.96	0.84	0.84	1.00
208 408	0.93	0.75	0.75	
210	0.91	0.68	0.68	
212	0.89	0.63	0.63	

使用金物表

名称	耐力 (kN)	終局倍率
TBL	6.180	1.0
TFH-S20	20.070	1.0
TFH-L29	29.920	1.0
TBH	11.220	1.0
TBIG-13	13.000	1.0

1.4. 仮定荷重

1.4.1. 固定荷重

屋根		彩色スレート葺 (下地)	240		
		野地板	80		
		たるき	80		
天井		計	400 (N/m ²)	水平見付け面積当たり	460 (N/m ²)
		仕上 (下地含む)	220		
		天井根太	80		
		計	300 (N/m ²)		
		計 (屋根+天井)	760 (N/m ²)		
2階床		仕上 (床板含む)	310		
		床根太	120		
		天井	270		
		計	700 (N/m ²)		
1階床		仕上 (床板含む)	320		
		床根太	80		
		計	400 (N/m ²)		
2階外壁		外部 (合板含む)	350		
		たて枠	100		
		内部	150		
		計	600 (N/m ²)		
1階外壁		外部 (合板含む)	350		
		たて枠	100		
		内部	150		
		計	600 (N/m ²)		
2階内壁		仕上両面	300		
		たて枠	100		
		計	400 (N/m ²)		
1階内壁		仕上両面	300		
		たて枠	100		
		計	400 (N/m ²)		
浴室					
		計	3000 (N/m ²)		
土間床		タイル	250		
		モルタル	400		
		計	650 (N/m ²)		
木質床 (ロフ)		仕上 (床板含む)	310		
		床根太	120		
		天井	270		
		計	700 (N/m ²)		
階段					
		計	300 (N/m ²)		

1.4.2. 設計荷重表 (N/m²)

	屋 根			2 階 床			1 階 床		
	固 定	積 載	合 計	固 定	積 載	合 計	固 定	積 載	合 計
床 用	760	0	760	700	1800	2500	400	1800	2200
まぐさ・たて枠用	760	0	760	700	1300	2000	400	1300	1700
浮上り・地震用	760	0	760	700	600	1300	400	600	1000
積 雪 用	760	520	1280	700	1300	2000	400	1300	1700

	浴室			土間床			木質床(ロフ)		
	固 定	積 載	合 計	固 定	積 載	合 計	固 定	積 載	合 計
床 用	3000	0	3000	650	1800	2450	700	1800	2500
まぐさ・たて枠用	3000	0	3000	650	1300	1950	700	1300	2000
浮上り・地震用	3000	0	3000	650	600	1250	700	600	1300
積 雪 用	3000	0	3000	650	1300	1950	700	1300	2000

	階段		
	固 定	積 載	合 計
床 用	300	1800	2100
まぐさ・たて枠用	300	1300	1600
浮上り・地震用	300	600	900
積 雪 用	300	1300	1600

1.4.3. 積雪荷重

垂直積雪量 : 30 (cm)
 単位荷重 : 20 (N/cm/m²)
 屋根勾配 β : 5.50 / 10

$$\text{屋根形状係数 } \mu b = \sqrt{\cos(1.5\beta)} = 0.854$$

短期 : $30 \times 20 \times \mu b \rightarrow 520$ (N/m²)
 長期 : 0 (N/m²)

1.4.4. 速度圧の計算

耐風等級 : 等級 1
 地表面粗度区分 : III
 Z_b : 5 (m)
 Z_G : 450 (m)
 α : 0.20
 基準風速 V_0 : 34 (m/s)
 建物最高高さ : 7.791 (m)
 建物軒高 : 5.827 (m)

$$\begin{aligned} \text{建物高さ } H &= (7.791 + 5.827) / 2 = 6.809 \text{ (m)} \\ G_f &= 2.500 \\ H' &= \max(H, Z_b) = 6.809 \text{ (m)} \\ E_r &= 1.7 \times [H' / Z_G]^\alpha = 0.735 \\ E &= E_r^2 \times G_f = 1.351 \\ \text{速度圧 } q &= 0.6 \times E \times V_0^2 \times 1.0 = 937 \text{ (N/m}^2\text{)} \end{aligned}$$

K_z の算出 (Z は当該階部分のGLからの高さ(m))

$H \leq Z_b$		1.0
$H > Z_b$	$Z \leq Z_b$	$(Z_b / H)^{2\alpha}$
	$Z > Z_b$	$(Z / H)^{2\alpha}$

	Z (m)	K_z
屋根	6.809	1.000
2階	4.596	0.884
1階	1.990	0.884

方向		風力係数 C_f	
X	屋根	0.688	$(0.2-0.0)/(30-10) \times (28.811-10) - (-0.5)$
	2階	1.107	$0.8K_z - (-0.4)$
	1階	1.107	$0.8K_z - (-0.4)$
Y	屋根	1.200	$0.8K_z - (-0.4)$
	2階	1.107	$0.8K_z - (-0.4)$
	1階	1.107	$0.8K_z - (-0.4)$

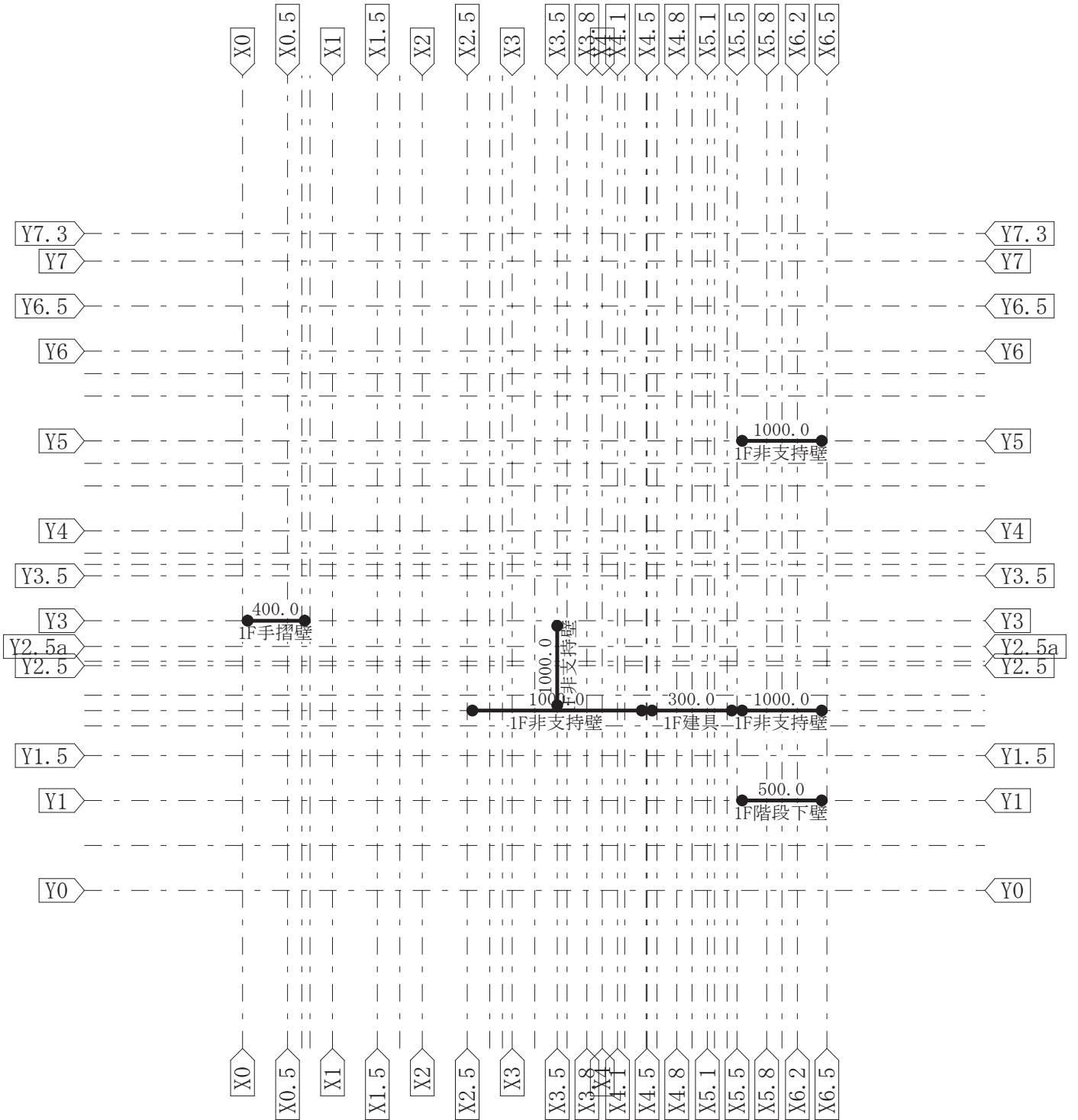
1.4.5. 地震力

耐震等級 : 等級 2
 建物高さ : $H = 6.809$ (m) (最高高さ と 軒高の平均)
 地震地域係数 : $Z = 1.00$
 せん断力係数 : $C_0 = 0.20 \times 1.25 = 0.25$
 振動特性係数 : $R_t = 1.00$
 一次固有周期 : $T = 0.03H = 0.03 \times 6.809 = 0.204$

凡例

線荷重 (N/m)
柱 長期追加荷重 (N)

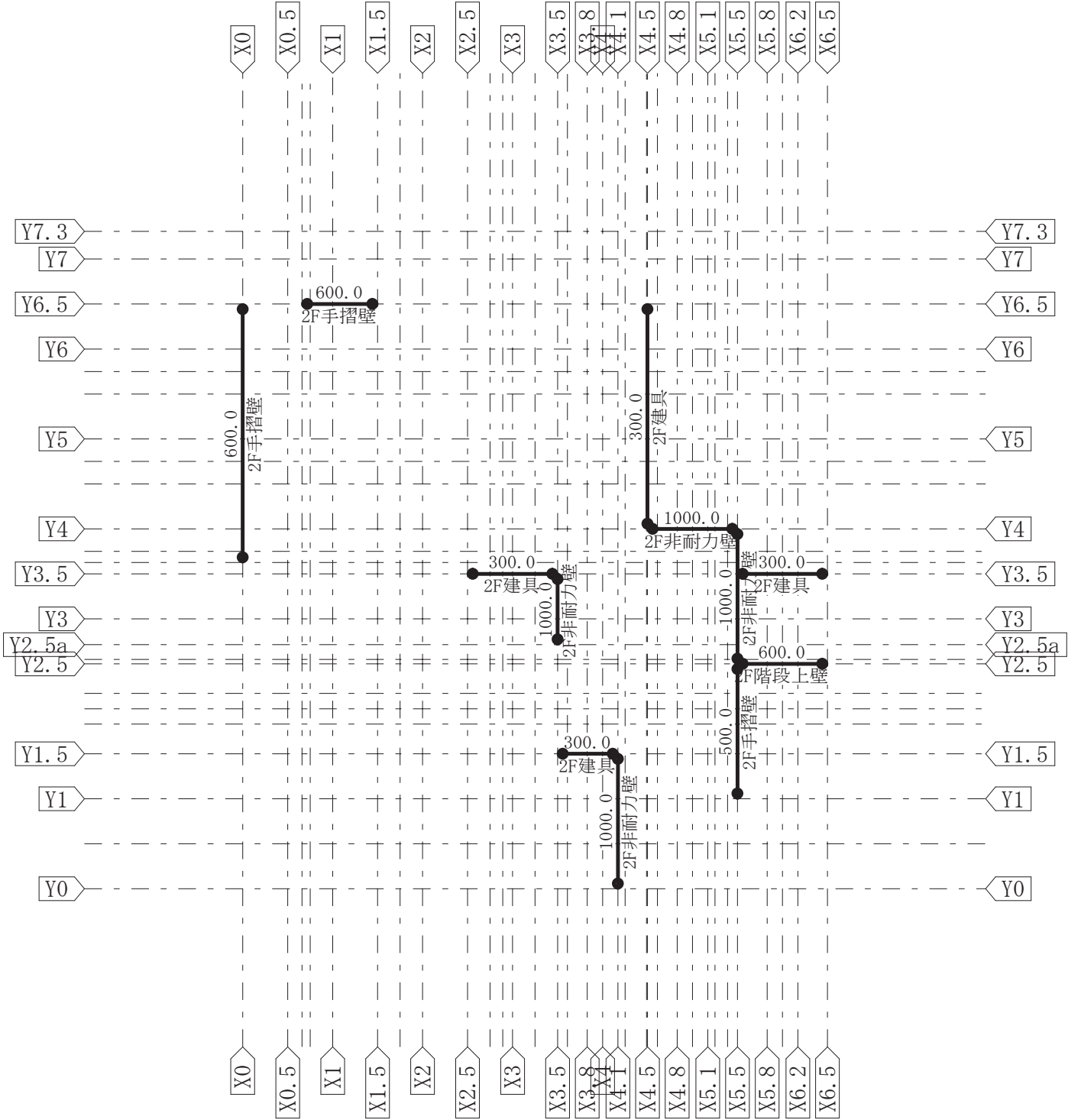
1.4.6. 荷重分布図



1階梁伏図

凡例

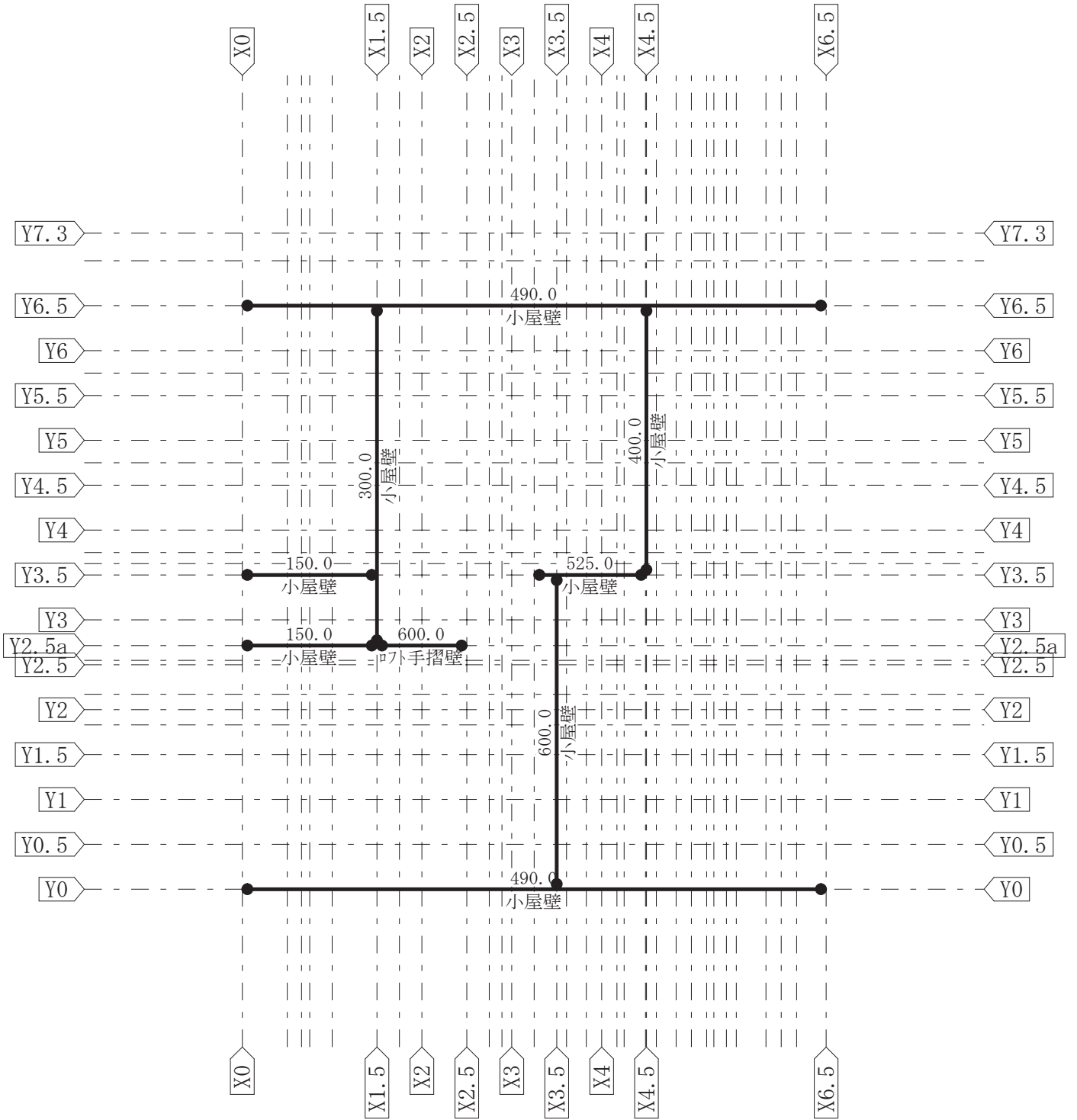
線荷重 (N/m)
 柱 長期追加荷重 (N)



2階梁伏図

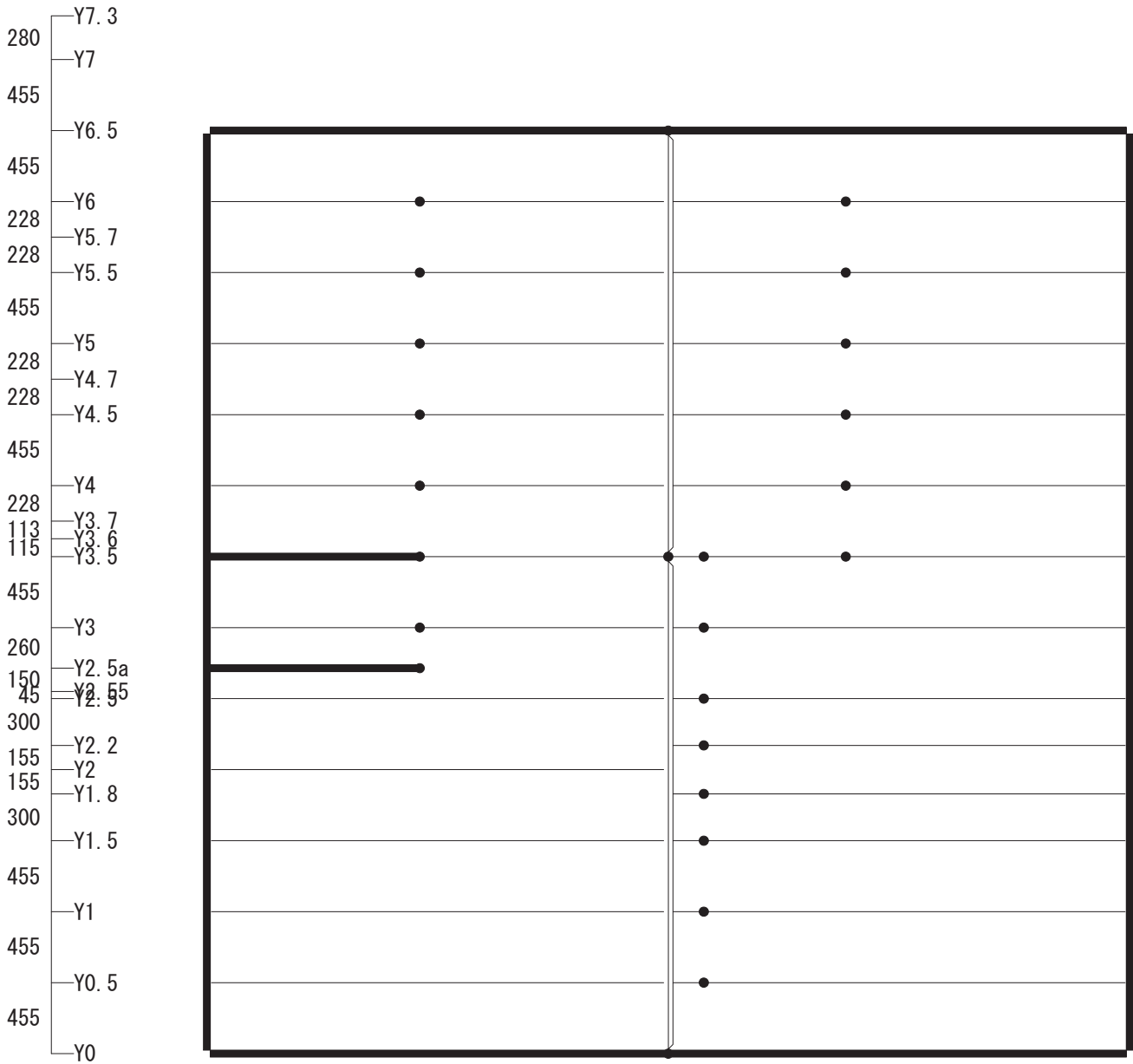
凡例

線荷重	(N/m)
柱	長期追加荷重 (N)

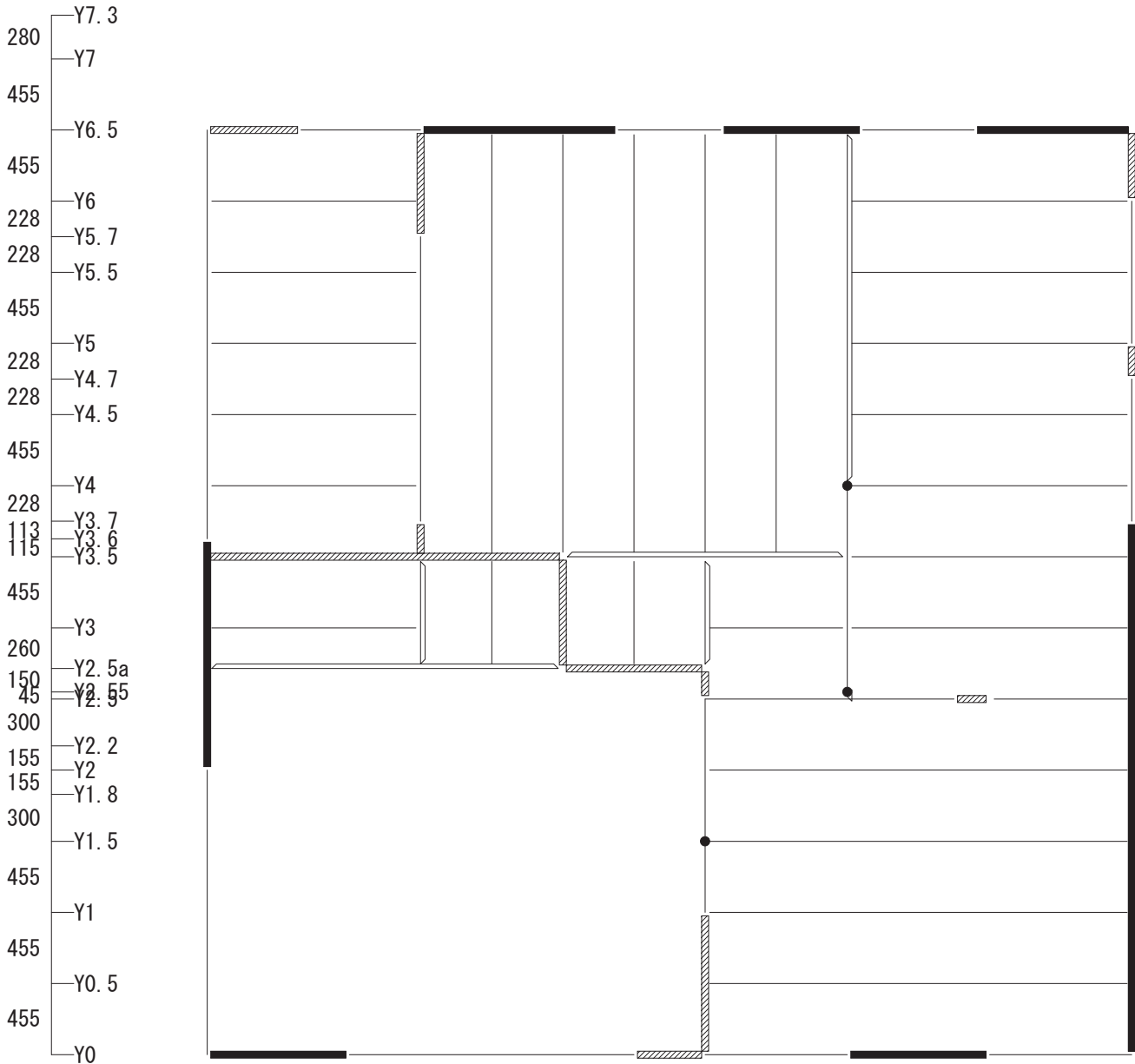


小屋伏図

1.5. 略伏図
2階小屋 略伏図

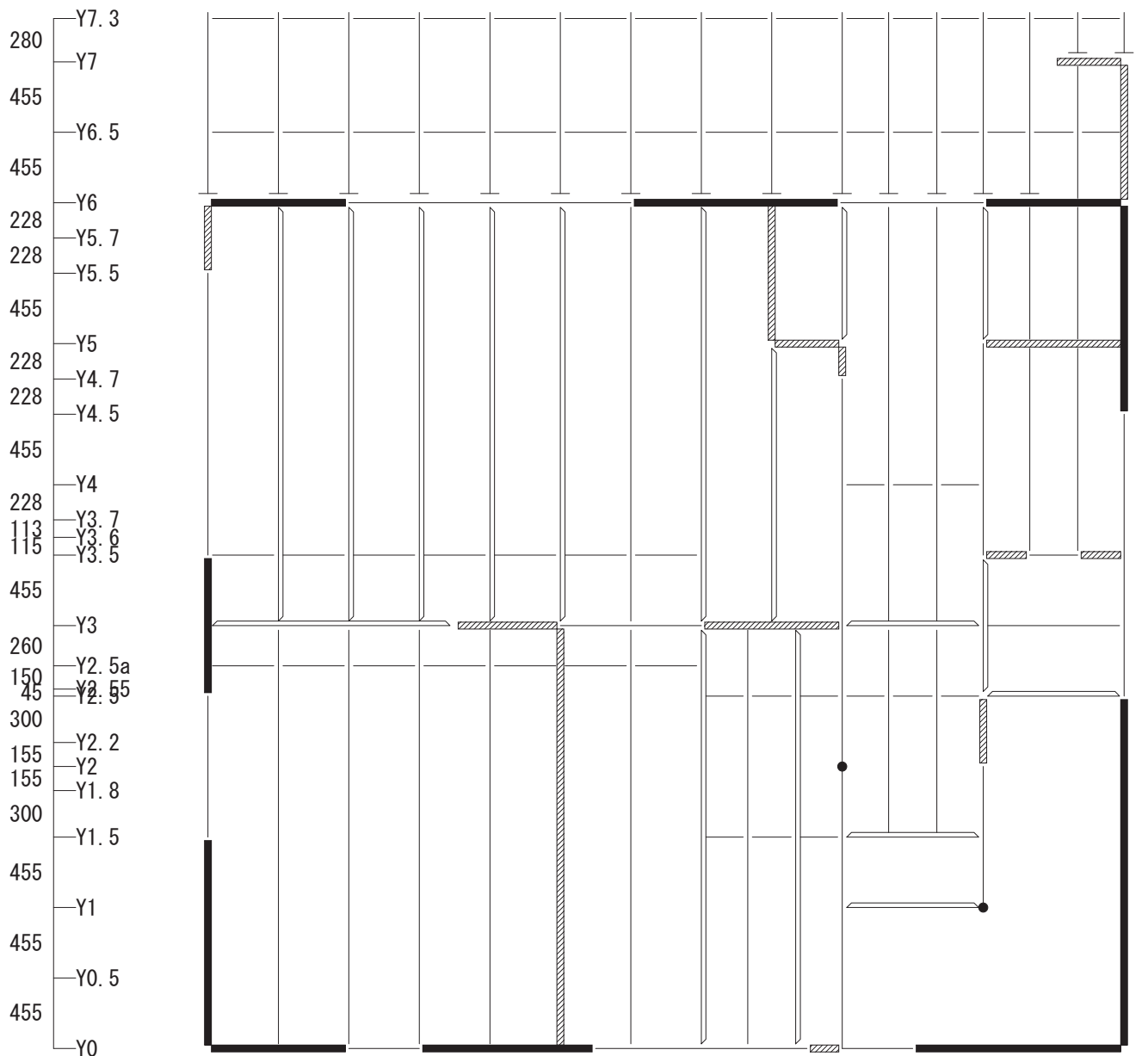


X0	X0.6	X1	X1.7	X2	X2.7	X3a	X3.5	X3.8	X4.1	X4.5	X4.8	X5.1	X5.5	X5.8	X6.2	X6.5
455	145	455	228	455	228	100	228	200	155	73	100	200	155	73	100	300



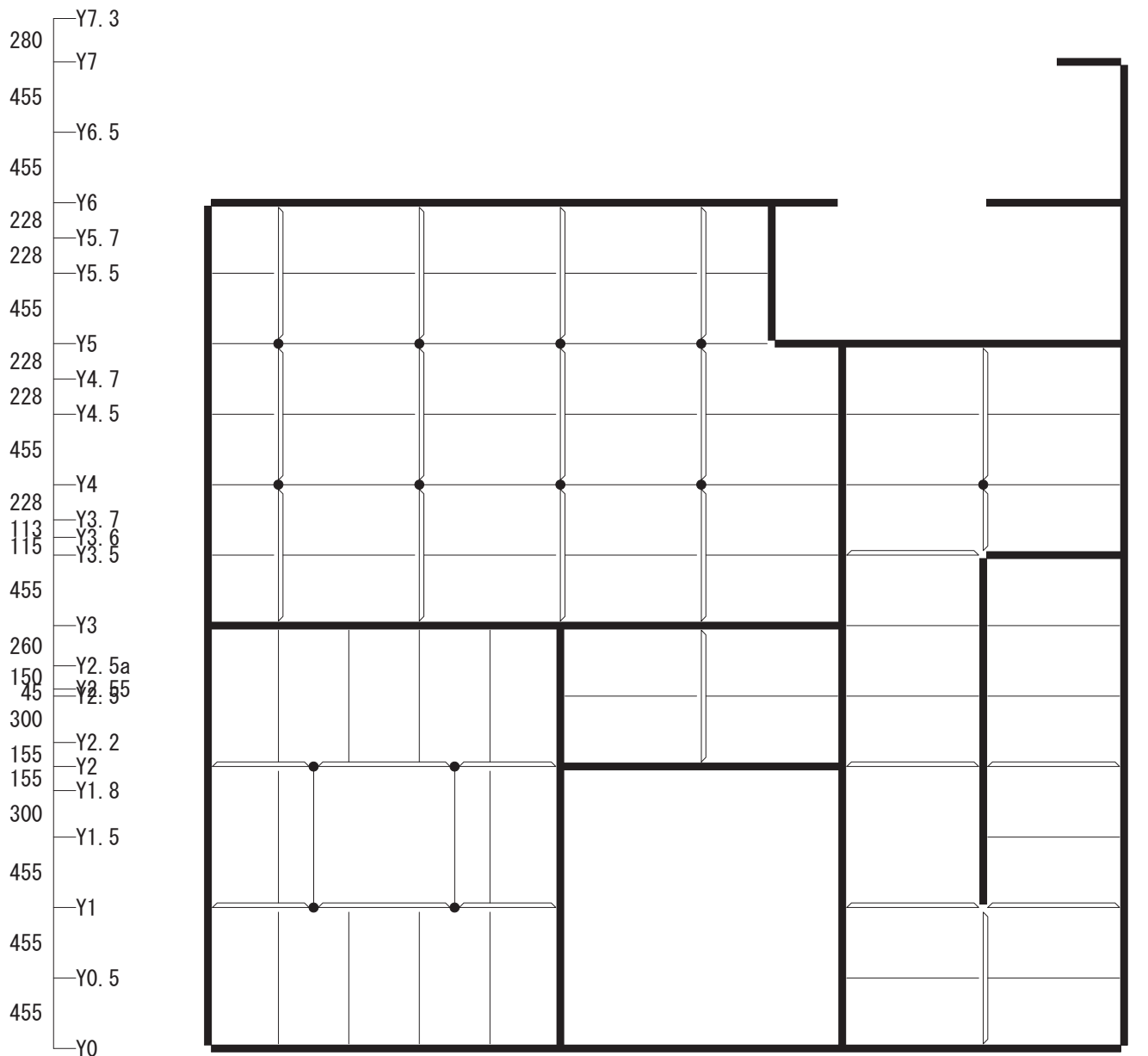
X0	X0.6	X1	X1.7	X2	X2.7	X3a	X3.5	X3.8	X4.1	X4.5	X4.8	X5.5	X5.8	X6.2	X6.5							
455	145	83	228	455	228	228	455	228	100	228	228	200	155	73	10	200	155	73	100	300	155	300

1階 (2階床) 略伏図



X0	X0.6	X1	X1.7	X2	X2.7	X3a	X3.5	X3.8	X4.1	X4.5	X4.8	X5.1	X5.5	X6.2	X6.5							
455	145	83	228	455	228	228	455	228	102	228	228	200	155	73	102	200	155	128	155	300	155	300

F階 (1階床) 略伏図



X0	X0.6	X1	X1.7	X2	X2.7	X3a	X3.5	X3.8	X4.1	X4.5	X4.8	X5.1	X5.4	X5.8	X6.2	X6.5						
455	145	83	228	455	228	228	455	228	102	228	228	200	155	73	10	200	155	73	100	300	155	300

2. 耐力壁の設計

2.1. 鉛直軸力の算出

長期・積雪時軸力
 ()内は積雪時軸力

符号	階	項目	単位荷重×長さ・面積	P0 (kN)	P (kN)
束 X1.5 Y2.5a	2R	屋根 屋根	0.760 (1.280) × 0.248 0.460 (0.980) × 0.089 Y2.5a 通り X2.5 X3.5 へ X0 通り Y2 Y3.6 へ X2.5 通り Y2.5aY3.5 へ	0.188 (0.317) 0.041 (0.087)	0.229 (0.404) 0.069 (0.121) 0.092 (0.162) 0.069 (0.121)
束 X1.5 Y3	2R	屋根 屋根	0.760 (1.280) × 0.285 0.460 (0.980) × 0.244 Y2.5a 通り X2.5 X3.5 へ Y3.5 通り X0 X2.5 へ X0 通り Y2 Y3.6 へ X2.5 通り Y2.5aY3.5 へ	0.216 (0.364) 0.112 (0.239)	0.329 (0.603) 0.063 (0.115) 0.119 (0.219) 0.084 (0.154) 0.063 (0.115)
束 X1.5 Y3.5	2R	屋根	0.760 (1.280) × 0.362 Y3.5 通り X0 X2.5 へ	0.275 (0.464)	0.275 (0.464) 0.275 (0.464)
束 X1.5 Y4	2R	屋根 屋根	0.760 (1.280) × 0.362 0.460 (0.980) × 0.311 X1.5 通り Y3.5 Y3.7 へ X1.5 通り Y5.7 Y6.5 へ	0.275 (0.464) 0.143 (0.304)	0.418 (0.768) 0.366 (0.672) 0.052 (0.096)
束 X1.5 Y4.5	2R	屋根 屋根	0.760 (1.280) × 0.362 0.460 (0.980) × 0.311 X1.5 通り Y3.5 Y3.7 へ X1.5 通り Y5.7 Y6.5 へ	0.275 (0.464) 0.143 (0.304)	0.418 (0.768) 0.261 (0.480) 0.157 (0.288)
束 X1.5 Y5	2R	屋根 屋根	0.760 (1.280) × 0.362 0.460 (0.980) × 0.311 X1.5 通り Y3.5 Y3.7 へ X1.5 通り Y5.7 Y6.5 へ	0.275 (0.464) 0.143 (0.304)	0.418 (0.768) 0.157 (0.288) 0.261 (0.480)
束 X1.5 Y5.5	2R	屋根 屋根	0.760 (1.280) × 0.362 0.460 (0.980) × 0.311 X1.5 通り Y3.5 Y3.7 へ X1.5 通り Y5.7 Y6.5 へ	0.275 (0.464) 0.143 (0.304)	0.418 (0.768) 0.052 (0.096) 0.366 (0.672)
束 X1.5 Y6	2R	屋根 屋根	0.760 (1.280) × 0.362 0.460 (0.980) × 0.311 X1.5 通り Y5.7 Y6.5 へ	0.275 (0.464) 0.143 (0.304)	0.418 (0.768) 0.418 (0.768)
束 X3a Y0	2R	屋根	0.760 (1.280) × 2.174 Y0 通り X3 X3.5 へ	1.652 (2.782)	1.652 (2.782) 1.652 (2.782)
束 X3a Y3.5	2R	屋根	0.760 (1.280) × 3.741 Y3.5 通り X0 X2.5 へ X2.5 通り Y2.5aY3.5 へ X4.5 Y2.55へ X4.5 Y4 へ	2.843 (4.789)	2.843 (4.789) 0.889 (1.496) 0.889 (1.496) 0.368 (0.619) 0.699 (1.177)
束 X3a Y6.5	2R	屋根 屋根	0.760 (1.280) × 1.627 0.460 (0.980) × 0.131 Y6.5 通り X1.5 X2.9 へ Y6.5 通り X3.6 X4.6 へ	1.237 (2.083) 0.060 (0.128)	1.297 (2.211) 0.648 (1.106) 0.648 (1.106)
束 X3.5 Y0.5	2R	屋根 屋根	0.760 (1.280) × 0.052 0.460 (0.980) × 0.621 X3.5 通り Y0 Y1 へ	0.039 (0.066) 0.286 (0.609)	0.325 (0.675) 0.325 (0.675)
束 X3.5 Y1	2R	屋根 屋根	0.760 (1.280) × 0.052 0.460 (0.980) × 0.621 X3.5 通り Y0 Y1 へ	0.039 (0.066) 0.286 (0.609)	0.325 (0.675) 0.325 (0.675)

符号	階	項目	単位荷重×長さ・面積	P0(kN)	P(kN)
束 X3.5 Y1.5	2R	屋根 屋根	0.760 (1.280) × 0.043 0.460 (0.980) × 0.515 X3.5 Y1.5 へ	0.033 (0.055) 0.237 (0.505)	0.270 (0.560) 0.270 (0.560)
束 X3.5 Y1.8	2R	屋根 屋根	0.760 (1.280) × 0.035 0.460 (0.980) × 0.416 X3.5 通リ Y2.5 Y2.5aへ X3.5 Y1.5 へ	0.026 (0.044) 0.192 (0.408)	0.218 (0.452) 0.072 (0.149) 0.146 (0.303)
束 X3.5 Y2.2	2R	屋根 屋根	0.760 (1.280) × 0.035 0.460 (0.980) × 0.416 X3.5 通リ Y2.5 Y2.5aへ X3.5 Y1.5 へ	0.026 (0.044) 0.192 (0.408)	0.218 (0.452) 0.146 (0.303) 0.072 (0.149)
束 X3.5 Y2.5	2R	屋根 屋根	0.760 (1.280) × 0.043 0.460 (0.980) × 0.515 X3.5 通リ Y2.5 Y2.5aへ	0.033 (0.055) 0.237 (0.505)	0.270 (0.560) 0.270 (0.560)
束 X3.5 Y3	2R	屋根 屋根	0.760 (1.280) × 0.052 0.460 (0.980) × 0.621 Y2.5a 通リ X2.5 X3.5 へ Y3.5 通リ X0 X2.5 へ X2.5 通リ Y2.5aY3.5 へ X3.5 通リ Y2.5 Y2.5aへ X4.5 Y2.55へ X4.5 Y4 へ	0.039 (0.066) 0.286 (0.609)	0.325 (0.675) 0.103 (0.215) 0.030 (0.061) 0.030 (0.061) 0.103 (0.215) 0.020 (0.042) 0.039 (0.080)
束 X3.5 Y3.5	2R	屋根 屋根	0.760 (1.280) × 0.155 0.460 (0.980) × 0.104 Y3.5 通リ X0 X2.5 へ X2.5 通リ Y2.5aY3.5 へ X4.5 Y2.55へ X4.5 Y4 へ	0.118 (0.199) 0.048 (0.101)	0.166 (0.300) 0.041 (0.075) 0.041 (0.075) 0.029 (0.052) 0.054 (0.098)
束 X4.5 Y3.5	2R	屋根 屋根	0.760 (1.280) × 0.104 0.460 (0.980) × 0.518 X4.5 Y2.55へ X4.5 Y4 へ	0.079 (0.132) 0.238 (0.507)	0.317 (0.640) 0.109 (0.221) 0.208 (0.419)
束 X4.5 Y4	2R	屋根 屋根	0.760 (1.280) × 0.259 0.460 (0.980) × 0.414 X4.5 Y4 へ	0.197 (0.331) 0.190 (0.406)	0.387 (0.737) 0.387 (0.737)
束 X4.5 Y4.5	2R	屋根 屋根	0.760 (1.280) × 0.259 0.460 (0.980) × 0.414 Y6.5 通リ X3.6 X4.6 へ X4.5 Y4 へ	0.197 (0.331) 0.190 (0.406)	0.387 (0.737) 0.077 (0.147) 0.310 (0.590)
束 X4.5 Y5	2R	屋根 屋根	0.760 (1.280) × 0.259 0.460 (0.980) × 0.414 Y6.5 通リ X3.6 X4.6 へ X4.5 Y4 へ	0.197 (0.331) 0.190 (0.406)	0.387 (0.737) 0.155 (0.295) 0.232 (0.442)
束 X4.5 Y5.5	2R	屋根 屋根	0.760 (1.280) × 0.259 0.460 (0.980) × 0.414 Y6.5 通リ X3.6 X4.6 へ X4.5 Y4 へ	0.197 (0.331) 0.190 (0.406)	0.387 (0.737) 0.232 (0.442) 0.155 (0.295)
束 X4.5 Y6	2R	屋根 屋根	0.760 (1.280) × 0.259 0.460 (0.980) × 0.414 Y6.5 通リ X3.6 X4.6 へ X4.5 Y4 へ	0.197 (0.331) 0.190 (0.406)	0.387 (0.737) 0.310 (0.590) 0.077 (0.147)

符号	階	項目	単位荷重×長さ・面積	P0(kN)	P(kN)
Y0 通り X0 X1	2	外壁上部 屋根 屋根 小屋壁 外壁下部	0.600 × 2.730 × 1.231 0.760 (1.280) × 1.423 0.460 (0.980) × 1.121 0.600 × 2.730 × 1.231 Y0 通り X0 X1 へ	2.016 1.082 (1.822) 0.516 (1.099) 0.892 2.016	 4.506 (5.829) 6.522 (7.845) 6.522 (7.845)
Y0 通り X3 X3.5	2	外壁上部 屋根 屋根 小屋壁 外壁下部	0.600 × 1.820 × 1.231 0.760 (1.280) × 0.311 0.460 (0.980) × 0.832 東 X3a Y0 より 0.600 × 1.820 × 1.231 Y0 通り X1.5 X2.7 へ Y0 通り X4.2 X4.5 へ	1.344 0.236 (0.397) 0.382 (0.815) 0.780 1.652 (2.782) 1.344	 4.395 (6.119) 5.739 (7.464) 3.826 (4.976) 1.913 (2.488)
Y0 通り X4.5 X5.5	2	外壁上部 屋根 天井 小屋壁 外壁下部	0.600 × 1.820 × 1.231 0.460 (0.980) × 1.142 0.300 × 0.414 0.600 × 1.820 × 1.231 Y0 通り X4.2 X4.5 へ Y0 通り X5 X6.5 へ	1.344 0.525 (1.119) 0.124 0.892 1.344	 2.886 (3.479) 4.230 (4.824) 1.057 (1.206) 3.172 (3.618)
Y2.5 通り X5.3 X5.5	2	内壁上部 内壁上部 天井 内壁下部	0.400 × 0.228 × 1.231 0.400 × 0.796 × 1.231 0.300 × 0.673 0.400 × 0.228 × 1.231 Y0 通り X4.2 X4.5 へ Y3 通り X3.5 X4.5 へ Y3.5 通り X5.5 X5.8 へ X5.5 通り Y2 Y2.5 へ X4.5 Y2 へ X5.5 Y1 へ	0.112 0.392 0.202 0.112	 0.706 (0.706) 0.818 (0.818) 0.009 (0.009) 0.068 (0.068) 0.069 (0.069) 0.612 (0.612) 0.026 (0.026) 0.035 (0.035)
Y2.5a通り X2.5 X3.5	2	内壁上部 木質床(ロフ 天井 叩手摺壁 小屋壁 内壁下部	0.400 × 0.910 × 1.231 2.000 (2.000) × 0.244 0.300 × 0.148 東東東 X1.5 Y2.5aより X1.5 Y3 より X3.5 Y3 より 0.400 × 0.910 × 1.231 Y0 通り X1.5 X2.7 へ Y0 通り X4.2 X4.5 へ Y3 通り X1.7 X2.5 へ Y3 通り X3.5 X4.5 へ X2.5 通り Y0 Y3 へ	0.448 0.488 (0.488) 0.044 0.218 0.170 0.069 (0.121) 0.063 (0.115) 0.103 (0.215) 0.448	 1.604 (1.820) 2.052 (2.268) 0.106 (0.117) 0.041 (0.045) 0.232 (0.257) 0.928 (1.026) 0.745 (0.824)
Y3.5 通り X0 X2.5	2	内壁上部 屋根 木質床(ロフ 天井 小屋壁 内壁下部	0.400 × 2.275 × 1.231 0.460 (0.980) × 0.621 2.000 (2.000) × 1.486 0.300 × 0.710 東東東東 X1.5 Y3 より X1.5 Y3.5 より X3a Y3.5 より X3.5 Y3 より X3.5 Y3.5 より 0.400 × 2.275 × 1.231 Y3 通り X1.7 X2.5 へ Y6 通り X0 X1 へ Y6 通り X3 X4.4 へ X0 通り Y2.5 Y3.5 へ X2.5 通り Y0 Y3 へ	1.120 0.286 (0.609) 2.972 (2.972) 0.213 0.459 0.119 (0.219) 0.275 (0.464) 0.889 (1.496) 0.030 (0.061) 0.041 (0.075) 1.120	 6.404 (7.689) 7.525 (8.809) 3.718 (4.352) 0.847 (0.991) 0.282 (0.330) 2.365 (2.769) 0.314 (0.367)

符号	階	項目	単位荷重×長さ・面積	P0(kN)	P(kN)
Y6.5 通り X0 X0.6	2	外壁上部 外壁上部 屋根 天井 小屋壁 外壁下部	0.600 × 0.600 × 1.231 0.600 × 1.690 × 0.821 0.460 (0.980) × 1.866 0.300 × 0.961 0.600 × 0.600 × 1.231	0.443 0.832 0.858 (1.829) 0.288 0.481 0.443	 2.903 (3.873) 3.346 (4.317) 2.712 (3.498) 0.634 (0.818)
Y6.5 通り X1.5 X2.9	2	外壁上部 外壁上部 屋根 屋根 木質床(口フ) 小屋壁 東 外壁下部	0.600 × 1.593 × 1.231 0.600 × 0.383 × 0.821 0.760 (1.280) × 0.325 0.460 (0.980) × 0.812 2.000 (2.000) × 1.863 X3a Y6.5 より 0.600 × 1.593 × 1.231	1.176 0.188 0.247 (0.416) 0.373 (0.795) 3.726 (3.726) 0.874 0.648 (1.106) 1.176	 7.234 (8.282) 8.410 (9.458) 3.385 (3.807) 5.025 (5.652)
Y6.5 通り X3.6 X4.6	2	外壁上部 屋根 屋根 木質床(口フ) 天井 小屋壁 東 東 東 東 東 外壁下部	0.600 × 1.593 × 1.231 0.760 (1.280) × 0.222 0.460 (0.980) × 0.675 2.000 (2.000) × 1.501 0.300 × 0.932 X3a Y6.5 より X4.5 Y4.5 より X4.5 Y5 より X4.5 Y5.5 より X4.5 Y6 より 0.600 × 1.593 × 1.231	1.176 0.168 (0.284) 0.311 (0.662) 3.002 (3.002) 0.279 1.235 0.648 (1.106) 0.077 (0.147) 0.155 (0.295) 0.232 (0.442) 0.310 (0.590) 1.176	 7.594 (9.218) 8.771 (10.394) 8.684 (10.291) 0.087 (0.103)
Y6.5 通り X5.4 X6.5	2	外壁上部 屋根 天井 小屋壁 外壁下部	0.600 × 1.365 × 1.231 0.460 (0.980) × 0.977 0.300 × 0.311 0.600 × 1.365 × 1.231	1.008 0.449 (0.957) 0.093 0.669 1.008	 2.219 (2.727) 3.228 (3.735) 0.017 (0.020) 2.244 (2.597) 0.487 (0.564) 0.479 (0.555)
X0 通り Y2 Y3.6	2	外壁上部 外壁上部 屋根 屋根 天井 口手摺壁 小屋壁 東 東 外壁下部	0.600 × 2.390 × 1.231 0.600 × 1.308 × 0.821 0.760 (1.280) × 2.229 0.460 (0.980) × 2.258 0.300 × 1.311 X1.5 Y2.5aより X1.5 Y3 より 0.600 × 2.390 × 1.231	1.765 0.644 1.694 (2.853) 1.038 (2.212) 0.393 0.109 0.186 0.092 (0.162) 0.084 (0.154) 1.765	 6.006 (8.479) 7.771 (10.244) 0.597 (0.787) 7.155 (9.432) 0.019 (0.025)

符号	階	項目	単位荷重×長さ・面積	P0(kN)	P(kN)
X1.5 通り Y3.5 Y3.7	2	内壁上部 木質床(ロフ 天井 小屋壁 東 東 東 東 東	0.400 × 1.138 × 1.231 2.000 (2.000) × 0.259 0.300 × 0.621 X1.5 Y4 より X1.5 Y4.5 より X1.5 Y5 より X1.5 Y5.5 より	0.560 0.518 (0.518) 0.186 0.341 0.366 (0.672) 0.261 (0.480) 0.157 (0.288) 0.052 (0.096)	2.442 (3.141)
		内壁下部	0.400 × 1.138 × 1.231 Y3 通り X1.7 X2.5 へ Y6 通り X0 X1 へ Y6 通り X3 X4.4 へ X0 通り Y2.5 Y3.5 へ	0.560	3.002 (3.701) 2.037 (2.512) 0.469 (0.578) 0.156 (0.193) 0.339 (0.419)
X1.5 通り Y5.7 Y6.5	2	内壁上部 木質床(ロフ 天井 小屋壁 東 東 東 東 東	0.400 × 1.593 × 1.231 2.000 (2.000) × 0.362 0.300 × 1.019 X1.5 Y4 より X1.5 Y4.5 より X1.5 Y5 より X1.5 Y5.5 より X1.5 Y6 より	0.784 0.725 (0.725) 0.306 0.571 0.052 (0.096) 0.157 (0.288) 0.261 (0.480) 0.366 (0.672) 0.418 (0.768)	3.640 (4.690)
		内壁下部	0.400 × 1.593 × 1.231 Y3 通り X1.7 X2.5 へ Y6 通り X0 X1 へ Y6 通り X3 X4.4 へ X0 通り Y2.5 Y3.5 へ	0.784	4.425 (5.474) 0.053 (0.065) 3.272 (4.049) 1.091 (1.350) 0.009 (0.011)
X2.5 通り Y2.5aY3.5	2	内壁上部 木質床(ロフ 天井 叩手摺壁 小屋壁 東 東 東 東 東	0.400 × 0.715 × 1.231 2.000 (2.000) × 1.745 0.300 × 0.081 X1.5 Y2.5aより X1.5 Y3 より X3a Y3.5 より X3.5 Y3 より X3.5 Y3.5 より	0.352 3.490 (3.490) 0.024 0.218 0.210 0.069 (0.121) 0.063 (0.115) 0.889 (1.496) 0.030 (0.061) 0.041 (0.075)	5.385 (6.164)
		内壁下部	0.400 × 0.715 × 1.231 Y3 通り X1.7 X2.5 へ Y6 通り X0 X1 へ Y6 通り X3 X4.4 へ X2.5 通り Y0 Y3 へ	0.352	5.738 (6.516) 1.673 (1.900) 0.076 (0.086) 0.228 (0.259) 3.760 (4.270)
X3.5 通り Y0 Y1	2	内壁上部 内壁上部 天井 小屋壁 東 東	0.400 × 0.910 × 1.231 0.400 × 0.228 × 0.821 0.300 × 1.346 X3.5 Y0.5 より X3.5 Y1 より	0.448 0.075 0.404 0.794 0.325 (0.675) 0.325 (0.675)	2.370 (3.070)
		内壁下部	0.400 × 0.910 × 1.231 Y0 通り X1.5 X2.7 へ Y0 通り X4.2 X4.5 へ Y3 通り X3.5 X4.5 へ	0.448	2.819 (3.518) 1.174 (1.466) 1.174 (1.466) 0.470 (0.586)
X3.5 通り Y2.5 Y2.5a	2	内壁上部 内壁上部 天井 小屋壁 東 東 東 東 東	0.400 × 0.195 × 1.231 0.400 × 1.251 × 1.231 0.300 × 0.673 X3.5 Y1.8 より X3.5 Y2.2 より X3.5 Y2.5 より X3.5 Y3 より	0.096 0.616 0.202 0.497 0.072 (0.149) 0.146 (0.303) 0.270 (0.560) 0.103 (0.215)	2.002 (2.638)
		内壁下部	0.400 × 0.195 × 1.231 Y0 通り X1.5 X2.7 へ Y0 通り X4.2 X4.5 へ Y3 通り X3.5 X4.5 へ	0.096	2.098 (2.734) 0.137 (0.179) 0.137 (0.179) 1.823 (2.376)

符号	階	項目	単位荷重×長さ・面積	P0(kN)	P(kN)
X6.5 通り Y0 Y3.7	2	外壁上部 屋根 天井 小屋壁 外壁下部	0.600 × 4.323 × 1.231 0.460 (0.980) × 6.120 0.300 × 4.037 0.600 × 4.323 × 1.231 Y3.5 通り X6.2 X6.5 へ X6.5 通り Y0 Y2.5 へ X6.5 通り Y4.5 Y6 へ	3.193 2.815 (5.998) 1.211 0.223 3.193	7.442 (10.625) 10.635 (13.817) 2.038 (2.648) 8.508 (11.054) 0.089 (0.115)
X6.5 通り Y4.7 Y5	2	外壁上部 屋根 天井 外壁下部	0.600 × 1.138 × 1.231 0.460 (0.980) × 1.376 0.300 × 1.035 0.600 × 1.138 × 1.231 X6.5 通り Y4.5 Y6 へ	0.840 0.633 (1.349) 0.311 0.840	1.784 (2.500) 2.624 (3.340) 2.624 (3.340)
X6.5 通り Y6 Y6.5	2	外壁上部 屋根 天井 外壁下部	0.600 × 0.910 × 1.231 0.460 (0.980) × 0.894 0.300 × 0.621 0.600 × 0.910 × 1.231 X6.5 通り Y6 Y7 へ	0.672 0.411 (0.876) 0.186 0.672	1.270 (1.735) 1.942 (2.407) 1.942 (2.407)
柱 X3.5 Y1.5	2	内壁上部 内壁上部 天井 小屋壁 東 東 東	0.400 × 0.455 × 1.231 0.400 × 0.228 × 0.821 0.300 × 0.932 X3.5 Y1.5 より X3.5 Y1.8 より X3.5 Y2.2 より Y0 通り X1.5 X2.7 へ Y0 通り X4.2 X4.5 へ Y3 通り X3.5 X4.5 へ	0.224 0.075 0.279 0.410 0.270 (0.560) 0.146 (0.303) 0.072 (0.149)	1.475 (2.000) 0.369 (0.500) 0.369 (0.500) 0.738 (1.000)
柱 X4.5 Y2.55	2	内壁上部 天井 小屋壁 東 東 東 東	0.400 × 0.660 × 1.231 0.300 × 0.721 X3a Y3.5 より X3.5 Y3 より X3.5 Y3.5 より X4.5 Y3.5 より Y3 通り X3.5 X4.5 へ X4.5 Y2 へ	0.325 0.216 0.210 0.368 (0.619) 0.020 (0.042) 0.029 (0.052) 0.109 (0.221)	1.277 (1.685) 0.575 (0.759) 0.702 (0.926)
柱 X4.5 Y4	2	内壁上部 木質床(口フ 天井 小屋壁 東 東 東 東 東 東 東 東	0.400 × 0.660 × 1.231 2.000 (2.000) × 1.294 0.300 × 1.822 X3a Y3.5 より X3.5 Y3 より X3.5 Y3.5 より X4.5 Y3.5 より X4.5 Y4 より X4.5 Y4.5 より X4.5 Y5 より X4.5 Y5.5 より X4.5 Y6 より Y3 通り X3.5 X4.5 へ X4.5 通り Y4.7 Y5 へ	0.325 2.588 (2.588) 0.547 0.945 0.699 (1.177) 0.039 (0.080) 0.054 (0.098) 0.208 (0.419) 0.387 (0.737) 0.310 (0.590) 0.232 (0.442) 0.155 (0.295) 0.077 (0.147)	6.565 (8.390) 3.751 (4.794) 2.814 (3.596)
Y0 通り X0 X1	1	外壁上部 床 Y0 通り 外壁下部	0.600 × 1.138 × 1.375 2.000 (2.000) × 1.242 X0 X1 より 0.600 × 1.138 × 1.375 Y0 通り X0 X6.5 へ	0.938 2.484 (2.484) 6.522 (7.845) 0.938	9.945 (11.268) 10.883 (12.206) 10.883 (12.206)

符号	階	項目	単位荷重×長さ・面積	P0(kN)	P(kN)
Y0 通り X1.5 X2.7	1	外壁上部 床 2F建具 2F非耐力壁 Y0 通り Y2.5a 通り X3.5 通り X3.5 通り 柱 外壁下部	0.600 × 2.048 × 1.375 2.000 (2.000) × 2.174 X3 X3.5 より X2.5 X3.5 より Y0 Y1 より Y2.5 Y2.5aより X3.5 Y1.5 より 0.600 × 2.048 × 1.375 Y0 通り X0 X6.5 へ	1.689 4.348 (4.348) 0.025 0.061 3.826 (4.976) 0.106 (0.117) 1.174 (1.466) 0.137 (0.179) 0.369 (0.500) 1.689	11.735 (13.360) 13.424 (15.050) 13.424 (15.050)
Y0 通り X4.2 X4.5	1	外壁上部 内壁上部 床 階段 2F建具 2F非耐力壁 Y0 通り Y0 通り Y2.5 通り Y2.5a 通り X3.5 通り X3.5 通り 柱 外壁下部	0.600 × 1.138 × 1.375 0.400 × 0.910 × 1.375 2.000 (2.000) × 1.174 1.600 (1.600) × 0.311 X3 X3.5 より X4.5 X5.5 より X5.3 X5.5 より X2.5 X3.5 より Y0 Y1 より Y2.5 Y2.5aより X3.5 Y1.5 より 0.600 × 1.138 × 1.375 Y0 通り X0 X6.5 へ	0.938 0.501 2.348 (2.348) 0.497 (0.497) 0.066 0.976 1.913 (2.488) 1.057 (1.206) 0.009 (0.009) 0.041 (0.045) 1.174 (1.466) 0.137 (0.179) 0.369 (0.500) 0.938	10.026 (11.218) 10.964 (12.156) 10.964 (12.156)
Y0 通り X5 X6.5	1	外壁上部 階段 Y0 通り 外壁下部	0.600 × 1.593 × 1.375 1.600 (1.600) × 0.932 X4.5 X5.5 より 0.600 × 1.593 × 1.375 Y0 通り X0 X6.5 へ	1.314 1.491 (1.491) 3.172 (3.618) 1.314	5.977 (6.422) 7.291 (7.736) 7.291 (7.736)
Y3 通り X1.7 X2.5	1	内壁上部 内壁上部 床 2F建具 Y2.5a 通り Y3.5 通り X1.5 通り X1.5 通り X2.5 通り 内壁下部	0.400 × 0.683 × 1.375 0.400 × 0.455 × 1.375 2.000 (2.000) × 4.037 X2.5 X3.5 より X0 X2.5 より Y3.5 Y3.7 より Y5.7 Y6.5 より Y2.5aY3.5 より 0.400 × 0.683 × 1.375 Y3 通り X0 X4.5 へ	0.375 0.250 8.074 (8.074) 0.057 0.232 (0.257) 3.718 (4.352) 2.037 (2.512) 0.053 (0.065) 1.673 (1.900) 0.375	16.469 (17.843) 16.844 (18.218) 16.844 (18.218)
Y3 通り X3.5 X4.5	1	内壁上部 内壁上部 内壁上部 床 2F建具 2F非耐力壁 Y2.5 通り Y2.5a 通り X3.5 通り X3.5 通り 柱 柱 柱 内壁下部	0.400 × 0.910 × 1.375 0.400 × 1.251 × 1.375 0.400 × 0.455 × 0.917 2.000 (2.000) × 4.066 X5.3 X5.5 より X2.5 X3.5 より Y0 Y1 より Y2.5 Y2.5aより X3.5 Y1.5 より X4.5 Y2.55より X4.5 Y4 より 0.400 × 0.910 × 1.375 Y3 通り X0 X4.5 へ	0.501 0.688 0.167 8.131 (8.131) 0.249 1.274 0.068 (0.068) 0.928 (1.026) 0.470 (0.586) 1.823 (2.376) 0.738 (1.000) 0.575 (0.759) 3.751 (4.794) 0.501	19.364 (21.620) 19.864 (22.121) 19.864 (22.121)

符号	階	項目	単位荷重×長さ・面積	P0(kN)	P(kN)
Y3.5 通り X5.5 X5.8	1	内壁上部 内壁上部 内壁上部 床 天井 2F建具 2F非耐力壁 Y2.5 通り 内壁下部	0.400 × 0.300 × 1.375 0.400 × 0.683 × 1.375 0.400 × 0.155 × 0.917 2.000 (2.000) × 0.897 0.300 × 0.207 X5.3 X5.5 より 0.400 × 0.300 × 1.375 Y3.5 通り X5.5 X6.5 へ	0.165 0.375 0.057 1.795 (1.795) 0.062 0.137 1.036 0.069 (0.069) 0.165	 3.696 (3.696) 3.861 (3.861) 3.861 (3.861)
Y3.5 通り X6.2 X6.5	1	外壁上部 内壁上部 内壁上部 床 天井 2F建具 X6.5 通り 外壁下部 内壁下部	0.600 × 0.910 × 1.375 0.400 × 0.300 × 1.375 0.400 × 0.155 × 0.917 2.000 (2.000) × 0.276 0.300 × 0.207 Y0 Y3.7 より 0.600 × 0.910 × 1.375 0.400 × 0.300 × 1.375 Y3.5 通り X5.5 X6.5 へ	0.751 0.165 0.057 0.553 (0.553) 0.062 0.137 2.038 (2.648) 0.751 0.165	 3.762 (4.372) 4.678 (5.288) 4.678 (5.288)
Y5 通り X4 X4.5	1	内壁上部 床 2F建具 内壁下部	0.400 × 0.455 × 1.375 2.000 (2.000) × 0.586 0.400 × 0.455 × 1.375 Y5 通り X4 X6.5 へ	0.250 1.172 (1.172) 0.068 0.250	 1.490 (1.490) 1.740 (1.740) 1.740 (1.740)
Y5 通り X5.5 X6.5	1	内壁上部 内壁上部 床 2F非耐力壁 内壁下部	0.400 × 0.910 × 1.375 0.400 × 0.683 × 1.375 2.000 (2.000) × 1.035 0.400 × 0.910 × 1.375 Y5 通り X4 X6.5 へ	0.501 0.375 2.070 (2.070) 0.126 0.501	 3.072 (3.072) 3.572 (3.572) 3.572 (3.572)
Y6 通り X0 X1	1	外壁上部 床 階段 屋根 2F手摺壁 2F建具 Y3.5 通り Y6.5 通り Y6.5 通り X1.5 通り X1.5 通り X2.5 通り 外壁下部	0.600 × 1.820 × 1.375 2.000 (2.000) × 2.174 1.600 (1.600) × 0.828 0.760 (1.280) × 2.406 X0 X2.5 より X0 X0.6 より X1.5 X2.9 より Y3.5 Y3.7 より Y5.7 Y6.5 より Y2.5aY3.5 より 0.600 × 1.820 × 1.375 Y6 通り X0 X4.4 へ	1.502 4.348 (4.348) 1.325 (1.325) 1.829 (3.080) 0.561 0.003 0.847 (0.991) 2.712 (3.498) 3.385 (3.807) 0.469 (0.578) 3.272 (4.049) 0.076 (0.086) 1.502	 20.328 (23.827) 21.829 (25.329) 21.829 (25.329)
Y6 通り X3 X4.4	1	外壁上部 床 階段 屋根 2F手摺壁 2F建具 2F非耐力壁 Y3.5 通り Y6.5 通り Y6.5 通り Y6.5 通り X1.5 通り X1.5 通り X2.5 通り 外壁下部	0.600 × 2.725 × 1.375 2.000 (2.000) × 2.755 1.600 (1.600) × 1.240 0.760 (1.280) × 3.093 X0 X2.5 より X1.5 X2.9 より X3.6 X4.6 より X5.4 X6.5 より Y3.5 Y3.7 より Y5.7 Y6.5 より Y2.5aY3.5 より 0.600 × 2.725 × 1.375 Y6 通り X0 X4.4 へ	2.248 5.510 (5.510) 1.984 (1.984) 2.351 (3.959) 0.034 0.313 0.138 0.282 (0.330) 5.025 (5.652) 8.684 (10.291) 0.017 (0.020) 0.156 (0.193) 1.091 (1.350) 0.228 (0.259) 2.248	 28.062 (32.281) 30.310 (34.529) 30.310 (34.529)

符号	階	項目	単位荷重×長さ・面積	P0(kN)	P(kN)
Y6 通り X5.5 X6.5	1	外壁上部 床 階段 屋根 2F建具 2F非耐力壁 Y6.5 通り Y6.5 通り 外壁下部	0.600 × 1.370 × 1.375 2.000 (2.000) × 0.837 1.600 (1.600) × 0.555 0.760 (1.280) × 1.010 X3.6 X4.6 より X5.4 X6.5 より 0.600 × 1.370 × 1.375 Y6 通り X5.5 X6.5 へ	1.130 1.674 (1.674) 0.888 (0.888) 0.768 (1.293) 0.003 0.103 0.087 (0.103) 2.244 (2.597)	6.896 (7.791) 8.027 (8.921) 8.027 (8.921)
Y7 通り X6 X6.5	1	外壁上部 屋根 Y6.5 通り 外壁下部	0.600 × 0.455 × 1.375 0.760 (1.280) × 0.681 X5.4 X6.5 より 0.600 × 0.455 × 1.375 Y7 通り X6 X6.5 へ	0.375 0.517 (0.871) 0.487 (0.564)	1.380 (1.811) 1.755 (2.186) 1.755 (2.186)
X0 通り Y0 Y1.5	1	外壁上部 床 X0 通り 外壁下部	0.600 × 1.820 × 1.375 2.000 (2.000) × 0.414 Y2 Y3.6 より 0.600 × 1.820 × 1.375 X0 通り Y0 Y6 へ	1.502 0.828 (0.828) 0.597 (0.787)	2.927 (3.117) 4.428 (4.618) 4.428 (4.618)
X0 通り Y2.5 Y3.5	1	外壁上部 床 2F手摺壁 Y3.5 通り X0 通り X1.5 通り X1.5 通り 外壁下部	0.600 × 2.275 × 1.375 2.000 (2.000) × 2.070 X0 X2.5 より Y2 Y3.6 より Y3.5 Y3.7 より Y5.7 Y6.5 より 0.600 × 2.275 × 1.375 X0 通り Y0 Y6 へ	1.877 4.141 (4.141) 0.479 2.365 (2.769) 7.155 (9.432) 0.339 (0.419) 0.009 (0.011)	16.364 (19.126) 18.241 (21.003) 18.241 (21.003)
X0 通り Y5.5 Y6	1	外壁上部 床 2F手摺壁 Y6.5 通り X0 通り 外壁下部	0.600 × 1.365 × 1.375 2.000 (2.000) × 0.311 X0 X0.6 より Y2 Y3.6 より 0.600 × 1.365 × 1.375 X0 通り Y0 Y6 へ	1.126 0.621 (0.621) 0.953 0.634 (0.818) 0.019 (0.025)	3.354 (3.544) 4.480 (4.670) 4.480 (4.670)
X2.5 通り Y0 Y3	1	内壁上部 床 2F建具 Y2.5a 通り Y3.5 通り X2.5 通り 内壁下部	0.400 × 2.730 × 1.375 2.000 (2.000) × 1.863 X2.5 X3.5 より X0 X2.5 より Y2.5aY3.5 より 0.400 × 2.730 × 1.375 X2.5 通り Y0 Y3 へ	1.502 3.726 (3.726) 0.057 0.745 (0.824) 0.314 (0.367) 3.760 (4.270)	10.103 (10.745) 11.605 (12.247) 11.605 (12.247)
X4 通り Y5 Y6	1	内壁上部 床 内壁下部	0.400 × 0.910 × 1.375 2.000 (2.000) × 0.414 0.400 × 0.910 × 1.375 X4 通り Y5 Y6 へ	0.501 0.828 (0.828)	1.329 (1.329) 1.829 (1.829) 1.829 (1.829)
X4.5 通り Y4.7 Y5	1	内壁上部 内壁上部 床 2F建具 2F非耐力壁 柱 内壁下部	0.400 × 0.228 × 1.375 0.400 × 0.796 × 1.375 2.000 (2.000) × 0.386 X4.5 Y4 より 0.400 × 0.228 × 1.375 X4.5 通り Y0 Y5 へ	0.125 0.438 0.773 (0.773) 0.297 0.086 2.814 (3.596)	4.533 (5.315) 4.658 (5.440) 4.658 (5.440)

符号	階	項目	単位荷重×長さ・面積	P0(kN)	P(kN)
X5.5 通り Y2 Y2.5	1	内壁上部 内壁上部 床 階段 天井 2F手摺壁 2F非耐力壁 2F階段上壁 Y2.5 通り 内壁下部	0.400 × 0.455 × 1.375 0.400 × 0.455 × 1.375 2.000 (2.000) × 0.621 1.600 (1.600) × 0.466 0.300 × 0.207 X5.3 X5.5 より 0.400 × 0.455 × 1.375 X5.5 通り Y1 Y3.5 へ	0.250 0.250 1.242 (1.242) 0.745 (0.745) 0.062 0.455 0.557 0.273 0.612 (0.612) 0.250	4.446 (4.446) 4.697 (4.697) 4.697 (4.697)
X6.5 通り Y0 Y2.5	1	外壁上部 階段 天井 2F階段上壁 X6.5 通り 外壁下部	0.600 × 2.730 × 1.375 1.600 (1.600) × 0.776 0.300 × 0.207 Y0 Y3.7 より 0.600 × 2.730 × 1.375 X6.5 通り Y0 Y7 へ	2.252 1.242 (1.242) 0.062 0.273 8.508 (11.054) 2.252	12.337 (14.883) 14.589 (17.135) 14.589 (17.135)
X6.5 通り Y4.5 Y6	1	外壁上部 床 X6.5 通り X6.5 通り 外壁下部	0.600 × 1.820 × 1.375 2.000 (2.000) × 0.273 Y0 Y3.7 より Y4.7 Y5 より 0.600 × 1.820 × 1.375 X6.5 通り Y0 Y7 へ	1.502 0.546 (0.546) 0.089 (0.115) 2.624 (3.340) 1.502	4.760 (5.502) 6.262 (7.004) 6.262 (7.004)
X6.5 通り Y6 Y7	1	外壁上部 階段 屋根 Y6.5 通り X6.5 通り 外壁下部	0.600 × 0.910 × 1.375 1.600 (1.600) × 0.068 0.760 (1.280) × 0.205 X5.4 X6.5 より Y6 Y6.5 より 0.600 × 0.910 × 1.375 X6.5 通り Y0 Y7 へ	0.751 0.109 (0.109) 0.156 (0.262) 0.479 (0.555) 1.942 (2.407) 0.751	3.437 (4.084) 4.188 (4.834) 4.188 (4.834)
柱 X4.5 Y2	1	内壁上部 内壁上部 床 Y2.5 通り 柱	0.400 × 0.910 × 1.375 0.400 × 0.455 × 0.917 2.000 (2.000) × 0.756 X5.3 X5.5 より X4.5 Y2.55より Y2 通り X2.5 X4.5 へ X4.5 通り Y0 Y5 へ	0.501 0.167 1.513 (1.513) 0.026 (0.026) 0.702 (0.926)	2.907 (3.131) 0.969 (1.044) 1.938 (2.088)
柱 X5.5 Y1	1	内壁上部 床 階段 2F手摺壁 Y2.5 通り	0.400 × 0.455 × 1.375 2.000 (2.000) × 0.207 1.600 (1.600) × 0.414 X5.3 X5.5 より X5.5 通り Y1 Y3.5 へ	0.250 0.414 (0.414) 0.662 (0.662) 0.228 0.035 (0.035)	1.589 (1.589) 1.589 (1.589)
Y0 通り X0 X6.5	F	床 浴室 Y0 通り Y0 通り Y0 通り Y0 通り	1.700 (1.700) × 1.449 3.000 (3.000) × 0.414 X0 X1 より X1.5 X2.7 より X4.2 X4.5 より X5 X6.5 より	2.464 (2.464) 1.242 (1.242) 10.883 (12.206) 13.424 (15.050) 10.964 (12.156) 7.291 (7.736)	46.268 (50.854)
Y2 通り X2.5 X4.5	F	床 浴室 1F非支持壁 柱	1.700 (1.700) × 0.621 3.000 (3.000) × 0.414 X4.5 Y2 より	1.056 (1.056) 1.242 (1.242) 2.275 0.969 (1.044)	5.542 (5.617)

符号	階	項目	単位荷重×長さ・面積	P0(kN)	P(kN)
Y3 通り X0 X4.5	F	床 1F非支持壁 1F手摺壁 Y3 通り Y3 通り	1.700 (1.700) × 3.157 X1.7 X2.5 より X3.5 X4.5 より	5.367 (5.367) 0.455 0.273 16.844 (18.218) 19.864 (22.121)	42.804 (46.434)
Y3.5 通り X5.5 X6.5	F	床 Y3.5 通り Y3.5 通り	1.700 (1.700) × 0.414 X5.5 X5.8 より X6.2 X6.5 より	0.704 (0.704) 3.861 (3.861) 4.678 (5.288)	9.243 (9.853)
Y5 通り X4 X6.5	F	床 土間床 1F非支持壁 Y5 通り Y5 通り	1.700 (1.700) × 0.725 1.950 (1.950) × 0.518 X4 X4.5 より X5.5 X6.5 より	1.232 (1.232) 1.009 (1.009) 0.910 1.740 (1.740) 3.572 (3.572)	8.464 (8.464)
Y6 通り X0 X4.4	F	床 土間床 Y6 通り Y6 通り	1.700 (1.700) × 1.553 1.950 (1.950) × 0.206 X0 X1 より X3 X4.4 より	2.640 (2.640) 0.401 (0.401) 21.829 (25.329) 30.310 (34.529)	55.180 (62.899)
Y6 通り X5.5 X6.5	F	土間床 Y6 通り	1.950 (1.950) × 0.415 X5.5 X6.5 より	0.810 (0.810) 8.027 (8.921)	8.836 (9.731)
Y7 通り X6 X6.5	F	土間床 Y7 通り	1.950 (1.950) × 0.104 X6 X6.5 より	0.202 (0.202) 1.755 (2.186)	1.957 (2.388)
X0 通り Y0 Y6	F	床 X0 通り X0 通り X0 通り	1.700 (1.700) × 1.346 Y0 Y1.5 より Y2.5 Y3.5 より Y5.5 Y6 より	2.288 (2.288) 4.428 (4.618) 18.241 (21.003) 4.480 (4.670)	29.437 (32.579)
X2.5 通り Y0 Y3	F	床 浴室 X2.5 通り	1.700 (1.700) × 1.035 3.000 (3.000) × 1.242 Y0 Y3 より	1.760 (1.760) 3.726 (3.726) 11.605 (12.247)	17.091 (17.733)
X4 通り Y5 Y6	F	床 土間床 X4 通り	1.700 (1.700) × 0.207 1.950 (1.950) × 0.518 Y5 Y6 より	0.352 (0.352) 1.009 (1.009) 1.829 (1.829)	3.190 (3.190)
X4.5 通り Y0 Y5	F	床 浴室 1F建具 X4.5 通り	1.700 (1.700) × 2.691 3.000 (3.000) × 1.242 Y4.7 Y5 より X4.5 Y2 より	4.575 (4.575) 3.726 (3.726) 0.137 4.658 (5.440) 1.938 (2.088)	15.034 (15.966)
X5.5 通り Y1 Y3.5	F	床 1F非支持壁 1F建具 1F階段下壁 X5.5 通り	1.700 (1.700) × 2.484 Y2 Y2.5 より X5.5 Y1 より	4.223 (4.223) 0.455 0.137 0.228 4.697 (4.697) 1.589 (1.589)	11.328 (11.328)
X6.5 通り Y0 Y7	F	床 土間床 1F非支持壁 1F階段下壁 X6.5 通り X6.5 通り X6.5 通り	1.700 (1.700) × 1.656 1.950 (1.950) × 0.725 Y0 Y2.5 より Y4.5 Y6 より Y6 Y7 より	2.816 (2.816) 1.413 (1.413) 0.455 0.227 14.589 (17.135) 6.262 (7.004) 4.188 (4.834)	29.950 (33.885)
束 X0.5 Y4	F	床	1.700 (1.700) × 0.621	1.056 (1.056)	1.056 (1.056)

符号	階	項目	単位荷重×長さ・面積	P0(kN)	P(kN)
束 X0.5 Y5	F	床	1.700 (1.700) × 0.621	1.056 (1.056)	1.056 (1.056)
束 X0.7 Y1	F	床	1.700 (1.700) × 0.725	1.232 (1.232)	1.232 (1.232)
束 X0.7 Y2	F	床	1.700 (1.700) × 0.725	1.232 (1.232)	1.232 (1.232)
束 X1.5 Y4	F	床	1.700 (1.700) × 0.828	1.408 (1.408)	1.408 (1.408)
束 X1.5 Y5	F	床	1.700 (1.700) × 0.828	1.408 (1.408)	1.408 (1.408)
束 X1.7 Y1	F	床	1.700 (1.700) × 0.725	1.232 (1.232)	1.232 (1.232)
束 X1.7 Y2	F	床	1.700 (1.700) × 0.725	1.232 (1.232)	1.232 (1.232)
束 X2.5 Y4	F	床	1.700 (1.700) × 0.828	1.408 (1.408)	1.408 (1.408)
束 X2.5 Y5	F	床	1.700 (1.700) × 0.828	1.408 (1.408)	1.408 (1.408)
束 X3.5 Y4	F	床	1.700 (1.700) × 0.828	1.408 (1.408)	1.408 (1.408)
束 X3.5 Y5	F	床	1.700 (1.700) × 0.673	1.144 (1.144)	1.144 (1.144)
束 X5.5 Y4	F	床	1.700 (1.700) × 0.621	1.056 (1.056)	1.056 (1.056)

引き抜き検討用軸力

符号	階	項目	単位荷重×長さ・面積	P0 (kN)	P (kN)
束 X1.5 Y2.5a	2R	屋根 屋根	0.760 × 0.248 0.460 × 0.089 Y2.5a 通り X2.5 X3.5 へ X0 通り Y2 Y3.6 へ X2.5 通り Y2.5aY3.5 へ	0.188 0.041	0.229 0.069 0.092 0.069
束 X1.5 Y3	2R	屋根 屋根	0.760 × 0.285 0.460 × 0.244 Y2.5a 通り X2.5 X3.5 へ Y3.5 通り X0 X2.5 へ X0 通り Y2 Y3.6 へ X2.5 通り Y2.5aY3.5 へ	0.216 0.112	0.329 0.063 0.119 0.084 0.063
束 X1.5 Y3.5	2R	屋根	0.760 × 0.362 Y3.5 通り X0 X2.5 へ	0.275	0.275 0.275
束 X1.5 Y4	2R	屋根 屋根	0.760 × 0.362 0.460 × 0.311 X1.5 通り Y3.5 Y3.7 へ X1.5 通り Y5.7 Y6.5 へ	0.275 0.143	0.418 0.366 0.052
束 X1.5 Y4.5	2R	屋根 屋根	0.760 × 0.362 0.460 × 0.311 X1.5 通り Y3.5 Y3.7 へ X1.5 通り Y5.7 Y6.5 へ	0.275 0.143	0.418 0.261 0.157
束 X1.5 Y5	2R	屋根 屋根	0.760 × 0.362 0.460 × 0.311 X1.5 通り Y3.5 Y3.7 へ X1.5 通り Y5.7 Y6.5 へ	0.275 0.143	0.418 0.157 0.261
束 X1.5 Y5.5	2R	屋根 屋根	0.760 × 0.362 0.460 × 0.311 X1.5 通り Y3.5 Y3.7 へ X1.5 通り Y5.7 Y6.5 へ	0.275 0.143	0.418 0.052 0.366
束 X1.5 Y6	2R	屋根 屋根	0.760 × 0.362 0.460 × 0.311 X1.5 通り Y5.7 Y6.5 へ	0.275 0.143	0.418 0.418
束 X3a Y0	2R	屋根	0.760 × 2.174 Y0 通り X3 X3.5 へ	1.652	1.652 1.652
束 X3a Y3.5	2R	屋根	0.760 × 3.741 Y3.5 通り X0 X2.5 へ X2.5 通り Y2.5aY3.5 へ X4.5 Y2.55 へ X4.5 Y4 へ	2.843	2.843 0.889 0.889 0.368 0.699
束 X3a Y6.5	2R	屋根 屋根	0.760 × 1.627 0.460 × 0.131 Y6.5 通り X1.5 X2.9 へ Y6.5 通り X3.6 X4.6 へ	1.237 0.060	1.297 0.648 0.648
束 X3.5 Y0.5	2R	屋根 屋根	0.760 × 0.052 0.460 × 0.621 X3.5 通り Y0 Y1 へ	0.039 0.286	0.325 0.325
束 X3.5 Y1	2R	屋根 屋根	0.760 × 0.052 0.460 × 0.621 X3.5 通り Y0 Y1 へ	0.039 0.286	0.325 0.325

符号	階	項目	単位荷重×長さ・面積	P0(kN)	P(kN)
束 X3.5 Y1.5	2R	屋根 屋根	0.760 × 0.043 0.460 × 0.515 X3.5 Y1.5 へ	0.033 0.237	0.270 0.270
束 X3.5 Y1.8	2R	屋根 屋根	0.760 × 0.035 0.460 × 0.416 X3.5 通り Y2.5 Y2.5aへ X3.5 Y1.5 へ	0.026 0.192	0.218 0.072 0.146
束 X3.5 Y2.2	2R	屋根 屋根	0.760 × 0.035 0.460 × 0.416 X3.5 通り Y2.5 Y2.5aへ X3.5 Y1.5 へ	0.026 0.192	0.218 0.146 0.072
束 X3.5 Y2.5	2R	屋根 屋根	0.760 × 0.043 0.460 × 0.515 X3.5 通り Y2.5 Y2.5aへ	0.033 0.237	0.270 0.270
束 X3.5 Y3	2R	屋根 屋根	0.760 × 0.052 0.460 × 0.621 Y2.5a 通り X2.5 X3.5 へ Y3.5 通り X0 X2.5 へ X2.5 通り Y2.5aY3.5 へ X3.5 通り Y2.5 Y2.5aへ X4.5 Y2.55へ X4.5 Y4 へ	0.039 0.286	0.325 0.103 0.030 0.030 0.103 0.020 0.039
束 X3.5 Y3.5	2R	屋根 屋根	0.760 × 0.155 0.460 × 0.104 Y3.5 通り X0 X2.5 へ X2.5 通り Y2.5aY3.5 へ X4.5 Y2.55へ X4.5 Y4 へ	0.118 0.048	0.166 0.041 0.041 0.029 0.054
束 X4.5 Y3.5	2R	屋根 屋根	0.760 × 0.104 0.460 × 0.518 X4.5 Y2.55へ X4.5 Y4 へ	0.079 0.238	0.317 0.109 0.208
束 X4.5 Y4	2R	屋根 屋根	0.760 × 0.259 0.460 × 0.414 X4.5 Y4 へ	0.197 0.190	0.387 0.387
束 X4.5 Y4.5	2R	屋根 屋根	0.760 × 0.259 0.460 × 0.414 Y6.5 通り X3.6 X4.6 へ X4.5 Y4 へ	0.197 0.190	0.387 0.077 0.310
束 X4.5 Y5	2R	屋根 屋根	0.760 × 0.259 0.460 × 0.414 Y6.5 通り X3.6 X4.6 へ X4.5 Y4 へ	0.197 0.190	0.387 0.155 0.232
束 X4.5 Y5.5	2R	屋根 屋根	0.760 × 0.259 0.460 × 0.414 Y6.5 通り X3.6 X4.6 へ X4.5 Y4 へ	0.197 0.190	0.387 0.232 0.155
束 X4.5 Y6	2R	屋根 屋根	0.760 × 0.259 0.460 × 0.414 Y6.5 通り X3.6 X4.6 へ X4.5 Y4 へ	0.197 0.190	0.387 0.310 0.077

符号	階	項目	単位荷重×長さ・面積	P0 (kN)	P (kN)
Y0 通り X0 X1	2	外壁上部 屋根 屋根 小屋壁 外壁下部	0.600 × 2.730 × 1.231 0.760 × 1.423 0.460 × 1.121 0.600 × 2.730 × 1.231 Y0 通り X0 X1 へ	2.016 1.082 0.516 0.892 2.016	4.506 6.522 6.522
Y0 通り X3 X3.5	2	外壁上部 屋根 屋根 小屋壁 外壁下部	0.600 × 1.820 × 1.231 0.760 × 0.311 0.460 × 0.832 東 X3a Y0 より 0.600 × 1.820 × 1.231 Y0 通り X1.5 X2.7 へ Y0 通り X4.2 X4.5 へ	1.344 0.236 0.382 0.780 1.652 1.344	4.395 5.739 3.826 1.913
Y0 通り X4.5 X5.5	2	外壁上部 屋根 天井 小屋壁 外壁下部	0.600 × 1.820 × 1.231 0.460 × 1.142 0.300 × 0.414 0.600 × 1.820 × 1.231 Y0 通り X4.2 X4.5 へ Y0 通り X5 X6.5 へ	1.344 0.525 0.124 0.892 1.344	2.886 4.230 1.057 3.172
Y2.5 通り X5.3 X5.5	2	内壁上部 内壁上部 天井 内壁下部	0.400 × 0.228 × 1.231 0.400 × 0.796 × 1.231 0.300 × 0.673 0.400 × 0.228 × 1.231 Y0 通り X4.2 X4.5 へ Y3 通り X3.5 X4.5 へ Y3.5 通り X5.5 X5.8 へ X5.5 通り Y2 Y2.5 へ X4.5 Y2 へ X5.5 Y1 へ	0.112 0.392 0.202 0.112	0.706 0.818 0.009 0.068 0.069 0.612 0.026 0.035
Y2.5a 通り X2.5 X3.5	2	内壁上部 木質床(ロフ 天井 叩き手摺壁 小屋壁 内壁下部	0.400 × 0.910 × 1.231 1.300 × 0.244 0.300 × 0.148 東東東 X1.5 Y2.5a より X1.5 Y3 より X3.5 Y3 より 0.400 × 0.910 × 1.231 Y0 通り X1.5 X2.7 へ Y0 通り X4.2 X4.5 へ Y3 通り X1.7 X2.5 へ Y3 通り X3.5 X4.5 へ X2.5 通り Y0 Y3 へ	0.448 0.317 0.044 0.218 0.170 0.069 0.063 0.103 0.448	1.433 1.881 0.097 0.037 0.213 0.851 0.683
Y3.5 通り X0 X2.5	2	内壁上部 屋根 木質床(ロフ 天井 小屋壁 内壁下部	0.400 × 2.275 × 1.231 0.460 × 0.621 1.300 × 1.486 0.300 × 0.710 東東東東 X1.5 Y3 より X1.5 Y3.5 より X3a Y3.5 より X3.5 Y3 より X3.5 Y3.5 より 0.400 × 2.275 × 1.231 Y3 通り X1.7 X2.5 へ Y6 通り X0 X1 へ Y6 通り X3 X4.4 へ X0 通り Y2.5 Y3.5 へ X2.5 通り Y0 Y3 へ	1.120 0.286 1.932 0.213 0.459 0.119 0.275 0.889 0.030 0.041 1.120	5.364 6.484 3.204 0.729 0.243 2.038 0.270

符号	階	項目	単位荷重×長さ・面積	P0 (kN)	P (kN)
Y6.5 通り X0 X0.6	2	外壁上部 外壁上部 屋根 天井 小屋壁 外壁下部	0.600 × 0.600 × 1.231 0.600 × 1.690 × 0.821 0.460 × 1.866 0.300 × 0.961 0.600 × 0.600 × 1.231	0.443 0.832 0.858 0.288 0.481 0.443	2.903 3.346 2.712 0.634
Y6.5 通り X1.5 X2.9	2	外壁上部 外壁上部 屋根 屋根 木質床(口フ 小屋壁 外壁下部	0.600 × 1.593 × 1.231 0.600 × 0.383 × 0.821 0.760 × 0.325 0.460 × 0.812 1.300 × 1.863 東 X3a Y6.5 より 0.600 × 1.593 × 1.231	1.176 0.188 0.247 0.373 2.422 0.874 0.648 1.176	5.930 7.106 2.860 4.246
Y6.5 通り X3.6 X4.6	2	外壁上部 屋根 屋根 木質床(口フ 天井 小屋壁 外壁下部	0.600 × 1.593 × 1.231 0.760 × 0.222 0.460 × 0.675 1.300 × 1.501 0.300 × 0.932 東 X3a Y6.5 より 東 X4.5 Y4.5 より 東 X4.5 Y5 より 東 X4.5 Y5.5 より 東 X4.5 Y6 より 0.600 × 1.593 × 1.231	1.176 0.168 0.311 1.951 0.279 1.235 0.648 0.077 0.155 0.232 0.310 1.176	6.544 7.720 7.644 0.076
Y6.5 通り X5.4 X6.5	2	外壁上部 屋根 天井 小屋壁 外壁下部	0.600 × 1.365 × 1.231 0.460 × 0.977 0.300 × 0.311 0.600 × 1.365 × 1.231	1.008 0.449 0.093 0.669 1.008	2.219 3.228 0.017 2.244 0.487 0.479
X0 通り Y2 Y3.6	2	外壁上部 外壁上部 屋根 屋根 天井 口手摺壁 小屋壁 外壁下部	0.600 × 2.390 × 1.231 0.600 × 1.308 × 0.821 0.760 × 2.229 0.460 × 2.258 0.300 × 1.311 東 X1.5 Y2.5aより 東 X1.5 Y3 より 0.600 × 2.390 × 1.231	1.765 0.644 1.694 1.038 0.393 0.109 0.186 0.092 0.084 1.765	6.006 7.771 0.597 7.155 0.019

符号	階	項目	単位荷重×長さ・面積	P0 (kN)	P (kN)
X1.5 通り Y3.5 Y3.7	2	内壁上部 木質床(口フ 天井 小屋壁 東 東 東 東 東 内壁下部	0.400 × 1.138 × 1.231 1.300 × 0.259 0.300 × 0.621 X1.5 Y4 より X1.5 Y4.5 より X1.5 Y5 より X1.5 Y5.5 より 0.400 × 1.138 × 1.231 Y3 通り X1.7 X2.5 へ Y6 通り X0 X1 へ Y6 通り X3 X4.4 へ X0 通り Y2.5 Y3.5 へ	0.560 0.336 0.186 0.341 0.366 0.261 0.157 0.052 0.560	2.260 2.821 1.914 0.441 0.147 0.319
X1.5 通り Y5.7 Y6.5	2	内壁上部 木質床(口フ 天井 小屋壁 東 東 東 東 東 内壁下部	0.400 × 1.593 × 1.231 1.300 × 0.362 0.300 × 1.019 X1.5 Y4 より X1.5 Y4.5 より X1.5 Y5 より X1.5 Y5.5 より X1.5 Y6 より 0.400 × 1.593 × 1.231 Y3 通り X1.7 X2.5 へ Y6 通り X0 X1 へ Y6 通り X3 X4.4 へ X0 通り Y2.5 Y3.5 へ	0.784 0.471 0.306 0.571 0.052 0.157 0.261 0.366 0.418 0.784	3.387 4.171 0.050 3.085 1.028 0.008
X2.5 通り Y2.5aY3.5	2	内壁上部 木質床(口フ 天井 口手摺壁 小屋壁 東 東 東 東 東 内壁下部	0.400 × 0.715 × 1.231 1.300 × 1.745 0.300 × 0.081 X1.5 Y2.5aより X1.5 Y3 より X3a Y3.5 より X3.5 Y3 より X3.5 Y3.5 より 0.400 × 0.715 × 1.231 Y3 通り X1.7 X2.5 へ Y6 通り X0 X1 へ Y6 通り X3 X4.4 へ X2.5 通り Y0 Y3 へ	0.352 2.268 0.024 0.218 0.210 0.069 0.063 0.889 0.030 0.041 0.352	4.164 4.516 1.317 0.060 0.180 2.959
X3.5 通り Y0 Y1	2	内壁上部 内壁上部 天井 小屋壁 東 東 内壁下部	0.400 × 0.910 × 1.231 0.400 × 0.228 × 0.821 0.300 × 1.346 X3.5 Y0.5 より X3.5 Y1 より 0.400 × 0.910 × 1.231 Y0 通り X1.5 X2.7 へ Y0 通り X4.2 X4.5 へ Y3 通り X3.5 X4.5 へ	0.448 0.075 0.404 0.794 0.325 0.325 0.448	2.370 2.819 1.174 1.174 0.470
X3.5 通り Y2.5 Y2.5a	2	内壁上部 内壁上部 天井 小屋壁 東 東 東 東 東 内壁下部	0.400 × 0.195 × 1.231 0.400 × 1.251 × 1.231 0.300 × 0.673 X3.5 Y1.8 より X3.5 Y2.2 より X3.5 Y2.5 より X3.5 Y3 より 0.400 × 0.195 × 1.231 Y0 通り X1.5 X2.7 へ Y0 通り X4.2 X4.5 へ Y3 通り X3.5 X4.5 へ	0.096 0.616 0.202 0.497 0.072 0.146 0.270 0.103 0.096	2.002 2.098 0.137 0.137 1.823

符号	階	項目	単位荷重×長さ・面積	P0(kN)	P(kN)
X6.5 通り Y0 Y3.7	2	外壁上部 屋根 天井 小屋壁 外壁下部	0.600 × 4.323 × 1.231 0.460 × 6.120 0.300 × 4.037 0.600 × 4.323 × 1.231 Y3.5 通り X6.2 X6.5 へ X6.5 通り Y0 Y2.5 へ X6.5 通り Y4.5 Y6 へ	3.193 2.815 1.211 0.223 3.193	7.442 10.635 2.038 8.508 0.089
X6.5 通り Y4.7 Y5	2	外壁上部 屋根 天井 外壁下部	0.600 × 1.138 × 1.231 0.460 × 1.376 0.300 × 1.035 0.600 × 1.138 × 1.231 X6.5 通り Y4.5 Y6 へ	0.840 0.633 0.311 0.840	1.784 2.624 2.624
X6.5 通り Y6 Y6.5	2	外壁上部 屋根 天井 外壁下部	0.600 × 0.910 × 1.231 0.460 × 0.894 0.300 × 0.621 0.600 × 0.910 × 1.231 X6.5 通り Y6 Y7 へ	0.672 0.411 0.186 0.672	1.270 1.942 1.942
柱 X3.5 Y1.5	2	内壁上部 内壁上部 天井 小屋壁 東 東 東	0.400 × 0.455 × 1.231 0.400 × 0.228 × 0.821 0.300 × 0.932 X3.5 Y1.5 より X3.5 Y1.8 より X3.5 Y2.2 より Y0 通り X1.5 X2.7 へ Y0 通り X4.2 X4.5 へ Y3 通り X3.5 X4.5 へ	0.224 0.075 0.279 0.410 0.270 0.146 0.072	1.475 0.369 0.369 0.738
柱 X4.5 Y2.55	2	内壁上部 天井 小屋壁 東 東 東 東	0.400 × 0.660 × 1.231 0.300 × 0.721 X3a Y3.5 より X3.5 Y3 より X3.5 Y3.5 より X4.5 Y3.5 より Y3 通り X3.5 X4.5 へ X4.5 Y2 へ	0.325 0.216 0.210 0.368 0.020 0.029 0.109	1.277 0.575 0.702
柱 X4.5 Y4	2	内壁上部 木質床(口フ 天井 小屋壁 東 東 東 東 東 東 東 東	0.400 × 0.660 × 1.231 1.300 × 1.294 0.300 × 1.822 X3a Y3.5 より X3.5 Y3 より X3.5 Y3.5 より X4.5 Y3.5 より X4.5 Y4 より X4.5 Y4.5 より X4.5 Y5 より X4.5 Y5.5 より X4.5 Y6 より Y3 通り X3.5 X4.5 へ X4.5 通り Y4.7 Y5 へ	0.325 1.682 0.547 0.945 0.699 0.039 0.054 0.208 0.387 0.310 0.232 0.155 0.077	5.659 3.234 2.425
Y0 通り X0 X1	1	外壁上部 床 Y0 通り 外壁下部	0.600 × 1.138 × 1.375 1.300 × 1.242 X0 X1 より 0.600 × 1.138 × 1.375 Y0 通り X0 X6.5 へ	0.938 1.615 6.522 0.938	9.075 10.014 10.014

符号	階	項目	単位荷重×長さ・面積	P0 (kN)	P (kN)
Y0 通り X1.5 X2.7	1	外壁上部 床 2F建具 2F非耐力壁 Y0 通り Y2.5a 通り X3.5 通り X3.5 通り 柱 外壁下部	0.600 × 2.048 × 1.375 1.300 × 2.174 X3 X3.5 より X2.5 X3.5 より Y0 Y1 より Y2.5 Y2.5aより X3.5 Y1.5 より 0.600 × 2.048 × 1.375 Y0 通り X0 X6.5 へ	1.689 2.826 0.025 0.061 3.826 0.097 1.174 0.137 0.369 1.689	10.205 11.894 11.894
Y0 通り X4.2 X4.5	1	外壁上部 内壁上部 床 階段 2F建具 2F非耐力壁 Y0 通り Y0 通り Y2.5 通り Y2.5a 通り X3.5 通り X3.5 通り 柱 外壁下部	0.600 × 1.138 × 1.375 0.400 × 0.910 × 1.375 1.300 × 1.174 0.900 × 0.311 X3 X3.5 より X4.5 X5.5 より X5.3 X5.5 より X2.5 X3.5 より Y0 Y1 より Y2.5 Y2.5aより X3.5 Y1.5 より 0.600 × 1.138 × 1.375 Y0 通り X0 X6.5 へ	0.938 0.501 1.526 0.279 0.066 0.976 1.913 1.057 0.009 0.037 1.174 0.137 0.369 0.938	8.983 9.922 9.922
Y0 通り X5 X6.5	1	外壁上部 階段 Y0 通り 外壁下部	0.600 × 1.593 × 1.375 0.900 × 0.932 X4.5 X5.5 より 0.600 × 1.593 × 1.375 Y0 通り X0 X6.5 へ	1.314 0.838 3.172 1.314	5.325 6.638 6.638
Y3 通り X1.7 X2.5	1	内壁上部 内壁上部 床 2F建具 Y2.5a 通り Y3.5 通り X1.5 通り X1.5 通り X2.5 通り 内壁下部	0.400 × 0.683 × 1.375 0.400 × 0.455 × 1.375 1.300 × 4.037 X2.5 X3.5 より X0 X2.5 より Y3.5 Y3.7 より Y5.7 Y6.5 より Y2.5aY3.5 より 0.400 × 0.683 × 1.375 Y3 通り X0 X4.5 へ	0.375 0.250 5.248 0.057 0.213 3.204 1.914 0.050 1.317 0.375	12.628 13.003 13.003
Y3 通り X3.5 X4.5	1	内壁上部 内壁上部 内壁上部 床 2F建具 2F非耐力壁 Y2.5 通り Y2.5a 通り X3.5 通り X3.5 通り 柱 柱 柱 内壁下部	0.400 × 0.910 × 1.375 0.400 × 1.251 × 1.375 0.400 × 0.455 × 0.917 1.300 × 4.066 X5.3 X5.5 より X2.5 X3.5 より Y0 Y1 より Y2.5 Y2.5aより X3.5 Y1.5 より X4.5 Y2.55より X4.5 Y4 より 0.400 × 0.910 × 1.375 Y3 通り X0 X4.5 へ	0.501 0.688 0.167 5.285 0.249 1.274 0.068 0.851 0.470 1.823 0.738 0.575 3.234 0.501	15.923 16.423 16.423

符号	階	項目	単位荷重×長さ・面積	P0(kN)	P(kN)
Y3.5 通り X5.5 X5.8	1	内壁上部 内壁上部 内壁上部 床 天井 2F建具 2F非耐力壁 Y2.5 通り 内壁下部	0.400 × 0.300 × 1.375 0.400 × 0.683 × 1.375 0.400 × 0.155 × 0.917 1.300 × 0.897 0.300 × 0.207 X5.3 X5.5 より 0.400 × 0.300 × 1.375 Y3.5 通り X5.5 X6.5 へ	0.165 0.375 0.057 1.167 0.062 0.137 1.036 0.069 0.165	 3.068 3.233 3.233
Y3.5 通り X6.2 X6.5	1	外壁上部 内壁上部 内壁上部 床 天井 2F建具 X6.5 通り 外壁下部 内壁下部	0.600 × 0.910 × 1.375 0.400 × 0.300 × 1.375 0.400 × 0.155 × 0.917 1.300 × 0.276 0.300 × 0.207 Y0 Y3.7 より 0.600 × 0.910 × 1.375 0.400 × 0.300 × 1.375 Y3.5 通り X5.5 X6.5 へ	0.751 0.165 0.057 0.359 0.062 0.137 2.038 0.751 0.165	 3.569 4.485 4.485
Y5 通り X4 X4.5	1	内壁上部 床 2F建具 内壁下部	0.400 × 0.455 × 1.375 1.300 × 0.586 0.400 × 0.455 × 1.375 Y5 通り X4 X6.5 へ	0.250 0.762 0.068 0.250	 1.080 1.330 1.330
Y5 通り X5.5 X6.5	1	内壁上部 内壁上部 床 2F非耐力壁 内壁下部	0.400 × 0.910 × 1.375 0.400 × 0.683 × 1.375 1.300 × 1.035 0.400 × 0.910 × 1.375 Y5 通り X4 X6.5 へ	0.501 0.375 1.346 0.126 0.501	 2.347 2.848 2.848
Y6 通り X0 X1	1	外壁上部 床 階段 屋根 2F手摺壁 2F建具 Y3.5 通り Y6.5 通り Y6.5 通り X1.5 通り X1.5 通り X2.5 通り 外壁下部	0.600 × 1.820 × 1.375 1.300 × 2.174 0.900 × 0.828 0.760 × 2.406 X0 X2.5 より X0 X0.6 より X1.5 X2.9 より Y3.5 Y3.7 より Y5.7 Y6.5 より Y2.5aY3.5 より 0.600 × 1.820 × 1.375 Y6 通り X0 X4.4 へ	1.502 2.826 0.745 1.829 0.561 0.003 0.729 2.712 2.860 0.441 3.085 0.060 1.502	 17.352 18.854 18.854
Y6 通り X3 X4.4	1	外壁上部 床 階段 屋根 2F手摺壁 2F建具 2F非耐力壁 Y3.5 通り Y6.5 通り Y6.5 通り Y6.5 通り X1.5 通り X1.5 通り X2.5 通り 外壁下部	0.600 × 2.725 × 1.375 1.300 × 2.755 0.900 × 1.240 0.760 × 3.093 X0 X2.5 より X1.5 X2.9 より X3.6 X4.6 より X5.4 X6.5 より Y3.5 Y3.7 より Y5.7 Y6.5 より Y2.5aY3.5 より 0.600 × 2.725 × 1.375 Y6 通り X0 X4.4 へ	2.248 3.582 1.116 2.351 0.034 0.313 0.138 0.243 4.246 7.644 0.017 0.147 1.028 0.180 2.248	 23.286 25.535 25.535

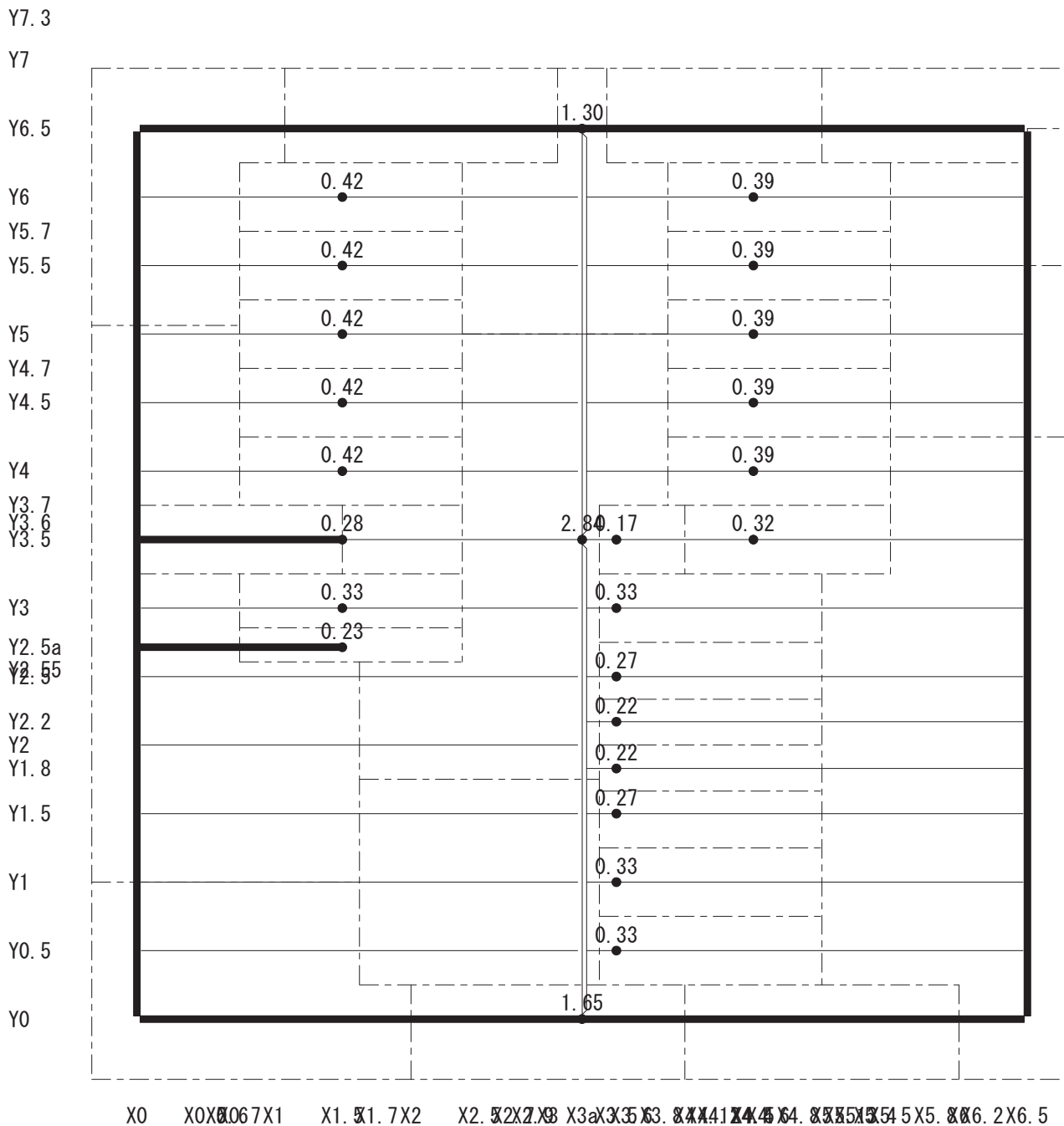
符号	階	項目	単位荷重×長さ・面積	P0(kN)	P(kN)
Y6 通り X5.5 X6.5	1	外壁上部 床 階段 屋根 2F建具 2F非耐力壁 Y6.5 通り Y6.5 通り 外壁下部	0.600 × 1.370 × 1.375 1.300 × 0.837 0.900 × 0.555 0.760 × 1.010 X3.6 X4.6 より X5.4 X6.5 より 0.600 × 1.370 × 1.375 Y6 通り X5.5 X6.5 へ	1.130 1.088 0.500 0.768 0.003 0.103 0.076 2.244 1.130	 5.911 7.042 7.042
Y7 通り X6 X6.5	1	外壁上部 屋根 Y6.5 通り 外壁下部	0.600 × 0.455 × 1.375 0.760 × 0.681 X5.4 X6.5 より 0.600 × 0.455 × 1.375 Y7 通り X6 X6.5 へ	0.375 0.517 0.487 0.375	 1.380 1.755 1.755
X0 通り Y0 Y1.5	1	外壁上部 床 X0 通り 外壁下部	0.600 × 1.820 × 1.375 1.300 × 0.414 Y2 Y3.6 より 0.600 × 1.820 × 1.375 X0 通り Y0 Y6 へ	1.502 0.538 0.597 1.502	 2.637 4.139 4.139
X0 通り Y2.5 Y3.5	1	外壁上部 床 2F手摺壁 Y3.5 通り X0 通り X1.5 通り X1.5 通り 外壁下部	0.600 × 2.275 × 1.375 1.300 × 2.070 X0 X2.5 より Y2 Y3.6 より Y3.5 Y3.7 より Y5.7 Y6.5 より 0.600 × 2.275 × 1.375 X0 通り Y0 Y6 へ	1.877 2.691 0.479 2.038 7.155 0.319 0.008 1.877	 14.567 16.444 16.444
X0 通り Y5.5 Y6	1	外壁上部 床 2F手摺壁 Y6.5 通り X0 通り 外壁下部	0.600 × 1.365 × 1.375 1.300 × 0.311 X0 X0.6 より Y2 Y3.6 より 0.600 × 1.365 × 1.375 X0 通り Y0 Y6 へ	1.126 0.404 0.953 0.634 0.019 1.126	 3.137 4.263 4.263
X2.5 通り Y0 Y3	1	内壁上部 床 2F建具 Y2.5a 通り Y3.5 通り X2.5 通り 内壁下部	0.400 × 2.730 × 1.375 1.300 × 1.863 X2.5 X3.5 より X0 X2.5 より Y2.5aY3.5 より 0.400 × 2.730 × 1.375 X2.5 通り Y0 Y3 へ	1.502 2.422 0.057 0.683 0.270 2.959 1.502	 7.893 9.395 9.395
X4 通り Y5 Y6	1	内壁上部 床 内壁下部	0.400 × 0.910 × 1.375 1.300 × 0.414 0.400 × 0.910 × 1.375 X4 通り Y5 Y6 へ	0.501 0.538 0.501	 1.039 1.539 1.539
X4.5 通り Y4.7 Y5	1	内壁上部 内壁上部 床 2F建具 2F非耐力壁 柱 内壁下部	0.400 × 0.228 × 1.375 0.400 × 0.796 × 1.375 1.300 × 0.386 X4.5 Y4 より 0.400 × 0.228 × 1.375 X4.5 通り Y0 Y5 へ	0.125 0.438 0.502 0.297 0.086 2.425 0.125	 3.874 3.999 3.999

符号	階	項目	単位荷重×長さ・面積	P0(kN)	P(kN)
X5.5 通り Y2 Y2.5	1	内壁上部 内壁上部 床 階段 天井 2F手摺壁 2F非耐力壁 2F階段上壁 Y2.5 通り 内壁下部	0.400 × 0.455 × 1.375 0.400 × 0.455 × 1.375 1.300 × 0.621 0.900 × 0.466 0.300 × 0.207 X5.3 X5.5 より 0.400 × 0.455 × 1.375 X5.5 通り Y1 Y3.5 へ	0.250 0.250 0.807 0.419 0.062 0.455 0.557 0.273 0.612 0.250	3.686 3.936 3.936
X6.5 通り Y0 Y2.5	1	外壁上部 階段 天井 2F階段上壁 X6.5 通り 外壁下部	0.600 × 2.730 × 1.375 0.900 × 0.776 0.300 × 0.207 Y0 Y3.7 より 0.600 × 2.730 × 1.375 X6.5 通り Y0 Y7 へ	2.252 0.699 0.062 0.273 8.508 2.252	11.794 14.046 14.046
X6.5 通り Y4.5 Y6	1	外壁上部 床 X6.5 通り X6.5 通り 外壁下部	0.600 × 1.820 × 1.375 1.300 × 0.273 Y0 Y3.7 より Y4.7 Y5 より 0.600 × 1.820 × 1.375 X6.5 通り Y0 Y7 へ	1.502 0.355 0.089 2.624 1.502	4.569 6.071 6.071
X6.5 通り Y6 Y7	1	外壁上部 階段 屋根 Y6.5 通り X6.5 通り 外壁下部	0.600 × 0.910 × 1.375 0.900 × 0.068 0.760 × 0.205 X5.4 X6.5 より Y6 Y6.5 より 0.600 × 0.910 × 1.375 X6.5 通り Y0 Y7 へ	0.751 0.061 0.156 0.479 1.942 0.751	3.389 4.140 4.140
柱 X4.5 Y2	1	内壁上部 内壁上部 床 Y2.5 通り 柱	0.400 × 0.910 × 1.375 0.400 × 0.455 × 0.917 1.300 × 0.756 X5.3 X5.5 より X4.5 Y2.55より Y2 通り X2.5 X4.5 へ X4.5 通り Y0 Y5 へ	0.501 0.167 0.983 0.026 0.702	2.378 0.793 1.585
柱 X5.5 Y1	1	内壁上部 床 階段 2F手摺壁 Y2.5 通り	0.400 × 0.455 × 1.375 1.300 × 0.207 0.900 × 0.414 X5.3 X5.5 より X5.5 通り Y1 Y3.5 へ	0.250 0.269 0.373 0.228 0.035	1.154 1.154
Y0 通り X0 X6.5	F	床 浴室 Y0 通り Y0 通り Y0 通り Y0 通り	1.000 × 1.449 3.000 × 0.414 X0 X1 より X1.5 X2.7 より X4.2 X4.5 より X5 X6.5 より	1.449 1.242 10.014 11.894 9.922 6.638	41.159
Y2 通り X2.5 X4.5	F	床 浴室 1F非支持壁 柱	1.000 × 0.621 3.000 × 0.414 X4.5 Y2 より	0.621 1.242 2.275 0.793	4.931

符号	階	項目	単位荷重×長さ・面積	P0(kN)	P(kN)
Y3 通り X0 X4.5	F	床 1F非支持壁 1F手摺壁 Y3 通り Y3 通り	1.000 × 3.157 X1.7 X2.5 より X3.5 X4.5 より	3.157 0.455 0.273 13.003 16.423	33.312
Y3.5 通り X5.5 X6.5	F	床 Y3.5 通り Y3.5 通り	1.000 × 0.414 X5.5 X5.8 より X6.2 X6.5 より	0.414 3.233 4.485	8.131
Y5 通り X4 X6.5	F	床 土間床 1F非支持壁 Y5 通り Y5 通り	1.000 × 0.725 1.250 × 0.518 X4 X4.5 より X5.5 X6.5 より	0.725 0.647 0.910 1.330 2.848	6.460
Y6 通り X0 X4.4	F	床 土間床 Y6 通り Y6 通り	1.000 × 1.553 1.250 × 0.206 X0 X1 より X3 X4.4 より	1.553 0.257 18.854 25.535	46.198
Y6 通り X5.5 X6.5	F	土間床 Y6 通り	1.250 × 0.415 X5.5 X6.5 より	0.519 7.042	7.561
Y7 通り X6 X6.5	F	土間床 Y7 通り	1.250 × 0.104 X6 X6.5 より	0.129 1.755	1.885
X0 通り Y0 Y6	F	床 X0 通り X0 通り X0 通り	1.000 × 1.346 Y0 Y1.5 より Y2.5 Y3.5 より Y5.5 Y6 より	1.346 4.139 16.444 4.263	26.191
X2.5 通り Y0 Y3	F	床 浴室 X2.5 通り	1.000 × 1.035 3.000 × 1.242 Y0 Y3 より	1.035 3.726 9.395	14.156
X4 通り Y5 Y6	F	床 土間床 X4 通り	1.000 × 0.207 1.250 × 0.518 Y5 Y6 より	0.207 0.647 1.539	2.393
X4.5 通り Y0 Y5	F	床 浴室 1F建具 X4.5 通り	1.000 × 2.691 3.000 × 1.242 Y4.7 Y5 より X4.5 Y2 より	2.691 3.726 0.137 3.999 1.585	12.139
X5.5 通り Y1 Y3.5	F	床 1F非支持壁 1F建具 1F階段下壁 X5.5 通り	1.000 × 2.484 Y2 Y2.5 より X5.5 Y1 より	2.484 0.455 0.137 0.228 3.936 1.154	8.393
X6.5 通り Y0 Y7	F	床 土間床 1F非支持壁 1F階段下壁 X6.5 通り X6.5 通り X6.5 通り	1.000 × 1.656 1.250 × 0.725 Y0 Y2.5 より Y4.5 Y6 より Y6 Y7 より	1.656 0.906 0.455 0.227 14.046 6.071 4.140	27.501
束 X0.5 Y4	F	床	1.000 × 0.621	0.621	0.621

符号	階	項目	単位荷重×長さ・面積	P0(kN)	P(kN)
束 X0.5 Y5	F	床	1.000 × 0.621	0.621	0.621
束 X0.7 Y1	F	床	1.000 × 0.725	0.725	0.725
束 X0.7 Y2	F	床	1.000 × 0.725	0.725	0.725
束 X1.5 Y4	F	床	1.000 × 0.828	0.828	0.828
束 X1.5 Y5	F	床	1.000 × 0.828	0.828	0.828
束 X1.7 Y1	F	床	1.000 × 0.725	0.725	0.725
束 X1.7 Y2	F	床	1.000 × 0.725	0.725	0.725
束 X2.5 Y4	F	床	1.000 × 0.828	0.828	0.828
束 X2.5 Y5	F	床	1.000 × 0.828	0.828	0.828
束 X3.5 Y4	F	床	1.000 × 0.828	0.828	0.828
束 X3.5 Y5	F	床	1.000 × 0.673	0.673	0.673
束 X5.5 Y4	F	床	1.000 × 0.621	0.621	0.621

2階小屋 長期鉛直軸力 (自階壁荷重をすべて含む) (kN)



2階（屋根） 長期鉛直軸力（自階壁荷重をすべて含む） (kN)

Y7.3

Y7

Y6.5

Y6

Y5.7

Y5.5

Y5

Y4.7

Y4.5

Y4

Y3.7

Y3.6

Y3.5

Y3

Y2.5a

Y2.5

Y2.2

Y2

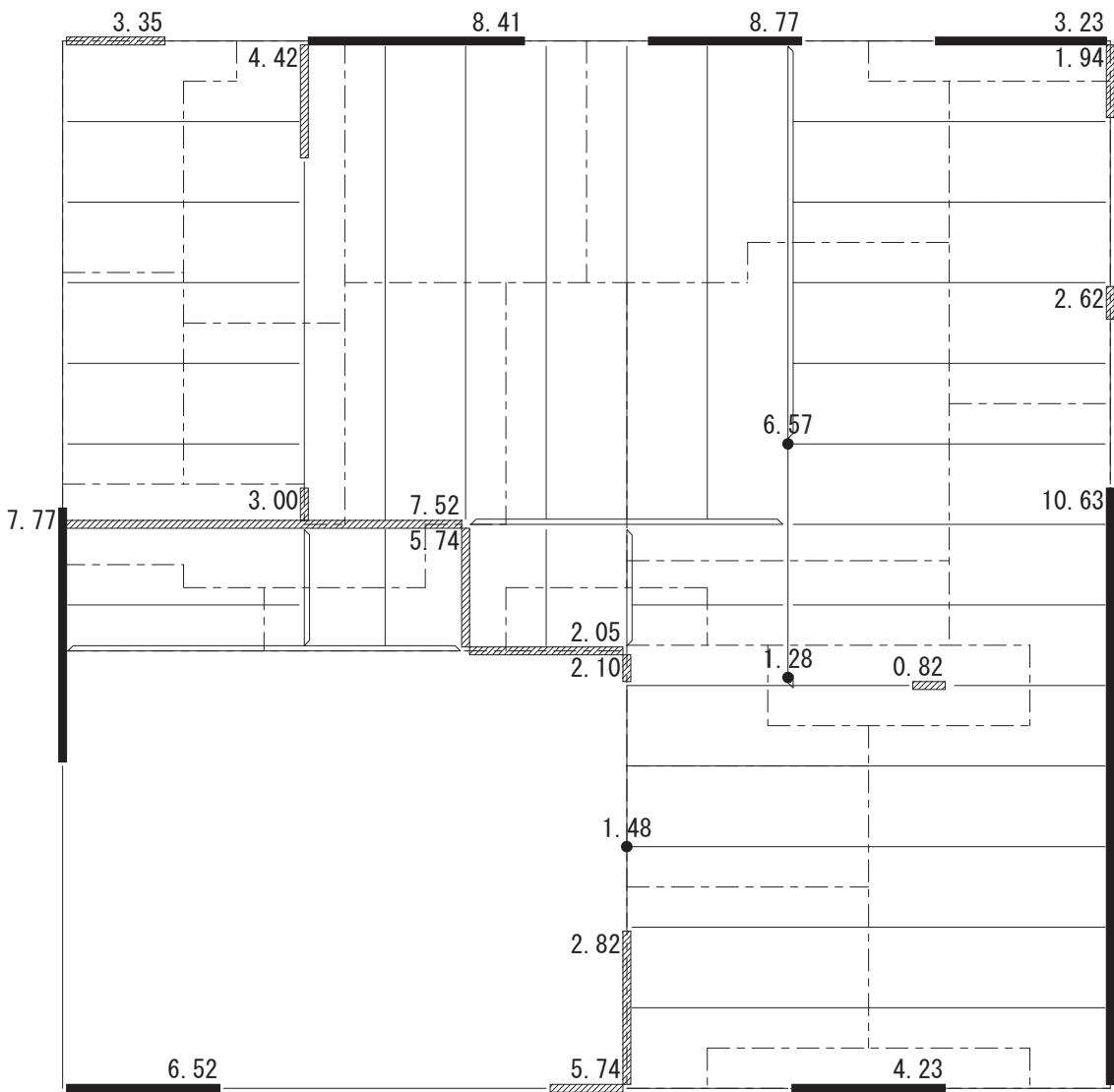
Y1.8

Y1.5

Y1

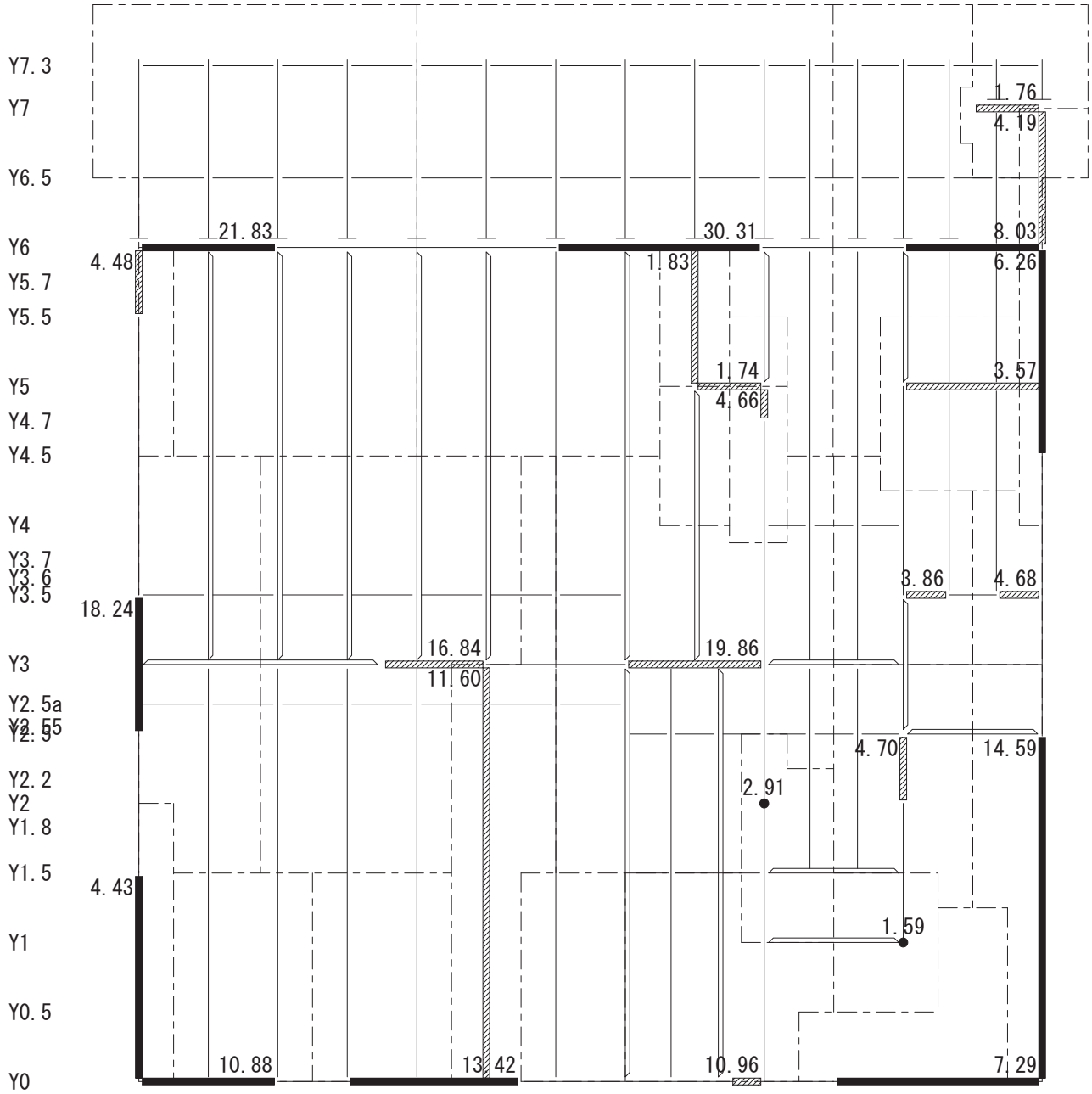
Y0.5

Y0



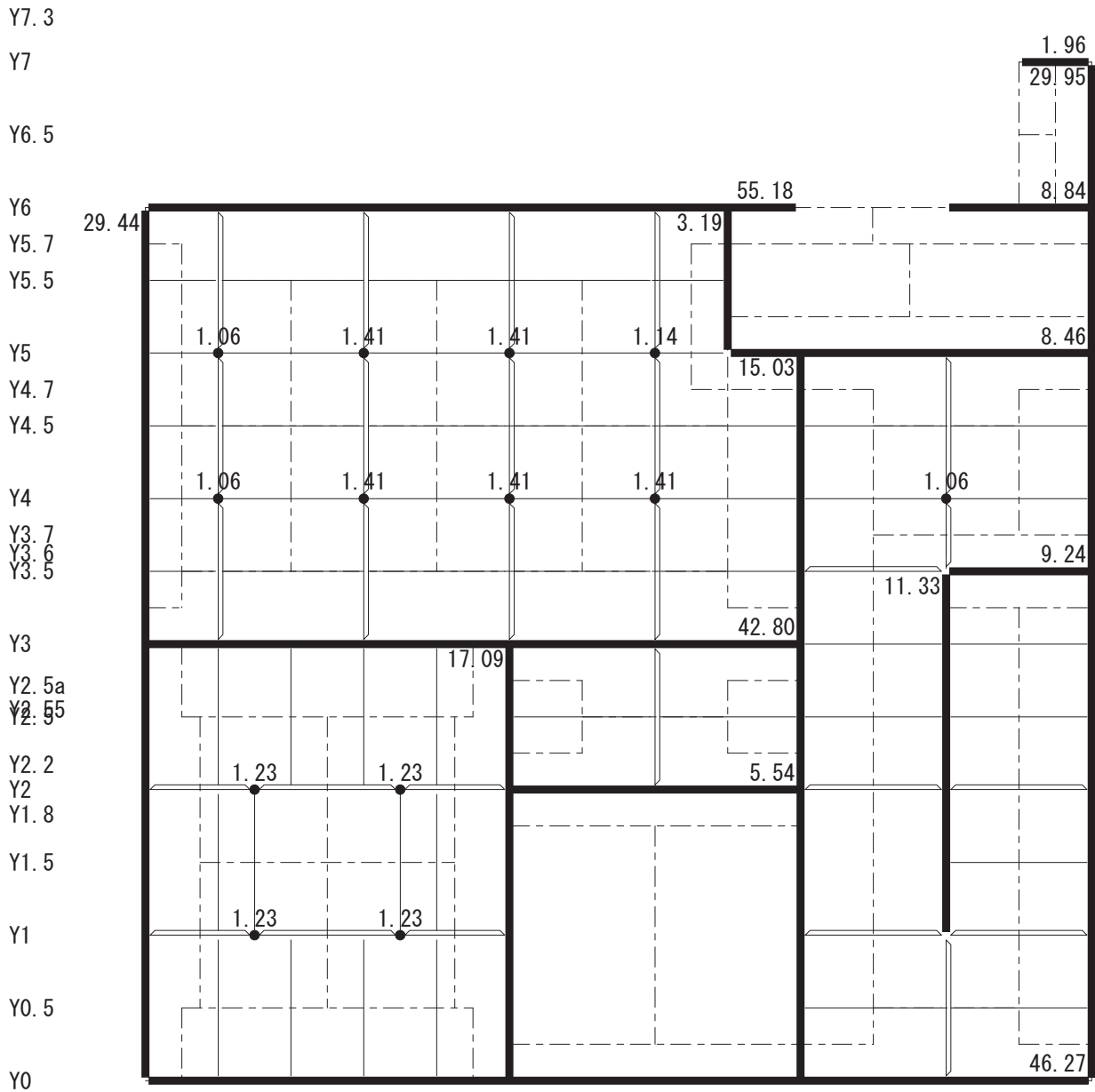
X0 X0.6 X1 X1.7 X2 X2.7 X3a X3.5 X3.8 X4.1 X4.5 X4.8 X5 X5.4 X5.5 X6 X6.2 X6.5

1階（2階床）長期鉛直軸力（自階壁荷重をすべて含む）(kN)



X0 X0.67 X1.7 X2.7 X3.35 X4.1 X4.5 X5.5 X6.2 X6.5

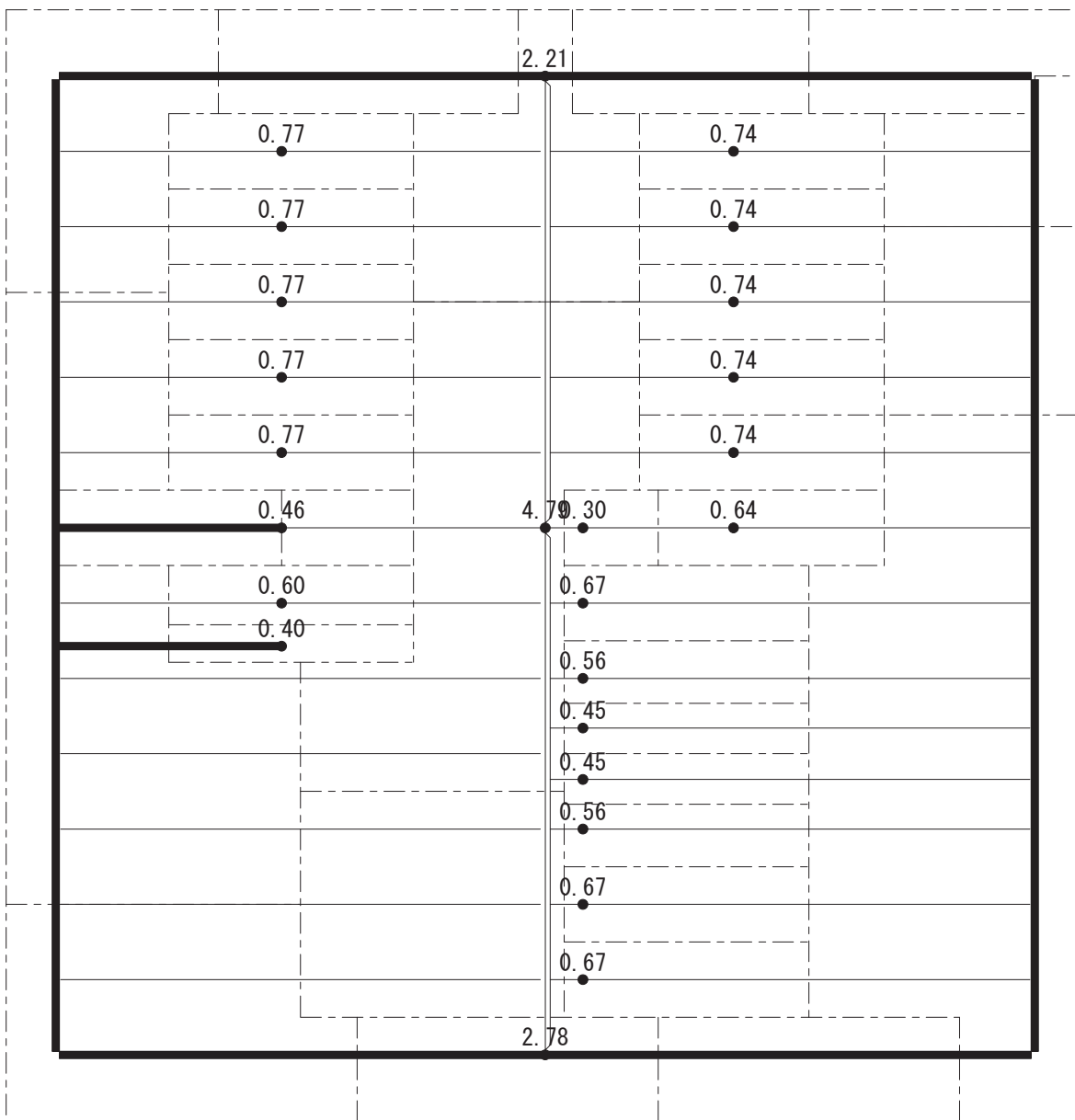
F階（1階床）長期鉛直軸力（自階壁荷重をすべて含む）(kN)



X0 X0.06 X1. 51.7 X2. 52 X2. X3 X3. 35 X3. 8 X4. 1 X4. 4 X4. 8 X5. 5 X5. 5 X5. 8 X6. 2 X6. 5

2階小屋 積雪時鉛直軸力 (自階壁荷重をすべて含む) (kN)

Y7.3
Y7
Y6.5
Y6
Y5.7
Y5.5
Y5
Y4.7
Y4.5
Y4
Y3.7
Y3.6
Y3.5
Y3
Y2.5a
Y2.5
Y2.2
Y2
Y1.8
Y1.5
Y1
Y0.5
Y0

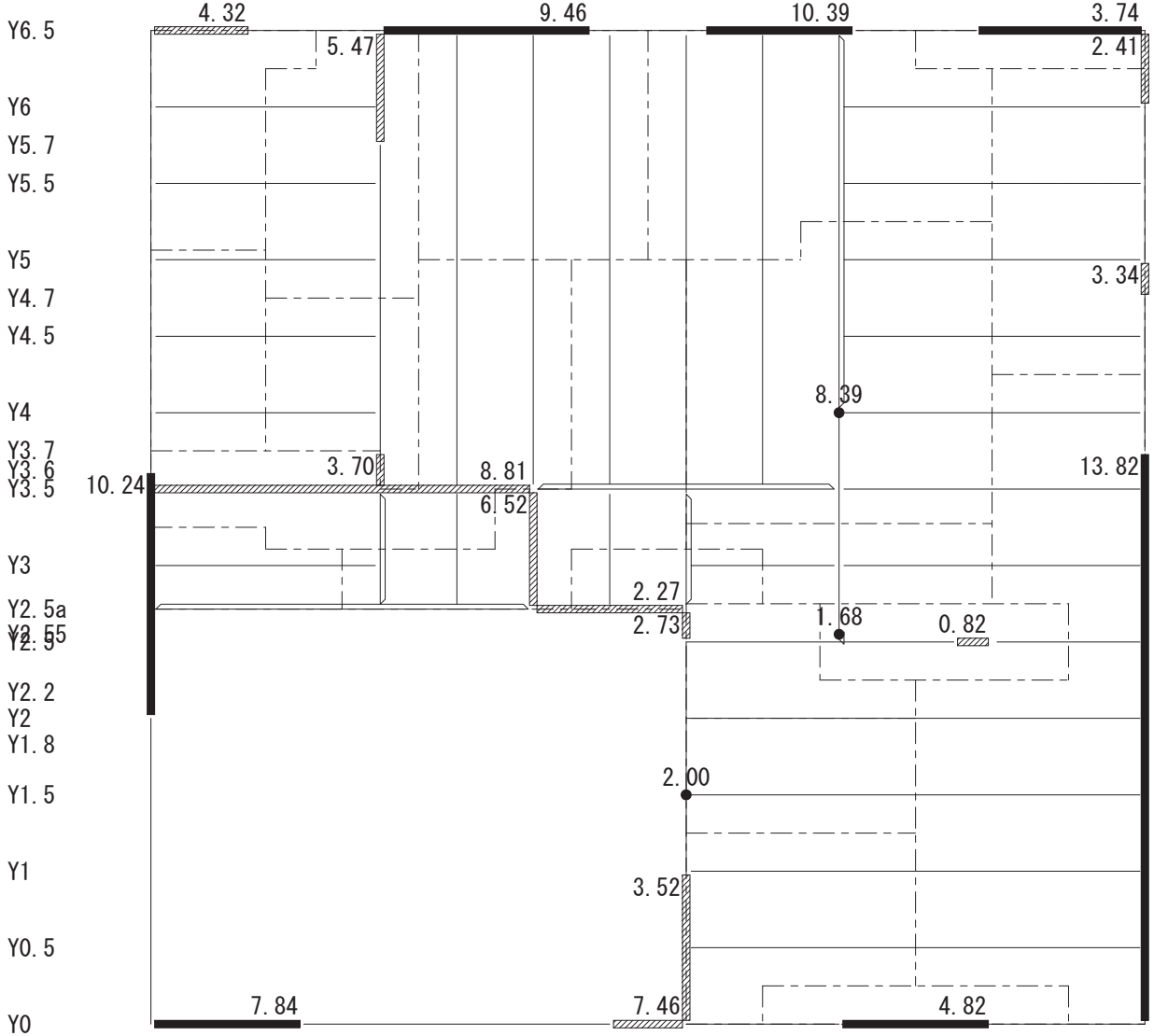


X0 X0.6 X0.7 X1 X1.7 X2 X2.2 X2.3 X3a X3.5 X3.8 X4.1 X4.4 X4.6 X4.8 X5.1 X5.4 X5.5 X5.6 X6.2 X6.5

2階（屋根） 積雪時鉛直軸力（自階壁荷重をすべて含む） (kN)

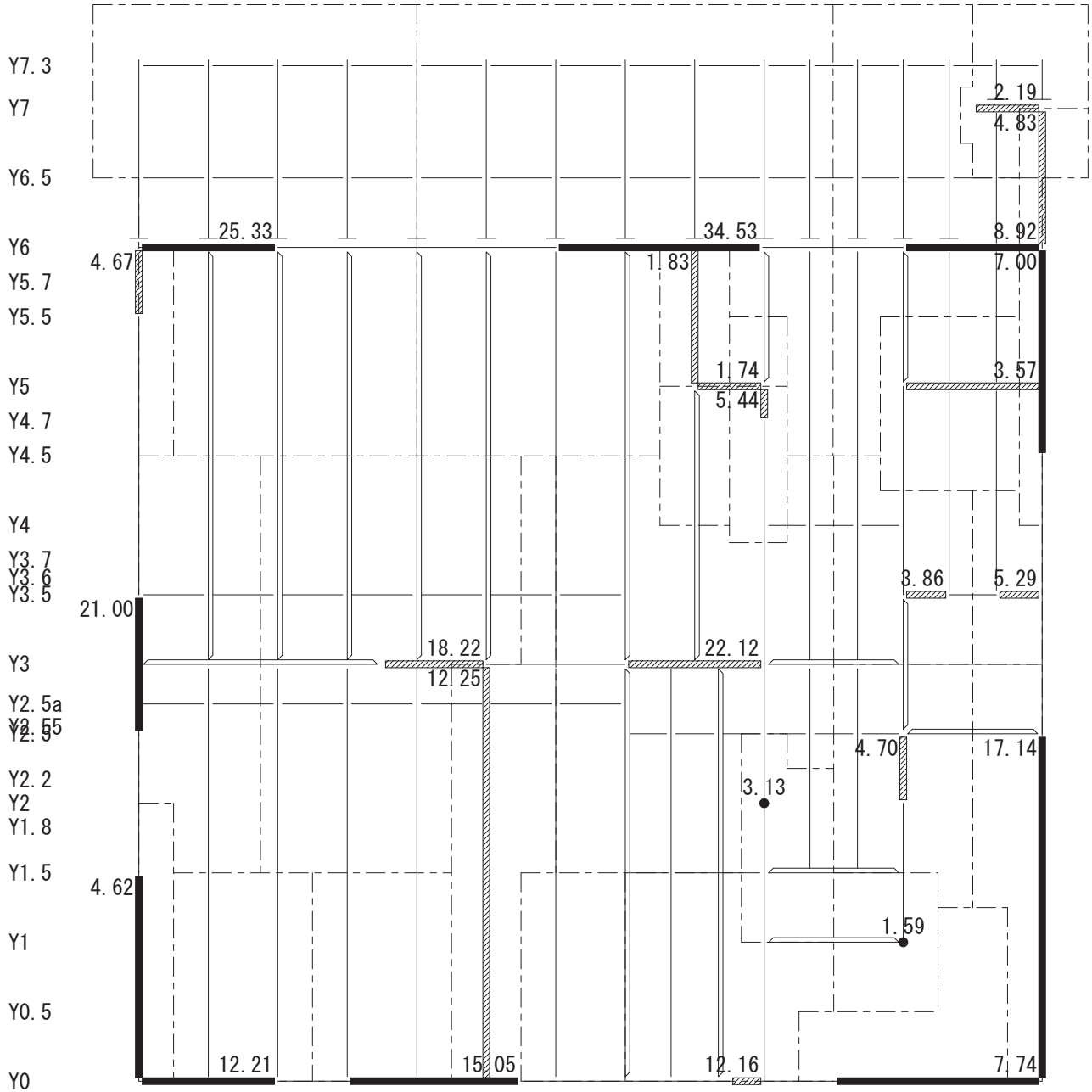
Y7.3

Y7



X0 X0.6 X1.7 X2.5 X3.5 X4.4 X5.5 X6.2 X6.5

1階（2階床）積雪時鉛直軸力（自階壁荷重をすべて含む）（kN）



X0 X0.67 X1 X1.7 X2 X2.5a X2.55 X3 X3.5 X3.6 X3.7 X4 X4.5 X4.7 X5 X5.5 X5.7 X6 X6.2 X6.5

Y7.3

Y7

Y6.5

Y6

Y5.7

Y5.5

Y5

Y4.7

Y4.5

Y4

Y3.7

Y3.6

Y3.5

Y3

Y2.5a

Y2.5

Y2.2

Y2

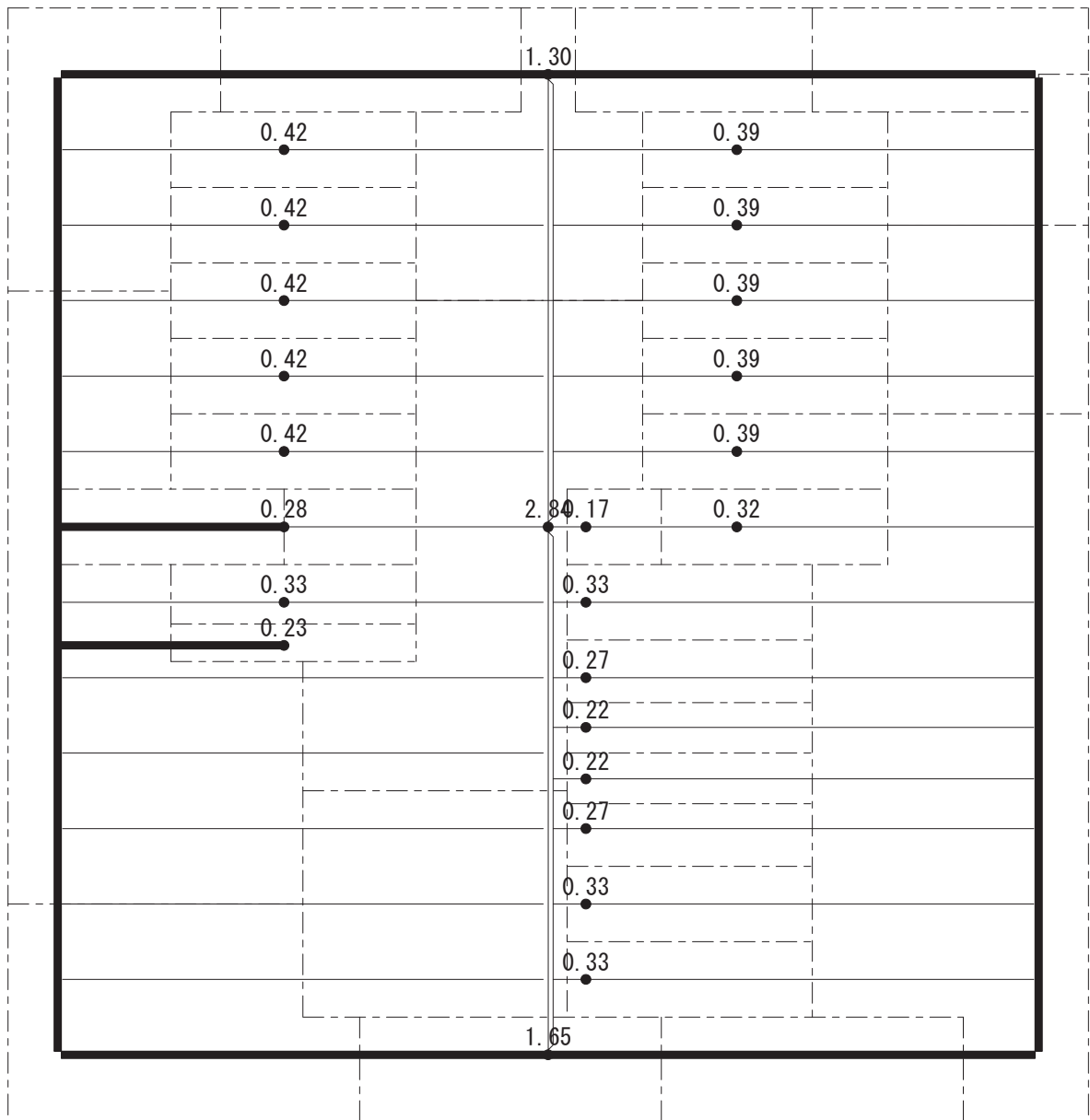
Y1.8

Y1.5

Y1

Y0.5

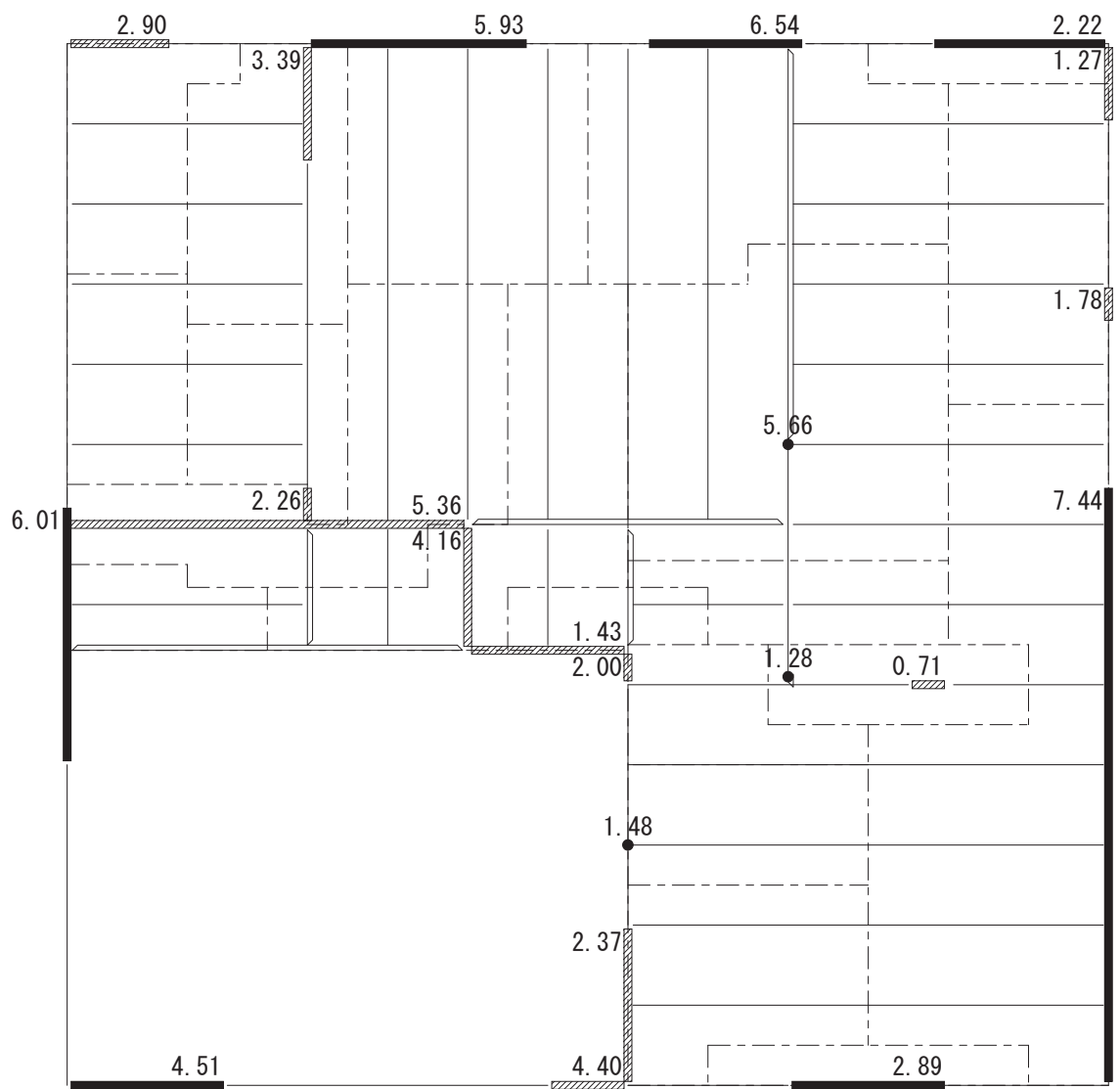
Y0



X0 X0.67 X1.17 X2.17 X3.17 X3.5 X4.17 X4.5 X5.17 X6.2 X6.5

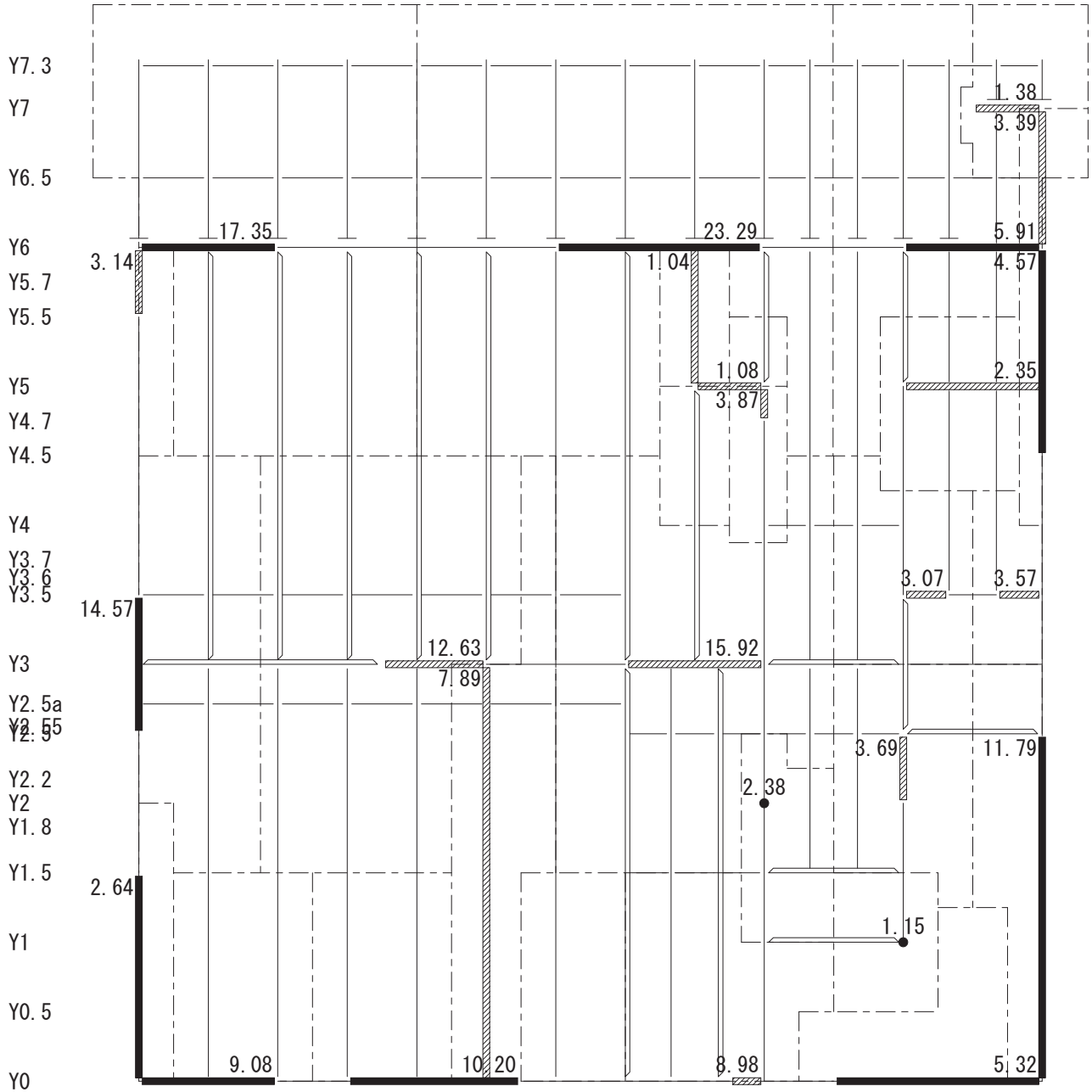
2階（屋根） 引き抜き検討用鉛直軸力（自階壁荷重の1/2を含む） (kN)

Y7.3
Y7
Y6.5
Y6
Y5.7
Y5.5
Y5
Y4.7
Y4.5
Y4
Y3.7
Y3.6
Y3.5
Y3
Y2.5a
Y2.5
Y2.2
Y2
Y1.8
Y1.5
Y1
Y0.5
Y0



X0 X0.6 X1.7 X2.7 X3.5 X4.1 X4.5 X5.5 X6.2 X6.5

1階（2階床） 引き抜き検討用鉛直軸力（自階壁荷重の1/2を含む）（kN）



X0 X0.6 X1 X1.7 X2 X2.7 X3 X3.5 X4 X4.5 X5 X5.5 X6 X6.5

2.2. 偏心率の計算

計算の原点は、座標の左下(X_0 , Y_0)とする。

L_x : 原点からのX方向距離
 L_y : 原点からのY方向距離

G_x : 原点からのX方向重心位置
 G_y : 原点からのY方向重心位置

K_x : 原点からのX方向剛心位置
 K_y : 原点からのY方向剛心位置

e_x : X方向偏心率
 e_y : Y方向偏心率

$$e_x = |G_x - K_x|$$

$$e_y = |G_y - K_y|$$

$J_x + J_y$: ねじり剛性

$$J_x = (\sum \alpha_i l_{ix} \cdot L_y^2) - (\sum \alpha_i l_{ix}) \cdot K_y^2$$

$$J_y = (\sum \alpha_i l_{iy} \cdot L_x^2) - (\sum \alpha_i l_{iy}) \cdot K_x^2$$

r_{ex} : X方向弾力半径
 r_{ey} : Y方向弾力半径

$$r_{ex} = \sqrt{(J_x + J_y) / (\sum \alpha_i l_{ix})}$$

$$r_{ey} = \sqrt{(J_x + J_y) / (\sum \alpha_i l_{iy})}$$

R_{ex} : X方向偏心率

R_{ey} : Y方向偏心率

$$R_{ex} = e_y / r_{ex}$$

$$R_{ey} = e_x / r_{ey}$$

α_i : 壁倍率

l_i : 耐力壁の長さ

2.2.1. 重心の計算
2階長期軸力
(◎=重心)

Y7.3

Y7

Y6.5

Y6

Y5.7

Y5.5

Y5

Y4.7

Y4.5

Y4

Y3.7

Y3.6

Y3.5

Y3

Y2.5a

Y2.5

Y2.2

Y2

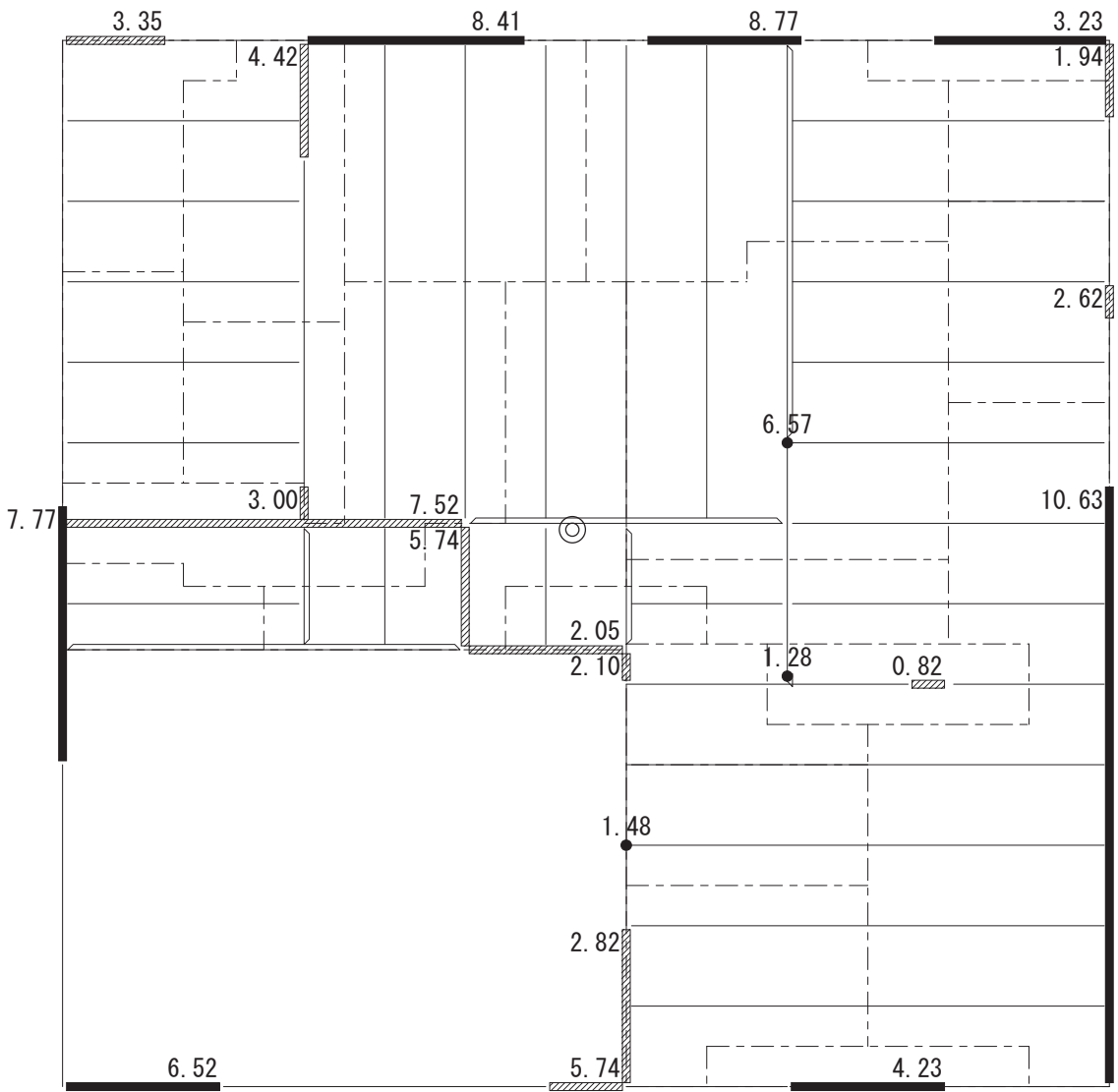
Y1.8

Y1.5

Y1

Y0.5

Y0



X0 X0.6 X1.7 X2.5 X3a X3.5 X3.8 X4.1 X4.5 X4.8 X5.5 X5.8 X6.2 X6.5

2階X方向

通り	W _i (kN)	L _{yi} (m)	W _i · L _{yi} (kN · m)
Y0	23.218	0.000	0.000
Y1	1.409	0.910	1.282
Y1.5	1.475	1.365	2.014
Y2	3.885	1.820	7.072
Y2.5	1.867	2.275	4.248
Y2.55	1.277	2.320	2.962
Y2.5a	5.970	2.470	14.745
Y3.5	11.894	3.185	37.883
Y3.6	3.885	3.300	12.822
Y3.7	6.818	3.413	23.267
Y4	6.565	3.640	23.897
Y4.7	1.312	4.323	5.671
Y5	1.312	4.550	5.970
Y5.7	2.212	5.233	11.576
Y6	0.971	5.460	5.301
Y6.5	26.938	5.915	159.338
計	101.010		318.048

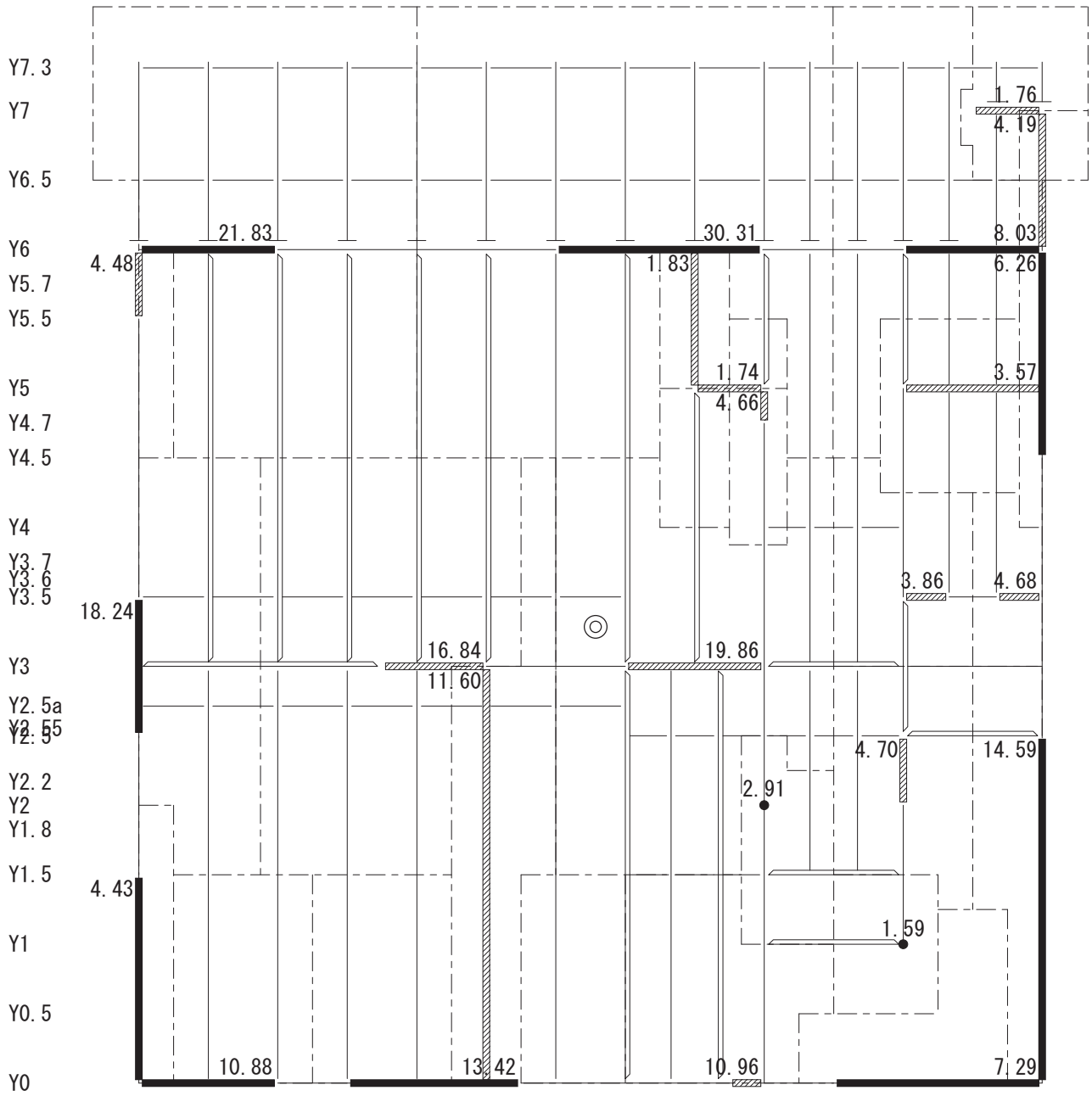
$$G_y = \sum (W_i \cdot L_{yi}) / \sum W_i = 318.048 / 101.010 = 3.149 \text{ (m)}$$

2階Y方向

通り	W _i (kN)	L _{xi} (m)	W _i · L _{xi} (kN · m)
X0	16.467	0.000	0.000
X0.6	1.673	0.600	1.004
X1	3.261	0.910	2.967
X1.5	11.631	1.365	15.877
X2.5	10.526	2.275	23.946
X2.9	4.205	2.630	11.059
X3	2.870	2.730	7.834
X3.5	10.288	3.185	32.766
X3.6	4.385	3.285	14.406
X4.5	9.957	4.095	40.773
X4.6	4.385	4.195	18.397
X5.3	0.409	4.778	1.954
X5.4	1.614	4.905	7.916
X5.5	2.524	5.005	12.632
X6.5	16.814	5.915	99.456
計	101.010		290.988

$$G_x = \sum (W_i \cdot L_{xi}) / \sum W_i = 290.988 / 101.010 = 2.881 \text{ (m)}$$

1階長期軸力
(◎=重心)



X0 X0.06 X1 X1.7 X2 X2.7 X3a X3.5 X3.8 X4.1 X4.5 X4.8 X5.1 X5.4 X5.8 X6.2 X6.5

1階X方向

通り	W _i (kN)	L _{yi} (m)	W _i · L _{yi} (kN · m)
Y0	57.874	0.000	0.000
Y1	1.589	0.910	1.446
Y1.5	2.214	1.365	3.022
Y2	5.256	1.820	9.565
Y2.5	18.764	2.275	42.687
Y3	42.511	2.730	116.055
Y3.5	17.660	3.185	56.246
Y4.5	3.131	4.095	12.821
Y4.7	2.329	4.323	10.067
Y5	8.556	4.550	38.931
Y5.5	2.240	5.005	11.212
Y6	68.545	5.460	374.256
Y7	3.849	6.370	24.519
計	234.517		700.827

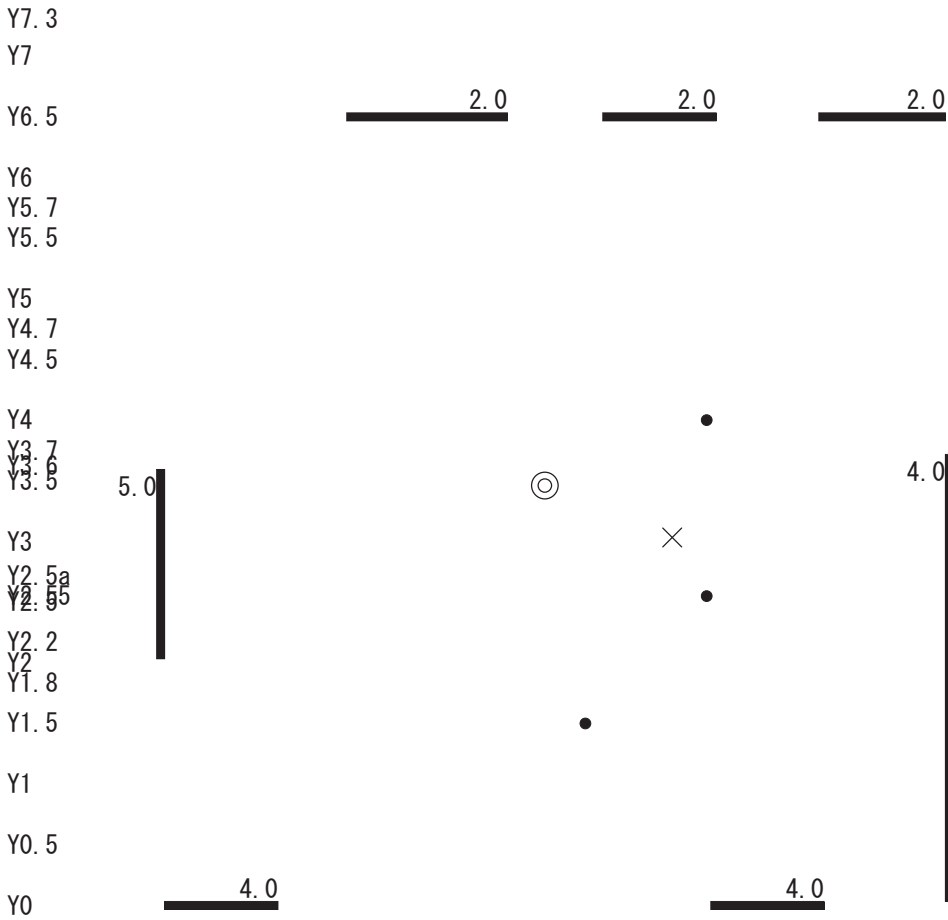
$$G_y = \frac{\sum (W_i \cdot L_{yi})}{\sum W_i} = \frac{700.827}{234.517} = 2.988 \text{ (m)}$$

1階Y方向

通り	W _i (kN)	L _{xi} (m)	W _i · L _{xi} (kN · m)
X0	43.506	0.000	0.000
X1	16.356	0.910	14.884
X1.5	6.712	1.365	9.162
X1.7	8.422	1.593	13.412
X2.5	20.027	2.275	45.561
X2.7	6.712	2.503	16.797
X3	15.155	2.730	41.373
X3.5	9.932	3.185	31.634
X4	2.699	3.640	9.825
X4.2	5.482	3.868	21.202
X4.4	15.155	4.085	61.908
X4.5	23.850	4.095	97.664
X5	3.645	4.550	16.586
X5.5	14.016	5.005	70.149
X5.8	1.930	5.305	10.241
X6	0.878	5.460	4.792
X6.2	2.339	5.615	13.134
X6.5	37.700	5.915	222.996
計	234.517		701.322

$$G_x = \frac{\sum (W_i \cdot L_{xi})}{\sum W_i} = \frac{701.322}{234.517} = 2.990 \text{ (m)}$$

2.2.2. 剛心の計算
 2階壁倍率
 (◎=重心 ×=剛心)



X0 X0.6 X1 X1.7 X2 X2.7 X3 X3.3 X4 X4.4 X5 X5.4 X6 X6.5
 2階X方向

通り	$\Sigma \alpha_{li}$	L_{yi} (m)	$\Sigma \alpha_{li} \cdot L_{yi}$	$\Sigma \alpha_{li} \cdot L_{yi}^2$
Y0	7.280	0.000	0.000	0.000
Y6.5	6.370	5.915	37.679	222.869
計	13.650		37.679	222.869

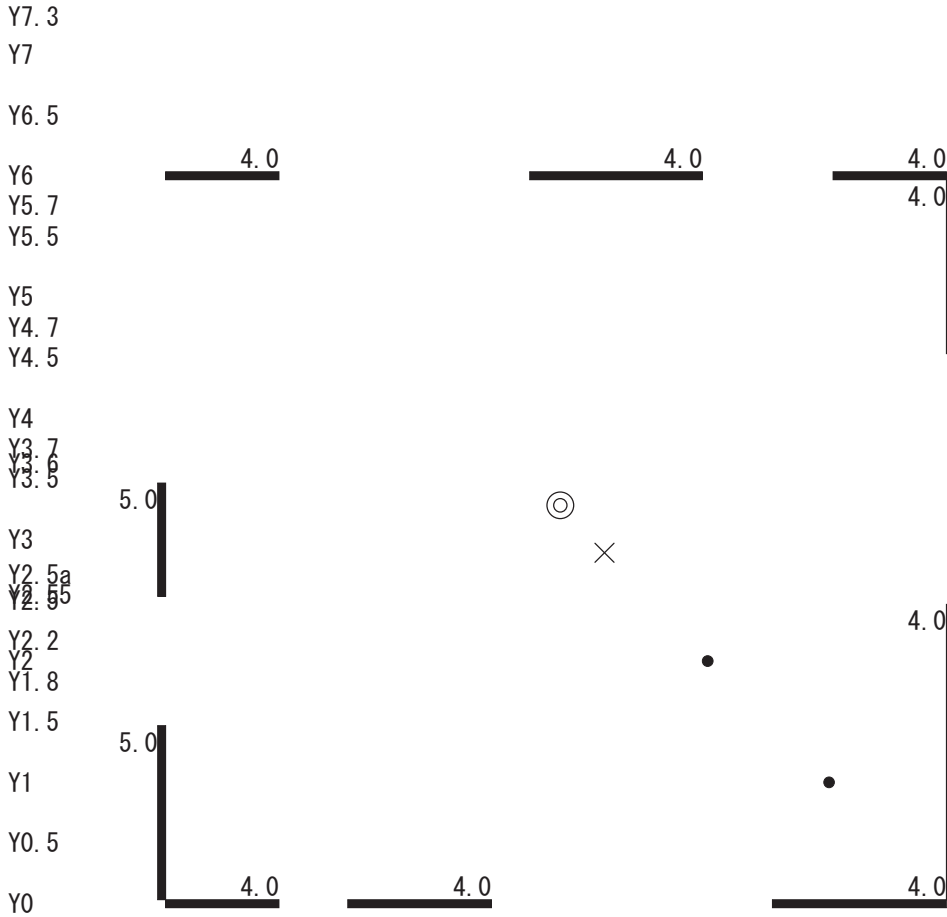
$K_y = \Sigma (\alpha_{li} \cdot L_{yi}) / \Sigma \alpha_{li} = 37.679 / 13.650 = 2.760$ (m)

2階Y方向

通り	$\Sigma \alpha_{li}$	L_{xi} (m)	$\Sigma \alpha_{li} \cdot L_{xi}$	$\Sigma \alpha_{li} \cdot L_{xi}^2$
X0	7.400	0.000	0.000	0.000
X6.5	13.650	5.915	80.740	477.576
計	21.050		80.740	477.576

$K_x = \Sigma (\alpha_{li} \cdot L_x) / \Sigma \alpha_{li} = 80.740 / 21.050 = 3.836$ (m)

1階壁倍率
(◎=重心 ×=剛心)



X0 X0.6 X1 X1.7 X2 X2.9 X3 X3.6 X4 X4.4 X5 X5.4 X6 X6.5

1階X方向

通り	$\sum \alpha_i l_i$	L_{yi} (m)	$\sum \alpha_i l_i \cdot L_{yi}$	$\sum \alpha_i l_i \cdot L_{yi}^2$
Y0	13.650	0.000	0.000	0.000
Y6	12.700	5.460	69.342	378.607
計	26.350		69.342	378.607

$$K_y = \frac{\sum (\alpha_i l_i \cdot L_{yi})}{\sum \alpha_i l_i} = \frac{69.342}{26.350} = 2.632 \text{ (m)}$$

1階Y方向

通り	$\sum \alpha_i l_i$	L_{xi} (m)	$\sum \alpha_i l_i \cdot L_{xi}$	$\sum \alpha_i l_i \cdot L_{xi}^2$
X0	11.375	0.000	0.000	0.000
X6.5	14.560	5.915	86.122	509.414
計	25.935		86.122	509.414

$$K_x = \frac{\sum (\alpha_i l_i \cdot L_{xi})}{\sum \alpha_i l_i} = \frac{86.122}{25.935} = 3.321 \text{ (m)}$$

2.2.3. 偏心率の計算（告示第1352号）

方向	階	G _y (m)	K _y (m)	e _y (m)	J _x + J _y	r _{ex} (m)	R _{ex}	
X	2	3.149	2.760	0.388	286.75	4.583	0.085	≦ 0.30 OK
	1	2.988	2.632	0.357	419.56	3.990	0.089	≦ 0.30 OK

方向	階	G _x (m)	K _x (m)	e _x (m)	J _x + J _y	r _{ey} (m)	R _{ey}	
Y	2	2.881	3.836	0.955	286.75	3.691	0.259	≦ 0.30 OK
	1	2.990	3.321	0.330	419.56	4.022	0.082	≦ 0.30 OK

2.3. 水平力に対する耐力壁の算定

2.3.1. 建物荷重の算定 () 内数値は、柱・梁用 積載荷重時

階	項目	単位重量	面積または長さ	W0 (kN)	Wi (kN)	Σ Wi (kN)
2	木質床(口フ)	1300 (2000)	8.75	11.38 (17.51)		
	屋根	760 (760)	16.62	12.63 (12.63)		
	屋根	460 (460)	27.13	12.48 (12.48)		
	天井	300	18.37	5.51		
	外壁2階	600	23.66 × 1.23	17.48		
	内壁2階	400	12.24 × 1.23	6.03		
	1F手摺壁	600	0.91	0.55		
	小屋壁	490	11.83	5.80		
	小屋壁	150	2.73	0.41		
	小屋壁	300	3.45	1.03		
	小屋壁	600	3.19	1.91		
	小屋壁	400	2.73	1.09		
	小屋壁	525	1.14	0.60	76.89 (83.02)	76.89 (83.02)
	1	外壁2階	600	23.66 × 1.23	17.48	
内壁2階		400	12.24 × 1.23	6.03		
床		1300 (2000)	28.57	37.14 (57.14)		
階段		900 (1600)	5.59	5.03 (8.94)		
屋根		760 (760)	7.39	5.62 (5.62)		
天井		300	0.83	0.25		
外壁1階		600	24.12 × 1.38	19.89		
内壁1階		400	15.70 × 1.38	8.63		
2F手摺壁		600	3.38	2.03		
2F建具		300	4.71	1.41		
2F非耐力壁		1000	4.36	4.36		
2F手摺壁		500	1.37	0.68		
2F階段上壁		600	0.91	0.55	109.09 (133.00)	185.98 (216.02)
F		外壁1階	600	24.12 × 1.38	19.89	
	内壁1階	400	15.70 × 1.38	8.63		
	床	1000 (1700)	26.91	26.91 (45.75)		
	浴室	3000 (3000)	3.31	9.94 (9.94)		
	土間床	1250 (1950)	2.48	3.11 (4.84)		
	1F非支持壁	1000	4.55	4.55		
	1F建具	300	0.91	0.27		
	1F階段下壁	500	0.91	0.46		
	1F手摺壁	400	0.68	0.27	74.04 (94.61)	260.02 (310.63)

2.3.2. 地震力の算定

地震地域係数 Z = 1.00

一次固有周期 T = 0.204

 $\alpha_i = \Sigma W_i / \Sigma W_1$ $A_i = 1 + (1/\sqrt{\alpha_i} - \alpha_i) \times (2T) / (1 + 3T)$ $C_i = C_0 \times Z \times A_i$ $L_{e2} = eQ_i \times 1/1.960 \text{ (kN/m)}$

階	Wi (kN)	Σ Wi (kN)	α_i	Ai	Ci	eQi (kN)	Le2 (m)
2	76.89	76.89	0.413	1.289	0.322	24.78	12.644
1	109.09	185.98	1.000	1.000	0.250	46.50	23.722

2.3.3. 風圧力の算定

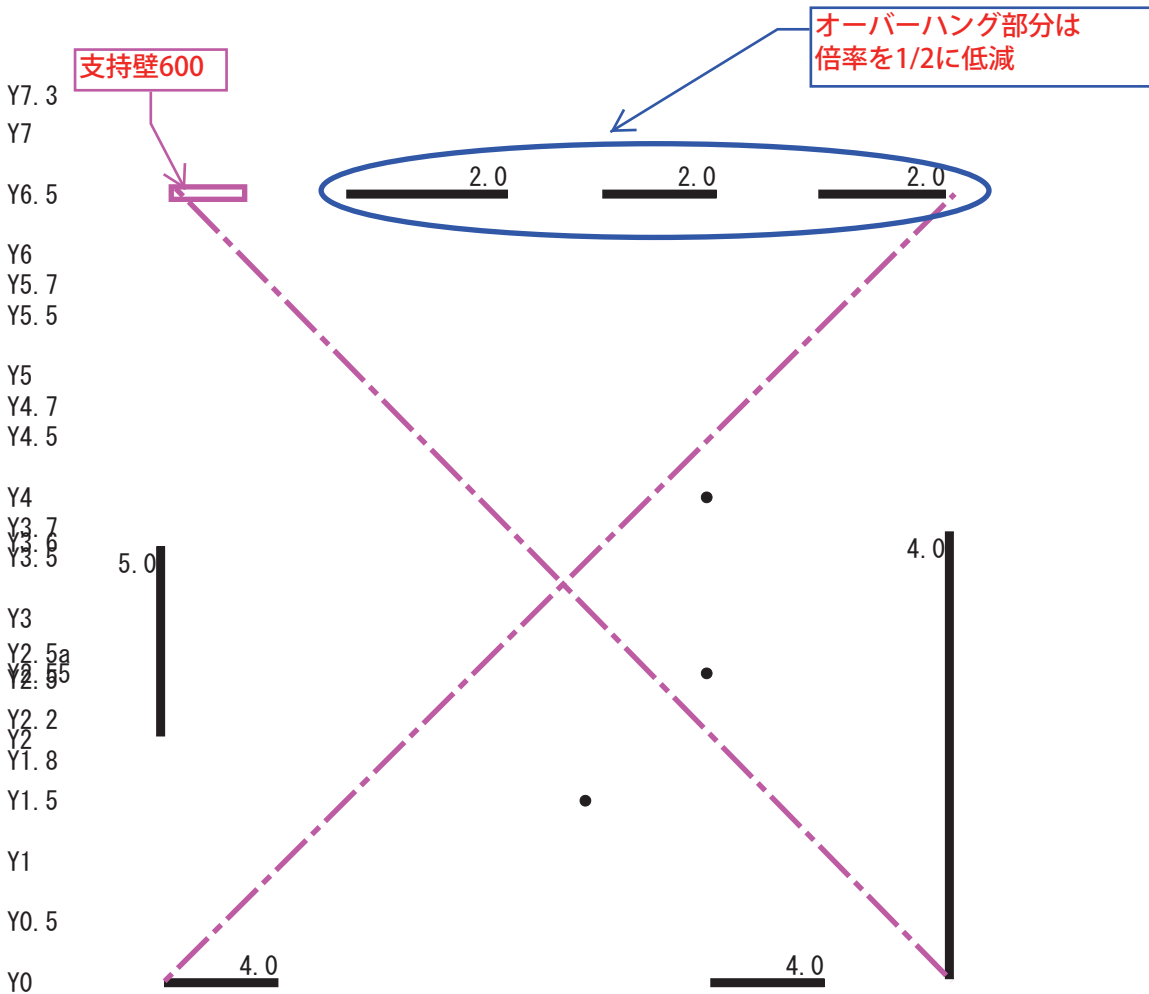
$$\text{速度圧 } q = 937 \text{ (N/m}^2\text{)}$$

$$Lw2 = \sum wQi \times 1/1.960 \text{ (kN/m)}$$

方向	階	ΣC	A_w (m^2)	wQ (kN)	wQi (kN)	ΣwQi (kN)	$Lw2$ (m)
X	2	0.69	13.40	8.643	15.844	15.844	8.084
		1.11	6.94	7.201			
	1	1.11	8.39	8.706	18.408	34.253	17.476
		1.11	9.35	9.702			
Y	2	1.20	6.96	7.829	15.020	15.020	7.663
		1.11	6.93	7.191			
	1	1.11	8.42	8.737	17.889	32.909	16.790
		1.11	8.82	9.152			

2.4. 耐力壁の配置と有効壁長 L d の算定

2階耐力壁の配置



X0 X0.6 X1 X1.7 X2 X2.7 X3 X3.3 X4 X4.4 X5 X5.4 X6 X6.5

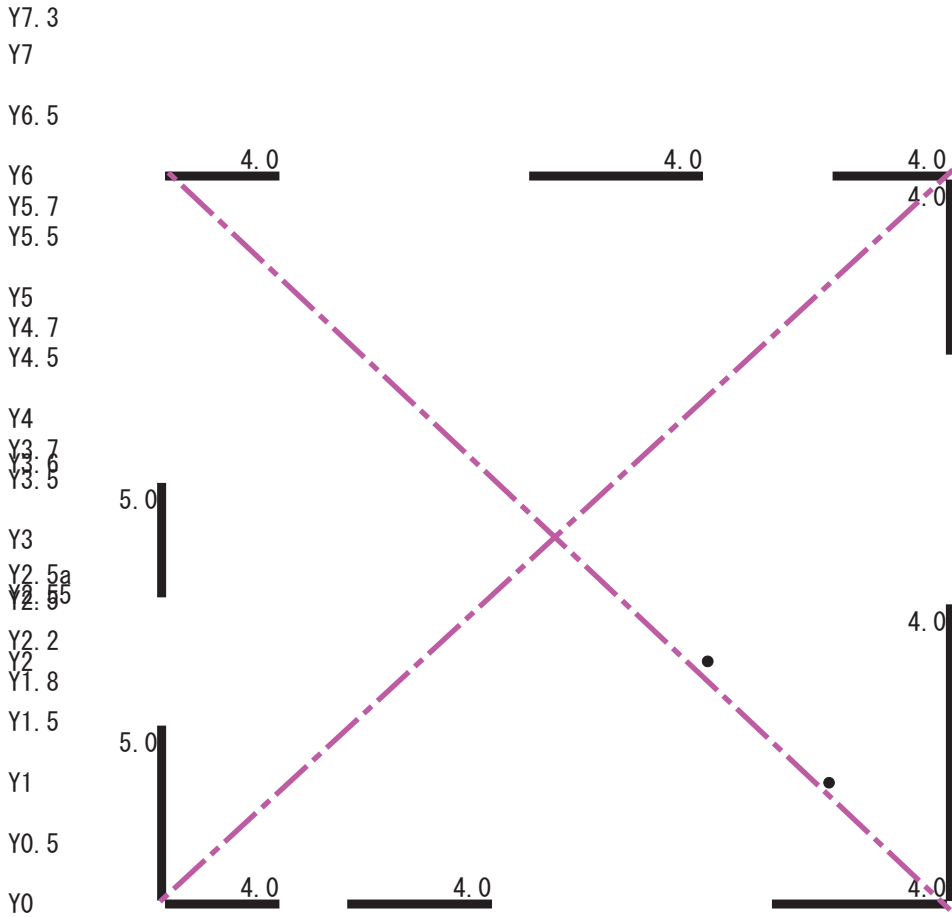
2階X方向

通り	αl_i		L d	負担せん断力Pi (kN)	負担地震力 (kN)	負担風圧力 (kN)
Y0	4.0	x 1.820	7.280	14.269	13.217	8.450
Y6.5	2.0	x 3.185	6.370	12.485	11.565	7.394
計			13.650	26.754	24.782	15.844

2階Y方向

通り	αl_i		L d	負担せん断力Pi (kN)	負担地震力 (kN)	負担風圧力 (kN)
X0	5.0	x 1.480	7.400	14.504	8.712	5.280
X6.5	4.0	x 3.413	13.650	26.754	16.070	9.740
計			21.050	41.258	24.782	15.020

1階耐力壁の配置



X0 X6.5 X13.0 Y0 Y1.5 Y2.2 Y2.5a Y2.5b Y3.5 Y3.6 Y3.7 Y4 Y4.5 Y4.7 Y5 Y5.5 Y5.7 Y6

1階X方向

通り	α		l_i	L d	負担せん断力 P_i (kN)	負担地震力 (kN)	負担風圧力 (kN)
Y0	4.0	x	3.413	13.650	26.754	24.086	17.744
Y6	4.0	x	3.175	12.700	24.892	22.410	16.509
計				26.350	51.646	46.495	34.253

1階Y方向

通り	α		l_i	L d	負担せん断力 P_i (kN)	負担地震力 (kN)	負担風圧力 (kN)
X0	5.0	x	2.275	11.375	22.295	20.393	14.434
X6.5	4.0	x	3.640	14.560	28.538	26.103	18.475
計				25.935	50.833	46.495	32.909

2.5. 枠組壁工法技術基準告示 耐力壁算定に定める壁量の算定 (告示第1540号)

2.5.1. 地震力に対する必要壁量の表

軽い屋根として設計
地盤種別 2種 (1.0)

階	床面積 m ²	単位壁量 m/m ²	地盤種別	必要壁量 Le1 (m)
2	34.99	0.150	1.0	5.249
1	32.71	0.290	1.0	9.486

2.5.2. 風圧力に対する必要壁量の表

X方向の壁長

階	各階見付面積 Aw (m ²)	ΣAw (m ²)	必要壁量 Lw1 ΣAw × 0.50 (m)
2	20.34	20.34	10.17
1	17.74	38.08	19.04

Y方向の壁長

階	各階見付面積 Aw (m ²)	ΣAw (m ²)	必要壁量 Lw1 ΣAw × 0.50 (m)
2	13.89	13.89	6.95
1	17.24	31.13	15.57

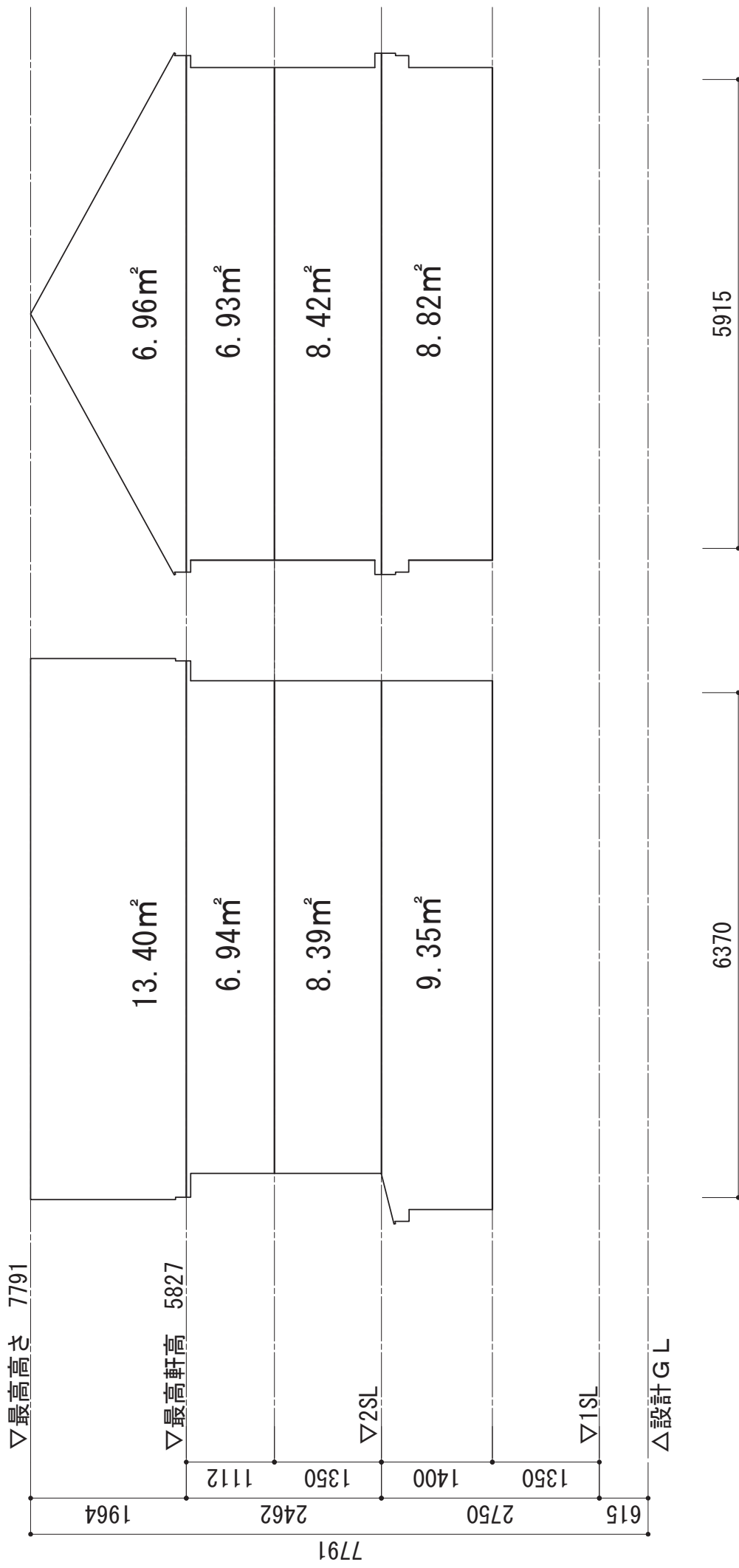
2.5.3. Ld/Lnの比率の表 (Ld/Ln > 1)

		風力に対して				地震力に対して				
		X方向		Y方向		X方向		Y方向		
		壁長	Ld/Ln	壁長	Ld/Ln	壁長	Ld/Ln	壁長	Ld/Ln	
2階	Ld	13.65	1.34	21.05	3.03	13.65	2.60	21.05	4.01	≥ 1.0 OK
	Ln	10.17		6.95		5.25		5.25		
1階	Ld	26.35	1.38	25.94	1.67	26.35	2.78	25.94	2.73	≥ 1.0 OK
	Ln	19.04		15.57		9.49		9.49		

2.6. 必要壁量の算定

Le1 : 告示床面積による必要壁量
Le2 : 地震力による必要壁量
Lw1 : 告示見付面積による必要壁量
Lw2 : 風圧力による必要壁量

方向	階	Ld (m)	地震時				風圧時			
			Le1	Le2	Le/Ld	判定	Lw1	Lw2	Lw/Ld	判定
X	2	13.65	5.25	12.64	0.93	OK	10.17	8.08	0.75	OK
	1	26.35	9.49	23.72	0.90	OK	19.04	17.48	0.72	OK
Y	2	21.05	5.25	12.64	0.60	OK	6.95	7.66	0.36	OK
	1	25.94	9.49	23.72	0.91	OK	15.57	16.79	0.65	OK



Y方向見付面積

X方向見付面積

3. 各部の設計

3.1. 水平力による耐力壁の応力

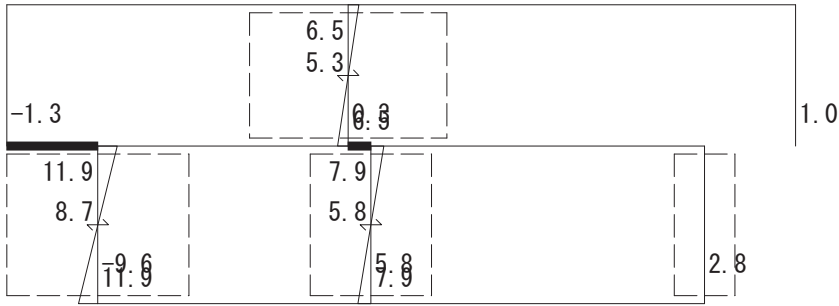
曲げモーメント (kN・m)

せん断力 (kN)

軸力 (kN)

風圧力による応力 (部材用)

X0通り



R階

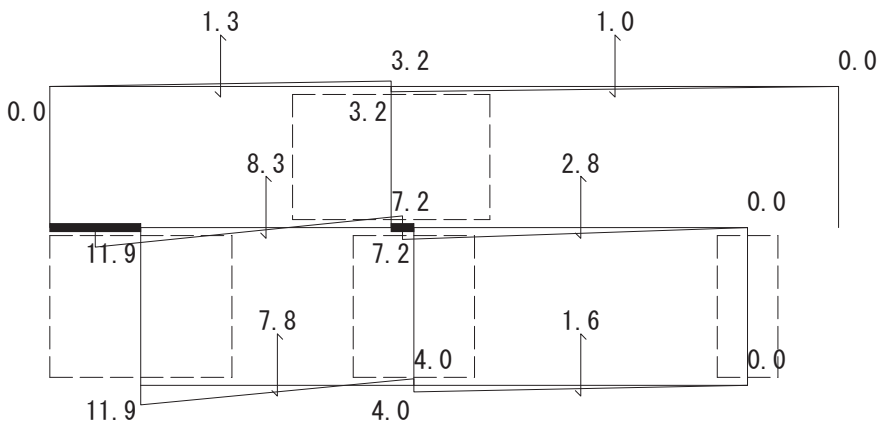
2.46 (m)

2階

2.75 (m)

1階

Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.76 Y6.5 Y7 Y7.3

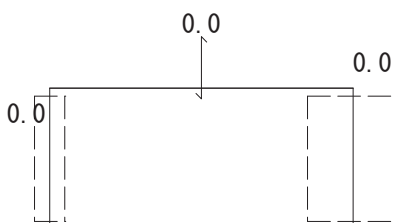


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.76 Y6.5 Y7 Y7.3

X1.5通り

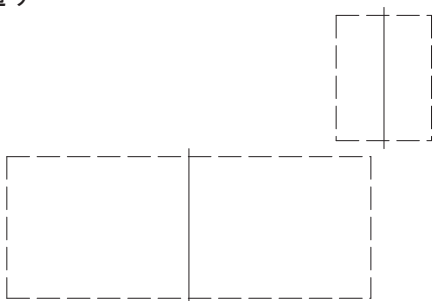


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

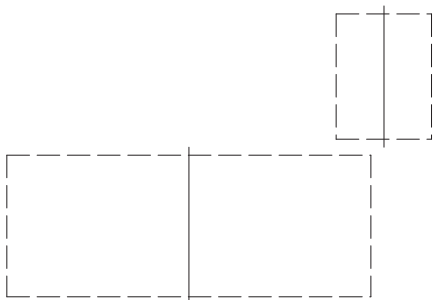


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

X2.5通り

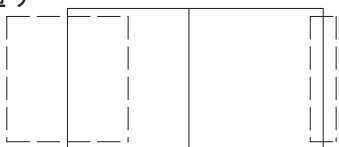


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

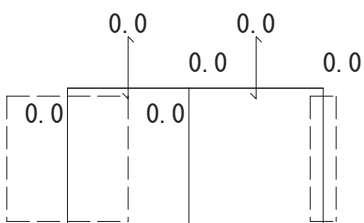


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

X3.5通り

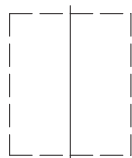


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6.5 Y7 Y7.3

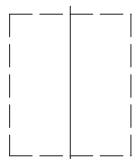


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6.5 Y7 Y7.3

X4通り

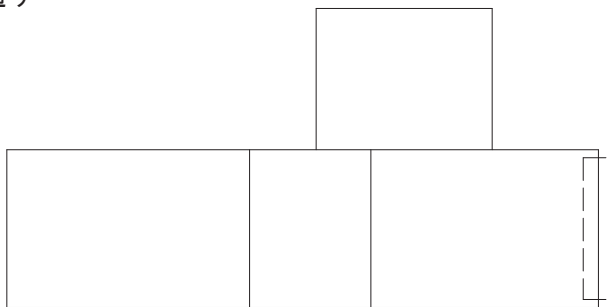


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6.5 Y7 Y7.3

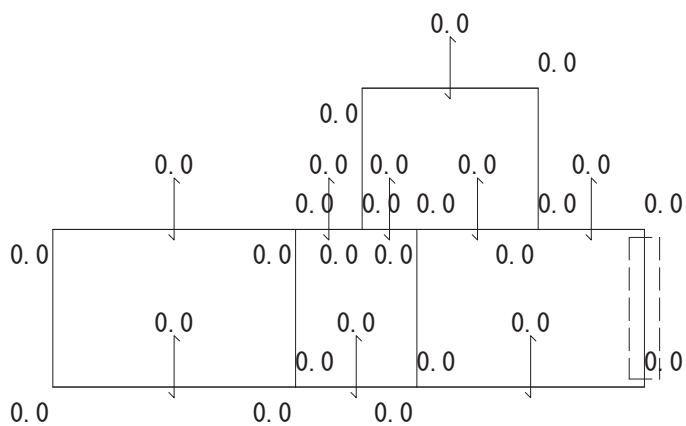


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6.5 Y7 Y7.3

X4.5通り

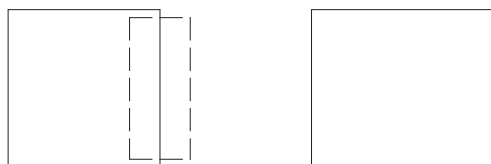


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

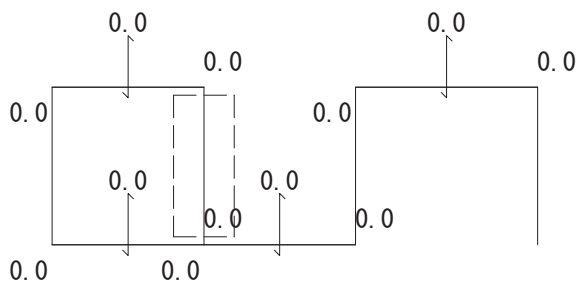


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X5.5通り

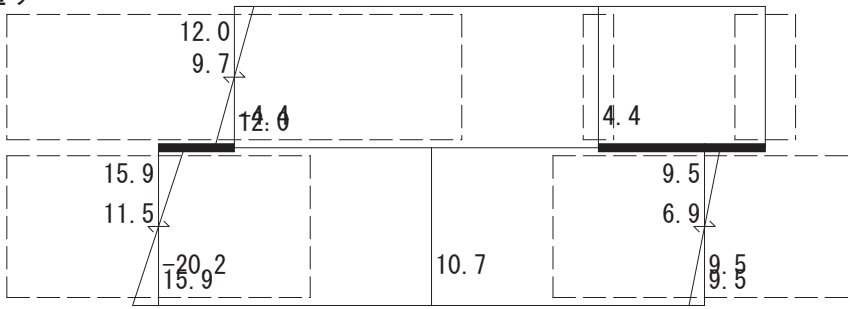


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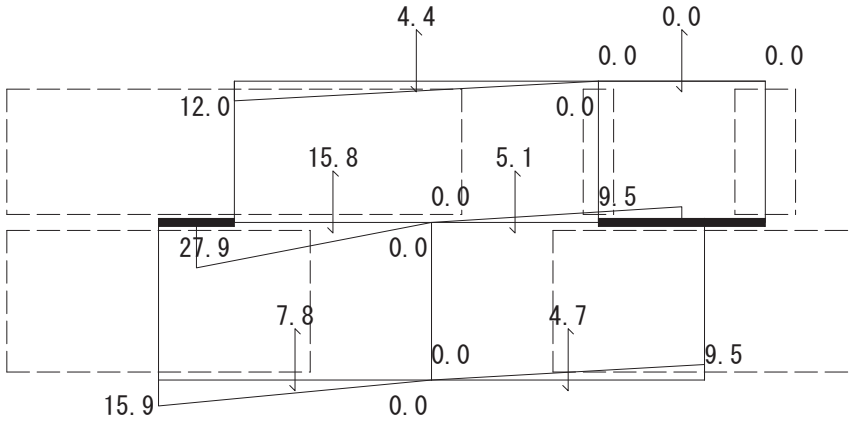


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X6.5通り

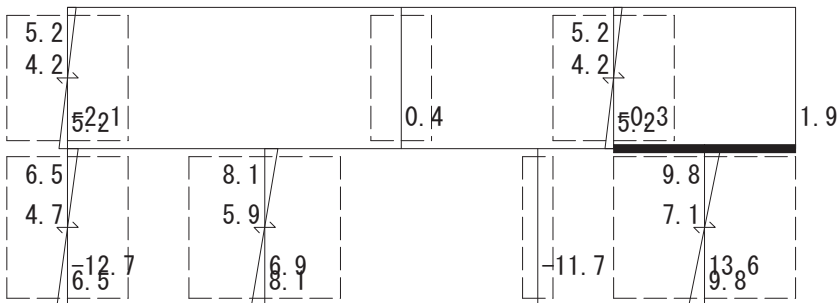


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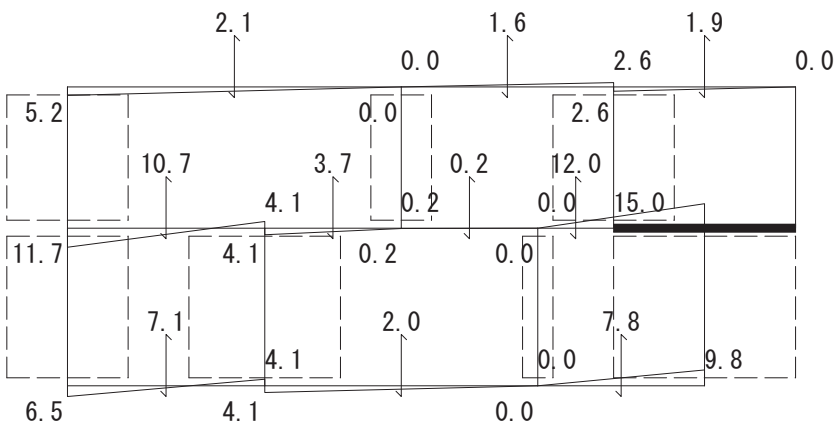


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

Y0通り

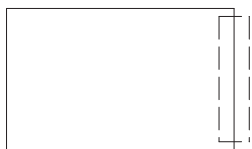


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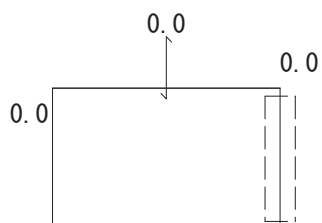


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Y2.5通り

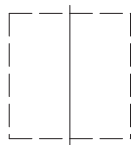


X0 X00671 X1.X1.72 X2.X279X3X356.X44.X440.X55.X54X5.X66.X6.5

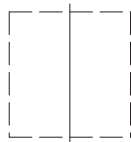


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Y2.5a通り

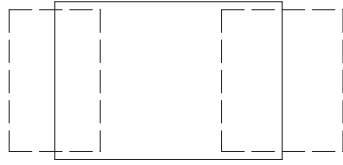


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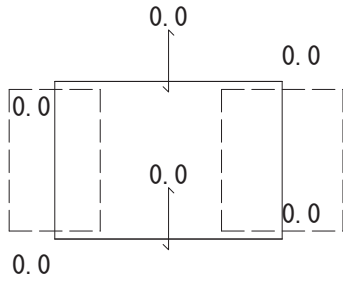


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Y3通り

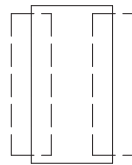
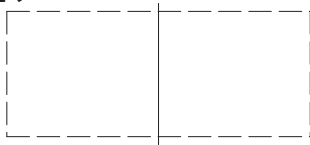


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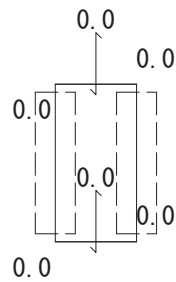
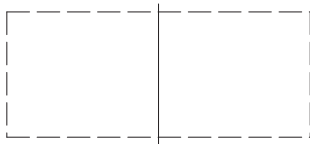


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Y3.5通り

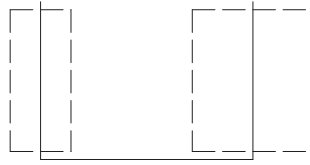


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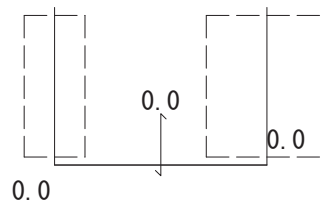


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Y5通り

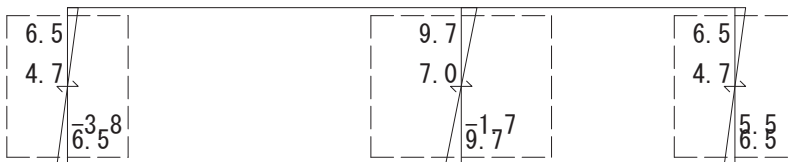


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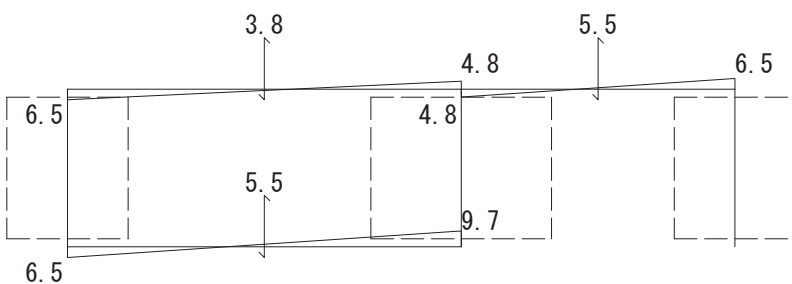


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Y6通り

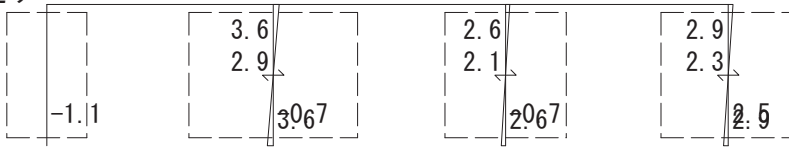


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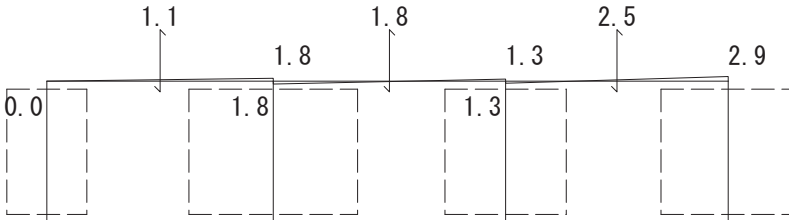


X0 X000.6X1 X1.X5.7X2 X2.X27X9X3X8X3X6.044 X2.4X0.055 X5.4X5.066 X6.5

Y6.5通り



X0 X006 X1 X1.72 X2 X279 X3 X336 X4 X440 X5 X545 X6 X6.5



X0 X006 X1 X1.72 X2 X279 X3 X336 X4 X440 X5 X545 X6 X6.5

Y7通り

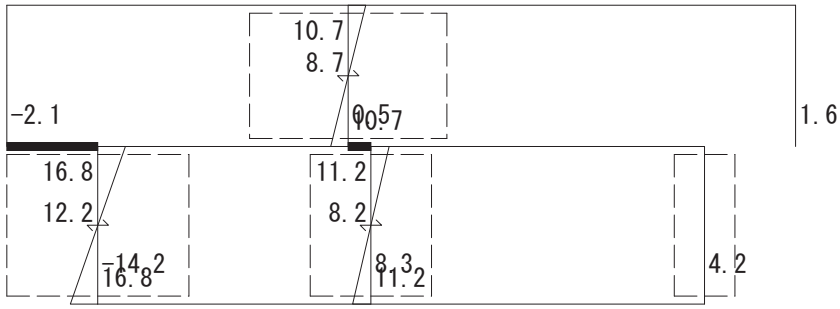


X0 X006 X1 X1.72 X2 X279 X3 X336 X4 X440 X5 X545 X6 X6.5



X0 X006 X1 X1.72 X2 X279 X3 X336 X4 X440 X5 X545 X6 X6.5

X0通り



R階

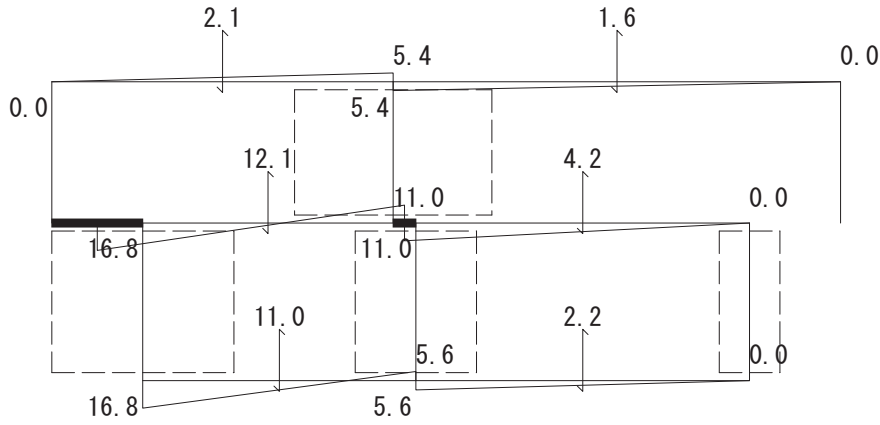
2.46 (m)

2階

2.75 (m)

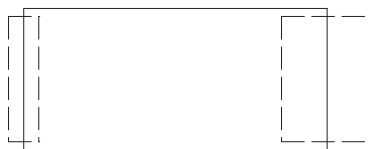
1階

Y0 Y0.5 Y1 Y1.5 Y1.8 Y2.1 Y2.5 Y3 Y3.6 Y4 Y4.4 Y5 Y5.7 Y6.5 Y7 Y7.3

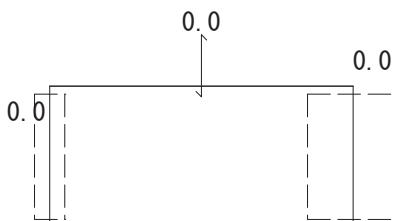


Y0 Y0.5 Y1 Y1.5 Y1.8 Y2.1 Y2.5 Y3 Y3.6 Y4 Y4.4 Y5 Y5.7 Y6.5 Y7 Y7.3

X1.5通り

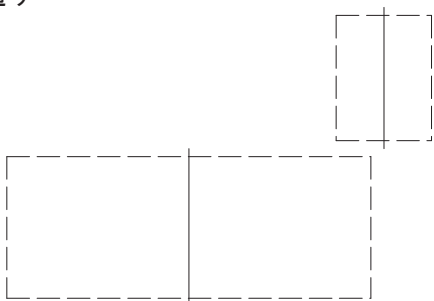


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6.5 Y7 Y7.3

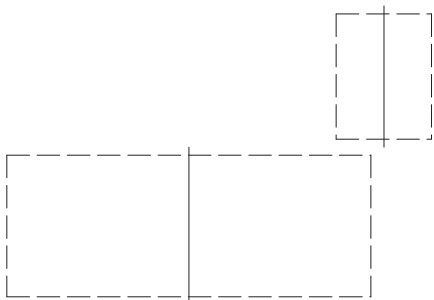


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6.5 Y7 Y7.3

X2.5通り

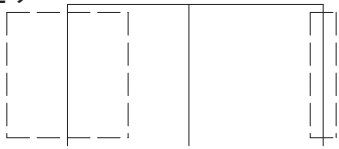


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6.5 Y7 Y7.3

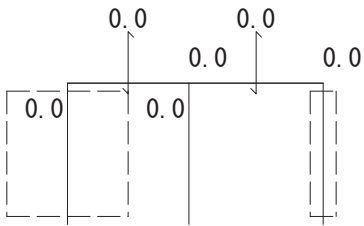


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6.5 Y7 Y7.3

X3.5通り

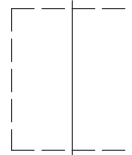


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

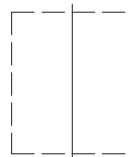


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

X4通り

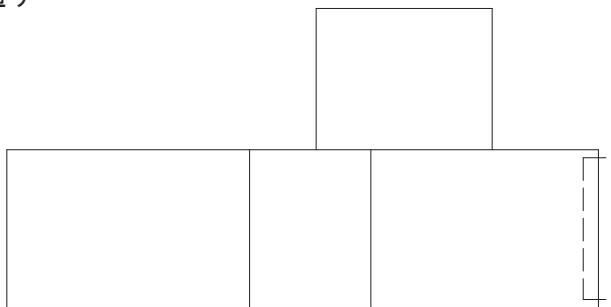


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

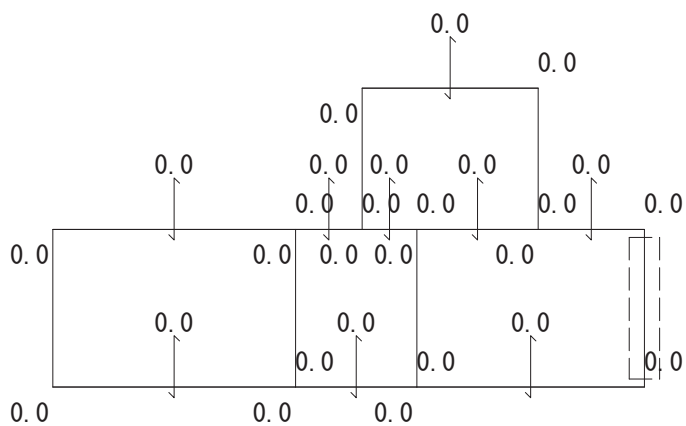


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

X4.5通り

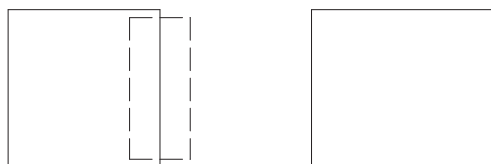


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

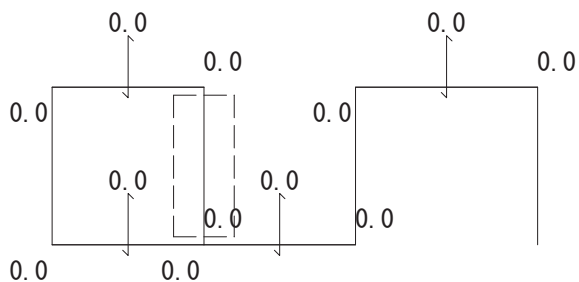


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

X5.5通り

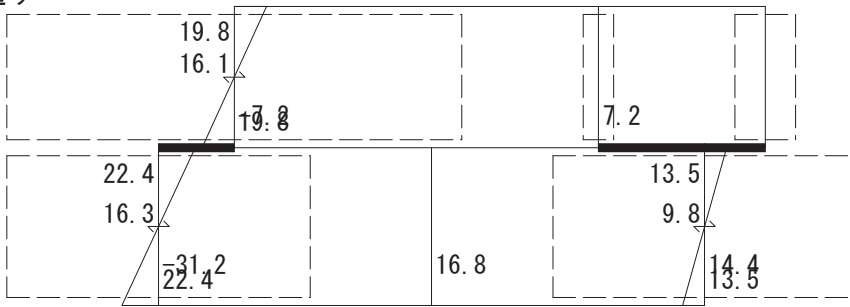


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

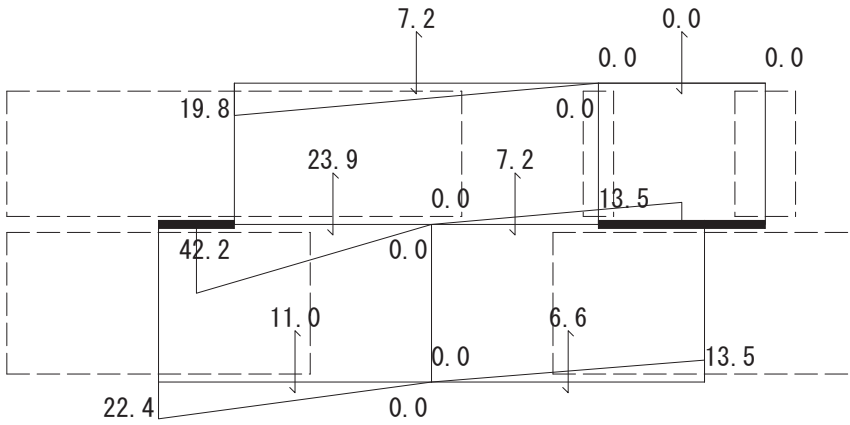


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X6.5通り

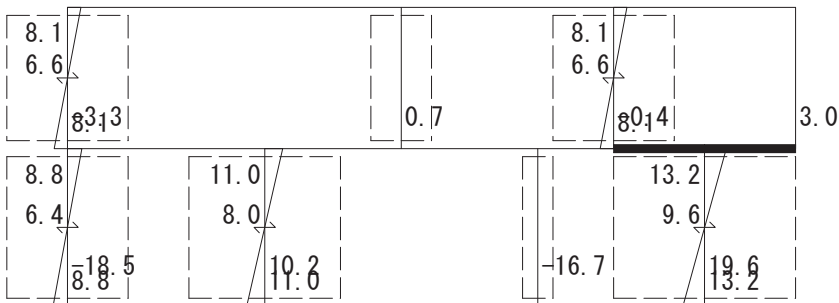


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

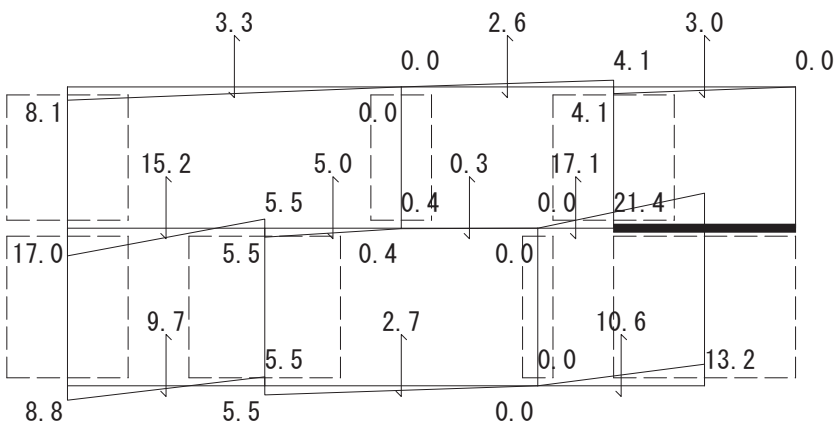


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

Y0通り

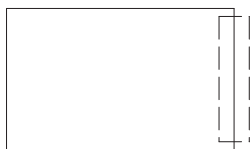


X0 X0.5 X1 X1.5 X2 X2.5 X3 X3.5 X4 X4.5 X5 X5.5 X6 X6.5

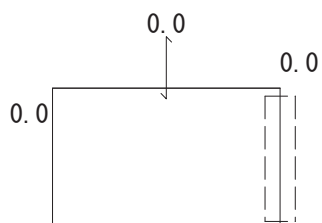


X0 X0.5 X1 X1.5 X2 X2.5 X3 X3.5 X4 X4.5 X5 X5.5 X6 X6.5

Y2. 5通り

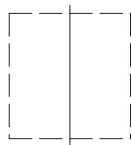


X0 X00671 X1.X1.72 X2.X279X3X356.X44.X440.X55.X54X5.X66.X6.5

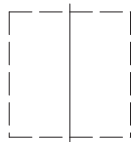


X0 X00671 X1.X1.72 X2.X279X3X356.X44.X440.X55.X54X5.X66.X6.5

Y2. 5a通り

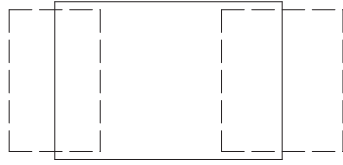


X0 X00671 X1.X1.72 X2.X279X3X356.X44.X440.X55.X54X5.X66.X6.5

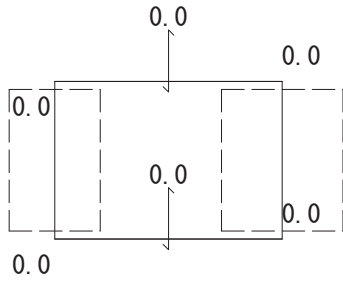


X0 X00671 X1.X1.72 X2.X279X3X356.X44.X440.X55.X54X5.X66.X6.5

Y3通り

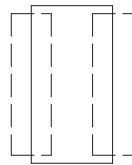
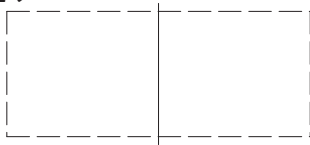


X0 X00.6X1 X1.X5.72 X2.X27X9X3&X356.X44.X2440.X55.X54&5.X66.X6.5

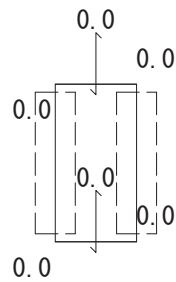
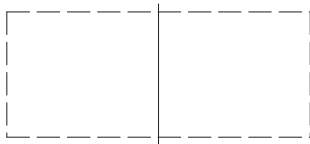


X0 X00.6X1 X1.X5.72 X2.X27X9X3&X356.X44.X2440.X55.X54&5.X66.X6.5

Y3.5通り

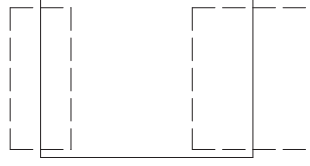


X0 X00.6X1 X1.X5.72 X2.X27X9X3&X356.X44.X2440.X55.X54&5.X66.X6.5

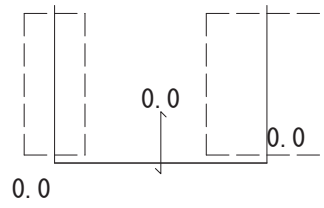


X0 X00.6X1 X1.X5.72 X2.X27X9X3&X356.X44.X2440.X55.X54&5.X66.X6.5

Y5通り

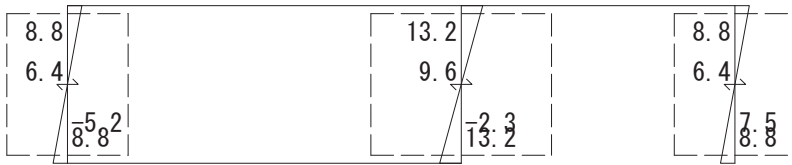


X0 X000.6X1 X1.X5.7X2 X2.X27X9X3X8X3X6.044 X2.4X0.055 X5.4X5.066 X6.5

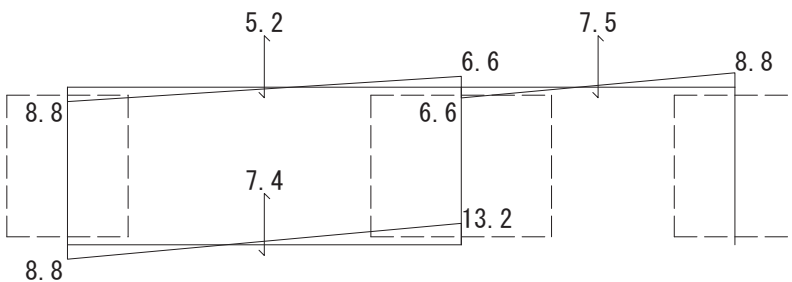


X0 X000.6X1 X1.X5.7X2 X2.X27X9X3X8X3X6.044 X2.4X0.055 X5.4X5.066 X6.5

Y6通り

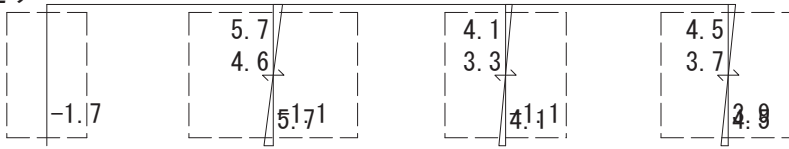


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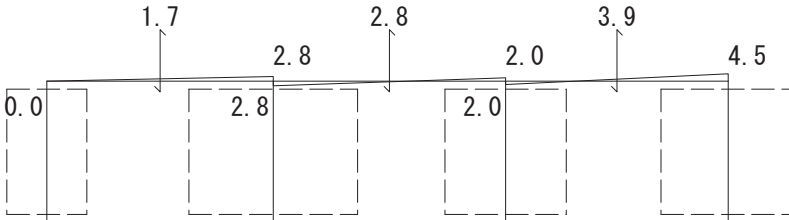


X0 X000.6X1 X1.X5.7X2 X2.X27X9X3X8X3X6.044 X2.4X0.055 X5.4X5.066 X6.5

Y6.5通り



X0 X0006X1 X1.X5.72 X2.X27X9X3X356.X44.X2470.X55.X54X5.X66.X6.5



X0 X0006X1 X1.X5.72 X2.X27X9X3X356.X44.X2470.X55.X54X5.X66.X6.5

Y7通り

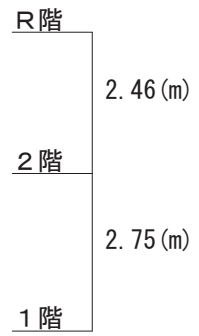
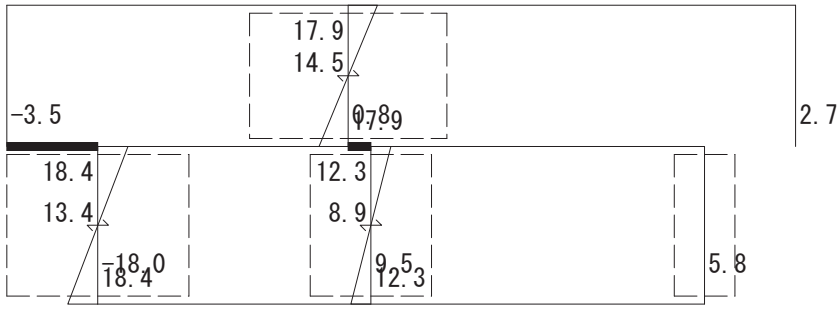


X0 X0006X1 X1.X5.72 X2.X27X9X3X356.X44.X2470.X55.X54X5.X66.X6.5

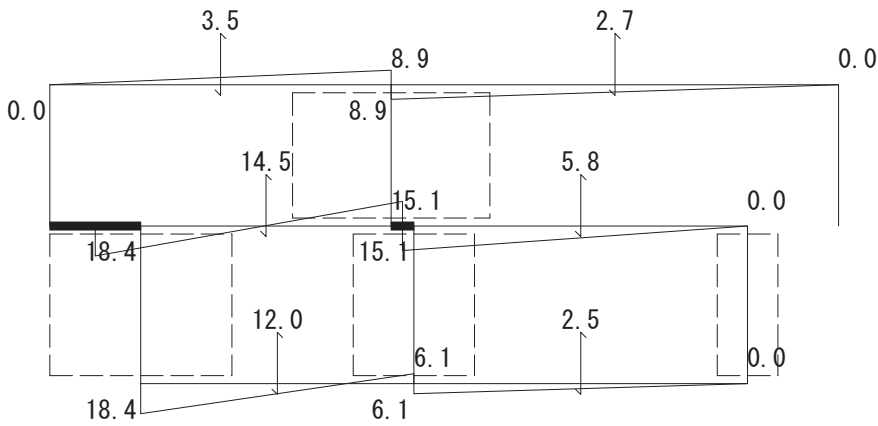


X0 X0006X1 X1.X5.72 X2.X27X9X3X356.X44.X2470.X55.X54X5.X66.X6.5

X0通り



Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

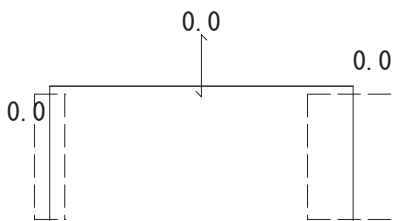


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

X1.5通り

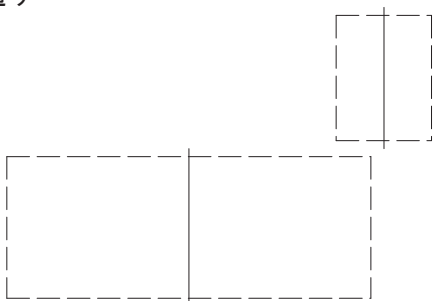


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

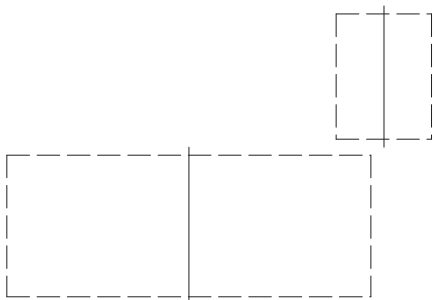


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

X2.5通り

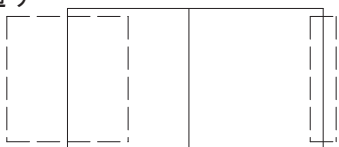


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

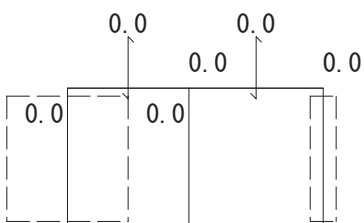


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

X3.5通り

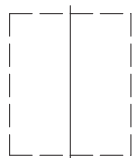


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

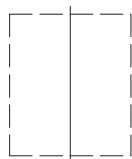


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

X4通り

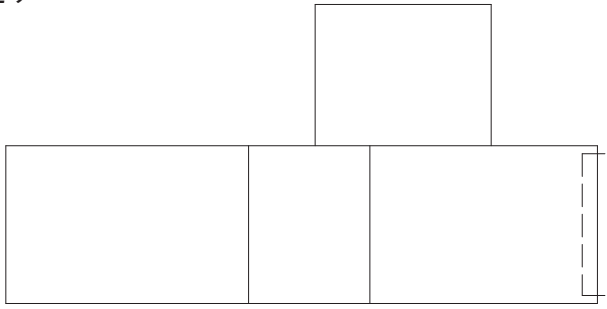


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

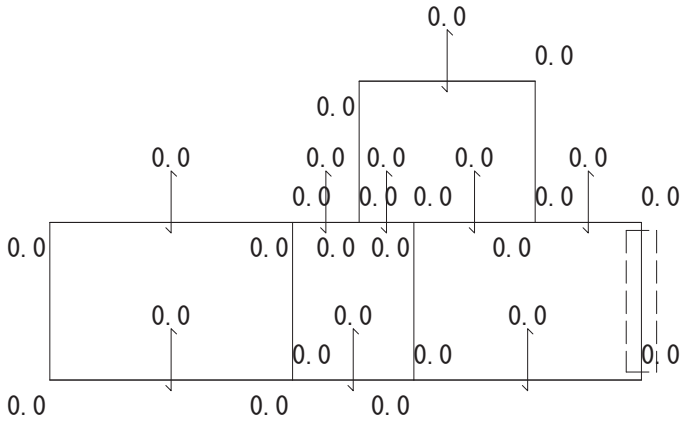


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

X4.5通り

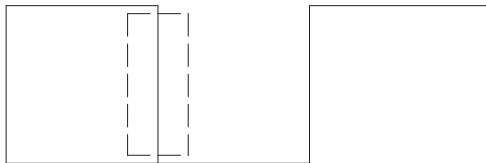


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

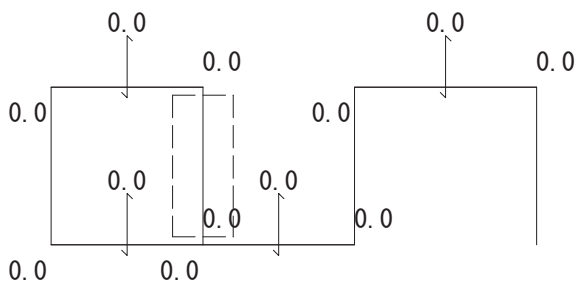


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

X5.5通り

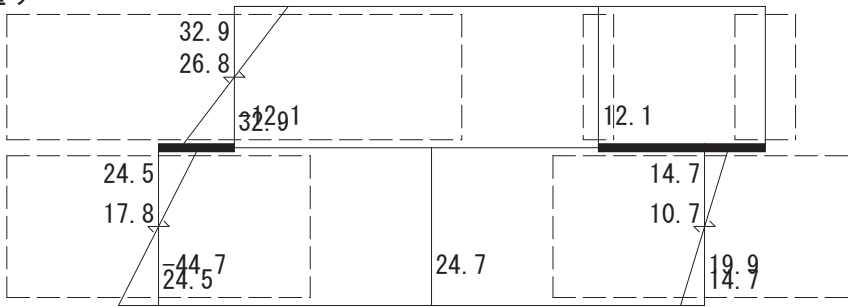


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

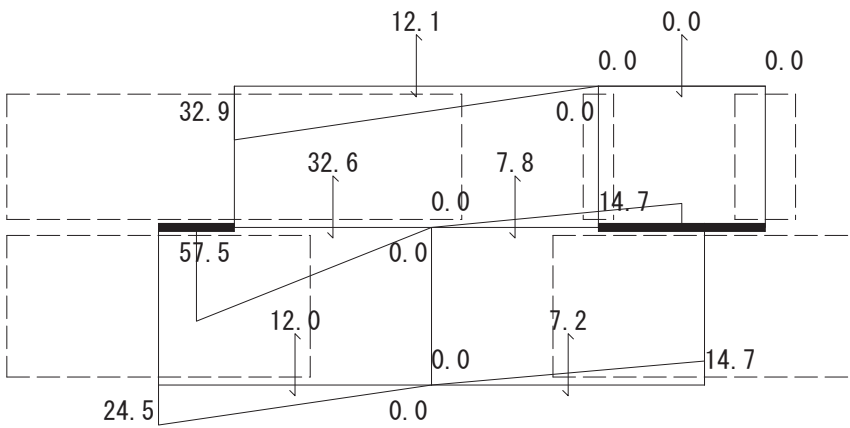


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

X6.5通り

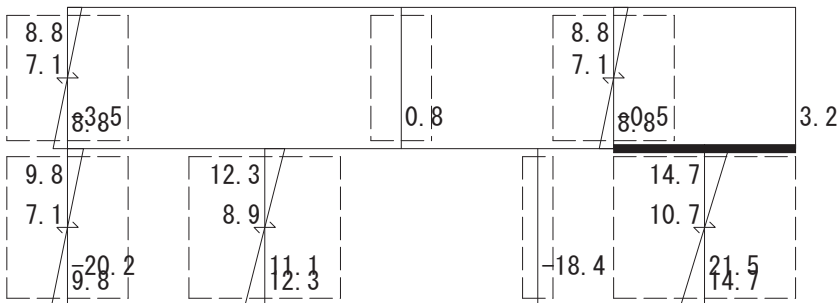


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

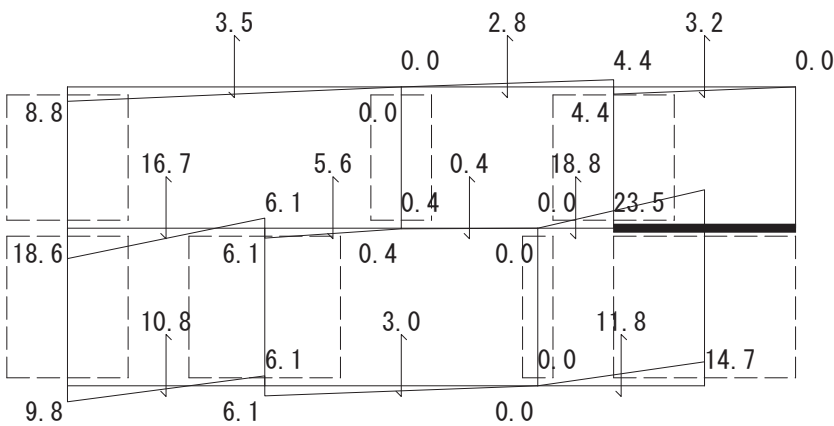


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

Y0通り

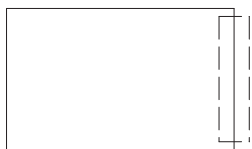


X0 X0.5 X1 X1.5 X2 X2.5 X3 X3.5 X4 X4.5 X5 X5.5 X6 X6.5

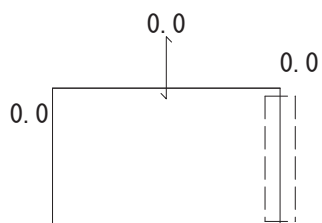


X0 X0.5 X1 X1.5 X2 X2.5 X3 X3.5 X4 X4.5 X5 X5.5 X6 X6.5

Y2.5通り

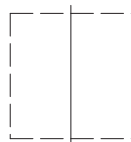


X0 X00671 X1.5.72 X2.5279X3&356.044 X2440.055 X54&5.066.26.5

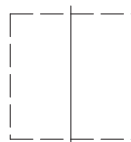


X0 X00671 X1.5.72 X2.5279X3&356.044 X2440.055 X54&5.066.26.5

Y2.5a通り

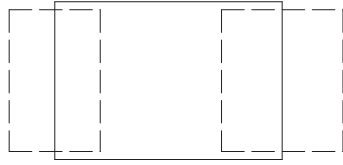


X0 X00671 X1.5.72 X2.5279X3&356.044 X2440.055 X54&5.066.26.5

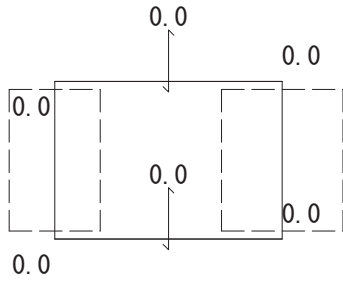


X0 X00671 X1.5.72 X2.5279X3&356.044 X2440.055 X54&5.066.26.5

Y3通り

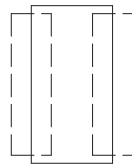
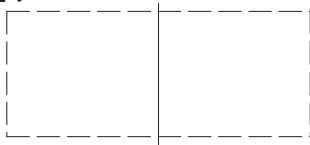


X0 X00.6X1 X1.X5.72 X2.X27X9X3&X356.X44.X2440.X55.X54&5.X66.X6.5

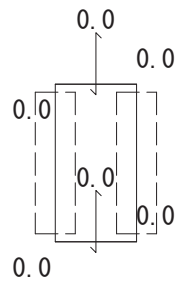
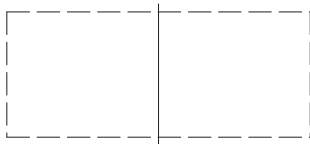


X0 X00.6X1 X1.X5.72 X2.X27X9X3&X356.X44.X2440.X55.X54&5.X66.X6.5

Y3.5通り

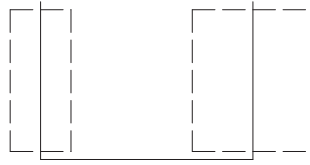


X0 X00.6X1 X1.X5.72 X2.X27X9X3&X356.X44.X2440.X55.X54&5.X66.X6.5

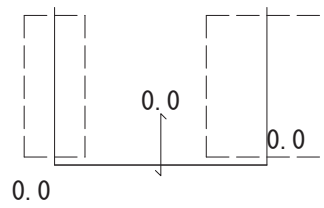


X0 X00.6X1 X1.X5.72 X2.X27X9X3&X356.X44.X2440.X55.X54&5.X66.X6.5

Y5通り

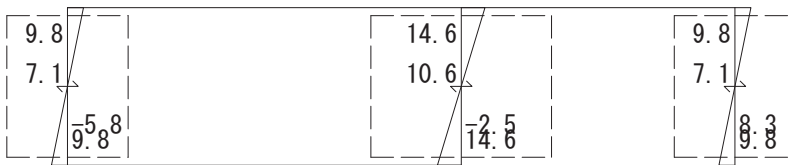


X0 X000.671 X1.X5.72 X2.X279X3X356.044 X2.470.055 X5.475.066.26.5

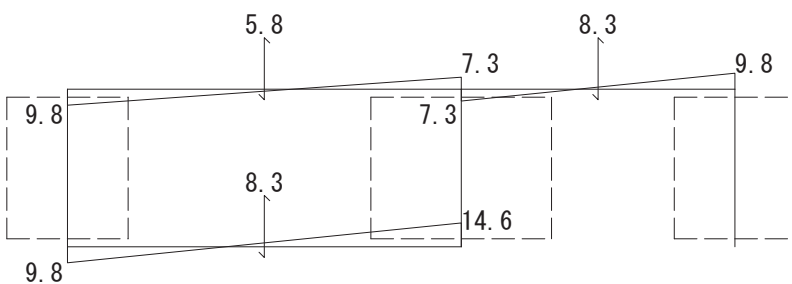


X0 X000.671 X1.X5.72 X2.X279X3X356.044 X2.470.055 X5.475.066.26.5

Y6通り

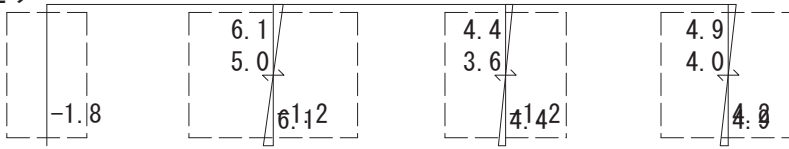


X0 X000.671 X1.X5.72 X2.X279X3X356.044 X2.470.055 X5.475.066.26.5

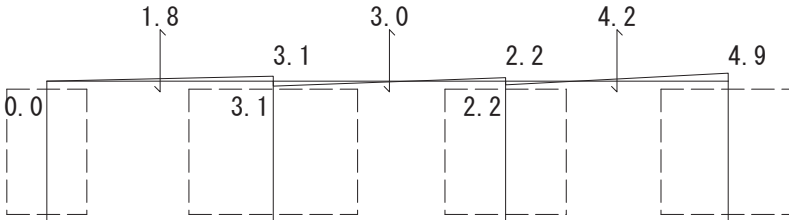


X0 X000.671 X1.X5.72 X2.X279X3X356.044 X2.470.055 X5.475.066.26.5

Y6.5通り



X0 X0006X1 X1.X5.72 X2.X27X9X3X356.X44.X2440.X55.X54X5.X66.X6.5



X0 X0006X1 X1.X5.72 X2.X27X9X3X356.X44.X2440.X55.X54X5.X66.X6.5

Y7通り

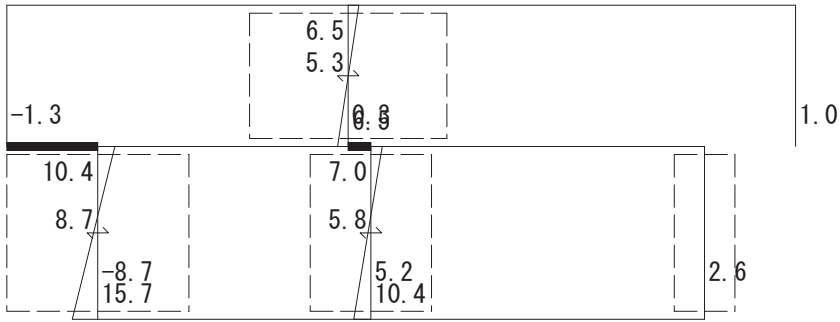


X0 X0006X1 X1.X5.72 X2.X27X9X3X356.X44.X2440.X55.X54X5.X66.X6.5



X0 X0006X1 X1.X5.72 X2.X27X9X3X356.X44.X2440.X55.X54X5.X66.X6.5

X0通り



R階

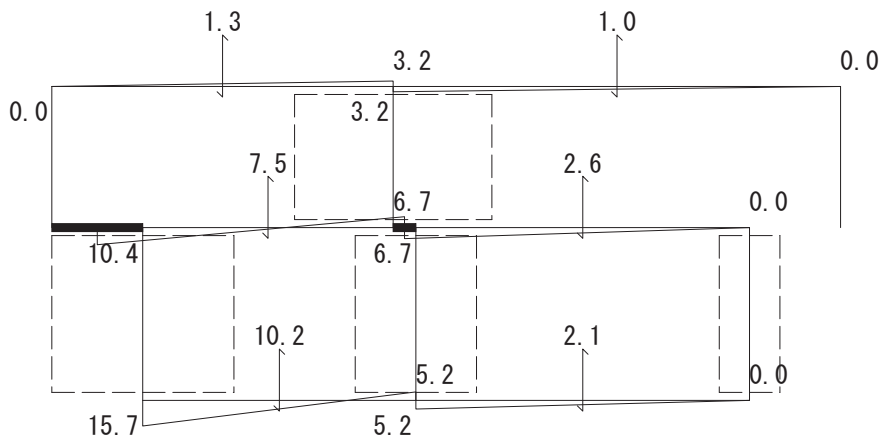
2.46 (m)

2階

3.02 (m)

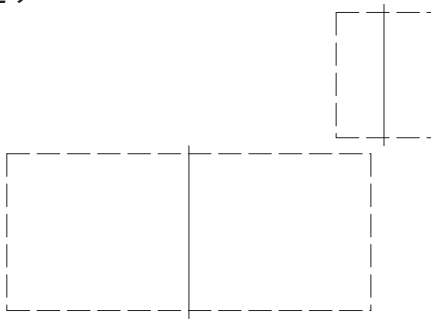
1階

Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

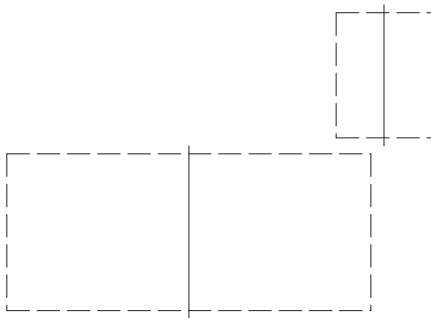


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

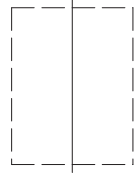
X2.5通り



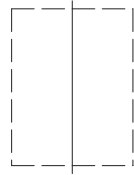
Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3



Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

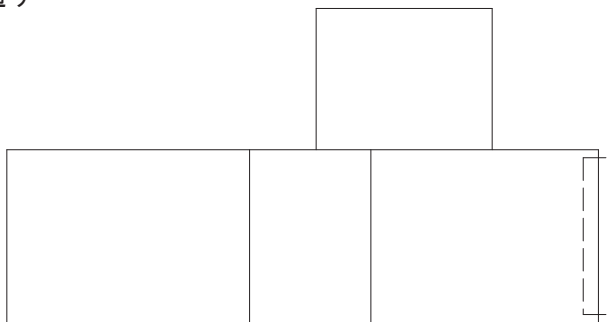


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

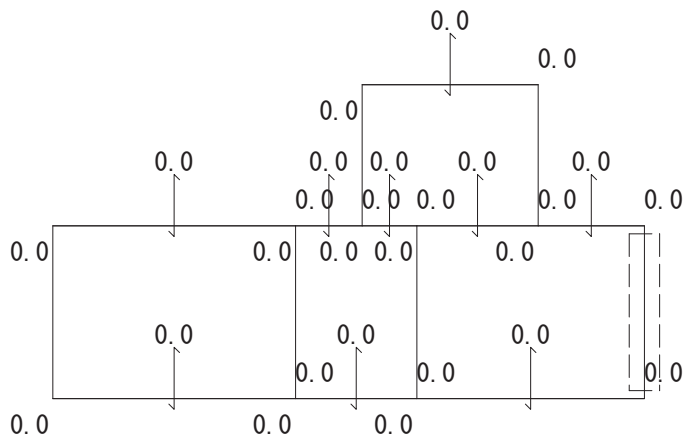


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

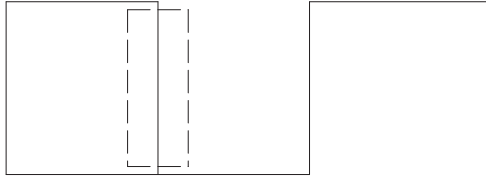
X4.5通り



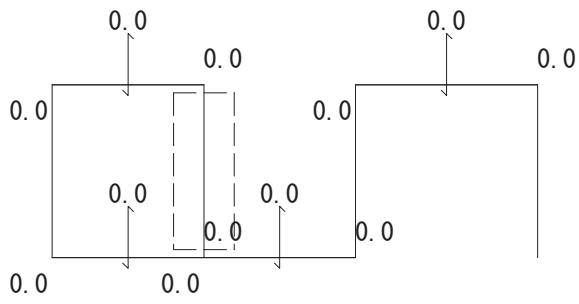
Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3



Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

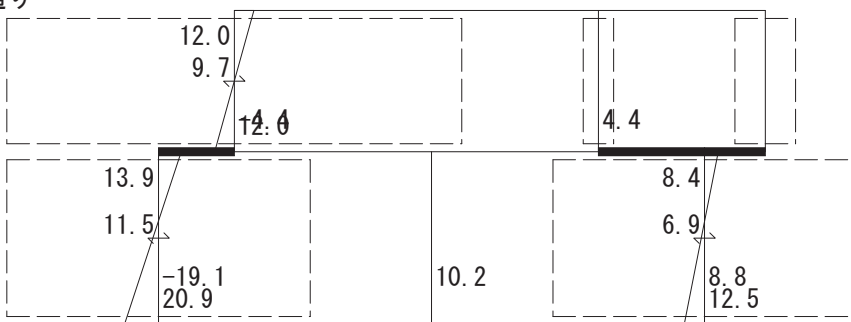


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

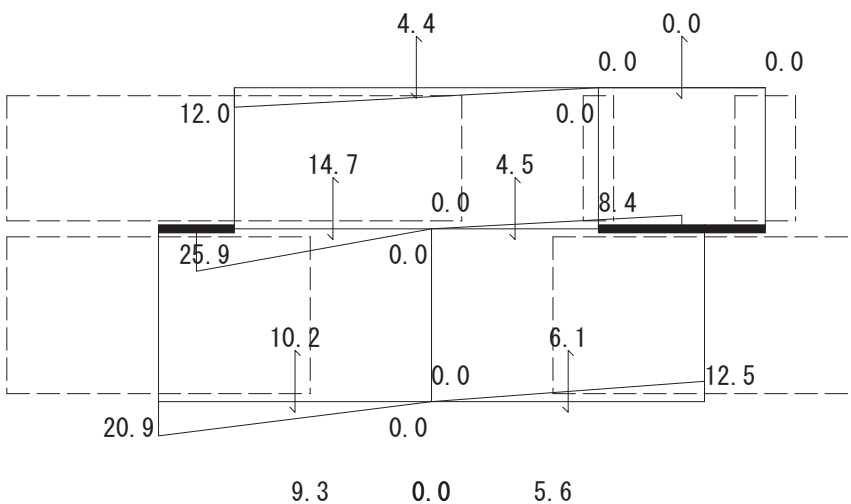


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

X6.5通り

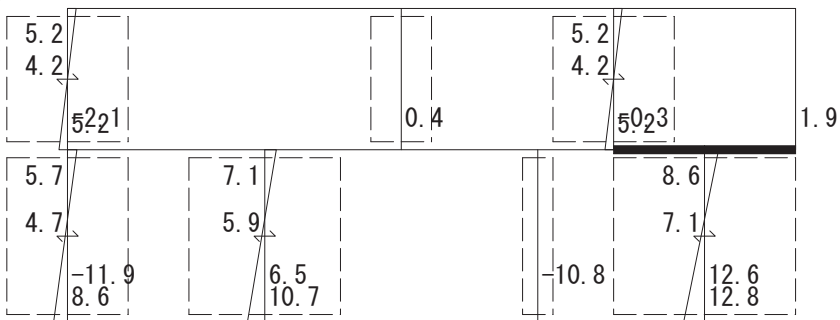


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

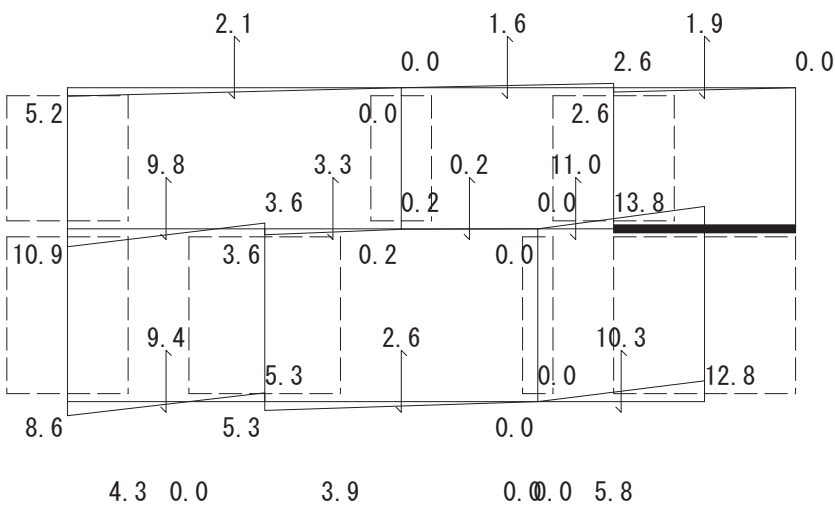


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

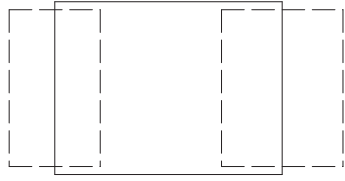
Y0通り



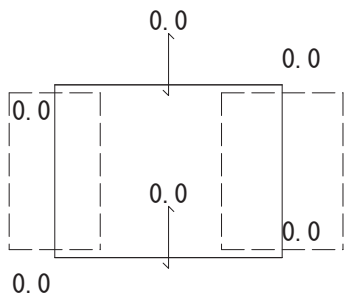
X0 X0.6 X1 X1.7 X2 X2.9 X3 X3.6 X4 X4.4 X5 X5.4 X6 X6.5



X0 X0.6 X1 X1.7 X2 X2.9 X3 X3.6 X4 X4.4 X5 X5.4 X6 X6.5

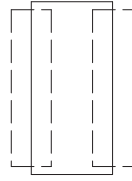
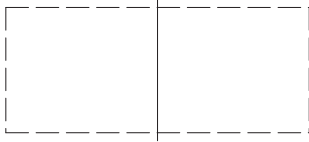


X0 X000.671 X1.X5.72 X2.X279X3.X356.X44.X440.X55.X54X5.X66.X6.5

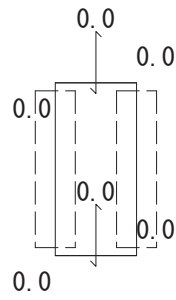
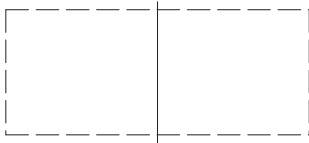


X0 X000.671 X1.X5.72 X2.X279X3.X356.X44.X440.X55.X54X5.X66.X6.5

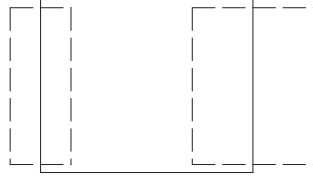
Y3.5通り



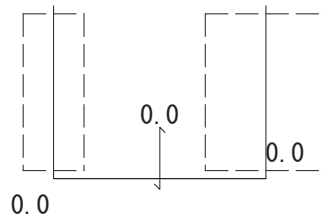
X0 X00.6X1 X1.X5.7X2 X2.X2X9X3X3X6.X44.X44X6.X55.X54X5.X66.X6.5



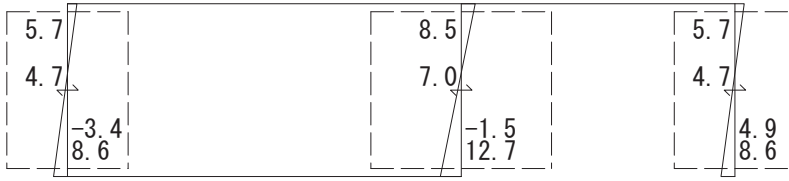
X0 X00.6X1 X1.X5.7X2 X2.X2X9X3X3X6.X44.X44X6.X55.X54X5.X66.X6.5



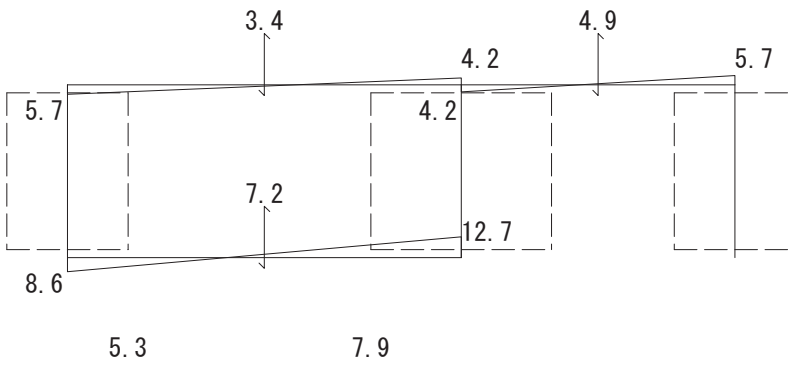
X0 X00.671 X1.X5.72 X2.X279X3.X356.X44.X440.X55.X5485.X66.X6.5



X0 X00.671 X1.X5.72 X2.X279X3.X356.X44.X440.X55.X5485.X66.X6.5



X0 X00.6 X1 X1.7 X2 X2.9 X3 X3.6 X4 X4.4 X5 X5.4 X6 X6.5



X0 X00.6 X1 X1.7 X2 X2.9 X3 X3.6 X4 X4.4 X5 X5.4 X6 X6.5



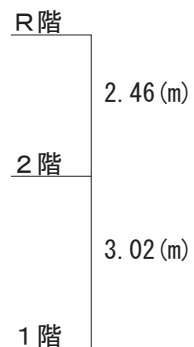
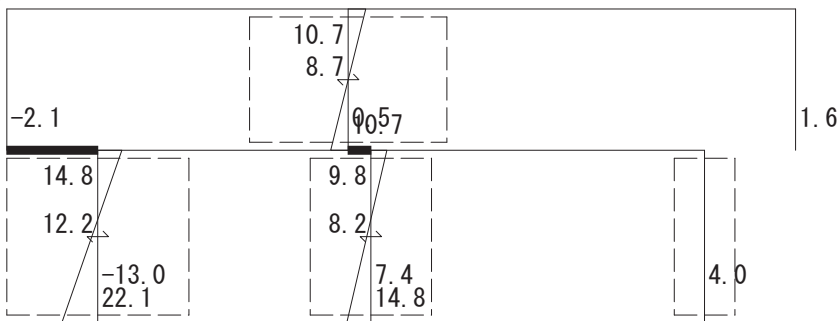
X0 X000671 X1.X5.72 X2.X279X3X356.X44.X1470.X55.X5475.X66.X6.5



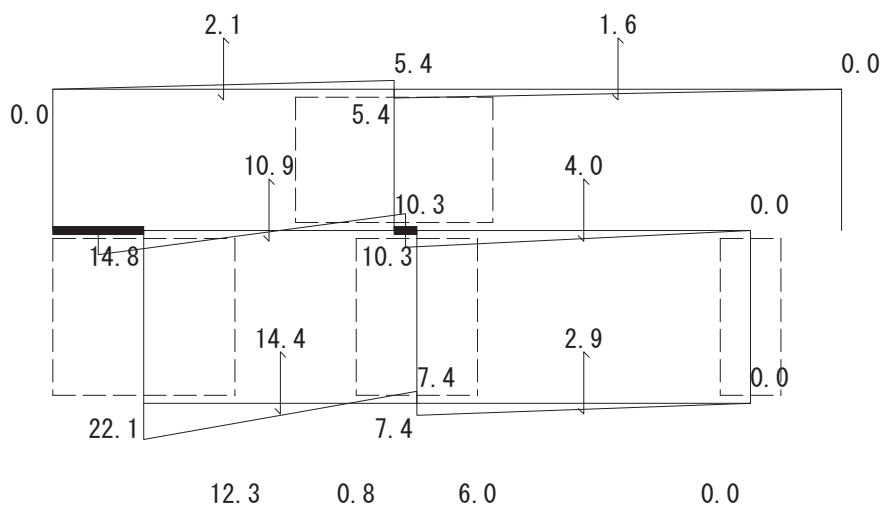
X0 X000671 X1.X5.72 X2.X279X3X356.X44.X1470.X55.X5475.X66.X6.5

地震力による応力 (地中梁用)

X0通り

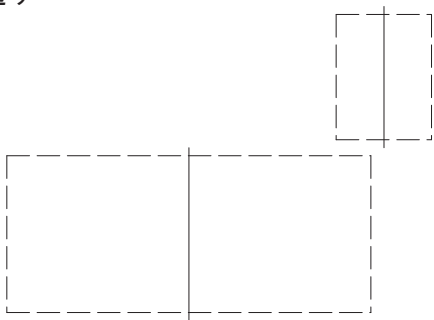


Y0 Y0.5 Y1 Y1.5 Y1.8 Y2.2 Y2.5 Y2.8 Y3 Y3.5 Y3.6 Y4 Y4.3 Y4.7 Y5 Y5.7 Y6 Y6.5 Y7 Y7.3

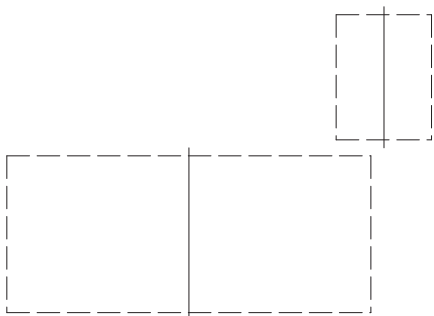


Y0 Y0.5 Y1 Y1.5 Y1.8 Y2.2 Y2.5 Y2.8 Y3 Y3.5 Y3.6 Y4 Y4.3 Y4.7 Y5 Y5.7 Y6 Y6.5 Y7 Y7.3

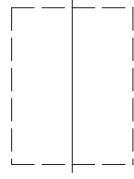
X2.5通り



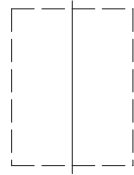
Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3



Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

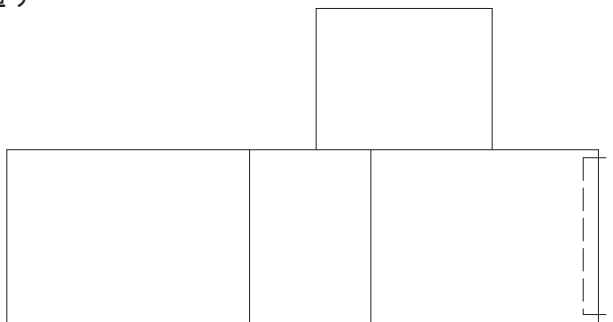


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

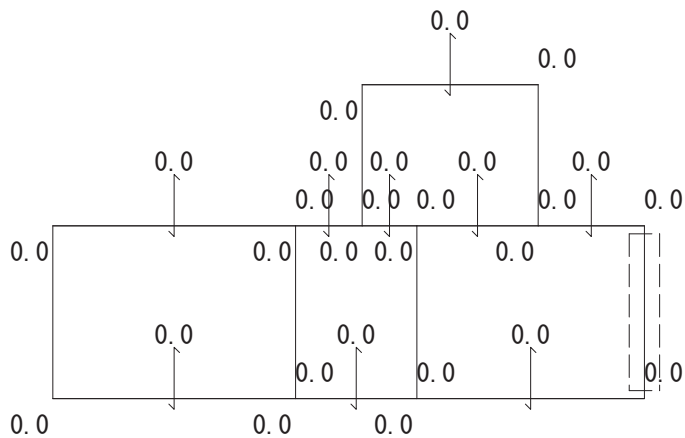


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

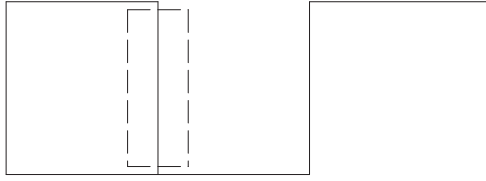
X4.5通り



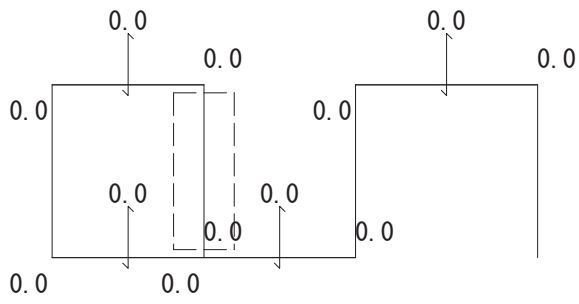
Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3



Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

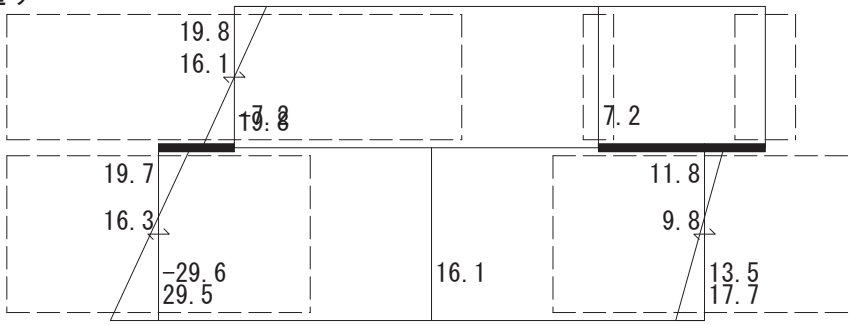


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

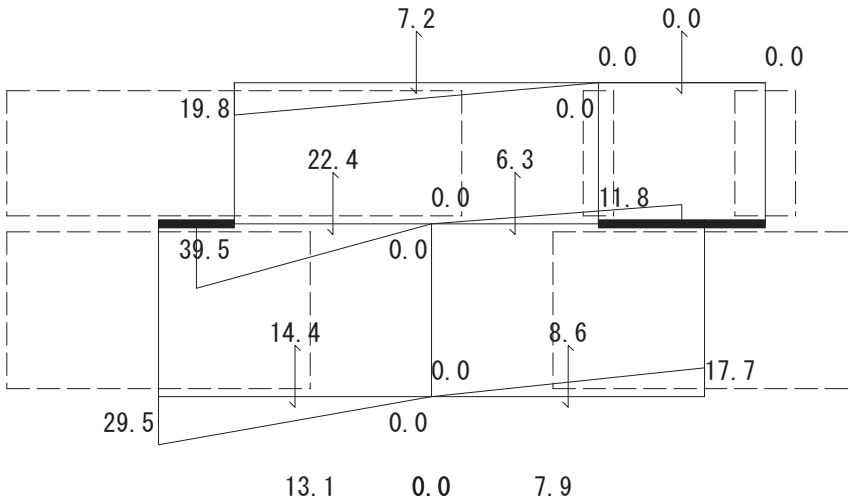


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

X6.5通り

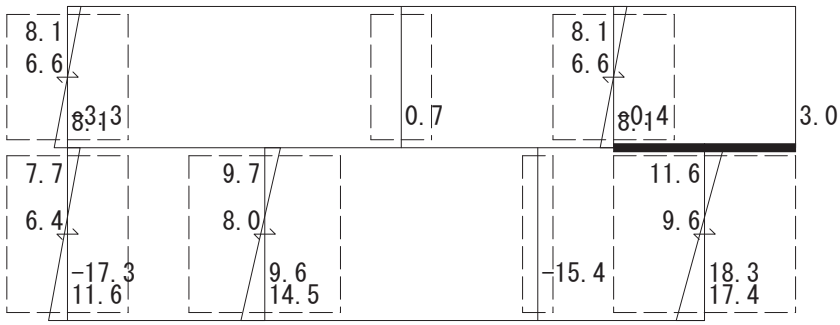


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

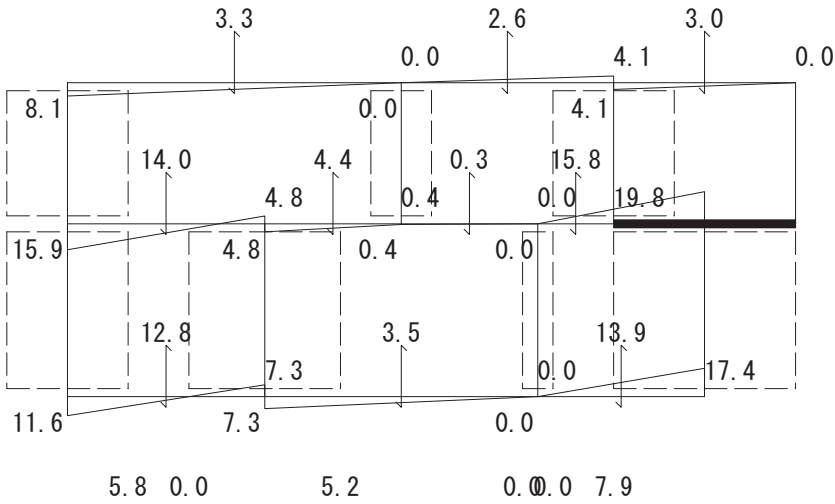


Y0 Y0.5 Y1 Y1.5 Y2 Y2.5 Y3 Y3.5 Y4 Y4.5 Y5 Y5.5 Y6 Y6.5 Y7 Y7.3

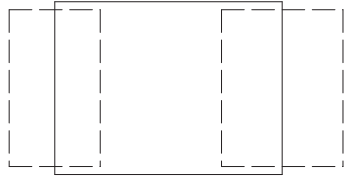
Y0通り



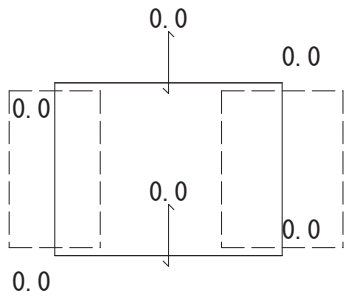
X0 X0.6 X1 X1.7 X2 X2.9 X3 X3.6 X4 X4.4 X5 X5.4 X6 X6.5



X0 X0.6 X1 X1.7 X2 X2.9 X3 X3.6 X4 X4.4 X5 X5.4 X6 X6.5

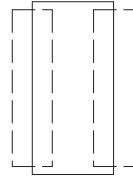
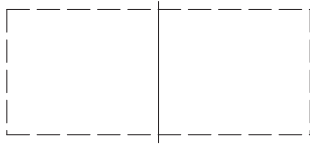


X0 X000.671 X1.X5.72 X2.X279X3X356.X44.X1470.X55.X5475.X66.X6.5

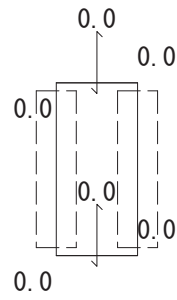
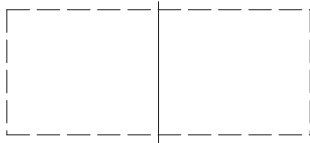


X0 X000.671 X1.X5.72 X2.X279X3X356.X44.X1470.X55.X5475.X66.X6.5

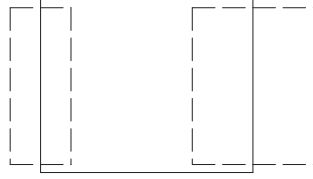
Y3.5通り



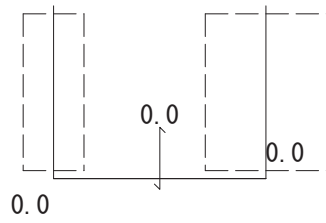
X0 X00.6X1 X1.X5.7X2 X2.X2X9X3X3X6.X44.X44X6.X55.X54X5.X66.X6.5



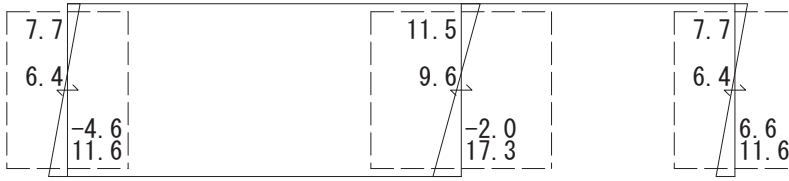
X0 X00.6X1 X1.X5.7X2 X2.X2X9X3X3X6.X44.X44X6.X55.X54X5.X66.X6.5



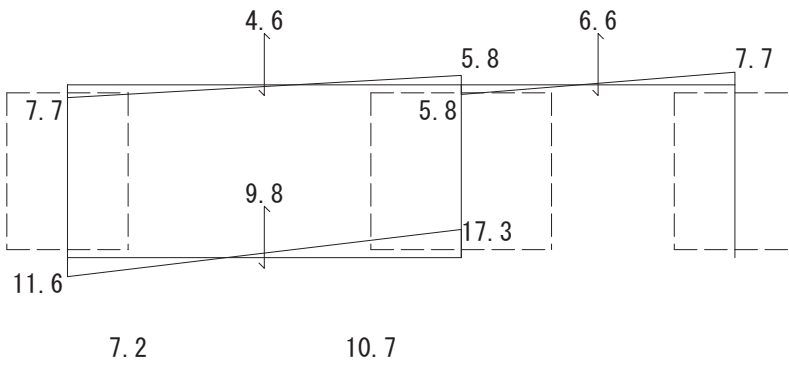
X0 X00.6X1 X1.X5.7X2 X2.X2X9X3X3X6.X44.X14X4.X55.X54X5.X66.X6.5



X0 X00.6X1 X1.X5.7X2 X2.X2X9X3X3X6.X44.X14X4.X55.X54X5.X66.X6.5



X0 X00.6 X1 X1.7 X2 X2.9 X3 X3.6 X4 X4.4 X5 X5.4 X6 X6.5



X0 X00.6 X1 X1.7 X2 X2.9 X3 X3.6 X4 X4.4 X5 X5.4 X6 X6.5



X0 X000671 X1.X5.72 X2.X279X3X356.X44.X1470.X55.X5475.X66.X6.5



X0 X000671 X1.X5.72 X2.X279X3X356.X44.X1470.X55.X5475.X66.X6.5

3.2. たて枠の設計

2階 Y0通り X0 - X1

S-P-F 2級 204 (3.8 × 8.9 (cm)), Lk = 2.700 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 104.97, 座屈係数 ω = 3.67Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz (曲げ) = 1.00 Kz (圧縮) = 1.00

軸力負担長さ L = 1.820 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 0.910 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 1.14 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 6522	6522	7845	3251 (N)
単位長さ当たりの軸力	N1 = 3583	3583	4310	[3572] (N/m)
1箇所当たりの軸力	N2 = 1630	1630	1961	1625 (N)
1本当たりの軸力(一般部)	N3 = 1630	1630	1961	1625 (N/本)
1本当たりの軸力(壁端部)	N4 = 2038	2038	2452	(N/本)
水平力による壁の回転力	Ms/b = 8940 (N)			
壁端部の短期軸力	Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 13826 (N)			
壁端部の短期軸力(1本あたり)	Ns1 = Ns0 / n1 = 6913 (N)			
一般部の短期軸力(1本あたり)	Ns2 = N3(短期) + N3(水平力) = 3256 (N)			

一般部

長期 N = 1630 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.28 \leq 1.0$ OK $N / (A \times fcv) = 0.22 \leq 1.0$ OK短期 N = 3256 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.30 \leq 1.0$ OK $N / (A \times fcv) = 0.24 \leq 1.0$ OK積雪時 N = 1961 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.23 \leq 1.0$ OK $N / (A \times fcv) = 0.18 \leq 1.0$ OK

壁端部

長期 N = 2038 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.35 \leq 1.0$ OK $N / (A \times fcv) = 0.27 \leq 1.0$ OK短期 N = 6913 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.65 \leq 1.0$ OK $N / (A \times fcv) = 0.51 \leq 1.0$ OK積雪時 N = 2452 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.29 \leq 1.0$ OK $N / (A \times fcv) = 0.23 \leq 1.0$ OK風圧時 Lfb = 1.1 × Kz × Fb / 3 = 7.920, Lfc = 1.1 × Kz × Fc / 3 = 6.380, Sfc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²)

一般部 N = 1630 (N), w1 = Q × C × a = 937.3 × 1.00 × 0.455 = 426.5 (N/m), Ms1 = 388.6 (N·m)

 $(\omega \times N) / (A \times Sfc) + (Lfc \times Ms1) / (Lfb \times Z \times Sfc) = 0.69 \leq 1.0$ OK

壁端部 N = 4076 (N), w2 = Q × C × l = 937.3 × 1.00 × 1.138 = 1066.2 (N/m), Ms2 = 971.6 (N·m)

 $(\omega \times N) / (2A \times Sfc) + (Lfc \times Ms2) / (Lfb \times 2Z \times Sfc) = 0.86 \leq 1.0$ OK

釘 : CN90 木口打ち, 一面せん断力値 = 400.0 (N)

せん断力 Q = (w1 × Lk) / 2 = 575.76 (N)

必要釘本数 n = Q / (2 × 一面せん断力値 × (2 / 3)) = 2 (本)

2階 YO通り X3 - X3.5

S-P-F 2級 2 - 204 (3.8×8.9 (cm)), Lk = 3.700 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 143.84, 座屈係数 ω = 6.90Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 1.820 (m) たて枠のピッチ a = 0.228 (m) 壁長 l = 0.455 (m)

壁端部たて枠本数 n1 = 4.0 (本) 壁端部負担幅 l = 1.14 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 5739	5739	7464	697 (N)
単位長さ当たりの軸力	N1 = 3154	3154	4101	[1531] (N/m)
1箇所当たりの軸力	N2 = 717	717	933	348 (N)
1本当たりの軸力(一般部)	N3 = 359	359	466	174 (N/本)
1本当たりの軸力(壁端部)	N4 = 897	897	1166	(N/本)

水平力による壁の回転力 Ms/b = 0 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 3218 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 804 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 533 (N)

一般部

長期 N = 359 (N), fc=1.1×Kz×Fc/3=6.380 (N/mm²), fcv=1.1×Fcv/3=2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.11 \leq 1.0$ OK

N / (A × fcv) = 0.05 ≤ 1.0 OK

短期 N = 533 (N), fc=2.0×Kz×Fc/3=11.600 (N/mm²), fcv=2.0×Fcv/3=4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.09 \leq 1.0$ OK

N / (A × fcv) = 0.04 ≤ 1.0 OK

積雪時 N = 466 (N), fc=0.8×2.0×Kz×Fc/3=9.280 (N/mm²), fcv=0.8×2.0×Fcv/3=3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.10 \leq 1.0$ OK

N / (A × fcv) = 0.04 ≤ 1.0 OK

壁端部

長期 N = 897 (N), fc=1.1×Kz×Fc/3=6.380 (N/mm²), fcv=1.1×Fcv/3=2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.29 \leq 1.0$ OK

N / (A × fcv) = 0.12 ≤ 1.0 OK

短期 N = 804 (N), fc=2.0×Kz×Fc/3=11.600 (N/mm²), fcv=2.0×Fcv/3=4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.14 \leq 1.0$ OK

N / (A × fcv) = 0.06 ≤ 1.0 OK

積雪時 N = 1166 (N), fc=0.8×2.0×Kz×Fc/3=9.280 (N/mm²), fcv=0.8×2.0×Fcv/3=3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.26 \leq 1.0$ OK

N / (A × fcv) = 0.11 ≤ 1.0 OK

風圧時 Lfb=1.1×Kz×Fb/3=7.920, Lfc=1.1×Kz×Fc/3=6.380, Sfc=2.0×Kz×Fc/3=11.600 (N/mm²)

一般部 N = 717 (N), w1 = Q×C×a = 937.3×1.00×0.228 = 213.2 (N/m), Ms1 = 364.9 (N·m)

 $(\omega \times N) / (2A \times Sfc) + (Lfc \times Ms1) / (Lfb \times 2Z \times Sfc) = 0.32 \leq 1.0$ OK

壁端部 N = 3587 (N), w2 = Q×C×l = 937.3×1.00×1.138 = 1066.2 (N/m), Ms2 = 1824.6 (N·m)

 $(\omega \times N) / (4A \times Sfc) + (Lfc \times Ms2) / (Lfb \times 4Z \times Sfc) = 0.79 \leq 1.0$ OK

釘 : CN90 木口打ち, 一面せん断力値 = 400.0 (N)

せん断力 Q = (w1 × Lk) / 2 = 394.50 (N)

必要釘本数 n = Q / (2 × 一面せん断力値 × (2 / 3)) = 1 (本)

2階 YO通り X4.5 - X5.5

S-P-F 2級 204 (3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 1.820 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 0.910 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 0.68 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 4230	4230	4824	426 (N)
単位長さ当たりの軸力	N1 = 2324	2324	2650	[468] (N/m)
1箇所当たりの軸力	N2 = 1057	1057	1206	213 (N)
1本当たりの軸力(一般部)	N3 = 1057	1057	1206	213 (N/本)
1本当たりの軸力(壁端部)	N4 = 793	793	904	(N/本)

水平力による壁の回転力 Ms/b = 8940 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 11267 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 5634 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 1270 (N)

一般部

長期 N = 1057 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.13 ≤ 1.0 OK

N / (A × fcv) = 0.14 ≤ 1.0 OK

短期 N = 1270 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.08 ≤ 1.0 OK

N / (A × fcv) = 0.09 ≤ 1.0 OK

積雪時 N = 1206 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.10 ≤ 1.0 OK

N / (A × fcv) = 0.11 ≤ 1.0 OK

壁端部

長期 N = 793 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.09 ≤ 1.0 OK

N / (A × fcv) = 0.11 ≤ 1.0 OK

短期 N = 5634 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.37 ≤ 1.0 OK

N / (A × fcv) = 0.42 ≤ 1.0 OK

積雪時 N = 904 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.07 ≤ 1.0 OK

N / (A × fcv) = 0.08 ≤ 1.0 OK

風圧時 Lfb = 1.1 × Kz × Fb / 3 = 7.920, Lfc = 1.1 × Kz × Fc / 3 = 6.380, Sfc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²)

一般部 N = 1057 (N), w1 = Q × C × a = 937.3 × 1.00 × 0.455 = 426.5 (N/m), Ms1 = 290.9 (N·m)

(ω × N) / (A × Sfc) + (Lfc × Ms1) / (Lfb × Z × Sfc) = 0.47 ≤ 1.0 OK

壁端部 N = 1586 (N), w2 = Q × C × l = 937.3 × 1.00 × 0.683 = 639.7 (N/m), Ms2 = 436.4 (N·m)

(ω × N) / (2A × Sfc) + (Lfc × Ms2) / (Lfb × 2Z × Sfc) = 0.35 ≤ 1.0 OK

釘 : CN90 木口打ち, 一面せん断力値 = 400.0 (N)

せん断力 Q = (w1 × Lk) / 2 = 498.14 (N)

必要釘本数 n = Q / (2 × 一面せん断力値 × (2 / 3)) = 1 (本)

2階 Y2.5a通り X2.5 - X3.5

S-P-F 2級 204(3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 0.910 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 0.910 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 0.46 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 2052	2052	2268	0 (N)
単位長さ当たりの軸力	N1 = 2255	2255	2493	[0] (N/m)
1箇所当たりの軸力	N2 = 1026	1026	1134	0 (N)
1本当たりの軸力(一般部)	N3 = 1026	1026	1134	0 (N/本)
1本当たりの軸力(壁端部)	N4 = 513	513	567	(N/本)

水平力による壁の回転力 Ms/b = 0 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 1026 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 513 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 1026 (N)

一般部

長期 N = 1026 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.12 ≤ 1.0 OK

N / (A × fcv) = 0.14 ≤ 1.0 OK

短期 N = 1026 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.07 ≤ 1.0 OK

N / (A × fcv) = 0.08 ≤ 1.0 OK

積雪時 N = 1134 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.09 ≤ 1.0 OK

N / (A × fcv) = 0.10 ≤ 1.0 OK

壁端部

長期 N = 513 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.06 ≤ 1.0 OK

N / (A × fcv) = 0.07 ≤ 1.0 OK

短期 N = 513 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.03 ≤ 1.0 OK

N / (A × fcv) = 0.04 ≤ 1.0 OK

積雪時 N = 567 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.05 ≤ 1.0 OK

N / (A × fcv) = 0.05 ≤ 1.0 OK

2階 Y3.5通り X0 - X2.5

S-P-F 2級 204 (3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 2.275 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 2.275 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 0.46 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 7525	7525	8809	0 (N)
単位長さ当たりの軸力	N1 = 3308	3308	3872	[0] (N/m)
1箇所当たりの軸力	N2 = 1505	1505	1762	0 (N)
1本当たりの軸力(一般部)	N3 = 1505	1505	1762	0 (N/本)
1本当たりの軸力(壁端部)	N4 = 752	752	881	(N/本)

水平力による壁の回転力 Ms/b = 0 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 3762 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 1881 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 1505 (N)

一般部

長期 N = 1505 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.18 \leq 1.0$ OK

N / (A × fcv) = 0.20 ≤ 1.0 OK

短期 N = 1505 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.10 \leq 1.0$ OK

N / (A × fcv) = 0.11 ≤ 1.0 OK

積雪時 N = 1762 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.14 \leq 1.0$ OK

N / (A × fcv) = 0.16 ≤ 1.0 OK

壁端部

長期 N = 752 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.09 \leq 1.0$ OK

N / (A × fcv) = 0.10 ≤ 1.0 OK

短期 N = 1881 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.12 \leq 1.0$ OK

N / (A × fcv) = 0.14 ≤ 1.0 OK

積雪時 N = 881 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.07 \leq 1.0$ OK

N / (A × fcv) = 0.08 ≤ 1.0 OK

2階 Y6.5通り X0 - X0.6

S-P-F 2級 204 (3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 0.983 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 0.600 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 0.68 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 3346	3346	4317	1665 (N)
単位長さ当たりの軸力	N1 = 3406	3406	4394	[2776] (N/m)
1箇所当たりの軸力	N2 = 1550	1550	1999	1263 (N)
1本当たりの軸力(一般部)	N3 = 1550	1550	1999	1263 (N/本)
1本当たりの軸力(壁端部)	N4 = 1162	1162	1499	(N/本)

水平力による壁の回転力 Ms/b = 0 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 2506 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 1253 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 2813 (N)

一般部

長期 N = 1550 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.18 ≤ 1.0 OK

N / (A × fcv) = 0.21 ≤ 1.0 OK

短期 N = 2813 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.18 ≤ 1.0 OK

N / (A × fcv) = 0.21 ≤ 1.0 OK

積雪時 N = 1999 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.16 ≤ 1.0 OK

N / (A × fcv) = 0.18 ≤ 1.0 OK

壁端部

長期 N = 1162 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.14 ≤ 1.0 OK

N / (A × fcv) = 0.16 ≤ 1.0 OK

短期 N = 1253 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.08 ≤ 1.0 OK

N / (A × fcv) = 0.09 ≤ 1.0 OK

積雪時 N = 1499 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.12 ≤ 1.0 OK

N / (A × fcv) = 0.14 ≤ 1.0 OK

風圧時 Lfb = 1.1 × Kz × Fb / 3 = 7.920, Lfc = 1.1 × Kz × Fc / 3 = 6.380, Sfc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²)

一般部 N = 1550 (N), w1 = Q × C × a = 937.3 × 1.00 × 0.455 = 426.5 (N/m), Ms1 = 290.9 (N·m)

(ω × N) / (A × Sfc) + (Lfc × Ms1) / (Lfb × Z × Sfc) = 0.50 ≤ 1.0 OK

壁端部 N = 2325 (N), w2 = Q × C × l = 937.3 × 1.00 × 0.683 = 639.7 (N/m), Ms2 = 436.4 (N·m)

(ω × N) / (2A × Sfc) + (Lfc × Ms2) / (Lfb × 2Z × Sfc) = 0.38 ≤ 1.0 OK

釘 : CN90 木口打ち, 一面せん断力値 = 400.0 (N)

せん断力 Q = (w1 × Lk) / 2 = 498.14 (N)

必要釘本数 n = Q / (2 × 一面せん断力値 × (2 / 3)) = 1 (本)

2階 Y6.5通り X1.5 - X2.9

S-P-F 2級 204 (3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 1.975 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 1.265 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 0.68 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 8410	8410	9458	1124 (N)
単位長さ当たりの軸力	N1 = 4258	4258	4789	[889] (N/m)
1箇所当たりの軸力	N2 = 1938	1938	2179	404 (N)
1本当たりの軸力(一般部)	N3 = 1938	1938	2179	404 (N/本)
1本当たりの軸力(壁端部)	N4 = 1453	1453	1634	(N/本)

水平力による壁の回転力 Ms/b = 4470 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 9237 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 4618 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 2342 (N)

一般部

長期 N = 1938 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.23 \leq 1.0$ OK

N / (A × fcv) = 0.26 ≤ 1.0 OK

短期 N = 2342 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.15 \leq 1.0$ OK

N / (A × fcv) = 0.17 ≤ 1.0 OK

積雪時 N = 2179 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.18 \leq 1.0$ OK

N / (A × fcv) = 0.20 ≤ 1.0 OK

壁端部

長期 N = 1453 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.17 \leq 1.0$ OK

N / (A × fcv) = 0.20 ≤ 1.0 OK

短期 N = 4618 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.30 \leq 1.0$ OK

N / (A × fcv) = 0.34 ≤ 1.0 OK

積雪時 N = 1634 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.13 \leq 1.0$ OK

N / (A × fcv) = 0.15 ≤ 1.0 OK

風圧時 Lfb = 1.1 × Kz × Fb / 3 = 7.920, Lfc = 1.1 × Kz × Fc / 3 = 6.380, Sfc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²)

一般部 N = 1938 (N), w1 = Q × C × a = 937.3 × 1.00 × 0.455 = 426.5 (N/m), Ms1 = 290.9 (N·m)

 $(\omega \times N) / (A \times Sfc) + (Lfc \times Ms1) / (Lfb \times Z \times Sfc) = 0.53 \leq 1.0$ OK

壁端部 N = 2906 (N), w2 = Q × C × l = 937.3 × 1.00 × 0.683 = 639.7 (N/m), Ms2 = 436.4 (N·m)

 $(\omega \times N) / (2A \times Sfc) + (Lfc \times Ms2) / (Lfb \times 2Z \times Sfc) = 0.40 \leq 1.0$ OK

釘 : CN90 木口打ち, 一面せん断力値 = 400.0 (N)

せん断力 Q = (w1 × Lk) / 2 = 498.14 (N)

必要釘本数 n = Q / (2 × 一面せん断力値 × (2 / 3)) = 1 (本)

2階 Y6.5通り X3.6 - X4.6

S-P-F 2級 204(3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 1.593 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 0.910 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 0.68 (m)

軸力	NO =	壁端部負担幅			1132 (N)
		(長期)	(短期)	(積雪時)	
単位長さ当たりの軸力	N1 =	8771	8771	10394	[1243] (N/m)
1箇所当たりの軸力	N2 =	5508	5508	6527	566 (N)
1本当たりの軸力(一般部)	N3 =	2506	2506	2970	566 (N/本)
1本当たりの軸力(壁端部)	N4 =	2506	2506	2970	566 (N/本)
1本当たりの軸力(壁端部)	N4 =	1879	1879	2227	(N/本)

水平力による壁の回転力 Ms/b = 4470 (N)

壁端部の短期軸力 Ns0 = (NO(短期) + NO(水平力)) / 2 + Ms/b = 9421 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 4710 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 3072 (N)

一般部

長期 N = 2506 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.30 \leq 1.0$ OK

N / (A × fcv) = 0.34 ≤ 1.0 OK

短期 N = 3072 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.20 \leq 1.0$ OK

N / (A × fcv) = 0.23 ≤ 1.0 OK

積雪時 N = 2970 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.24 \leq 1.0$ OK

N / (A × fcv) = 0.27 ≤ 1.0 OK

壁端部

長期 N = 1879 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.22 \leq 1.0$ OK

N / (A × fcv) = 0.25 ≤ 1.0 OK

短期 N = 4710 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.31 \leq 1.0$ OK

N / (A × fcv) = 0.35 ≤ 1.0 OK

積雪時 N = 2227 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.18 \leq 1.0$ OK

N / (A × fcv) = 0.21 ≤ 1.0 OK

風圧時 Lfb = 1.1 × Kz × Fb / 3 = 7.920, Lfc = 1.1 × Kz × Fc / 3 = 6.380, Sfc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²)

一般部 N = 2506 (N), w1 = Q × C × a = 937.3 × 1.00 × 0.455 = 426.5 (N/m), Ms1 = 290.9 (N·m)

 $(\omega \times N) / (A \times Sfc) + (Lfc \times Ms1) / (Lfb \times Z \times Sfc) = 0.57 \leq 1.0$ OK

壁端部 N = 3759 (N), w2 = Q × C × l = 937.3 × 1.00 × 0.683 = 639.7 (N/m), Ms2 = 436.4 (N·m)

 $(\omega \times N) / (2A \times Sfc) + (Lfc \times Ms2) / (Lfb \times 2Z \times Sfc) = 0.42 \leq 1.0$ OK

釘 : CN90 木口打ち, 一面せん断力値 = 400.0 (N)

せん断力 Q = (w1 × Lk) / 2 = 498.14 (N)

必要釘本数 n = Q / (2 × 一面せん断力値 × (2 / 3)) = 1 (本)

2階 Y6.5通り X5.4 - X6.5

S-P-F 2級 204 (3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 1.365 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 1.010 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 0.68 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 3228	3228	3735	3921 (N)
単位長さ当たりの軸力	N1 = 2365	2365	2737	[3882] (N/m)
1箇所当たりの軸力	N2 = 1076	1076	1245	1766 (N)
1本当たりの軸力(一般部)	N3 = 1076	1076	1245	1766 (N/本)
1本当たりの軸力(壁端部)	N4 = 807	807	934	(N/本)

水平力による壁の回転力 Ms/b = 4470 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 8044 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 4022 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 2842 (N)

一般部

長期 N = 1076 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.13 ≤ 1.0 OK

N / (A × fcv) = 0.14 ≤ 1.0 OK

短期 N = 2842 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.18 ≤ 1.0 OK

N / (A × fcv) = 0.21 ≤ 1.0 OK

積雪時 N = 1245 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.10 ≤ 1.0 OK

N / (A × fcv) = 0.12 ≤ 1.0 OK

壁端部

長期 N = 807 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.10 ≤ 1.0 OK

N / (A × fcv) = 0.11 ≤ 1.0 OK

短期 N = 4022 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.26 ≤ 1.0 OK

N / (A × fcv) = 0.30 ≤ 1.0 OK

積雪時 N = 934 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.08 ≤ 1.0 OK

N / (A × fcv) = 0.09 ≤ 1.0 OK

風圧時 Lfb = 1.1 × Kz × Fb / 3 = 7.920, Lfc = 1.1 × Kz × Fc / 3 = 6.380, Sfc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²)

一般部 N = 1076 (N), w1 = Q × C × a = 937.3 × 1.00 × 0.455 = 426.5 (N/m), Ms1 = 290.9 (N·m)

(ω × N) / (A × Sfc) + (Lfc × Ms1) / (Lfb × Z × Sfc) = 0.47 ≤ 1.0 OK

壁端部 N = 1614 (N), w2 = Q × C × l = 937.3 × 1.00 × 0.683 = 639.7 (N/m), Ms2 = 436.4 (N·m)

(ω × N) / (2A × Sfc) + (Lfc × Ms2) / (Lfb × 2Z × Sfc) = 0.35 ≤ 1.0 OK

釘 : CN90 木口打ち, 一面せん断力値 = 400.0 (N)

せん断力 Q = (w1 × Lk) / 2 = 498.14 (N)

必要釘本数 n = Q / (2 × 一面せん断力値 × (2 / 3)) = 1 (本)

2階 X0通り Y2 - Y3.6

S-P-F 2級 204 (3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 3.698 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 1.480 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 1.59 (m)

軸力	N0 =	7771	7771	10244	496 (N)
単位長さ当たりの軸力	N1 =	2102	2102	2771	[335] (N/m)
1箇所当たりの軸力	N2 =	956	956	1261	153 (N)
1本当たりの軸力(一般部)	N3 =	956	956	1261	153 (N/本)
1本当たりの軸力(壁端部)	N4 =	1673	1673	2206	(N/本)

水平力による壁の回転力 Ms/b = 7246 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 11380 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 5690 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 1109 (N)

一般部

長期 N = 956 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.11 ≤ 1.0 OK

N / (A × fcv) = 0.13 ≤ 1.0 OK

短期 N = 1109 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.07 ≤ 1.0 OK

N / (A × fcv) = 0.08 ≤ 1.0 OK

積雪時 N = 1261 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.10 ≤ 1.0 OK

N / (A × fcv) = 0.12 ≤ 1.0 OK

壁端部

長期 N = 1673 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.20 ≤ 1.0 OK

N / (A × fcv) = 0.22 ≤ 1.0 OK

短期 N = 5690 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.37 ≤ 1.0 OK

N / (A × fcv) = 0.42 ≤ 1.0 OK

積雪時 N = 2206 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.18 ≤ 1.0 OK

N / (A × fcv) = 0.20 ≤ 1.0 OK

風圧時 Lfb = 1.1 × Kz × Fb / 3 = 7.920, Lfc = 1.1 × Kz × Fc / 3 = 6.380, Sfc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²)

一般部 N = 956 (N), w1 = Q × C × a = 937.3 × 1.00 × 0.455 = 426.5 (N/m), Ms1 = 290.9 (N·m)

(ω × N) / (A × Sfc) + (Lfc × Ms1) / (Lfb × Z × Sfc) = 0.46 ≤ 1.0 OK

壁端部 N = 3347 (N), w2 = Q × C × l = 937.3 × 1.00 × 1.593 = 1492.7 (N/m), Ms2 = 1018.2 (N·m)

(ω × N) / (2A × Sfc) + (Lfc × Ms2) / (Lfb × 2Z × Sfc) = 0.81 ≤ 1.0 OK

釘 : CN90 木口打ち, 一面せん断力値 = 400.0 (N)

せん断力 Q = (w1 × Lk) / 2 = 498.14 (N)

必要釘本数 n = Q / (2 × 一面せん断力値 × (2 / 3)) = 1 (本)

2階 X1.5通り Y5.7 - Y6.5

S-P-F 2級 204(3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 1.593 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 0.683 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 1.14 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 4425	4425	5474	0 (N)
単位長さ当たりの軸力	N1 = 2778	2778	3437	[0] (N/m)
1箇所当たりの軸力	N2 = 1264	1264	1564	0 (N)
1本当たりの軸力(一般部)	N3 = 1264	1264	1564	0 (N/本)
1本当たりの軸力(壁端部)	N4 = 1580	1580	1955	(N/本)

水平力による壁の回転力 Ms/b = 0 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 2212 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 1106 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 1264 (N)

一般部

長期 N = 1264 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.15 \leq 1.0$ OK

N / (A × fcv) = 0.17 ≤ 1.0 OK

短期 N = 1264 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.08 \leq 1.0$ OK

N / (A × fcv) = 0.09 ≤ 1.0 OK

積雪時 N = 1564 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.13 \leq 1.0$ OK

N / (A × fcv) = 0.14 ≤ 1.0 OK

壁端部

長期 N = 1580 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.19 \leq 1.0$ OK

N / (A × fcv) = 0.21 ≤ 1.0 OK

短期 N = 1106 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.07 \leq 1.0$ OK

N / (A × fcv) = 0.08 ≤ 1.0 OK

積雪時 N = 1955 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.16 \leq 1.0$ OK

N / (A × fcv) = 0.18 ≤ 1.0 OK

2階 X2.5通り Y2.5a - Y3.5

S-P-F 2級 204 (3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 0.715 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 0.715 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 0.46 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 5738	5738	6516	0 (N)
単位長さ当たりの軸力	N1 = 8025	8025	9113	[0] (N/m)
1箇所当たりの軸力	N2 = 3651	3651	4146	0 (N)
1本当たりの軸力(一般部)	N3 = 3651	3651	4146	0 (N/本)
1本当たりの軸力(壁端部)	N4 = 1826	1826	2073	(N/本)

水平力による壁の回転力 Ms/b = 0 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 2869 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 1434 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 3651 (N)

一般部

長期 N = 3651 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.43 ≤ 1.0 OK

N / (A × fcv) = 0.49 ≤ 1.0 OK

短期 N = 3651 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.24 ≤ 1.0 OK

N / (A × fcv) = 0.27 ≤ 1.0 OK

積雪時 N = 4146 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.34 ≤ 1.0 OK

N / (A × fcv) = 0.38 ≤ 1.0 OK

壁端部

長期 N = 1826 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.22 ≤ 1.0 OK

N / (A × fcv) = 0.25 ≤ 1.0 OK

短期 N = 1434 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.09 ≤ 1.0 OK

N / (A × fcv) = 0.11 ≤ 1.0 OK

積雪時 N = 2073 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.17 ≤ 1.0 OK

N / (A × fcv) = 0.19 ≤ 1.0 OK

2階 X3.5通り Y0 - Y1

S-P-F 2級 204 (3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 1.138 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 0.910 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 0.46 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 2819	2819	3518	0 (N)
単位長さ当たりの軸力	N1 = 2478	2478	3093	[0] (N/m)
1箇所当たりの軸力	N2 = 1127	1127	1407	0 (N)
1本当たりの軸力(一般部)	N3 = 1127	1127	1407	0 (N/本)
1本当たりの軸力(壁端部)	N4 = 564	564	704	(N/本)

水平力による壁の回転力 Ms/b = 0 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 1409 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 705 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 1127 (N)

一般部

長期 N = 1127 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.13 ≤ 1.0 OK

N / (A × fcv) = 0.15 ≤ 1.0 OK

短期 N = 1127 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.07 ≤ 1.0 OK

N / (A × fcv) = 0.08 ≤ 1.0 OK

積雪時 N = 1407 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.11 ≤ 1.0 OK

N / (A × fcv) = 0.13 ≤ 1.0 OK

壁端部

長期 N = 564 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.07 ≤ 1.0 OK

N / (A × fcv) = 0.08 ≤ 1.0 OK

短期 N = 705 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.05 ≤ 1.0 OK

N / (A × fcv) = 0.05 ≤ 1.0 OK

積雪時 N = 704 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.06 ≤ 1.0 OK

N / (A × fcv) = 0.07 ≤ 1.0 OK

2階 X6.5通り Y0 - Y3.7

S-P-F 2級 204 (3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 3.868 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 3.413 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 0.68 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 10635	10635	13817	7246 (N)
単位長さ当たりの軸力	N1 = 2750	2750	3573	[2123] (N/m)
1箇所当たりの軸力	N2 = 1251	1251	1626	966 (N)
1本当たりの軸力(一般部)	N3 = 1251	1251	1626	966 (N/本)
1本当たりの軸力(壁端部)	N4 = 938	938	1219	(N/本)

水平力による壁の回転力 Ms/b = 5797 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 14737 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 7369 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 2217 (N)

一般部

長期 N = 1251 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.15 ≤ 1.0 OK

N / (A × fcv) = 0.17 ≤ 1.0 OK

短期 N = 2217 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.14 ≤ 1.0 OK

N / (A × fcv) = 0.16 ≤ 1.0 OK

積雪時 N = 1626 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.13 ≤ 1.0 OK

N / (A × fcv) = 0.15 ≤ 1.0 OK

壁端部

長期 N = 938 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.11 ≤ 1.0 OK

N / (A × fcv) = 0.13 ≤ 1.0 OK

短期 N = 7369 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.48 ≤ 1.0 OK

N / (A × fcv) = 0.54 ≤ 1.0 OK

積雪時 N = 1219 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.10 ≤ 1.0 OK

N / (A × fcv) = 0.11 ≤ 1.0 OK

風圧時 Lfb = 1.1 × Kz × Fb / 3 = 7.920, Lfc = 1.1 × Kz × Fc / 3 = 6.380, Sfc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²)

一般部 N = 1251 (N), w1 = Q × C × a = 937.3 × 1.00 × 0.455 = 426.5 (N/m), Ms1 = 290.9 (N·m)

(ω × N) / (A × Sfc) + (Lfc × Ms1) / (Lfb × Z × Sfc) = 0.48 ≤ 1.0 OK

壁端部 N = 1877 (N), w2 = Q × C × l = 937.3 × 1.00 × 0.683 = 639.7 (N/m), Ms2 = 436.4 (N·m)

(ω × N) / (2A × Sfc) + (Lfc × Ms2) / (Lfb × 2Z × Sfc) = 0.36 ≤ 1.0 OK

釘 : CN90 木口打ち, 一面せん断力値 = 400.0 (N)

せん断力 Q = (w1 × Lk) / 2 = 498.14 (N)

必要釘本数 n = Q / (2 × 一面せん断力値 × (2 / 3)) = 1 (本)

2階 X6.5通り Y6 - Y6.5

S-P-F 2級 204 (3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 0.910 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 0.455 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 0.68 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 1942	1942	2407	0 (N)
単位長さ当たりの軸力	N1 = 2134	2134	2645	[0] (N/m)
1箇所当たりの軸力	N2 = 971	971	1203	0 (N)
1本当たりの軸力(一般部)	N3 = 971	971	1203	0 (N/本)
1本当たりの軸力(壁端部)	N4 = 728	728	903	(N/本)

水平力による壁の回転力 Ms/b = 0 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 971 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 485 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 971 (N)

一般部

長期 N = 971 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.11 ≤ 1.0 OK

N / (A × fcv) = 0.13 ≤ 1.0 OK

短期 N = 971 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.06 ≤ 1.0 OK

N / (A × fcv) = 0.07 ≤ 1.0 OK

積雪時 N = 1203 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.10 ≤ 1.0 OK

N / (A × fcv) = 0.11 ≤ 1.0 OK

壁端部

長期 N = 728 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.09 ≤ 1.0 OK

N / (A × fcv) = 0.10 ≤ 1.0 OK

短期 N = 485 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.03 ≤ 1.0 OK

N / (A × fcv) = 0.04 ≤ 1.0 OK

積雪時 N = 903 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.07 ≤ 1.0 OK

N / (A × fcv) = 0.08 ≤ 1.0 OK

風圧時 Lfb = 1.1 × Kz × Fb / 3 = 7.920, Lfc = 1.1 × Kz × Fc / 3 = 6.380, Sfc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²)

一般部 N = 971 (N), w1 = Q × C × a = 937.3 × 1.00 × 0.455 = 426.5 (N/m), Ms1 = 290.9 (N·m)

(ω × N) / (A × Sfc) + (Lfc × Ms1) / (Lfb × Z × Sfc) = 0.47 ≤ 1.0 OK

壁端部 N = 1456 (N), w2 = Q × C × l = 937.3 × 1.00 × 0.683 = 639.7 (N/m), Ms2 = 436.4 (N·m)

(ω × N) / (2A × Sfc) + (Lfc × Ms2) / (Lfb × 2Z × Sfc) = 0.35 ≤ 1.0 OK

釘 : CN90 木口打ち, 一面せん断力値 = 400.0 (N)

せん断力 Q = (w1 × Lk) / 2 = 498.14 (N)

必要釘本数 n = Q / (2 × 一面せん断力値 × (2 / 3)) = 1 (本)

1階 YO通り X0 - X1

S-P-F 2級 2 - 204 (3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 1.138 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 0.910 (m)

壁端部たて枠本数 n1 = 3.0 (本) 壁端部負担幅 l = 0.46 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 10883	10883	12206	18457 (N)
単位長さ当たりの軸力	N1 = 9568	9568	10731	[20283] (N/m)
1箇所当たりの軸力	N2 = 4353	4353	4882	9229 (N)
1本当たりの軸力(一般部)	N3 = 2177	2177	2441	4614 (N/本)
1本当たりの軸力(壁端部)	N4 = 1451	1451	1627	(N/本)

水平力による壁の回転力 Ms/b = 9705 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 24375 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 8125 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 6791 (N)

一般部

長期 N = 2177 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.26 \leq 1.0$ OK

N / (A × fcv) = 0.29 ≤ 1.0 OK

短期 N = 6791 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.44 \leq 1.0$ OK

N / (A × fcv) = 0.50 ≤ 1.0 OK

積雪時 N = 2441 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.20 \leq 1.0$ OK

N / (A × fcv) = 0.23 ≤ 1.0 OK

壁端部

長期 N = 1451 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.17 \leq 1.0$ OK

N / (A × fcv) = 0.20 ≤ 1.0 OK

短期 N = 8125 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.53 \leq 1.0$ OK

N / (A × fcv) = 0.60 ≤ 1.0 OK

積雪時 N = 1627 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.13 \leq 1.0$ OK

N / (A × fcv) = 0.15 ≤ 1.0 OK

風圧時 Lfb = 1.1 × Kz × Fb / 3 = 7.920, Lfc = 1.1 × Kz × Fc / 3 = 6.380, Sfc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²)

一般部 N = 4353 (N), w1 = Q × C × a = 937.3 × 1.00 × 0.455 = 426.5 (N/m), Ms1 = 290.9 (N·m)

 $(\omega \times N) / (2A \times Sfc) + (Lfc \times Ms1) / (Lfb \times 2Z \times Sfc) = 0.34 \leq 1.0$ OK

壁端部 N = 4353 (N), w2 = Q × C × l = 937.3 × 1.00 × 0.455 = 426.5 (N/m), Ms2 = 290.9 (N·m)

 $(\omega \times N) / (3A \times Sfc) + (Lfc \times Ms2) / (Lfb \times 3Z \times Sfc) = 0.23 \leq 1.0$ OK

釘 : CN90 木口打ち, 一面せん断力値 = 400.0 (N)

せん断力 Q = (w1 × Lk) / 2 = 498.14 (N)

必要釘本数 n = Q / (2 × 一面せん断力値 × (2 / 3)) = 1 (本)

1階 YO通り X1.5 - X2.7

S-P-F 2級 204 (3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 2.048 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 1.138 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 1.14 (m)

軸力	N0 =	13424	13424	15050	10163 (N)
単位長さ当たりの軸力	N1 =	6557	6557	7350	[8934] (N/m)
1箇所当たりの軸力	N2 =	2983	2983	3344	4065 (N)
1本当たりの軸力(一般部)	N3 =	2983	2983	3344	4065 (N/本)
1本当たりの軸力(壁端部)	N4 =	3729	3729	4180	(N/本)

水平力による壁の回転力 Ms/b = 9705 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 21499 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 10749 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 7048 (N)

一般部

長期 N = 2983 (N), fc=1.1×Kz×Fc/3=6.380 (N/mm²), fcv=1.1×Fcv/3=2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.35 \leq 1.0$ OK

N / (A × fcv) = 0.40 ≤ 1.0 OK

短期 N = 7048 (N), fc=2.0×Kz×Fc/3=11.600 (N/mm²), fcv=2.0×Fcv/3=4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.46 \leq 1.0$ OK

N / (A × fcv) = 0.52 ≤ 1.0 OK

積雪時 N = 3344 (N), fc=0.8×2.0×Kz×Fc/3=9.280 (N/mm²), fcv=0.8×2.0×Fcv/3=3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.27 \leq 1.0$ OK

N / (A × fcv) = 0.31 ≤ 1.0 OK

壁端部

長期 N = 3729 (N), fc=1.1×Kz×Fc/3=6.380 (N/mm²), fcv=1.1×Fcv/3=2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.44 \leq 1.0$ OK

N / (A × fcv) = 0.50 ≤ 1.0 OK

短期 N = 10749 (N), fc=2.0×Kz×Fc/3=11.600 (N/mm²), fcv=2.0×Fcv/3=4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.70 \leq 1.0$ OK

N / (A × fcv) = 0.79 ≤ 1.0 OK

積雪時 N = 4180 (N), fc=0.8×2.0×Kz×Fc/3=9.280 (N/mm²), fcv=0.8×2.0×Fcv/3=3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.34 \leq 1.0$ OK

N / (A × fcv) = 0.39 ≤ 1.0 OK

風圧時 Lfb=1.1×Kz×Fb/3=7.920, Lfc=1.1×Kz×Fc/3=6.380, Sfc=2.0×Kz×Fc/3=11.600 (N/mm²)

一般部 N = 2983 (N), w1 = Q×C×a = 937.3×1.00×0.455 = 426.5 (N/m), Ms1 = 290.9 (N·m)

 $(\omega \times N) / (A \times Sfc) + (Lfc \times Ms1) / (Lfb \times Z \times Sfc) = 0.60 \leq 1.0$ OK

壁端部 N = 7458 (N), w2 = Q×C×l = 937.3×1.00×1.138 = 1066.2 (N/m), Ms2 = 727.3 (N·m)

 $(\omega \times N) / (2A \times Sfc) + (Lfc \times Ms2) / (Lfb \times 2Z \times Sfc) = 0.75 \leq 1.0$ OK

釘 : CN90 木口打ち, 一面せん断力値 = 400.0 (N)

せん断力 Q = (w1 × Lk) / 2 = 498.14 (N)

必要釘本数 n = Q / (2 × 一面せん断力値 × (2 / 3)) = 1 (本)

1階 YO通り X5 - X6.5

S-P-F 2級 204 (3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 1.593 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 1.365 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 0.46 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 7291	7291	7736	19643 (N)
単位長さ当たりの軸力	N1 = 4578	4578	4858	[14390] (N/m)
1箇所当たりの軸力	N2 = 2083	2083	2210	6548 (N)
1本当たりの軸力(一般部)	N3 = 2083	2083	2210	6548 (N/本)
1本当たりの軸力(壁端部)	N4 = 1042	1042	1105	(N/本)

水平力による壁の回転力 Ms/b = 9705 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 23172 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 11586 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 8631 (N)

一般部

長期 N = 2083 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.25 \leq 1.0$ OK

N / (A × fcv) = 0.28 ≤ 1.0 OK

短期 N = 8631 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.56 \leq 1.0$ OK

N / (A × fcv) = 0.64 ≤ 1.0 OK

積雪時 N = 2210 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.18 \leq 1.0$ OK

N / (A × fcv) = 0.20 ≤ 1.0 OK

壁端部

長期 N = 1042 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.12 \leq 1.0$ OK

N / (A × fcv) = 0.14 ≤ 1.0 OK

短期 N = 11586 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.75 \leq 1.0$ OK

N / (A × fcv) = 0.86 ≤ 1.0 OK

積雪時 N = 1105 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.09 \leq 1.0$ OK

N / (A × fcv) = 0.10 ≤ 1.0 OK

風圧時 Lfb = 1.1 × Kz × Fb / 3 = 7.920, Lfc = 1.1 × Kz × Fc / 3 = 6.380, Sfc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²)

一般部 N = 2083 (N), w1 = Q × C × a = 937.3 × 1.00 × 0.455 = 426.5 (N/m), Ms1 = 290.9 (N·m)

 $(\omega \times N) / (A \times Sfc) + (Lfc \times Ms1) / (Lfb \times Z \times Sfc) = 0.54 \leq 1.0$ OK

壁端部 N = 2083 (N), w2 = Q × C × l = 937.3 × 1.00 × 0.455 = 426.5 (N/m), Ms2 = 290.9 (N·m)

 $(\omega \times N) / (2A \times Sfc) + (Lfc \times Ms2) / (Lfb \times 2Z \times Sfc) = 0.27 \leq 1.0$ OK

釘 : CN90 木口打ち, 一面せん断力値 = 400.0 (N)

せん断力 Q = (w1 × Lk) / 2 = 498.14 (N)

必要釘本数 n = Q / (2 × 一面せん断力値 × (2 / 3)) = 1 (本)

1階 Y3通り X1.7 - X2.5

S-P-F 2級 204 (3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 1.138 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 0.683 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 0.69 (m)

軸力	N0 =	壁端部負担幅			水平力
		(長期)	(短期)	(積雪時)	
軸力	N0 =	16844	16844	18218	0 (N)
単位長さ当たりの軸力	N1 =	14808	14808	16016	[0] (N/m)
1箇所当たりの軸力	N2 =	6738	6738	7287	0 (N)
1本当たりの軸力(一般部)	N3 =	6738	6738	7287	0 (N/本)
1本当たりの軸力(壁端部)	N4 =	5090	5090	5505	(N/本)

水平力による壁の回転力 Ms/b = 0 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 8422 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 4211 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 6738 (N)

一般部

長期 N = 6738 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.80 \leq 1.0$ OK

N / (A × fcv) = 0.91 ≤ 1.0 OK

短期 N = 6738 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.44 \leq 1.0$ OK

N / (A × fcv) = 0.50 ≤ 1.0 OK

積雪時 N = 7287 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.59 \leq 1.0$ OK

N / (A × fcv) = 0.67 ≤ 1.0 OK

壁端部

長期 N = 5090 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.60 \leq 1.0$ OK

N / (A × fcv) = 0.68 ≤ 1.0 OK

短期 N = 4211 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.27 \leq 1.0$ OK

N / (A × fcv) = 0.31 ≤ 1.0 OK

積雪時 N = 5505 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.45 \leq 1.0$ OK

N / (A × fcv) = 0.51 ≤ 1.0 OK

1階 Y3通り X3.5 - X4.5

S-P-F 2級 204(3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 1.365 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 0.910 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 0.68 (m)

		(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 =	19864	19864	22121	0 (N)
単位長さ当たりの軸力	N1 =	14553	14553	16206	[0] (N/m)
1箇所当たりの軸力	N2 =	6621	6621	7374	0 (N)
1本当たりの軸力(一般部)	N3 =	6621	6621	7374	0 (N/本)
1本当たりの軸力(壁端部)	N4 =	4966	4966	5530	(N/本)

水平力による壁の回転力 Ms/b = 0 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 9932 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 4966 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 6621 (N)

一般部

長期 N = 6621 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.78 ≤ 1.0 OK

N / (A × fcv) = 0.89 ≤ 1.0 OK

短期 N = 6621 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.43 ≤ 1.0 OK

N / (A × fcv) = 0.49 ≤ 1.0 OK

積雪時 N = 7374 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.60 ≤ 1.0 OK

N / (A × fcv) = 0.68 ≤ 1.0 OK

壁端部

長期 N = 4966 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.59 ≤ 1.0 OK

N / (A × fcv) = 0.67 ≤ 1.0 OK

短期 N = 4966 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.32 ≤ 1.0 OK

N / (A × fcv) = 0.37 ≤ 1.0 OK

積雪時 N = 5530 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.45 ≤ 1.0 OK

N / (A × fcv) = 0.51 ≤ 1.0 OK

1階 Y5通り X4 - X4.5

S-P-F 2級 204 (3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 0.455 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 0.455 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 0.46 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 1740	1740	1740	0 (N)
単位長さ当たりの軸力	N1 = 3825	3825	3825	[0] (N/m)
1箇所当たりの軸力	N2 = 1740	1740	1740	0 (N)
1本当たりの軸力(一般部)	N3 = 1740	1740	1740	0 (N/本)
1本当たりの軸力(壁端部)	N4 = 870	870	870	(N/本)

水平力による壁の回転力 Ms/b = 0 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 870 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 435 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 1740 (N)

一般部

長期 N = 1740 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.21 ≤ 1.0 OK

N / (A × fcv) = 0.23 ≤ 1.0 OK

短期 N = 1740 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.11 ≤ 1.0 OK

N / (A × fcv) = 0.13 ≤ 1.0 OK

積雪時 N = 1740 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.14 ≤ 1.0 OK

N / (A × fcv) = 0.16 ≤ 1.0 OK

壁端部

長期 N = 870 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.10 ≤ 1.0 OK

N / (A × fcv) = 0.12 ≤ 1.0 OK

短期 N = 435 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.03 ≤ 1.0 OK

N / (A × fcv) = 0.03 ≤ 1.0 OK

積雪時 N = 870 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.07 ≤ 1.0 OK

N / (A × fcv) = 0.08 ≤ 1.0 OK

1階 Y5通り X5.5 - X6.5

S-P-F 2級 204(3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 0.910 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 0.910 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 0.46 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 3572	3572	3572	0 (N)
単位長さ当たりの軸力	N1 = 3926	3926	3926	[0] (N/m)
1箇所当たりの軸力	N2 = 1786	1786	1786	0 (N)
1本当たりの軸力(一般部)	N3 = 1786	1786	1786	0 (N/本)
1本当たりの軸力(壁端部)	N4 = 893	893	893	(N/本)

水平力による壁の回転力 Ms/b = 0 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 1786 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 893 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 1786 (N)

一般部

長期 N = 1786 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.21 ≤ 1.0 OK

N / (A × fcv) = 0.24 ≤ 1.0 OK

短期 N = 1786 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.12 ≤ 1.0 OK

N / (A × fcv) = 0.13 ≤ 1.0 OK

積雪時 N = 1786 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.15 ≤ 1.0 OK

N / (A × fcv) = 0.17 ≤ 1.0 OK

壁端部

長期 N = 893 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.11 ≤ 1.0 OK

N / (A × fcv) = 0.12 ≤ 1.0 OK

短期 N = 893 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.06 ≤ 1.0 OK

N / (A × fcv) = 0.07 ≤ 1.0 OK

積雪時 N = 893 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.07 ≤ 1.0 OK

N / (A × fcv) = 0.08 ≤ 1.0 OK

1階 Y6通り X0 - X1

S-P-F 2級 204 (3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 1.820 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 0.910 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 1.14 (m)

軸力	N0 =	21829	21829	25329	5218 (N)
単位長さ当たりの軸力	N1 =	11994	11994	13917	[5734] (N/m)
1箇所当たりの軸力	N2 =	5457	5457	6332	2609 (N)
1本当たりの軸力(一般部)	N3 =	5457	5457	6332	2609 (N/本)
1本当たりの軸力(壁端部)	N4 =	6822	6822	7915	(N/本)

水平力による壁の回転力 Ms/b = 9705 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 23229 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 11614 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 8066 (N)

一般部

長期 N = 5457 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.65 \leq 1.0$ OK

N / (A × fcv) = 0.73 ≤ 1.0 OK

短期 N = 8066 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.52 \leq 1.0$ OK

N / (A × fcv) = 0.60 ≤ 1.0 OK

積雪時 N = 6332 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.51 \leq 1.0$ OK

N / (A × fcv) = 0.59 ≤ 1.0 OK

壁端部

長期 N = 6822 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.81 \leq 1.0$ OK

N / (A × fcv) = 0.92 ≤ 1.0 OK

短期 N = 11614 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.76 \leq 1.0$ OK

N / (A × fcv) = 0.86 ≤ 1.0 OK

積雪時 N = 7915 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.64 \leq 1.0$ OK

N / (A × fcv) = 0.73 ≤ 1.0 OK

風圧時 Lfb = 1.1 × Kz × Fb / 3 = 7.920, Lfc = 1.1 × Kz × Fc / 3 = 6.380, Sfc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²)

一般部 N = 5457 (N), w1 = Q × C × a = 937.3 × 1.00 × 0.455 = 426.5 (N/m), Ms1 = 290.9 (N·m)

 $(\omega \times N) / (A \times Sfc) + (Lfc \times Ms1) / (Lfb \times Z \times Sfc) = 0.76 \leq 1.0$ OK

壁端部 N = 13643 (N), w2 = Q × C × l = 937.3 × 1.00 × 1.138 = 1066.2 (N/m), Ms2 = 727.3 (N·m)

 $(\omega \times N) / (2A \times Sfc) + (Lfc \times Ms2) / (Lfb \times 2Z \times Sfc) = 0.95 \leq 1.0$ OK

釘 : CN90 木口打ち, 一面せん断力値 = 400.0 (N)

せん断力 Q = (w1 × Lk) / 2 = 498.14 (N)

必要釘本数 n = Q / (2 × 一面せん断力値 × (2 / 3)) = 1 (本)

1階 Y6通り X3 - X4.4

S-P-F 2級 204 (3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 2.725 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 1.355 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 1.14 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 30310	30310	34529	2288 (N)
単位長さ当たりの軸力	N1 = 11123	11123	12671	[1689] (N/m)
1箇所当たりの軸力	N2 = 5061	5061	5765	768 (N)
1本当たりの軸力(一般部)	N3 = 5061	5061	5765	768 (N/本)
1本当たりの軸力(壁端部)	N4 = 6326	6326	7207	(N/本)

水平力による壁の回転力 Ms/b = 9705 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 26004 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 13002 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 5829 (N)

一般部

長期 N = 5061 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.60 \leq 1.0$ OK

N / (A × fcv) = 0.68 ≤ 1.0 OK

短期 N = 5829 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.38 \leq 1.0$ OK

N / (A × fcv) = 0.43 ≤ 1.0 OK

積雪時 N = 5765 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.47 \leq 1.0$ OK

N / (A × fcv) = 0.53 ≤ 1.0 OK

壁端部

長期 N = 6326 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.75 \leq 1.0$ OK

N / (A × fcv) = 0.85 ≤ 1.0 OK

短期 N = 13002 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.85 \leq 1.0$ OK

N / (A × fcv) = 0.96 ≤ 1.0 OK

積雪時 N = 7207 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.59 \leq 1.0$ OK

N / (A × fcv) = 0.67 ≤ 1.0 OK

風圧時 Lfb = 1.1 × Kz × Fb / 3 = 7.920, Lfc = 1.1 × Kz × Fc / 3 = 6.380, Sfc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²)

一般部 N = 5061 (N), w1 = Q × C × a = 937.3 × 1.00 × 0.455 = 426.5 (N/m), Ms1 = 290.9 (N·m)

 $(\omega \times N) / (A \times Sfc) + (Lfc \times Ms1) / (Lfb \times Z \times Sfc) = 0.73 \leq 1.0$ OK

壁端部 N = 12652 (N), w2 = Q × C × l = 937.3 × 1.00 × 1.138 = 1066.2 (N/m), Ms2 = 727.3 (N·m)

 $(\omega \times N) / (2A \times Sfc) + (Lfc \times Ms2) / (Lfb \times 2Z \times Sfc) = 0.91 \leq 1.0$ OK

釘 : CN90 木口打ち, 一面せん断力値 = 400.0 (N)

せん断力 Q = (w1 × Lk) / 2 = 498.14 (N)

必要釘本数 n = Q / (2 × 一面せん断力値 × (2 / 3)) = 1 (本)

1階 Y6通り X5.5 - X6.5

S-P-F 2級 204 (3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 1.370 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 0.910 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 0.69 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 8027	8027	8921	7506 (N)
単位長さ当たりの軸力	N1 = 5859	5859	6512	[8249] (N/m)
1箇所当たりの軸力	N2 = 2666	2666	2963	3753 (N)
1本当たりの軸力(一般部)	N3 = 2666	2666	2963	3753 (N/本)
1本当たりの軸力(壁端部)	N4 = 2014	2014	2238	(N/本)

水平力による壁の回転力 Ms/b = 9705 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 17471 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 8736 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 6419 (N)

一般部

長期 N = 2666 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.32 ≤ 1.0 OK

N / (A × fcv) = 0.36 ≤ 1.0 OK

短期 N = 6419 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.42 ≤ 1.0 OK

N / (A × fcv) = 0.47 ≤ 1.0 OK

積雪時 N = 2963 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.24 ≤ 1.0 OK

N / (A × fcv) = 0.27 ≤ 1.0 OK

壁端部

長期 N = 2014 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.24 ≤ 1.0 OK

N / (A × fcv) = 0.27 ≤ 1.0 OK

短期 N = 8736 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.57 ≤ 1.0 OK

N / (A × fcv) = 0.65 ≤ 1.0 OK

積雪時 N = 2238 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.18 ≤ 1.0 OK

N / (A × fcv) = 0.21 ≤ 1.0 OK

風圧時 Lfb = 1.1 × Kz × Fb / 3 = 7.920, Lfc = 1.1 × Kz × Fc / 3 = 6.380, Sfc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²)

一般部 N = 2666 (N), w1 = Q × C × a = 937.3 × 1.00 × 0.455 = 426.5 (N/m), Ms1 = 290.9 (N·m)

(ω × N) / (A × Sfc) + (Lfc × Ms1) / (Lfb × Z × Sfc) = 0.58 ≤ 1.0 OK

壁端部 N = 4028 (N), w2 = Q × C × l = 937.3 × 1.00 × 0.688 = 644.4 (N/m), Ms2 = 439.6 (N·m)

(ω × N) / (2A × Sfc) + (Lfc × Ms2) / (Lfb × 2Z × Sfc) = 0.44 ≤ 1.0 OK

釘 : CN90 木口打ち, 一面せん断力値 = 400.0 (N)

せん断力 Q = (w1 × Lk) / 2 = 498.14 (N)

必要釘本数 n = Q / (2 × 一面せん断力値 × (2 / 3)) = 1 (本)

1階 Y7通り X6 - X6.5

S-P-F 2級 204 (3.8×8.9 (cm)), Lk = 2.453 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 95.36, 座屈係数 ω = 2.89Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 0.455 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 0.455 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 0.46 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 1755	1755	2186	0 (N)
単位長さ当たりの軸力	N1 = 3858	3858	4804	[0] (N/m)
1箇所当たりの軸力	N2 = 1755	1755	2186	0 (N)
1本当たりの軸力(一般部)	N3 = 1755	1755	2186	0 (N/本)
1本当たりの軸力(壁端部)	N4 = 878	878	1093	(N/本)

水平力による壁の回転力 Ms/b = 0 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 878 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 439 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 1755 (N)

一般部

長期 N = 1755 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.23 ≤ 1.0 OK

N / (A × fcv) = 0.24 ≤ 1.0 OK

短期 N = 1755 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.13 ≤ 1.0 OK

N / (A × fcv) = 0.13 ≤ 1.0 OK

積雪時 N = 2186 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.20 ≤ 1.0 OK

N / (A × fcv) = 0.20 ≤ 1.0 OK

壁端部

長期 N = 878 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.12 ≤ 1.0 OK

N / (A × fcv) = 0.12 ≤ 1.0 OK

短期 N = 439 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.03 ≤ 1.0 OK

N / (A × fcv) = 0.03 ≤ 1.0 OK

積雪時 N = 1093 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.10 ≤ 1.0 OK

N / (A × fcv) = 0.10 ≤ 1.0 OK

風圧時 Lfb = 1.1 × Kz × Fb / 3 = 7.920, Lfc = 1.1 × Kz × Fc / 3 = 6.380, Sfc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²)

一般部 N = 1755 (N), w1 = Q × C × a = 937.3 × 1.00 × 0.455 = 426.5 (N/m), Ms1 = 320.8 (N·m)

(ω × N) / (A × Sfc) + (Lfc × Ms1) / (Lfb × Z × Sfc) = 0.57 ≤ 1.0 OK

壁端部 N = 1755 (N), w2 = Q × C × l = 937.3 × 1.00 × 0.455 = 426.5 (N/m), Ms2 = 320.8 (N·m)

(ω × N) / (2A × Sfc) + (Lfc × Ms2) / (Lfb × 2Z × Sfc) = 0.29 ≤ 1.0 OK

釘 : CN90 木口打ち, 一面せん断力値 = 400.0 (N)

せん断力 Q = (w1 × Lk) / 2 = 523.09 (N)

必要釘本数 n = Q / (2 × 一面せん断力値 × (2 / 3)) = 1 (本)

1階 X0通り Y0 - Y1.5

S-P-F 2級 204 (3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 1.820 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 1.365 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 0.68 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 4428	4428	4618	14159 (N)
単位長さ当たりの軸力	N1 = 2433	2433	2538	[10373] (N/m)
1箇所当たりの軸力	N2 = 1107	1107	1155	4720 (N)
1本当たりの軸力(一般部)	N3 = 1107	1107	1155	4720 (N/本)
1本当たりの軸力(壁端部)	N4 = 830	830	866	(N/本)

水平力による壁の回転力 Ms/b = 12325 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 21619 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 10810 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 5827 (N)

一般部

長期 N = 1107 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.13 ≤ 1.0 OK

N / (A × fcv) = 0.15 ≤ 1.0 OK

短期 N = 5827 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.38 ≤ 1.0 OK

N / (A × fcv) = 0.43 ≤ 1.0 OK

積雪時 N = 1155 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.09 ≤ 1.0 OK

N / (A × fcv) = 0.11 ≤ 1.0 OK

壁端部

長期 N = 830 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.10 ≤ 1.0 OK

N / (A × fcv) = 0.11 ≤ 1.0 OK

短期 N = 10810 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.70 ≤ 1.0 OK

N / (A × fcv) = 0.80 ≤ 1.0 OK

積雪時 N = 866 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.07 ≤ 1.0 OK

N / (A × fcv) = 0.08 ≤ 1.0 OK

風圧時 Lfb = 1.1 × Kz × Fb / 3 = 7.920, Lfc = 1.1 × Kz × Fc / 3 = 6.380, Sfc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²)

一般部 N = 1107 (N), w1 = Q × C × a = 937.3 × 1.00 × 0.455 = 426.5 (N/m), Ms1 = 290.9 (N·m)

(ω × N) / (A × Sfc) + (Lfc × Ms1) / (Lfb × Z × Sfc) = 0.47 ≤ 1.0 OK

壁端部 N = 1661 (N), w2 = Q × C × l = 937.3 × 1.00 × 0.683 = 639.7 (N/m), Ms2 = 436.4 (N·m)

(ω × N) / (2A × Sfc) + (Lfc × Ms2) / (Lfb × 2Z × Sfc) = 0.36 ≤ 1.0 OK

釘 : CN90 木口打ち, 一面せん断力値 = 400.0 (N)

せん断力 Q = (w1 × Lk) / 2 = 498.14 (N)

必要釘本数 n = Q / (2 × 一面せん断力値 × (2 / 3)) = 1 (本)

1階 X0通り Y2.5 - Y3.5

S-P-F 2級 204(3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 2.275 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 0.910 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 1.14 (m)

軸力	N0 =	18241	18241	21003	8321 (N)
単位長さ当たりの軸力	N1 =	8018	8018	9232	[9144] (N/m)
1箇所当たりの軸力	N2 =	3648	3648	4201	4161 (N)
1本当たりの軸力(一般部)	N3 =	3648	3648	4201	4161 (N/本)
1本当たりの軸力(壁端部)	N4 =	4560	4560	5251	(N/本)

水平力による壁の回転力 Ms/b = 12325 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 25607 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 12803 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 7809 (N)

一般部

長期 N = 3648 (N), fc=1.1×Kz×Fc/3=6.380 (N/mm²), fcv=1.1×Fcv/3=2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.43 \leq 1.0$ OK

N / (A × fcv) = 0.49 ≤ 1.0 OK

短期 N = 7809 (N), fc=2.0×Kz×Fc/3=11.600 (N/mm²), fcv=2.0×Fcv/3=4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.51 \leq 1.0$ OK

N / (A × fcv) = 0.58 ≤ 1.0 OK

積雪時 N = 4201 (N), fc=0.8×2.0×Kz×Fc/3=9.280 (N/mm²), fcv=0.8×2.0×Fcv/3=3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.34 \leq 1.0$ OK

N / (A × fcv) = 0.39 ≤ 1.0 OK

壁端部

長期 N = 4560 (N), fc=1.1×Kz×Fc/3=6.380 (N/mm²), fcv=1.1×Fcv/3=2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.54 \leq 1.0$ OK

N / (A × fcv) = 0.61 ≤ 1.0 OK

短期 N = 12803 (N), fc=2.0×Kz×Fc/3=11.600 (N/mm²), fcv=2.0×Fcv/3=4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.83 \leq 1.0$ OK

N / (A × fcv) = 0.95 ≤ 1.0 OK

積雪時 N = 5251 (N), fc=0.8×2.0×Kz×Fc/3=9.280 (N/mm²), fcv=0.8×2.0×Fcv/3=3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.43 \leq 1.0$ OK

N / (A × fcv) = 0.49 ≤ 1.0 OK

風圧時 Lfb=1.1×Kz×Fb/3=7.920, Lfc=1.1×Kz×Fc/3=6.380, Sfc=2.0×Kz×Fc/3=11.600 (N/mm²)

一般部 N = 3648 (N), w1 = Q×C×a = 937.3×1.00×0.455 = 426.5 (N/m), Ms1 = 290.9 (N·m)

 $(\omega \times N) / (A \times Sfc) + (Lfc \times Ms1) / (Lfb \times Z \times Sfc) = 0.64 \leq 1.0$ OK

壁端部 N = 9121 (N), w2 = Q×C×l = 937.3×1.00×1.138 = 1066.2 (N/m), Ms2 = 727.3 (N·m)

 $(\omega \times N) / (2A \times Sfc) + (Lfc \times Ms2) / (Lfb \times 2Z \times Sfc) = 0.80 \leq 1.0$ OK

釘 : CN90 木口打ち, 一面せん断力値 = 400.0 (N)

せん断力 Q = (w1 × Lk) / 2 = 498.14 (N)

必要釘本数 n = Q / (2 × 一面せん断力値 × (2 / 3)) = 1 (本)

1階 X0通り Y5.5 - Y6

S-P-F 2級 204 (3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 1.365 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 0.455 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 1.14 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 4480	4480	4670	4240 (N)
単位長さ当たりの軸力	N1 = 3282	3282	3421	[9318] (N/m)
1箇所当たりの軸力	N2 = 1493	1493	1557	4240 (N)
1本当たりの軸力(一般部)	N3 = 1493	1493	1557	4240 (N/本)
1本当たりの軸力(壁端部)	N4 = 1867	1867	1946	(N/本)

水平力による壁の回転力 Ms/b = 0 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 4360 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 2180 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 5733 (N)

一般部

長期 N = 1493 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.18 ≤ 1.0 OK

N / (A × fcv) = 0.20 ≤ 1.0 OK

短期 N = 5733 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.37 ≤ 1.0 OK

N / (A × fcv) = 0.42 ≤ 1.0 OK

積雪時 N = 1557 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.13 ≤ 1.0 OK

N / (A × fcv) = 0.14 ≤ 1.0 OK

壁端部

長期 N = 1867 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.22 ≤ 1.0 OK

N / (A × fcv) = 0.25 ≤ 1.0 OK

短期 N = 2180 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.14 ≤ 1.0 OK

N / (A × fcv) = 0.16 ≤ 1.0 OK

積雪時 N = 1946 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.16 ≤ 1.0 OK

N / (A × fcv) = 0.18 ≤ 1.0 OK

風圧時 Lfb = 1.1 × Kz × Fb / 3 = 7.920, Lfc = 1.1 × Kz × Fc / 3 = 6.380, Sfc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²)

一般部 N = 1493 (N), w1 = Q × C × a = 937.3 × 1.00 × 0.455 = 426.5 (N/m), Ms1 = 290.9 (N·m)

(ω × N) / (A × Sfc) + (Lfc × Ms1) / (Lfb × Z × Sfc) = 0.50 ≤ 1.0 OK

壁端部 N = 3733 (N), w2 = Q × C × l = 937.3 × 1.00 × 1.138 = 1066.2 (N/m), Ms2 = 727.3 (N·m)

(ω × N) / (2A × Sfc) + (Lfc × Ms2) / (Lfb × 2Z × Sfc) = 0.62 ≤ 1.0 OK

釘 : CN90 木口打ち, 一面せん断力値 = 400.0 (N)

せん断力 Q = (w1 × Lk) / 2 = 498.14 (N)

必要釘本数 n = Q / (2 × 一面せん断力値 × (2 / 3)) = 1 (本)

1階 X2.5通り Y0 - Y3

S-P-F 2級 204 (3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 2.730 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 2.730 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 0.46 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 11605	11605	12247	0 (N)
単位長さ当たりの軸力	N1 = 4251	4251	4486	[0] (N/m)
1箇所当たりの軸力	N2 = 1934	1934	2041	0 (N)
1本当たりの軸力(一般部)	N3 = 1934	1934	2041	0 (N/本)
1本当たりの軸力(壁端部)	N4 = 967	967	1021	(N/本)

水平力による壁の回転力 Ms/b = 0 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 5802 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 2901 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 1934 (N)

一般部

長期 N = 1934 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.23 ≤ 1.0 OK

N / (A × fcv) = 0.26 ≤ 1.0 OK

短期 N = 1934 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.13 ≤ 1.0 OK

N / (A × fcv) = 0.14 ≤ 1.0 OK

積雪時 N = 2041 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.17 ≤ 1.0 OK

N / (A × fcv) = 0.19 ≤ 1.0 OK

壁端部

長期 N = 967 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.11 ≤ 1.0 OK

N / (A × fcv) = 0.13 ≤ 1.0 OK

短期 N = 2901 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.19 ≤ 1.0 OK

N / (A × fcv) = 0.21 ≤ 1.0 OK

積雪時 N = 1021 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.08 ≤ 1.0 OK

N / (A × fcv) = 0.09 ≤ 1.0 OK

1階 X4通り Y5 - Y6

S-P-F 2級 204 (3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 0.910 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 0.910 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 0.46 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 1829	1829	1829	0 (N)
単位長さ当たりの軸力	N1 = 2010	2010	2010	[0] (N/m)
1箇所当たりの軸力	N2 = 915	915	915	0 (N)
1本当たりの軸力(一般部)	N3 = 915	915	915	0 (N/本)
1本当たりの軸力(壁端部)	N4 = 457	457	457	(N/本)

水平力による壁の回転力 Ms/b = 0 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 915 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 457 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 915 (N)

一般部

長期 N = 915 (N), fc=1.1×Kz×Fc/3=6.380 (N/mm²), fcv=1.1×Fcv/3=2.200 (N/mm²)

(ω × N) / (A × fc) = 0.11 ≤ 1.0 OK

N / (A × fcv) = 0.12 ≤ 1.0 OK

短期 N = 915 (N), fc=2.0×Kz×Fc/3=11.600 (N/mm²), fcv=2.0×Fcv/3=4.000 (N/mm²)

(ω × N) / (A × fc) = 0.06 ≤ 1.0 OK

N / (A × fcv) = 0.07 ≤ 1.0 OK

積雪時 N = 915 (N), fc=0.8×2.0×Kz×Fc/3=9.280 (N/mm²), fcv=0.8×2.0×Fcv/3=3.200 (N/mm²)

(ω × N) / (A × fc) = 0.07 ≤ 1.0 OK

N / (A × fcv) = 0.08 ≤ 1.0 OK

壁端部

長期 N = 457 (N), fc=1.1×Kz×Fc/3=6.380 (N/mm²), fcv=1.1×Fcv/3=2.200 (N/mm²)

(ω × N) / (A × fc) = 0.05 ≤ 1.0 OK

N / (A × fcv) = 0.06 ≤ 1.0 OK

短期 N = 457 (N), fc=2.0×Kz×Fc/3=11.600 (N/mm²), fcv=2.0×Fcv/3=4.000 (N/mm²)

(ω × N) / (A × fc) = 0.03 ≤ 1.0 OK

N / (A × fcv) = 0.03 ≤ 1.0 OK

積雪時 N = 457 (N), fc=0.8×2.0×Kz×Fc/3=9.280 (N/mm²), fcv=0.8×2.0×Fcv/3=3.200 (N/mm²)

(ω × N) / (A × fc) = 0.04 ≤ 1.0 OK

N / (A × fcv) = 0.04 ≤ 1.0 OK

1階 X5.5通り Y2 - Y2.5

S-P-F 2級 204 (3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 0.910 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 0.455 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 0.46 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 4697	4697	4697	0 (N)
単位長さ当たりの軸力	N1 = 5161	5161	5161	[0] (N/m)
1箇所当たりの軸力	N2 = 2348	2348	2348	0 (N)
1本当たりの軸力(一般部)	N3 = 2348	2348	2348	0 (N/本)
1本当たりの軸力(壁端部)	N4 = 1174	1174	1174	(N/本)

水平力による壁の回転力 Ms/b = 0 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 2348 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 1174 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 2348 (N)

一般部

長期 N = 2348 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.28 \leq 1.0$ OK

N / (A × fcv) = 0.32 ≤ 1.0 OK

短期 N = 2348 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.15 \leq 1.0$ OK

N / (A × fcv) = 0.17 ≤ 1.0 OK

積雪時 N = 2348 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.19 \leq 1.0$ OK

N / (A × fcv) = 0.22 ≤ 1.0 OK

壁端部

長期 N = 1174 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.14 \leq 1.0$ OK

N / (A × fcv) = 0.16 ≤ 1.0 OK

短期 N = 1174 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.08 \leq 1.0$ OK

N / (A × fcv) = 0.09 ≤ 1.0 OK

積雪時 N = 1174 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.10 \leq 1.0$ OK

N / (A × fcv) = 0.11 ≤ 1.0 OK

1階 X6.5通り Y0 - Y2.5

S-P-F 2級 204 (3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 2.730 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 2.275 (m)

壁端部たて枠本数 n1 = 3.0 (本) 壁端部負担幅 l = 0.68 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 14589	14589	17135	31189 (N)
単位長さ当たりの軸力	N1 = 5344	5344	6277	[13710] (N/m)
1箇所当たりの軸力	N2 = 2432	2432	2856	6238 (N)
1本当たりの軸力(一般部)	N3 = 2432	2432	2856	6238 (N/本)
1本当たりの軸力(壁端部)	N4 = 1216	1216	1428	(N/本)

水平力による壁の回転力 Ms/b = 9860 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 32750 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 10917 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 8669 (N)

一般部

長期 N = 2432 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.29 \leq 1.0$ OK

N / (A × fcv) = 0.33 ≤ 1.0 OK

短期 N = 8669 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.56 \leq 1.0$ OK

N / (A × fcv) = 0.64 ≤ 1.0 OK

積雪時 N = 2856 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.23 \leq 1.0$ OK

N / (A × fcv) = 0.26 ≤ 1.0 OK

壁端部

長期 N = 1216 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.14 \leq 1.0$ OK

N / (A × fcv) = 0.16 ≤ 1.0 OK

短期 N = 10917 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.71 \leq 1.0$ OK

N / (A × fcv) = 0.81 ≤ 1.0 OK

積雪時 N = 1428 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.12 \leq 1.0$ OK

N / (A × fcv) = 0.13 ≤ 1.0 OK

風圧時 Lfb = 1.1 × Kz × Fb / 3 = 7.920, Lfc = 1.1 × Kz × Fc / 3 = 6.380, Sfc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²)

一般部 N = 2432 (N), w1 = Q × C × a = 937.3 × 1.00 × 0.455 = 426.5 (N/m), Ms1 = 290.9 (N·m)

 $(\omega \times N) / (A \times Sfc) + (Lfc \times Ms1) / (Lfb \times Z \times Sfc) = 0.56 \leq 1.0$ OK

壁端部 N = 3647 (N), w2 = Q × C × l = 937.3 × 1.00 × 0.683 = 639.7 (N/m), Ms2 = 436.4 (N·m)

 $(\omega \times N) / (3A \times Sfc) + (Lfc \times Ms2) / (Lfb \times 3Z \times Sfc) = 0.28 \leq 1.0$ OK

釘 : CN90 木口打ち, 一面せん断力値 = 400.0 (N)

せん断力 Q = (w1 × Lk) / 2 = 498.14 (N)

必要釘本数 n = Q / (2 × 一面せん断力値 × (2 / 3)) = 1 (本)

1階 X6.5通り Y4.5 - Y6

S-P-F 2級 204(3.8×8.9 (cm)), Lk = 2.336 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 90.82, 座屈係数 ω = 2.55Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 1.820 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 1.365 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 0.68 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 6262	6262	7004	14417 (N)
単位長さ当たりの軸力	N1 = 3440	3440	3848	[6337] (N/m)
1箇所当たりの軸力	N2 = 1565	1565	1751	2883 (N)
1本当たりの軸力(一般部)	N3 = 1565	1565	1751	2883 (N/本)
1本当たりの軸力(壁端部)	N4 = 1174	1174	1313	(N/本)

水平力による壁の回転力 Ms/b = 5916 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 16256 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 8128 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 4449 (N)

一般部

長期 N = 1565 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.19 \leq 1.0$ OK

N / (A × fcv) = 0.21 ≤ 1.0 OK

短期 N = 4449 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.29 \leq 1.0$ OK

N / (A × fcv) = 0.33 ≤ 1.0 OK

積雪時 N = 1751 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.14 \leq 1.0$ OK

N / (A × fcv) = 0.16 ≤ 1.0 OK

壁端部

長期 N = 1174 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.14 \leq 1.0$ OK

N / (A × fcv) = 0.16 ≤ 1.0 OK

短期 N = 8128 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²) $(\omega \times N) / (A \times fc) = 0.53 \leq 1.0$ OK

N / (A × fcv) = 0.60 ≤ 1.0 OK

積雪時 N = 1313 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²) $(\omega \times N) / (A \times fc) = 0.11 \leq 1.0$ OK

N / (A × fcv) = 0.12 ≤ 1.0 OK

風圧時 Lfb = 1.1 × Kz × Fb / 3 = 7.920, Lfc = 1.1 × Kz × Fc / 3 = 6.380, Sfc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²)

一般部 N = 1565 (N), w1 = Q × C × a = 937.3 × 1.00 × 0.455 = 426.5 (N/m), Ms1 = 290.9 (N·m)

 $(\omega \times N) / (A \times Sfc) + (Lfc \times Ms1) / (Lfb \times Z \times Sfc) = 0.50 \leq 1.0$ OK

壁端部 N = 2348 (N), w2 = Q × C × l = 937.3 × 1.00 × 0.683 = 639.7 (N/m), Ms2 = 436.4 (N·m)

 $(\omega \times N) / (2A \times Sfc) + (Lfc \times Ms2) / (Lfb \times 2Z \times Sfc) = 0.38 \leq 1.0$ OK

釘 : CN90 木口打ち, 一面せん断力値 = 400.0 (N)

せん断力 Q = (w1 × Lk) / 2 = 498.14 (N)

必要釘本数 n = Q / (2 × 一面せん断力値 × (2 / 3)) = 1 (本)

1階 X6.5通り Y6 - Y7

S-P-F 2級 204 (3.8×8.9 (cm)), Lk = 2.453 (m)

下枠 S-P-F 2級

A = 33.8 (cm²), Z = 50.2 (cm³), i = 2.57 (cm), λ = 95.36, 座屈係数 ω = 2.89Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)

Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

軸力負担長さ L = 0.910 (m) たて枠のピッチ a = 0.455 (m) 壁長 l = 0.910 (m)

壁端部たて枠本数 n1 = 2.0 (本) 壁端部負担幅 l = 0.23 (m)

	(長期)	(短期)	(積雪時)	(水平力)
軸力	N0 = 4188	4188	4834	14417 (N)
単位長さ当たりの軸力	N1 = 4602	4602	5312	[6337] (N/m)
1箇所当たりの軸力	N2 = 2094	2094	2417	2883 (N)
1本当たりの軸力(一般部)	N3 = 2094	2094	2417	2883 (N/本)
1本当たりの軸力(壁端部)	N4 = 523	523	604	(N/本)

水平力による壁の回転力 Ms/b = 5916 (N)

壁端部の短期軸力 Ns0 = (N0(短期) + N0(水平力)) / 2 + Ms/b = 15219 (N)

壁端部の短期軸力(1本あたり) Ns1 = Ns0 / n1 = 7609 (N)

一般部の短期軸力(1本あたり) Ns2 = N3(短期) + N3(水平力) = 4977 (N)

一般部

長期 N = 2094 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.28 ≤ 1.0 OK

N / (A × fcv) = 0.28 ≤ 1.0 OK

短期 N = 4977 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.37 ≤ 1.0 OK

N / (A × fcv) = 0.37 ≤ 1.0 OK

積雪時 N = 2417 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.22 ≤ 1.0 OK

N / (A × fcv) = 0.22 ≤ 1.0 OK

壁端部

長期 N = 523 (N), fc = 1.1 × Kz × Fc / 3 = 6.380 (N/mm²), fcv = 1.1 × Fcv / 3 = 2.200 (N/mm²)

(ω × N) / (A × fc) = 0.07 ≤ 1.0 OK

N / (A × fcv) = 0.07 ≤ 1.0 OK

短期 N = 7609 (N), fc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²), fcv = 2.0 × Fcv / 3 = 4.000 (N/mm²)

(ω × N) / (A × fc) = 0.56 ≤ 1.0 OK

N / (A × fcv) = 0.56 ≤ 1.0 OK

積雪時 N = 604 (N), fc = 0.8 × 2.0 × Kz × Fc / 3 = 9.280 (N/mm²), fcv = 0.8 × 2.0 × Fcv / 3 = 3.200 (N/mm²)

(ω × N) / (A × fc) = 0.06 ≤ 1.0 OK

N / (A × fcv) = 0.06 ≤ 1.0 OK

風圧時 Lfb = 1.1 × Kz × Fb / 3 = 7.920, Lfc = 1.1 × Kz × Fc / 3 = 6.380, Sfc = 2.0 × Kz × Fc / 3 = 11.600 (N/mm²)

一般部 N = 2094 (N), w1 = Q × C × a = 937.3 × 1.00 × 0.455 = 426.5 (N/m), Ms1 = 320.8 (N·m)

(ω × N) / (A × Sfc) + (Lfc × Ms1) / (Lfb × Z × Sfc) = 0.60 ≤ 1.0 OK

壁端部 N = 1047 (N), w2 = Q × C × l = 937.3 × 1.00 × 0.228 = 213.2 (N/m), Ms2 = 160.4 (N·m)

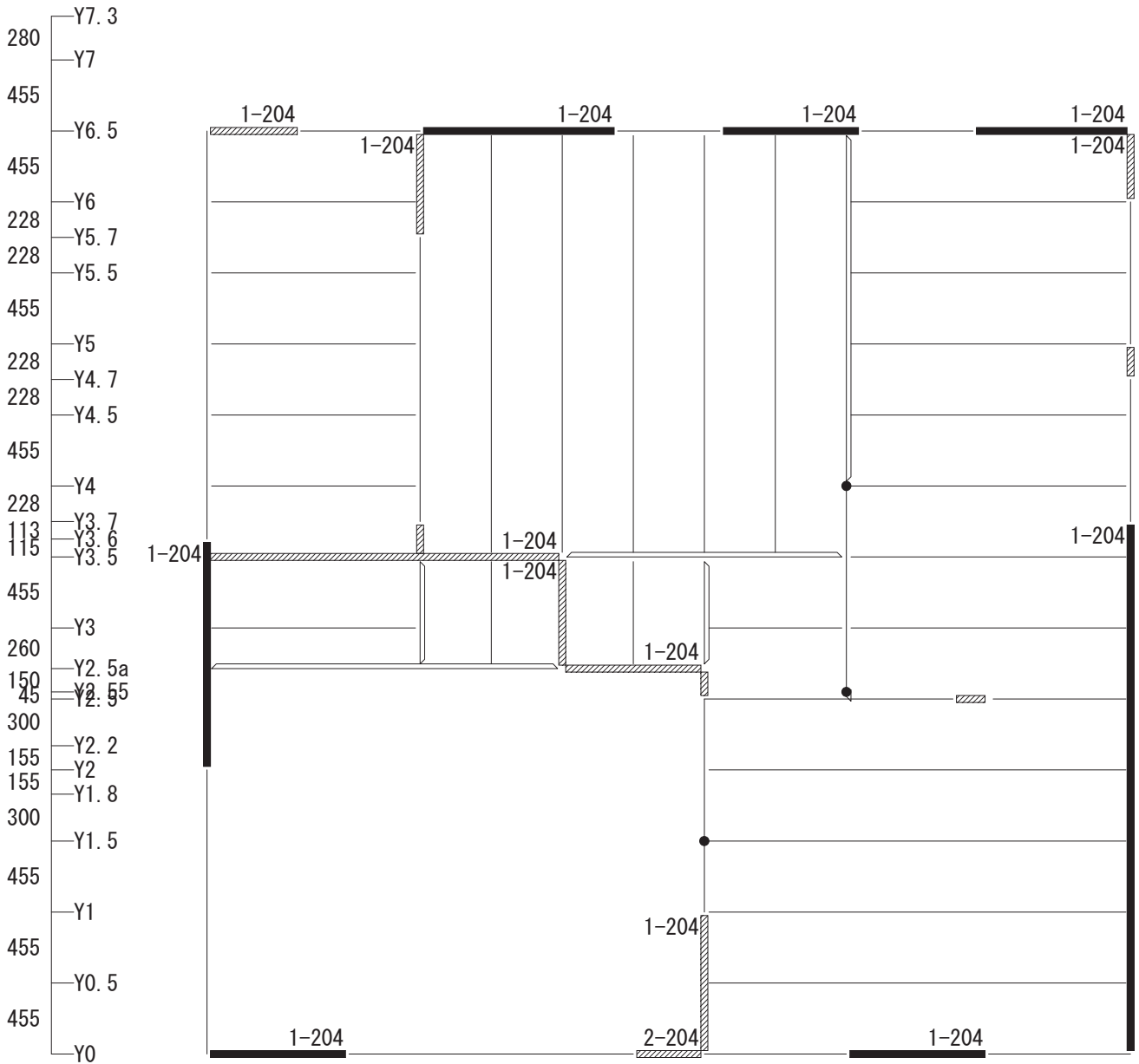
(ω × N) / (2A × Sfc) + (Lfc × Ms2) / (Lfb × 2Z × Sfc) = 0.15 ≤ 1.0 OK

釘 : CN90 木口打ち, 一面せん断力値 = 400.0 (N)

せん断力 Q = (w1 × Lk) / 2 = 523.09 (N)

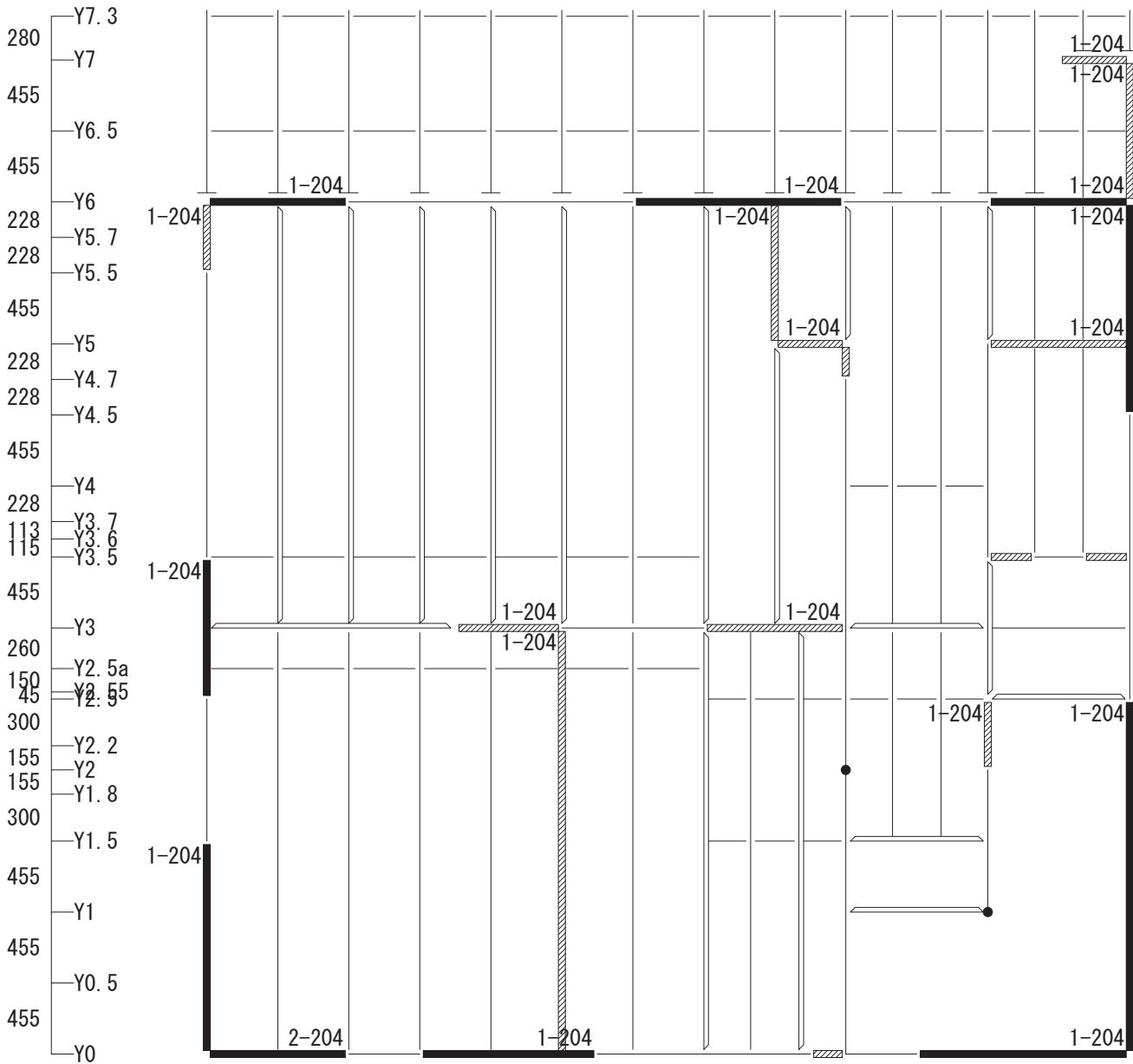
必要釘本数 n = Q / (2 × 一面せん断力値 × (2 / 3)) = 1 (本)

2階たて枠



X0	X0.06	X1	X1.7	X2	X2.7	X3a	X3.5	X3.8	X4.1	X4.5	X4.8	X5.5	X5.8	X6.2	X6.5				
455	145	455	228	455	228	100	228	228	200	155	73	100	200	155	73	100	300	155	300

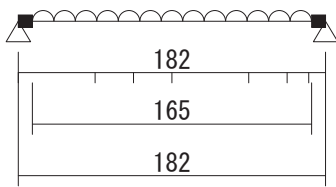
1階たて枠



X0	X0.5	X1	X1.5	X2	X2.5	X3	X3.5	X4	X4.5	X5	X5.5	X6	X6.5
455	145	228	228	455	128	100	155	73	100	155	128	155	300

3.3. まぐさの設計

階、位置： 2階まぐさ Y0通り X1 - X3



S-P-F 2級 2 - 210 (3.8 × 23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}, Kz = 0.68$
 $Zx = 699.52 \text{ (cm}^3\text{)}, Zy = 113.11 \text{ (cm}^3\text{)}$
 $Ix = 8219.32 \text{ (cm}^4\text{)}, Iy = 214.92 \text{ (cm}^4\text{)}$
 $Fb = 21.60 \text{ (N/mm}^2\text{)}, Fs = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega_a = 760 \times 0.628 = 477 \text{ (N/m)} \rightarrow 4.77 \text{ (N/cm)}$ (長期)
 $\omega_a = 760 \times 0.628 = 477 \text{ (N/m)} \rightarrow 4.77 \text{ (N/cm)}$ (短期)
 $\omega_a = 1280 \times 0.628 = 803 \text{ (N/m)} \rightarrow 8.03 \text{ (N/cm)}$ (積雪時)
 $\omega_b = 600 \times 1.23 = 738.60 \text{ (N/m)} \rightarrow 7.39 \text{ (N/cm)}$ (長期, 短期, 積雪時)
 $\omega_1 (a - b) = 891.80$ (長期) 891.80 (短期) 891.80 (積雪時) (N)

長期 $f_b = 1.1 \times Kz \times Fb / 3 = 5.39, f_s = 1.1 \times 1.00 \times Fs / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω_a	16308	394.4	394.4	0.006
ω_b	25257	610.8	610.8	0.009
ω_1	18438	445.9	445.9	0.007
Total	60004	1451.1	1451.1	0.022

$M_{max} / (Zx \times f_b) = 60003.8 / (699.52 \times 538.56) = 0.16 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 1451.12) / (178.60 \times 66.00) = 0.18 \leq 1.0 \text{ OK}$
 $\delta = 0.022 \text{ (cm)} \leq 1.00 \text{ OK}$
 $= 1/7632 \leq 1/300 \text{ OK}$

短期 $f_b = 2.0 \times Kz \times Fb / 3 = 9.79, f_s = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω_a	16308	394.4	394.4	0.006
ω_b	25257	610.8	610.8	0.009
ω_1	18438	445.9	445.9	0.007
Total	60004	1451.1	1451.1	0.022

$M_{max} / (Zx \times f_b) = 60003.8 / (699.52 \times 979.20) = 0.09 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 1451.12) / (178.60 \times 120.00) = 0.10 \leq 1.0 \text{ OK}$
 $\delta = 0.022 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/7632 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times Kz \times Fb / 3 = 7.83, f_s = 0.8 \times 2.0 \times 1.00 \times Fs / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω_a	27467	664.2	664.2	0.010
ω_b	25257	610.8	610.8	0.009
ω_1	18438	445.9	445.9	0.007
Total	71162	1721.0	1721.0	0.026

$M_{max} / (Zx \times f_b) = 71162.1 / (699.52 \times 783.36) = 0.13 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 1720.97) / (178.60 \times 96.00) = 0.15 \leq 1.0 \text{ OK}$
 $\delta = 0.026 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/6436 \leq 1/150 \text{ OK}$

風圧力に対する曲げ

$f_{bx} = 2.0 \times Kz \times Fb / 3 = 9.79, f_{by} = 2.0 \times Fb / 3 = 14.40, f_s = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

風圧力 $w = Q \times C \times l = 937.3 \times 1.00 \times 1.23 = 1153.9 \text{ (N/m)}$

$Q = 954.2 \text{ (N)}, Ms = 394.6 \text{ (N·m)}$

$M_{max} / (Zx \times f_{bx}) + Ms / (Zy \times f_{by}) = 60003.8 / (699.52 \times 979.20) + 39457.9 / (113.11 \times 1440.00)$
 $= 0.33 \leq 1.0 \text{ OK}$
 $(\alpha \times Q) / (A \times f_s) = (1.5 \times 954.2) / (178.60 \times 120.00) = 0.07 \leq 1.0 \text{ OK}$
 $\delta = 0.54 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/303 \leq 1/150 \text{ OK}$

まぐさ端部の接合

釘：CN90 木口打ち，一面せん断力値 = 400.0 (N)

必要釘本数 $n = Q / (2 \times \text{一面せん断力値} \times (2 / 3)) = 2 \text{ (本)}$

まぐさ受け

S-P-F 2級 204 (3.8 × 8.9 (cm)), $L_k = 2.03 \text{ (m)}$

下枠 S-P-F 2級

$A = 33.82 \text{ (cm}^2\text{)}, Z = 50.17 \text{ (cm}^3\text{)}, i = 2.57 \text{ (cm)}, \lambda = 78.72, \text{ 座屈係数 } \omega = 1.95$

$F_c = 17.40 \text{ (N/mm}^2\text{)}, F_b = 21.60 \text{ (N/mm}^2\text{)}, F_{cv} = 6.00 \text{ (N/mm}^2\text{)}$

$K_z (\text{曲げ}) = 1.00, K_z (\text{圧縮}) = 1.00$

長期 $N = 1451.12 \text{ (N)}, f_c = 1.1 \times Kz \times F_c / 3 = 6.38 \text{ (N/mm}^2\text{)}, f_{cv} = 1.1 \times F_{cv} / 3 = 2.20 \text{ (N/mm}^2\text{)}$

$(\omega \times N) / (A \times f_c) = 0.13 \leq 1.0 \text{ OK}$

$N / (A \times f_{cv}) = 0.20 \leq 1.0 \text{ OK}$

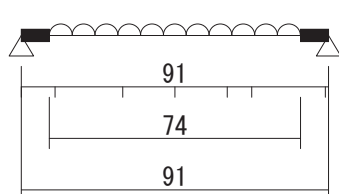
短期 $N = 1451.12 \text{ (N)}, f_c = 2.0 \times Kz \times F_c / 3 = 11.60 \text{ (N/mm}^2\text{)}, f_{cv} = 2.0 \times F_{cv} / 3 = 4.00 \text{ (N/mm}^2\text{)}$

$$\begin{aligned}(\omega \times N) / (A \times f_c) &= 0.07 \leq 1.0 \text{ OK} \\ N / (A \times f_{cv}) &= 0.11 \leq 1.0 \text{ OK}\end{aligned}$$

積雪時 $N = 1720.97 \text{ (N)}$, $f_c = 0.8 \times 2.0 \times K_z \times F_c / 3 = 9.28 \text{ (N/mm}^2\text{)}$, $f_{cv} = 0.8 \times 2.0 \times F_{cv} / 3 = 3.20 \text{ (N/mm}^2\text{)}$

$$\begin{aligned}(\omega \times N) / (A \times f_c) &= 0.11 \leq 1.0 \text{ OK} \\ N / (A \times f_{cv}) &= 0.16 \leq 1.0 \text{ OK}\end{aligned}$$

階、位置： 2階まぐさ Y0通り X3.5 - X4.5



S-P-F 2級 2 - 204 (3.8×8.9 (cm))
 $A = 67.64 \text{ (cm}^2\text{)}$, $Kz = 1.00$
 $Zx = 100.33 \text{ (cm}^3\text{)}$, $Zy = 42.84 \text{ (cm}^3\text{)}$
 $Ix = 446.48 \text{ (cm}^4\text{)}$, $Iy = 81.39 \text{ (cm}^4\text{)}$
 $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fs = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$$\begin{aligned} \omega &= 300 \times 0.228 = 68 \text{ (N/m)} \rightarrow 0.68 \text{ (N/cm)} \text{ (長期)} \\ \omega &= 300 \times 0.228 = 68 \text{ (N/m)} \rightarrow 0.68 \text{ (N/cm)} \text{ (短期)} \\ \omega &= 300 \times 0.228 = 68 \text{ (N/m)} \rightarrow 0.68 \text{ (N/cm)} \text{ (積雪時)} \\ \omega a &= 460 \times 0.628 = 289 \text{ (N/m)} \rightarrow 2.89 \text{ (N/cm)} \text{ (長期)} \\ \omega a &= 460 \times 0.628 = 289 \text{ (N/m)} \rightarrow 2.89 \text{ (N/cm)} \text{ (短期)} \\ \omega a &= 980 \times 0.628 = 615 \text{ (N/m)} \rightarrow 6.15 \text{ (N/cm)} \text{ (積雪時)} \\ \omega b &= 600 \times 1.23 = 738.60 \text{ (N/m)} \rightarrow 7.39 \text{ (N/cm)} \text{ (長期, 短期, 積雪時)} \\ \omega l (a - b) &= 445.90 \text{ (長期)} \quad 445.90 \text{ (短期)} \quad 445.90 \text{ (積雪時)} \text{ (N)} \end{aligned}$$

長期 $f_b = 1.1 \times Kz \times Fb / 3 = 7.92$, $f_s = 1.1 \times 1.00 \times Fs / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	472	25.4	25.4	0.001
ωa	1997	107.4	107.4	0.003
ωb	5111	274.8	274.8	0.007
ωl	4147	223.0	223.0	0.006
Total	11727	630.5	630.5	0.016

$$\begin{aligned} M_{\max} / (Zx \times f_b) &= 11726.9 / (100.33 \times 792.00) = 0.15 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 630.48) / (67.64 \times 66.00) = 0.21 \leq 1.0 \text{ OK} \\ \delta &= 0.016 \text{ (cm)} \leq 1.00 \text{ OK} \\ &= 1/4716 \leq 1/300 \text{ OK} \end{aligned}$$

短期 $f_b = 2.0 \times Kz \times Fb / 3 = 14.40$, $f_s = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	472	25.4	25.4	0.001
ωa	1997	107.4	107.4	0.003
ωb	5111	274.8	274.8	0.007
ωl	4147	223.0	223.0	0.006
Total	11727	630.5	630.5	0.016

$$\begin{aligned} M_{\max} / (Zx \times f_b) &= 11726.9 / (100.33 \times 1440.00) = 0.08 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 630.48) / (67.64 \times 120.00) = 0.12 \leq 1.0 \text{ OK} \\ \delta &= 0.016 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/4716 \leq 1/150 \text{ OK} \end{aligned}$$

積雪時 $f_b = 0.8 \times 2.0 \times Kz \times Fb / 3 = 11.52$, $f_s = 0.8 \times 2.0 \times 1.00 \times Fs / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	472	25.4	25.4	0.001
ωa	4255	228.8	228.8	0.006
ωb	5111	274.8	274.8	0.007
ωl	4147	223.0	223.0	0.006
Total	13985	751.9	751.9	0.019

$$\begin{aligned} M_{\max} / (Zx \times f_b) &= 13984.6 / (100.33 \times 1152.00) = 0.12 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 751.86) / (67.64 \times 96.00) = 0.17 \leq 1.0 \text{ OK} \\ \delta &= 0.019 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/3955 \leq 1/150 \text{ OK} \end{aligned}$$

風圧力に対する曲げ

$$f_{bx} = 2.0 \times Kz \times Fb / 3 = 14.40, f_{by} = 2.0 \times Fb / 3 = 14.40, f_s = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$$

$$\text{風圧力 } w = Q \times C \times l = 937.3 \times 1.00 \times 1.23 = 1153.9 \text{ (N/m)}$$

$$Q = 429.2 \text{ (N)} \quad M_s = 79.8 \text{ (N}\cdot\text{m)}$$

$$\begin{aligned} M_{\max} / (Zx \times f_{bx}) + M_s / (Zy \times f_{by}) &= 11726.9 / (100.33 \times 1440.00) + 7983.8 / (42.84 \times 1440.00) \\ &= 0.21 \leq 1.0 \text{ OK} \\ (\alpha \times Q) / (A \times f_s) &= (1.5 \times 429.2) / (67.64 \times 120.00) = 0.08 \leq 1.0 \text{ OK} \\ \delta &= 0.06 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/1263 \leq 1/150 \text{ OK} \end{aligned}$$

まぐさ端部の接合

釘：CN90 木口打ち，一面せん断力値 = 400.0 (N)

$$\text{必要釘本数 } n = Q / (2 \times \text{一面せん断力値} \times (2 / 3)) = 1 \text{ (本)}$$

まぐさ受け

S-P-F 2級 204 (3.8×8.9 (cm)), $L_k = 1.75 \text{ (m)}$

下枠 S-P-F 2級

$A = 33.82 \text{ (cm}^2\text{)}$, $Z = 50.17 \text{ (cm}^3\text{)}$, $i = 2.57 \text{ (cm)}$, $\lambda = 68.03$, 座屈係数 $\omega = 1.61$

$F_c = 17.40 \text{ (N/mm}^2\text{)}$, $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_{cv} = 6.00 \text{ (N/mm}^2\text{)}$

K_z (曲げ) = 1.00 K_z (圧縮) = 1.00

長期 $N = 630.48$ (N), $f_c = 1.1 \times K_z \times F_c / 3 = 6.38$ (N/mm²), $f_{cv} = 1.1 \times F_{cv} / 3 = 2.20$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.05 \leq 1.0 \text{ OK}$$

$$N / (A \times f_{cv}) = 0.08 \leq 1.0 \text{ OK}$$

短期 $N = 630.48$ (N), $f_c = 2.0 \times K_z \times F_c / 3 = 11.60$ (N/mm²), $f_{cv} = 2.0 \times F_{cv} / 3 = 4.00$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.03 \leq 1.0 \text{ OK}$$

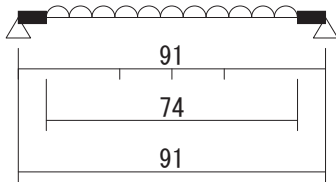
$$N / (A \times f_{cv}) = 0.05 \leq 1.0 \text{ OK}$$

積雪時 $N = 751.86$ (N), $f_c = 0.8 \times 2.0 \times K_z \times F_c / 3 = 9.28$ (N/mm²), $f_{cv} = 0.8 \times 2.0 \times F_{cv} / 3 = 3.20$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.04 \leq 1.0 \text{ OK}$$

$$N / (A \times f_{cv}) = 0.07 \leq 1.0 \text{ OK}$$

階、位置： 2階まぐさ Y0通り X5.5 - X6.5



S-P-F 2級 2 - 204 (3.8 × 8.9 (cm))
 $A = 67.64 \text{ (cm}^2\text{)}$, $Kz = 1.00$
 $Zx = 100.33 \text{ (cm}^3\text{)}$, $Zy = 42.84 \text{ (cm}^3\text{)}$
 $Ix = 446.48 \text{ (cm}^4\text{)}$, $Iy = 81.39 \text{ (cm}^4\text{)}$
 $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fs = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 300 \times 0.228 = 68 \text{ (N/m)} \rightarrow 0.68 \text{ (N/cm)}$ (長期)
 $\omega = 300 \times 0.228 = 68 \text{ (N/m)} \rightarrow 0.68 \text{ (N/cm)}$ (短期)
 $\omega = 300 \times 0.228 = 68 \text{ (N/m)} \rightarrow 0.68 \text{ (N/cm)}$ (積雪時)
 $\omega_a = 460 \times 0.628 = 289 \text{ (N/m)} \rightarrow 2.89 \text{ (N/cm)}$ (長期)
 $\omega_a = 460 \times 0.628 = 289 \text{ (N/m)} \rightarrow 2.89 \text{ (N/cm)}$ (短期)
 $\omega_a = 980 \times 0.628 = 615 \text{ (N/m)} \rightarrow 6.15 \text{ (N/cm)}$ (積雪時)
 $\omega_b = 600 \times 1.23 = 738.60 \text{ (N/m)} \rightarrow 7.39 \text{ (N/cm)}$ (長期, 短期, 積雪時)
 $\omega_1 (a - b) = 445.90$ (長期) 445.90 (短期) 445.90 (積雪時) (N)

長期 $f_b = 1.1 \times Kz \times Fb / 3 = 7.92$, $f_s = 1.1 \times 1.00 \times Fs / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	472	25.4	25.4	0.001
ω_a	1997	107.4	107.4	0.003
ω_b	5111	274.8	274.8	0.007
ω_1	4147	223.0	223.0	0.006
Total	11727	630.5	630.5	0.016

$M_{max} / (Zx \times f_b) = 11726.9 / (100.33 \times 792.00) = 0.15 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 630.48) / (67.64 \times 66.00) = 0.21 \leq 1.0 \text{ OK}$
 $\delta = 0.016 \text{ (cm)} \leq 1.00 \text{ OK}$
 $= 1/4716 \leq 1/300 \text{ OK}$

短期 $f_b = 2.0 \times Kz \times Fb / 3 = 14.40$, $f_s = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	472	25.4	25.4	0.001
ω_a	1997	107.4	107.4	0.003
ω_b	5111	274.8	274.8	0.007
ω_1	4147	223.0	223.0	0.006
Total	11727	630.5	630.5	0.016

$M_{max} / (Zx \times f_b) = 11726.9 / (100.33 \times 1440.00) = 0.08 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 630.48) / (67.64 \times 120.00) = 0.12 \leq 1.0 \text{ OK}$
 $\delta = 0.016 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/4716 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times Kz \times Fb / 3 = 11.52$, $f_s = 0.8 \times 2.0 \times 1.00 \times Fs / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	472	25.4	25.4	0.001
ω_a	4255	228.8	228.8	0.006
ω_b	5111	274.8	274.8	0.007
ω_1	4147	223.0	223.0	0.006
Total	13985	751.9	751.9	0.019

$M_{max} / (Zx \times f_b) = 13984.6 / (100.33 \times 1152.00) = 0.12 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 751.86) / (67.64 \times 96.00) = 0.17 \leq 1.0 \text{ OK}$
 $\delta = 0.019 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/3955 \leq 1/150 \text{ OK}$

風圧力に対する曲げ

$f_{bx} = 2.0 \times Kz \times Fb / 3 = 14.40$, $f_{by} = 2.0 \times Fb / 3 = 14.40$, $f_s = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

風圧力 $w = Q \times C \times l = 937.3 \times 1.00 \times 1.23 = 1153.9 \text{ (N/m)}$

$Q = 429.2 \text{ (N)}$ $M_s = 79.8 \text{ (N·m)}$

$M_{max} / (Zx \times f_{bx}) + M_s / (Zy \times f_{by}) = 11726.9 / (100.33 \times 1440.00) + 7983.8 / (42.84 \times 1440.00)$
 $= 0.21 \leq 1.0 \text{ OK}$
 $(\alpha \times Q) / (A \times f_s) = (1.5 \times 429.2) / (67.64 \times 120.00) = 0.08 \leq 1.0 \text{ OK}$
 $\delta = 0.06 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1263 \leq 1/150 \text{ OK}$

まぐさ端部の接合

釘：CN90 木口打ち，一面せん断力値 = 400.0 (N)

必要釘本数 $n = Q / (2 \times \text{一面せん断力値} \times (2 / 3)) = 1 \text{ (本)}$

まぐさ受け

S-P-F 2級 204 (3.8 × 8.9 (cm)), $L_k = 1.50 \text{ (m)}$

下枠 S-P-F 2級

$A = 33.82 \text{ (cm}^2\text{)}$ $Z = 50.17 \text{ (cm}^3\text{)}$, $i = 2.57 \text{ (cm)}$, $\lambda = 58.31$, 座屈係数 $\omega = 1.39$

$F_c = 17.40 \text{ (N/mm}^2\text{)}$, $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_{cv} = 6.00 \text{ (N/mm}^2\text{)}$

K_z (曲げ) = 1.00 K_z (圧縮) = 1.00

長期 $N = 630.48$ (N), $f_c = 1.1 \times K_z \times F_c / 3 = 6.38$ (N/mm²), $f_{cv} = 1.1 \times F_{cv} / 3 = 2.20$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.04 \leq 1.0 \text{ OK}$$

$$N / (A \times f_{cv}) = 0.08 \leq 1.0 \text{ OK}$$

短期 $N = 630.48$ (N), $f_c = 2.0 \times K_z \times F_c / 3 = 11.60$ (N/mm²), $f_{cv} = 2.0 \times F_{cv} / 3 = 4.00$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.02 \leq 1.0 \text{ OK}$$

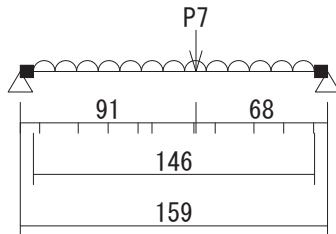
$$N / (A \times f_{cv}) = 0.05 \leq 1.0 \text{ OK}$$

積雪時 $N = 751.86$ (N), $f_c = 0.8 \times 2.0 \times K_z \times F_c / 3 = 9.28$ (N/mm²), $f_{cv} = 0.8 \times 2.0 \times F_{cv} / 3 = 3.20$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.03 \leq 1.0 \text{ OK}$$

$$N / (A \times f_{cv}) = 0.07 \leq 1.0 \text{ OK}$$

階、位置： 2階まぐさ Y2.5通り X3.5 - X5.3



S-P-F 2級 2 - 206 (3.8 × 14.0 (cm))
 $A = 106.40 \text{ (cm}^2\text{)}, Kz = 0.84$
 $Zx = 248.27 \text{ (cm}^3\text{)}, Zy = 67.39 \text{ (cm}^3\text{)}$
 $Ix = 1737.87 \text{ (cm}^4\text{)}, Iy = 128.03 \text{ (cm}^4\text{)}$
 $Fb = 21.60 \text{ (N/mm}^2\text{)}, Fs = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 300 \times 0.455 = 137 \text{ (N/m)} \rightarrow 1.37 \text{ (N/cm)}$ (長期)
 $\omega = 300 \times 0.455 = 137 \text{ (N/m)} \rightarrow 1.37 \text{ (N/cm)}$ (短期)
 $\omega = 300 \times 0.455 = 137 \text{ (N/m)} \rightarrow 1.37 \text{ (N/cm)}$ (積雪時)
 $\omega b = 400 \times 1.23 = 492.40 \text{ (N/m)} \rightarrow 4.92 \text{ (N/cm)}$ (長期, 短期, 積雪時)
 $P7 = 9.21 \text{ (長期)} \quad 9.21 \text{ (短期)} \quad 9.21 \text{ (積雪時) (N)}$

長期 $fb = 1.1 \times Kz \times Fb / 3 = 6.65$, $fs = 1.1 \times 1.00 \times Fs / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	3620	99.4	99.4	0.005
ωb	13057	358.6	358.6	0.017
P7	327	3.9	5.3	0.000
Total	17004	461.9	463.3	0.022

$M_{max} / (Zx \times fb) = 17004.1 / (248.27 \times 665.28) = 0.10 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 463.32) / (106.40 \times 66.00) = 0.10 \leq 1.0 \text{ OK}$
 $\delta = 0.022 \text{ (cm)} \leq 1.00 \text{ OK}$
 $= 1/6493 \leq 1/300 \text{ OK}$

短期 $fb = 2.0 \times Kz \times Fb / 3 = 12.10$, $fs = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	3620	99.4	99.4	0.005
ωb	13057	358.6	358.6	0.017
P7	327	3.9	5.3	0.000
Total	17004	461.9	463.3	0.022

$M_{max} / (Zx \times fb) = 17004.1 / (248.27 \times 1209.60) = 0.06 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 463.32) / (106.40 \times 120.00) = 0.05 \leq 1.0 \text{ OK}$
 $\delta = 0.022 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/6493 \leq 1/150 \text{ OK}$

積雪時 $fb = 0.8 \times 2.0 \times Kz \times Fb / 3 = 9.68$, $fs = 0.8 \times 2.0 \times 1.00 \times Fs / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	3620	99.4	99.4	0.005
ωb	13057	358.6	358.6	0.017
P7	327	3.9	5.3	0.000
Total	17004	461.9	463.3	0.022

$M_{max} / (Zx \times fb) = 17004.1 / (248.27 \times 967.68) = 0.07 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 463.32) / (106.40 \times 96.00) = 0.07 \leq 1.0 \text{ OK}$
 $\delta = 0.022 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/6493 \leq 1/150 \text{ OK}$

まぐさ受け

S-P-F 2級 204 (3.8 × 8.9 (cm)), $Lk = 2.03 \text{ (m)}$

下枠 S-P-F 2級

$A = 33.82 \text{ (cm}^2\text{)}, Z = 50.17 \text{ (cm}^3\text{)}, i = 2.57 \text{ (cm)}, \lambda = 78.72$, 座屈係数 $\omega = 1.95$

$Fc = 17.40 \text{ (N/mm}^2\text{)}, Fb = 21.60 \text{ (N/mm}^2\text{)}, Fcv = 6.00 \text{ (N/mm}^2\text{)}$

Kz (曲げ) = 1.00 Kz (圧縮) = 1.00

長期 $N = 463.32 \text{ (N)}$, $fc = 1.1 \times Kz \times Fc / 3 = 6.38 \text{ (N/mm}^2\text{)}$, $fcv = 1.1 \times Fcv / 3 = 2.20 \text{ (N/mm}^2\text{)}$

$(\omega \times N) / (A \times fc) = 0.04 \leq 1.0 \text{ OK}$

$N / (A \times fcv) = 0.06 \leq 1.0 \text{ OK}$

短期 $N = 463.32 \text{ (N)}$, $fc = 2.0 \times Kz \times Fc / 3 = 11.60 \text{ (N/mm}^2\text{)}$, $fcv = 2.0 \times Fcv / 3 = 4.00 \text{ (N/mm}^2\text{)}$

$(\omega \times N) / (A \times fc) = 0.02 \leq 1.0 \text{ OK}$

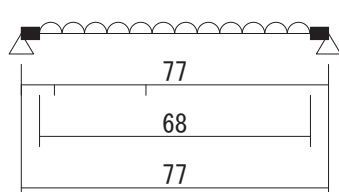
$N / (A \times fcv) = 0.03 \leq 1.0 \text{ OK}$

積雪時 $N = 463.32 \text{ (N)}$, $fc = 0.8 \times 2.0 \times Kz \times Fc / 3 = 9.28 \text{ (N/mm}^2\text{)}$, $fcv = 0.8 \times 2.0 \times Fcv / 3 = 3.20 \text{ (N/mm}^2\text{)}$

$(\omega \times N) / (A \times fc) = 0.03 \leq 1.0 \text{ OK}$

$N / (A \times fcv) = 0.04 \leq 1.0 \text{ OK}$

階、位置： 2階まぐさ Y6.5通り X0.6 - X1.5



S-P-F 2級 2 - 204 (3.8 × 8.9 (cm))
 $A = 67.64 \text{ (cm}^2\text{)}$, $Kz = 1.00$
 $Zx = 100.33 \text{ (cm}^3\text{)}$, $Zy = 42.84 \text{ (cm}^3\text{)}$
 $Ix = 446.48 \text{ (cm}^4\text{)}$, $Iy = 81.39 \text{ (cm}^4\text{)}$
 $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fs = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$$\begin{aligned} \omega &= 300 \times 0.228 = 68 \text{ (N/m)} \rightarrow 0.68 \text{ (N/cm)} \text{ (長期)} \\ \omega &= 300 \times 0.228 = 68 \text{ (N/m)} \rightarrow 0.68 \text{ (N/cm)} \text{ (短期)} \\ \omega &= 300 \times 0.228 = 68 \text{ (N/m)} \rightarrow 0.68 \text{ (N/cm)} \text{ (積雪時)} \\ \omega_a &= 460 \times 0.628 = 289 \text{ (N/m)} \rightarrow 2.89 \text{ (N/cm)} \text{ (長期)} \\ \omega_a &= 460 \times 0.628 = 289 \text{ (N/m)} \rightarrow 2.89 \text{ (N/cm)} \text{ (短期)} \\ \omega_a &= 980 \times 0.628 = 615 \text{ (N/m)} \rightarrow 6.15 \text{ (N/cm)} \text{ (積雪時)} \\ \omega_b &= 600 \times 0.82 = 492.40 \text{ (N/m)} \rightarrow 4.92 \text{ (N/cm)} \text{ (長期, 短期, 積雪時)} \\ \omega_1 (a - b) &= 374.85 \text{ (長期)} \quad 374.85 \text{ (短期)} \quad 374.85 \text{ (積雪時)} \text{ (N)} \end{aligned}$$

長期 $f_b = 1.1 \times Kz \times Fb / 3 = 7.92$, $f_s = 1.1 \times 1.00 \times Fs / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	389	23.0	23.0	0.000
ω_a	1644	97.4	97.4	0.002
ω_b	2804	166.2	166.2	0.003
ω_1	3163	187.4	187.4	0.004
Total	8000	474.1	474.1	0.009

$$\begin{aligned} M_{\max} / (Zx \times f_b) &= 7999.8 / (100.33 \times 792.00) = 0.10 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 474.06) / (67.64 \times 66.00) = 0.16 \leq 1.0 \text{ OK} \\ \delta &= 0.009 \text{ (cm)} \leq 1.00 \text{ OK} \\ &= 1/7620 \leq 1/300 \text{ OK} \end{aligned}$$

短期 $f_b = 2.0 \times Kz \times Fb / 3 = 14.40$, $f_s = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	389	23.0	23.0	0.000
ω_a	1644	97.4	97.4	0.002
ω_b	2804	166.2	166.2	0.003
ω_1	3163	187.4	187.4	0.004
Total	8000	474.1	474.1	0.009

$$\begin{aligned} M_{\max} / (Zx \times f_b) &= 7999.8 / (100.33 \times 1440.00) = 0.06 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 474.06) / (67.64 \times 120.00) = 0.09 \leq 1.0 \text{ OK} \\ \delta &= 0.009 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/7620 \leq 1/150 \text{ OK} \end{aligned}$$

積雪時 $f_b = 0.8 \times 2.0 \times Kz \times Fb / 3 = 11.52$, $f_s = 0.8 \times 2.0 \times 1.00 \times Fs / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	389	23.0	23.0	0.000
ω_a	3502	207.5	207.5	0.004
ω_b	2804	166.2	166.2	0.003
ω_1	3163	187.4	187.4	0.004
Total	9858	584.2	584.2	0.011

$$\begin{aligned} M_{\max} / (Zx \times f_b) &= 9858.2 / (100.33 \times 1152.00) = 0.09 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 584.19) / (67.64 \times 96.00) = 0.13 \leq 1.0 \text{ OK} \\ \delta &= 0.011 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/6184 \leq 1/150 \text{ OK} \end{aligned}$$

風圧力に対する曲げ

$f_{bx} = 2.0 \times Kz \times Fb / 3 = 14.40$, $f_{by} = 2.0 \times Fb / 3 = 14.40$, $f_s = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

風圧力 $w = Q \times C \times l = 937.3 \times 1.00 \times 1.23 = 1153.9 \text{ (N/m)}$

$Q = 389.4 \text{ (N)}$ $M_s = 65.7 \text{ (N·m)}$

$$\begin{aligned} M_{\max} / (Zx \times f_{bx}) + M_s / (Zy \times f_{by}) &= 7999.8 / (100.33 \times 1440.00) + 6571.6 / (42.84 \times 1440.00) \\ &= 0.16 \leq 1.0 \text{ OK} \\ (\alpha \times Q) / (A \times f_s) &= (1.50 \times 389.4) / (67.64 \times 120.00) = 0.07 \leq 1.0 \text{ OK} \\ \delta &= 0.04 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/1691 \leq 1/150 \text{ OK} \end{aligned}$$

まぐさ端部の接合

釘：CN90 木口打ち，一面せん断力値 = 400.0 (N)

必要釘本数 $n = Q / (2 \times \text{一面せん断力値} \times (2 / 3)) = 1 \text{ (本)}$

まぐさ受け

S-P-F 2級 204 (3.8 × 8.9 (cm)), $L_k = 2.10 \text{ (m)}$

下枠 S-P-F 2級

$A = 33.82 \text{ (cm}^2\text{)}$ $Z = 50.17 \text{ (cm}^3\text{)}$, $i = 2.57 \text{ (cm)}$, $\lambda = 81.68$, 座屈係数 $\omega = 2.07$

$F_c = 17.40 \text{ (N/mm}^2\text{)}$, $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_{cv} = 6.00 \text{ (N/mm}^2\text{)}$

K_z (曲げ) = 1.00 K_z (圧縮) = 1.00

長期 $N = 474.06$ (N), $f_c = 1.1 \times K_z \times F_c / 3 = 6.38$ (N/mm²), $f_{cv} = 1.1 \times F_{cv} / 3 = 2.20$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.05 \leq 1.0 \text{ OK}$$

$$N / (A \times f_{cv}) = 0.06 \leq 1.0 \text{ OK}$$

短期 $N = 474.06$ (N), $f_c = 2.0 \times K_z \times F_c / 3 = 11.60$ (N/mm²), $f_{cv} = 2.0 \times F_{cv} / 3 = 4.00$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.03 \leq 1.0 \text{ OK}$$

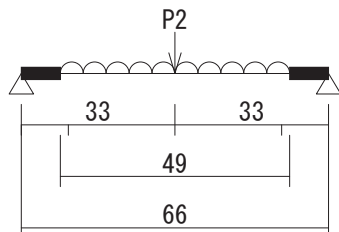
$$N / (A \times f_{cv}) = 0.04 \leq 1.0 \text{ OK}$$

積雪時 $N = 584.19$ (N), $f_c = 0.8 \times 2.0 \times K_z \times F_c / 3 = 9.28$ (N/mm²), $f_{cv} = 0.8 \times 2.0 \times F_{cv} / 3 = 3.20$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.04 \leq 1.0 \text{ OK}$$

$$N / (A \times f_{cv}) = 0.05 \leq 1.0 \text{ OK}$$

階、位置： 2階まぐさ Y6.5通り X2.9 - X3.6



S-P-F 2級 2 - 206 (3.8 × 14.0 (cm))
 $A = 106.40 \text{ (cm}^2\text{)}, Kz = 0.84$
 $Zx = 248.27 \text{ (cm}^3\text{)}, Zy = 67.39 \text{ (cm}^3\text{)}$
 $Ix = 1737.87 \text{ (cm}^4\text{)}, Iy = 128.03 \text{ (cm}^4\text{)}$
 $Fb = 21.60 \text{ (N/mm}^2\text{)}, Fs = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 1.365 = 2730 \text{ (N/m)} \rightarrow 27.30 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 1.365 = 2730 \text{ (N/m)} \rightarrow 27.30 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 1.365 = 2730 \text{ (N/m)} \rightarrow 27.30 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 1.365 = 1775 \text{ (N/m)} \rightarrow 17.75 \text{ (N/cm)}$ (長期たわみ)
 $\omega_b = 600 \times 1.23 = 738.60 \text{ (N/m)} \rightarrow 7.39 \text{ (N/cm)}$ (長期, 短期, 積雪時)
 $\omega_1(a - b) = 320.95$ (長期) 320.95 (短期) 320.95 (積雪時) 320.95 (長期たわみ) (N)
 $P2 = 1296.93$ (長期) 1296.93 (短期) 2211.19 (積雪時) 1296.93 (長期たわみ) (N)

長期 $fb = 1.1 \times Kz \times Fb / 3 = 6.65$, $fs = 1.1 \times 1.00 \times Fs / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	8160	667.5	667.5	0.001	0.002
ω_b	2208	180.6	180.6	0.000	0.001
ω_1	1962	160.5	160.5	0.000	0.001
P2	15855	648.5	648.5	0.002	0.004
Total	28184	1657.0	1657.0	0.004	0.007

$M_{max} / (Zx \times fb) = 28184.4 / (248.27 \times 665.28) = 0.17 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 1657.01) / (106.40 \times 66.00) = 0.35 \leq 1.0 \text{ OK}$
 $\delta = 0.004 \text{ (cm)} \leq 1.00 \text{ OK}$
 $= 1/13094 \leq 1/300 \text{ OK}$
 $\delta' \times 2.0 = 0.007 \text{ (cm)} = 1/7391 \leq 1/250 \text{ OK}$

短期 $fb = 2.0 \times Kz \times Fb / 3 = 12.10$, $fs = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	8160	667.5	667.5	0.001
ω_b	2208	180.6	180.6	0.000
ω_1	1962	160.5	160.5	0.000
P2	15855	648.5	648.5	0.002
Total	28184	1657.0	1657.0	0.004

$M_{max} / (Zx \times fb) = 28184.4 / (248.27 \times 1209.60) = 0.09 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 1657.01) / (106.40 \times 120.00) = 0.19 \leq 1.0 \text{ OK}$
 $\delta = 0.004 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/13094 \leq 1/150 \text{ OK}$

積雪時 $fb = 0.8 \times 2.0 \times Kz \times Fb / 3 = 9.68$, $fs = 0.8 \times 2.0 \times 1.00 \times Fs / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	8160	667.5	667.5	0.001
ω_b	2208	180.6	180.6	0.000
ω_1	1962	160.5	160.5	0.000
P2	27032	1105.6	1105.6	0.003
Total	39361	2114.1	2114.1	0.005

$M_{max} / (Zx \times fb) = 39361.3 / (248.27 \times 967.68) = 0.16 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 2114.14) / (106.40 \times 96.00) = 0.31 \leq 1.0 \text{ OK}$
 $\delta = 0.005 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/9646 \leq 1/150 \text{ OK}$

風圧力に対する曲げ

$fbx = 2.0 \times Kz \times Fb / 3 = 12.10$, $fby = 2.0 \times Fb / 3 = 14.40$, $fs = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

風圧力 $w = Q \times C \times l = 937.3 \times 1.00 \times 1.23 = 1153.9 \text{ (N/m)}$

$Q = 282.1 \text{ (N)}$ $Ms = 34.5 \text{ (N·m)}$

$M_{max} / (Zx \times fbx) + Ms / (Zy \times fby) = 28184.4 / (248.27 \times 1209.60) + 3448.9 / (67.39 \times 1440.00)$
 $= 0.13 \leq 1.0 \text{ OK}$
 $(\alpha \times Q) / (A \times fs) = (1.5 \times 282.1) / (106.40 \times 120.00) = 0.03 \leq 1.0 \text{ OK}$
 $\delta = 0.01 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/6996 \leq 1/150 \text{ OK}$

まぐさ端部の接合

釘：CN90 木口打ち，一面せん断力値 = 400.0 (N)

必要釘本数 $n = Q / (2 \times \text{一面せん断力値} \times (2 / 3)) = 1 \text{ (本)}$

まぐさ受け

S-P-F 2級 204 (3.8 × 8.9 (cm)), $Lk = 2.08 \text{ (m)}$

下枠 S-P-F 2級

$A = 33.82 \text{ (cm}^2\text{)}, Z = 50.17 \text{ (cm}^3\text{)}, i = 2.57 \text{ (cm)}, \lambda = 80.67$, 座屈係数 $\omega = 2.03$

$Fc = 17.40 \text{ (N/mm}^2\text{)}, Fb = 21.60 \text{ (N/mm}^2\text{)}, Fcv = 6.00 \text{ (N/mm}^2\text{)}$

Kz (曲げ) = 1.00 Kz (圧縮) = 1.00

長期 $N = 1657.01$ (N), $f_c = 1.1 \times K_z \times F_c / 3 = 6.38$ (N/mm²), $f_{cv} = 1.1 \times F_{cv} / 3 = 2.20$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.16 \leq 1.0 \text{ OK}$$

$$N / (A \times f_{cv}) = 0.22 \leq 1.0 \text{ OK}$$

短期 $N = 1657.01$ (N), $f_c = 2.0 \times K_z \times F_c / 3 = 11.60$ (N/mm²), $f_{cv} = 2.0 \times F_{cv} / 3 = 4.00$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.09 \leq 1.0 \text{ OK}$$

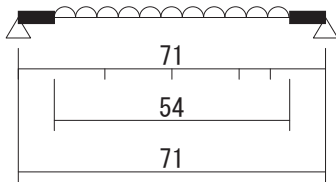
$$N / (A \times f_{cv}) = 0.12 \leq 1.0 \text{ OK}$$

積雪時 $N = 2114.14$ (N), $f_c = 0.8 \times 2.0 \times K_z \times F_c / 3 = 9.28$ (N/mm²), $f_{cv} = 0.8 \times 2.0 \times F_{cv} / 3 = 3.20$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.14 \leq 1.0 \text{ OK}$$

$$N / (A \times f_{cv}) = 0.20 \leq 1.0 \text{ OK}$$

階、位置： 2階まぐさ Y6.5通り X4.6 - X5.4



S-P-F 2級 2 - 204 (3.8×8.9 (cm))
 $A = 67.64 \text{ (cm}^2\text{)}$, $Kz = 1.00$
 $Zx = 100.33 \text{ (cm}^3\text{)}$, $Zy = 42.84 \text{ (cm}^3\text{)}$
 $Ix = 446.48 \text{ (cm}^4\text{)}$, $Iy = 81.39 \text{ (cm}^4\text{)}$
 $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fs = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$$\begin{aligned} \omega &= 300 \times 0.228 = 68 \text{ (N/m)} \rightarrow 0.68 \text{ (N/cm)} \text{ (長期)} \\ \omega &= 300 \times 0.228 = 68 \text{ (N/m)} \rightarrow 0.68 \text{ (N/cm)} \text{ (短期)} \\ \omega &= 300 \times 0.228 = 68 \text{ (N/m)} \rightarrow 0.68 \text{ (N/cm)} \text{ (積雪時)} \\ \omega_a &= 460 \times 0.628 = 289 \text{ (N/m)} \rightarrow 2.89 \text{ (N/cm)} \text{ (長期)} \\ \omega_a &= 460 \times 0.628 = 289 \text{ (N/m)} \rightarrow 2.89 \text{ (N/cm)} \text{ (短期)} \\ \omega_a &= 980 \times 0.628 = 615 \text{ (N/m)} \rightarrow 6.15 \text{ (N/cm)} \text{ (積雪時)} \\ \omega_b &= 600 \times 1.23 = 738.60 \text{ (N/m)} \rightarrow 7.39 \text{ (N/cm)} \text{ (長期, 短期, 積雪時)} \\ \omega_1 (a - b) &= 347.90 \text{ (長期)} \quad 347.90 \text{ (短期)} \quad 347.90 \text{ (積雪時)} \text{ (N)} \end{aligned}$$

長期 $f_b = 1.1 \times Kz \times Fb / 3 = 7.92$, $f_s = 1.1 \times 1.00 \times Fs / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	252	18.6	18.6	0.000
ω_a	1068	78.5	78.5	0.001
ω_b	2732	200.9	200.9	0.002
ω_1	2366	174.0	174.0	0.002
Total	6418	471.9	471.9	0.005

$$\begin{aligned} M_{\max} / (Zx \times f_b) &= 6418.2 / (100.33 \times 792.00) = 0.08 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 471.93) / (67.64 \times 66.00) = 0.16 \leq 1.0 \text{ OK} \\ \delta &= 0.005 \text{ (cm)} \leq 1.00 \text{ OK} \\ &= 1/11785 \leq 1/300 \text{ OK} \end{aligned}$$

短期 $f_b = 2.0 \times Kz \times Fb / 3 = 14.40$, $f_s = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	252	18.6	18.6	0.000
ω_a	1068	78.5	78.5	0.001
ω_b	2732	200.9	200.9	0.002
ω_1	2366	174.0	174.0	0.002
Total	6418	471.9	471.9	0.005

$$\begin{aligned} M_{\max} / (Zx \times f_b) &= 6418.2 / (100.33 \times 1440.00) = 0.04 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 471.93) / (67.64 \times 120.00) = 0.09 \leq 1.0 \text{ OK} \\ \delta &= 0.005 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/11785 \leq 1/150 \text{ OK} \end{aligned}$$

積雪時 $f_b = 0.8 \times 2.0 \times Kz \times Fb / 3 = 11.52$, $f_s = 0.8 \times 2.0 \times 1.00 \times Fs / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	252	18.6	18.6	0.000
ω_a	2275	167.3	167.3	0.002
ω_b	2732	200.9	200.9	0.002
ω_1	2366	174.0	174.0	0.002
Total	7625	560.7	560.7	0.005

$$\begin{aligned} M_{\max} / (Zx \times f_b) &= 7625.2 / (100.33 \times 1152.00) = 0.07 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 560.68) / (67.64 \times 96.00) = 0.13 \leq 1.0 \text{ OK} \\ \delta &= 0.005 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/9920 \leq 1/150 \text{ OK} \end{aligned}$$

風圧力に対する曲げ

$f_{bx} = 2.0 \times Kz \times Fb / 3 = 14.40$, $f_{by} = 2.0 \times Fb / 3 = 14.40$, $f_s = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

風圧力 $w = Q \times C \times l = 937.3 \times 1.00 \times 1.23 = 1153.9 \text{ (N/m)}$

$Q = 313.9 \text{ (N)}$ $M_s = 42.7 \text{ (N·m)}$

$$\begin{aligned} M_{\max} / (Zx \times f_{bx}) + M_s / (Zy \times f_{by}) &= 6418.2 / (100.33 \times 1440.00) + 4268.4 / (42.84 \times 1440.00) \\ &= 0.11 \leq 1.0 \text{ OK} \\ (\alpha \times Q) / (A \times f_s) &= (1.5 \times 313.9) / (67.64 \times 120.00) = 0.06 \leq 1.0 \text{ OK} \\ \delta &= 0.02 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/3231 \leq 1/150 \text{ OK} \end{aligned}$$

まぐさ端部の接合

釘：CN90 木口打ち，一面せん断力値 = 400.0 (N)

必要釘本数 $n = Q / (2 \times \text{一面せん断力値} \times (2 / 3)) = 1 \text{ (本)}$

まぐさ受け

S-P-F 2級 204 (3.8×8.9 (cm)), $L_k = 2.08 \text{ (m)}$

下枠 S-P-F 2級

$A = 33.82 \text{ (cm}^2\text{)}$ $Z = 50.17 \text{ (cm}^3\text{)}$, $i = 2.57 \text{ (cm)}$, $\lambda = 80.67$, 座屈係数 $\omega = 2.03$

$F_c = 17.40 \text{ (N/mm}^2\text{)}$, $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_{cv} = 6.00 \text{ (N/mm}^2\text{)}$

Kz (曲げ) = 1.00 Kz (圧縮) = 1.00

長期 $N = 471.93$ (N), $f_c = 1.1 \times K_z \times F_c / 3 = 6.38$ (N/mm²), $f_{cv} = 1.1 \times F_{cv} / 3 = 2.20$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.04 \leq 1.0 \text{ OK}$$

$$N / (A \times f_{cv}) = 0.06 \leq 1.0 \text{ OK}$$

短期 $N = 471.93$ (N), $f_c = 2.0 \times K_z \times F_c / 3 = 11.60$ (N/mm²), $f_{cv} = 2.0 \times F_{cv} / 3 = 4.00$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.02 \leq 1.0 \text{ OK}$$

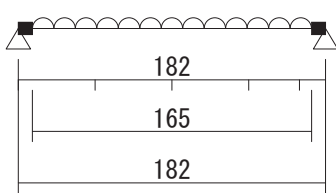
$$N / (A \times f_{cv}) = 0.03 \leq 1.0 \text{ OK}$$

積雪時 $N = 560.68$ (N), $f_c = 0.8 \times 2.0 \times K_z \times F_c / 3 = 9.28$ (N/mm²), $f_{cv} = 0.8 \times 2.0 \times F_{cv} / 3 = 3.20$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.04 \leq 1.0 \text{ OK}$$

$$N / (A \times f_{cv}) = 0.05 \leq 1.0 \text{ OK}$$

階、位置： 2階まぐさ X0通り Y0 - Y2



S-P-F 2級 2 - 206 (3.8 × 14.0 (cm))
 $A = 106.40 \text{ (cm}^2\text{)}$, $Kz = 0.84$
 $Zx = 248.27 \text{ (cm}^3\text{)}$, $Zy = 67.39 \text{ (cm}^3\text{)}$
 $Ix = 1737.87 \text{ (cm}^4\text{)}$, $Iy = 128.03 \text{ (cm}^4\text{)}$
 $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fs = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega a = 760 \times 1.779 = 1352 \text{ (N/m)} \rightarrow 13.52 \text{ (N/cm)}$ (長期)
 $\omega a = 760 \times 1.779 = 1352 \text{ (N/m)} \rightarrow 13.52 \text{ (N/cm)}$ (短期)
 $\omega a = 1280 \times 1.779 = 2277 \text{ (N/m)} \rightarrow 22.77 \text{ (N/cm)}$ (積雪時)
 $\omega b = 600 \times 1.23 = 738.60 \text{ (N/m)} \rightarrow 7.39 \text{ (N/cm)}$ (長期, 短期, 積雪時)

長期 $f_b = 1.1 \times Kz \times F_b / 3 = 6.65$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ωa	46228	1118.0	1118.0	0.079
ωb	25257	610.8	610.8	0.043
Total	71486	1728.8	1728.8	0.122

$M_{\max} / (Zx \times f_b) = 71486.0 / (248.27 \times 665.28) = 0.43 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 1728.80) / (106.40 \times 66.00) = 0.37 \leq 1.0 \text{ OK}$
 $\delta = 0.122 \text{ (cm)} \leq 1.00 \text{ OK}$
 $= 1/1355 \leq 1/300 \text{ OK}$

短期 $f_b = 2.0 \times Kz \times F_b / 3 = 12.10$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ωa	46228	1118.0	1118.0	0.079
ωb	25257	610.8	610.8	0.043
Total	71486	1728.8	1728.8	0.122

$M_{\max} / (Zx \times f_b) = 71486.0 / (248.27 \times 1209.60) = 0.24 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 1728.80) / (106.40 \times 120.00) = 0.20 \leq 1.0 \text{ OK}$
 $\delta = 0.122 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1355 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times Kz \times F_b / 3 = 9.68$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ωa	77858	1882.9	1882.9	0.133
ωb	25257	610.8	610.8	0.043
Total	103116	2493.7	2493.7	0.176

$M_{\max} / (Zx \times f_b) = 103116.0 / (248.27 \times 967.68) = 0.43 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2493.74) / (106.40 \times 96.00) = 0.37 \leq 1.0 \text{ OK}$
 $\delta = 0.176 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/939 \leq 1/150 \text{ OK}$

風圧力に対する曲げ

$f_{bx} = 2.0 \times Kz \times F_b / 3 = 12.10$, $f_{by} = 2.0 \times F_b / 3 = 14.40$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$
 風圧力 $w = Q \times C \times l = 937.3 \times 1.00 \times 1.23 = 1153.9 \text{ (N/m)}$
 $Q = 954.2 \text{ (N)}$ $M_s = 394.6 \text{ (N·m)}$

$M_{\max} / (Zx \times f_{bx}) + M_s / (Zy \times f_{by}) = 71486.0 / (248.27 \times 1209.60) + 39457.9 / (67.39 \times 1440.00)$
 $= 0.64 \leq 1.0 \text{ OK}$
 $(\alpha \times Q) / (A \times f_s) = (1.5 \times 954.2) / (106.40 \times 120.00) = 0.11 \leq 1.0 \text{ OK}$
 $\delta = 0.91 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/181 \leq 1/150 \text{ OK}$

まぐさ端部の接合

釘：CN90 木口打ち，一面せん断力値 = 400.0 (N)
 必要釘本数 $n = Q / (2 \times \text{一面せん断力値} \times (2 / 3)) = 2 \text{ (本)}$

まぐさ受け

S-P-F 2級 204 (3.8 × 8.9 (cm)), $L_k = 2.03 \text{ (m)}$
 下枠 S-P-F 2級
 $A = 33.82 \text{ (cm}^2\text{)}$ $Z = 50.17 \text{ (cm}^3\text{)}$, $i = 2.57 \text{ (cm)}$, $\lambda = 78.72$, 座屈係数 $\omega = 1.95$
 $F_c = 17.40 \text{ (N/mm}^2\text{)}$, $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_{cv} = 6.00 \text{ (N/mm}^2\text{)}$
 Kz (曲げ) = 1.00 Kz (圧縮) = 1.00

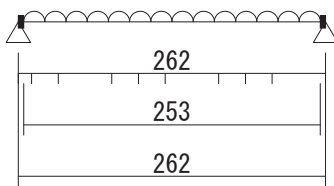
長期 $N = 1728.80 \text{ (N)}$, $f_c = 1.1 \times Kz \times F_c / 3 = 6.38 \text{ (N/mm}^2\text{)}$, $f_{cv} = 1.1 \times F_{cv} / 3 = 2.20 \text{ (N/mm}^2\text{)}$
 $(\omega \times N) / (A \times f_c) = 0.16 \leq 1.0 \text{ OK}$
 $N / (A \times f_{cv}) = 0.23 \leq 1.0 \text{ OK}$

短期 $N = 1728.80 \text{ (N)}$, $f_c = 2.0 \times Kz \times F_c / 3 = 11.60 \text{ (N/mm}^2\text{)}$, $f_{cv} = 2.0 \times F_{cv} / 3 = 4.00 \text{ (N/mm}^2\text{)}$
 $(\omega \times N) / (A \times f_c) = 0.09 \leq 1.0 \text{ OK}$
 $N / (A \times f_{cv}) = 0.13 \leq 1.0 \text{ OK}$

積雪時 $N = 2493.74 \text{ (N)}$, $f_c = 0.8 \times 2.0 \times Kz \times F_c / 3 = 9.28 \text{ (N/mm}^2\text{)}$, $f_{cv} = 0.8 \times 2.0 \times F_{cv} / 3 = 3.20 \text{ (N/mm}^2\text{)}$
 $(\omega \times N) / (A \times f_c) = 0.15 \leq 1.0 \text{ OK}$

$$N / (A \times f_{cv}) = 0.23 \leq 1.0 \text{ OK}$$

階、位置： 2階まぐさ X0通り Y3.6 - Y6.5



E120-F330 410 (8.9 × 23.5 (cm))
 $A = 209.15 \text{ (cm}^2\text{)}, K_z = 1.00$
 $Z_x = 819.17 \text{ (cm}^3\text{)}, Z_y = 310.24 \text{ (cm}^3\text{)}$
 $I_x = 9625.26 \text{ (cm}^4\text{)}, I_y = 1380.56 \text{ (cm}^4\text{)}$
 $F_{bx} = 33.00 \text{ (N/mm}^2\text{)}, F_{by} = 24.00 \text{ (N/mm}^2\text{)}, F_s = 3.00 \text{ (N/mm}^2\text{)}$
 許容せん断割増係数 1.00
 $E = 12000.0 \text{ (N/mm}^2\text{)}$

$\omega = 300 \times 0.683 = 205 \text{ (N/m)} \rightarrow 2.05 \text{ (N/cm)}$ (長期)
 $\omega = 300 \times 0.683 = 205 \text{ (N/m)} \rightarrow 2.05 \text{ (N/cm)}$ (短期)
 $\omega = 300 \times 0.683 = 205 \text{ (N/m)} \rightarrow 2.05 \text{ (N/cm)}$ (積雪時)
 $\omega_a = 460 \times 1.779 = 818 \text{ (N/m)} \rightarrow 8.18 \text{ (N/cm)}$ (長期)
 $\omega_a = 460 \times 1.779 = 818 \text{ (N/m)} \rightarrow 8.18 \text{ (N/cm)}$ (短期)
 $\omega_a = 980 \times 1.779 = 1743 \text{ (N/m)} \rightarrow 17.43 \text{ (N/cm)}$ (積雪時)
 $\omega_b = 600 \times 0.82 = 492.40 \text{ (N/m)} \rightarrow 4.92 \text{ (N/cm)}$ (長期, 短期, 積雪時)

長期 $f_b = 1.1 \times K_z \times F_b / 3 = 12.10$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 1.10 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	16318	258.5	258.5	0.009
ω_a	65209	1033.0	1033.0	0.037
ω_b	39242	621.7	621.7	0.023
Total	120768	1913.2	1913.2	0.069

$M_{max} / (Z_x \times f_b) = 120768.3 / (819.17 \times 1210.00) = 0.12 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 1913.16) / (209.15 \times 110.00) = 0.12 \leq 1.0 \text{ OK}$
 $\delta = 0.069 \text{ (cm)} \leq 1.00 \text{ OK}$
 $= 1/3636 \leq 1/300 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times F_b / 3 = 22.00$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 2.00 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	16318	258.5	258.5	0.009
ω_a	65209	1033.0	1033.0	0.037
ω_b	39242	621.7	621.7	0.023
Total	120768	1913.2	1913.2	0.069

$M_{max} / (Z_x \times f_b) = 120768.3 / (819.17 \times 2200.00) = 0.07 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 1913.16) / (209.15 \times 200.00) = 0.07 \leq 1.0 \text{ OK}$
 $\delta = 0.069 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/3636 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times F_b / 3 = 17.60$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 1.60 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	16318	258.5	258.5	0.009
ω_a	138923	2200.8	2200.8	0.080
ω_b	39242	621.7	621.7	0.023
Total	194483	3080.9	3080.9	0.112

$M_{max} / (Z_x \times f_b) = 194482.5 / (819.17 \times 1760.00) = 0.13 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 3080.91) / (209.15 \times 160.00) = 0.14 \leq 1.0 \text{ OK}$
 $\delta = 0.112 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/2258 \leq 1/150 \text{ OK}$

風圧力に対する曲げ

$f_{bx} = 2.0 \times K_z \times F_{bx} / 3 = 22.00$, $f_{by} = 2.0 \times F_{by} / 3 = 16.00$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 2.00 \text{ (N/mm}^2\text{)}$
 風圧力 $w = Q \times C \times l = 937.3 \times 1.00 \times 1.23 = 1153.9 \text{ (N/m)}$
 $Q = 1456.7 \text{ (N)}$, $M_s = 919.6 \text{ (N·m)}$

$M_{max} / (Z_x \times f_{bx}) + M_s / (Z_y \times f_{by}) = 120768.3 / (819.17 \times 2200.00) + 91957.3 / (310.24 \times 1600.00)$
 $= 0.25 \leq 1.0 \text{ OK}$
 $(\alpha \times Q) / (A \times f_s) = (1.5 \times 1456.7) / (209.15 \times 200.00) = 0.05 \leq 1.0 \text{ OK}$
 $\delta = 0.37 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/685 \leq 1/150 \text{ OK}$

まぐさ端部の接合

釘：CN90 木口打ち，一面せん断力値 = 400.0 (N)
 必要釘本数 $n = Q / (2 \times \text{一面せん断力値} \times (2 / 3)) = 3 \text{ (本)}$

まぐさ受け

S-P-F 2級 2 - 204 (3.8 × 8.9 (cm)), $L_k = 2.10 \text{ (m)}$
 下枠 S-P-F 2級
 $A = 67.64 \text{ (cm}^2\text{)}, Z = 100.33 \text{ (cm}^3\text{)}, i = 2.57 \text{ (cm)}, \lambda = 81.68$, 座屈係数 $\omega = 2.07$
 $F_c = 17.40 \text{ (N/mm}^2\text{)}, F_b = 21.60 \text{ (N/mm}^2\text{)}, F_{cv} = 6.00 \text{ (N/mm}^2\text{)}$
 $K_z \text{ (曲げ)} = 1.00$, $K_z \text{ (圧縮)} = 1.00$

長期 $N = 1913.16 \text{ (N)}$, $f_c = 1.1 \times K_z \times F_c / 3 = 6.38 \text{ (N/mm}^2\text{)}$, $f_{cv} = 1.1 \times F_{cv} / 3 = 2.20 \text{ (N/mm}^2\text{)}$
 $(\omega \times N) / (A \times f_c) = 0.09 \leq 1.0 \text{ OK}$

$$N / (A \times f_{cv}) = 0.13 \leq 1.0 \text{ OK}$$

短期 $N = 1913.16 \text{ (N)}$, $f_c = 2.0 \times K_z \times F_c / 3 = 11.60 \text{ (N/mm}^2\text{)}$, $f_{cv} = 2.0 \times F_{cv} / 3 = 4.00 \text{ (N/mm}^2\text{)}$

$$(\omega \times N) / (A \times f_c) = 0.05 \leq 1.0 \text{ OK}$$

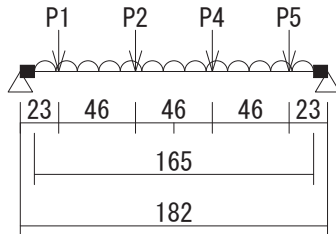
$$N / (A \times f_{cv}) = 0.07 \leq 1.0 \text{ OK}$$

積雪時 $N = 3080.91 \text{ (N)}$, $f_c = 0.8 \times 2.0 \times K_z \times F_c / 3 = 9.28 \text{ (N/mm}^2\text{)}$, $f_{cv} = 0.8 \times 2.0 \times F_{cv} / 3 = 3.20 \text{ (N/mm}^2\text{)}$

$$(\omega \times N) / (A \times f_c) = 0.10 \leq 1.0 \text{ OK}$$

$$N / (A \times f_{cv}) = 0.14 \leq 1.0 \text{ OK}$$

階、位置： 2階まぐさ X1.5通り Y3.7 - Y5.7



S-P-F 2級 2 - 206 (3.8 × 14.0 (cm))
 A = 106.40 (cm²), Kz = 0.84
 Zx = 248.27 (cm³), Zy = 67.39 (cm³)
 Ix = 1737.87 (cm⁴), Iy = 128.03 (cm⁴)
 Fb = 21.60 (N/mm²), Fs = 1.80 (N/mm²)
 許容せん断 割増係数 1.00
 E = 9600.0 (N/mm²)

$\omega = 300 \times 0.683 + 2000 \times 0.228 = 660$ (N/m) → 6.60 (N/cm) (長期)
 $\omega = 300 \times 0.683 + 2000 \times 0.228 = 660$ (N/m) → 6.60 (N/cm) (短期)
 $\omega = 300 \times 0.683 + 2000 \times 0.228 = 660$ (N/m) → 6.60 (N/cm) (積雪時)
 $\omega = 300 \times 0.683 + 1300 \times 0.228 = 501$ (N/m) → 5.01 (N/cm) (長期たわみ)
 $\omega_b = 400 \times 1.23 = 492.40$ (N/m) → 4.92 (N/cm) (長期, 短期, 積雪時)
 $\omega_1(a - b) = 546.00$ (長期) 546.00 (短期) 546.00 (積雪時) 546.00 (長期たわみ) (N)
 P1 = 418.19 (長期) 418.19 (短期) 768.06 (積雪時) 418.19 (長期たわみ) (N)
 P2 = 418.19 (長期) 418.19 (短期) 768.06 (積雪時) 418.19 (長期たわみ) (N)
 P4 = 418.19 (長期) 418.19 (短期) 768.06 (積雪時) 418.19 (長期たわみ) (N)
 P5 = 418.19 (長期) 418.19 (短期) 768.06 (積雪時) 418.19 (長期たわみ) (N)

長期 fb=1.1 × Kz × Fb / 3 = 6.65, fs=1.1 × 1.00 × Fs / 3 = 0.66 (N/mm²)

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	δ' × 2.0 (cm)
ω	22561	545.6	545.6	0.039	0.058
ωb	16838	407.2	407.2	0.029	0.058
ω1	11289	273.0	273.0	0.019	0.039
P1	5515	381.7	36.5	0.006	0.013
P2	15984	266.6	151.6	0.021	0.043
P4	15984	151.6	266.6	0.021	0.043
P5	5515	36.5	381.7	0.006	0.013
Total	93685	2062.2	2062.2	0.142	0.265

Mmax / (Zx × fb) = 93685.0 / (248.27 × 665.28) = 0.57 ≤ 1.0 OK
 (α × Qmax) / (A × fs) = (1.50 × 2062.21) / (106.40 × 66.00) = 0.44 ≤ 1.0 OK
 δ = 0.142 (cm) ≤ 1.00 OK
 = 1/1166 ≤ 1/300 OK
 δ' × 2.0 = 0.265 (cm) = 1/624 ≤ 1/250 OK

短期 fb=2.0 × Kz × Fb / 3 = 12.10, fs=2.0 × 1.00 × Fs / 3 = 1.20 (N/mm²)

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	22561	545.6	545.6	0.039
ωb	16838	407.2	407.2	0.029
ω1	11289	273.0	273.0	0.019
P1	5515	381.7	36.5	0.006
P2	15984	266.6	151.6	0.021
P4	15984	151.6	266.6	0.021
P5	5515	36.5	381.7	0.006
Total	93685	2062.2	2062.2	0.142

Mmax / (Zx × fb) = 93685.0 / (248.27 × 1209.60) = 0.31 ≤ 1.0 OK
 (α × Qmax) / (A × fs) = (1.50 × 2062.21) / (106.40 × 120.00) = 0.24 ≤ 1.0 OK
 δ = 0.142 (cm) ≤ 2.00 OK
 = 1/1166 ≤ 1/150 OK

積雪時 fb=0.8 × 2.0 × Kz × Fb / 3 = 9.68, fs=0.8 × 2.0 × 1.00 × Fs / 3 = 0.96 (N/mm²)

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	22561	545.6	545.6	0.039
ωb	16838	407.2	407.2	0.029
ω1	11289	273.0	273.0	0.019
P1	10129	701.0	67.1	0.012
P2	29356	489.7	278.4	0.039
P4	29356	278.4	489.7	0.039
P5	10129	67.1	701.0	0.012
Total	129658	2762.0	2762.0	0.188

Mmax / (Zx × fb) = 129657.8 / (248.27 × 967.68) = 0.54 ≤ 1.0 OK
 (α × Qmax) / (A × fs) = (1.50 × 2761.95) / (106.40 × 96.00) = 0.41 ≤ 1.0 OK
 δ = 0.188 (cm) ≤ 2.00 OK
 = 1/879 ≤ 1/150 OK

まぐさ受け

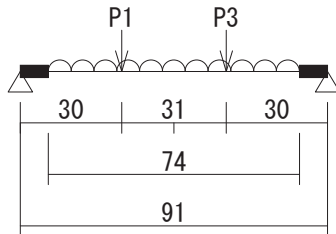
S-P-F 2級 204 (3.8 × 8.9 (cm)), Lk = 2.03 (m)
 下枠 S-P-F 2級
 A = 33.82 (cm²), Z = 50.17 (cm³), i = 2.57 (cm), λ = 78.72, 座屈係数 ω = 1.95
 Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)
 Kz(曲げ) = 1.00 Kz(圧縮) = 1.00

長期 N = 2062.21 (N), fc=1.1 × Kz × Fc / 3 = 6.38 (N/mm²), fcv=1.1 × Fcv / 3 = 2.20 (N/mm²)
 (ω × N) / (A × fc) = 0.19 ≤ 1.0 OK
 N / (A × fcv) = 0.28 ≤ 1.0 OK

短期 $N = 2062.21$ (N), $f_c = 2.0 \times K_z \times F_c / 3 = 11.60$ (N/mm²), $f_{cv} = 2.0 \times F_{cv} / 3 = 4.00$ (N/mm²)
 $(\omega \times N) / (A \times f_c) = 0.10 \leq 1.0$ OK
 $N / (A \times f_{cv}) = 0.15 \leq 1.0$ OK

積雪時 $N = 2761.95$ (N), $f_c = 0.8 \times 2.0 \times K_z \times F_c / 3 = 9.28$ (N/mm²), $f_{cv} = 0.8 \times 2.0 \times F_{cv} / 3 = 3.20$ (N/mm²)
 $(\omega \times N) / (A \times f_c) = 0.17 \leq 1.0$ OK
 $N / (A \times f_{cv}) = 0.26 \leq 1.0$ OK

階、位置： 2階まぐさ X3.5通り Y1.5 - Y2.5



S-P-F 2級 2 - 204 (3.8×8.9 (cm))
 $A = 67.64 \text{ (cm}^2\text{)}$, $Kz = 1.00$
 $Zx = 100.33 \text{ (cm}^3\text{)}$, $Zy = 42.84 \text{ (cm}^3\text{)}$
 $Ix = 446.48 \text{ (cm}^4\text{)}$, $Iy = 81.39 \text{ (cm}^4\text{)}$
 $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fs = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 300 \times 1.365 = 410 \text{ (N/m)} \rightarrow 4.10 \text{ (N/cm)}$ (長期)
 $\omega = 300 \times 1.365 = 410 \text{ (N/m)} \rightarrow 4.10 \text{ (N/cm)}$ (短期)
 $\omega = 300 \times 1.365 = 410 \text{ (N/m)} \rightarrow 4.10 \text{ (N/cm)}$ (積雪時)
 $\omega b = 400 \times 1.23 = 492.40 \text{ (N/m)} \rightarrow 4.92 \text{ (N/cm)}$ (長期, 短期, 積雪時)
 $\omega (a - b) = 546.00$ (長期) 546.00 (短期) 546.00 (積雪時) (N)
 $P1 = 217.88$ (長期) 217.88 (短期) 452.41 (積雪時) (N)
 $P3 = 217.88$ (長期) 217.88 (短期) 452.41 (積雪時) (N)

長期 $fb = 1.1 \times Kz \times Fb / 3 = 7.92$, $fs = 1.1 \times 1.00 \times Fs / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	2833	152.3	152.3	0.004
ωb	3407	183.2	183.2	0.005
$\omega 1$	5078	273.0	273.0	0.007
P1	3349	154.3	63.5	0.003
P3	3349	63.5	154.3	0.003
Total	18016	826.4	826.4	0.022

$M_{max} / (Zx \times fb) = 18016.1 / (100.33 \times 792.00) = 0.23 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 826.38) / (67.64 \times 66.00) = 0.28 \leq 1.0 \text{ OK}$
 $\delta = 0.022 \text{ (cm)} \leq 1.00 \text{ OK}$
 $= 1/3369 \leq 1/300 \text{ OK}$

短期 $fb = 2.0 \times Kz \times Fb / 3 = 14.40$, $fs = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	2833	152.3	152.3	0.004
ωb	3407	183.2	183.2	0.005
$\omega 1$	5078	273.0	273.0	0.007
P1	3349	154.3	63.5	0.003
P3	3349	63.5	154.3	0.003
Total	18016	826.4	826.4	0.022

$M_{max} / (Zx \times fb) = 18016.1 / (100.33 \times 1440.00) = 0.12 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 826.38) / (67.64 \times 120.00) = 0.15 \leq 1.0 \text{ OK}$
 $\delta = 0.022 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/3369 \leq 1/150 \text{ OK}$

積雪時 $fb = 0.8 \times 2.0 \times Kz \times Fb / 3 = 11.52$, $fs = 0.8 \times 2.0 \times 1.00 \times Fs / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	2833	152.3	152.3	0.004
ωb	3407	183.2	183.2	0.005
$\omega 1$	5078	273.0	273.0	0.007
P1	6954	320.5	132.0	0.007
P3	6954	132.0	320.5	0.007
Total	25226	1060.9	1060.9	0.029

$M_{max} / (Zx \times fb) = 25226.0 / (100.33 \times 1152.00) = 0.22 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 1060.91) / (67.64 \times 96.00) = 0.25 \leq 1.0 \text{ OK}$
 $\delta = 0.029 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/2525 \leq 1/150 \text{ OK}$

まぐさ受け

S-P-F 2級 204 (3.8×8.9 (cm)), $Lk = 2.03 \text{ (m)}$

下枠 S-P-F 2級

$A = 33.82 \text{ (cm}^2\text{)}$, $Z = 50.17 \text{ (cm}^3\text{)}$, $i = 2.57 \text{ (cm)}$, $\lambda = 78.72$, 座屈係数 $\omega = 1.95$
 $Fc = 17.40 \text{ (N/mm}^2\text{)}$, $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fcv = 6.00 \text{ (N/mm}^2\text{)}$
 Kz (曲げ) = 1.00 Kz (圧縮) = 1.00

長期 $N = 826.38 \text{ (N)}$, $fc = 1.1 \times Kz \times Fc / 3 = 6.38 \text{ (N/mm}^2\text{)}$, $fcv = 1.1 \times Fcv / 3 = 2.20 \text{ (N/mm}^2\text{)}$

$(\omega \times N) / (A \times fc) = 0.07 \leq 1.0 \text{ OK}$
 $N / (A \times fcv) = 0.11 \leq 1.0 \text{ OK}$

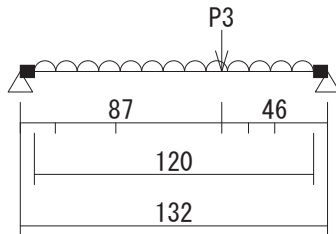
短期 $N = 826.38 \text{ (N)}$, $fc = 2.0 \times Kz \times Fc / 3 = 11.60 \text{ (N/mm}^2\text{)}$, $fcv = 2.0 \times Fcv / 3 = 4.00 \text{ (N/mm}^2\text{)}$

$(\omega \times N) / (A \times fc) = 0.04 \leq 1.0 \text{ OK}$
 $N / (A \times fcv) = 0.06 \leq 1.0 \text{ OK}$

積雪時 $N = 1060.91 \text{ (N)}$, $fc = 0.8 \times 2.0 \times Kz \times Fc / 3 = 9.28 \text{ (N/mm}^2\text{)}$, $fcv = 0.8 \times 2.0 \times Fcv / 3 = 3.20 \text{ (N/mm}^2\text{)}$

$(\omega \times N) / (A \times fc) = 0.07 \leq 1.0 \text{ OK}$
 $N / (A \times fcv) = 0.10 \leq 1.0 \text{ OK}$

階、位置： 2階まぐさ X4.5通り Y2.55 - Y4



S-P-F 2級 2 - 210 (3.8 × 23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}$, $Kz = 0.68$
 $Zx = 699.52 \text{ (cm}^3\text{)}$, $Zy = 113.11 \text{ (cm}^3\text{)}$
 $Ix = 8219.32 \text{ (cm}^4\text{)}$, $Iy = 214.92 \text{ (cm}^4\text{)}$
 $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fs = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.455 + 300 \times 0.910 = 1183 \text{ (N/m)} \rightarrow 11.83 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.455 + 300 \times 0.910 = 1183 \text{ (N/m)} \rightarrow 11.83 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.455 + 300 \times 0.910 = 1183 \text{ (N/m)} \rightarrow 11.83 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.455 + 300 \times 0.910 = 865 \text{ (N/m)} \rightarrow 8.65 \text{ (N/cm)}$ (長期たわみ)
 $\omega b = 400 \times 1.23 = 492.40 \text{ (N/m)} \rightarrow 4.92 \text{ (N/cm)}$ (長期, 短期, 積雪時)
 $\omega 1 (Y3.5 - b) = 158.00$ (長期) 158.00 (短期) 158.00 (積雪時) 158.00 (長期たわみ) (N)
 $P3 = 5202.07$ (長期) 5202.07 (短期) 6385.47 (積雪時) 4104.84 (長期たわみ) (N)

長期 $fb = 1.1 \times Kz \times Fb / 3 = 5.39$, $fs = 1.1 \times 1.00 \times Fs / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	21294	709.8	709.8	0.004	0.006
ωb	8863	295.4	295.4	0.002	0.003
$\omega 1$	2607	26.0	132.0	0.000	0.001
P3	137844	1712.3	3489.7	0.020	0.032
Total	170608	2743.6	4627.0	0.026	0.042

$M_{max} / (Zx \times fb) = 170608.2 / (699.52 \times 538.56) = 0.45 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 4626.96) / (178.60 \times 66.00) = 0.59 \leq 1.0 \text{ OK}$
 $\delta = 0.026 \text{ (cm)} \leq 1.00 \text{ OK}$
 $= 1/4556 \leq 1/300 \text{ OK}$
 $\delta' \times 2.0 = 0.042 \text{ (cm)} = 1/2860 \leq 1/250 \text{ OK}$

短期 $fb = 2.0 \times Kz \times Fb / 3 = 9.79$, $fs = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	21294	709.8	709.8	0.004
ωb	8863	295.4	295.4	0.002
$\omega 1$	2607	26.0	132.0	0.000
P3	137844	1712.3	3489.7	0.020
Total	170608	2743.6	4627.0	0.026

$M_{max} / (Zx \times fb) = 170608.2 / (699.52 \times 979.20) = 0.25 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 4626.96) / (178.60 \times 120.00) = 0.32 \leq 1.0 \text{ OK}$
 $\delta = 0.026 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/4556 \leq 1/150 \text{ OK}$

積雪時 $fb = 0.8 \times 2.0 \times Kz \times Fb / 3 = 7.83$, $fs = 0.8 \times 2.0 \times 1.00 \times Fs / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	21294	709.8	709.8	0.004
ωb	8863	295.4	295.4	0.002
$\omega 1$	2607	26.0	132.0	0.000
P3	169202	2101.9	4283.6	0.025
Total	201966	3133.1	5420.8	0.031

$M_{max} / (Zx \times fb) = 201965.8 / (699.52 \times 783.36) = 0.37 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 5420.82) / (178.60 \times 96.00) = 0.47 \leq 1.0 \text{ OK}$
 $\delta = 0.031 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/3878 \leq 1/150 \text{ OK}$

まぐさ受け

S-P-F 2級 204 (3.8 × 8.9 (cm)), $Lk = 2.03 \text{ (m)}$

下枠 S-P-F 2級

$A = 33.82 \text{ (cm}^2\text{)}$, $Z = 50.17 \text{ (cm}^3\text{)}$, $i = 2.57 \text{ (cm)}$, $\lambda = 78.72$, 座屈係数 $\omega = 1.95$

$Fc = 17.40 \text{ (N/mm}^2\text{)}$, $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fcv = 6.00 \text{ (N/mm}^2\text{)}$

Kz (曲げ) = 1.00 Kz (圧縮) = 1.00

長期 $N = 4626.96 \text{ (N)}$, $fc = 1.1 \times Kz \times Fc / 3 = 6.38 \text{ (N/mm}^2\text{)}$, $fcv = 1.1 \times Fcv / 3 = 2.20 \text{ (N/mm}^2\text{)}$

$(\omega \times N) / (A \times fc) = 0.42 \leq 1.0 \text{ OK}$

$N / (A \times fcv) = 0.62 \leq 1.0 \text{ OK}$

短期 $N = 4626.96 \text{ (N)}$, $fc = 2.0 \times Kz \times Fc / 3 = 11.60 \text{ (N/mm}^2\text{)}$, $fcv = 2.0 \times Fcv / 3 = 4.00 \text{ (N/mm}^2\text{)}$

$(\omega \times N) / (A \times fc) = 0.23 \leq 1.0 \text{ OK}$

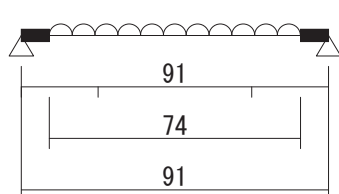
$N / (A \times fcv) = 0.34 \leq 1.0 \text{ OK}$

積雪時 $N = 5420.82 \text{ (N)}$, $fc = 0.8 \times 2.0 \times Kz \times Fc / 3 = 9.28 \text{ (N/mm}^2\text{)}$, $fcv = 0.8 \times 2.0 \times Fcv / 3 = 3.20 \text{ (N/mm}^2\text{)}$

$(\omega \times N) / (A \times fc) = 0.34 \leq 1.0 \text{ OK}$

$N / (A \times fcv) = 0.50 \leq 1.0 \text{ OK}$

階、位置： 2階まぐさ X6.5通り Y3.7 - Y4.7



S-P-F 2級 2 - 204 (3.8 × 8.9 (cm))
 $A = 67.64 \text{ (cm}^2\text{)}$, $Kz = 1.00$
 $Zx = 100.33 \text{ (cm}^3\text{)}$, $Zy = 42.84 \text{ (cm}^3\text{)}$
 $Ix = 446.48 \text{ (cm}^4\text{)}$, $Iy = 81.39 \text{ (cm}^4\text{)}$
 $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fs = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 300 \times 0.910 = 273 \text{ (N/m)} \rightarrow 2.73 \text{ (N/cm)}$ (長期)
 $\omega = 300 \times 0.910 = 273 \text{ (N/m)} \rightarrow 2.73 \text{ (N/cm)}$ (短期)
 $\omega = 300 \times 0.910 = 273 \text{ (N/m)} \rightarrow 2.73 \text{ (N/cm)}$ (積雪時)
 $\omega_a = 460 \times 1.779 = 818 \text{ (N/m)} \rightarrow 8.18 \text{ (N/cm)}$ (長期)
 $\omega_a = 460 \times 1.779 = 818 \text{ (N/m)} \rightarrow 8.18 \text{ (N/cm)}$ (短期)
 $\omega_a = 980 \times 1.779 = 1743 \text{ (N/m)} \rightarrow 17.43 \text{ (N/cm)}$ (積雪時)
 $\omega_b = 600 \times 1.23 = 738.60 \text{ (N/m)} \rightarrow 7.39 \text{ (N/cm)}$ (長期, 短期, 積雪時)

長期 $fb = 1.1 \times Kz \times Fb / 3 = 7.92$, $fs = 1.1 \times 1.00 \times Fs / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	1889	101.6	101.6	0.003
ω_a	5661	304.4	304.4	0.008
ω_b	5111	274.8	274.8	0.007
Total	12661	680.7	680.7	0.017

$M_{max} / (Zx \times fb) = 12660.9 / (100.33 \times 792.00) = 0.16 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 680.69) / (67.64 \times 66.00) = 0.23 \leq 1.0 \text{ OK}$
 $\delta = 0.017 \text{ (cm)} \leq 1.00 \text{ OK}$
 $= 1/4368 \leq 1/300 \text{ OK}$

短期 $fb = 2.0 \times Kz \times Fb / 3 = 14.40$, $fs = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	1889	101.6	101.6	0.003
ω_a	5661	304.4	304.4	0.008
ω_b	5111	274.8	274.8	0.007
Total	12661	680.7	680.7	0.017

$M_{max} / (Zx \times fb) = 12660.9 / (100.33 \times 1440.00) = 0.09 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 680.69) / (67.64 \times 120.00) = 0.13 \leq 1.0 \text{ OK}$
 $\delta = 0.017 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/4368 \leq 1/150 \text{ OK}$

積雪時 $fb = 0.8 \times 2.0 \times Kz \times Fb / 3 = 11.52$, $fs = 0.8 \times 2.0 \times 1.00 \times Fs / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	1889	101.6	101.6	0.003
ω_a	12061	648.5	648.5	0.016
ω_b	5111	274.8	274.8	0.007
Total	19061	1024.8	1024.8	0.026

$M_{max} / (Zx \times fb) = 19060.8 / (100.33 \times 1152.00) = 0.16 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 1024.78) / (67.64 \times 96.00) = 0.24 \leq 1.0 \text{ OK}$
 $\delta = 0.026 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/2902 \leq 1/150 \text{ OK}$

風圧力に対する曲げ

$fbx = 2.0 \times Kz \times Fb / 3 = 14.40$, $fby = 2.0 \times Fb / 3 = 14.40$, $fs = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

風圧力 $w = Q \times C \times l = 937.3 \times 1.00 \times 1.23 = 1153.9 \text{ (N/m)}$

$Q = 429.2 \text{ (N)}$ $Ms = 79.8 \text{ (N·m)}$

$M_{max} / (Zx \times fbx) + Ms / (Zy \times fby) = 12660.9 / (100.33 \times 1440.00) + 7983.8 / (42.84 \times 1440.00)$
 $= 0.22 \leq 1.0 \text{ OK}$

$(\alpha \times Q) / (A \times fs) = (1.5 \times 429.2) / (67.64 \times 120.00) = 0.08 \leq 1.0 \text{ OK}$
 $\delta = 0.06 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1263 \leq 1/150 \text{ OK}$

まぐさ端部の接合

釘：CN90 木口打ち，一面せん断力値 = 400.0 (N)

必要釘本数 $n = Q / (2 \times \text{一面せん断力値} \times (2 / 3)) = 1 \text{ (本)}$

まぐさ受け

S-P-F 2級 204 (3.8 × 8.9 (cm)), $Lk = 1.75 \text{ (m)}$

下枠 S-P-F 2級

$A = 33.82 \text{ (cm}^2\text{)}$, $Z = 50.17 \text{ (cm}^3\text{)}$, $i = 2.57 \text{ (cm)}$, $\lambda = 68.03$, 座屈係数 $\omega = 1.61$

$Fc = 17.40 \text{ (N/mm}^2\text{)}$, $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fcv = 6.00 \text{ (N/mm}^2\text{)}$

Kz (曲げ) = 1.00 Kz (圧縮) = 1.00

長期 $N = 680.69 \text{ (N)}$, $fc = 1.1 \times Kz \times Fc / 3 = 6.38 \text{ (N/mm}^2\text{)}$, $fcv = 1.1 \times Fcv / 3 = 2.20 \text{ (N/mm}^2\text{)}$

$(\omega \times N) / (A \times fc) = 0.05 \leq 1.0 \text{ OK}$

$N / (A \times fcv) = 0.09 \leq 1.0 \text{ OK}$

短期 $N = 680.69$ (N), $f_c = 2.0 \times K_z \times F_c / 3 = 11.60$ (N/mm²), $f_{cv} = 2.0 \times F_{cv} / 3 = 4.00$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.03 \leq 1.0 \text{ OK}$$

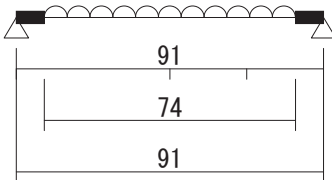
$$N / (A \times f_{cv}) = 0.05 \leq 1.0 \text{ OK}$$

積雪時 $N = 1024.78$ (N), $f_c = 0.8 \times 2.0 \times K_z \times F_c / 3 = 9.28$ (N/mm²), $f_{cv} = 0.8 \times 2.0 \times F_{cv} / 3 = 3.20$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.05 \leq 1.0 \text{ OK}$$

$$N / (A \times f_{cv}) = 0.09 \leq 1.0 \text{ OK}$$

階、位置： 2階まぐさ X6.5通り Y5 - Y6



S-P-F 2級 2 - 204 (3.8 × 8.9 (cm))
 $A = 67.64 \text{ (cm}^2\text{)}, Kz = 1.00$
 $Zx = 100.33 \text{ (cm}^3\text{)}, Zy = 42.84 \text{ (cm}^3\text{)}$
 $Ix = 446.48 \text{ (cm}^4\text{)}, Iy = 81.39 \text{ (cm}^4\text{)}$
 $Fb = 21.60 \text{ (N/mm}^2\text{)}, Fs = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 300 \times 0.910 = 273 \text{ (N/m)} \rightarrow 2.73 \text{ (N/cm)}$ (長期)
 $\omega = 300 \times 0.910 = 273 \text{ (N/m)} \rightarrow 2.73 \text{ (N/cm)}$ (短期)
 $\omega = 300 \times 0.910 = 273 \text{ (N/m)} \rightarrow 2.73 \text{ (N/cm)}$ (積雪時)
 $\omega_a = 460 \times 1.779 = 818 \text{ (N/m)} \rightarrow 8.18 \text{ (N/cm)}$ (長期)
 $\omega_a = 460 \times 1.779 = 818 \text{ (N/m)} \rightarrow 8.18 \text{ (N/cm)}$ (短期)
 $\omega_a = 980 \times 1.779 = 1743 \text{ (N/m)} \rightarrow 17.43 \text{ (N/cm)}$ (積雪時)
 $\omega_b = 600 \times 1.23 = 738.60 \text{ (N/m)} \rightarrow 7.39 \text{ (N/cm)}$ (長期, 短期, 積雪時)

長期 $fb = 1.1 \times Kz \times Fb / 3 = 7.92, fs = 1.1 \times 1.00 \times Fs / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	1889	101.6	101.6	0.003
ω_a	5661	304.4	304.4	0.008
ω_b	5111	274.8	274.8	0.007
Total	12661	680.7	680.7	0.017

$M_{max} / (Zx \times fb) = 12660.9 / (100.33 \times 792.00) = 0.16 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 680.69) / (67.64 \times 66.00) = 0.23 \leq 1.0 \text{ OK}$
 $\delta = 0.017 \text{ (cm)} \leq 1.00 \text{ OK}$
 $= 1/4368 \leq 1/300 \text{ OK}$

短期 $fb = 2.0 \times Kz \times Fb / 3 = 14.40, fs = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	1889	101.6	101.6	0.003
ω_a	5661	304.4	304.4	0.008
ω_b	5111	274.8	274.8	0.007
Total	12661	680.7	680.7	0.017

$M_{max} / (Zx \times fb) = 12660.9 / (100.33 \times 1440.00) = 0.09 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 680.69) / (67.64 \times 120.00) = 0.13 \leq 1.0 \text{ OK}$
 $\delta = 0.017 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/4368 \leq 1/150 \text{ OK}$

積雪時 $fb = 0.8 \times 2.0 \times Kz \times Fb / 3 = 11.52, fs = 0.8 \times 2.0 \times 1.00 \times Fs / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	1889	101.6	101.6	0.003
ω_a	12061	648.5	648.5	0.016
ω_b	5111	274.8	274.8	0.007
Total	19061	1024.8	1024.8	0.026

$M_{max} / (Zx \times fb) = 19060.8 / (100.33 \times 1152.00) = 0.16 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 1024.78) / (67.64 \times 96.00) = 0.24 \leq 1.0 \text{ OK}$
 $\delta = 0.026 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/2902 \leq 1/150 \text{ OK}$

風圧力に対する曲げ

$fbx = 2.0 \times Kz \times Fb / 3 = 14.40, fby = 2.0 \times Fb / 3 = 14.40, fs = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

風圧力 $w = Q \times C \times l = 937.3 \times 1.00 \times 1.23 = 1153.9 \text{ (N/m)}$

$Q = 429.2 \text{ (N)}, Ms = 79.8 \text{ (N·m)}$

$M_{max} / (Zx \times fbx) + Ms / (Zy \times fby) = 12660.9 / (100.33 \times 1440.00) + 7983.8 / (42.84 \times 1440.00)$
 $= 0.22 \leq 1.0 \text{ OK}$

$(\alpha \times Q) / (A \times fs) = (1.5 \times 429.2) / (67.64 \times 120.00) = 0.08 \leq 1.0 \text{ OK}$
 $\delta = 0.06 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1263 \leq 1/150 \text{ OK}$

まぐさ端部の接合

釘：CN90 木口打ち，一面せん断力値 = 400.0 (N)

必要釘本数 $n = Q / (2 \times \text{一面せん断力値} \times (2 / 3)) = 1 \text{ (本)}$

まぐさ受け

S-P-F 2級 204 (3.8 × 8.9 (cm)), Lk = 1.75 (m)

下枠 S-P-F 2級

$A = 33.82 \text{ (cm}^2\text{)}, Z = 50.17 \text{ (cm}^3\text{)}, i = 2.57 \text{ (cm)}, \lambda = 68.03, \text{ 座屈係数 } \omega = 1.61$

$Fc = 17.40 \text{ (N/mm}^2\text{)}, Fb = 21.60 \text{ (N/mm}^2\text{)}, Fcv = 6.00 \text{ (N/mm}^2\text{)}$

$Kz \text{ (曲げ)} = 1.00, Kz \text{ (圧縮)} = 1.00$

長期 $N = 680.69 \text{ (N)}, fc = 1.1 \times Kz \times Fc / 3 = 6.38 \text{ (N/mm}^2\text{)}, fcv = 1.1 \times Fcv / 3 = 2.20 \text{ (N/mm}^2\text{)}$

$(\omega \times N) / (A \times fc) = 0.05 \leq 1.0 \text{ OK}$

$N / (A \times fcv) = 0.09 \leq 1.0 \text{ OK}$

短期 $N = 680.69$ (N), $f_c = 2.0 \times K_z \times F_c / 3 = 11.60$ (N/mm²), $f_{cv} = 2.0 \times F_{cv} / 3 = 4.00$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.03 \leq 1.0 \text{ OK}$$

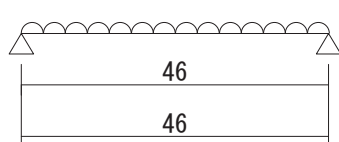
$$N / (A \times f_{cv}) = 0.05 \leq 1.0 \text{ OK}$$

積雪時 $N = 1024.78$ (N), $f_c = 0.8 \times 2.0 \times K_z \times F_c / 3 = 9.28$ (N/mm²), $f_{cv} = 0.8 \times 2.0 \times F_{cv} / 3 = 3.20$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.05 \leq 1.0 \text{ OK}$$

$$N / (A \times f_{cv}) = 0.09 \leq 1.0 \text{ OK}$$

階、位置： 1階まぐさ Y0通り X1 - X1.5



S-P-F 2級 2 - 204 (3.8 × 8.9 (cm))
 $A = 67.64 \text{ (cm}^2\text{)}$, $Kz = 1.00$
 $Zx = 100.33 \text{ (cm}^3\text{)}$, $Zy = 42.84 \text{ (cm}^3\text{)}$
 $Ix = 446.48 \text{ (cm}^4\text{)}$, $Iy = 81.39 \text{ (cm}^4\text{)}$
 $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fs = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 1.235 = 2470 \text{ (N/m)} \rightarrow 24.70 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 1.235 = 2470 \text{ (N/m)} \rightarrow 24.70 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 1.235 = 2470 \text{ (N/m)} \rightarrow 24.70 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 1.235 = 1606 \text{ (N/m)} \rightarrow 16.06 \text{ (N/cm)}$ (長期たわみ)
 $\omega_b = 600 \times 1.38 = 825.00 \text{ (N/m)} \rightarrow 8.25 \text{ (N/cm)}$ (長期, 短期, 積雪時)

長期 $fb = 1.1 \times Kz \times Fb / 3 = 7.92$, $fs = 1.1 \times 1.00 \times Fs / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	6392	561.9	561.9	0.003	0.004
ω_b	2135	187.7	187.7	0.001	0.002
Total	8527	749.6	749.6	0.004	0.006

$M_{max} / (Zx \times fb) = 8526.8 / (100.33 \times 792.00) = 0.11 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 749.61) / (67.64 \times 66.00) = 0.25 \leq 1.0 \text{ OK}$
 $\delta = 0.004 \text{ (cm)} \leq 1.00 \text{ OK}$
 $= 1/10606 \leq 1/300 \text{ OK}$
 $\delta' \times 2.0 = 0.006 \text{ (cm)} = 1/7189 \leq 1/250 \text{ OK}$

短期 $fb = 2.0 \times Kz \times Fb / 3 = 14.40$, $fs = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	6392	561.9	561.9	0.003
ω_b	2135	187.7	187.7	0.001
Total	8527	749.6	749.6	0.004

$M_{max} / (Zx \times fb) = 8526.8 / (100.33 \times 1440.00) = 0.06 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 749.61) / (67.64 \times 120.00) = 0.14 \leq 1.0 \text{ OK}$
 $\delta = 0.004 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/10606 \leq 1/150 \text{ OK}$

積雪時 $fb = 0.8 \times 2.0 \times Kz \times Fb / 3 = 11.52$, $fs = 0.8 \times 2.0 \times 1.00 \times Fs / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	6392	561.9	561.9	0.003
ω_b	2135	187.7	187.7	0.001
Total	8527	749.6	749.6	0.004

$M_{max} / (Zx \times fb) = 8526.8 / (100.33 \times 1152.00) = 0.07 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 749.61) / (67.64 \times 96.00) = 0.17 \leq 1.0 \text{ OK}$
 $\delta = 0.004 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/10606 \leq 1/150 \text{ OK}$

風圧力に対する曲げ

$fbx = 2.0 \times Kz \times Fb / 3 = 14.40$, $fby = 2.0 \times Fb / 3 = 14.40$, $fs = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$
 風圧力 $w = Q \times C \times l = 937.3 \times 1.00 \times 1.38 = 1288.8 \text{ (N/m)}$
 $Q = 293.2 \text{ (N)}$ $Ms = 33.4 \text{ (N·m)}$

$M_{max} / (Zx \times fbx) + Ms / (Zy \times fby) = 8526.8 / (100.33 \times 1440.00) + 3335.3 / (42.84 \times 1440.00) = 0.11 \leq 1.0 \text{ OK}$
 $(\alpha \times Q) / (A \times fs) = (1.5 \times 293.2) / (67.64 \times 120.00) = 0.05 \leq 1.0 \text{ OK}$
 $\delta = 0.01 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/4943 \leq 1/150 \text{ OK}$

まぐさ端部の接合

釘：CN90 木口打ち，一面せん断力値 = 400.0 (N)
 必要釘本数 $n = Q / (2 \times \text{一面せん断力値} \times (2 / 3)) = 1 \text{ (本)}$

まぐさ受け

S-P-F 2級 204 (3.8 × 8.9 (cm)), $Lk = 2.03 \text{ (m)}$
 下枠 S-P-F 2級
 $A = 33.82 \text{ (cm}^2\text{)}$, $Z = 50.17 \text{ (cm}^3\text{)}$, $i = 2.57 \text{ (cm)}$, $\lambda = 78.72$, 座屈係数 $\omega = 1.95$
 $Fc = 17.40 \text{ (N/mm}^2\text{)}$, $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fcv = 6.00 \text{ (N/mm}^2\text{)}$
 Kz (曲げ) = 1.00 Kz (圧縮) = 1.00

長期 $N = 749.61 \text{ (N)}$, $fc = 1.1 \times Kz \times Fc / 3 = 6.38 \text{ (N/mm}^2\text{)}$, $fcv = 1.1 \times Fcv / 3 = 2.20 \text{ (N/mm}^2\text{)}$
 $(\omega \times N) / (A \times fc) = 0.07 \leq 1.0 \text{ OK}$
 $N / (A \times fcv) = 0.10 \leq 1.0 \text{ OK}$

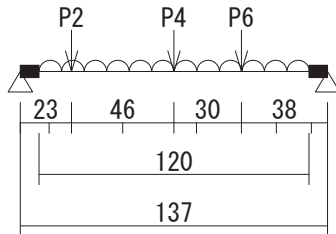
短期 $N = 749.61 \text{ (N)}$, $fc = 2.0 \times Kz \times Fc / 3 = 11.60 \text{ (N/mm}^2\text{)}$, $fcv = 2.0 \times Fcv / 3 = 4.00 \text{ (N/mm}^2\text{)}$
 $(\omega \times N) / (A \times fc) = 0.04 \leq 1.0 \text{ OK}$
 $N / (A \times fcv) = 0.06 \leq 1.0 \text{ OK}$

積雪時 $N = 749.61$ (N), $f_c = 0.8 \times 2.0 \times K_z \times F_c / 3 = 9.28$ (N/mm²), $f_{cv} = 0.8 \times 2.0 \times F_{cv} / 3 = 3.20$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.05 \leq 1.0 \text{ OK}$$

$$N / (A \times f_{cv}) = 0.07 \leq 1.0 \text{ OK}$$

階、位置： 1階まぐさ Y0通り X2.7 - X4.2



E120-F330 410 (8.9 × 23.5 (cm))
 $A = 209.15 \text{ (cm}^2\text{)}$, $Kz = 1.00$
 $Zx = 819.17 \text{ (cm}^3\text{)}$, $Zy = 310.24 \text{ (cm}^3\text{)}$
 $Ix = 9625.26 \text{ (cm}^4\text{)}$, $Iy = 1380.56 \text{ (cm}^4\text{)}$
 $Fbx = 33.00 \text{ (N/mm}^2\text{)}$, $Fby = 24.00 \text{ (N/mm}^2\text{)}$, $Fs = 3.00 \text{ (N/mm}^2\text{)}$
 許容せん断割増係数 1.00
 $E = 12000.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 1.235 = 2470 \text{ (N/m)} \rightarrow 24.70 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 1.235 = 2470 \text{ (N/m)} \rightarrow 24.70 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 1.235 = 2470 \text{ (N/m)} \rightarrow 24.70 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 1.235 = 1606 \text{ (N/m)} \rightarrow 16.06 \text{ (N/cm)}$ (長期たわみ)
 $\omega_b = 600 \times 1.38 = 825.00 \text{ (N/m)} \rightarrow 8.25 \text{ (N/cm)}$ (長期, 短期, 積雪時)
 $\omega 1 (X3 - X3.5) = 5739.39$ (長期) 5739.39 (短期) 7463.61 (積雪時) 5739.39 (長期たわみ) (N)
 $\omega 2 (X3 - X3.5) = 696.60$ (水平力) (N)
 $P2 = 216.01$ (長期) 216.01 (短期) 226.31 (積雪時) 166.47 (長期たわみ) (N)
 $P4 = 3708.85$ (長期) 3708.85 (短期) 4642.82 (積雪時) 3612.41 (長期たわみ) (N)
 $P6 = 462.08$ (長期) 462.08 (短期) 462.08 (積雪時) 316.36 (長期たわみ) (N)

長期 $fb = 1.1 \times Kz \times Fb / 3 = 12.10$, $fs = 1.1 \times 1.00 \times Fs / 3 = 1.10 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	44386	1480.8	1480.8	0.006	0.007
ω_b	14825	494.6	494.6	0.002	0.004
$\omega 1$	147264	3958.7	1780.7	0.015	0.029
P2	2745	190.0	26.0	0.000	0.000
P4	111173	1854.4	1854.4	0.012	0.022
P6	10382	115.4	346.7	0.001	0.001
Total	330775	8093.9	5983.2	0.035	0.065

$M_{max} / (Zx \times fb) = 330774.8 / (819.17 \times 1210.00) = 0.33 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 8093.87) / (209.15 \times 110.00) = 0.53 \leq 1.0 \text{ OK}$
 $\delta = 0.035 \text{ (cm)} \leq 1.00 \text{ OK}$
 $= 1/3416 \leq 1/300 \text{ OK}$
 $\delta' \times 2.0 = 0.065 \text{ (cm)} = 1/1849 \leq 1/250 \text{ OK}$

短期 $fb = 2.0 \times Kz \times Fb / 3 = 22.00$, $fs = 2.0 \times 1.00 \times Fs / 3 = 2.00 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	44386	1480.8	1480.8	0.006
ω_b	14825	494.6	494.6	0.002
$\omega 1$	147264	3958.7	1780.7	0.015
$\omega 2$	17874	480.5	216.1	0.002
P2	2745	190.0	26.0	0.000
P4	111173	1854.4	1854.4	0.012
P6	10382	115.4	346.7	0.001
Total	348648	8574.3	6199.3	0.037

$M_{max} / (Zx \times fb) = 348648.4 / (819.17 \times 2200.00) = 0.19 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 8574.35) / (209.15 \times 200.00) = 0.31 \leq 1.0 \text{ OK}$
 $\delta = 0.037 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/3251 \leq 1/150 \text{ OK}$

積雪時 $fb = 0.8 \times 2.0 \times Kz \times Fb / 3 = 17.60$, $fs = 0.8 \times 2.0 \times 1.00 \times Fs / 3 = 1.60 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	44386	1480.8	1480.8	0.006
ω_b	14825	494.6	494.6	0.002
$\omega 1$	191504	5148.0	2315.6	0.019
P2	2876	199.0	27.3	0.000
P4	139169	2321.4	2321.4	0.014
P6	10382	115.4	346.7	0.001
Total	403142	9759.2	6986.3	0.042

$M_{max} / (Zx \times fb) = 403142.3 / (819.17 \times 1760.00) = 0.28 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 9759.19) / (209.15 \times 160.00) = 0.44 \leq 1.0 \text{ OK}$
 $\delta = 0.042 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/2827 \leq 1/150 \text{ OK}$

風圧力に対する曲げ

$fbx = 2.0 \times Kz \times Fbx / 3 = 22.00$, $fby = 2.0 \times Fby / 3 = 16.00$, $fs = 2.0 \times 1.00 \times Fs / 3 = 2.00 \text{ (N/mm}^2\text{)}$
 風圧力 $w = Q \times C \times l = 937.3 \times 1.00 \times 1.38 = 1288.8 \text{ (N/m)}$
 $Q = 772.7 \text{ (N)}$ $Ms = 231.6 \text{ (N·m)}$

$M_{max} / (Zx \times fbx) + Ms / (Zy \times fby) = 330774.8 / (819.17 \times 2200.00) + 23160.4 / (310.24 \times 1600.00)$
 $= 0.23 \leq 1.0 \text{ OK}$
 $(\alpha \times Q) / (A \times fs) = (1.50 \times 772.7) / (209.15 \times 200.00) = 0.03 \leq 1.0 \text{ OK}$
 $\delta = 0.02 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/5727 \leq 1/150 \text{ OK}$

まぐさ端部の接合

釘：CN90 木口打ち，一面せん断力値 = 400.0 (N)

$$\text{必要釘本数 } n = Q / (2 \times \text{一面せん断力値} \times (2 / 3)) = 2 \text{ (本)}$$

まぐさ受け

$$\text{S-P-F 2級 } 2 - 204 (3.8 \times 8.9 \text{ (cm)}), \quad L_k = 1.55 \text{ (m)}$$

下枠 S-P-F 2級

$$A = 67.64 \text{ (cm}^2), \quad Z = 100.33 \text{ (cm}^3), \quad i = 2.57 \text{ (cm)}, \quad \lambda = 60.26, \quad \text{座屈係数 } \omega = 1.43$$

$$F_c = 17.40 \text{ (N/mm}^2), \quad F_b = 21.60 \text{ (N/mm}^2), \quad F_{cv} = 6.00 \text{ (N/mm}^2)$$

$$K_z (\text{曲げ}) = 1.00 \quad K_z (\text{圧縮}) = 1.00$$

$$\text{長期 } N = 8093.87 \text{ (N)}, \quad f_c = 1.1 \times K_z \times F_c / 3 = 6.38 \text{ (N/mm}^2), \quad f_{cv} = 1.1 \times F_{cv} / 3 = 2.20 \text{ (N/mm}^2)$$

$$(\omega \times N) / (A \times f_c) = 0.27 \leq 1.0 \text{ OK}$$

$$N / (A \times f_{cv}) = 0.54 \leq 1.0 \text{ OK}$$

$$\text{短期 } N = 8574.35 \text{ (N)}, \quad f_c = 2.0 \times K_z \times F_c / 3 = 11.60 \text{ (N/mm}^2), \quad f_{cv} = 2.0 \times F_{cv} / 3 = 4.00 \text{ (N/mm}^2)$$

$$(\omega \times N) / (A \times f_c) = 0.16 \leq 1.0 \text{ OK}$$

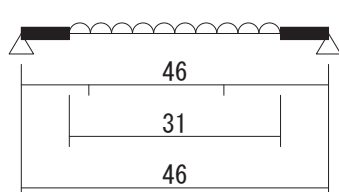
$$N / (A \times f_{cv}) = 0.32 \leq 1.0 \text{ OK}$$

$$\text{積雪時 } N = 9759.19 \text{ (N)}, \quad f_c = 0.8 \times 2.0 \times K_z \times F_c / 3 = 9.28 \text{ (N/mm}^2), \quad f_{cv} = 0.8 \times 2.0 \times F_{cv} / 3 = 3.20 \text{ (N/mm}^2)$$

$$(\omega \times N) / (A \times f_c) = 0.22 \leq 1.0 \text{ OK}$$

$$N / (A \times f_{cv}) = 0.45 \leq 1.0 \text{ OK}$$

階、位置： 1階まぐさ Y0通り X4.5 - X5



S-P-F 2級 2 - 204 (3.8 × 8.9 (cm))
 $A = 67.64 \text{ (cm}^2\text{)}$, $Kz = 1.00$
 $Zx = 100.33 \text{ (cm}^3\text{)}$, $Zy = 42.84 \text{ (cm}^3\text{)}$
 $Ix = 446.48 \text{ (cm}^4\text{)}$, $Iy = 81.39 \text{ (cm}^4\text{)}$
 $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fs = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (長期)
 $\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (短期)
 $\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (積雪時)
 $\omega = 900 \times 0.455 = 410 \text{ (N/m)} \rightarrow 4.10 \text{ (N/cm)}$ (長期たわみ)
 $\omega b = 600 \times 1.38 = 825.00 \text{ (N/m)} \rightarrow 8.25 \text{ (N/cm)}$ (長期, 短期, 積雪時)
 $\omega 1 (a - b) = 1454.89$ (長期) 1454.89 (短期) 1659.15 (積雪時) 1454.89 (長期たわみ) (N)
 $\omega 2 (a - b) = 146.42$ (水平力) (N)

長期 $fb = 1.1 \times Kz \times Fb / 3 = 7.92$, $fs = 1.1 \times 1.00 \times Fs / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	892	113.9	113.9	0.000	0.000
ωb	1010	129.1	129.1	0.000	0.000
$\omega 1$	5692	727.4	727.4	0.001	0.003
Total	7594	970.5	970.5	0.002	0.003

$M_{max} / (Zx \times fb) = 7594.1 / (100.33 \times 792.00) = 0.10 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 970.49) / (67.64 \times 66.00) = 0.33 \leq 1.0 \text{ OK}$
 $\delta = 0.002 \text{ (cm)} \leq 1.00 \text{ OK}$
 $\delta' \times 2.0 = 0.003 \text{ (cm)} = 1/9124 \leq 1/250 \text{ OK}$

短期 $fb = 2.0 \times Kz \times Fb / 3 = 14.40$, $fs = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	892	113.9	113.9	0.000
ωb	1010	129.1	129.1	0.000
$\omega 1$	5692	727.4	727.4	0.001
$\omega 2$	1146	73.2	73.2	0.000
Total	8740	1043.7	1043.7	0.002

$M_{max} / (Zx \times fb) = 8739.8 / (100.33 \times 1440.00) = 0.06 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 1043.70) / (67.64 \times 120.00) = 0.19 \leq 1.0 \text{ OK}$
 $\delta = 0.002 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/15447 \leq 1/150 \text{ OK}$

積雪時 $fb = 0.8 \times 2.0 \times Kz \times Fb / 3 = 11.52$, $fs = 0.8 \times 2.0 \times 1.00 \times Fs / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	892	113.9	113.9	0.000
ωb	1010	129.1	129.1	0.000
$\omega 1$	6491	829.6	829.6	0.002
Total	8393	1072.6	1072.6	0.002

$M_{max} / (Zx \times fb) = 8393.2 / (100.33 \times 1152.00) = 0.07 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 1072.62) / (67.64 \times 96.00) = 0.25 \leq 1.0 \text{ OK}$
 $\delta = 0.002 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/15663 \leq 1/150 \text{ OK}$

風圧力に対する曲げ

$fbx = 2.0 \times Kz \times Fb / 3 = 14.40$, $fby = 2.0 \times Fb / 3 = 14.40$, $fs = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$
 風圧力 $w = Q \times C \times l = 937.3 \times 1.00 \times 1.38 = 1288.8 \text{ (N/m)}$
 $Q = 201.7 \text{ (N)}$ $Ms = 15.8 \text{ (N·m)}$

$M_{max} / (Zx \times fbx) + Ms / (Zy \times fby) = 7594.1 / (100.33 \times 1440.00) + 1578.3 / (42.84 \times 1440.00)$
 $= 0.08 \leq 1.0 \text{ OK}$
 $(\alpha \times Q) / (A \times fs) = (1.5 \times 201.7) / (67.64 \times 120.00) = 0.04 \leq 1.0 \text{ OK}$
 $\delta = 0.00 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/15184 \leq 1/150 \text{ OK}$

まぐさ端部の接合

釘：CN90 木口打ち，一面せん断力値 = 400.0 (N)
 必要釘本数 $n = Q / (2 \times \text{一面せん断力値} \times (2 / 3)) = 1 \text{ (本)}$

まぐさ受け

S-P-F 2級 204 (3.8 × 8.9 (cm)), $Lk = 2.03 \text{ (m)}$
 下枠 S-P-F 2級
 $A = 33.82 \text{ (cm}^2\text{)}$, $Z = 50.17 \text{ (cm}^3\text{)}$, $i = 2.57 \text{ (cm)}$, $\lambda = 78.72$, 座屈係数 $\omega = 1.95$
 $Fc = 17.40 \text{ (N/mm}^2\text{)}$, $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fcv = 6.00 \text{ (N/mm}^2\text{)}$
 Kz (曲げ) = 1.00 Kz (圧縮) = 1.00

長期 $N = 970.49 \text{ (N)}$, $fc = 1.1 \times Kz \times Fc / 3 = 6.38 \text{ (N/mm}^2\text{)}$, $fcv = 1.1 \times Fcv / 3 = 2.20 \text{ (N/mm}^2\text{)}$
 $(\omega \times N) / (A \times fc) = 0.09 \leq 1.0 \text{ OK}$

$$N / (A \times f_{cv}) = 0.13 \leq 1.0 \text{ OK}$$

短期 $N = 1043.70 \text{ (N)}$, $f_c = 2.0 \times K_z \times F_c / 3 = 11.60 \text{ (N/mm}^2\text{)}$, $f_{cv} = 2.0 \times F_{cv} / 3 = 4.00 \text{ (N/mm}^2\text{)}$

$$(\omega \times N) / (A \times f_c) = 0.05 \leq 1.0 \text{ OK}$$

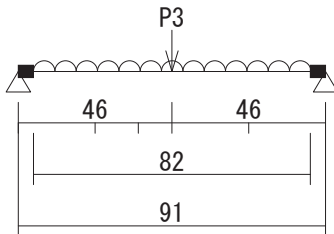
$$N / (A \times f_{cv}) = 0.08 \leq 1.0 \text{ OK}$$

積雪時 $N = 1072.62 \text{ (N)}$, $f_c = 0.8 \times 2.0 \times K_z \times F_c / 3 = 9.28 \text{ (N/mm}^2\text{)}$, $f_{cv} = 0.8 \times 2.0 \times F_{cv} / 3 = 3.20 \text{ (N/mm}^2\text{)}$

$$(\omega \times N) / (A \times f_c) = 0.07 \leq 1.0 \text{ OK}$$

$$N / (A \times f_{cv}) = 0.10 \leq 1.0 \text{ OK}$$

階、位置： 1階まぐさ Y3通り X2.5 - X3.5



S-P-F 2級 2 - 206 (3.8 × 14.0 (cm))
 $A = 106.40 \text{ (cm}^2\text{)}, Kz = 0.84$
 $Zx = 248.27 \text{ (cm}^3\text{)}, Zy = 67.39 \text{ (cm}^3\text{)}$
 $Ix = 1737.87 \text{ (cm}^4\text{)}, Iy = 128.03 \text{ (cm}^4\text{)}$
 $Fb = 21.60 \text{ (N/mm}^2\text{)}, Fs = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.358 = 715 \text{ (N/m)} \rightarrow 7.15 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.358 = 715 \text{ (N/m)} \rightarrow 7.15 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.358 = 715 \text{ (N/m)} \rightarrow 7.15 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.358 = 465 \text{ (N/m)} \rightarrow 4.65 \text{ (N/cm)}$ (長期たわみ)
 $\omega_b = 400 \times 1.38 = 550.00 \text{ (N/m)} \rightarrow 5.50 \text{ (N/cm)}$ (長期, 短期, 積雪時)
 $P3 = 3200.98$ (長期) 3200.98 (短期) 3298.82 (積雪時) 2368.07 (長期たわみ) (N)

長期 $f_b = 1.1 \times Kz \times Fb / 3 = 6.65$, $f_s = 1.1 \times 1.00 \times Fs / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	6010	293.2	293.2	0.003	0.003
ω_b	4623	225.5	225.5	0.002	0.004
P3	65620	1600.5	1600.5	0.022	0.033
Total	76252	2119.1	2119.1	0.027	0.040

$M_{max} / (Zx \times f_b) = 76252.3 / (248.27 \times 66.5) = 0.46 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 2119.14) / (106.40 \times 66.00) = 0.45 \leq 1.0 \text{ OK}$
 $\delta = 0.027 \text{ (cm)} \leq 1.00 \text{ OK}$
 $= 1/3094 \leq 1/300 \text{ OK}$
 $\delta' \times 2.0 = 0.040 \text{ (cm)} = 1/2062 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times Kz \times Fb / 3 = 12.10$, $f_s = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	6010	293.2	293.2	0.003
ω_b	4623	225.5	225.5	0.002
P3	65620	1600.5	1600.5	0.022
Total	76252	2119.1	2119.1	0.027

$M_{max} / (Zx \times f_b) = 76252.3 / (248.27 \times 120.9) = 0.25 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 2119.14) / (106.40 \times 120.00) = 0.25 \leq 1.0 \text{ OK}$
 $\delta = 0.027 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/3094 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times Kz \times Fb / 3 = 9.68$, $f_s = 0.8 \times 2.0 \times 1.00 \times Fs / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	6010	293.2	293.2	0.003
ω_b	4623	225.5	225.5	0.002
P3	67626	1649.4	1649.4	0.023
Total	78258	2168.1	2168.1	0.027

$M_{max} / (Zx \times f_b) = 78258.1 / (248.27 \times 96.7) = 0.33 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 2168.06) / (106.40 \times 96.00) = 0.32 \leq 1.0 \text{ OK}$
 $\delta = 0.027 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/3017 \leq 1/150 \text{ OK}$

まぐさ受け

S-P-F 2級 204 (3.8 × 8.9 (cm)), $Lk = 2.03 \text{ (m)}$

下枠 S-P-F 2級

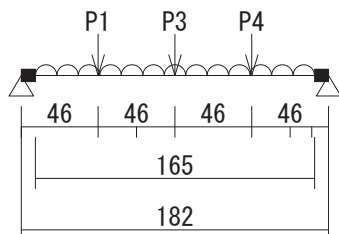
 $A = 33.82 \text{ (cm}^2\text{)}, Z = 50.17 \text{ (cm}^3\text{)}, i = 2.57 \text{ (cm)}, \lambda = 78.72$, 座屈係数 $\omega = 1.95$ $F_c = 17.40 \text{ (N/mm}^2\text{)}, F_b = 21.60 \text{ (N/mm}^2\text{)}, F_{cv} = 6.00 \text{ (N/mm}^2\text{)}$ K_z (曲げ) = 1.00 K_z (圧縮) = 1.00

長期 $N = 2119.14 \text{ (N)}$, $f_c = 1.1 \times K_z \times F_c / 3 = 6.38 \text{ (N/mm}^2\text{)}$, $f_{cv} = 1.1 \times F_{cv} / 3 = 2.20 \text{ (N/mm}^2\text{)}$
 $(\omega \times N) / (A \times f_c) = 0.19 \leq 1.0 \text{ OK}$
 $N / (A \times f_{cv}) = 0.28 \leq 1.0 \text{ OK}$

短期 $N = 2119.14 \text{ (N)}$, $f_c = 2.0 \times K_z \times F_c / 3 = 11.60 \text{ (N/mm}^2\text{)}$, $f_{cv} = 2.0 \times F_{cv} / 3 = 4.00 \text{ (N/mm}^2\text{)}$
 $(\omega \times N) / (A \times f_c) = 0.11 \leq 1.0 \text{ OK}$
 $N / (A \times f_{cv}) = 0.16 \leq 1.0 \text{ OK}$

積雪時 $N = 2168.06 \text{ (N)}$, $f_c = 0.8 \times 2.0 \times K_z \times F_c / 3 = 9.28 \text{ (N/mm}^2\text{)}$, $f_{cv} = 0.8 \times 2.0 \times F_{cv} / 3 = 3.20 \text{ (N/mm}^2\text{)}$
 $(\omega \times N) / (A \times f_c) = 0.13 \leq 1.0 \text{ OK}$
 $N / (A \times f_{cv}) = 0.20 \leq 1.0 \text{ OK}$

階、位置： 1階まぐさ Y6通り X1 - X3



E120-F330 410 (8.9 × 23.5 (cm))
 $A = 209.15 \text{ (cm}^2\text{)}$, $Kz = 1.00$
 $Zx = 819.17 \text{ (cm}^3\text{)}$, $Zy = 310.24 \text{ (cm}^3\text{)}$
 $Ix = 9625.26 \text{ (cm}^4\text{)}$, $Iy = 1380.56 \text{ (cm}^4\text{)}$
 $Fbx = 33.00 \text{ (N/mm}^2\text{)}$, $Fby = 24.00 \text{ (N/mm}^2\text{)}$, $Fs = 3.00 \text{ (N/mm}^2\text{)}$
 許容せん断割増係数 1.00
 $E = 12000.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 1.138 + 1600 \times 0.228 = 2639 \text{ (N/m)} \rightarrow 26.39 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 1.138 + 1600 \times 0.228 = 2639 \text{ (N/m)} \rightarrow 26.39 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 1.138 + 1600 \times 0.228 = 2639 \text{ (N/m)} \rightarrow 26.39 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 1.138 + 900 \times 0.228 = 1684 \text{ (N/m)} \rightarrow 16.84 \text{ (N/cm)}$ (長期たわみ)
 $\omega_b = 600 \times 1.38 = 825.00 \text{ (N/m)} \rightarrow 8.25 \text{ (N/cm)}$ (長期, 短期, 積雪時)
 $P1 = 4703.67$ (長期) 4703.67 (短期) 5684.61 (積雪時) 4170.77 (長期たわみ) (N)
 $P3 = 4040.91$ (長期) 4040.91 (短期) 4729.28 (積雪時) 3392.20 (長期たわみ) (N)
 $P4 = 4158.08$ (長期) 4158.08 (短期) 4857.21 (積雪時) 3473.26 (長期たわみ) (N)

長期 $f_b = 1.1 \times Kz \times F_b / 3 = 12.10$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 1.10 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	90244	2182.5	2182.5	0.022	0.028
ω_b	28212	682.3	682.3	0.007	0.014
P1	135623	3645.8	1057.9	0.025	0.044
P3	167092	2020.5	2020.5	0.033	0.055
P4	119892	935.2	3222.9	0.022	0.036
Total	541063	9466.1	9166.0	0.109	0.178

$M_{max} / (Zx \times f_b) = 541062.5 / (819.17 \times 1210.00) = 0.55 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 9466.15) / (209.15 \times 110.00) = 0.62 \leq 1.0 \text{ OK}$
 $\delta = 0.109 \text{ (cm)} \leq 1.00 \text{ OK}$
 $= 1/1524 \leq 1/300 \text{ OK}$
 $\delta' \times 2.0 = 0.178 \text{ (cm)} = 1/931 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times Kz \times F_b / 3 = 22.00$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 2.00 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	90244	2182.5	2182.5	0.022
ω_b	28212	682.3	682.3	0.007
P1	135623	3645.8	1057.9	0.025
P3	167092	2020.5	2020.5	0.033
P4	119892	935.2	3222.9	0.022
Total	541063	9466.1	9166.0	0.109

$M_{max} / (Zx \times f_b) = 541062.5 / (819.17 \times 2200.00) = 0.30 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 9466.15) / (209.15 \times 200.00) = 0.34 \leq 1.0 \text{ OK}$
 $\delta = 0.109 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1524 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times Kz \times F_b / 3 = 17.60$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 1.60 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	90244	2182.5	2182.5	0.022
ω_b	28212	682.3	682.3	0.007
P1	163907	4406.1	1278.5	0.030
P3	195556	2364.6	2364.6	0.039
P4	140050	1092.4	3764.8	0.025
Total	617968	10727.9	10272.7	0.123

$M_{max} / (Zx \times f_b) = 617968.2 / (819.17 \times 1760.00) = 0.43 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 10727.89) / (209.15 \times 160.00) = 0.48 \leq 1.0 \text{ OK}$
 $\delta = 0.123 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1345 \leq 1/150 \text{ OK}$

風圧力に対する曲げ

$f_{bx} = 2.0 \times Kz \times F_{bx} / 3 = 22.00$, $f_{by} = 2.0 \times F_{by} / 3 = 16.00$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 2.00 \text{ (N/mm}^2\text{)}$

風圧力 $w = Q \times C \times l = 937.3 \times 1.00 \times 1.38 = 1288.8 \text{ (N/m)}$

$Q = 1065.9 \text{ (N)}$ $M_s = 440.7 \text{ (N·m)}$

$M_{max} / (Zx \times f_{bx}) + M_s / (Zy \times f_{by}) = 541062.5 / (819.17 \times 2200.00) + 44073.7 / (310.24 \times 1600.00)$
 $= 0.39 \leq 1.0 \text{ OK}$

$(\alpha \times Q) / (A \times f_s) = (1.5 \times 1065.9) / (209.15 \times 200.00) = 0.04 \leq 1.0 \text{ OK}$

$\delta = 0.08 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/2182 \leq 1/150 \text{ OK}$

まぐさ端部の接合

釘：CN90 木口打ち，一面せん断力値 = 400.0 (N)

必要釘本数 $n = Q / (2 \times \text{一面せん断力値} \times (2 / 3)) = 2 \text{ (本)}$

まぐさ受け

S-P-F 2級 2 - 204 (3.8 × 8.9 (cm)), $L_k = 2.03 \text{ (m)}$

下枠 S-P-F 2級

$$A = 67.64 \text{ (cm}^2\text{)} \quad Z = 100.33 \text{ (cm}^3\text{)}, \quad i = 2.57 \text{ (cm)}, \quad \lambda = 78.72, \quad \text{座屈係数 } \omega = 1.95$$

$$F_c = 17.40 \text{ (N/mm}^2\text{)}, \quad F_b = 21.60 \text{ (N/mm}^2\text{)}, \quad F_{cv} = 6.00 \text{ (N/mm}^2\text{)}$$

$$K_z(\text{曲げ}) = 1.00 \quad K_z(\text{圧縮}) = 1.00$$

長期 $N = 9466.15 \text{ (N)}$, $f_c = 1.1 \times K_z \times F_c / 3 = 6.38 \text{ (N/mm}^2\text{)}$, $f_{cv} = 1.1 \times F_{cv} / 3 = 2.20 \text{ (N/mm}^2\text{)}$

$$(\omega \times N) / (A \times f_c) = 0.43 \leq 1.0 \text{ OK}$$

$$N / (A \times f_{cv}) = 0.64 \leq 1.0 \text{ OK}$$

短期 $N = 9466.15 \text{ (N)}$, $f_c = 2.0 \times K_z \times F_c / 3 = 11.60 \text{ (N/mm}^2\text{)}$, $f_{cv} = 2.0 \times F_{cv} / 3 = 4.00 \text{ (N/mm}^2\text{)}$

$$(\omega \times N) / (A \times f_c) = 0.24 \leq 1.0 \text{ OK}$$

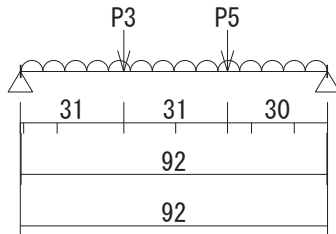
$$N / (A \times f_{cv}) = 0.35 \leq 1.0 \text{ OK}$$

積雪時 $N = 10727.89 \text{ (N)}$, $f_c = 0.8 \times 2.0 \times K_z \times F_c / 3 = 9.28 \text{ (N/mm}^2\text{)}$, $f_{cv} = 0.8 \times 2.0 \times F_{cv} / 3 = 3.20 \text{ (N/mm}^2\text{)}$

$$(\omega \times N) / (A \times f_c) = 0.33 \leq 1.0 \text{ OK}$$

$$N / (A \times f_{cv}) = 0.50 \leq 1.0 \text{ OK}$$

階、位置： 1階まぐさ Y6通り X4.4 - X5.5



S-P-F 2級 2 - 206 (3.8 × 14.0 (cm))
 $A = 106.40 \text{ (cm}^2\text{)}$, $Kz = 0.84$
 $Zx = 248.27 \text{ (cm}^3\text{)}$, $Zy = 67.39 \text{ (cm}^3\text{)}$
 $Ix = 1737.87 \text{ (cm}^4\text{)}$, $Iy = 128.03 \text{ (cm}^4\text{)}$
 $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fs = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$$\begin{aligned} \omega &= 2000 \times 0.910 + 1600 \times 0.228 = 2184 \text{ (N/m)} \rightarrow 21.84 \text{ (N/cm)} \text{ (長期)} \\ \omega &= 2000 \times 0.910 + 1600 \times 0.228 = 2184 \text{ (N/m)} \rightarrow 21.84 \text{ (N/cm)} \text{ (短期)} \\ \omega &= 2000 \times 0.910 + 1600 \times 0.228 = 2184 \text{ (N/m)} \rightarrow 21.84 \text{ (N/cm)} \text{ (積雪時)} \\ \omega &= 1300 \times 0.910 + 900 \times 0.228 = 1388 \text{ (N/m)} \rightarrow 13.88 \text{ (N/cm)} \text{ (長期たわみ)} \\ \omega_b &= 600 \times 1.38 = 825.00 \text{ (N/m)} \rightarrow 8.25 \text{ (N/cm)} \text{ (長期, 短期, 積雪時)} \\ P3 &= 913.97 \text{ (長期)} \quad 913.97 \text{ (短期)} \quad 1123.70 \text{ (積雪時)} \quad 749.01 \text{ (長期たわみ)} \text{ (N)} \\ P5 &= 806.59 \text{ (長期)} \quad 806.59 \text{ (短期)} \quad 994.98 \text{ (積雪時)} \quad 660.88 \text{ (長期たわみ)} \text{ (N)} \end{aligned}$$

長期 $fb = 1.1 \times Kz \times Fb / 3 = 6.65$, $fs = 1.1 \times 1.00 \times Fs / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	22906	1000.3	1000.3	0.012	0.015
ω_b	8653	377.9	377.9	0.005	0.009
P3	18685	606.7	307.3	0.008	0.012
P5	16217	262.4	544.2	0.007	0.011
Total	66461	2247.2	2229.6	0.031	0.047

$$\begin{aligned} M_{\max} / (Zx \times fb) &= 66460.5 / (248.27 \times 6.65) = 0.40 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times fs) &= (1.50 \times 2247.18) / (106.40 \times 0.66) = 0.48 \leq 1.0 \text{ OK} \\ \delta &= 0.031 \text{ (cm)} \leq 1.00 \text{ OK} \\ &= 1/2986 \leq 1/300 \text{ OK} \\ \delta' \times 2.0 &= 0.047 \text{ (cm)} = 1/1929 \leq 1/250 \text{ OK} \end{aligned}$$

短期 $fb = 2.0 \times Kz \times Fb / 3 = 12.10$, $fs = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	22906	1000.3	1000.3	0.012
ω_b	8653	377.9	377.9	0.005
P3	18685	606.7	307.3	0.008
P5	16217	262.4	544.2	0.007
Total	66461	2247.2	2229.6	0.031

$$\begin{aligned} M_{\max} / (Zx \times fb) &= 66460.5 / (248.27 \times 12.10) = 0.22 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times fs) &= (1.50 \times 2247.18) / (106.40 \times 1.20) = 0.26 \leq 1.0 \text{ OK} \\ \delta &= 0.031 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/2986 \leq 1/150 \text{ OK} \end{aligned}$$

積雪時 $fb = 0.8 \times 2.0 \times Kz \times Fb / 3 = 9.68$, $fs = 0.8 \times 2.0 \times 1.00 \times Fs / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	22906	1000.3	1000.3	0.012
ω_b	8653	377.9	377.9	0.005
P3	22973	745.9	377.8	0.009
P5	20004	323.7	671.3	0.008
Total	74536	2447.7	2427.2	0.034

$$\begin{aligned} M_{\max} / (Zx \times fb) &= 74536.0 / (248.27 \times 9.68) = 0.31 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times fs) &= (1.50 \times 2447.68) / (106.40 \times 0.96) = 0.36 \leq 1.0 \text{ OK} \\ \delta &= 0.034 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/2698 \leq 1/150 \text{ OK} \end{aligned}$$

風圧力に対する曲げ

$$fbx = 2.0 \times Kz \times Fb / 3 = 12.10, \quad fby = 2.0 \times Fb / 3 = 14.40, \quad fs = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$$

$$\text{風圧力 } w = Q \times C \times l = 937.3 \times 1.00 \times 1.38 = 1288.8 \text{ (N/m)}$$

$$Q = 590.3 \text{ (N)} \quad Ms = 135.2 \text{ (N·m)}$$

$$\begin{aligned} M_{\max} / (Zx \times fbx) + Ms / (Zy \times fby) &= 66460.5 / (248.27 \times 12.10) + 13517.6 / (67.39 \times 1440.00) \\ &= 0.36 \leq 1.0 \text{ OK} \\ (\alpha \times Q) / (A \times fs) &= (1.5 \times 590.3) / (106.40 \times 1.20) = 0.07 \leq 1.0 \text{ OK} \\ \delta &= 0.10 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/953 \leq 1/150 \text{ OK} \end{aligned}$$

まぐさ端部の接合

釘：CN90 木口打ち，一面せん断力値 = 400.0 (N)

$$\text{必要釘本数 } n = Q / (2 \times \text{一面せん断力値} \times (2 / 3)) = 2 \text{ (本)}$$

まぐさ受け

S-P-F 2級 204 (3.8 × 8.9 (cm)), $Lk = 2.14 \text{ (m)}$

下枠 S-P-F 2級

$A = 33.82 \text{ (cm}^2\text{)}$, $Z = 50.17 \text{ (cm}^3\text{)}$, $i = 2.57 \text{ (cm)}$, $\lambda = 83.20$, 座屈係数 $\omega = 2.14$

$Fc = 17.40 \text{ (N/mm}^2\text{)}$, $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fcv = 6.00 \text{ (N/mm}^2\text{)}$

Kz (曲げ) = 1.00 Kz (圧縮) = 1.00

長期 $N = 2247.18$ (N), $f_c = 1.1 \times K_z \times F_c / 3 = 6.38$ (N/mm²), $f_{cv} = 1.1 \times F_{cv} / 3 = 2.20$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.22 \leq 1.0 \text{ OK}$$

$$N / (A \times f_{cv}) = 0.30 \leq 1.0 \text{ OK}$$

短期 $N = 2247.18$ (N), $f_c = 2.0 \times K_z \times F_c / 3 = 11.60$ (N/mm²), $f_{cv} = 2.0 \times F_{cv} / 3 = 4.00$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.12 \leq 1.0 \text{ OK}$$

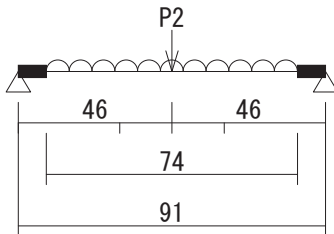
$$N / (A \times f_{cv}) = 0.17 \leq 1.0 \text{ OK}$$

積雪時 $N = 2447.68$ (N), $f_c = 0.8 \times 2.0 \times K_z \times F_c / 3 = 9.28$ (N/mm²), $f_{cv} = 0.8 \times 2.0 \times F_{cv} / 3 = 3.20$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.17 \leq 1.0 \text{ OK}$$

$$N / (A \times f_{cv}) = 0.23 \leq 1.0 \text{ OK}$$

階、位置： 1階まぐさ X0通り Y1.5 - Y2.5



S-P-F 2級 2 - 206 (3.8 × 14.0 (cm))
 $A = 106.40 \text{ (cm}^2\text{)}, Kz = 0.84$
 $Zx = 248.27 \text{ (cm}^3\text{)}, Zy = 67.39 \text{ (cm}^3\text{)}$
 $Ix = 1737.87 \text{ (cm}^4\text{)}, Iy = 128.03 \text{ (cm}^4\text{)}$
 $Fb = 21.60 \text{ (N/mm}^2\text{)}, Fs = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.228 = 455 \text{ (N/m)} \rightarrow 4.55 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.228 = 455 \text{ (N/m)} \rightarrow 4.55 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.228 = 455 \text{ (N/m)} \rightarrow 4.55 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.228 = 296 \text{ (N/m)} \rightarrow 2.96 \text{ (N/cm)}$ (長期たわみ)
 $\omega b = 600 \times 1.38 = 825.00 \text{ (N/m)} \rightarrow 8.25 \text{ (N/cm)}$ (長期, 短期, 積雪時)
 $\omega 1 (Y2 - b) = 1953.25 \text{ (長期)} 1953.25 \text{ (短期)} 2574.86 \text{ (積雪時)} 1953.25 \text{ (長期たわみ)}$ (N)
 $\omega 2 (Y2 - b) = 124.76 \text{ (水平力)}$ (N)
 $P2 = -7246.25 \text{ (回転力)}$ (N)

長期 $f_b = 1.1 \times Kz \times Fb / 3 = 6.65, f_s = 1.1 \times 1.00 \times Fs / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	3148	169.3	169.3	0.001	0.001
ωb	5708	306.9	306.9	0.002	0.004
$\omega 1$	27248	488.3	1464.9	0.007	0.014
Total	36104	964.5	1941.1	0.010	0.019

$M_{max} / (Zx \times f_b) = 36104.4 / (248.27 \times 66.5) = 0.22 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 1941.10) / (106.40 \times 66.00) = 0.41 \leq 1.0 \text{ OK}$
 $\delta = 0.010 \text{ (cm)} \leq 1.00 \text{ OK}$
 $= 1/7381 \leq 1/300 \text{ OK}$
 $\delta' \times 2.0 = 0.019 \text{ (cm)} = 1/3835 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times Kz \times Fb / 3 = 12.10, f_s = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	3148	169.3	169.3	0.001
ωb	5708	306.9	306.9	0.002
$\omega 1$	27248	488.3	1464.9	0.007
$\omega 2$	1740	31.2	93.6	0.000
P2	134780	3623.1	3623.1	0.037
Total	172625	4618.8	5657.8	0.048

$M_{max} / (Zx \times f_b) = 172624.9 / (248.27 \times 120.9) = 0.57 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 5657.79) / (106.40 \times 120.00) = 0.66 \leq 1.0 \text{ OK}$
 $\delta = 0.048 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1557 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times Kz \times Fb / 3 = 9.68, f_s = 0.8 \times 2.0 \times 1.00 \times Fs / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	3148	169.3	169.3	0.001
ωb	5708	306.9	306.9	0.002
$\omega 1$	35919	643.7	1931.1	0.009
Total	44776	1119.9	2407.3	0.012

$M_{max} / (Zx \times f_b) = 44775.8 / (248.27 \times 96.8) = 0.19 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 2407.30) / (106.40 \times 96.00) = 0.35 \leq 1.0 \text{ OK}$
 $\delta = 0.012 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/6042 \leq 1/150 \text{ OK}$

風圧力に対する曲げ

$f_{bx} = 2.0 \times Kz \times Fb / 3 = 12.10, f_{by} = 2.0 \times Fb / 3 = 14.40, f_s = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$
 風圧力 $w = Q \times C \times l = 937.3 \times 1.00 \times 1.38 = 1288.8 \text{ (N/m)}$
 $Q = 479.4 \text{ (N)} \quad M_s = 89.2 \text{ (N·m)}$

$M_{max} / (Zx \times f_{bx}) + M_s / (Zy \times f_{by}) = 36104.4 / (248.27 \times 120.9) + 8917.7 / (67.39 \times 1440.00)$
 $= 0.21 \leq 1.0 \text{ OK}$
 $(\alpha \times Q) / (A \times f_s) = (1.50 \times 479.4) / (106.40 \times 120.00) = 0.06 \leq 1.0 \text{ OK}$
 $\delta = 0.04 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1778 \leq 1/150 \text{ OK}$

まぐさ端部の接合

釘：CN90 木口打ち，一面せん断力値 = 400.0 (N)
 必要釘本数 $n = Q / (2 \times \text{一面せん断力値} \times (2 / 3)) = 1 \text{ (本)}$

まぐさ受け

S-P-F 2級 204 (3.8 × 8.9 (cm)), $L_k = 1.55 \text{ (m)}$
 下枠 S-P-F 2級
 $A = 33.82 \text{ (cm}^2\text{)}, Z = 50.17 \text{ (cm}^3\text{)}, i = 2.57 \text{ (cm)}, \lambda = 60.26, \text{ 座屈係数 } \omega = 1.43$
 $F_c = 17.40 \text{ (N/mm}^2\text{)}, F_b = 21.60 \text{ (N/mm}^2\text{)}, F_{cv} = 6.00 \text{ (N/mm}^2\text{)}$
 $K_z \text{ (曲げ)} = 1.00 \quad K_z \text{ (圧縮)} = 1.00$

長期 $N = 1941.10$ (N), $f_c = 1.1 \times K_z \times F_c / 3 = 6.38$ (N/mm²), $f_{cv} = 1.1 \times F_{cv} / 3 = 2.20$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.13 \leq 1.0 \text{ OK}$$

$$N / (A \times f_{cv}) = 0.26 \leq 1.0 \text{ OK}$$

短期 $N = 5657.79$ (N), $f_c = 2.0 \times K_z \times F_c / 3 = 11.60$ (N/mm²), $f_{cv} = 2.0 \times F_{cv} / 3 = 4.00$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.21 \leq 1.0 \text{ OK}$$

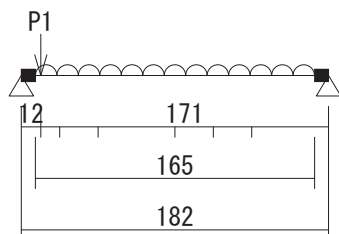
$$N / (A \times f_{cv}) = 0.42 \leq 1.0 \text{ OK}$$

積雪時 $N = 2407.30$ (N), $f_c = 0.8 \times 2.0 \times K_z \times F_c / 3 = 9.28$ (N/mm²), $f_{cv} = 0.8 \times 2.0 \times F_{cv} / 3 = 3.20$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.11 \leq 1.0 \text{ OK}$$

$$N / (A \times f_{cv}) = 0.22 \leq 1.0 \text{ OK}$$

階、位置： 1階まぐさ X0通り Y3.5 - Y5.5



S-P-F 2級 2 - 210 (3.8 × 23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}, Kz = 0.68$
 $Zx = 699.52 \text{ (cm}^3\text{)}, Zy = 113.11 \text{ (cm}^3\text{)}$
 $Ix = 8219.32 \text{ (cm}^4\text{)}, Iy = 214.92 \text{ (cm}^4\text{)}$
 $Fb = 21.60 \text{ (N/mm}^2\text{)}, Fs = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.228 = 455 \text{ (N/m)} \rightarrow 4.55 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.228 = 455 \text{ (N/m)} \rightarrow 4.55 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.228 = 455 \text{ (N/m)} \rightarrow 4.55 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.228 = 296 \text{ (N/m)} \rightarrow 2.96 \text{ (N/cm)}$ (長期たわみ)
 $\omega b = 600 \times 1.38 = 825.00 \text{ (N/m)} \rightarrow 8.25 \text{ (N/cm)}$ (長期, 短期, 積雪時)
 $\omega 1 (a - Y3.6) = 168.02$ (長期) 168.02 (短期) 221.49 (積雪時) 168.02 (長期たわみ) (N)
 $\omega 2 (a - Y3.6) = 10.73$ (水平力) (N)
 $\omega 3 (Y3.6 - b) = 973.20$ (長期) 973.20 (短期) 973.20 (積雪時) 973.20 (長期たわみ) (N)
 $P1 = 7246.25$ (回転力) (N)

長期 $f_b = 1.1 \times Kz \times Fb / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times Fs / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	15559	376.3	376.3	0.006	0.007
ωb	28212	682.3	682.3	0.010	0.020
$\omega 1$	266	166.4	1.6	0.000	0.000
$\omega 3$	40227	477.2	496.0	0.012	0.023
Total	84264	1702.1	1556.2	0.027	0.051

$M_{max} / (Zx \times f_b) = 84264.5 / (699.52 \times 538.56) = 0.22 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 1702.14) / (178.60 \times 66.00) = 0.22 \leq 1.0 \text{ OK}$
 $\delta = 0.027 \text{ (cm)} \leq 1.00 \text{ OK}$
 $= 1/6017 \leq 1/300 \text{ OK}$
 $\delta' \times 2.0 = 0.051 \text{ (cm)} = 1/3240 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times Kz \times Fb / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	15559	376.3	376.3	0.006
ωb	28212	682.3	682.3	0.010
$\omega 1$	266	166.4	1.6	0.000
$\omega 2$	17	10.6	0.1	0.000
$\omega 3$	40227	477.2	496.0	0.012
P1	22739	7106.1	140.2	0.005
Total	107021	8818.8	1696.5	0.033

$M_{max} / (Zx \times f_b) = 107020.9 / (699.52 \times 979.20) = 0.16 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 8818.82) / (178.60 \times 120.00) = 0.62 \leq 1.0 \text{ OK}$
 $\delta = 0.033 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/5066 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times Kz \times Fb / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times Fs / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	15559	376.3	376.3	0.006
ωb	28212	682.3	682.3	0.010
$\omega 1$	351	219.4	2.1	0.000
$\omega 3$	40227	477.2	496.0	0.012
Total	84349	1755.1	1556.7	0.028

$M_{max} / (Zx \times f_b) = 84349.2 / (699.52 \times 783.36) = 0.15 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 1755.10) / (178.60 \times 96.00) = 0.15 \leq 1.0 \text{ OK}$
 $\delta = 0.028 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/6013 \leq 1/150 \text{ OK}$

風圧力に対する曲げ

$f_{bx} = 2.0 \times Kz \times Fb / 3 = 9.79$, $f_{by} = 2.0 \times Fb / 3 = 14.40$, $f_s = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

風圧力 $w = Q \times C \times l = 937.3 \times 1.00 \times 1.38 = 1288.8 \text{ (N/m)}$

$Q = 1065.9 \text{ (N)}$ $M_s = 440.7 \text{ (N·m)}$

$M_{max} / (Zx \times f_{bx}) + M_s / (Zy \times f_{by}) = 84264.5 / (699.52 \times 979.20) + 44073.7 / (113.11 \times 1440.00)$
 $= 0.39 \leq 1.0 \text{ OK}$
 $(\alpha \times Q) / (A \times f_s) = (1.5 \times 1065.9) / (178.60 \times 120.00) = 0.07 \leq 1.0 \text{ OK}$
 $\delta = 0.61 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/272 \leq 1/150 \text{ OK}$

まぐさ端部の接合

釘：CN90 木口打ち，一面せん断力値 = 400.0 (N)

必要釘本数 $n = Q / (2 \times \text{一面せん断力値} \times (2 / 3)) = 2 \text{ (本)}$

まぐさ受け

S-P-F 2級 204 (3.8 × 8.9 (cm)), $L_k = 2.03 \text{ (m)}$

下枠 S-P-F 2級

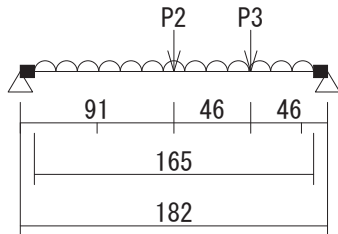
$A = 33.82 \text{ (cm}^2\text{)}$ $Z = 50.17 \text{ (cm}^3\text{)}$, $i = 2.57 \text{ (cm)}$, $\lambda = 78.72$, 座屈係数 $\omega = 1.95$
 $F_c = 17.40 \text{ (N/mm}^2\text{)}$, $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_{cv} = 6.00 \text{ (N/mm}^2\text{)}$
 $K_z(\text{曲げ}) = 1.00$ $K_z(\text{圧縮}) = 1.00$

長期 $N = 1702.14 \text{ (N)}$, $f_c = 1.1 \times K_z \times F_c / 3 = 6.38 \text{ (N/mm}^2\text{)}$, $f_{cv} = 1.1 \times F_{cv} / 3 = 2.20 \text{ (N/mm}^2\text{)}$
 $(\omega \times N) / (A \times f_c) = 0.15 \leq 1.0 \text{ OK}$
 $N / (A \times f_{cv}) = 0.23 \leq 1.0 \text{ OK}$

短期 $N = 8818.82 \text{ (N)}$, $f_c = 2.0 \times K_z \times F_c / 3 = 11.60 \text{ (N/mm}^2\text{)}$, $f_{cv} = 2.0 \times F_{cv} / 3 = 4.00 \text{ (N/mm}^2\text{)}$
 $(\omega \times N) / (A \times f_c) = 0.44 \leq 1.0 \text{ OK}$
 $N / (A \times f_{cv}) = 0.65 \leq 1.0 \text{ OK}$

積雪時 $N = 1755.10 \text{ (N)}$, $f_c = 0.8 \times 2.0 \times K_z \times F_c / 3 = 9.28 \text{ (N/mm}^2\text{)}$, $f_{cv} = 0.8 \times 2.0 \times F_{cv} / 3 = 3.20 \text{ (N/mm}^2\text{)}$
 $(\omega \times N) / (A \times f_c) = 0.11 \leq 1.0 \text{ OK}$
 $N / (A \times f_{cv}) = 0.16 \leq 1.0 \text{ OK}$

階、位置： 1階まぐさ X4.5通り Y0 - Y2



S-P-F 2級 2 - 206 (3.8 × 14.0 (cm))
 A = 106.40 (cm²), Kz = 0.84
 Zx = 248.27 (cm³), Zy = 67.39 (cm³)
 Ix = 1737.87 (cm⁴), Iy = 128.03 (cm⁴)
 Fb = 21.60 (N/mm²), Fs = 1.80 (N/mm²)
 許容せん断割増係数 1.00
 E = 9600.0 (N/mm²)

$\omega = 2000 \times 0.683 = 1365$ (N/m) → 13.65 (N/cm) (長期)
 $\omega = 2000 \times 0.683 = 1365$ (N/m) → 13.65 (N/cm) (短期)
 $\omega = 2000 \times 0.683 = 1365$ (N/m) → 13.65 (N/cm) (積雪時)
 $\omega = 1300 \times 0.683 = 887$ (N/m) → 8.87 (N/cm) (長期たわみ)
 $\omega_b = 400 \times 1.38 = 550.00$ (N/m) → 5.50 (N/cm) (長期, 短期, 積雪時)
 P2 = 331.24 (長期) 331.24 (短期) 331.24 (積雪時) 186.32 (長期たわみ) (N)
 P3 = 928.16 (長期) 928.16 (短期) 928.16 (積雪時) 615.23 (長期たわみ) (N)

長期 fb=1.1 × Kz × Fb / 3 = 6.65, fs=1.1 × 1.00 × Fs / 3 = 0.66 (N/mm²)

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	δ' × 2.0 (cm)
ω	46678	1128.9	1128.9	0.080	0.104
ωb	18808	454.9	454.9	0.032	0.064
P2	13697	165.6	165.6	0.019	0.021
P3	26762	208.8	719.4	0.034	0.045
Total	105945	1958.1	2468.7	0.164	0.234

Mmax / (Zx × fb) = 105944.9 / (248.27 × 665.28) = 0.64 ≤ 1.0 OK
 (α × Qmax) / (A × fs) = (1.50 × 2468.73) / (106.40 × 66.00) = 0.53 ≤ 1.0 OK
 δ = 0.164 (cm) ≤ 1.00 OK
 = 1/1007 ≤ 1/300 OK
 δ' × 2.0 = 0.234 (cm) = 1/708 ≤ 1/250 OK

短期 fb=2.0 × Kz × Fb / 3 = 12.10, fs=2.0 × 1.00 × Fs / 3 = 1.20 (N/mm²)

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	46678	1128.9	1128.9	0.080
ωb	18808	454.9	454.9	0.032
P2	13697	165.6	165.6	0.019
P3	26762	208.8	719.4	0.034
Total	105945	1958.1	2468.7	0.164

Mmax / (Zx × fb) = 105944.9 / (248.27 × 1209.60) = 0.35 ≤ 1.0 OK
 (α × Qmax) / (A × fs) = (1.50 × 2468.73) / (106.40 × 120.00) = 0.29 ≤ 1.0 OK
 δ = 0.164 (cm) ≤ 2.00 OK
 = 1/1007 ≤ 1/150 OK

積雪時 fb=0.8 × 2.0 × Kz × Fb / 3 = 9.68, fs=0.8 × 2.0 × 1.00 × Fs / 3 = 0.96 (N/mm²)

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	46678	1128.9	1128.9	0.080
ωb	18808	454.9	454.9	0.032
P2	13697	165.6	165.6	0.019
P3	26762	208.8	719.4	0.034
Total	105945	1958.1	2468.7	0.164

Mmax / (Zx × fb) = 105944.9 / (248.27 × 967.68) = 0.44 ≤ 1.0 OK
 (α × Qmax) / (A × fs) = (1.50 × 2468.73) / (106.40 × 96.00) = 0.36 ≤ 1.0 OK
 δ = 0.164 (cm) ≤ 2.00 OK
 = 1/1007 ≤ 1/150 OK

まぐさ受け

S-P-F 2級 204 (3.8 × 8.9 (cm)), Lk = 2.20 (m)

下枠 S-P-F 2級

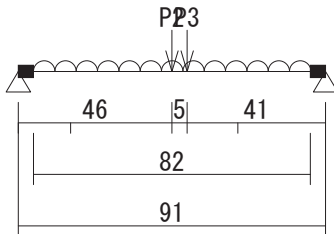
A = 33.82 (cm²) Z = 50.17 (cm³), i = 2.57 (cm), λ = 85.37, 座屈係数 ω = 2.24
 Fc = 17.40 (N/mm²), Fb = 21.60 (N/mm²), Fcv = 6.00 (N/mm²)
 Kz (曲げ) = 1.00 Kz (圧縮) = 1.00

長期 N = 2468.73 (N), fc=1.1 × Kz × Fc / 3 = 6.38 (N/mm²), fcv=1.1 × Fcv / 3 = 2.20 (N/mm²)
 (ω × N) / (A × fc) = 0.26 ≤ 1.0 OK
 N / (A × fcv) = 0.33 ≤ 1.0 OK

短期 N = 2468.73 (N), fc=2.0 × Kz × Fc / 3 = 11.60 (N/mm²), fcv=2.0 × Fcv / 3 = 4.00 (N/mm²)
 (ω × N) / (A × fc) = 0.14 ≤ 1.0 OK
 N / (A × fcv) = 0.18 ≤ 1.0 OK

積雪時 N = 2468.73 (N), fc=0.8 × 2.0 × Kz × Fc / 3 = 9.28 (N/mm²), fcv=0.8 × 2.0 × Fcv / 3 = 3.20 (N/mm²)
 (ω × N) / (A × fc) = 0.18 ≤ 1.0 OK
 N / (A × fcv) = 0.23 ≤ 1.0 OK

階、位置： 1階まぐさ X4.5通り Y2 - Y3



S-P-F 2級 2 - 206 (3.8 × 14.0 (cm))
 $A = 106.40 \text{ (cm}^2\text{)}$, $Kz = 0.84$
 $Zx = 248.27 \text{ (cm}^3\text{)}$, $Zy = 67.39 \text{ (cm}^3\text{)}$
 $Ix = 1737.87 \text{ (cm}^4\text{)}$, $Iy = 128.03 \text{ (cm}^4\text{)}$
 $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fs = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)}$ (長期たわみ)
 $\omega_b = 400 \times 0.92 = 366.67 \text{ (N/m)} \rightarrow 3.67 \text{ (N/cm)}$ (長期, 短期, 積雪時)
 $P2 = 409.50$ (長期) 409.50 (短期) 409.50 (積雪時) 266.18 (長期たわみ) (N)
 $P3 = 1276.82$ (長期) 1276.82 (短期) 1684.74 (積雪時) 1276.82 (長期たわみ) (N)

長期 $fb = 1.1 \times Kz \times Fb / 3 = 6.65$, $fs = 1.1 \times 1.00 \times Fs / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	7649	373.1	373.1	0.003	0.004
ω_b	3082	150.3	150.3	0.001	0.003
P2	8395	204.8	204.8	0.003	0.004
P3	25860	568.3	708.5	0.009	0.017
Total	44985	1296.5	1436.7	0.016	0.028

$M_{max} / (Zx \times fb) = 44984.7 / (248.27 \times 665.28) = 0.27 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 1436.67) / (106.40 \times 66.00) = 0.31 \leq 1.0 \text{ OK}$
 $\delta = 0.016 \text{ (cm)} \leq 1.00 \text{ OK}$
 $= 1/5133 \leq 1/300 \text{ OK}$
 $\delta' \times 2.0 = 0.028 \text{ (cm)} = 1/2957 \leq 1/250 \text{ OK}$

短期 $fb = 2.0 \times Kz \times Fb / 3 = 12.10$, $fs = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	7649	373.1	373.1	0.003
ω_b	3082	150.3	150.3	0.001
P2	8395	204.8	204.8	0.003
P3	25860	568.3	708.5	0.009
Total	44985	1296.5	1436.7	0.016

$M_{max} / (Zx \times fb) = 44984.7 / (248.27 \times 1209.60) = 0.15 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 1436.67) / (106.40 \times 120.00) = 0.17 \leq 1.0 \text{ OK}$
 $\delta = 0.016 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/5133 \leq 1/150 \text{ OK}$

積雪時 $fb = 0.8 \times 2.0 \times Kz \times Fb / 3 = 9.68$, $fs = 0.8 \times 2.0 \times 1.00 \times Fs / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	7649	373.1	373.1	0.003
ω_b	3082	150.3	150.3	0.001
P2	8395	204.8	204.8	0.003
P3	34121	749.9	934.8	0.011
Total	53246	1478.1	1663.0	0.019

$M_{max} / (Zx \times fb) = 53246.2 / (248.27 \times 967.68) = 0.22 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 1663.01) / (106.40 \times 96.00) = 0.24 \leq 1.0 \text{ OK}$
 $\delta = 0.019 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/4376 \leq 1/150 \text{ OK}$

まぐさ受け

S-P-F 2級 204 (3.8 × 8.9 (cm)), $Lk = 2.20 \text{ (m)}$

下枠 S-P-F 2級

$A = 33.82 \text{ (cm}^2\text{)}$, $Z = 50.17 \text{ (cm}^3\text{)}$, $i = 2.57 \text{ (cm)}$, $\lambda = 85.37$, 座屈係数 $\omega = 2.24$
 $Fc = 17.40 \text{ (N/mm}^2\text{)}$, $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fcv = 6.00 \text{ (N/mm}^2\text{)}$
 Kz (曲げ) = 1.00 Kz (圧縮) = 1.00

長期 $N = 1436.67 \text{ (N)}$, $fc = 1.1 \times Kz \times Fc / 3 = 6.38 \text{ (N/mm}^2\text{)}$, $fcv = 1.1 \times Fcv / 3 = 2.20 \text{ (N/mm}^2\text{)}$

$(\omega \times N) / (A \times fc) = 0.15 \leq 1.0 \text{ OK}$

$N / (A \times fcv) = 0.19 \leq 1.0 \text{ OK}$

短期 $N = 1436.67 \text{ (N)}$, $fc = 2.0 \times Kz \times Fc / 3 = 11.60 \text{ (N/mm}^2\text{)}$, $fcv = 2.0 \times Fcv / 3 = 4.00 \text{ (N/mm}^2\text{)}$

$(\omega \times N) / (A \times fc) = 0.08 \leq 1.0 \text{ OK}$

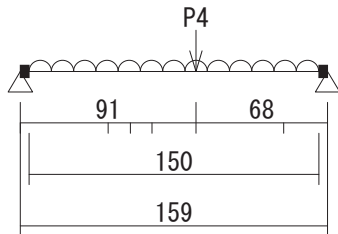
$N / (A \times fcv) = 0.11 \leq 1.0 \text{ OK}$

積雪時 $N = 1663.01 \text{ (N)}$, $fc = 0.8 \times 2.0 \times Kz \times Fc / 3 = 9.28 \text{ (N/mm}^2\text{)}$, $fcv = 0.8 \times 2.0 \times Fcv / 3 = 3.20 \text{ (N/mm}^2\text{)}$

$(\omega \times N) / (A \times fc) = 0.12 \leq 1.0 \text{ OK}$

$N / (A \times fcv) = 0.15 \leq 1.0 \text{ OK}$

階、位置： 1階まぐさ X4.5通り Y3 - Y4.7



S-P-F 2級 2 - 210 (3.8 × 23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}$, $Kz = 0.68$
 $Zx = 699.52 \text{ (cm}^3\text{)}$, $Zy = 113.11 \text{ (cm}^3\text{)}$
 $Ix = 8219.32 \text{ (cm}^4\text{)}$, $Iy = 214.92 \text{ (cm}^4\text{)}$
 $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fs = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)}$ (長期たわみ)
 $\omega b = 400 \times 1.38 = 550.00 \text{ (N/m)} \rightarrow 5.50 \text{ (N/cm)}$ (長期, 短期, 積雪時)
 $\omega 1 (Y4 - b) = 191.25$ (長期) 191.25 (短期) 191.25 (積雪時) 191.25 (長期たわみ) (N)
 $P4 = 7124.63$ (長期) 7124.63 (短期) 8949.72 (積雪時) 6075.57 (長期たわみ) (N)

長期 $fb = 1.1 \times Kz \times Fb / 3 = 5.39$, $fs = 1.1 \times 1.00 \times Fs / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	25679	683.6	683.6	0.008	0.010
ωb	15520	413.2	413.2	0.005	0.009
$\omega 1$	4803	40.6	150.7	0.001	0.002
P4	261483	3022.9	4101.7	0.062	0.106
Total	307486	4160.3	5349.2	0.075	0.127

$M_{max} / (Zx \times fb) = 307485.5 / (699.52 \times 538.56) = 0.82 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 5349.20) / (178.60 \times 66.00) = 0.68 \leq 1.0 \text{ OK}$
 $\delta = 0.075 \text{ (cm)} \leq 1.00 \text{ OK}$
 $= 1/1998 \leq 1/300 \text{ OK}$
 $\delta' \times 2.0 = 0.127 \text{ (cm)} = 1/1184 \leq 1/250 \text{ OK}$

短期 $fb = 2.0 \times Kz \times Fb / 3 = 9.79$, $fs = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	25679	683.6	683.6	0.008
ωb	15520	413.2	413.2	0.005
$\omega 1$	4803	40.6	150.7	0.001
P4	261483	3022.9	4101.7	0.062
Total	307486	4160.3	5349.2	0.075

$M_{max} / (Zx \times fb) = 307485.5 / (699.52 \times 979.20) = 0.45 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 5349.20) / (178.60 \times 120.00) = 0.37 \leq 1.0 \text{ OK}$
 $\delta = 0.075 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1998 \leq 1/150 \text{ OK}$

積雪時 $fb = 0.8 \times 2.0 \times Kz \times Fb / 3 = 7.83$, $fs = 0.8 \times 2.0 \times 1.00 \times Fs / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	25679	683.6	683.6	0.008
ωb	15520	413.2	413.2	0.005
$\omega 1$	4803	40.6	150.7	0.001
P4	328467	3797.3	5152.4	0.078
Total	374469	4934.7	6399.9	0.091

$M_{max} / (Zx \times fb) = 374469.1 / (699.52 \times 783.36) = 0.68 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 6399.92) / (178.60 \times 96.00) = 0.56 \leq 1.0 \text{ OK}$
 $\delta = 0.091 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1650 \leq 1/150 \text{ OK}$

まぐさ受け

S-P-F 2級 204 (3.8 × 8.9 (cm)), $Lk = 2.03 \text{ (m)}$

下枠 S-P-F 2級

$A = 33.82 \text{ (cm}^2\text{)}$, $Z = 50.17 \text{ (cm}^3\text{)}$, $i = 2.57 \text{ (cm)}$, $\lambda = 78.72$, 座屈係数 $\omega = 1.95$
 $Fc = 17.40 \text{ (N/mm}^2\text{)}$, $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fcv = 6.00 \text{ (N/mm}^2\text{)}$
 Kz (曲げ) = 1.00 Kz (圧縮) = 1.00

長期 $N = 5349.20 \text{ (N)}$, $fc = 1.1 \times Kz \times Fc / 3 = 6.38 \text{ (N/mm}^2\text{)}$, $fcv = 1.1 \times Fcv / 3 = 2.20 \text{ (N/mm}^2\text{)}$

$(\omega \times N) / (A \times fc) = 0.48 \leq 1.0 \text{ OK}$
 $N / (A \times fcv) = 0.72 \leq 1.0 \text{ OK}$

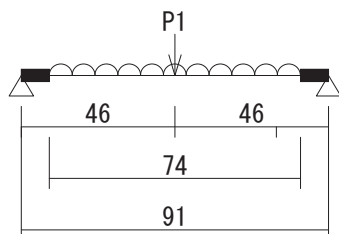
短期 $N = 5349.20 \text{ (N)}$, $fc = 2.0 \times Kz \times Fc / 3 = 11.60 \text{ (N/mm}^2\text{)}$, $fcv = 2.0 \times Fcv / 3 = 4.00 \text{ (N/mm}^2\text{)}$

$(\omega \times N) / (A \times fc) = 0.27 \leq 1.0 \text{ OK}$
 $N / (A \times fcv) = 0.40 \leq 1.0 \text{ OK}$

積雪時 $N = 6399.92 \text{ (N)}$, $fc = 0.8 \times 2.0 \times Kz \times Fc / 3 = 9.28 \text{ (N/mm}^2\text{)}$, $fcv = 0.8 \times 2.0 \times Fcv / 3 = 3.20 \text{ (N/mm}^2\text{)}$

$(\omega \times N) / (A \times fc) = 0.40 \leq 1.0 \text{ OK}$
 $N / (A \times fcv) = 0.59 \leq 1.0 \text{ OK}$

階、位置： 1階まぐさ X5.5通り Y1 - Y2



S-P-F 2級 2 - 204 (3.8×8.9 (cm))
 $A = 67.64 \text{ (cm}^2\text{)}$, $Kz = 1.00$
 $Zx = 100.33 \text{ (cm}^3\text{)}$, $Zy = 42.84 \text{ (cm}^3\text{)}$
 $Ix = 446.48 \text{ (cm}^4\text{)}$, $Iy = 81.39 \text{ (cm}^4\text{)}$
 $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fs = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.455 + 1600 \times 0.228 = 1274 \text{ (N/m)} \rightarrow 12.74 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.455 + 1600 \times 0.228 = 1274 \text{ (N/m)} \rightarrow 12.74 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.455 + 1600 \times 0.228 = 1274 \text{ (N/m)} \rightarrow 12.74 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.455 + 900 \times 0.228 = 796 \text{ (N/m)} \rightarrow 7.96 \text{ (N/cm)}$ (長期たわみ)
 $\omega b = 400 \times 1.38 = 550.00 \text{ (N/m)} \rightarrow 5.50 \text{ (N/cm)}$ (長期, 短期, 積雪時)
 $\omega l (a - b) = 455.00$ (長期) 455.00 (短期) 455.00 (積雪時) 455.00 (長期たわみ) (N)
 $P1 = 622.12$ (長期) 622.12 (短期) 622.12 (積雪時) 428.64 (長期たわみ) (N)

長期 $fb = 1.1 \times Kz \times Fb / 3 = 7.92$, $fs = 1.1 \times 1.00 \times Fs / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	8815	473.9	473.9	0.012	0.015
ωb	3806	204.6	204.6	0.005	0.010
ωl	4232	227.5	227.5	0.006	0.011
P1	11572	311.1	311.1	0.012	0.017
Total	28424	1217.1	1217.1	0.035	0.054

$M_{max} / (Zx \times fb) = 28423.6 / (100.33 \times 792.00) = 0.36 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 1217.09) / (67.64 \times 66.00) = 0.41 \leq 1.0 \text{ OK}$
 $\delta = 0.035 \text{ (cm)} \leq 1.00 \text{ OK}$
 $= 1/2118 \leq 1/300 \text{ OK}$
 $\delta' \times 2.0 = 0.054 \text{ (cm)} = 1/1388 \leq 1/250 \text{ OK}$

短期 $fb = 2.0 \times Kz \times Fb / 3 = 14.40$, $fs = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	8815	473.9	473.9	0.012
ωb	3806	204.6	204.6	0.005
ωl	4232	227.5	227.5	0.006
P1	11572	311.1	311.1	0.012
Total	28424	1217.1	1217.1	0.035

$M_{max} / (Zx \times fb) = 28423.6 / (100.33 \times 1440.00) = 0.20 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 1217.09) / (67.64 \times 120.00) = 0.22 \leq 1.0 \text{ OK}$
 $\delta = 0.035 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/2118 \leq 1/150 \text{ OK}$

積雪時 $fb = 0.8 \times 2.0 \times Kz \times Fb / 3 = 11.52$, $fs = 0.8 \times 2.0 \times 1.00 \times Fs / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	8815	473.9	473.9	0.012
ωb	3806	204.6	204.6	0.005
ωl	4232	227.5	227.5	0.006
P1	11572	311.1	311.1	0.012
Total	28424	1217.1	1217.1	0.035

$M_{max} / (Zx \times fb) = 28423.6 / (100.33 \times 1152.00) = 0.25 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 1217.09) / (67.64 \times 96.00) = 0.28 \leq 1.0 \text{ OK}$
 $\delta = 0.035 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/2118 \leq 1/150 \text{ OK}$

まぐさ受け

S-P-F 2級 204 (3.8×8.9 (cm)), $Lk = 2.03 \text{ (m)}$

下枠 S-P-F 2級

$A = 33.82 \text{ (cm}^2\text{)}$, $Z = 50.17 \text{ (cm}^3\text{)}$, $i = 2.57 \text{ (cm)}$, $\lambda = 78.72$, 座屈係数 $\omega = 1.95$

$Fc = 17.40 \text{ (N/mm}^2\text{)}$, $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fcv = 6.00 \text{ (N/mm}^2\text{)}$

Kz (曲げ) = 1.00 Kz (圧縮) = 1.00

長期 $N = 1217.09 \text{ (N)}$, $fc = 1.1 \times Kz \times Fc / 3 = 6.38 \text{ (N/mm}^2\text{)}$, $fcv = 1.1 \times Fcv / 3 = 2.20 \text{ (N/mm}^2\text{)}$

$(\omega \times N) / (A \times fc) = 0.11 \leq 1.0 \text{ OK}$

$N / (A \times fcv) = 0.16 \leq 1.0 \text{ OK}$

短期 $N = 1217.09 \text{ (N)}$, $fc = 2.0 \times Kz \times Fc / 3 = 11.60 \text{ (N/mm}^2\text{)}$, $fcv = 2.0 \times Fcv / 3 = 4.00 \text{ (N/mm}^2\text{)}$

$(\omega \times N) / (A \times fc) = 0.06 \leq 1.0 \text{ OK}$

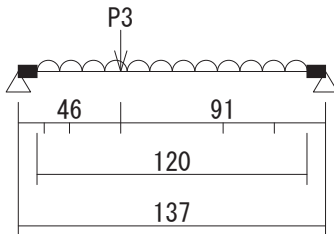
$N / (A \times fcv) = 0.09 \leq 1.0 \text{ OK}$

積雪時 $N = 1217.09 \text{ (N)}$, $fc = 0.8 \times 2.0 \times Kz \times Fc / 3 = 9.28 \text{ (N/mm}^2\text{)}$, $fcv = 0.8 \times 2.0 \times Fcv / 3 = 3.20 \text{ (N/mm}^2\text{)}$

$(\omega \times N) / (A \times fc) = 0.08 \leq 1.0 \text{ OK}$

$N / (A \times fcv) = 0.11 \leq 1.0 \text{ OK}$

階、位置： 1階まぐさ X5.5通り Y3.5 - Y5



S-P-F 2級 2 - 206 (3.8 × 14.0 (cm))
 $A = 106.40 \text{ (cm}^2\text{)}$, $Kz = 0.84$
 $Zx = 248.27 \text{ (cm}^3\text{)}$, $Zy = 67.39 \text{ (cm}^3\text{)}$
 $Ix = 1737.87 \text{ (cm}^4\text{)}$, $Iy = 128.03 \text{ (cm}^4\text{)}$
 $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fs = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)}$ (長期たわみ)
 $\omega_b = 400 \times 1.38 = 550.00 \text{ (N/m)} \rightarrow 5.50 \text{ (N/cm)}$ (長期, 短期, 積雪時)
 $\omega_1 (a - Y4) = 372.00$ (長期) 372.00 (短期) 372.00 (積雪時) 372.00 (長期たわみ) (N)
 $P3 = 559.50$ (長期) 559.50 (短期) 559.50 (積雪時) 416.18 (長期たわみ) (N)

長期 $f_b = 1.1 \times Kz \times Fb / 3 = 6.65$, $f_s = 1.1 \times 1.00 \times Fs / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	16353	545.5	545.5	0.015	0.019
ω_b	9884	329.7	329.7	0.009	0.018
ω_1	5846	314.3	57.7	0.004	0.007
P3	14356	385.9	173.6	0.010	0.015
Total	46438	1575.5	1106.6	0.037	0.059

$M_{max} / (Zx \times f_b) = 46437.9 / (248.27 \times 665.28) = 0.28 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 1575.47) / (106.40 \times 66.00) = 0.34 \leq 1.0 \text{ OK}$
 $\delta = 0.037 \text{ (cm)} \leq 1.00 \text{ OK}$
 $= 1/3230 \leq 1/300 \text{ OK}$
 $\delta' \times 2.0 = 0.059 \text{ (cm)} = 1/2036 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times Kz \times Fb / 3 = 12.10$, $f_s = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	16353	545.5	545.5	0.015
ω_b	9884	329.7	329.7	0.009
ω_1	5846	314.3	57.7	0.004
P3	14356	385.9	173.6	0.010
Total	46438	1575.5	1106.6	0.037

$M_{max} / (Zx \times f_b) = 46437.9 / (248.27 \times 1209.60) = 0.15 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 1575.47) / (106.40 \times 120.00) = 0.19 \leq 1.0 \text{ OK}$
 $\delta = 0.037 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/3230 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times Kz \times Fb / 3 = 9.68$, $f_s = 0.8 \times 2.0 \times 1.00 \times Fs / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	16353	545.5	545.5	0.015
ω_b	9884	329.7	329.7	0.009
ω_1	5846	314.3	57.7	0.004
P3	14356	385.9	173.6	0.010
Total	46438	1575.5	1106.6	0.037

$M_{max} / (Zx \times f_b) = 46437.9 / (248.27 \times 967.68) = 0.19 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 1575.47) / (106.40 \times 96.00) = 0.23 \leq 1.0 \text{ OK}$
 $\delta = 0.037 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/3230 \leq 1/150 \text{ OK}$

まぐさ受け

S-P-F 2級 204 (3.8 × 8.9 (cm)), $L_k = 2.03 \text{ (m)}$

下枠 S-P-F 2級

$A = 33.82 \text{ (cm}^2\text{)}$, $Z = 50.17 \text{ (cm}^3\text{)}$, $i = 2.57 \text{ (cm)}$, $\lambda = 78.72$, 座屈係数 $\omega = 1.95$

$F_c = 17.40 \text{ (N/mm}^2\text{)}$, $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_{cv} = 6.00 \text{ (N/mm}^2\text{)}$

K_z (曲げ) = 1.00 K_z (圧縮) = 1.00

長期 $N = 1575.47 \text{ (N)}$, $f_c = 1.1 \times K_z \times F_c / 3 = 6.38 \text{ (N/mm}^2\text{)}$, $f_{cv} = 1.1 \times F_{cv} / 3 = 2.20 \text{ (N/mm}^2\text{)}$

$(\omega \times N) / (A \times f_c) = 0.14 \leq 1.0 \text{ OK}$

$N / (A \times f_{cv}) = 0.21 \leq 1.0 \text{ OK}$

短期 $N = 1575.47 \text{ (N)}$, $f_c = 2.0 \times K_z \times F_c / 3 = 11.60 \text{ (N/mm}^2\text{)}$, $f_{cv} = 2.0 \times F_{cv} / 3 = 4.00 \text{ (N/mm}^2\text{)}$

$(\omega \times N) / (A \times f_c) = 0.08 \leq 1.0 \text{ OK}$

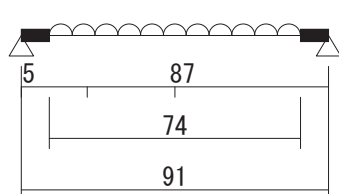
$N / (A \times f_{cv}) = 0.12 \leq 1.0 \text{ OK}$

積雪時 $N = 1575.47 \text{ (N)}$, $f_c = 0.8 \times 2.0 \times K_z \times F_c / 3 = 9.28 \text{ (N/mm}^2\text{)}$, $f_{cv} = 0.8 \times 2.0 \times F_{cv} / 3 = 3.20 \text{ (N/mm}^2\text{)}$

$(\omega \times N) / (A \times f_c) = 0.10 \leq 1.0 \text{ OK}$

$N / (A \times f_{cv}) = 0.15 \leq 1.0 \text{ OK}$

階、位置： 1階まぐさ X6.5通り Y2.5 - Y3.5



S-P-F 2級 2 - 206 (3.8 × 14.0 (cm))
 $A = 106.40 \text{ (cm}^2\text{)}$, $Kz = 0.84$
 $Zx = 248.27 \text{ (cm}^3\text{)}$, $Zy = 67.39 \text{ (cm}^3\text{)}$
 $Ix = 1737.87 \text{ (cm}^4\text{)}$, $Iy = 128.03 \text{ (cm}^4\text{)}$
 $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fs = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 300 \times 0.455 = 137 \text{ (N/m)} \rightarrow 1.37 \text{ (N/cm)}$ (長期)
 $\omega = 300 \times 0.455 = 137 \text{ (N/m)} \rightarrow 1.37 \text{ (N/cm)}$ (短期)
 $\omega = 300 \times 0.455 = 137 \text{ (N/m)} \rightarrow 1.37 \text{ (N/cm)}$ (積雪時)
 $\omega b = 600 \times 1.38 = 825.00 \text{ (N/m)} \rightarrow 8.25 \text{ (N/cm)}$ (長期, 短期, 積雪時)
 $\omega 1 (a - b) = 2318.57 \text{ (長期)} 2318.57 \text{ (短期)} 3012.44 \text{ (積雪時)} \text{ (N)}$
 $\omega 2 (a - b) = 1579.84 \text{ (水平力)} \text{ (N)}$

長期 $f_b = 1.1 \times Kz \times Fb / 3 = 6.65$, $f_s = 1.1 \times 1.00 \times Fs / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	944	50.8	50.8	0.000
ωb	5708	306.9	306.9	0.002
$\omega 1$	21563	1159.3	1159.3	0.007
Total	28216	1517.0	1517.0	0.010

$M_{max} / (Zx \times f_b) = 28215.5 / (248.27 \times 665.28) = 0.17 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 1516.97) / (106.40 \times 66.00) = 0.32 \leq 1.0 \text{ OK}$
 $\delta = 0.010 \text{ (cm)} \leq 1.00 \text{ OK}$
 $= 1/7630 \leq 1/300 \text{ OK}$

短期 $f_b = 2.0 \times Kz \times Fb / 3 = 12.10$, $f_s = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	944	50.8	50.8	0.000
ωb	5708	306.9	306.9	0.002
$\omega 1$	21563	1159.3	1159.3	0.007
$\omega 2$	29385	789.9	789.9	0.008
Total	57601	2306.9	2306.9	0.018

$M_{max} / (Zx \times f_b) = 57600.6 / (248.27 \times 1209.60) = 0.19 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 2306.89) / (106.40 \times 120.00) = 0.27 \leq 1.0 \text{ OK}$
 $\delta = 0.018 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/4162 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times Kz \times Fb / 3 = 9.68$, $f_s = 0.8 \times 2.0 \times 1.00 \times Fs / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	944	50.8	50.8	0.000
ωb	5708	306.9	306.9	0.002
$\omega 1$	28016	1506.2	1506.2	0.010
Total	34669	1863.9	1863.9	0.012

$M_{max} / (Zx \times f_b) = 34668.5 / (248.27 \times 967.68) = 0.14 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 1863.90) / (106.40 \times 96.00) = 0.27 \leq 1.0 \text{ OK}$
 $\delta = 0.012 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/6209 \leq 1/150 \text{ OK}$

風圧力に対する曲げ

$f_{bx} = 2.0 \times Kz \times Fb / 3 = 12.10$, $f_{by} = 2.0 \times Fb / 3 = 14.40$, $f_s = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

風圧力 $w = Q \times C \times l = 937.3 \times 1.00 \times 1.38 = 1288.8 \text{ (N/m)}$

$Q = 479.4 \text{ (N)}$ $M_s = 89.2 \text{ (N·m)}$

$M_{max} / (Zx \times f_{bx}) + M_s / (Zy \times f_{by}) = 28215.5 / (248.27 \times 1209.60) + 8917.7 / (67.39 \times 1440.00)$
 $= 0.19 \leq 1.0 \text{ OK}$

$(\alpha \times Q) / (A \times f_s) = (1.5 \times 479.4) / (106.40 \times 120.00) = 0.06 \leq 1.0 \text{ OK}$
 $\delta = 0.04 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1778 \leq 1/150 \text{ OK}$

まぐさ端部の接合

釘：CN90 木口打ち，一面せん断力値 = 400.0 (N)

必要釘本数 $n = Q / (2 \times \text{一面せん断力値} \times (2 / 3)) = 1 \text{ (本)}$

まぐさ受け

S-P-F 2級 204 (3.8 × 8.9 (cm)), $L_k = 1.75 \text{ (m)}$

下枠 S-P-F 2級

$A = 33.82 \text{ (cm}^2\text{)}$, $Z = 50.17 \text{ (cm}^3\text{)}$, $i = 2.57 \text{ (cm)}$, $\lambda = 68.03$, 座屈係数 $\omega = 1.61$

$F_c = 17.40 \text{ (N/mm}^2\text{)}$, $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_{cv} = 6.00 \text{ (N/mm}^2\text{)}$

K_z (曲げ) = 1.00 K_z (圧縮) = 1.00

長期 $N = 1516.97 \text{ (N)}$, $f_c = 1.1 \times K_z \times F_c / 3 = 6.38 \text{ (N/mm}^2\text{)}$, $f_{cv} = 1.1 \times F_{cv} / 3 = 2.20 \text{ (N/mm}^2\text{)}$

$(\omega \times N) / (A \times f_c) = 0.11 \leq 1.0 \text{ OK}$

$N / (A \times f_{cv}) = 0.20 \leq 1.0 \text{ OK}$

短期 $N = 2306.89$ (N), $f_c = 2.0 \times K_z \times F_c / 3 = 11.60$ (N/mm²), $f_{cv} = 2.0 \times F_{cv} / 3 = 4.00$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.09 \leq 1.0 \text{ OK}$$

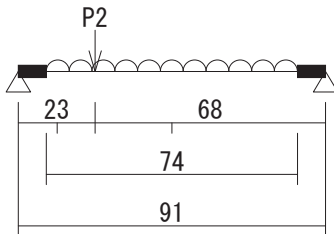
$$N / (A \times f_{cv}) = 0.17 \leq 1.0 \text{ OK}$$

積雪時 $N = 1863.90$ (N), $f_c = 0.8 \times 2.0 \times K_z \times F_c / 3 = 9.28$ (N/mm²), $f_{cv} = 0.8 \times 2.0 \times F_{cv} / 3 = 3.20$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.10 \leq 1.0 \text{ OK}$$

$$N / (A \times f_{cv}) = 0.17 \leq 1.0 \text{ OK}$$

階、位置： 1階まぐさ X6.5通り Y3.5 - Y4.5



S-P-F 2級 2 - 206 (3.8 × 14.0 (cm))
 $A = 106.40 \text{ (cm}^2\text{)}, Kz = 0.84$
 $Zx = 248.27 \text{ (cm}^3\text{)}, Zy = 67.39 \text{ (cm}^3\text{)}$
 $Ix = 1737.87 \text{ (cm}^4\text{)}, Iy = 128.03 \text{ (cm}^4\text{)}$
 $Fb = 21.60 \text{ (N/mm}^2\text{)}, Fs = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.228 = 455 \text{ (N/m)} \rightarrow 4.55 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.228 = 455 \text{ (N/m)} \rightarrow 4.55 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.228 = 455 \text{ (N/m)} \rightarrow 4.55 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.228 = 296 \text{ (N/m)} \rightarrow 2.96 \text{ (N/cm)}$ (長期たわみ)
 $\omega_b = 600 \times 1.38 = 825.00 \text{ (N/m)} \rightarrow 8.25 \text{ (N/cm)}$ (長期, 短期, 積雪時)
 $\omega_1 (a - Y3.7) = 450.31 \text{ (長期)}, 450.31 \text{ (短期)}, 585.08 \text{ (積雪時)}, 450.31 \text{ (長期たわみ)}$ (N)
 $\omega_2 (a - Y3.7) = 306.84 \text{ (水平力)}$ (N)
 $P2 = 5797.00 \text{ (回転力)}$ (N)

長期 $f_b = 1.1 \times Kz \times Fb / 3 = 6.65, f_s = 1.1 \times 1.00 \times Fs / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	3148	169.3	169.3	0.001	0.001
ω_b	5708	306.9	306.9	0.002	0.004
ω_1	2938	406.6	43.7	0.001	0.001
Total	11794	882.7	519.9	0.004	0.007

$M_{max} / (Zx \times f_b) = 11794.2 / (248.27 \times 665.28) = 0.07 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 882.74) / (106.40 \times 66.00) = 0.19 \leq 1.0 \text{ OK}$
 $\delta = 0.004 \text{ (cm)} \leq 1.00 \text{ OK}$
 $= 1/19874 \leq 1/300 \text{ OK}$
 $\delta' \times 2.0 = 0.007 \text{ (cm)} = 1/11062 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times Kz \times Fb / 3 = 12.10, f_s = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	3148	169.3	169.3	0.001
ω_b	5708	306.9	306.9	0.002
ω_1	2938	406.6	43.7	0.001
ω_2	2002	277.0	29.8	0.000
P2	67497	4671.1	1125.9	0.017
Total	81293	5830.9	1675.6	0.021

$M_{max} / (Zx \times f_b) = 81293.2 / (248.27 \times 1209.60) = 0.27 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 5830.89) / (106.40 \times 120.00) = 0.69 \leq 1.0 \text{ OK}$
 $\delta = 0.021 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/3536 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times Kz \times Fb / 3 = 9.68, f_s = 0.8 \times 2.0 \times 1.00 \times Fs / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	3148	169.3	169.3	0.001
ω_b	5708	306.9	306.9	0.002
ω_1	3817	528.3	56.8	0.001
Total	12673	1004.4	533.0	0.004

$M_{max} / (Zx \times f_b) = 12673.3 / (248.27 \times 967.68) = 0.05 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 1004.42) / (106.40 \times 96.00) = 0.15 \leq 1.0 \text{ OK}$
 $\delta = 0.004 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/18845 \leq 1/150 \text{ OK}$

風圧力に対する曲げ

$f_{bx} = 2.0 \times Kz \times Fb / 3 = 12.10, f_{by} = 2.0 \times Fb / 3 = 14.40, f_s = 2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$
 風圧力 $w = Q \times C \times l = 937.3 \times 1.00 \times 1.38 = 1288.8 \text{ (N/m)}$
 $Q = 479.4 \text{ (N)}, Ms = 89.2 \text{ (N·m)}$

$M_{max} / (Zx \times f_{bx}) + Ms / (Zy \times f_{by}) = 11794.2 / (248.27 \times 1209.60) + 8917.7 / (67.39 \times 1440.00)$
 $= 0.13 \leq 1.0 \text{ OK}$
 $(\alpha \times Q) / (A \times f_s) = (1.5 \times 479.4) / (106.40 \times 120.00) = 0.06 \leq 1.0 \text{ OK}$
 $\delta = 0.04 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1778 \leq 1/150 \text{ OK}$

まぐさ端部の接合

釘：CN90 木口打ち，一面せん断力値 = 400.0 (N)
 必要釘本数 $n = Q / (2 \times \text{一面せん断力値} \times (2 / 3)) = 1 \text{ (本)}$

まぐさ受け

S-P-F 2級 204 (3.8 × 8.9 (cm)), $L_k = 1.75 \text{ (m)}$
 下枠 S-P-F 2級
 $A = 33.82 \text{ (cm}^2\text{)}, Z = 50.17 \text{ (cm}^3\text{)}, i = 2.57 \text{ (cm)}, \lambda = 68.03, \text{ 座屈係数 } \omega = 1.61$
 $F_c = 17.40 \text{ (N/mm}^2\text{)}, F_b = 21.60 \text{ (N/mm}^2\text{)}, F_{cv} = 6.00 \text{ (N/mm}^2\text{)}$
 $K_z (\text{曲げ}) = 1.00, K_z (\text{圧縮}) = 1.00$

長期 $N = 882.74$ (N), $f_c = 1.1 \times K_z \times F_c / 3 = 6.38$ (N/mm²), $f_{cv} = 1.1 \times F_{cv} / 3 = 2.20$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.07 \leq 1.0 \text{ OK}$$

$$N / (A \times f_{cv}) = 0.12 \leq 1.0 \text{ OK}$$

短期 $N = 5830.89$ (N), $f_c = 2.0 \times K_z \times F_c / 3 = 11.60$ (N/mm²), $f_{cv} = 2.0 \times F_{cv} / 3 = 4.00$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.24 \leq 1.0 \text{ OK}$$

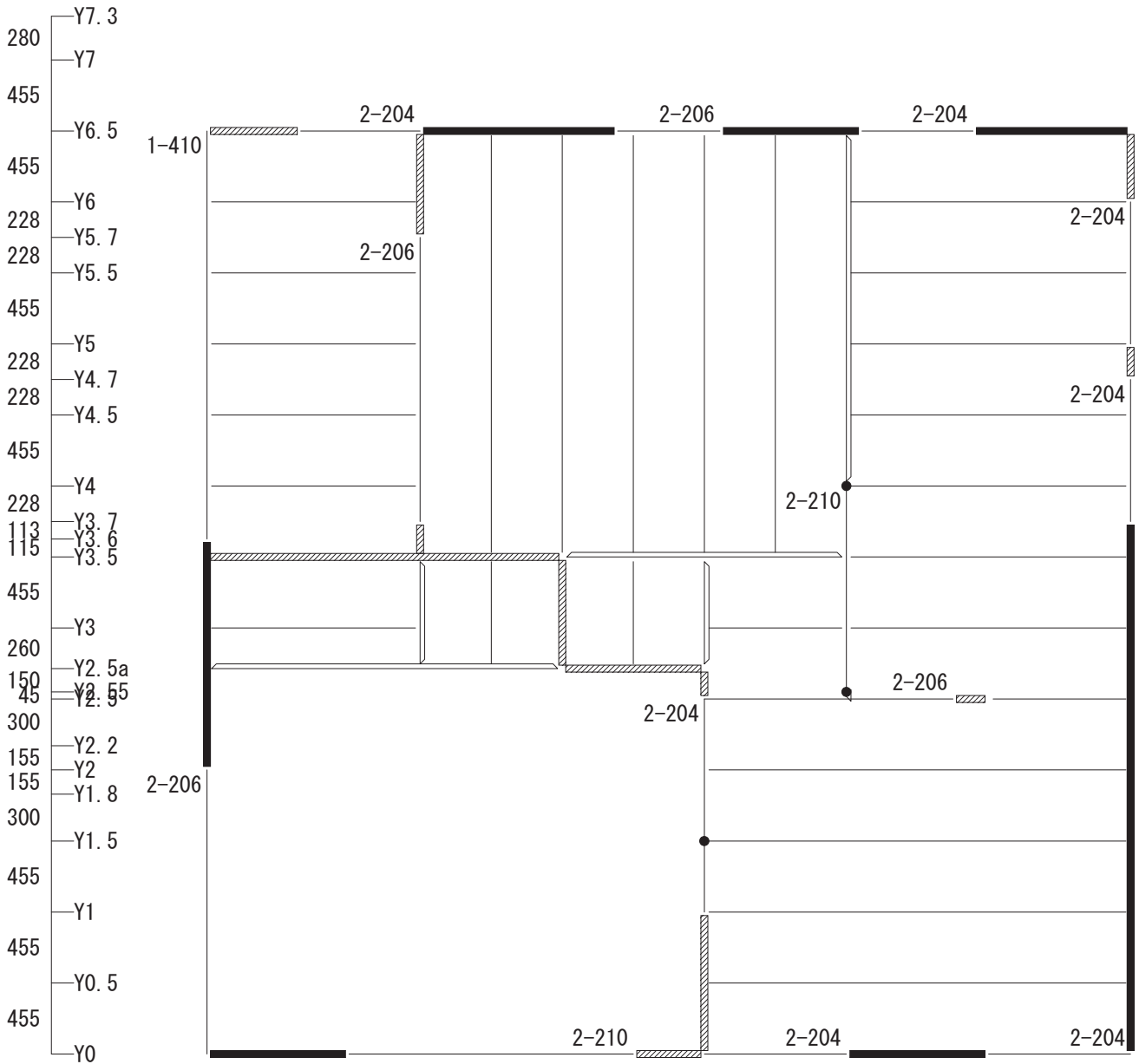
$$N / (A \times f_{cv}) = 0.43 \leq 1.0 \text{ OK}$$

積雪時 $N = 1004.42$ (N), $f_c = 0.8 \times 2.0 \times K_z \times F_c / 3 = 9.28$ (N/mm²), $f_{cv} = 0.8 \times 2.0 \times F_{cv} / 3 = 3.20$ (N/mm²)

$$(\omega \times N) / (A \times f_c) = 0.05 \leq 1.0 \text{ OK}$$

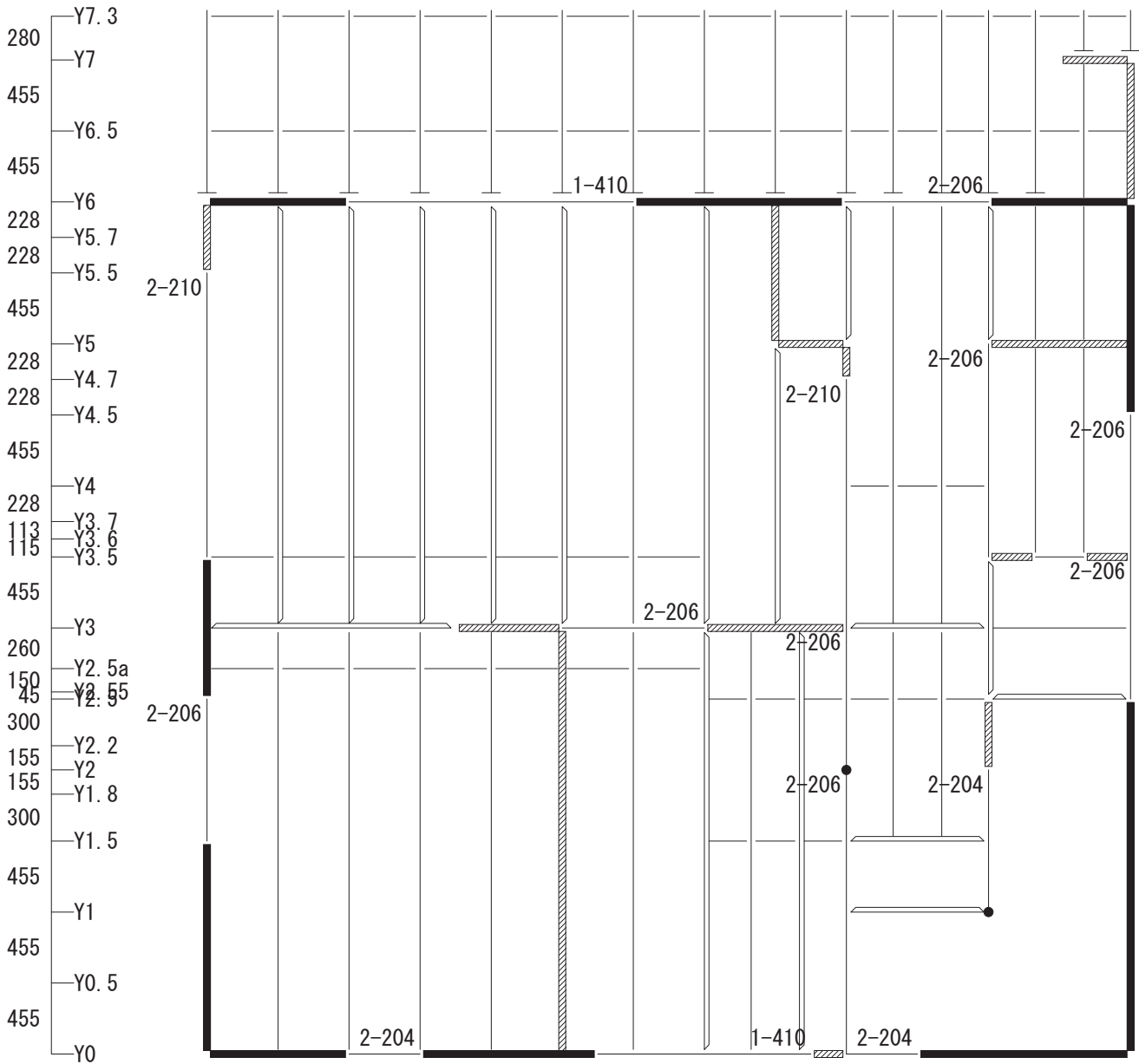
$$N / (A \times f_{cv}) = 0.09 \leq 1.0 \text{ OK}$$

2階まぐさ



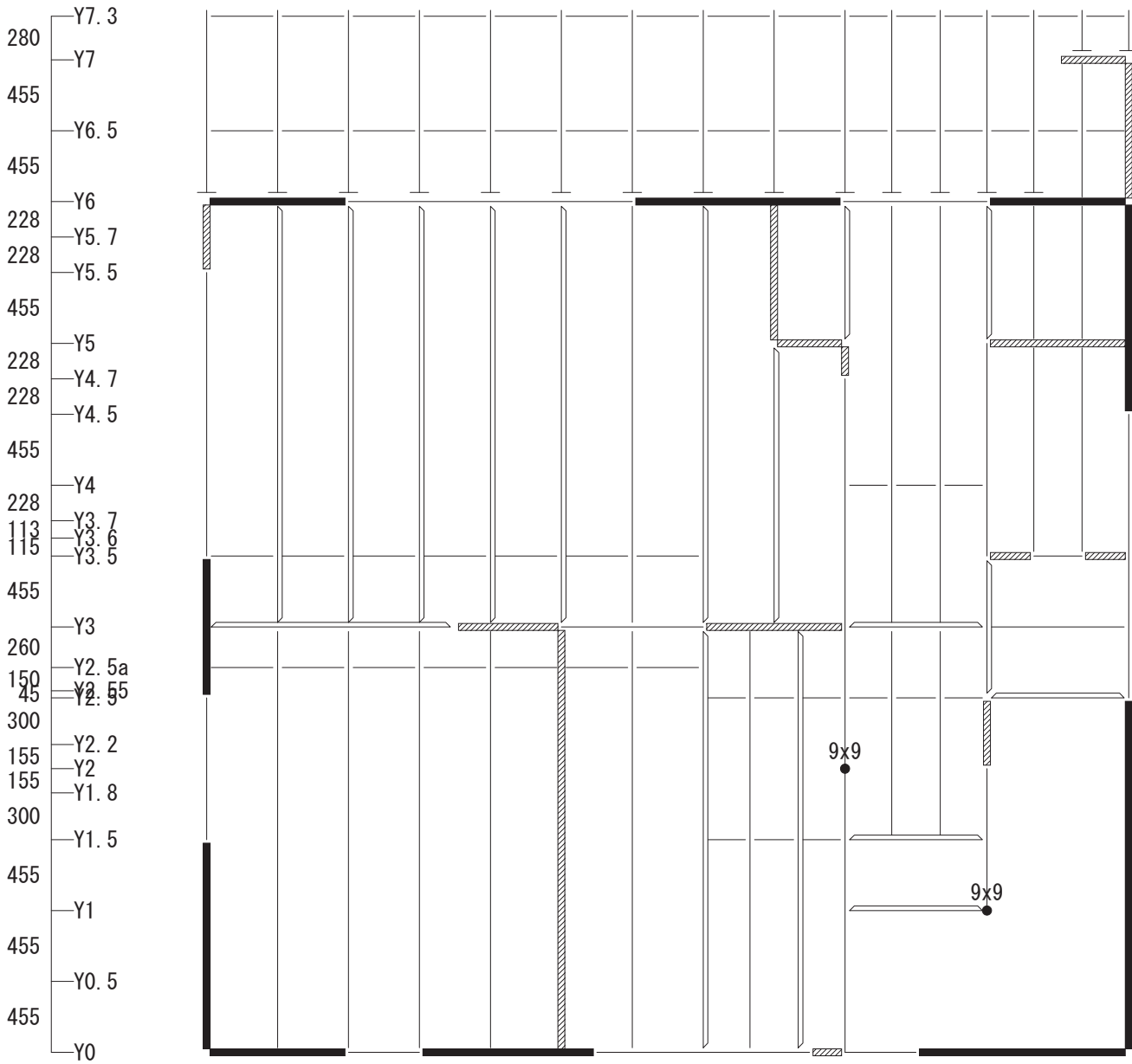
X0	X0.06	X1.5	X1.7	X2.5	X2.7	X3a	X3.5	X3.6	X4.1	X4.5	X4.8	X5.5	X5.8	X6.2	X6.5				
455	83	228	228	455	228	100	228	228	200	155	73	10	200	155	73	100	300	155	300

1階まぐさ



X0	X0.067	X1.51.7	X2.52.2	X3a.33.5	X3.84.1	X4.45.6	X5.55.1	X5.54.5	X5.86.2	X6.5			
455	83228	455	228228	455	228	100	155	73	10200	155	128	155	300

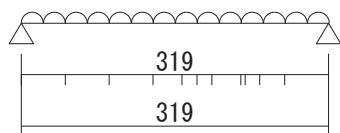
1階柱



X0	X0.6	X1	X1.7	X2	X3a	X3.5	X3.8	X4.1	X4.5	X4.8	X5.1	X5.4	X5.8	X6.2	X6.5					
455	832	455	228	228	455	228	100	228	228	200	155	73	100	200	155	73	100	300	155	300

3.5. 梁の設計

階、位置：屋根梁 X3a通り Y0 - Y3.5



S-P-F 2級 2 - 210 (3.8 × 23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}, K_z = 0.68, K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}, I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}, F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$$\omega_a = 760 \times 2.958 = 2248 \text{ (N/m)} \rightarrow 22.48 \text{ (N/cm)} \text{ (長期)}$$

$$\omega_a = 760 \times 2.958 = 2248 \text{ (N/m)} \rightarrow 22.48 \text{ (N/cm)} \text{ (短期)}$$

$$\omega_a = 1280 \times 2.958 = 3786 \text{ (N/m)} \rightarrow 37.86 \text{ (N/cm)} \text{ (積雪時)}$$

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39, f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω_a	285015	3579.5	3579.5	0.382
Total	285015	3579.5	3579.5	0.382

$$M_{\max} / (Z \times f_b) = 285015 / (699.52 \times 538.56) = 0.76 \leq 1.0 \text{ OK}$$

$$(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 3579.46) / (178.60 \times 66.00) = 0.46 \leq 1.0 \text{ OK}$$

$$\delta = 0.382 \text{ (cm)} \leq 2.00 \text{ OK}$$

$$= 1/834 \leq 1/200 \text{ OK}$$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79, f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω_a	285015	3579.5	3579.5	0.382
Total	285015	3579.5	3579.5	0.382

$$M_{\max} / (Z \times f_b) = 285015 / (699.52 \times 979.20) = 0.42 \leq 1.0 \text{ OK}$$

$$(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 3579.46) / (178.60 \times 120.00) = 0.25 \leq 1.0 \text{ OK}$$

$$\delta = 0.382 \text{ (cm)} \leq 4.00 \text{ OK}$$

$$= 1/834 \leq 1/100 \text{ OK}$$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83, f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω_a	480025	6028.6	6028.6	0.643
Total	480025	6028.6	6028.6	0.643

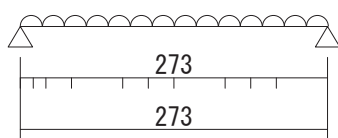
$$M_{\max} / (Z \times f_b) = 480025 / (699.52 \times 783.36) = 0.88 \leq 1.0 \text{ OK}$$

$$(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 6028.57) / (178.60 \times 96.00) = 0.53 \leq 1.0 \text{ OK}$$

$$\delta = 0.643 \text{ (cm)} \leq 4.00 \text{ OK}$$

$$= 1/495 \leq 1/100 \text{ OK}$$

階、位置：屋根梁 X3a通り Y3.5 - Y6.5



S-P-F 2級 2 - 210 (3.8 × 23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}$, $I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$$\omega_a = 760 \times 2.958 = 2248 \text{ (N/m)} \rightarrow 22.48 \text{ (N/cm)} \text{ (長期)}$$

$$\omega_a = 760 \times 2.958 = 2248 \text{ (N/m)} \rightarrow 22.48 \text{ (N/cm)} \text{ (短期)}$$

$$\omega_a = 1280 \times 2.958 = 3786 \text{ (N/m)} \rightarrow 37.86 \text{ (N/cm)} \text{ (積雪時)}$$

$$\text{長期 } f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39, \quad f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω_a	209399	3068.1	3068.1	0.206
Total	209399	3068.1	3068.1	0.206

$$M_{\max} / (Z \times f_b) = 209399 / (699.52 \times 538.56) = 0.56 \leq 1.0 \text{ OK}$$

$$(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 3068.11) / (178.60 \times 66.00) = 0.39 \leq 1.0 \text{ OK}$$

$$\delta = 0.206 \text{ (cm)} \leq 2.00 \text{ OK}$$

$$= 1/1325 \leq 1/200 \text{ OK}$$

$$\text{短期 } f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79, \quad f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω_a	209399	3068.1	3068.1	0.206
Total	209399	3068.1	3068.1	0.206

$$M_{\max} / (Z \times f_b) = 209399 / (699.52 \times 979.20) = 0.31 \leq 1.0 \text{ OK}$$

$$(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 3068.11) / (178.60 \times 120.00) = 0.21 \leq 1.0 \text{ OK}$$

$$\delta = 0.206 \text{ (cm)} \leq 4.00 \text{ OK}$$

$$= 1/1325 \leq 1/100 \text{ OK}$$

$$\text{積雪時 } f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83, \quad f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω_a	352671	5167.3	5167.3	0.347
Total	352671	5167.3	5167.3	0.347

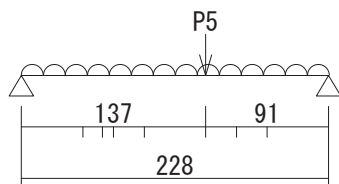
$$M_{\max} / (Z \times f_b) = 352671 / (699.52 \times 783.36) = 0.64 \leq 1.0 \text{ OK}$$

$$(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 5167.34) / (178.60 \times 96.00) = 0.45 \leq 1.0 \text{ OK}$$

$$\delta = 0.347 \text{ (cm)} \leq 4.00 \text{ OK}$$

$$= 1/787 \leq 1/100 \text{ OK}$$

階、位置：小屋梁 Y2.5a通り X0 - X2.5



S-P-F 2級 2 - 210 (3.8×23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}$, $I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.358 = 715 \text{ (N/m)} \rightarrow 7.15 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.358 = 715 \text{ (N/m)} \rightarrow 7.15 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.358 = 715 \text{ (N/m)} \rightarrow 7.15 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.358 = 465 \text{ (N/m)} \rightarrow 4.65 \text{ (N/cm)}$ (長期たわみ)
 $\omega 1 (X0 - X1.5) = 204.75 \text{ (長期)} \quad 204.75 \text{ (短期)} \quad 204.75 \text{ (積雪時)} \quad 204.75 \text{ (長期たわみ)} \text{ (N)}$
 $\omega 2 (X1.5 - X2.5) = 546.00 \text{ (長期)} \quad 546.00 \text{ (短期)} \quad 546.00 \text{ (積雪時)} \quad 546.00 \text{ (長期たわみ)} \text{ (N)}$
 $P5 = 618.60 \text{ (長期)} \quad 618.60 \text{ (短期)} \quad 968.47 \text{ (積雪時)} \quad 618.60 \text{ (長期たわみ)} \text{ (N)}$

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	46257	813.3	813.3	0.032	0.041
$\omega 1$	9782	143.3	61.4	0.005	0.010
$\omega 2$	19874	109.2	436.8	0.010	0.020
P5	33776	247.4	371.2	0.018	0.036
Total	109689	1313.3	1682.7	0.065	0.107

$M_{\max} / (Z \times f_b) = 109689 / (699.52 \times 538.56) = 0.29 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 1682.70) / (178.60 \times 66.00) = 0.21 \leq 1.0 \text{ OK}$
 $\delta = 0.065 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/3512 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.107 \text{ (cm)} = 1/2118 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	46257	813.3	813.3	0.032
$\omega 1$	9782	143.3	61.4	0.005
$\omega 2$	19874	109.2	436.8	0.010
P5	33776	247.4	371.2	0.018
Total	109689	1313.3	1682.7	0.065

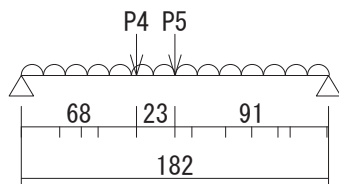
$M_{\max} / (Z \times f_b) = 109689 / (699.52 \times 979.20) = 0.16 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 1682.70) / (178.60 \times 120.00) = 0.12 \leq 1.0 \text{ OK}$
 $\delta = 0.065 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/3512 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	46257	813.3	813.3	0.032
$\omega 1$	9782	143.3	61.4	0.005
$\omega 2$	19874	109.2	436.8	0.010
P5	52879	387.4	581.1	0.029
Total	128792	1453.2	1892.6	0.075

$M_{\max} / (Z \times f_b) = 128792 / (699.52 \times 783.36) = 0.24 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 1892.62) / (178.60 \times 96.00) = 0.17 \leq 1.0 \text{ OK}$
 $\delta = 0.075 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/3030 \leq 1/150 \text{ OK}$

階、位置： 小屋梁 Y3.5通り X2.5 - X4.5



S-P-F 2級 2 - 210 (3.8×23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}$, $I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 1.723 = 3445 \text{ (N/m)} \rightarrow 34.45 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 1.723 = 3445 \text{ (N/m)} \rightarrow 34.45 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 1.723 = 3445 \text{ (N/m)} \rightarrow 34.45 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 1.723 = 2239 \text{ (N/m)} \rightarrow 22.39 \text{ (N/cm)}$ (長期たわみ)
 $\omega 1 (X3a -X4.5) = 597.19 \text{ (長期)} \quad 597.19 \text{ (短期)} \quad 597.19 \text{ (積雪時)} \quad 597.19 \text{ (長期たわみ)} \text{ (N)}$
 $P4 = 2843.34 \text{ (長期)} \quad 2843.34 \text{ (短期)} \quad 4788.78 \text{ (積雪時)} \quad 2843.34 \text{ (長期たわみ)} \text{ (N)}$
 $P5 = 547.11 \text{ (長期)} \quad 547.11 \text{ (短期)} \quad 808.90 \text{ (積雪時)} \quad 547.11 \text{ (長期たわみ)} \text{ (N)}$

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	142640	3135.0	3135.0	0.062	0.081
$\omega 1$	23351	186.6	410.6	0.008	0.016
P4	121286	1777.1	1066.3	0.042	0.083
P5	24894	273.6	273.6	0.009	0.017
Total	312171	5372.2	4885.3	0.121	0.197

$M_{max} / (Z \times f_b) = 312171 / (699.52 \times 538.56) = 0.83 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 5372.21) / (178.60 \times 66.00) = 0.68 \leq 1.0 \text{ OK}$
 $\delta = 0.121 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1510 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.197 \text{ (cm)} = 1/922 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	142640	3135.0	3135.0	0.062
$\omega 1$	23351	186.6	410.6	0.008
P4	121286	1777.1	1066.3	0.042
P5	24894	273.6	273.6	0.009
Total	312171	5372.2	4885.3	0.121

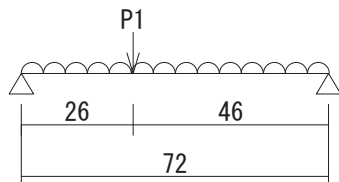
$M_{max} / (Z \times f_b) = 312171 / (699.52 \times 979.20) = 0.46 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 5372.21) / (178.60 \times 120.00) = 0.38 \leq 1.0 \text{ OK}$
 $\delta = 0.121 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1510 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	142640	3135.0	3135.0	0.062
$\omega 1$	23351	186.6	410.6	0.008
P4	204272	2993.0	1795.8	0.070
P5	36805	404.5	404.5	0.013
Total	407068	6719.0	5745.8	0.153

$M_{max} / (Z \times f_b) = 407068 / (699.52 \times 783.36) = 0.74 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 6719.01) / (178.60 \times 96.00) = 0.59 \leq 1.0 \text{ OK}$
 $\delta = 0.153 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1188 \leq 1/150 \text{ OK}$

階、位置： 小屋梁 X1.5通り Y2.5a - Y3.5



S-P-F 2級 2 - 210 (3.8×23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}, K_z = 0.68, K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}, I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}, F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 300 \times 0.683 + 2000 \times 0.228 = 660 \text{ (N/m)} \rightarrow 6.60 \text{ (N/cm)}$ (長期)
 $\omega = 300 \times 0.683 + 2000 \times 0.228 = 660 \text{ (N/m)} \rightarrow 6.60 \text{ (N/cm)}$ (短期)
 $\omega = 300 \times 0.683 + 2000 \times 0.228 = 660 \text{ (N/m)} \rightarrow 6.60 \text{ (N/cm)}$ (積雪時)
 $\omega = 300 \times 0.683 + 1300 \times 0.228 = 501 \text{ (N/m)} \rightarrow 5.01 \text{ (N/cm)}$ (長期たわみ)
 $\omega 1 (Y2.5a-Y3.5) = 214.50 \text{ (長期)} \quad 214.50 \text{ (短期)} \quad 214.50 \text{ (積雪時)} \quad 214.50 \text{ (長期たわみ)} \text{ (N)}$
 $P1 = 328.58 \text{ (長期)} \quad 328.58 \text{ (短期)} \quad 603.48 \text{ (積雪時)} \quad 328.58 \text{ (長期たわみ)} \text{ (N)}$

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39, f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	4216	235.9	235.9	0.000	0.000
$\omega 1$	1917	107.3	107.3	0.000	0.000
P1	5436	209.1	119.5	0.000	0.001
Total	11570	552.2	462.6	0.001	0.001

$M_{\max} / (Z \times f_b) = 11570 / (699.52 \times 538.56) = 0.03 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 552.21) / (178.60 \times 66.00) = 0.07 \leq 1.0 \text{ OK}$
 $\delta = 0.001 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/102006 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.001 \text{ (cm)} = 1/56543 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79, f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	4216	235.9	235.9	0.000
$\omega 1$	1917	107.3	107.3	0.000
P1	5436	209.1	119.5	0.000
Total	11570	552.2	462.6	0.001

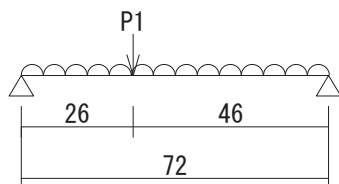
$M_{\max} / (Z \times f_b) = 11570 / (699.52 \times 979.20) = 0.02 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 552.21) / (178.60 \times 120.00) = 0.04 \leq 1.0 \text{ OK}$
 $\delta = 0.001 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/102006 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83, f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	4216	235.9	235.9	0.000
$\omega 1$	1917	107.3	107.3	0.000
P1	9985	384.0	219.4	0.001
Total	16118	727.1	562.6	0.001

$M_{\max} / (Z \times f_b) = 16118 / (699.52 \times 783.36) = 0.03 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 727.14) / (178.60 \times 96.00) = 0.06 \leq 1.0 \text{ OK}$
 $\delta = 0.001 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/75977 \leq 1/150 \text{ OK}$

階、位置： 小屋梁 X3.5通り Y2.5a - Y3.5



S-P-F 2級 2 - 210 (3.8×23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}$, $I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$$\begin{aligned} \omega &= 2000 \times 0.228 + 300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)} \text{ (長期)} \\ \omega &= 2000 \times 0.228 + 300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)} \text{ (短期)} \\ \omega &= 2000 \times 0.228 + 300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)} \text{ (積雪時)} \\ \omega &= 1300 \times 0.228 + 300 \times 0.455 = 432 \text{ (N/m)} \rightarrow 4.32 \text{ (N/cm)} \text{ (長期たわみ)} \\ \omega 1 (Y2.5a-Y3.5) &= 429.00 \text{ (長期)} \quad 429.00 \text{ (短期)} \quad 429.00 \text{ (積雪時)} \quad 429.00 \text{ (長期たわみ)} \text{ (N)} \\ P1 &= 325.03 \text{ (長期)} \quad 325.03 \text{ (短期)} \quad 674.90 \text{ (積雪時)} \quad 325.03 \text{ (長期たわみ)} \text{ (N)} \end{aligned}$$

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	3780	211.5	211.5	0.000	0.000
$\omega 1$	3834	214.5	214.5	0.000	0.001
P1	5378	206.8	118.2	0.000	0.001
Total	12992	632.8	544.2	0.001	0.001

$$\begin{aligned} M_{\max} / (Z \times f_b) &= 12992 / (699.52 \times 538.56) = 0.03 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 632.80) / (178.60 \times 66.00) = 0.08 \leq 1.0 \text{ OK} \\ \delta &= 0.001 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/89622 \leq 1/250 \text{ OK} \\ \delta' \times 2.0 &= 0.001 \text{ (cm)} = 1/49032 \leq 1/250 \text{ OK} \end{aligned}$$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	3780	211.5	211.5	0.000
$\omega 1$	3834	214.5	214.5	0.000
P1	5378	206.8	118.2	0.000
Total	12992	632.8	544.2	0.001

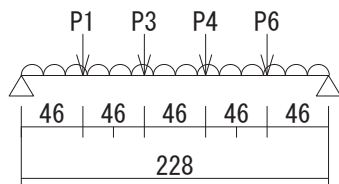
$$\begin{aligned} M_{\max} / (Z \times f_b) &= 12992 / (699.52 \times 979.20) = 0.02 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 632.80) / (178.60 \times 120.00) = 0.04 \leq 1.0 \text{ OK} \\ \delta &= 0.001 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/89622 \leq 1/150 \text{ OK} \end{aligned}$$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	3780	211.5	211.5	0.000
$\omega 1$	3834	214.5	214.5	0.000
P1	11167	429.5	245.4	0.001
Total	18781	855.4	671.4	0.001

$$\begin{aligned} M_{\max} / (Z \times f_b) &= 18781 / (699.52 \times 783.36) = 0.03 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 855.44) / (178.60 \times 96.00) = 0.07 \leq 1.0 \text{ OK} \\ \delta &= 0.001 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/64799 \leq 1/150 \text{ OK} \end{aligned}$$

階、位置： 小屋梁 X4.5通り Y4 - Y6.5



S-P-F 2級 2 - 210 (3.8×23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}$, $I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.228 + 300 \times 0.910 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.228 + 300 \times 0.910 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.228 + 300 \times 0.910 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.228 + 300 \times 0.910 = 569 \text{ (N/m)} \rightarrow 5.69 \text{ (N/cm)}$ (長期たわみ)
 $\omega 1 (Y4 - Y6.5) = 910.00 \text{ (長期)}$ 910.00 (短期) 910.00 (積雪時) 910.00 (長期たわみ) (N)
 $P1 = 387.14 \text{ (長期)}$ 387.14 (短期) 737.01 (積雪時) 387.14 (長期たわみ) (N)
 $P3 = 387.14 \text{ (長期)}$ 387.14 (短期) 737.01 (積雪時) 387.14 (長期たわみ) (N)
 $P4 = 387.14 \text{ (長期)}$ 387.14 (短期) 737.01 (積雪時) 387.14 (長期たわみ) (N)
 $P6 = 387.14 \text{ (長期)}$ 387.14 (短期) 737.01 (積雪時) 387.14 (長期たわみ) (N)

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	47098	828.1	828.1	0.032	0.050
$\omega 1$	25878	455.0	455.0	0.018	0.035
P1	14092	309.7	77.4	0.007	0.014
P3	21138	232.3	154.9	0.011	0.023
P4	21138	154.9	232.3	0.011	0.023
P6	14092	77.4	309.7	0.007	0.014
Total	143435	2057.4	2057.4	0.087	0.159

$M_{\max} / (Z \times f_b) = 143435 / (699.52 \times 538.56) = 0.38 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2057.37) / (178.60 \times 66.00) = 0.26 \leq 1.0 \text{ OK}$
 $\delta = 0.087 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/2626 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.159 \text{ (cm)} = 1/1429 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	47098	828.1	828.1	0.032
$\omega 1$	25878	455.0	455.0	0.018
P1	14092	309.7	77.4	0.007
P3	21138	232.3	154.9	0.011
P4	21138	154.9	232.3	0.011
P6	14092	77.4	309.7	0.007
Total	143435	2057.4	2057.4	0.087

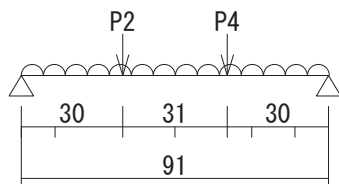
$M_{\max} / (Z \times f_b) = 143435 / (699.52 \times 979.20) = 0.21 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2057.37) / (178.60 \times 120.00) = 0.14 \leq 1.0 \text{ OK}$
 $\delta = 0.087 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/2626 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	47098	828.1	828.1	0.032
$\omega 1$	25878	455.0	455.0	0.018
P1	26827	589.6	147.4	0.013
P3	40241	442.2	294.8	0.022
P4	40241	294.8	442.2	0.022
P6	26827	147.4	589.6	0.013
Total	207112	2757.1	2757.1	0.120

$M_{\max} / (Z \times f_b) = 207112 / (699.52 \times 783.36) = 0.38 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2757.12) / (178.60 \times 96.00) = 0.24 \leq 1.0 \text{ OK}$
 $\delta = 0.120 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1898 \leq 1/150 \text{ OK}$

階、位置： 2階梁 Y1.5通り X4.5 - X5.5



S-P-F 2級 2 - 210 (3.8 × 23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}$, $I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.683 = 1365 \text{ (N/m)} \rightarrow 13.65 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.683 = 1365 \text{ (N/m)} \rightarrow 13.65 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.683 = 1365 \text{ (N/m)} \rightarrow 13.65 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.683 = 887 \text{ (N/m)} \rightarrow 8.87 \text{ (N/cm)}$ (長期たわみ)
 $P_2 = 138.78$ (長期) 138.78 (短期) 138.78 (積雪時) 90.20 (長期たわみ) (N)
 $P_4 = 242.16$ (長期) 242.16 (短期) 242.16 (積雪時) 193.59 (長期たわみ) (N)

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	14129	621.1	621.1	0.002	0.002
P2	2791	93.0	45.8	0.000	0.000
P4	4870	79.8	162.3	0.000	0.001
Total	21790	793.9	829.1	0.002	0.003

$M_{\max} / (Z \times f_b) = 21790 / (699.52 \times 538.56) = 0.06 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 829.15) / (178.60 \times 66.00) = 0.11 \leq 1.0 \text{ OK}$
 $\delta = 0.002 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/41513 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.003 \text{ (cm)} = 1/30612 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	14129	621.1	621.1	0.002
P2	2791	93.0	45.8	0.000
P4	4870	79.8	162.3	0.000
Total	21790	793.9	829.1	0.002

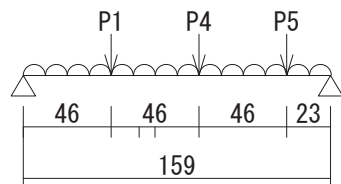
$M_{\max} / (Z \times f_b) = 21790 / (699.52 \times 979.20) = 0.03 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 829.15) / (178.60 \times 120.00) = 0.06 \leq 1.0 \text{ OK}$
 $\delta = 0.002 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/41513 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	14129	621.1	621.1	0.002
P2	2791	93.0	45.8	0.000
P4	4870	79.8	162.3	0.000
Total	21790	793.9	829.1	0.002

$M_{\max} / (Z \times f_b) = 21790 / (699.52 \times 783.36) = 0.04 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 829.15) / (178.60 \times 96.00) = 0.07 \leq 1.0 \text{ OK}$
 $\delta = 0.002 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/41513 \leq 1/150 \text{ OK}$

階、位置： 2階梁 Y3通り X0 - X1.7



E120-F330 410 (8.9 × 23.5 (cm))
 A = 209.15 (cm²), Kz = 1.00, Ks = 1.00
 Z = 819.17 (cm³), I = 9625.26 (cm⁴)
 Fb = 33.00 (N/mm²), Fs = 3.00 (N/mm²)
 許容せん断 割増係数 1.00
 E = 12000.0 (N/mm²)

$\omega = 2000 \times 0.358 = 715$ (N/m) → 7.15 (N/cm) (長期)
 $\omega = 2000 \times 0.358 = 715$ (N/m) → 7.15 (N/cm) (短期)
 $\omega = 2000 \times 0.358 = 715$ (N/m) → 7.15 (N/cm) (積雪時)
 $\omega = 1300 \times 0.358 = 465$ (N/m) → 4.65 (N/cm) (長期たわみ)
 P1 = 3413.08 (長期) 3413.08 (短期) 3627.20 (積雪時) 2484.05 (長期たわみ) (N)
 P4 = 3413.08 (長期) 3413.08 (短期) 3627.19 (積雪時) 2484.05 (長期たわみ) (N)
 P5 = 5850.89 (長期) 5850.89 (短期) 6633.56 (積雪時) 4774.94 (長期たわみ) (N)

長期 fb=1.1 × Kz × Ks × Fb / 3 = 12.10, fs=1.1 × 1.00 × Fs / 3 = 1.10 (N/mm²)

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	22666	569.3	569.3	0.005	0.007
P1	110925	2437.9	975.2	0.019	0.028
P4	133110	1462.7	1950.3	0.024	0.035
P5	114092	835.8	5015.1	0.018	0.030
Total	380793	5305.8	8509.9	0.067	0.100

Mmax / (Z × fb) = 380793 / (819.17 × 1210.00) = 0.38 ≤ 1.0 OK
 ($\alpha \times Q_{max}$) / (A × fs) = (1.50 × 8509.86) / (209.15 × 110.00) = 0.55 ≤ 1.0 OK
 $\delta = 0.067$ (cm) ≤ 2.00 OK
 = 1/2384 ≤ 1/250 OK
 $\delta' \times 2.0 = 0.100$ (cm) = 1/1598 ≤ 1/250 OK

短期 fb=2.0 × Kz × Ks × Fb / 3 = 22.00, fs=2.0 × 1.00 × Fs / 3 = 2.00 (N/mm²)

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	22666	569.3	569.3	0.005
P1	110925	2437.9	975.2	0.019
P4	133110	1462.7	1950.3	0.024
P5	114092	835.8	5015.1	0.018
Total	380793	5305.8	8509.9	0.067

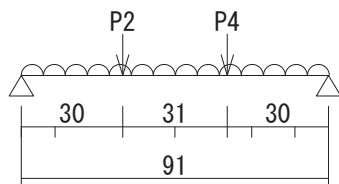
Mmax / (Z × fb) = 380793 / (819.17 × 2200.00) = 0.21 ≤ 1.0 OK
 ($\alpha \times Q_{max}$) / (A × fs) = (1.50 × 8509.86) / (209.15 × 200.00) = 0.31 ≤ 1.0 OK
 $\delta = 0.067$ (cm) ≤ 2.00 OK
 = 1/2384 ≤ 1/150 OK

積雪時 fb=0.8 × 2.0 × Kz × Ks × Fb / 3 = 17.60, fs=0.8 × 2.0 × 1.00 × Fs / 3 = 1.60 (N/mm²)

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	22666	569.3	569.3	0.005
P1	117884	2590.9	1036.3	0.020
P4	141461	1554.5	2072.7	0.026
P5	129354	947.7	5685.9	0.021
Total	411365	5662.3	9364.2	0.072

Mmax / (Z × fb) = 411365 / (819.17 × 1760.00) = 0.29 ≤ 1.0 OK
 ($\alpha \times Q_{max}$) / (A × fs) = (1.50 × 9364.25) / (209.15 × 160.00) = 0.42 ≤ 1.0 OK
 $\delta = 0.072$ (cm) ≤ 2.00 OK
 = 1/2213 ≤ 1/150 OK

階、位置： 2階梁 Y3通り X4.5 - X5.5



S-P-F 2級 2 - 210 (3.8 × 23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}$, $I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.683 = 1365 \text{ (N/m)} \rightarrow 13.65 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.683 = 1365 \text{ (N/m)} \rightarrow 13.65 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.683 = 1365 \text{ (N/m)} \rightarrow 13.65 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.683 = 887 \text{ (N/m)} \rightarrow 8.87 \text{ (N/cm)}$ (長期たわみ)
 $P2 = 1035.98$ (長期) 1035.98 (短期) 1035.98 (積雪時) 744.56 (長期たわみ) (N)
 $P4 = 1242.75$ (長期) 1242.75 (短期) 1242.75 (積雪時) 951.32 (長期たわみ) (N)

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	14129	621.1	621.1	0.002	0.002
P2	20834	694.5	341.5	0.002	0.003
P4	24991	409.7	833.1	0.002	0.003
Total	59954	1725.2	1795.7	0.005	0.008

$M_{\max} / (Z \times f_b) = 59954 / (699.52 \times 538.56) = 0.16 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 1795.66) / (178.60 \times 66.00) = 0.23 \leq 1.0 \text{ OK}$
 $\delta = 0.005 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/16797 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.008 \text{ (cm)} = 1/11708 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	14129	621.1	621.1	0.002
P2	20834	694.5	341.5	0.002
P4	24991	409.7	833.1	0.002
Total	59954	1725.2	1795.7	0.005

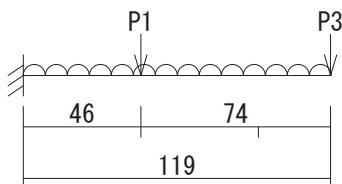
$M_{\max} / (Z \times f_b) = 59954 / (699.52 \times 979.20) = 0.09 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 1795.66) / (178.60 \times 120.00) = 0.13 \leq 1.0 \text{ OK}$
 $\delta = 0.005 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/16797 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	14129	621.1	621.1	0.002
P2	20834	694.5	341.5	0.002
P4	24991	409.7	833.1	0.002
Total	59954	1725.2	1795.7	0.005

$M_{\max} / (Z \times f_b) = 59954 / (699.52 \times 783.36) = 0.11 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 1795.66) / (178.60 \times 96.00) = 0.16 \leq 1.0 \text{ OK}$
 $\delta = 0.005 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/16797 \leq 1/150 \text{ OK}$

階、位置： 2階梁 X0通り Y6 - Y7.3



S-P-F 2級 2 - 210 (3.8×23.5 (cm))
 $A = 178.60$ (cm²), $K_z = 0.68$, $K_s = 1.00$
 $Z = 699.52$ (cm³), $I = 8219.32$ (cm⁴)
 $F_b = 21.60$ (N/mm²), $F_s = 1.80$ (N/mm²)
 許容せん断 割増係数 1.00
 $E = 9600.0$ (N/mm²)

$$\begin{aligned} \omega &= 760 \times 0.300 + 1600 \times 0.228 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)} \text{ (長期)} \\ \omega &= 760 \times 0.300 + 1600 \times 0.228 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)} \text{ (短期)} \\ \omega &= 1280 \times 0.300 + 1600 \times 0.228 = 748 \text{ (N/m)} \rightarrow 7.48 \text{ (N/cm)} \text{ (積雪時)} \\ \omega &= 760 \times 0.300 + 900 \times 0.228 = 433 \text{ (N/m)} \rightarrow 4.33 \text{ (N/cm)} \text{ (長期たわみ)} \\ \omega 1 (Y6 - Y6.5) &= 273.00 \text{ (長期)} \quad 273.00 \text{ (短期)} \quad 273.00 \text{ (積雪時)} \quad 273.00 \text{ (長期たわみ)} \text{ (N)} \\ P1 &= 1415.19 \text{ (長期)} \quad 1415.19 \text{ (短期)} \quad 1826.55 \text{ (積雪時)} \quad 1378.96 \text{ (長期たわみ)} \text{ (N)} \\ &1598.28 \text{ (水平力)} \text{ (N)} \\ P3 &= 132.70 \text{ (長期)} \quad 132.70 \text{ (短期)} \quad 223.50 \text{ (積雪時)} \quad 132.70 \text{ (長期たわみ)} \text{ (N)} \end{aligned}$$

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66$ (N/mm²)

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	41917	704.5	0.0	0.019	0.027
$\omega 1$	6211	273.0	0.0	0.001	0.002
P1	64391	1415.2	0.0	0.019	0.038
P3	15791	132.7	0.0	0.009	0.019
Total	128310	2525.4	0.0	0.049	0.086

$$\begin{aligned} M_{\max} / (Z \times f_b) &= 128310 / (699.52 \times 538.56) = 0.34 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 2525.37) / (178.60 \times 66.00) = 0.32 \leq 1.0 \text{ OK} \\ \delta &= 0.049 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/2452 \leq 1/250 \text{ OK} \\ \delta' \times 2.0 &= 0.086 \text{ (cm)} = 1/1385 \leq 1/250 \text{ OK} \end{aligned}$$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20$ (N/mm²)

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	41917	704.5	0.0	0.019
$\omega 1$	6211	273.0	0.0	0.001
P1	137113	3013.5	0.0	0.041
P3	15791	132.7	0.0	0.009
Total	201031	4123.6	0.0	0.070

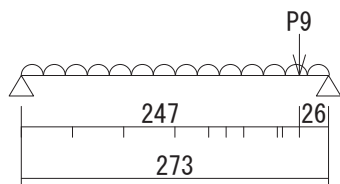
$$\begin{aligned} M_{\max} / (Z \times f_b) &= 201031 / (699.52 \times 979.20) = 0.29 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 4123.65) / (178.60 \times 120.00) = 0.29 \leq 1.0 \text{ OK} \\ \delta &= 0.070 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/1693 \leq 1/250 \text{ OK} \end{aligned}$$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96$ (N/mm²)

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	52962	890.1	0.0	0.024
$\omega 1$	6211	273.0	0.0	0.001
P1	83108	1826.6	0.0	0.025
P3	26596	223.5	0.0	0.016
Total	168877	3213.2	0.0	0.066

$$\begin{aligned} M_{\max} / (Z \times f_b) &= 168877 / (699.52 \times 783.36) = 0.31 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 3213.17) / (178.60 \times 96.00) = 0.28 \leq 1.0 \text{ OK} \\ \delta &= 0.066 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/1815 \leq 1/250 \text{ OK} \end{aligned}$$

階、位置： 2階梁 X0.5通り Y0 - Y3



S-P-F 2級 210 (3.8×23.5 (cm))
 $A = 89.30 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 349.76 \text{ (cm}^3\text{)}$, $I = 4109.66 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)}$ (長期たわみ)
 $P_9 = 1242.15 \text{ (長期)}$ 1242.15 (短期) 1242.15 (積雪時) 807.40 (長期たわみ) (N)

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	84777	1242.2	1242.2	0.167	0.217
P9	29220	118.3	1123.9	0.039	0.050
Total	113997	1360.5	2366.0	0.205	0.267

$M_{\max} / (Z \times f_b) = 113997 / (349.76 \times 538.56) = 0.61 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2366.00) / (89.30 \times 66.00) = 0.60 \leq 1.0 \text{ OK}$
 $\delta = 0.205 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1329 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.267 \text{ (cm)} = 1/1022 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.167
P9	29220	118.3	1123.9	0.039
Total	113997	1360.5	2366.0	0.205

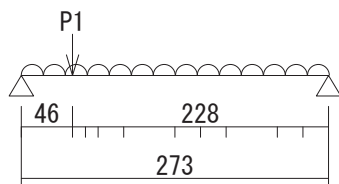
$M_{\max} / (Z \times f_b) = 113997 / (349.76 \times 979.20) = 0.33 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2366.00) / (89.30 \times 120.00) = 0.33 \leq 1.0 \text{ OK}$
 $\delta = 0.205 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1329 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.167
P9	29220	118.3	1123.9	0.039
Total	113997	1360.5	2366.0	0.205

$M_{\max} / (Z \times f_b) = 113997 / (349.76 \times 783.36) = 0.42 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2366.00) / (89.30 \times 96.00) = 0.41 \leq 1.0 \text{ OK}$
 $\delta = 0.205 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1329 \leq 1/150 \text{ OK}$

階、位置： 2階梁 X0.5通り Y3 - Y6



S-P-F 2級 2 - 210 (3.8×23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}$, $I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)}$ (長期たわみ)
 $P1 = 2747.07$ (長期) 2747.07 (短期) 3004.01 (積雪時) 2104.26 (長期たわみ) (N)

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	84777	1242.2	1242.2	0.083	0.108
P1	104160	2289.2	457.8	0.073	0.111
Total	188937	3531.4	1700.0	0.156	0.220

$M_{\max} / (Z \times f_b) = 188937 / (699.52 \times 538.56) = 0.50 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 3531.38) / (178.60 \times 66.00) = 0.45 \leq 1.0 \text{ OK}$
 $\delta = 0.156 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1750 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.220 \text{ (cm)} = 1/1243 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.083
P1	104160	2289.2	457.8	0.073
Total	188937	3531.4	1700.0	0.156

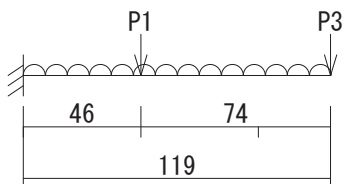
$M_{\max} / (Z \times f_b) = 188937 / (699.52 \times 979.20) = 0.28 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 3531.38) / (178.60 \times 120.00) = 0.25 \leq 1.0 \text{ OK}$
 $\delta = 0.156 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1750 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.083
P1	113902	2503.3	500.7	0.079
Total	198679	3745.5	1742.8	0.163

$M_{\max} / (Z \times f_b) = 198679 / (699.52 \times 783.36) = 0.36 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 3745.50) / (178.60 \times 96.00) = 0.33 \leq 1.0 \text{ OK}$
 $\delta = 0.163 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1677 \leq 1/150 \text{ OK}$

階、位置： 2階梁 X0.5通り Y6 - Y7.3



S-P-F 2級 2 - 210 (3.8 × 23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}, K_z = 0.68, K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}, I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}, F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (長期)
 $\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (短期)
 $\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (積雪時)
 $\omega = 900 \times 0.455 = 410 \text{ (N/m)} \rightarrow 4.10 \text{ (N/cm)}$ (長期たわみ)
 $P1 = 2304.75 \text{ (長期)} 2304.75 \text{ (短期)} 2956.71 \text{ (積雪時)} 2232.29 \text{ (長期たわみ)} \text{ (N)}$
 $P3 = 265.40 \text{ (長期)} 265.40 \text{ (短期)} 446.99 \text{ (積雪時)} 265.40 \text{ (長期たわみ)} \text{ (N)}$

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39, f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	51546	866.3	0.0	0.023	0.026
P1	104866	2304.8	0.0	0.031	0.061
P3	31583	265.4	0.0	0.019	0.038
Total	187995	3436.5	0.0	0.073	0.125

$M_{\max} / (Z \times f_b) = 187995 / (699.52 \times 538.56) = 0.50 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 3436.47) / (178.60 \times 66.00) = 0.44 \leq 1.0 \text{ OK}$
 $\delta = 0.073 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1621 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.125 \text{ (cm)} = 1/955 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79, f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.023
P1	104866	2304.8	0.0	0.031
P3	31583	265.4	0.0	0.019
Total	187995	3436.5	0.0	0.073

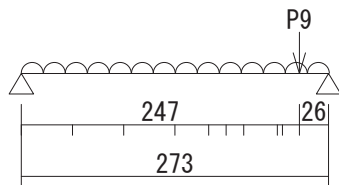
$M_{\max} / (Z \times f_b) = 187995 / (699.52 \times 979.20) = 0.27 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 3436.47) / (178.60 \times 120.00) = 0.24 \leq 1.0 \text{ OK}$
 $\delta = 0.073 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1621 \leq 1/250 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83, f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.023
P1	134530	2956.7	0.0	0.040
P3	53192	447.0	0.0	0.032
Total	239268	4270.0	0.0	0.095

$M_{\max} / (Z \times f_b) = 239268 / (699.52 \times 783.36) = 0.44 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 4270.02) / (178.60 \times 96.00) = 0.37 \leq 1.0 \text{ OK}$
 $\delta = 0.095 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1250 \leq 1/250 \text{ OK}$

階、位置： 2階梁 X1通り Y0 - Y3



S-P-F 2級 210 (3.8×23.5 (cm))
 $A = 89.30 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 349.76 \text{ (cm}^3\text{)}$, $I = 4109.66 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)}$ (長期たわみ)
 $P_9 = 1242.15 \text{ (長期)} \ 1242.15 \text{ (短期)} \ 1242.15 \text{ (積雪時)} \ 807.40 \text{ (長期たわみ)} \text{ (N)}$

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	84777	1242.2	1242.2	0.167	0.217
P9	29220	118.3	1123.9	0.039	0.050
Total	113997	1360.5	2366.0	0.205	0.267

$M_{\max} / (Z \times f_b) = 113997 / (349.76 \times 538.56) = 0.61 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2366.00) / (89.30 \times 66.00) = 0.60 \leq 1.0 \text{ OK}$
 $\delta = 0.205 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1329 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.267 \text{ (cm)} = 1/1022 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.167
P9	29220	118.3	1123.9	0.039
Total	113997	1360.5	2366.0	0.205

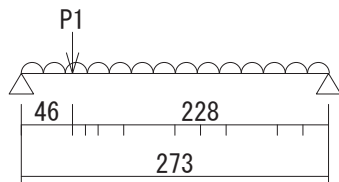
$M_{\max} / (Z \times f_b) = 113997 / (349.76 \times 979.20) = 0.33 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2366.00) / (89.30 \times 120.00) = 0.33 \leq 1.0 \text{ OK}$
 $\delta = 0.205 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1329 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.167
P9	29220	118.3	1123.9	0.039
Total	113997	1360.5	2366.0	0.205

$M_{\max} / (Z \times f_b) = 113997 / (349.76 \times 783.36) = 0.42 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2366.00) / (89.30 \times 96.00) = 0.41 \leq 1.0 \text{ OK}$
 $\delta = 0.205 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1329 \leq 1/150 \text{ OK}$

階、位置： 2階梁 X1通り Y3 - Y6



S-P-F 2級 2 - 210 (3.8 × 23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}$, $I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)}$ (長期たわみ)
 $P1 = 2747.07$ (長期) 2747.07 (短期) 3004.01 (積雪時) 2104.26 (長期たわみ) (N)

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	84777	1242.2	1242.2	0.083	0.108
P1	104160	2289.2	457.8	0.073	0.111
Total	188937	3531.4	1700.0	0.156	0.220

$M_{\max} / (Z \times f_b) = 188937 / (699.52 \times 538.56) = 0.50 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 3531.38) / (178.60 \times 66.00) = 0.45 \leq 1.0 \text{ OK}$
 $\delta = 0.156 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1750 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.220 \text{ (cm)} = 1/1243 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.083
P1	104160	2289.2	457.8	0.073
Total	188937	3531.4	1700.0	0.156

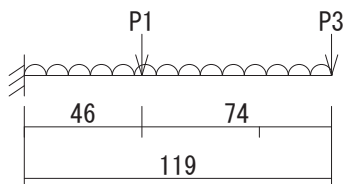
$M_{\max} / (Z \times f_b) = 188937 / (699.52 \times 979.20) = 0.28 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 3531.38) / (178.60 \times 120.00) = 0.25 \leq 1.0 \text{ OK}$
 $\delta = 0.156 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1750 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.083
P1	113902	2503.3	500.7	0.079
Total	198679	3745.5	1742.8	0.163

$M_{\max} / (Z \times f_b) = 198679 / (699.52 \times 783.36) = 0.36 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 3745.49) / (178.60 \times 96.00) = 0.33 \leq 1.0 \text{ OK}$
 $\delta = 0.163 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1677 \leq 1/150 \text{ OK}$

階、位置： 2階梁 X1通り Y6 - Y7.3



S-P-F 2級 2 - 210 (3.8 × 23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}$, $I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (長期)
 $\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (短期)
 $\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (積雪時)
 $\omega = 900 \times 0.455 = 410 \text{ (N/m)} \rightarrow 4.10 \text{ (N/cm)}$ (長期たわみ)
 $P1 = 680.70$ (長期) 680.70 (短期) 805.01 (積雪時) 608.24 (長期たわみ) (N)
 $P3 = 265.40$ (長期) 265.40 (短期) 446.99 (積雪時) 265.40 (長期たわみ) (N)

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	51546	866.3	0.0	0.023	0.026
P1	30972	680.7	0.0	0.009	0.017
P3	31583	265.4	0.0	0.019	0.038
Total	114101	1812.4	0.0	0.051	0.080

$M_{\max} / (Z \times f_b) = 114101 / (699.52 \times 538.56) = 0.30 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 1812.42) / (178.60 \times 66.00) = 0.23 \leq 1.0 \text{ OK}$
 $\delta = 0.051 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/2320 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.080 \text{ (cm)} = 1/1481 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.023
P1	30972	680.7	0.0	0.009
P3	31583	265.4	0.0	0.019
Total	114101	1812.4	0.0	0.051

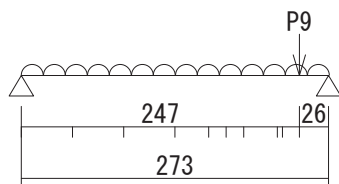
$M_{\max} / (Z \times f_b) = 114101 / (699.52 \times 979.20) = 0.17 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 1812.42) / (178.60 \times 120.00) = 0.13 \leq 1.0 \text{ OK}$
 $\delta = 0.051 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/2320 \leq 1/250 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.023
P1	36628	805.0	0.0	0.011
P3	53192	447.0	0.0	0.032
Total	141366	2118.3	0.0	0.066

$M_{\max} / (Z \times f_b) = 141366 / (699.52 \times 783.36) = 0.26 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2118.32) / (178.60 \times 96.00) = 0.19 \leq 1.0 \text{ OK}$
 $\delta = 0.066 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1805 \leq 1/250 \text{ OK}$

階、位置： 2階梁 X1.5通り Y0 - Y3



S-P-F 2級 210 (3.8×23.5 (cm))
 $A = 89.30 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 349.76 \text{ (cm}^3\text{)}$, $I = 4109.66 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$$\begin{aligned} \omega &= 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)} \text{ (長期)} \\ \omega &= 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)} \text{ (短期)} \\ \omega &= 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)} \text{ (積雪時)} \\ \omega &= 1300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)} \text{ (長期たわみ)} \\ P_9 &= 1242.15 \text{ (長期)} \quad 1242.15 \text{ (短期)} \quad 1242.15 \text{ (積雪時)} \quad 807.40 \text{ (長期たわみ)} \text{ (N)} \end{aligned}$$

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	84777	1242.2	1242.2	0.167	0.217
P9	29220	118.3	1123.9	0.039	0.050
Total	113997	1360.5	2366.0	0.205	0.267

$$\begin{aligned} M_{\max} / (Z \times f_b) &= 113997 / (349.76 \times 538.56) = 0.61 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 2366.00) / (89.30 \times 66.00) = 0.60 \leq 1.0 \text{ OK} \\ \delta &= 0.205 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/1329 \leq 1/250 \text{ OK} \\ \delta' \times 2.0 &= 0.267 \text{ (cm)} = 1/1022 \leq 1/250 \text{ OK} \end{aligned}$$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.167
P9	29220	118.3	1123.9	0.039
Total	113997	1360.5	2366.0	0.205

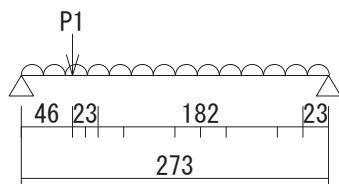
$$\begin{aligned} M_{\max} / (Z \times f_b) &= 113997 / (349.76 \times 979.20) = 0.33 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 2366.00) / (89.30 \times 120.00) = 0.33 \leq 1.0 \text{ OK} \\ \delta &= 0.205 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/1329 \leq 1/150 \text{ OK} \end{aligned}$$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.167
P9	29220	118.3	1123.9	0.039
Total	113997	1360.5	2366.0	0.205

$$\begin{aligned} M_{\max} / (Z \times f_b) &= 113997 / (349.76 \times 783.36) = 0.42 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 2366.00) / (89.30 \times 96.00) = 0.41 \leq 1.0 \text{ OK} \\ \delta &= 0.205 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/1329 \leq 1/150 \text{ OK} \end{aligned}$$

階、位置： 2階梁 X1.5通り Y3 - Y6



S-P-F 2級 2 - 210 (3.8×23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}$, $I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)}$ (長期たわみ)
 $\omega 1 \text{ (Y3.5 - Y3.7)} = 3001.73 \text{ (長期)} 3001.73 \text{ (短期)} 3701.47 \text{ (積雪時)} 2820.58 \text{ (長期たわみ)}$ (N)
 $\omega 2 \text{ (Y5.7 - Y6)} = 1474.84 \text{ (長期)} 1474.84 \text{ (短期)} 1824.71 \text{ (積雪時)} 1390.30 \text{ (長期たわみ)}$ (N)
 $P1 = 2747.07 \text{ (長期)} 2747.07 \text{ (短期)} 3004.01 \text{ (積雪時)} 2104.26 \text{ (長期たわみ)}$ (N)

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	84777	1242.2	1242.2	0.083	0.108
$\omega 1$	135156	2376.4	625.4	0.097	0.182
$\omega 2$	16077	61.5	1413.4	0.010	0.019
P1	104160	2289.2	457.8	0.073	0.111
Total	340170	5969.2	3738.7	0.263	0.421

$M_{\max} / (Z \times f_b) = 340170 / (699.52 \times 538.56) = 0.90 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 5969.19) / (178.60 \times 66.00) = 0.76 \leq 1.0 \text{ OK}$
 $\delta = 0.263 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1038 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.421 \text{ (cm)} = 1/649 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.083
$\omega 1$	135156	2376.4	625.4	0.097
$\omega 2$	16077	61.5	1413.4	0.010
P1	104160	2289.2	457.8	0.073
Total	340170	5969.2	3738.7	0.263

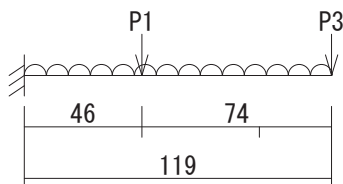
$M_{\max} / (Z \times f_b) = 340170 / (699.52 \times 979.20) = 0.50 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 5969.19) / (178.60 \times 120.00) = 0.42 \leq 1.0 \text{ OK}$
 $\delta = 0.263 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1038 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.083
$\omega 1$	166663	2930.3	771.1	0.119
$\omega 2$	19891	76.0	1748.7	0.013
P1	113902	2503.3	500.7	0.079
Total	385233	6751.9	4262.6	0.295

$M_{\max} / (Z \times f_b) = 385233 / (699.52 \times 783.36) = 0.70 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 6751.85) / (178.60 \times 96.00) = 0.59 \leq 1.0 \text{ OK}$
 $\delta = 0.295 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/926 \leq 1/150 \text{ OK}$

階、位置： 2階梁 X1.5通り Y6 - Y7.3



S-P-F 2級 2 - 210 (3.8×23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}$, $I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (長期)
 $\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (短期)
 $\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (積雪時)
 $\omega = 900 \times 0.455 = 410 \text{ (N/m)} \rightarrow 4.10 \text{ (N/cm)}$ (長期たわみ)
 $\omega 1 (Y6 - Y6.5) = 2949.67 \text{ (長期)} 2949.67 \text{ (短期)} 3649.41 \text{ (積雪時)} 2780.60 \text{ (長期たわみ)}$ (N)
 $P1 = 1941.68 \text{ (長期)} 1941.68 \text{ (短期)} 2217.13 \text{ (積雪時)} 1634.67 \text{ (長期たわみ)}$ (N)
 $P3 = 265.40 \text{ (長期)} 265.40 \text{ (短期)} 446.99 \text{ (積雪時)} 265.40 \text{ (長期たわみ)}$ (N)

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	51546	866.3	0.0	0.023	0.026
$\omega 1$	67105	2949.7	0.0	0.011	0.020
P1	88347	1941.7	0.0	0.026	0.045
P3	31583	265.4	0.0	0.019	0.038
Total	238580	6023.1	0.0	0.079	0.129

$M_{\max} / (Z \times f_b) = 238580 / (699.52 \times 538.56) = 0.63 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 6023.08) / (178.60 \times 66.00) = 0.77 \leq 1.0 \text{ OK}$
 $\delta = 0.079 \text{ (cm)} \leq 2.00 \text{ OK}$
 $\delta' \times 2.0 = 0.129 \text{ (cm)} = 1/925 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.023
$\omega 1$	67105	2949.7	0.0	0.011
P1	88347	1941.7	0.0	0.026
P3	31583	265.4	0.0	0.019
Total	238580	6023.1	0.0	0.079

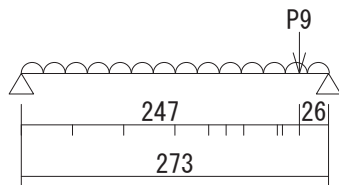
$M_{\max} / (Z \times f_b) = 238580 / (699.52 \times 979.20) = 0.35 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 6023.08) / (178.60 \times 120.00) = 0.42 \leq 1.0 \text{ OK}$
 $\delta = 0.079 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1502 \leq 1/250 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.023
$\omega 1$	83024	3649.4	0.0	0.013
P1	100880	2217.1	0.0	0.030
P3	53192	447.0	0.0	0.032
Total	288642	7179.9	0.0	0.098

$M_{\max} / (Z \times f_b) = 288642 / (699.52 \times 783.36) = 0.53 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 7179.86) / (178.60 \times 96.00) = 0.63 \leq 1.0 \text{ OK}$
 $\delta = 0.098 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1208 \leq 1/250 \text{ OK}$

階、位置： 2階梁 X2通り Y0 - Y3



S-P-F 2級 210 (3.8×23.5 (cm))
 $A = 89.30 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 349.76 \text{ (cm}^3\text{)}$, $I = 4109.66 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)}$ (長期たわみ)
 $P_9 = 1242.15 \text{ (長期)}$ 1242.15 (短期) 1242.15 (積雪時) 807.40 (長期たわみ) (N)

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	84777	1242.2	1242.2	0.167	0.217
P9	29220	118.3	1123.9	0.039	0.050
Total	113997	1360.5	2366.0	0.205	0.267

$M_{\max} / (Z \times f_b) = 113997 / (349.76 \times 538.56) = 0.61 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2366.00) / (89.30 \times 66.00) = 0.60 \leq 1.0 \text{ OK}$
 $\delta = 0.205 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1329 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.267 \text{ (cm)} = 1/1022 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.167
P9	29220	118.3	1123.9	0.039
Total	113997	1360.5	2366.0	0.205

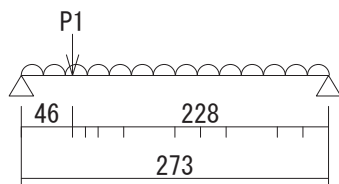
$M_{\max} / (Z \times f_b) = 113997 / (349.76 \times 979.20) = 0.33 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2366.00) / (89.30 \times 120.00) = 0.33 \leq 1.0 \text{ OK}$
 $\delta = 0.205 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1329 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.167
P9	29220	118.3	1123.9	0.039
Total	113997	1360.5	2366.0	0.205

$M_{\max} / (Z \times f_b) = 113997 / (349.76 \times 783.36) = 0.42 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2366.00) / (89.30 \times 96.00) = 0.41 \leq 1.0 \text{ OK}$
 $\delta = 0.205 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1329 \leq 1/150 \text{ OK}$

階、位置： 2階梁 X2通り Y3 - Y6



S-P-F 2級 2 - 210 (3.8 × 23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}$, $I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)}$ (長期たわみ)
 $P1 = 2747.07$ (長期) 2747.07 (短期) 3004.01 (積雪時) 2104.26 (長期たわみ) (N)

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	84777	1242.2	1242.2	0.083	0.108
P1	104160	2289.2	457.8	0.073	0.111
Total	188937	3531.4	1700.0	0.156	0.220

$M_{\max} / (Z \times f_b) = 188937 / (699.52 \times 538.56) = 0.50 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 3531.38) / (178.60 \times 66.00) = 0.45 \leq 1.0 \text{ OK}$
 $\delta = 0.156 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1750 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.220 \text{ (cm)} = 1/1243 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.083
P1	104160	2289.2	457.8	0.073
Total	188937	3531.4	1700.0	0.156

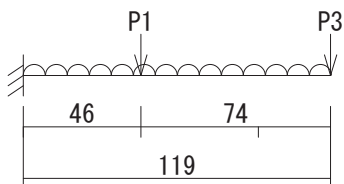
$M_{\max} / (Z \times f_b) = 188937 / (699.52 \times 979.20) = 0.28 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 3531.38) / (178.60 \times 120.00) = 0.25 \leq 1.0 \text{ OK}$
 $\delta = 0.156 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1750 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.083
P1	113902	2503.3	500.7	0.079
Total	198679	3745.5	1742.8	0.163

$M_{\max} / (Z \times f_b) = 198679 / (699.52 \times 783.36) = 0.36 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 3745.49) / (178.60 \times 96.00) = 0.33 \leq 1.0 \text{ OK}$
 $\delta = 0.163 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1677 \leq 1/150 \text{ OK}$

階、位置： 2階梁 X2通り Y6 - Y7.3



S-P-F 2級 2 - 210 (3.8 × 23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}$, $I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (長期)
 $\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (短期)
 $\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (積雪時)
 $\omega = 900 \times 0.455 = 410 \text{ (N/m)} \rightarrow 4.10 \text{ (N/cm)}$ (長期たわみ)
 $P1 = 3317.67$ (長期) 3317.67 (短期) 3781.61 (積雪時) 2776.09 (長期たわみ) (N)
 $P3 = 265.40$ (長期) 265.40 (短期) 446.99 (積雪時) 265.40 (長期たわみ) (N)

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	51546	866.3	0.0	0.023	0.026
P1	150954	3317.7	0.0	0.045	0.076
P3	31583	265.4	0.0	0.019	0.038
Total	234083	4449.4	0.0	0.087	0.139

$M_{\max} / (Z \times f_b) = 234083 / (699.52 \times 538.56) = 0.62 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 4449.39) / (178.60 \times 66.00) = 0.57 \leq 1.0 \text{ OK}$
 $\delta = 0.087 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1364 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.139 \text{ (cm)} = 1/853 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.023
P1	150954	3317.7	0.0	0.045
P3	31583	265.4	0.0	0.019
Total	234083	4449.4	0.0	0.087

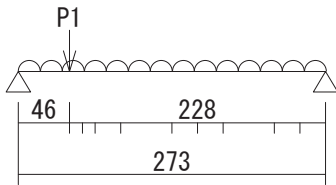
$M_{\max} / (Z \times f_b) = 234083 / (699.52 \times 979.20) = 0.34 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 4449.39) / (178.60 \times 120.00) = 0.31 \leq 1.0 \text{ OK}$
 $\delta = 0.087 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1364 \leq 1/250 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.023
P1	172063	3781.6	0.0	0.052
P3	53192	447.0	0.0	0.032
Total	276802	5094.9	0.0	0.106

$M_{\max} / (Z \times f_b) = 276802 / (699.52 \times 783.36) = 0.51 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 5094.93) / (178.60 \times 96.00) = 0.45 \leq 1.0 \text{ OK}$
 $\delta = 0.106 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1118 \leq 1/250 \text{ OK}$

階、位置： 2階梁 X2.5通り Y3 - Y6



S-P-F 2級 2 - 210 (3.8 × 23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}$, $I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)}$ (長期たわみ)
 $\omega 1 (Y3 - Y3.5) = 3651.17 \text{ (長期)} 3651.17 \text{ (短期)} 4146.49 \text{ (積雪時)} 2873.88 \text{ (長期たわみ)} \text{ (N)}$
 $P1 = 2062.86 \text{ (長期)} 2062.86 \text{ (短期)} 2191.33 \text{ (積雪時)} 1524.08 \text{ (長期たわみ)} \text{ (N)}$

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	84777	1242.2	1242.2	0.083	0.108
$\omega 1$	76142	3346.9	304.3	0.050	0.078
P1	78217	1719.1	343.8	0.055	0.081
Total	239136	6308.1	1890.2	0.188	0.267

$M_{\max} / (Z \times f_b) = 239136 / (699.52 \times 538.56) = 0.63 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 6308.10) / (178.60 \times 66.00) = 0.80 \leq 1.0 \text{ OK}$
 $\delta = 0.188 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1454 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.267 \text{ (cm)} = 1/1021 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.083
$\omega 1$	76142	3346.9	304.3	0.050
P1	78217	1719.1	343.8	0.055
Total	239136	6308.1	1890.2	0.188

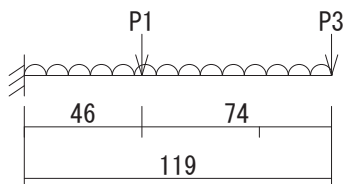
$M_{\max} / (Z \times f_b) = 239136 / (699.52 \times 979.20) = 0.35 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 6308.10) / (178.60 \times 120.00) = 0.44 \leq 1.0 \text{ OK}$
 $\delta = 0.188 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1454 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.083
$\omega 1$	86471	3800.9	345.5	0.057
P1	83088	1826.1	365.2	0.058
Total	254336	6869.2	1952.9	0.198

$M_{\max} / (Z \times f_b) = 254336 / (699.52 \times 783.36) = 0.46 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 6869.21) / (178.60 \times 96.00) = 0.60 \leq 1.0 \text{ OK}$
 $\delta = 0.198 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1380 \leq 1/150 \text{ OK}$

階、位置： 2階梁 X2.5通り Y6 - Y7.3



S-P-F 2級 2 - 210 (3.8 × 23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}, K_z = 0.68, K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}, I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}, F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (長期)
 $\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (短期)
 $\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (積雪時)
 $\omega = 900 \times 0.455 = 410 \text{ (N/m)} \rightarrow 4.10 \text{ (N/cm)}$ (長期たわみ)
 $P1 = 3244.61 \text{ (長期)} 3244.61 \text{ (短期)} 3699.45 \text{ (積雪時)} 2714.36 \text{ (長期たわみ)} \text{ (N)}$
 $P3 = 265.40 \text{ (長期)} 265.40 \text{ (短期)} 446.99 \text{ (積雪時)} 265.40 \text{ (長期たわみ)} \text{ (N)}$

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39, f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	51546	866.3	0.0	0.023	0.026
P1	147630	3244.6	0.0	0.044	0.074
P3	31583	265.4	0.0	0.019	0.038
Total	230758	4376.3	0.0	0.086	0.138

$M_{\max} / (Z \times f_b) = 230758 / (699.52 \times 538.56) = 0.61 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 4376.33) / (178.60 \times 66.00) = 0.56 \leq 1.0 \text{ OK}$
 $\delta = 0.086 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1380 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.138 \text{ (cm)} = 1/864 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79, f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.023
P1	147630	3244.6	0.0	0.044
P3	31583	265.4	0.0	0.019
Total	230758	4376.3	0.0	0.086

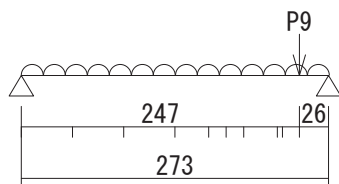
$M_{\max} / (Z \times f_b) = 230758 / (699.52 \times 979.20) = 0.34 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 4376.33) / (178.60 \times 120.00) = 0.31 \leq 1.0 \text{ OK}$
 $\delta = 0.086 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1380 \leq 1/250 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83, f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.023
P1	168325	3699.5	0.0	0.050
P3	53192	447.0	0.0	0.032
Total	273063	5012.8	0.0	0.105

$M_{\max} / (Z \times f_b) = 273063 / (699.52 \times 783.36) = 0.50 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 5012.76) / (178.60 \times 96.00) = 0.44 \leq 1.0 \text{ OK}$
 $\delta = 0.105 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1130 \leq 1/250 \text{ OK}$

階、位置： 2階梁 X3通り Y0 - Y3



S-P-F 2級 210 (3.8×23.5 (cm))
 $A = 89.30 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 349.76 \text{ (cm}^3\text{)}$, $I = 4109.66 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)}$ (長期たわみ)
 $P_9 = 2268.11 \text{ (長期)} \ 2268.11 \text{ (短期)} \ 2376.25 \text{ (積雪時)} \ 1747.96 \text{ (長期たわみ)} \text{ (N)}$

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	84777	1242.2	1242.2	0.167	0.217
P9	53355	216.0	2052.1	0.070	0.109
Total	138131	1458.2	3294.2	0.237	0.326

$M_{\max} / (Z \times f_b) = 138131 / (349.76 \times 538.56) = 0.73 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 3294.25) / (89.30 \times 66.00) = 0.84 \leq 1.0 \text{ OK}$
 $\delta = 0.237 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1150 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.326 \text{ (cm)} = 1/839 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.167
P9	53355	216.0	2052.1	0.070
Total	138131	1458.2	3294.2	0.237

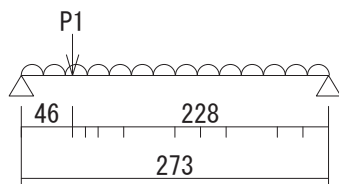
$M_{\max} / (Z \times f_b) = 138131 / (349.76 \times 979.20) = 0.40 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 3294.25) / (89.30 \times 120.00) = 0.46 \leq 1.0 \text{ OK}$
 $\delta = 0.237 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1150 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.167
P9	55898	226.3	2149.9	0.074
Total	140675	1468.5	3392.1	0.241

$M_{\max} / (Z \times f_b) = 140675 / (349.76 \times 783.36) = 0.51 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 3392.09) / (89.30 \times 96.00) = 0.59 \leq 1.0 \text{ OK}$
 $\delta = 0.241 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1134 \leq 1/150 \text{ OK}$

階、位置： 2階梁 X3通り Y3 - Y6



S-P-F 2級 210 (3.8×23.5 (cm))
 $A = 89.30 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 349.76 \text{ (cm}^3\text{)}$, $I = 4109.66 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)}$ (長期たわみ)
 $P1 = 1378.65$ (長期) 1378.65 (短期) 1378.65 (積雪時) 943.90 (長期たわみ) (N)

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	84777	1242.2	1242.2	0.167	0.217
P1	52274	1148.9	229.8	0.073	0.100
Total	137051	2391.0	1471.9	0.240	0.317

$M_{\max} / (Z \times f_b) = 137051 / (349.76 \times 538.56) = 0.73 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2391.03) / (89.30 \times 66.00) = 0.61 \leq 1.0 \text{ OK}$
 $\delta = 0.240 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1139 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.317 \text{ (cm)} = 1/862 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.167
P1	52274	1148.9	229.8	0.073
Total	137051	2391.0	1471.9	0.240

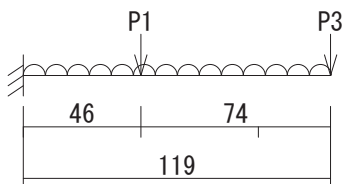
$M_{\max} / (Z \times f_b) = 137051 / (349.76 \times 979.20) = 0.40 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2391.03) / (89.30 \times 120.00) = 0.33 \leq 1.0 \text{ OK}$
 $\delta = 0.240 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1139 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.167
P1	52274	1148.9	229.8	0.073
Total	137051	2391.0	1471.9	0.240

$M_{\max} / (Z \times f_b) = 137051 / (349.76 \times 783.36) = 0.50 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2391.03) / (89.30 \times 96.00) = 0.42 \leq 1.0 \text{ OK}$
 $\delta = 0.240 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1139 \leq 1/150 \text{ OK}$

階、位置： 2階梁 X3通り Y6 - Y7.3



S-P-F 2級 210 (3.8×23.5 (cm))
 $A = 89.30 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 349.76 \text{ (cm}^3\text{)}$, $I = 4109.66 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (長期)
 $\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (短期)
 $\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (積雪時)
 $\omega = 900 \times 0.455 = 410 \text{ (N/m)} \rightarrow 4.10 \text{ (N/cm)}$ (長期たわみ)
 $P1 = 1213.41$ (長期) 1213.41 (短期) 1415.11 (積雪時) 998.17 (長期たわみ) (N)
 $P3 = 265.40$ (長期) 265.40 (短期) 446.99 (積雪時) 265.40 (長期たわみ) (N)

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	51546	866.3	0.0	0.046	0.052
P1	55210	1213.4	0.0	0.033	0.054
P3	31583	265.4	0.0	0.038	0.076
Total	138339	2345.1	0.0	0.117	0.182

$M_{\max} / (Z \times f_b) = 138339 / (349.76 \times 538.56) = 0.73 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2345.14) / (89.30 \times 66.00) = 0.60 \leq 1.0 \text{ OK}$
 $\delta = 0.117 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1016 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.182 \text{ (cm)} = 1/654 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.046
P1	55210	1213.4	0.0	0.033
P3	31583	265.4	0.0	0.038
Total	138339	2345.1	0.0	0.117

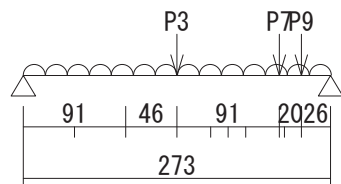
$M_{\max} / (Z \times f_b) = 138339 / (349.76 \times 979.20) = 0.40 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2345.14) / (89.30 \times 120.00) = 0.33 \leq 1.0 \text{ OK}$
 $\delta = 0.117 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1016 \leq 1/250 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.046
P1	64388	1415.1	0.0	0.039
P3	53192	447.0	0.0	0.064
Total	169126	2728.4	0.0	0.148

$M_{\max} / (Z \times f_b) = 169126 / (349.76 \times 783.36) = 0.62 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2728.42) / (89.30 \times 96.00) = 0.48 \leq 1.0 \text{ OK}$
 $\delta = 0.148 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/802 \leq 1/250 \text{ OK}$

階、位置： 2階梁 X3.5通り YO - Y3



S-P-F 2級 3 - 210 (3.8×23.5 (cm))
 $A = 267.90 \text{ (cm}^2\text{)}$, $Kz = 0.68$, $Ks = 1.15$
 $Z = 1049.28 \text{ (cm}^3\text{)}$, $I = 12328.98 \text{ (cm}^4\text{)}$
 $Fb = 21.60 \text{ (N/mm}^2\text{)}$, $Fs = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)}$ (長期たわみ)
 $\omega 1 \text{ (Y0 -Y1)} = 2818.58 \text{ (長期)} 2818.58 \text{ (短期)} 3518.33 \text{ (積雪時)} 2818.58 \text{ (長期たわみ)}$ (N)
 $\omega 2 \text{ (Y2.5 -Y2.5a)} = 2098.21 \text{ (長期)} 2098.21 \text{ (短期)} 2734.34 \text{ (積雪時)} 2098.21 \text{ (長期たわみ)}$ (N)
 $\omega 3 \text{ (Y2.5a-Y3)} = 260.00 \text{ (長期)} 260.00 \text{ (短期)} 260.00 \text{ (積雪時)} 260.00 \text{ (長期たわみ)}$ (N)
 $P3 = 1861.50 \text{ (長期)} 1861.50 \text{ (短期)} 2386.31 \text{ (積雪時)} 1742.06 \text{ (長期たわみ)}$ (N)
 $P7 = 204.75 \text{ (長期)} 204.75 \text{ (短期)} 204.75 \text{ (積雪時)} 133.09 \text{ (長期たわみ)}$ (N)
 $P9 = 1134.06 \text{ (長期)} 1134.06 \text{ (短期)} 1188.13 \text{ (積雪時)} 873.98 \text{ (長期たわみ)}$ (N)

長期 $fb=1.1 \times Kz \times Ks \times Fb / 3 = 6.19$, $fs=1.1 \times 1.00 \times Fs / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	84777	1242.2	1242.2	0.056	0.072
$\omega 1$	106871	2348.8	469.8	0.050	0.099
$\omega 2$	65188	274.8	1823.4	0.030	0.059
$\omega 3$	3219	12.4	247.6	0.001	0.003
P3	127047	930.8	930.8	0.067	0.125
P7	7763	34.1	170.6	0.004	0.005
P9	26677	108.0	1026.1	0.012	0.018
Total	421543	4951.0	5910.4	0.218	0.381

$M_{max} / (Z \times fb) = 421543 / (1049.28 \times 619.34) = 0.65 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 5910.40) / (267.90 \times 66.00) = 0.50 \leq 1.0 \text{ OK}$
 $\delta = 0.218 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1251 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.381 \text{ (cm)} = 1/717 \leq 1/250 \text{ OK}$

短期 $fb=2.0 \times Kz \times Ks \times Fb / 3 = 11.26$, $fs=2.0 \times 1.00 \times Fs / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.056
$\omega 1$	106871	2348.8	469.8	0.050
$\omega 2$	65188	274.8	1823.4	0.030
$\omega 3$	3219	12.4	247.6	0.001
P3	127047	930.8	930.8	0.067
P7	7763	34.1	170.6	0.004
P9	26677	108.0	1026.1	0.012
Total	421543	4951.0	5910.4	0.218

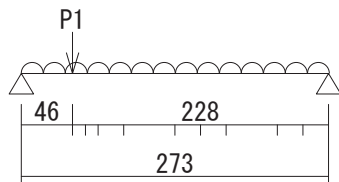
$M_{max} / (Z \times fb) = 421543 / (1049.28 \times 1126.08) = 0.36 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 5910.40) / (267.90 \times 120.00) = 0.28 \leq 1.0 \text{ OK}$
 $\delta = 0.218 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1251 \leq 1/150 \text{ OK}$

積雪時 $fb=0.8 \times 2.0 \times Kz \times Ks \times Fb / 3 = 9.01$, $fs=0.8 \times 2.0 \times 1.00 \times Fs / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.056
$\omega 1$	133403	2931.9	586.4	0.062
$\omega 2$	84952	358.1	2376.3	0.038
$\omega 3$	3219	12.4	247.6	0.001
P3	162866	1193.2	1193.2	0.085
P7	7763	34.1	170.6	0.004
P9	27949	113.2	1075.0	0.012
Total	504929	5885.0	6891.2	0.259

$M_{max} / (Z \times fb) = 504929 / (1049.28 \times 900.86) = 0.53 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{max}) / (A \times fs) = (1.50 \times 6891.18) / (267.90 \times 96.00) = 0.40 \leq 1.0 \text{ OK}$
 $\delta = 0.259 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1055 \leq 1/150 \text{ OK}$

階、位置： 2階梁 X3.5通り Y3 - Y6



S-P-F 2級 2 - 210 (3.8 × 23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}, K_z = 0.68, K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}, I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}, F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)}$ (長期たわみ)
 $\omega 1 (Y3 - Y3.5) = 455.00 \text{ (長期)} \quad 455.00 \text{ (短期)} \quad 455.00 \text{ (積雪時)} \quad 455.00 \text{ (長期たわみ)} \text{ (N)}$
 $P1 = 689.33 \text{ (長期)} \quad 689.33 \text{ (短期)} \quad 689.33 \text{ (積雪時)} \quad 471.95 \text{ (長期たわみ)} \text{ (N)}$

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39, f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	84777	1242.2	1242.2	0.083	0.108
$\omega 1$	9489	417.1	37.9	0.006	0.012
P1	26137	574.4	114.9	0.018	0.025
Total	120402	2233.7	1395.0	0.108	0.146

$M_{\max} / (Z \times f_b) = 120402 / (699.52 \times 538.56) = 0.32 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2233.67) / (178.60 \times 66.00) = 0.28 \leq 1.0 \text{ OK}$
 $\delta = 0.108 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/2532 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.146 \text{ (cm)} = 1/1873 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79, f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.083
$\omega 1$	9489	417.1	37.9	0.006
P1	26137	574.4	114.9	0.018
Total	120402	2233.7	1395.0	0.108

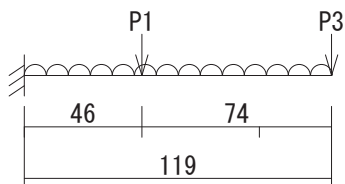
$M_{\max} / (Z \times f_b) = 120402 / (699.52 \times 979.20) = 0.18 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2233.67) / (178.60 \times 120.00) = 0.16 \leq 1.0 \text{ OK}$
 $\delta = 0.108 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/2532 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83, f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.083
$\omega 1$	9489	417.1	37.9	0.006
P1	26137	574.4	114.9	0.018
Total	120402	2233.7	1395.0	0.108

$M_{\max} / (Z \times f_b) = 120402 / (699.52 \times 783.36) = 0.22 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2233.67) / (178.60 \times 96.00) = 0.20 \leq 1.0 \text{ OK}$
 $\delta = 0.108 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/2532 \leq 1/150 \text{ OK}$

階、位置： 2階梁 X3.5通り Y6 - Y7.3



S-P-F 2級 2 - 210 (3.8 × 23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}$, $I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (長期)
 $\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (短期)
 $\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (積雪時)
 $\omega = 900 \times 0.455 = 410 \text{ (N/m)} \rightarrow 4.10 \text{ (N/cm)}$ (長期たわみ)
 $P1 = 1627.48$ (長期) 1627.48 (短期) 1961.44 (積雪時) 1395.13 (長期たわみ) (N)
 $P3 = 265.40$ (長期) 265.40 (短期) 446.99 (積雪時) 265.40 (長期たわみ) (N)

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	51546	866.3	0.0	0.023	0.026
P1	74050	1627.5	0.0	0.022	0.038
P3	31583	265.4	0.0	0.019	0.038
Total	157179	2759.2	0.0	0.064	0.102

$M_{\max} / (Z \times f_b) = 157179 / (699.52 \times 538.56) = 0.42 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2759.20) / (178.60 \times 66.00) = 0.35 \leq 1.0 \text{ OK}$
 $\delta = 0.064 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1854 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.102 \text{ (cm)} = 1/1169 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.023
P1	74050	1627.5	0.0	0.022
P3	31583	265.4	0.0	0.019
Total	157179	2759.2	0.0	0.064

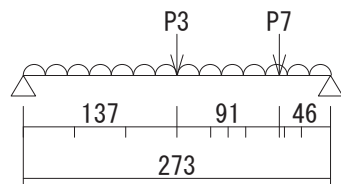
$M_{\max} / (Z \times f_b) = 157179 / (699.52 \times 979.20) = 0.23 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2759.20) / (178.60 \times 120.00) = 0.19 \leq 1.0 \text{ OK}$
 $\delta = 0.064 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1854 \leq 1/250 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.023
P1	89245	1961.4	0.0	0.027
P3	53192	447.0	0.0	0.032
Total	193984	3274.8	0.0	0.082

$M_{\max} / (Z \times f_b) = 193984 / (699.52 \times 783.36) = 0.35 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 3274.75) / (178.60 \times 96.00) = 0.29 \leq 1.0 \text{ OK}$
 $\delta = 0.082 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1457 \leq 1/250 \text{ OK}$

階、位置： 2階梁 X3.8通り Y0 - Y3



S-P-F 2級 210 (3.8×23.5 (cm))
 $A = 89.30 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 349.76 \text{ (cm}^3\text{)}$, $I = 4109.66 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)}$ (長期たわみ)
 $P3 = 785.38$ (長期) 785.38 (短期) 785.38 (積雪時) 542.52 (長期たわみ) (N)
 $P7 = 416.33$ (長期) 416.33 (短期) 416.33 (積雪時) 270.61 (長期たわみ) (N)

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	84777	1242.2	1242.2	0.167	0.217
P3	53602	392.7	392.7	0.084	0.117
P7	15786	69.4	346.9	0.022	0.029
Total	154164	1704.2	1981.8	0.273	0.362

$M_{\max} / (Z \times f_b) = 154164 / (349.76 \times 538.56) = 0.82 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 1981.78) / (89.30 \times 66.00) = 0.50 \leq 1.0 \text{ OK}$
 $\delta = 0.273 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/999 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.362 \text{ (cm)} = 1/754 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.167
P3	53602	392.7	392.7	0.084
P7	15786	69.4	346.9	0.022
Total	154164	1704.2	1981.8	0.273

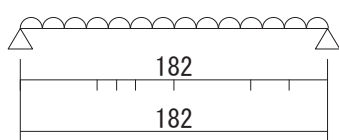
$M_{\max} / (Z \times f_b) = 154164 / (349.76 \times 979.20) = 0.45 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 1981.78) / (89.30 \times 120.00) = 0.28 \leq 1.0 \text{ OK}$
 $\delta = 0.273 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/999 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.167
P3	53602	392.7	392.7	0.084
P7	15786	69.4	346.9	0.022
Total	154164	1704.2	1981.8	0.273

$M_{\max} / (Z \times f_b) = 154164 / (349.76 \times 783.36) = 0.56 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 1981.78) / (89.30 \times 96.00) = 0.35 \leq 1.0 \text{ OK}$
 $\delta = 0.273 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/999 \leq 1/150 \text{ OK}$

階、位置： 2階梁 X4通り Y3 - Y5



S-P-F 2級 2 - 210 (3.8 × 23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}$, $I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$$\begin{aligned} \omega &= 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)} \text{ (長期)} \\ \omega &= 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)} \text{ (短期)} \\ \omega &= 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)} \text{ (積雪時)} \\ \omega &= 1300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)} \text{ (長期たわみ)} \end{aligned}$$

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	37679	828.1	828.1	0.016	0.021
Total	37679	828.1	828.1	0.016	0.021

$$\begin{aligned} M_{\max} / (Z \times f_b) &= 37679 / (699.52 \times 538.56) = 0.10 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 828.10) / (178.60 \times 66.00) = 0.11 \leq 1.0 \text{ OK} \\ \delta &= 0.016 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/11046 \leq 1/250 \text{ OK} \\ \delta' \times 2.0 &= 0.021 \text{ (cm)} = 1/8497 \leq 1/250 \text{ OK} \end{aligned}$$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	37679	828.1	828.1	0.016
Total	37679	828.1	828.1	0.016

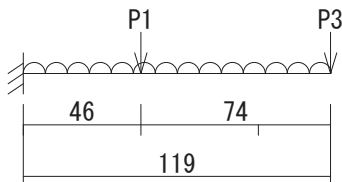
$$\begin{aligned} M_{\max} / (Z \times f_b) &= 37679 / (699.52 \times 979.20) = 0.06 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 828.10) / (178.60 \times 120.00) = 0.06 \leq 1.0 \text{ OK} \\ \delta &= 0.016 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/11046 \leq 1/150 \text{ OK} \end{aligned}$$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	37679	828.1	828.1	0.016
Total	37679	828.1	828.1	0.016

$$\begin{aligned} M_{\max} / (Z \times f_b) &= 37679 / (699.52 \times 783.36) = 0.07 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 828.10) / (178.60 \times 96.00) = 0.07 \leq 1.0 \text{ OK} \\ \delta &= 0.016 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/11046 \leq 1/150 \text{ OK} \end{aligned}$$

階、位置： 2階梁 X4通り Y6 - Y7.3



S-P-F 2級 2 - 210 (3.8 × 23.5 (cm))
 $A = 178.60$ (cm²), $K_z = 0.68$, $K_s = 1.00$
 $Z = 699.52$ (cm³), $I = 8219.32$ (cm⁴)
 $F_b = 21.60$ (N/mm²), $F_s = 1.80$ (N/mm²)
 許容せん断 割増係数 1.00
 $E = 9600.0$ (N/mm²)

$\omega = 1600 \times 0.455 = 728$ (N/m) → 7.28 (N/cm) (長期)
 $\omega = 1600 \times 0.455 = 728$ (N/m) → 7.28 (N/cm) (短期)
 $\omega = 1600 \times 0.455 = 728$ (N/m) → 7.28 (N/cm) (積雪時)
 $\omega = 900 \times 0.455 = 410$ (N/m) → 4.10 (N/cm) (長期たわみ)
 $P1 = 4572.14$ (長期) 4572.14 (短期) 5451.03 (積雪時) 3987.05 (長期たわみ) (N)
 $P3 = 265.40$ (長期) 265.40 (短期) 446.99 (積雪時) 265.40 (長期たわみ) (N)

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66$ (N/mm²)

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	51546	866.3	0.0	0.023	0.026
P1	208032	4572.1	0.0	0.062	0.109
P3	31583	265.4	0.0	0.019	0.038
Total	291161	5703.9	0.0	0.104	0.172

$M_{max} / (Z \times f_b) = 291161 / (699.52 \times 538.56) = 0.77 \leq 1.0$ OK
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 5703.86) / (178.60 \times 66.00) = 0.73 \leq 1.0$ OK
 $\delta = 0.104$ (cm) ≤ 2.00 OK
 $= 1/1141 \leq 1/250$ OK
 $\delta' \times 2.0 = 0.172$ (cm) $= 1/690 \leq 1/250$ OK

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20$ (N/mm²)

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.023
P1	208032	4572.1	0.0	0.062
P3	31583	265.4	0.0	0.019
Total	291161	5703.9	0.0	0.104

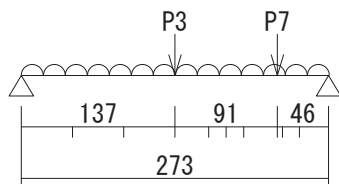
$M_{max} / (Z \times f_b) = 291161 / (699.52 \times 979.20) = 0.43 \leq 1.0$ OK
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 5703.86) / (178.60 \times 120.00) = 0.40 \leq 1.0$ OK
 $\delta = 0.104$ (cm) ≤ 2.00 OK
 $= 1/1141 \leq 1/250$ OK

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96$ (N/mm²)

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.023
P1	248022	5451.0	0.0	0.074
P3	53192	447.0	0.0	0.032
Total	352760	6764.3	0.0	0.129

$M_{max} / (Z \times f_b) = 352760 / (699.52 \times 783.36) = 0.64 \leq 1.0$ OK
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 6764.34) / (178.60 \times 96.00) = 0.59 \leq 1.0$ OK
 $\delta = 0.129$ (cm) ≤ 2.00 OK
 $= 1/921 \leq 1/250$ OK

階、位置： 2階梁 X4.1通り Y0 - Y3



S-P-F 2級 2 - 210 (3.8×23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}$, $I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)}$ (長期たわみ)
 $\omega 1 (Y0 - Y1.5) = 1365.00 \text{ (長期)} \quad 1365.00 \text{ (短期)} \quad 1365.00 \text{ (積雪時)} \quad 1365.00 \text{ (長期たわみ)}$ (N)
 $P3 = 740.38 \text{ (長期)} \quad 740.38 \text{ (短期)} \quad 740.38 \text{ (積雪時)} \quad 497.52 \text{ (長期たわみ)}$ (N)
 $P7 = 416.33 \text{ (長期)} \quad 416.33 \text{ (短期)} \quad 416.33 \text{ (積雪時)} \quad 270.61 \text{ (長期たわみ)}$ (N)

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	84777	1242.2	1242.2	0.083	0.108
$\omega 1$	69871	1023.8	341.3	0.051	0.102
P3	50531	370.2	370.2	0.040	0.053
P7	15786	69.4	346.9	0.011	0.014
Total	220964	2705.5	2300.5	0.185	0.279

$M_{\max} / (Z \times f_b) = 220964 / (699.52 \times 538.56) = 0.59 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2705.48) / (178.60 \times 66.00) = 0.34 \leq 1.0 \text{ OK}$
 $\delta = 0.185 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1472 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.279 \text{ (cm)} = 1/980 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.083
$\omega 1$	69871	1023.8	341.3	0.051
P3	50531	370.2	370.2	0.040
P7	15786	69.4	346.9	0.011
Total	220964	2705.5	2300.5	0.185

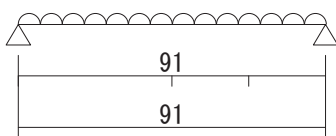
$M_{\max} / (Z \times f_b) = 220964 / (699.52 \times 979.20) = 0.32 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2705.48) / (178.60 \times 120.00) = 0.19 \leq 1.0 \text{ OK}$
 $\delta = 0.185 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1472 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.083
$\omega 1$	69871	1023.8	341.3	0.051
P3	50531	370.2	370.2	0.040
P7	15786	69.4	346.9	0.011
Total	220964	2705.5	2300.5	0.185

$M_{\max} / (Z \times f_b) = 220964 / (699.52 \times 783.36) = 0.40 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2705.48) / (178.60 \times 96.00) = 0.24 \leq 1.0 \text{ OK}$
 $\delta = 0.185 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1472 \leq 1/150 \text{ OK}$

階、位置： 2階梁 X4.5通り Y5 - Y6



S-P-F 2級 2 - 210 (3.8 × 23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}, K_z = 0.68, K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}, I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}, F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$$\begin{aligned} \omega &= 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)} \text{ (長期)} \\ \omega &= 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)} \text{ (短期)} \\ \omega &= 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)} \text{ (積雪時)} \\ \omega &= 1300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)} \text{ (長期たわみ)} \\ \omega 1 (\text{Y5 - Y6}) &= 273.00 \text{ (長期)} \quad 273.00 \text{ (短期)} \quad 273.00 \text{ (積雪時)} \quad 273.00 \text{ (長期たわみ)} \text{ (N)} \end{aligned}$$

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	9420	414.1	414.1	0.001	0.001
$\omega 1$	3105	136.5	136.5	0.000	0.001
Total	12525	550.6	550.6	0.001	0.002

$$\begin{aligned} M_{\max} / (Z \times f_b) &= 12525 / (699.52 \times 538.56) = 0.03 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 550.55) / (178.60 \times 66.00) = 0.07 \leq 1.0 \text{ OK} \\ \delta &= 0.001 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/66460 \leq 1/250 \text{ OK} \\ \delta' \times 2.0 &= 0.002 \text{ (cm)} = 1/45102 \leq 1/250 \text{ OK} \end{aligned}$$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	9420	414.1	414.1	0.001
$\omega 1$	3105	136.5	136.5	0.000
Total	12525	550.6	550.6	0.001

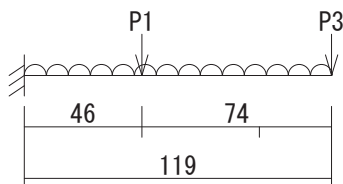
$$\begin{aligned} M_{\max} / (Z \times f_b) &= 12525 / (699.52 \times 979.20) = 0.02 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 550.55) / (178.60 \times 120.00) = 0.04 \leq 1.0 \text{ OK} \\ \delta &= 0.001 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/66460 \leq 1/150 \text{ OK} \end{aligned}$$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	9420	414.1	414.1	0.001
$\omega 1$	3105	136.5	136.5	0.000
Total	12525	550.6	550.6	0.001

$$\begin{aligned} M_{\max} / (Z \times f_b) &= 12525 / (699.52 \times 783.36) = 0.02 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 550.55) / (178.60 \times 96.00) = 0.05 \leq 1.0 \text{ OK} \\ \delta &= 0.001 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/66460 \leq 1/150 \text{ OK} \end{aligned}$$

階、位置： 2階梁 X4.5通り Y6 - Y7.3



S-P-F 2級 2 - 210 (3.8×23.5 (cm))
 $A = 178.60$ (cm²), $K_z = 0.68$, $K_s = 1.00$
 $Z = 699.52$ (cm³), $I = 8219.32$ (cm⁴)
 $F_b = 21.60$ (N/mm²), $F_s = 1.80$ (N/mm²)
 許容せん断 割増係数 1.00
 $E = 9600.0$ (N/mm²)

$\omega = 1600 \times 0.455 = 728$ (N/m) $\rightarrow 7.28$ (N/cm) (長期)
 $\omega = 1600 \times 0.455 = 728$ (N/m) $\rightarrow 7.28$ (N/cm) (短期)
 $\omega = 1600 \times 0.455 = 728$ (N/m) $\rightarrow 7.28$ (N/cm) (積雪時)
 $\omega = 900 \times 0.455 = 410$ (N/m) $\rightarrow 4.10$ (N/cm) (長期たわみ)
 $\omega 1$ (Y6 -Y6.5) = 136.50 (長期) 136.50 (短期) 136.50 (積雪時) 136.50 (長期たわみ) (N)
 $P1 = 3238.70$ (長期) 3238.70 (短期) 3865.25 (積雪時) 2819.71 (長期たわみ) (N)
 $P3 = 220.20$ (長期) 220.20 (短期) 370.86 (積雪時) 220.20 (長期たわみ) (N)

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66$ (N/mm²)

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	51546	866.3	0.0	0.023	0.026
$\omega 1$	3105	136.5	0.0	0.000	0.001
P1	147361	3238.7	0.0	0.044	0.077
P3	26203	220.2	0.0	0.016	0.031
Total	228216	4461.7	0.0	0.083	0.135

$M_{max} / (Z \times f_b) = 228216 / (699.52 \times 538.56) = 0.61 \leq 1.0$ OK
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 4461.72) / (178.60 \times 66.00) = 0.57 \leq 1.0$ OK
 $\delta = 0.083$ (cm) ≤ 2.00 OK
 $= 1/1427 \leq 1/250$ OK
 $\delta' \times 2.0 = 0.135$ (cm) $= 1/880 \leq 1/250$ OK

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20$ (N/mm²)

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.023
$\omega 1$	3105	136.5	0.0	0.000
P1	147361	3238.7	0.0	0.044
P3	26203	220.2	0.0	0.016
Total	228216	4461.7	0.0	0.083

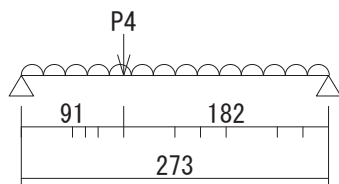
$M_{max} / (Z \times f_b) = 228216 / (699.52 \times 979.20) = 0.33 \leq 1.0$ OK
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 4461.72) / (178.60 \times 120.00) = 0.31 \leq 1.0$ OK
 $\delta = 0.083$ (cm) ≤ 2.00 OK
 $= 1/1427 \leq 1/250$ OK

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96$ (N/mm²)

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.023
$\omega 1$	3105	136.5	0.0	0.000
P1	175869	3865.2	0.0	0.053
P3	44132	370.9	0.0	0.026
Total	274652	5238.9	0.0	0.103

$M_{max} / (Z \times f_b) = 274652 / (699.52 \times 783.36) = 0.50 \leq 1.0$ OK
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 5238.92) / (178.60 \times 96.00) = 0.46 \leq 1.0$ OK
 $\delta = 0.103$ (cm) ≤ 2.00 OK
 $= 1/1159 \leq 1/250$ OK

階、位置： 2階梁 X4.8通り Y3 - Y6



S-P-F 2級 210 (3.8×23.5 (cm))
 $A = 89.30 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 349.76 \text{ (cm}^3\text{)}$, $I = 4109.66 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)}$ (長期たわみ)
 $P4 = 1137.65 \text{ (長期)} \ 1137.65 \text{ (短期)} \ 1137.65 \text{ (積雪時)} \ 846.22 \text{ (長期たわみ)} \text{ (N)}$

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	84777	1242.2	1242.2	0.167	0.217
P4	69017	758.4	379.2	0.105	0.156
Total	153794	2000.6	1621.4	0.272	0.373

$M_{\max} / (Z \times f_b) = 153794 / (349.76 \times 538.56) = 0.82 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2000.58) / (89.30 \times 66.00) = 0.51 \leq 1.0 \text{ OK}$
 $\delta = 0.272 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1004 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.373 \text{ (cm)} = 1/731 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.167
P4	69017	758.4	379.2	0.105
Total	153794	2000.6	1621.4	0.272

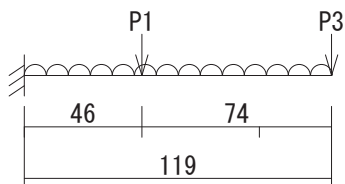
$M_{\max} / (Z \times f_b) = 153794 / (349.76 \times 979.20) = 0.45 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2000.58) / (89.30 \times 120.00) = 0.28 \leq 1.0 \text{ OK}$
 $\delta = 0.272 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1004 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.167
P4	69017	758.4	379.2	0.105
Total	153794	2000.6	1621.4	0.272

$M_{\max} / (Z \times f_b) = 153794 / (349.76 \times 783.36) = 0.56 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2000.58) / (89.30 \times 96.00) = 0.35 \leq 1.0 \text{ OK}$
 $\delta = 0.272 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1004 \leq 1/150 \text{ OK}$

階、位置： 2階梁 X4.8通り Y6 - Y7.3



S-P-F 2級 210 (3.8 × 23.5 (cm))
 $A = 89.30 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 349.76 \text{ (cm}^3\text{)}$, $I = 4109.66 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (長期)
 $\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (短期)
 $\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (積雪時)
 $\omega = 900 \times 0.455 = 410 \text{ (N/m)} \rightarrow 4.10 \text{ (N/cm)}$ (長期たわみ)
 $P1 = 356.84$ (長期) 356.84 (短期) 444.86 (積雪時) 289.03 (長期たわみ) (N)
 $P3 = 177.91$ (長期) 177.91 (短期) 299.63 (積雪時) 177.91 (長期たわみ) (N)

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	51546	866.3	0.0	0.046	0.052
P1	16236	356.8	0.0	0.010	0.016
P3	21171	177.9	0.0	0.025	0.051
Total	88953	1401.1	0.0	0.081	0.118

$M_{\max} / (Z \times f_b) = 88953 / (349.76 \times 538.56) = 0.47 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 1401.07) / (89.30 \times 66.00) = 0.36 \leq 1.0 \text{ OK}$
 $\delta = 0.081 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1464 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.118 \text{ (cm)} = 1/1005 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.046
P1	16236	356.8	0.0	0.010
P3	21171	177.9	0.0	0.025
Total	88953	1401.1	0.0	0.081

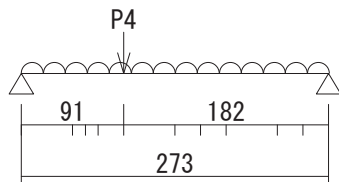
$M_{\max} / (Z \times f_b) = 88953 / (349.76 \times 979.20) = 0.26 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 1401.07) / (89.30 \times 120.00) = 0.20 \leq 1.0 \text{ OK}$
 $\delta = 0.081 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1464 \leq 1/250 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.046
P1	20241	444.9	0.0	0.012
P3	35656	299.6	0.0	0.043
Total	107443	1610.8	0.0	0.101

$M_{\max} / (Z \times f_b) = 107443 / (349.76 \times 783.36) = 0.39 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 1610.81) / (89.30 \times 96.00) = 0.28 \leq 1.0 \text{ OK}$
 $\delta = 0.101 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1178 \leq 1/250 \text{ OK}$

階、位置： 2階梁 X5.1通り Y3 - Y6



S-P-F 2級 210 (3.8×23.5 (cm))
 $A = 89.30 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 349.76 \text{ (cm}^3\text{)}$, $I = 4109.66 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (長期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (短期)
 $\omega = 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)}$ (積雪時)
 $\omega = 1300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)}$ (長期たわみ)
 $P4 = 1137.65 \text{ (長期)} \ 1137.65 \text{ (短期)} \ 1137.65 \text{ (積雪時)} \ 846.22 \text{ (長期たわみ)} \text{ (N)}$

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	84777	1242.2	1242.2	0.167	0.217
P4	69017	758.4	379.2	0.105	0.156
Total	153794	2000.6	1621.4	0.272	0.373

$M_{\max} / (Z \times f_b) = 153794 / (349.76 \times 538.56) = 0.82 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2000.58) / (89.30 \times 66.00) = 0.51 \leq 1.0 \text{ OK}$
 $\delta = 0.272 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1004 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.373 \text{ (cm)} = 1/731 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.167
P4	69017	758.4	379.2	0.105
Total	153794	2000.6	1621.4	0.272

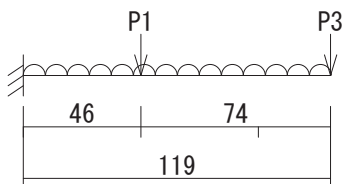
$M_{\max} / (Z \times f_b) = 153794 / (349.76 \times 979.20) = 0.45 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2000.58) / (89.30 \times 120.00) = 0.28 \leq 1.0 \text{ OK}$
 $\delta = 0.272 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1004 \leq 1/150 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	84777	1242.2	1242.2	0.167
P4	69017	758.4	379.2	0.105
Total	153794	2000.6	1621.4	0.272

$M_{\max} / (Z \times f_b) = 153794 / (349.76 \times 783.36) = 0.56 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2000.58) / (89.30 \times 96.00) = 0.35 \leq 1.0 \text{ OK}$
 $\delta = 0.272 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1004 \leq 1/150 \text{ OK}$

階、位置： 2階梁 X5.1通り Y6 - Y7.3



S-P-F 2級 210 (3.8×23.5 (cm))
 $A = 89.30 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 349.76 \text{ (cm}^3\text{)}$, $I = 4109.66 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (長期)
 $\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (短期)
 $\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (積雪時)
 $\omega = 900 \times 0.455 = 410 \text{ (N/m)} \rightarrow 4.10 \text{ (N/cm)}$ (長期たわみ)
 $P1 = 249.47$ (長期) 249.47 (短期) 316.13 (積雪時) 200.90 (長期たわみ) (N)
 $P3 = 177.91$ (長期) 177.91 (短期) 299.63 (積雪時) 177.91 (長期たわみ) (N)

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	51546	866.3	0.0	0.046	0.052
P1	11351	249.5	0.0	0.007	0.011
P3	21171	177.9	0.0	0.025	0.051
Total	84068	1293.7	0.0	0.078	0.114

$M_{\max} / (Z \times f_b) = 84068 / (349.76 \times 538.56) = 0.45 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 1293.69) / (89.30 \times 66.00) = 0.33 \leq 1.0 \text{ OK}$
 $\delta = 0.078 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1518 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.114 \text{ (cm)} = 1/1047 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.046
P1	11351	249.5	0.0	0.007
P3	21171	177.9	0.0	0.025
Total	84068	1293.7	0.0	0.078

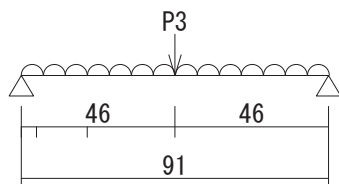
$M_{\max} / (Z \times f_b) = 84068 / (349.76 \times 979.20) = 0.25 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 1293.69) / (89.30 \times 120.00) = 0.18 \leq 1.0 \text{ OK}$
 $\delta = 0.078 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1518 \leq 1/250 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.046
P1	14384	316.1	0.0	0.009
P3	35656	299.6	0.0	0.043
Total	101586	1482.1	0.0	0.098

$M_{\max} / (Z \times f_b) = 101586 / (349.76 \times 783.36) = 0.37 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 1482.08) / (89.30 \times 96.00) = 0.26 \leq 1.0 \text{ OK}$
 $\delta = 0.098 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1220 \leq 1/250 \text{ OK}$

階、位置： 2階梁 X5.5通り Y2.5 - Y3.5



S-P-F 2級 2 - 210 (3.8 × 23.5 (cm))
 $A = 178.60$ (cm²), $K_z = 0.68$, $K_s = 1.00$
 $Z = 699.52$ (cm³), $I = 8219.32$ (cm⁴)
 $F_b = 21.60$ (N/mm²), $F_s = 1.80$ (N/mm²)
 許容せん断 割増係数 1.00
 $E = 9600.0$ (N/mm²)

$\omega = 2000 \times 0.228 + 300 \times 0.455 = 592$ (N/m) → 5.92 (N/cm) (長期)
 $\omega = 2000 \times 0.228 + 300 \times 0.455 = 592$ (N/m) → 5.92 (N/cm) (短期)
 $\omega = 2000 \times 0.228 + 300 \times 0.455 = 592$ (N/m) → 5.92 (N/cm) (積雪時)
 $\omega = 1300 \times 0.228 + 300 \times 0.455 = 432$ (N/m) → 4.32 (N/cm) (長期たわみ)
 $\omega 1 (Y2.5 - Y3.5) = 910.00$ (長期) 910.00 (短期) 910.00 (積雪時) 910.00 (長期たわみ) (N)
 $P3 = 1795.66$ (長期) 1795.66 (短期) 1795.66 (積雪時) 1286.85 (長期たわみ) (N)

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66$ (N/mm²)

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	6123	269.1	269.1	0.001	0.001
$\omega 1$	10351	455.0	455.0	0.001	0.002
P3	40851	897.8	897.8	0.004	0.005
Total	57325	1622.0	1622.0	0.005	0.008

$M_{max} / (Z \times f_b) = 57325 / (699.52 \times 538.56) = 0.15 \leq 1.0$ OK
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 1621.96) / (178.60 \times 66.00) = 0.21 \leq 1.0$ OK
 $\delta = 0.005$ (cm) ≤ 2.00 OK
 $= 1/16934 \leq 1/250$ OK
 $\delta' \times 2.0 = 0.008$ (cm) $= 1/10882 \leq 1/250$ OK

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20$ (N/mm²)

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	6123	269.1	269.1	0.001
$\omega 1$	10351	455.0	455.0	0.001
P3	40851	897.8	897.8	0.004
Total	57325	1622.0	1622.0	0.005

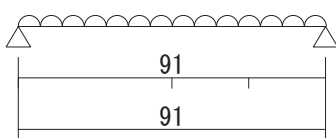
$M_{max} / (Z \times f_b) = 57325 / (699.52 \times 979.20) = 0.08 \leq 1.0$ OK
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 1621.96) / (178.60 \times 120.00) = 0.11 \leq 1.0$ OK
 $\delta = 0.005$ (cm) ≤ 2.00 OK
 $= 1/16934 \leq 1/150$ OK

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96$ (N/mm²)

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	6123	269.1	269.1	0.001
$\omega 1$	10351	455.0	455.0	0.001
P3	40851	897.8	897.8	0.004
Total	57325	1622.0	1622.0	0.005

$M_{max} / (Z \times f_b) = 57325 / (699.52 \times 783.36) = 0.10 \leq 1.0$ OK
 $(\alpha \times Q_{max}) / (A \times f_s) = (1.50 \times 1621.96) / (178.60 \times 96.00) = 0.14 \leq 1.0$ OK
 $\delta = 0.005$ (cm) ≤ 2.00 OK
 $= 1/16934 \leq 1/150$ OK

階、位置： 2階梁 X5.5通り Y5 - Y6



S-P-F 2級 2 - 210 (3.8 × 23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}, K_z = 0.68, K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}, I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}, F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$$\begin{aligned} \omega &= 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)} \text{ (長期)} \\ \omega &= 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)} \text{ (短期)} \\ \omega &= 2000 \times 0.455 = 910 \text{ (N/m)} \rightarrow 9.10 \text{ (N/cm)} \text{ (積雪時)} \\ \omega &= 1300 \times 0.455 = 592 \text{ (N/m)} \rightarrow 5.92 \text{ (N/cm)} \text{ (長期たわみ)} \end{aligned}$$

長期 $fb = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39, fs = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	9420	414.1	414.1	0.001	0.001
Total	9420	414.1	414.1	0.001	0.001

$$\begin{aligned} M_{\max} / (Z \times fb) &= 9420 / (699.52 \times 538.56) = 0.03 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times fs) &= (1.50 \times 414.05) / (178.60 \times 66.00) = 0.05 \leq 1.0 \text{ OK} \\ \delta &= 0.001 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/88370 \leq 1/250 \text{ OK} \\ \delta' \times 2.0 &= 0.001 \text{ (cm)} = 1/67977 \leq 1/250 \text{ OK} \end{aligned}$$

短期 $fb = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79, fs = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	9420	414.1	414.1	0.001
Total	9420	414.1	414.1	0.001

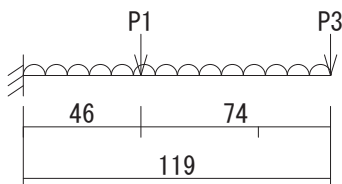
$$\begin{aligned} M_{\max} / (Z \times fb) &= 9420 / (699.52 \times 979.20) = 0.01 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times fs) &= (1.50 \times 414.05) / (178.60 \times 120.00) = 0.03 \leq 1.0 \text{ OK} \\ \delta &= 0.001 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/88370 \leq 1/150 \text{ OK} \end{aligned}$$

積雪時 $fb = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83, fs = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	9420	414.1	414.1	0.001
Total	9420	414.1	414.1	0.001

$$\begin{aligned} M_{\max} / (Z \times fb) &= 9420 / (699.52 \times 783.36) = 0.02 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times fs) &= (1.50 \times 414.05) / (178.60 \times 96.00) = 0.04 \leq 1.0 \text{ OK} \\ \delta &= 0.001 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/88370 \leq 1/150 \text{ OK} \end{aligned}$$

階、位置： 2階梁 X5.5通り Y6 - Y7.3



S-P-F 2級 2 - 210 (3.8 × 23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}, K_z = 0.68, K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}, I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}, F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (長期)
 $\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (短期)
 $\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (積雪時)
 $\omega = 900 \times 0.455 = 410 \text{ (N/m)} \rightarrow 4.10 \text{ (N/cm)}$ (長期たわみ)
 $P1 = 938.64 \text{ (長期)} \quad 938.64 \text{ (短期)} \quad 1113.28 \text{ (積雪時)} \quad 890.86 \text{ (長期たわみ)} \text{ (N)}$
 $P3 = 174.99 \text{ (長期)} \quad 174.99 \text{ (短期)} \quad 294.72 \text{ (積雪時)} \quad 174.99 \text{ (長期たわみ)} \text{ (N)}$

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39, f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	51546	866.3	0.0	0.023	0.026
P1	42708	938.6	0.0	0.013	0.024
P3	20824	175.0	0.0	0.012	0.025
Total	115078	1980.0	0.0	0.048	0.075

$M_{\max} / (Z \times f_b) = 115078 / (699.52 \times 538.56) = 0.31 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 1979.95) / (178.60 \times 66.00) = 0.25 \leq 1.0 \text{ OK}$
 $\delta = 0.048 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/2460 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.075 \text{ (cm)} = 1/1582 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79, f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.023
P1	42708	938.6	0.0	0.013
P3	20824	175.0	0.0	0.012
Total	115078	1980.0	0.0	0.048

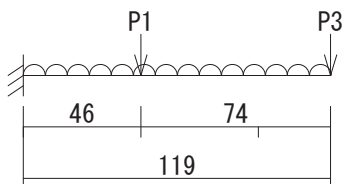
$M_{\max} / (Z \times f_b) = 115078 / (699.52 \times 979.20) = 0.17 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 1979.95) / (178.60 \times 120.00) = 0.14 \leq 1.0 \text{ OK}$
 $\delta = 0.048 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/2460 \leq 1/250 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83, f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.023
P1	50654	1113.3	0.0	0.015
P3	35072	294.7	0.0	0.021
Total	137272	2274.3	0.0	0.059

$M_{\max} / (Z \times f_b) = 137272 / (699.52 \times 783.36) = 0.25 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2274.32) / (178.60 \times 96.00) = 0.20 \leq 1.0 \text{ OK}$
 $\delta = 0.059 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/2008 \leq 1/250 \text{ OK}$

階、位置： 2階梁 X5.8通り Y6 - Y7.3



S-P-F 2級 210 (3.8×23.5 (cm))
 $A = 89.30 \text{ (cm}^2\text{)}$, $K_z = 0.68$, $K_s = 1.00$
 $Z = 349.76 \text{ (cm}^3\text{)}$, $I = 4109.66 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (長期)
 $\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (短期)
 $\omega = 1600 \times 0.455 = 728 \text{ (N/m)} \rightarrow 7.28 \text{ (N/cm)}$ (積雪時)
 $\omega = 900 \times 0.455 = 410 \text{ (N/m)} \rightarrow 4.10 \text{ (N/cm)}$ (長期たわみ)
 $P1 = 1170.88$ (長期) 1170.88 (短期) 1382.51 (積雪時) 1122.30 (長期たわみ) (N)
 $P3 = 177.91$ (長期) 177.91 (短期) 299.63 (積雪時) 177.91 (長期たわみ) (N)

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	51546	866.3	0.0	0.046	0.052
P1	53275	1170.9	0.0	0.032	0.061
P3	21171	177.9	0.0	0.025	0.051
Total	125992	2215.1	0.0	0.103	0.164

$M_{\max} / (Z \times f_b) = 125992 / (349.76 \times 538.56) = 0.67 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2215.10) / (89.30 \times 66.00) = 0.56 \leq 1.0 \text{ OK}$
 $\delta = 0.103 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1150 \leq 1/250 \text{ OK}$
 $\delta' \times 2.0 = 0.164 \text{ (cm)} = 1/726 \leq 1/250 \text{ OK}$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.046
P1	53275	1170.9	0.0	0.032
P3	21171	177.9	0.0	0.025
Total	125992	2215.1	0.0	0.103

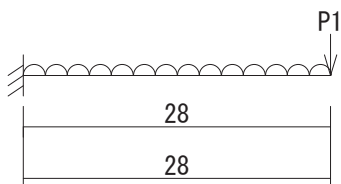
$M_{\max} / (Z \times f_b) = 125992 / (349.76 \times 979.20) = 0.37 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2215.10) / (89.30 \times 120.00) = 0.31 \leq 1.0 \text{ OK}$
 $\delta = 0.103 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/1150 \leq 1/250 \text{ OK}$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	51546	866.3	0.0	0.046
P1	62904	1382.5	0.0	0.038
P3	35656	299.6	0.0	0.043
Total	150106	2548.5	0.0	0.127

$M_{\max} / (Z \times f_b) = 150106 / (349.76 \times 783.36) = 0.55 \leq 1.0 \text{ OK}$
 $(\alpha \times Q_{\max}) / (A \times f_s) = (1.50 \times 2548.46) / (89.30 \times 96.00) = 0.45 \leq 1.0 \text{ OK}$
 $\delta = 0.127 \text{ (cm)} \leq 2.00 \text{ OK}$
 $= 1/940 \leq 1/250 \text{ OK}$

階、位置： 2階梁 X6.5通り Y7 - Y7.3



S-P-F 2級 2 - 210 (3.8 × 23.5 (cm))
 $A = 178.60 \text{ (cm}^2\text{)}, K_z = 0.68, K_s = 1.00$
 $Z = 699.52 \text{ (cm}^3\text{)}, I = 8219.32 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}, F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$$\begin{aligned} \omega &= 760 \times 0.528 = 401 \text{ (N/m)} \rightarrow 4.01 \text{ (N/cm)} \text{ (長期)} \\ \omega &= 760 \times 0.528 = 401 \text{ (N/m)} \rightarrow 4.01 \text{ (N/cm)} \text{ (短期)} \\ \omega &= 1280 \times 0.528 = 675 \text{ (N/m)} \rightarrow 6.75 \text{ (N/cm)} \text{ (積雪時)} \\ P1 &= 61.56 \text{ (長期)} \quad 61.56 \text{ (短期)} \quad 103.68 \text{ (積雪時)} \text{ (N)} \end{aligned}$$

長期 $fb = 1.1 \times K_z \times K_s \times F_b / 3 = 5.39, fs = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	1572	112.3	0.0	0.000
P1	1724	61.6	0.0	0.000
Total	3295	173.8	0.0	0.000

$$\begin{aligned} M_{\max} / (Z \times fb) &= 3295 / (699.52 \times 538.56) = 0.01 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times fs) &= (1.50 \times 173.81) / (178.60 \times 66.00) = 0.02 \leq 1.0 \text{ OK} \\ \delta &= 0.000 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/291289 \leq 1/250 \text{ OK} \end{aligned}$$

短期 $fb = 2.0 \times K_z \times K_s \times F_b / 3 = 9.79, fs = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	1572	112.3	0.0	0.000
P1	1724	61.6	0.0	0.000
Total	3295	173.8	0.0	0.000

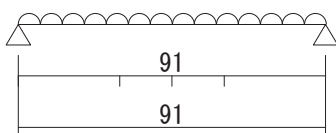
$$\begin{aligned} M_{\max} / (Z \times fb) &= 3295 / (699.52 \times 979.20) = 0.00 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times fs) &= (1.50 \times 173.81) / (178.60 \times 120.00) = 0.01 \leq 1.0 \text{ OK} \\ \delta &= 0.000 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/291289 \leq 1/250 \text{ OK} \end{aligned}$$

積雪時 $fb = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 7.83, fs = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	2647	189.1	0.0	0.000
P1	2903	103.7	0.0	0.000
Total	5550	292.7	0.0	0.000

$$\begin{aligned} M_{\max} / (Z \times fb) &= 5550 / (699.52 \times 783.36) = 0.01 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times fs) &= (1.50 \times 292.74) / (178.60 \times 96.00) = 0.03 \leq 1.0 \text{ OK} \\ \delta &= 0.000 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/172953 \leq 1/250 \text{ OK} \end{aligned}$$

階、位置： 1階梁 Y1通り X5.5 - X6.5



S-P-F 2級 2 - 204 (3.8 × 8.9 (cm))
 $A = 67.64 \text{ (cm}^2\text{)}$, $K_z = 1.00$, $K_s = 1.00$
 $Z = 100.33 \text{ (cm}^3\text{)}$, $I = 446.48 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$$\begin{aligned} \omega &= 1700 \times 0.455 = 774 \text{ (N/m)} \rightarrow 7.74 \text{ (N/cm)} \text{ (長期)} \\ \omega &= 1700 \times 0.455 = 774 \text{ (N/m)} \rightarrow 7.74 \text{ (N/cm)} \text{ (短期)} \\ \omega &= 1700 \times 0.455 = 774 \text{ (N/m)} \rightarrow 7.74 \text{ (N/cm)} \text{ (積雪時)} \\ \omega &= 1000 \times 0.455 = 455 \text{ (N/m)} \rightarrow 4.55 \text{ (N/cm)} \text{ (長期たわみ)} \\ \omega 1 (X5.5 - X6.5) &= 455.00 \text{ (長期)} \quad 455.00 \text{ (短期)} \quad 455.00 \text{ (積雪時)} \quad 455.00 \text{ (長期たわみ)} \text{ (N)} \end{aligned}$$

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 7.92$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	8007	351.9	351.9	0.016	0.019
$\omega 1$	5176	227.5	227.5	0.010	0.021
Total	13182	579.4	579.4	0.027	0.040

$$\begin{aligned} M_{\max} / (Z \times f_b) &= 13182 / (100.33 \times 792.00) = 0.17 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 579.44) / (67.64 \times 66.00) = 0.19 \leq 1.0 \text{ OK} \\ \delta &= 0.027 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/3430 \leq 1/250 \text{ OK} \\ \delta' \times 2.0 &= 0.040 \text{ (cm)} = 1/2287 \leq 1/250 \text{ OK} \end{aligned}$$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 14.40$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	8007	351.9	351.9	0.016
$\omega 1$	5176	227.5	227.5	0.010
Total	13182	579.4	579.4	0.027

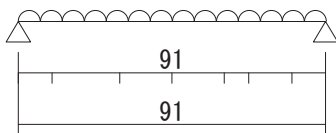
$$\begin{aligned} M_{\max} / (Z \times f_b) &= 13182 / (100.33 \times 1440.00) = 0.09 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 579.44) / (67.64 \times 120.00) = 0.11 \leq 1.0 \text{ OK} \\ \delta &= 0.027 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/3430 \leq 1/150 \text{ OK} \end{aligned}$$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 11.52$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	8007	351.9	351.9	0.016
$\omega 1$	5176	227.5	227.5	0.010
Total	13182	579.4	579.4	0.027

$$\begin{aligned} M_{\max} / (Z \times f_b) &= 13182 / (100.33 \times 1152.00) = 0.11 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 579.44) / (67.64 \times 96.00) = 0.13 \leq 1.0 \text{ OK} \\ \delta &= 0.027 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/3430 \leq 1/150 \text{ OK} \end{aligned}$$

階、位置： 1階梁 Y2通り X4.5 - X5.5



S-P-F 2級 2 - 204 (3.8 × 8.9 (cm))
 $A = 67.64 \text{ (cm}^2\text{)}$, $K_z = 1.00$, $K_s = 1.00$
 $Z = 100.33 \text{ (cm}^3\text{)}$, $I = 446.48 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$$\begin{aligned} \omega &= 1700 \times 0.455 = 774 \text{ (N/m)} \rightarrow 7.74 \text{ (N/cm)} \text{ (長期)} \\ \omega &= 1700 \times 0.455 = 774 \text{ (N/m)} \rightarrow 7.74 \text{ (N/cm)} \text{ (短期)} \\ \omega &= 1700 \times 0.455 = 774 \text{ (N/m)} \rightarrow 7.74 \text{ (N/cm)} \text{ (積雪時)} \\ \omega &= 1000 \times 0.455 = 455 \text{ (N/m)} \rightarrow 4.55 \text{ (N/cm)} \text{ (長期たわみ)} \\ \omega 1 (X4.5 - X5.5) &= 273.00 \text{ (長期)} \quad 273.00 \text{ (短期)} \quad 273.00 \text{ (積雪時)} \quad 273.00 \text{ (長期たわみ)} \text{ (N)} \end{aligned}$$

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 7.92$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	8007	351.9	351.9	0.016	0.019
$\omega 1$	3105	136.5	136.5	0.006	0.012
Total	11112	488.4	488.4	0.022	0.031

$$\begin{aligned} M_{\max} / (Z \times f_b) &= 11112 / (100.33 \times 792.00) = 0.14 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 488.44) / (67.64 \times 66.00) = 0.16 \leq 1.0 \text{ OK} \\ \delta &= 0.022 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/4069 \leq 1/250 \text{ OK} \\ \delta' \times 2.0 &= 0.031 \text{ (cm)} = 1/2893 \leq 1/250 \text{ OK} \end{aligned}$$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 14.40$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	8007	351.9	351.9	0.016
$\omega 1$	3105	136.5	136.5	0.006
Total	11112	488.4	488.4	0.022

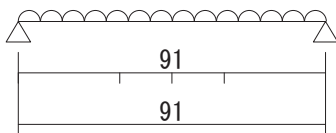
$$\begin{aligned} M_{\max} / (Z \times f_b) &= 11112 / (100.33 \times 1440.00) = 0.08 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 488.44) / (67.64 \times 120.00) = 0.09 \leq 1.0 \text{ OK} \\ \delta &= 0.022 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/4069 \leq 1/150 \text{ OK} \end{aligned}$$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 11.52$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	8007	351.9	351.9	0.016
$\omega 1$	3105	136.5	136.5	0.006
Total	11112	488.4	488.4	0.022

$$\begin{aligned} M_{\max} / (Z \times f_b) &= 11112 / (100.33 \times 1152.00) = 0.10 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 488.44) / (67.64 \times 96.00) = 0.11 \leq 1.0 \text{ OK} \\ \delta &= 0.022 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/4069 \leq 1/150 \text{ OK} \end{aligned}$$

階、位置： 1階梁 Y2通り X5.5 - X6.5



S-P-F 2級 2 - 204 (3.8 × 8.9 (cm))
 $A = 67.64 \text{ (cm}^2\text{)}$, $K_z = 1.00$, $K_s = 1.00$
 $Z = 100.33 \text{ (cm}^3\text{)}$, $I = 446.48 \text{ (cm}^4\text{)}$
 $F_b = 21.60 \text{ (N/mm}^2\text{)}$, $F_s = 1.80 \text{ (N/mm}^2\text{)}$
 許容せん断 割増係数 1.00
 $E = 9600.0 \text{ (N/mm}^2\text{)}$

$$\begin{aligned} \omega &= 1700 \times 0.455 = 774 \text{ (N/m)} \rightarrow 7.74 \text{ (N/cm)} \text{ (長期)} \\ \omega &= 1700 \times 0.455 = 774 \text{ (N/m)} \rightarrow 7.74 \text{ (N/cm)} \text{ (短期)} \\ \omega &= 1700 \times 0.455 = 774 \text{ (N/m)} \rightarrow 7.74 \text{ (N/cm)} \text{ (積雪時)} \\ \omega &= 1000 \times 0.455 = 455 \text{ (N/m)} \rightarrow 4.55 \text{ (N/cm)} \text{ (長期たわみ)} \\ \omega 1 (X5.5 - X6.5) &= 910.00 \text{ (長期)} \quad 910.00 \text{ (短期)} \quad 910.00 \text{ (積雪時)} \quad 910.00 \text{ (長期たわみ)} \text{ (N)} \end{aligned}$$

長期 $f_b = 1.1 \times K_z \times K_s \times F_b / 3 = 7.92$, $f_s = 1.1 \times 1.00 \times F_s / 3 = 0.66 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)	$\delta' \times 2.0$ (cm)
ω	8007	351.9	351.9	0.016	0.019
$\omega 1$	10351	455.0	455.0	0.021	0.042
Total	18358	806.9	806.9	0.037	0.061

$$\begin{aligned} M_{\max} / (Z \times f_b) &= 18358 / (100.33 \times 792.00) = 0.23 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 806.94) / (67.64 \times 66.00) = 0.27 \leq 1.0 \text{ OK} \\ \delta &= 0.037 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/2463 \leq 1/250 \text{ OK} \\ \delta' \times 2.0 &= 0.061 \text{ (cm)} = 1/1501 \leq 1/250 \text{ OK} \end{aligned}$$

短期 $f_b = 2.0 \times K_z \times K_s \times F_b / 3 = 14.40$, $f_s = 2.0 \times 1.00 \times F_s / 3 = 1.20 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	8007	351.9	351.9	0.016
$\omega 1$	10351	455.0	455.0	0.021
Total	18358	806.9	806.9	0.037

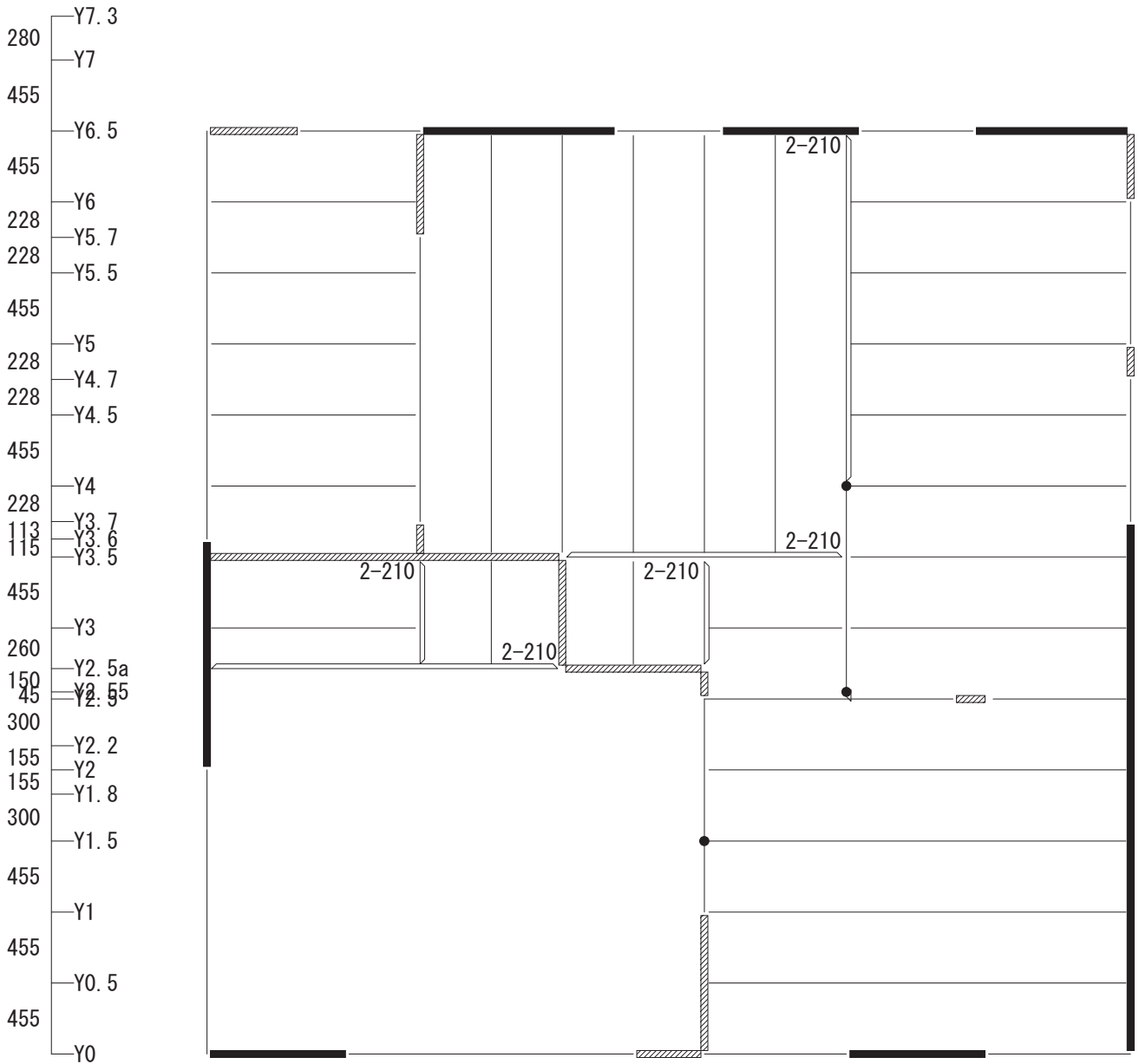
$$\begin{aligned} M_{\max} / (Z \times f_b) &= 18358 / (100.33 \times 1440.00) = 0.13 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 806.94) / (67.64 \times 120.00) = 0.15 \leq 1.0 \text{ OK} \\ \delta &= 0.037 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/2463 \leq 1/150 \text{ OK} \end{aligned}$$

積雪時 $f_b = 0.8 \times 2.0 \times K_z \times K_s \times F_b / 3 = 11.52$, $f_s = 0.8 \times 2.0 \times 1.00 \times F_s / 3 = 0.96 \text{ (N/mm}^2\text{)}$

	Mmax (N·cm)	Qa (N)	Qb (N)	δ (cm)
ω	8007	351.9	351.9	0.016
$\omega 1$	10351	455.0	455.0	0.021
Total	18358	806.9	806.9	0.037

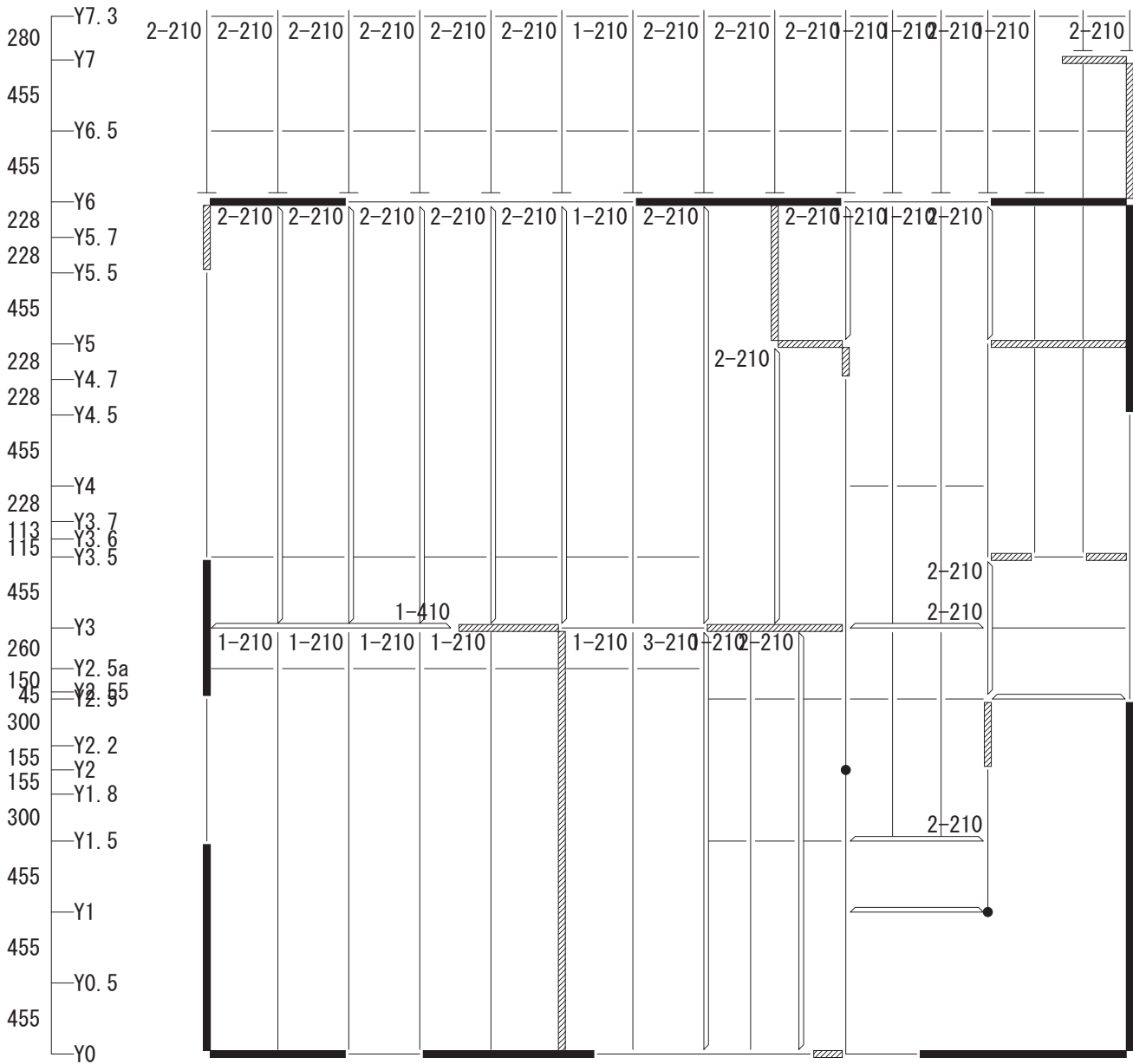
$$\begin{aligned} M_{\max} / (Z \times f_b) &= 18358 / (100.33 \times 1152.00) = 0.16 \leq 1.0 \text{ OK} \\ (\alpha \times Q_{\max}) / (A \times f_s) &= (1.50 \times 806.94) / (67.64 \times 96.00) = 0.19 \leq 1.0 \text{ OK} \\ \delta &= 0.037 \text{ (cm)} \leq 2.00 \text{ OK} \\ &= 1/2463 \leq 1/150 \text{ OK} \end{aligned}$$

小屋梁



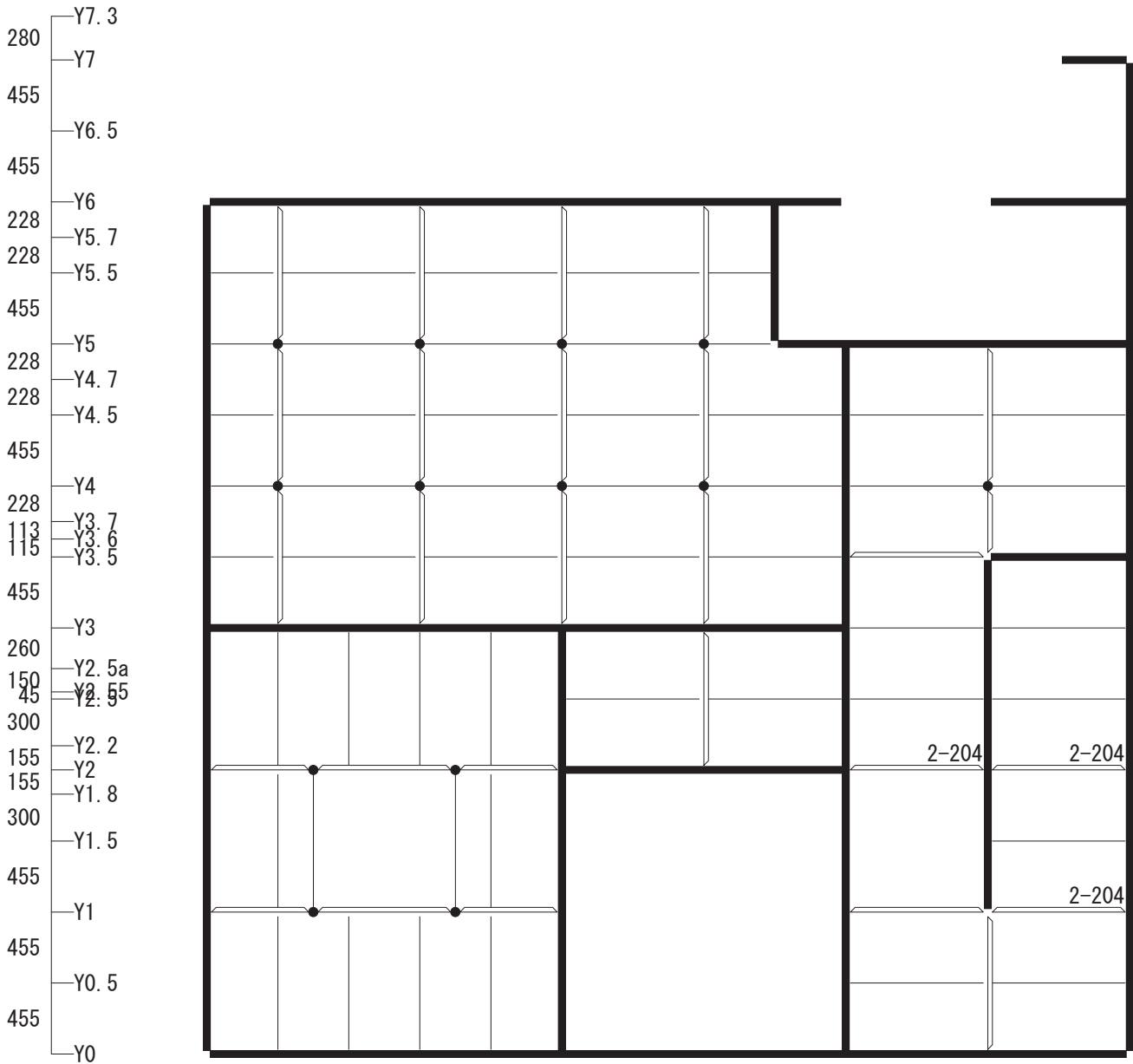
X0	X0.06	X1	X1.5	X1.7	X2	X2.2	X3	X3.5	X3.8	X4.1	X4.5	X4.8	X5.1	X5.4	X5.8	X6.2	X6.5			
455	145	455	228	228	455	228	100	228	228	200	155	73	100	200	155	73	100	300	155	300

2階梁



X0	X0.06	X1.51.7	X2.52	X3a	X3.5	X3.8	X4.1	X4.5	X4.8	X5.5	X5.8	X6.2	X6.5		
455	83228	455	228228	455	228	10228	228	200	155	73	10200	155	128	155	300

1 階梁



X0	X0.6	X1	X1.7	X2	X2.7	X3a	X3.5	X3.8	X4.1	X4.5	X4.8	X5.1	X5.4	X5.8	X6.2	X6.5		
455	145	455	228	228	455	228	100	228	228	200	155	73	100	200	155	128	155	300

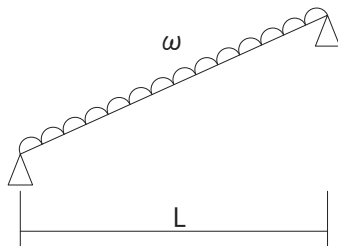
3.6. たる木・母屋・根太・他の設計

3.6.1. 速度圧の計算

地表面粗度区分 :	Ⅲ	
Z _b :	5 (m)	
Z _G :	450 (m)	
α :	0.20	
基準風速 V ₀ :	34 (m/s)	
建物最高高さ :	7.791 (m)	
建物軒高 :	5.827 (m)	
建物高さ H = (7.791 + 5.827) / 2 :	=	6.809 (m)
G _f :	=	2.500
H' = max(H, Z _b) :	=	6.809 (m)
E _r = 1.7 × [H' / Z _G] ^α :	=	0.735
E = E _r ² × G _f :	=	1.351
速度圧 q = 0.6 × E × V ₀ ² :	=	937 (N/m ²)

3.6.2. 部材の設計

垂木(5.5寸) 1-206@455



たる木 (一般部) 勾配 4.5 / 10
S-P-F 2級 3.8 × 14.0 (cm)

スパン L = 273.0 (cm)	勾配実長 L ₁ = L × √(4.5 ² + 10 ²) / 10 = 299.4 (cm)
負担幅 w = 45.5 (cm)	ω _{g0} = 460 (N/m ²)
I ₀ = 868.9 (cm ⁴)	Z ₀ = 124.1 (cm ³)
I = 868.9 (cm ⁴)	Z = 124.1 (cm ³)
F _b = 21.60 (N/mm ²)	F _s = 1.80 (N/mm ²)
E _b = 9600 (N/mm ²)	E _b = 9600 (N/mm ²)
q = 937.3 (N/m ²)	c = 0.4
F _b 割増係数 = 0.96	

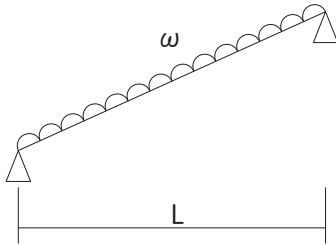
ω _g = 2.09 (N/cm)	ω _p = 0.00 (N/cm)	ω _w = 1.58 (N/cm)
l ω _s = 0.00 (N/cm)	s ω _s = 2.37 (N/cm)	

長期 fb=1.10 × 0.96 × F_b / 3 = 7.60 fs=1.10 × F_s / 3 = 0.66 (N/mm²)
 設計荷重 ω = ω_g + ω_p = 2.09 (N/cm)
 M = 23447 (N·cm) Q = 313.3 (N)
 σ / fb = M / (fb × Z) = 0.25 ≤ 1.0 OK
 τ / fs = (1.5 × Q) / (fs × A) = 0.13 ≤ 1.0 OK
 δ = (5 × ω × L⁴) / (384 × E × I) = 0.26 (cm) ≤ 2.00 OK
 = l / 1141 ≤ l / 250 OK

短期 fb=2.00 × 0.96 × F_b / 3 = 13.82 fs=2.00 × F_s / 3 = 1.20 (N/mm²)
 設計荷重 ω = ω_g + ω_p + ω_w = 3.67 (N/cm)
 M = 41125 (N·cm) Q = 549.5 (N)
 σ / fb = M / (fb × Z) = 0.24 ≤ 1.0 OK
 τ / fs = (1.5 × Q) / (fs × A) = 0.13 ≤ 1.0 OK
 δ = (5 × ω × L⁴) / (384 × E_b × I) = 0.46 (cm) ≤ 2.00 OK
 = l / 650 ≤ l / 150 OK

積雪時 fb=0.80 × 2.00 × 0.96 × F_b / 3 = 11.06 fs=0.80 × 2.00 × F_s / 3 = 0.96 (N/mm²)
 設計荷重 ω = ω_g + ω_p + s ω_s = 4.46 (N/cm)
 M = 49953 (N·cm) Q = 667.4 (N)
 σ / fb = M / (fb × Z) = 0.36 ≤ 1.0 OK
 τ / fs = (1.5 × Q) / (fs × A) = 0.20 ≤ 1.0 OK
 δ = (5 × ω × L⁴) / (384 × E_b × I) = 0.56 (cm) ≤ 2.00 OK
 = l / 536 ≤ l / 150 OK

垂木(5.5寸 勾配天井部) 1-206@455



たる木 (一般部) 勾配 4.5 / 10
S-P-F 2級 3.8 × 14.0 (cm)

スパン L = 265.8 (cm)	勾配実長 L1 = L × $\sqrt{4.5^2 + 10^2} / 10 = 291.4$ (cm)	
負担幅 w = 45.5 (cm)	$\omega g0 = 760$ (N/m ²)	$\omega p0 = 0$ (N/m ²)
I0 = 868.9 (cm ⁴)	Z0 = 124.1 (cm ³)	AO = 53.2 (cm ²)
I = 868.9 (cm ⁴)	Z = 124.1 (cm ³)	A = 53.2 (cm ²)
Fb = 21.60 (N/mm ²)	Fs = 1.80 (N/mm ²)	Eb = 9600 (N/mm ²)
Eb = 9600 (N/mm ²)		
q = 937.3 (N/m ²)	c = 0.4	
Fb割増係数 = 0.96		

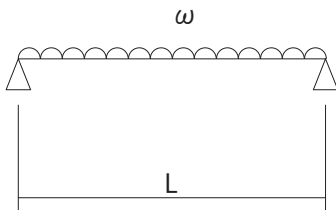
$\omega g = 3.46$ (N/cm)	$\omega p = 0.00$ (N/cm)	$\omega w = 1.58$ (N/cm)
$l\omega s = 0.00$ (N/cm)	$s\omega s = 2.37$ (N/cm)	

長期 fb=1.10 × 0.96 × Fb / 3 = 7.60 fs=1.10 × Fs / 3 = 0.66 (N/mm²)
 設計荷重 $\omega = \omega g + \omega p = 3.46$ (N/cm)
 M = 36709 (N·cm) Q = 503.9 (N)
 $\sigma / fb = M / (fb \times Z) = 0.39 \leq 1.0$ OK
 $\tau / fs = (1.5 \times Q) / (fs \times A) = 0.22 \leq 1.0$ OK
 $\delta = (5 \times \omega \times L^4) / (384 \times E \times I) = 0.39$ (cm) ≤ 2.00 OK
 = 1 / 749 $\leq 1/250$ OK

短期 fb=2.00 × 0.96 × Fb / 3 = 13.82 fs=2.00 × Fs / 3 = 1.20 (N/mm²)
 設計荷重 $\omega = \omega g + \omega p + \omega w = 5.04$ (N/cm)
 M = 53460 (N·cm) Q = 733.8 (N)
 $\sigma / fb = M / (fb \times Z) = 0.31 \leq 1.0$ OK
 $\tau / fs = (1.5 \times Q) / (fs \times A) = 0.17 \leq 1.0$ OK
 $\delta = (5 \times \omega \times L^4) / (384 \times E \times I) = 0.57$ (cm) ≤ 2.00 OK
 = 1 / 514 $\leq 1/150$ OK

積雪時 fb=0.80 × 2.00 × 0.96 × Fb / 3 = 11.06 fs=0.80 × 2.00 × Fs / 3 = 0.96 (N/mm²)
 設計荷重 $\omega = \omega g + \omega p + s\omega s = 5.82$ (N/cm)
 M = 61825 (N·cm) Q = 848.6 (N)
 $\sigma / fb = M / (fb \times Z) = 0.45 \leq 1.0$ OK
 $\tau / fs = (1.5 \times Q) / (fs \times A) = 0.25 \leq 1.0$ OK
 $\delta = (5 \times \omega \times L^4) / (384 \times E \times I) = 0.66$ (cm) ≤ 2.00 OK
 = 1 / 444 $\leq 1/150$ OK

天井根太 1-204@455



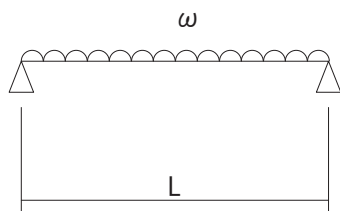
根太
S-P-F 2級 3.8 × 9.0 (cm)

スパン L = 273.0 (cm)	$\omega g0 = 300$ (N/m ²)	$\omega p0 = 0$ (N/m ²)
負担幅 w = 45.5 (cm)	Z0 = 51.3 (cm ³)	AO = 34.2 (cm ²)
I0 = 230.9 (cm ⁴)	Z = 51.3 (cm ³)	A = 34.2 (cm ²)
I = 230.9 (cm ⁴)	Fs = 1.80 (N/mm ²)	Eb = 9600 (N/mm ²)
Fb = 21.60 (N/mm ²)		
Eb = 9600 (N/mm ²)		
Fb割増係数 = 0.96		

$\omega g = 1.37$ (N/cm)	$\omega p = 0.00$ (N/cm)
--------------------------	--------------------------

長期 fb=1.10 × 0.96 × Fb / 3 = 7.60 fs=1.10 × Fs / 3 = 0.66 (N/mm²)
 設計荷重 $\omega = \omega g + \omega p = 1.37$ (N/cm)
 M = 12717 (N·cm) Q = 186.3 (N)
 $\sigma / fb = M / (fb \times Z) = 0.33 \leq 1.0$ OK
 $\tau / fs = (1.5 \times Q) / (fs \times A) = 0.12 \leq 1.0$ OK
 $\delta = (5 \times \omega \times L^4) / (384 \times E \times I) = 0.45$ (cm) ≤ 2.00 OK
 = 1 / 613 $\leq 1/250$ OK

1F床根太 1-204(一般居室部分)



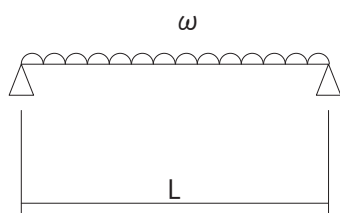
根太
S-P-F 2級 3.8 × 90.0 (cm)

スパン L = 91.0 (cm)
 負担幅 w = 45.5 (cm) $\omega_{g0} = 400$ (N/m²) $\omega_{p0} = 1800$ (N/m²)
 $I_0 = 230850.0$ (cm⁴) $Z_0 = 5130.0$ (cm³) $A_0 = 342.0$ (cm²)
 $I = 230850.0$ (cm⁴) $Z = 5130.0$ (cm³) $A = 342.0$ (cm²)
 $F_b = 21.60$ (N/mm²) $F_s = 1.80$ (N/mm²) $E_b = 9600$ (N/mm²)
 $E_b = 9600$ (N/mm²)
 Fb割増係数 = 1.15

$\omega_g = 1.82$ (N/cm) $\omega_p = 8.19$ (N/cm)

長期 $f_b = 1.10 \times 1.15 \times F_b / 3 = 9.11$ $f_s = 1.10 \times F_s / 3 = 0.66$ (N/mm²)
 設計荷重 $\omega = \omega_g + \omega_p = 10.01$ (N/cm)
 $M = 10362$ (N·cm) $Q = 455.5$ (N)
 $\sigma / f_b = M / (f_b \times Z)$ = 0.00 ≤ 1.0 OK
 $\tau / f_s = (1.5 \times Q) / (f_s \times A)$ = 0.03 ≤ 1.0 OK
 $\delta = (5 \times \omega \times L^4) / (384 \times E \times I)$ = 0.00 (cm) ≤ 2.00 OK
 = 1 / 2256338 ≤ 1/250 OK

2F階段 耐風梁 E120-F330 410



耐風梁
E120-F330 9.0 × 23.5 (cm)

スパン L = 318.5 (cm)
 負担幅 w = 271.2 (cm)
 $I_{x0} = 9733.4$ (cm⁴) $Z_{x0} = 828.4$ (cm³) $A_0 = 211.5$ (cm²)
 $I_{y0} = 1427.6$ (cm⁴) $Z_{y0} = 317.3$ (cm³)
 $I_x = 9733.4$ (cm⁴) $Z_x = 828.4$ (cm³) $A = 211.5$ (cm²)
 $I_y = 1427.6$ (cm⁴) $Z_y = 317.3$ (cm³)
 $F_{bx} = 33.00$ (N/mm²) $F_{by} = 24.00$ (N/mm²)
 $F_s = 3.00$ (N/mm²) $E_b = 12000$ (N/mm²)
 $E_b = 12000$ (N/mm²)
 $q = 937.3$ (N/m²) $c = 1.0$

$\omega = 12$ (N/cm) $\omega_w = 25.42$ (N/cm)

短期 $f_{bx} = 2.00 \times F_{bx} / 3 = 22.00$ $f_{by} = 2.00 \times F_{by} / 3 = 16.00$ $f_s = 2.00 \times F_s / 3 = 2.00$ (N/mm²)
 $M_{max} = 152163$ (N·cm) $M_s = 322340$ (N·cm) $Q = 4048.2$ (N)
 $M_{max} / (f_{bx} \times Z_x) + M_s / (f_{by} \times Z_y)$ = 0.72 ≤ 1.0 OK
 $\tau / f_s = (1.5 \times Q) / (f_s \times A)$ = 0.14 ≤ 1.0 OK
 $\delta = (5 \times \omega_w \times L^4) / (384 \times E_b \times I_y)$ = 1.99 (cm) ≤ 2.00 OK
 = 1 / 160 ≤ 1/150 OK

3.7. 接合部の設計

3.7.1. 浮上がりの検討

$$N1 = (NL - Ns) / 2 - Ms / b$$

$$N2 = (NL - Ns) / 2 + Ms / b$$

$$N3 = (NL + Ns) / 2 - Ms / b$$

$$N4 = (NL + Ns) / 2 + Ms / b$$

降伏時浮上がりの検討

2階

符号			N L (kN)	N s (kN)	Ms/b (kN)	N 1 (kN)	N 2 (kN)	N 3 (kN)	N 4 (kN)	金物
X0 通り Y2 Y3.6	圧縮	右	6.01	0.83	12.06				15.48	
		左	6.01				14.65	-8.65		
	右					-9.47		15.48		
X1.5 通り Y3.5 Y3.7	圧縮	左	2.44	0.00	0.00				1.22	
		左	2.26			1.13			1.13	
	右						1.13	1.13		
X1.5 通り Y5.7 Y6.5	圧縮	左	3.64	0.00	0.00				1.82	
		左	3.39			1.69			1.69	
	右						1.69	1.69		
X2.5 通り Y2.5aY3.5	圧縮	左	5.39	0.00	0.00				2.69	
		左	4.16			2.08			2.08	
	右						2.08	2.08		
X3.5 通り Y0 Y1	圧縮	左	2.37	0.00	0.00				1.19	
		左	2.37			1.19			1.19	
	右						1.19	1.19		
X3.5 通り Y2.5 Y2.5a	圧縮	左	2.00	0.00	0.00				1.00	
		左	2.00			1.00			1.00	
	右						1.00	1.00		
X6.5 通り Y0 Y3.7	圧縮	左	7.44	12.06	9.65				19.40	
		左	7.44			-11.96			19.40	
	右						7.34	0.10		
X6.5 通り Y4.7 Y5	圧縮	右	1.78	12.06	0.00				6.92	
		左	1.78				-5.14	6.92		
	右					-5.14		6.92		
X6.5 通り Y6 Y6.5	圧縮	左	1.27	0.00	0.00				0.63	
		左	1.27			0.63			0.63	
	右						0.63	0.63		
Y0 通り X0 X1	圧縮	左	4.51	3.51	9.65				13.66	
		左	4.51			-9.15			13.66	
	右						10.15	-5.64		
Y0 通り X3 X3.5	圧縮	右	4.40	0.75	0.00				2.57	
		左	4.40				1.82	2.57		
	右					1.82		2.57		

符号			N L (kN)	N s (kN)	Ms/b (kN)	N 1 (kN)	N 2 (kN)	N 3 (kN)	N 4 (kN)	金物
Y0 通り X4.5 X5.5	圧縮	左	2.89	0.46	9.65				11.32	
	浮上り	左	2.89			-8.44			11.32	
		右					10.86	-7.98		
Y2.5 通り X5.3 X5.5	圧縮	左	0.71	0.00	0.00				0.35	
	浮上り	左	0.71			0.35			0.35	
		右					0.35	0.35		
Y2.5a 通り X2.5 X3.5	圧縮	左	1.60	0.00	0.00				0.80	
	浮上り	左	1.43			0.72			0.72	
		右					0.72	0.72		
Y3.5 通り X0 X2.5	圧縮	左	6.40	0.00	0.00				3.20	
	浮上り	左	5.36			2.68			2.68	
		右					2.68	2.68		
Y6.5 通り X0 X0.6	圧縮	左	2.90	1.80	0.00				2.35	
	浮上り	左	2.90			0.55			2.35	
		右					0.55	2.35		
Y6.5 通り X1.5 X2.9	圧縮	左	7.23	1.21	4.83				9.05	
	浮上り	左	5.93			-2.47			8.40	
		右					7.18	-1.25		
Y6.5 通り X3.6 X4.6	圧縮	左	7.59	1.22	4.83				9.23	
	浮上り	左	6.54			-2.16			8.71	
		右					7.49	-0.94		
Y6.5 通り X5.4 X6.5	圧縮	右	2.22	4.23	4.83				8.05	
	浮上り	左	2.22				3.82	-1.60		
		右					-5.83		8.05	

1階

符号			N L (kN)	N s (kN)	Ms/b (kN)	N 1 (kN)	N 2 (kN)	N 3 (kN)	N 4 (kN)	金物
X0 通り Y0 Y1.5	圧縮	左	2.93	18.01	13.48				23.94	
	浮上り	左	2.64			-21.16			23.80	
		右					5.79	-3.15		
X0 通り Y2.5 Y3.5	圧縮	右	16.36	9.53	13.48				26.42	
	浮上り	左	14.57				15.99	-1.43		
		右					-10.96		25.52	
X0 通り Y5.5 Y6	圧縮	右	3.35	5.82	0.00				4.59	
	浮上り	左	3.14				-1.34	4.48		
		右					-1.34		4.48	
X2.5 通り Y0 Y3	圧縮	左	10.10	0.00	0.00				5.05	
	浮上り	左	7.89			3.95			3.95	
		右					3.95	3.95		

符号			N L (kN)	N s (kN)	Ms/b (kN)	N 1 (kN)	N 2 (kN)	N 3 (kN)	N 4 (kN)	金物
X4 通り Y5 Y6	圧縮	左	1.33	0.00	0.00				0.66	
	浮上り	左	1.04			0.52			0.52	
右				0.52	0.52					
X4.5 通り Y4.7 Y5	圧縮	左	4.53	0.00	0.00				2.27	
	浮上り	左	3.87			1.94			1.94	
右				1.94	1.94					
X5.5 通り Y2 Y2.5	圧縮	左	4.45	0.00	0.00				2.22	
	浮上り	左	3.69			1.84			1.84	
右				1.84	1.84					
X6.5 通り Y0 Y2.5	圧縮	左	12.34	44.65	10.78				39.28	
	浮上り	左	11.79			-27.21			39.00	
右				-5.65	17.44					
X6.5 通り Y4.5 Y7	圧縮	右	8.20	19.90	6.47				20.52	
	浮上り	左	7.96			0.50	7.46			
右				-12.44			20.40			
Y0 通り X0 X1	圧縮	左	9.94	20.23	10.78				25.87	
	浮上り	左	9.08			-16.36			25.43	
右				5.20	3.87					
Y0 通り X1.5 X2.7	圧縮	右	11.74	11.11	10.78				22.20	
	浮上り	左	10.20			10.33	-0.12			
右				-11.23			21.44			
Y0 通り X4.2 X4.5	圧縮	左	10.03	18.40	0.00				14.21	
	浮上り	左	8.98			-4.71			13.69	
右				-4.71	13.69					
Y0 通り X5 X6.5	圧縮	右	5.98	21.54	10.78				24.54	
	浮上り	左	5.32			2.67	2.65			
右				-18.89			24.21			
Y3 通り X1.7 X2.5	圧縮	左	16.47	0.00	0.00				8.23	
	浮上り	左	12.63			6.31			6.31	
右				6.31	6.31					
Y3 通り X3.5 X4.5	圧縮	左	19.36	0.00	0.00				9.68	
	浮上り	左	15.92			7.96			7.96	
右				7.96	7.96					
Y3.5 通り X5.5 X5.8	圧縮	左	3.70	0.00	0.00				1.85	
	浮上り	左	3.07			1.53			1.53	
右				1.53	1.53					
Y3.5 通り X6.2 X6.5	圧縮	左	3.76	0.00	0.00				1.88	
	浮上り	左	3.57			1.78			1.78	
右				1.78	1.78					

符号			N L (kN)	N s (kN)	Ms/b (kN)	N 1 (kN)	N 2 (kN)	N 3 (kN)	N 4 (kN)	金物
Y5 通り X4 X4.5	圧縮	左	1.49	0.00	0.00				0.75	
	浮上り	左	1.08			0.54			0.54	
		右					0.54	0.54		
Y5 通り X5.5 X6.5	圧縮	左	3.07	0.00	0.00				1.54	
	浮上り	左	2.35			1.17			1.17	
		右					1.17	1.17		
Y6 通り X0 X1	圧縮	左	20.33	5.80	10.78				23.84	
	浮上り	左	17.35			-5.00			22.35	
		右					16.56	0.79		
Y6 通り X3 X4.4	圧縮	左	28.06	2.54	10.78				26.08	
	浮上り	左	23.29			-0.41			23.69	
		右					21.15	2.13		
Y6 通り X5.5 X6.5	圧縮	右	6.90	8.34	10.78				18.40	
	浮上り	左	5.91				9.57	-3.66		
		右					-11.99		17.90	
Y7 通り X6 X6.5	圧縮	左	1.38	0.00	0.00				0.69	
	浮上り	左	1.38			0.69			0.69	
		右					0.69	0.69		

2階引き抜き力 (kN)

Y7.3

Y7

Y6.5

Y6

Y5.7

Y5.5

Y5

Y4.7

Y4.5

Y4

Y3.7

Y3.6

Y3.5

Y3

Y2.5a

Y2.5

Y2.2

Y2

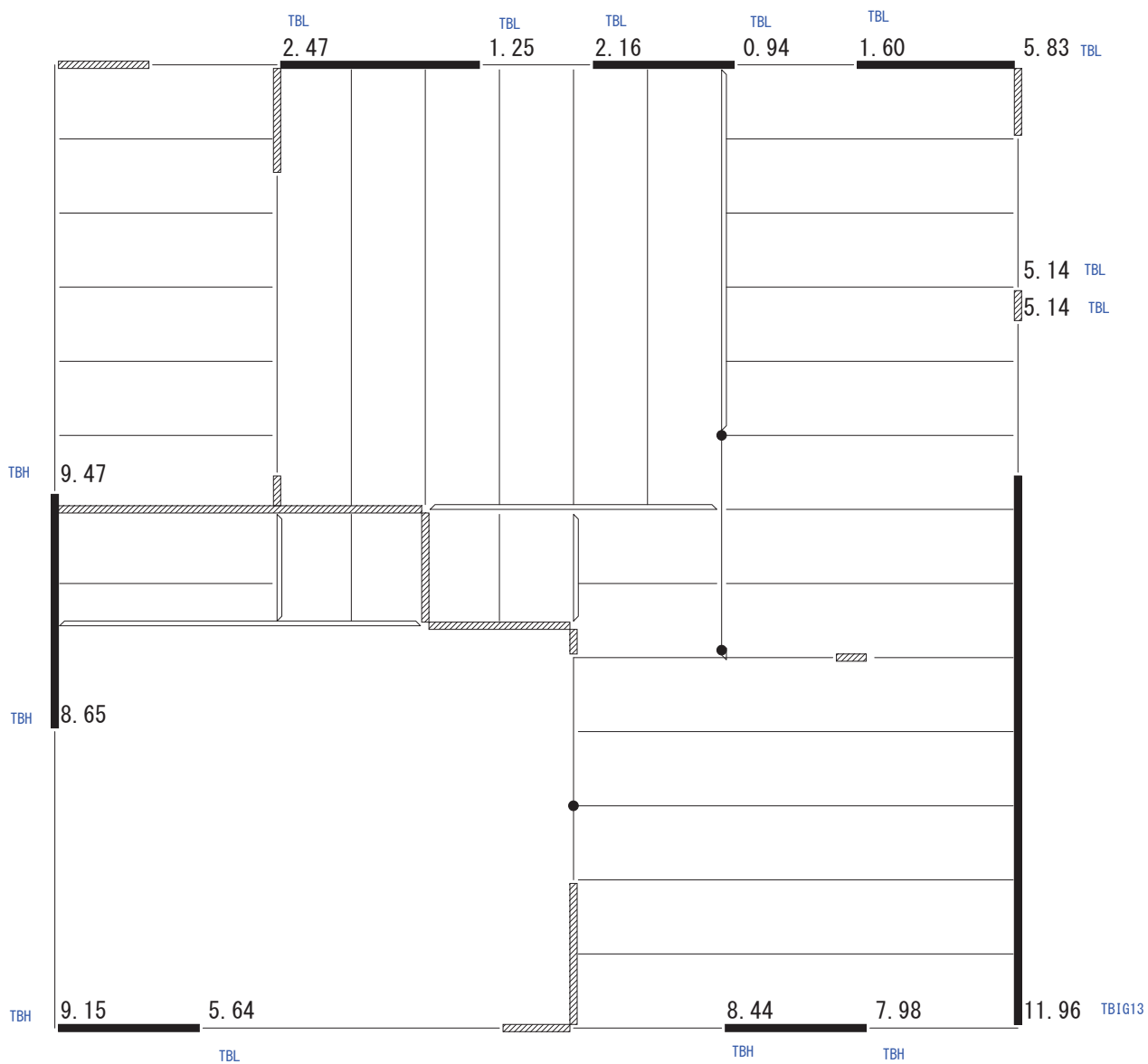
Y1.8

Y1.5

Y1

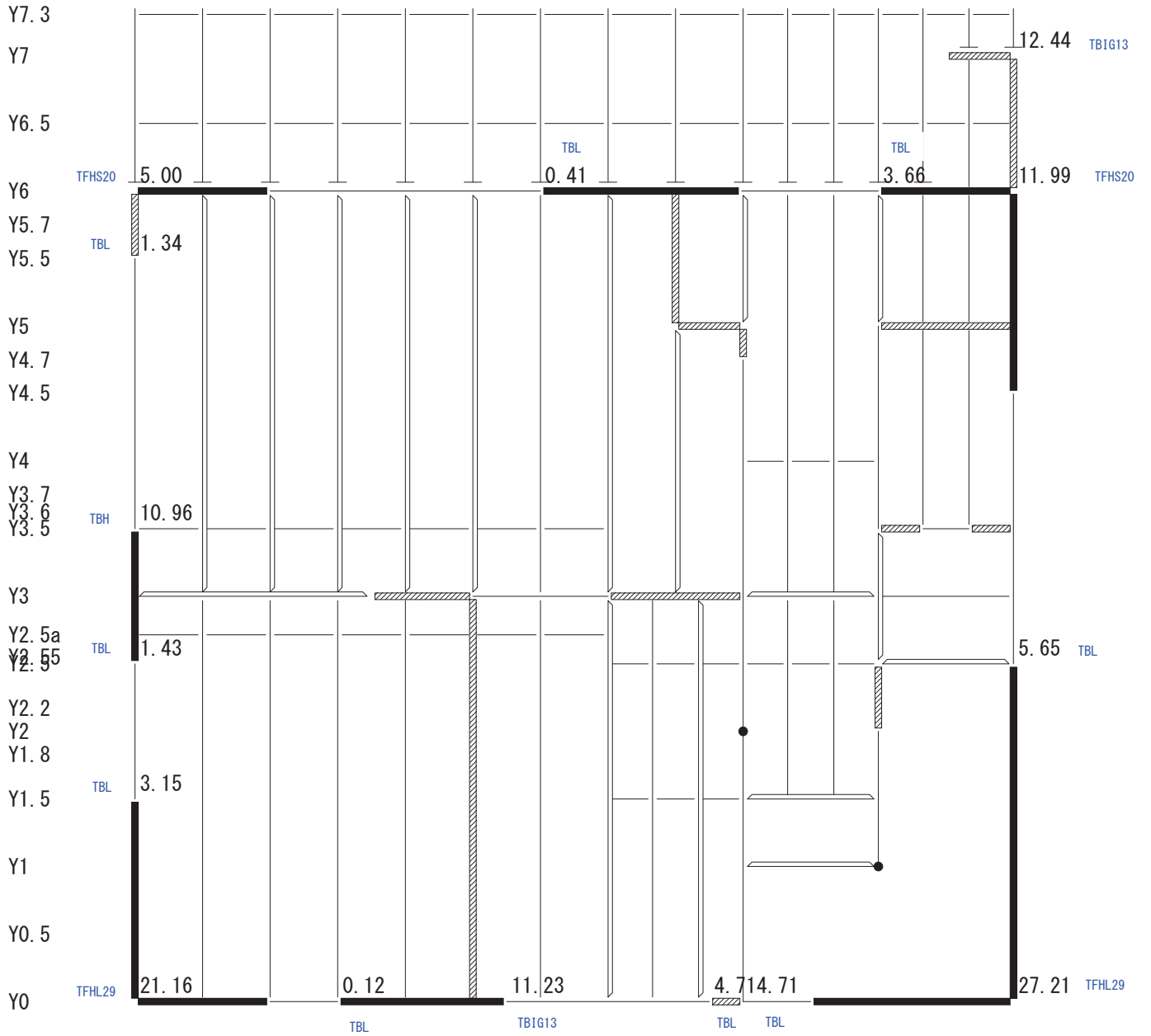
Y0.5

Y0



X0 X0.067X1 X1.51.7X2 X2.52X2.9 X3aX3.5 X3.8X4.1 X4.5 X4.8 X5.1 X5.4 X5.8 X6.2 X6.5

1階引き抜き力 (kN)



X0 X0.067X1 X1. 1.7X2 X2. 2.7X3 X3aX3.5X3. 4.1X4.5X4. 5.5X5.5X5. 6.2X6.5

3.8. 基礎の設計

地盤調査方法
スエーデン式サウンディング*

地業	:	べた基礎
建物総重量	ΣW :	260.0 (kN) → P57より建物重量は310.63(ΣW_i)-45.75(F床)-4.84(土間床)=260.04kNとなる
1階床重量	W1 :	13.1 (kN) (1階床荷重を再加算する為、差し引く)
地盤支持力	f_e :	20.0 (kN/m ²)
基礎版面積	A :	32.71 (m ²)
基礎立上り部重量	Wt :	61.1 (kN)
スラブ重量	Ws :	141.3 (kN)
積載荷重	WL :	58.9 (kN)
底版厚	t :	18.0 (cm)
安全率	n :	1.10

3.8.1. 地盤支持力の検討

$$f_e = 20.00 \text{ (kN/m}^2\text{)}$$

支持力 算定用分布荷重

$$\begin{aligned} \omega_0 &= n \times (\Sigma w + W_1 + W_t + W_s + W_L) / A \\ &= 1.10 \times (260.04 + 13.08 + 61.13 + 141.31 + 58.88) / 32.71 \\ &= 17.97 \text{ (kN/m}^2\text{)} \leq 20.0 \text{ OK} \end{aligned}$$

スラブ配筋 算定用分布荷重

$$\begin{aligned} \omega_1 &= n \times (\Sigma w + W_t) / A \\ &= 1.10 \times (260.04 + 61.13) / 32.71 = 10.80 \text{ (kN/m}^2\text{)} \end{aligned}$$

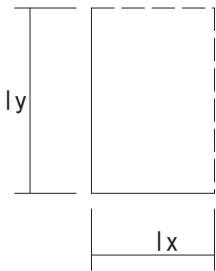
地中梁配筋 算定用分布荷重

$$\begin{aligned} \omega_2 &= n \times \Sigma w / A \\ &= 1.10 \times 260.04 / 32.71 = 8.74 \text{ (kN/m}^2\text{)} \end{aligned}$$

3.8.2. スラブの配筋

FS1 (X0~2.5/Y0~3)

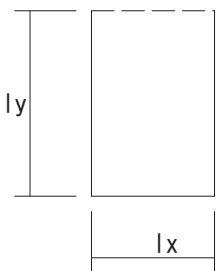
$$\begin{aligned} l_x &= 1.28 \text{ (m)} & l_y &= 2.73 \text{ (m)} & \text{配筋} &: \text{D13} \\ \omega_1 &= 10.80 \text{ (kN/m}^2\text{)} \\ t &= 18.0 \text{ (cm)} & dt &= 8.5 \text{ (cm)} \\ dx &= t - dt = 9.50 \text{ (cm)} & dy &= t - dt - 1.4 = 8.10 \text{ (cm)} \\ j_x &= 7/8 \times dx = 8.31 \text{ (cm)} & j_y &= 7/8 \times dy = 7.09 \text{ (cm)} \end{aligned}$$



$$\begin{aligned} \omega_x &= (L_y^4 \times \omega_1) / (L_x^4 + L_y^4) = 10.310 \text{ (kN/m}^2\text{)} \\ M_{x1} &= 1 \times \omega_x \times L_x^2 / 8 = 2.10 \text{ (kN}\cdot\text{m)} & at &= 1.29 \text{ (cm}^2\text{/m)} \\ M_{x2} &= 1 \times \omega_x \times L_x^2 / 18 = 0.93 \text{ (kN}\cdot\text{m)} & at &= 0.57 \text{ (cm}^2\text{/m)} \\ M_{y1} &= 1 \times \omega_1 \times L_x^2 / 12 = 1.46 \text{ (kN}\cdot\text{m)} & at &= 1.06 \text{ (cm}^2\text{/m)} \\ M_{y2} &= 1 \times \omega_1 \times L_x^2 / 36 = 0.49 \text{ (kN}\cdot\text{m)} & at &= 0.35 \text{ (cm}^2\text{/m)} \\ l &= 127 / at_{\text{Max}} = 98.26 \text{ (cm)} \rightarrow \text{D13 @300 両方向} \end{aligned}$$

FS1 (X2.5~4.5/Y0~3)

$$\begin{aligned} l_x &= 1.82 \text{ (m)} & l_y &= 2.73 \text{ (m)} & \text{配筋} &: \text{D13} \\ \omega_1 &= 10.80 \text{ (kN/m}^2\text{)} \\ t &= 18.0 \text{ (cm)} & dt &= 8.5 \text{ (cm)} \\ dx &= t - dt = 9.50 \text{ (cm)} & dy &= t - dt - 1.4 = 8.10 \text{ (cm)} \\ j_x &= 7/8 \times dx = 8.31 \text{ (cm)} & j_y &= 7/8 \times dy = 7.09 \text{ (cm)} \end{aligned}$$



$$\begin{aligned} \omega_x &= (L_y^4 \times \omega_1) / (L_x^4 + L_y^4) = 9.019 \text{ (kN/m}^2\text{)} \\ M_{x1} &= 1 \times \omega_x \times L_x^2 / 9 = 3.32 \text{ (kN}\cdot\text{m)} & at &= 2.05 \text{ (cm}^2\text{/m)} \\ M_{x2} &= 1 \times \omega_x \times L_x^2 / 18 = 1.66 \text{ (kN}\cdot\text{m)} & at &= 1.02 \text{ (cm}^2\text{/m)} \\ M_{y1} &= 1 \times \omega_1 \times L_x^2 / 14 = 2.56 \text{ (kN}\cdot\text{m)} & at &= 1.85 \text{ (cm}^2\text{/m)} \\ M_{y2} &= 1 \times \omega_1 \times L_x^2 / 36 = 0.99 \text{ (kN}\cdot\text{m)} & at &= 0.72 \text{ (cm}^2\text{/m)} \\ l &= 127 / at_{\text{Max}} = 62.02 \text{ (cm)} \rightarrow \text{D13 @300 両方向} \end{aligned}$$

FS1 (X4.5~6.5/Y0~5)

$$l_x = 1.82 \text{ (m)} \quad l_y = 4.55 \text{ (m)} \quad \text{配筋 : D13}$$

$$\omega_1 = 10.80 \text{ (kN/m}^2\text{)}$$

$$t = 18.0 \text{ (cm)} \quad dt = 8.5 \text{ (cm)}$$

$$dx = t - dt = 9.50 \text{ (cm)} \quad dy = t - dt - 1.4 = 8.10 \text{ (cm)}$$

$$j_x = 7/8 \times dx = 8.31 \text{ (cm)} \quad j_y = 7/8 \times dy = 7.09 \text{ (cm)}$$

$$\omega_x = (L_y^4 \times \omega_1) / (L_x^4 + L_y^4) = 10.531 \text{ (kN/m}^2\text{)}$$

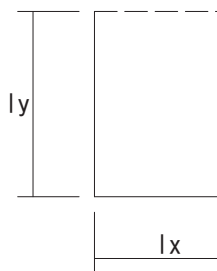
$$M_{x1} = 1 \times \omega_x \times L_x^2 / 8 = 4.36 \text{ (kN}\cdot\text{m)} \quad at = 2.69 \text{ (cm}^2\text{/m)}$$

$$M_{x2} = 1 \times \omega_x \times L_x^2 / 18 = 1.94 \text{ (kN}\cdot\text{m)} \quad at = 1.20 \text{ (cm}^2\text{/m)}$$

$$M_{y1} = 1 \times \omega_1 \times L_x^2 / 12 = 2.98 \text{ (kN}\cdot\text{m)} \quad at = 2.16 \text{ (cm}^2\text{/m)}$$

$$M_{y2} = 1 \times \omega_1 \times L_x^2 / 36 = 0.99 \text{ (kN}\cdot\text{m)} \quad at = 0.72 \text{ (cm}^2\text{/m)}$$

$$l = 127 / at_{\text{Max}} = 47.21 \text{ (cm)} \rightarrow \text{D13 @300 両方向}$$



FS1 (X0~4.5/Y3~6)

$$l_x = 2.73 \text{ (m)} \quad l_y = 4.10 \text{ (m)} \quad \text{配筋 : D13}$$

$$\omega_1 = 10.80 \text{ (kN/m}^2\text{)}$$

$$t = 18.0 \text{ (cm)} \quad dt = 8.5 \text{ (cm)}$$

$$dx = t - dt = 9.50 \text{ (cm)} \quad dy = t - dt - 1.4 = 8.10 \text{ (cm)}$$

$$j_x = 7/8 \times dx = 8.31 \text{ (cm)} \quad j_y = 7/8 \times dy = 7.09 \text{ (cm)}$$

$$\omega_x = (L_y^4 \times \omega_1) / (L_x^4 + L_y^4) = 9.019 \text{ (kN/m}^2\text{)}$$

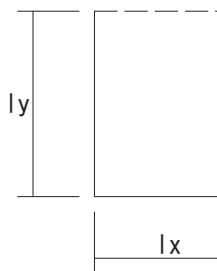
$$M_{x1} = 1 \times \omega_x \times L_x^2 / 8 = 8.40 \text{ (kN}\cdot\text{m)} \quad at = 5.18 \text{ (cm}^2\text{/m)}$$

$$M_{x2} = 1 \times \omega_x \times L_x^2 / 18 = 3.73 \text{ (kN}\cdot\text{m)} \quad at = 2.30 \text{ (cm}^2\text{/m)}$$

$$M_{y1} = 1 \times \omega_1 \times L_x^2 / 12 = 6.71 \text{ (kN}\cdot\text{m)} \quad at = 4.85 \text{ (cm}^2\text{/m)}$$

$$M_{y2} = 1 \times \omega_1 \times L_x^2 / 36 = 2.24 \text{ (kN}\cdot\text{m)} \quad at = 1.62 \text{ (cm}^2\text{/m)}$$

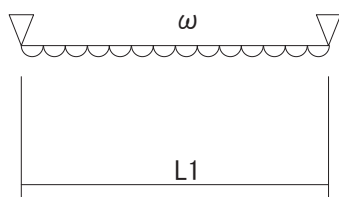
$$l = 127 / at_{\text{Max}} = 24.50 \text{ (cm)} \rightarrow \text{D13 @200 両方向}$$



3.8.3. 地中梁の設計

FG1(外周通り)

SD295A Lft = 195.00 (N/mm²) Sft = 295.00 (N/mm²)
 Fc = 21 Lfs = 0.70 (N/mm²) Sfs = 1.05 (N/mm²)
 上部主筋 : 1-D16 下部主筋 : 1-D16 S T : D10@200



負担幅 : 1.14 (m) L1 = 0.74 (m)
 $\omega = \omega_2 \times \text{負担幅} = 9.947$ (kN/m)
 b = 15.0 (cm) D = 53.0 (cm) dt = 8.5 (cm)

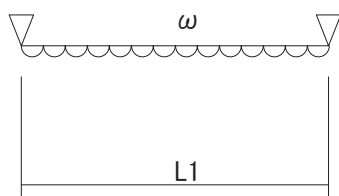
$d' = D - dt = 44.50$ (cm)
 $j = 7/8 \times d' = 38.94$ (cm)
 A = b × j = 584.06 (cm²)

ML = $(\omega \times L1^2) / 8 = 0.69$ (kN·m)
 QL = $(\omega \times L1) / 2 = 3.70$ (kN)

at = ML / (Lft × j) = 0.09 (cm²) ≤ 1.99 [1-D16] OK
 $\tau / Lfs = Q / (A \times Lfs) = 0.09 \leq 1.0$ OK

FG11-1(外周通り/深基礎)

SD295A Lft = 195.00 (N/mm²) Sft = 295.00 (N/mm²)
 Fc = 21 Lfs = 0.70 (N/mm²) Sfs = 1.05 (N/mm²)
 上部主筋 : 1-D16 下部主筋 : 1-D16 S T : D10@200



負担幅 : 2.56 (m) L1 = 1.65 (m)
 $\omega = \omega_2 \times \text{負担幅} = 22.343$ (kN/m)
 b = 15.0 (cm) D = 92.0 (cm) dt = 8.5 (cm)

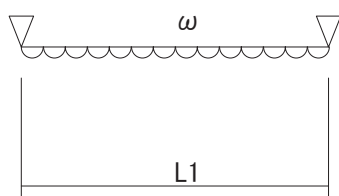
$d' = D - dt = 83.50$ (cm)
 $j = 7/8 \times d' = 73.06$ (cm)
 A = b × j = 1095.94 (cm²)

ML = $(\omega \times L1^2) / 8 = 7.64$ (kN·m)
 QL = $(\omega \times L1) / 2 = 18.48$ (kN)

at = ML / (Lft × j) = 0.54 (cm²) ≤ 1.99 [1-D16] OK
 $\tau / Lfs = Q / (A \times Lfs) = 0.24 \leq 1.0$ OK

FG11-1A(外周通り/深基礎/玄関部分)

SD295A Lft = 195.00 (N/mm²) Sft = 295.00 (N/mm²)
 Fc = 21 Lfs = 0.70 (N/mm²) Sfs = 1.05 (N/mm²)
 上部主筋 : 1-D16 下部主筋 : 1-D16 S T : D10@200



負担幅 : 1.65 (m) L1 = 0.92 (m)
 $\omega = \omega_2 \times \text{負担幅} = 14.385$ (kN/m)
 b = 15.0 (cm) D = 86.0 (cm) dt = 8.5 (cm)

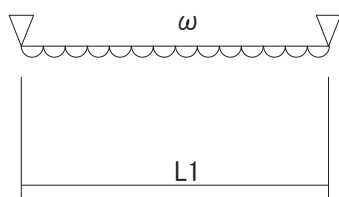
$d' = D - dt = 77.50$ (cm)
 $j = 7/8 \times d' = 67.81$ (cm)
 A = b × j = 1017.19 (cm²)

ML = $(\omega \times L1^2) / 8 = 1.51$ (kN·m)
 QL = $(\omega \times L1) / 2 = 6.59$ (kN)

at = ML / (Lft × j) = 0.11 (cm²) ≤ 1.99 [1-D16] OK
 $\tau / Lfs = Q / (A \times Lfs) = 0.09 \leq 1.0$ OK

FG11-1B(外周通り/深基礎/木ノ子部分)

SD295A Lft = 195.00 (N/mm²) Sft = 295.00 (N/mm²)
 Fc = 21 Lfs = 0.70 (N/mm²) Sfs = 1.05 (N/mm²)
 上部主筋 : 1-D16 下部主筋 : 1-D16 S T : D10@200



負担幅 : 0.23 (m) L1 = 0.91 (m)
 $\omega = \omega_2 \times \text{負担幅} = 1.976$ (kN/m)
 b = 15.0 (cm) D = 84.0 (cm) dt = 8.5 (cm)

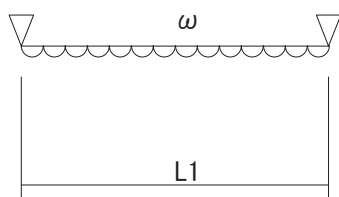
$d' = D - dt = 75.50$ (cm)
 $j = 7/8 \times d' = 66.06$ (cm)
 A = b × j = 990.94 (cm²)

ML = $(\omega \times L1^2) / 8 = 0.20$ (kN·m)
 QL = $(\omega \times L1) / 2 = 0.90$ (kN)

at = ML / (Lft × j) = 0.02 (cm²) ≤ 1.99 [1-D16] OK
 $\tau / Lfs = Q / (A \times Lfs) = 0.01 \leq 1.0$ OK

FG3(中通り)

SD295A Lft = 195.00 (N/mm²) Sft = 295.00 (N/mm²)
 Fc = 21 Lfs = 0.70 (N/mm²) Sfs = 1.05 (N/mm²)
 上部主筋 : 1-D16 下部主筋 : 1-D16 S T : D10@200



負担幅 : 2.50 (m) L1 = 1.55 (m)
 $\omega = \omega_2 \times \text{負担幅} = 21.884$ (kN/m)
 b = 15.0 (cm) D = 53.0 (cm) dt = 8.5 (cm)

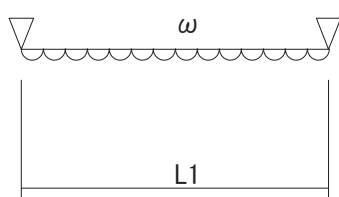
d' = D - dt = 44.50 (cm)
 j = 7/8 × d' = 38.94 (cm)
 A = b × j = 584.06 (cm²)

ML = (ω × L1²) / 8 = 6.53 (kN·m)
 QL = (ω × L1) / 2 = 16.91 (kN)

at = ML / (Lft × j) = 0.86 (cm²) ≤ 1.99 [1-D16] OK
 $\tau / \text{Lfs} = Q / (A \times \text{Lfs}) = 0.41 \leq 1.0$ OK

人通りB

SD295A Lft = 195.00 (N/mm²) Sft = 295.00 (N/mm²)
 Fc = 21 Lfs = 0.70 (N/mm²) Sfs = 1.05 (N/mm²)
 上部主筋 : 1-D16 下部主筋 : 1-D16 S T : D10@200



負担幅 : 2.28 (m) L1 = 1.49 (m)
 $\omega = \omega_2 \times \text{負担幅} = 19.895$ (kN/m)
 b = 15.0 (cm) D = 26.0 (cm) dt = 8.5 (cm)

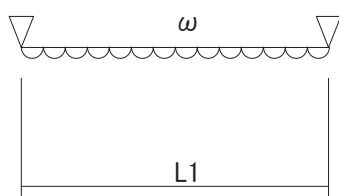
d' = D - dt = 17.50 (cm)
 j = 7/8 × d' = 15.31 (cm)
 A = b × j = 229.69 (cm²)

ML = (ω × L1²) / 8 = 5.54 (kN·m)
 QL = (ω × L1) / 2 = 14.85 (kN)

at = ML / (Lft × j) = 1.86 (cm²) ≤ 1.99 [1-D16] OK
 $\tau / \text{Lfs} = Q / (A \times \text{Lfs}) = 0.92 \leq 1.0$ OK

人通りB

SD295A Lft = 195.00 (N/mm²) Sft = 295.00 (N/mm²)
 Fc = 21 Lfs = 0.70 (N/mm²) Sfs = 1.05 (N/mm²)
 上部主筋 : 1-D16 下部主筋 : 1-D16 S T : D10@200



負担幅 : 1.82 (m) L1 = 1.65 (m)
 $\omega = \omega_2 \times \text{負担幅} = 15.916$ (kN/m)
 b = 15.0 (cm) D = 26.0 (cm) dt = 8.5 (cm)

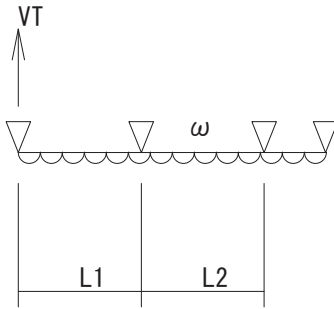
d' = D - dt = 17.50 (cm)
 j = 7/8 × d' = 15.31 (cm)
 A = b × j = 229.69 (cm²)

ML = (ω × L1²) / 8 = 5.44 (kN·m)
 QL = (ω × L1) / 2 = 13.16 (kN)

at = ML / (Lft × j) = 1.82 (cm²) ≤ 1.99 [1-D16] OK
 $\tau / \text{Lfs} = Q / (A \times \text{Lfs}) = 0.82 \leq 1.0$ OK

FG1 (X0/Y0 X方向引抜) Vt=21.16-4.34-5.21=11.61

SD295A Lft = 195.00 (N/mm²) Sft = 295.00 (N/mm²)
 Fc = 21 Lfs = 0.70 (N/mm²) Sfs = 1.05 (N/mm²)
 上部主筋 : 1-D16 下部主筋 : 1-D16 ST : D10@200



負担幅 : 1.14 (m) L1 = 0.99 (m) L2 = 0.31 (m)
 $\omega = \omega_2 \times \text{負担幅} = 9.947$ (kN/m)
 b = 15.0 (cm) D = 53.0 (cm) dt = 8.5 (cm)
 VT = 11.61 (kN)

$d' = D - dt = 44.50$ (cm)
 $j = 7/8 \times d' = 38.94$ (cm)
 $A = b \times j = 584.06$ (cm²)

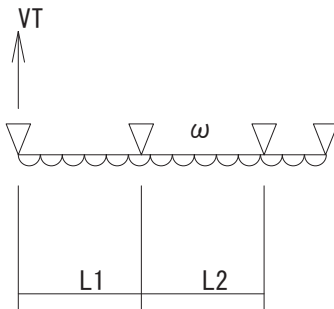
$ML1 = (\omega \times L1^2) / 8 = 1.23$ (kN·m)
 $ML2 = (\omega \times L2^2) / 12 = 0.08$ (kN·m)
 $QL = (\omega \times L1) / 2 = 4.94$ (kN)
 $QS = QL + VT = 16.55$ (kN)

$Mt = VT \times L1 = 11.53$ (kN·m)
 $Ms = ML + Mt = 12.75$ (kN·m)

$atL = ML / (Lft \times j) = 0.16$ (cm²) ≤ 1.99 [1-D16] OK
 $atS = Ms / (sft \times j) = 1.11$ (cm²) ≤ 1.99 [1-D16] OK
 $\tau / Lfs = Q / (A \times Lfs) = 0.12 \leq 1.0$ OK
 $\tau / Sfs = Q / (A \times Sfs) = 0.27 \leq 1.0$ OK

FG1 (X0/Y0 Y方向引抜) Vt=21.16-4.34-5.21=11.61

SD295A Lft = 195.00 (N/mm²) Sft = 295.00 (N/mm²)
 Fc = 21 Lfs = 0.70 (N/mm²) Sfs = 1.05 (N/mm²)
 上部主筋 : 1-D16 下部主筋 : 1-D16 ST : D10@200



負担幅 : 1.14 (m) L1 = 1.45 (m) L2 = 0.74 (m)
 $\omega = \omega_2 \times \text{負担幅} = 9.947$ (kN/m)
 b = 15.0 (cm) D = 53.0 (cm) dt = 8.5 (cm)
 VT = 11.61 (kN)

$d' = D - dt = 44.50$ (cm)
 $j = 7/8 \times d' = 38.94$ (cm)
 $A = b \times j = 584.06$ (cm²)

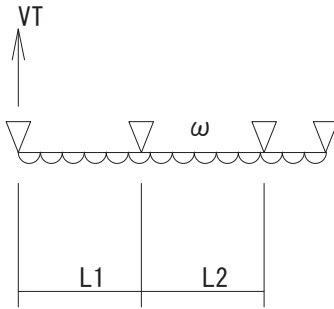
$ML1 = (\omega \times L1^2) / 8 = 2.61$ (kN·m)
 $ML2 = (\omega \times L2^2) / 12 = 0.46$ (kN·m)
 $QL = (\omega \times L1) / 2 = 7.20$ (kN)
 $QS = QL + VT = 18.81$ (kN)

$Mt = VT \times L1 = 16.81$ (kN·m)
 $Ms = ML + Mt = 19.42$ (kN·m)

$atL = ML / (Lft \times j) = 0.34$ (cm²) ≤ 1.99 [1-D16] OK
 $atS = Ms / (sft \times j) = 1.69$ (cm²) ≤ 1.99 [1-D16] OK
 $\tau / Lfs = Q / (A \times Lfs) = 0.18 \leq 1.0$ OK
 $\tau / Sfs = Q / (A \times Sfs) = 0.31 \leq 1.0$ OK

FG1 (X6.5/Y0 X方向引抜) Vt=27.21-3.47-8.68=15.06

SD295A Lft = 195.00 (N/mm²) Sft = 295.00 (N/mm²)
 Fc = 21 Lfs = 0.70 (N/mm²) Sfs = 1.05 (N/mm²)
 上部主筋 : 1-D16 下部主筋 : 1-D16 S T : D10@200



負担幅 : 3.02 (m) L1 = 1.43 (m) L2 = 0.31 (m)
 $\omega = \omega_2 \times \text{負担幅} = 26.409$ (kN/m)
 b = 15.0 (cm) D = 82.0 (cm) dt = 8.5 (cm)
 VT = 15.06 (kN)

$d' = D - dt = 73.50$ (cm)
 $j = 7/8 \times d' = 64.31$ (cm)
 $A = b \times j = 964.69$ (cm²)

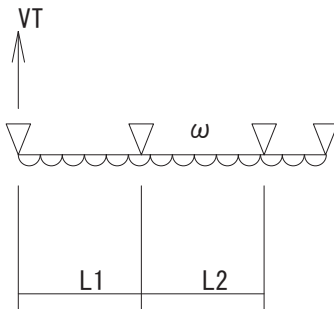
$ML1 = (\omega \times L1^2) / 8 = 6.71$ (kN·m)
 $ML2 = (\omega \times L2^2) / 12 = 0.21$ (kN·m)
 $QL = (\omega \times L1) / 2 = 18.83$ (kN)
 $QS = QL + VT = 33.89$ (kN)

$Mt = VT \times L1 = 21.48$ (kN·m)
 $Ms = ML + Mt = 28.19$ (kN·m)

$atL = ML / (Lft \times j) = 0.54$ (cm²) ≤ 1.99 [1-D16] OK
 $atS = Ms / (sft \times j) = 1.49$ (cm²) ≤ 1.99 [1-D16] OK
 $\tau / Lfs = Q / (A \times Lfs) = 0.28 \leq 1.0$ OK
 $\tau / Sfs = Q / (A \times Sfs) = 0.33 \leq 1.0$ OK

FG1B (X6.5/Y0 Y方向引抜) Vt=27.21-3.47-8.68=15.06

SD295A Lft = 195.00 (N/mm²) Sft = 295.00 (N/mm²)
 Fc = 21 Lfs = 0.70 (N/mm²) Sfs = 1.05 (N/mm²)
 上部主筋 : 2-D16 下部主筋 : 2-D16 S T : D10@200



負担幅 : 3.02 (m) L1 = 2.36 (m) L2 = 0.74 (m)
 $\omega = \omega_2 \times \text{負担幅} = 26.409$ (kN/m)
 b = 15.0 (cm) D = 82.0 (cm) dt = 8.5 (cm)
 VT = 15.06 (kN)

$d' = D - dt = 73.50$ (cm)
 $j = 7/8 \times d' = 64.31$ (cm)
 $A = b \times j = 964.69$ (cm²)

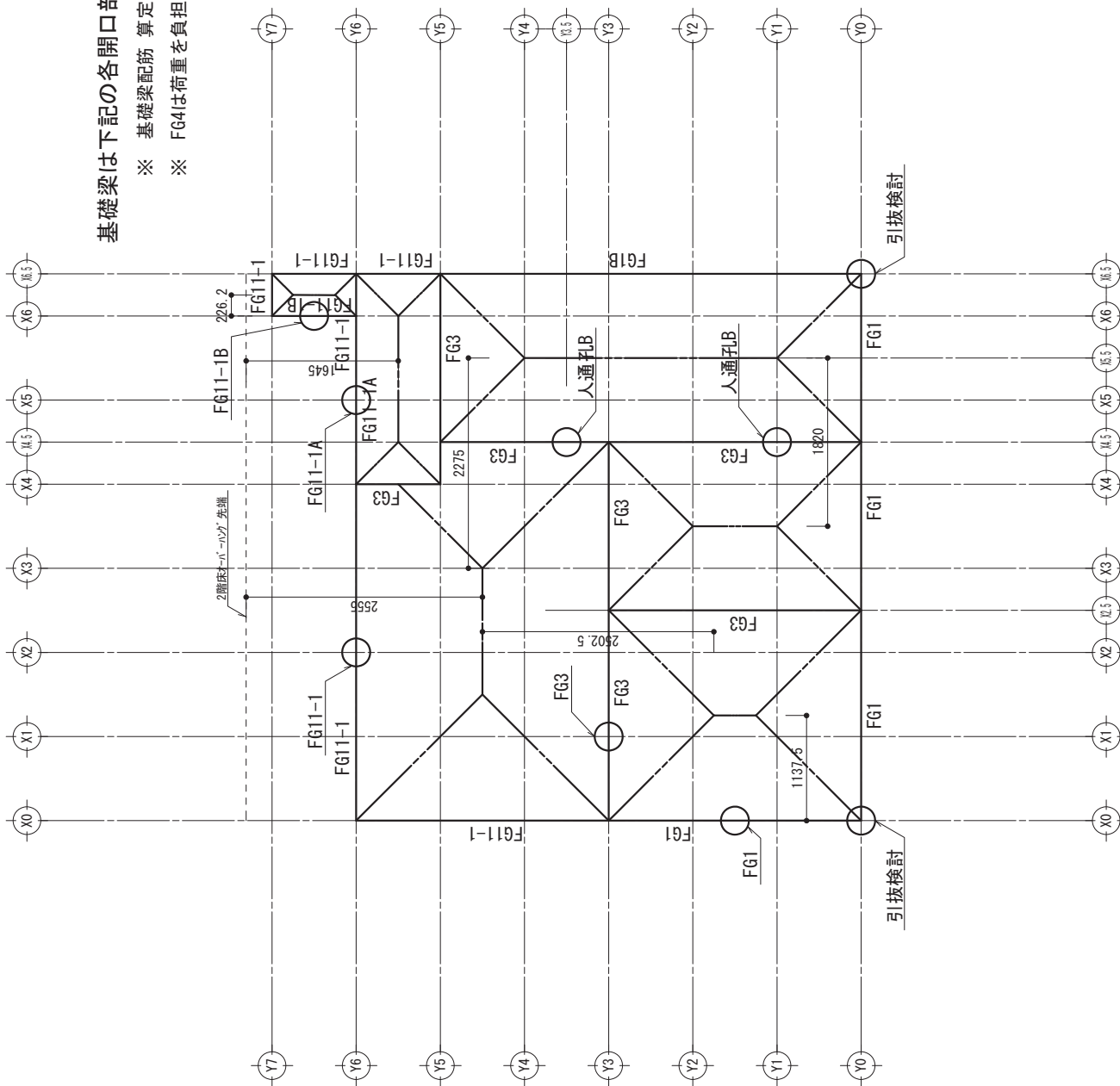
$ML1 = (\omega \times L1^2) / 8 = 18.36$ (kN·m)
 $ML2 = (\omega \times L2^2) / 12 = 1.22$ (kN·m)
 $QL = (\omega \times L1) / 2 = 31.14$ (kN)
 $QS = QL + VT = 46.20$ (kN)

$Mt = VT \times L1 = 35.51$ (kN·m)
 $Ms = ML + Mt = 53.87$ (kN·m)

$atL = ML / (Lft \times j) = 1.46$ (cm²) ≤ 3.98 [2-D16] OK
 $atS = Ms / (sft \times j) = 2.84$ (cm²) ≤ 3.98 [2-D16] OK
 $\tau / Lfs = Q / (A \times Lfs) = 0.46 \leq 1.0$ OK
 $\tau / Sfs = Q / (A \times Sfs) = 0.46 \leq 1.0$ OK

基礎梁は下記の各開口部分について検討する

- ※ 基礎梁配筋 算定用分布荷重 8.74 kN/m²
- ※ FG4は荷重を負担しない為、算定しない



基礎荷重算定根拠

物件名 **新築工事**

基礎面積 32.71

内訳

 車庫 0.00

 居室 32.71

基礎スラブ 24 x 0.18 x 32.71 = 141.31 **141.307** ①

1階床 0.4 x 32.71 = 13.08
 0.65 x 0.00 = 0.00 **13.084** ②

積載荷重 1.8 x 32.71 = 58.88
 3.9 x 0.00 = 0.00 **58.878** ③

(車庫の積載荷重は乗用車専用車庫の積載荷重(東京都建築構造設計指針)とする。)

立上り 内部の基礎梁のせい(高さ)は、基礎スラブの厚さを減じた寸法とする。

		W	H	延べ長さ	
1	24 x	0.150 x	0.40 x	5.460 =	7.86
1	24 x	0.150 x	0.40 x	6.370 =	9.17
1	24 x	0.150 x	0.40 x	5.915 =	8.52
1	24 x	0.150 x	0.40 x	4.999 =	7.20
1	24 x	0.150 x	0.40 x	0.455 =	0.66
1	24 x	0.150 x	0.40 x	0.916 =	1.32
1	24 x	0.150 x	0.34 x	0.946 =	1.16
	24 x	0.150 x	0.32 x	0.910 =	1.05
3	24 x	0.150 x	0.35 x	4.095 =	5.16
3	24 x	0.150 x	0.35 x	2.730 =	3.44
3	24 x	0.150 x	0.35 x	4.550 =	5.73
3	24 x	0.150 x	0.35 x	2.275 =	2.87
3	24 x	0.150 x	0.35 x	0.910 =	1.15
3	24 x	0.150 x	0.35 x	2.275 =	2.87
3	24 x	0.150 x	0.35 x	0.910 =	1.15
4	24 x	0.120 x	0.35 x	1.820 =	1.83

(①+②+③+④)

立上り合計 **61.125** ④

基礎総重量 **274.394**

平均重量 **8.39**

3.9. その他

3.9.1. 転倒の検討

$$\begin{aligned} X \text{ 方向建物長さ} & L_x = 5.92 \text{ (m)} \\ Y \text{ 方向建物長さ} & L_y = 6.37 \text{ (m)} \\ \text{支持力(短期)} & \sigma_s = 40.0 \text{ (kN/m}^2\text{)} \\ \text{転倒根入れ} & h' = 0.13 \text{ (m)} \end{aligned}$$

転倒モーメント

地震時

$$\begin{aligned} M_k &= P_{2k} \times h_2 + P_{1k} \times h_1 \\ &= 24.78 \times 5.96 + 21.71 \times 3.50 = 223.52 \text{ (kN}\cdot\text{m)} \end{aligned}$$

風圧時

$$\begin{aligned} M_w &= P_{2w} \times h_2 + P_{1w} \times h_1 \\ M_{wx} &= 15.84 \times 5.96 + 18.41 \times 3.50 = 158.72 \text{ (kN}\cdot\text{m)} \\ M_{wy} &= 15.02 \times 5.96 + 17.89 \times 3.50 = 152.00 \text{ (kN}\cdot\text{m)} \end{aligned}$$

$$\begin{aligned} \text{基礎自重 } N_f &= 141.31 \text{ (kN)} \\ \text{建物重量 } W &= 260.02 + 141.31 = 401.32 \text{ (kN)} \end{aligned}$$

鉛直方向の力のつり合い

$$\begin{aligned} W &= (\sigma_s \times X_x \times L_y) / 2 \\ 401.32 &= (40.0 \times X_x \times 6.37) / 2 \\ X_x &= 3.15 \text{ (m)} \\ W &= (\sigma_s \times X_y \times L_x) / 2 \\ 401.32 &= (40.0 \times X_y \times 5.92) / 2 \\ X_y &= 3.39 \text{ (m)} \end{aligned}$$

安定モーメント

$$\begin{aligned} M_{ox} &= \{ \sigma_s \times X_x \times L_y \times (L_x/2 - X_x/3) \} / 2 \\ &= \{ 40.0 \times 3.15 \times 6.37 \times (5.92/2 - 3.15/3) \} / 2 \\ &= 765.51 \text{ (kN}\cdot\text{m)} \\ M_{oy} &= \{ \sigma_s \times X_y \times L_x \times (L_y/2 - X_y/3) \} / 2 \\ &= \{ 40.0 \times 3.39 \times 5.92 \times (6.37/2 - 3.39/3) \} / 2 \\ &= 824.40 \text{ (kN}\cdot\text{m)} \end{aligned}$$

判定

$$\begin{aligned} M_k &\leq M_{ox} \quad \text{OK} \\ M_{wx} &\leq M_{ox} \quad \text{OK} \\ M_k &\leq M_{oy} \quad \text{OK} \\ M_{wy} &\leq M_{oy} \quad \text{OK} \end{aligned}$$

3.9.2. 転倒の検討(引抜き力の検討)

$$\begin{aligned} X \text{ 方向建物長さ} & L_x = 5.92 \text{ (m)} \\ Y \text{ 方向建物長さ} & L_y = 6.37 \text{ (m)} \\ \text{2階建物重量} & W_2 = 76.89 \text{ (kN)} \\ \text{1階建物重量} & W_1 = 109.09 \text{ (kN)} \\ e_{Q2} &= 24.78 & e_{Q1} &= 21.71 \text{ (kN)} \\ w_{Q2x} &= 15.84 & w_{Q1x} &= 18.41 \text{ (kN)} \\ w_{Q2y} &= 15.02 & w_{Q1y} &= 17.89 \text{ (kN)} \\ h_2 &= 2.46 & h_1 &= 2.75 \text{ (m)} \end{aligned}$$

地震時転倒モーメント

$$\begin{aligned} M_{k2} &= e_{Q2} \times h_2 \\ &= 24.78 \times 2.46 \\ &= 61.01 \text{ (kN}\cdot\text{m)} \\ M_{k1} &= e_{Q2} \times (h_2 + h_1) + e_{Q1} \times h_1 \\ &= 24.78 \times 5.21 + 21.71 \times 2.75 \\ &= 188.88 \text{ (kN}\cdot\text{m)} \end{aligned}$$

風圧時転倒モーメント

$$\begin{aligned} M_{w2x} &= w_{Q2x} \times h_2 \\ &= 15.84 \times 2.46 \\ &= 39.01 \text{ (kN}\cdot\text{m)} \\ M_{w1x} &= w_{Q2x} \times (h_2 + h_1) + w_{Q1x} \times h_1 \\ &= 15.84 \times 5.21 + 18.41 \times 2.75 \\ &= 133.20 \text{ (kN}\cdot\text{m)} \\ M_{w2y} &= w_{Q2y} \times h_2 \\ &= 15.02 \times 2.46 \\ &= 36.98 \text{ (kN}\cdot\text{m)} \\ M_{w1y} &= w_{Q2y} \times (h_2 + h_1) + w_{Q1y} \times h_1 \\ &= 15.02 \times 5.21 + 17.89 \times 2.75 \\ &= 127.48 \text{ (kN}\cdot\text{m)} \end{aligned}$$

地震時浮上り力

$$\begin{aligned}
 Tk2x &= W2 / 2 - Mk2 / Lx \\
 &= 76.89 / 2 - 61.01 / 5.92 &= & 28.13 \text{ (kN)} \quad (\downarrow) \\
 Tk2y &= W2 / 2 - Mk2 / Ly \\
 &= 76.89 / 2 - 61.01 / 6.37 &= & 28.87 \text{ (kN)} \quad (\downarrow) \\
 Tk1x &= (W2 + W1) / 2 - Mk1 / Lx \\
 &= 185.98 / 2 - 188.88 / 5.92 &= & 61.06 \text{ (kN)} \quad (\downarrow) \\
 Tk1y &= (W2 + W1) / 2 - Mk1 / Ly \\
 &= 185.98 / 2 - 188.88 / 6.37 &= & 63.34 \text{ (kN)} \quad (\downarrow)
 \end{aligned}$$

風圧時浮上り力

$$\begin{aligned}
 Tw2x &= W2 / 2 - Mw2x / Lx \\
 &= 76.89 / 2 - 39.01 / 5.92 &= & 31.85 \text{ (kN)} \quad (\downarrow) \\
 Tw2y &= W2 / 2 - Mw2y / Ly \\
 &= 76.89 / 2 - 36.98 / 6.37 &= & 32.64 \text{ (kN)} \quad (\downarrow) \\
 Tw1x &= (W2 + W1) / 2 - Mw1x / Lx \\
 &= 185.98 / 2 - 133.20 / 5.92 &= & 70.47 \text{ (kN)} \quad (\downarrow) \\
 Tw1y &= (W2 + W1) / 2 - Mw1y / Ly \\
 &= 185.98 / 2 - 127.48 / 6.37 &= & 72.98 \text{ (kN)} \quad (\downarrow)
 \end{aligned}$$

3.9.3. 層間変形角 (令109条の2の2)

$$\delta i = (h_i / 150) \times (Q_i / P_i)$$

$$\gamma_{si} = h_i / \delta i$$

γ_{si} : 層間変形角の逆数 h_i : 構造階高 δi : 変位
 Q_i : 当該階 (又は壁) に作用する水平力 (kN)
 P_i : 当該階の耐力壁の許容耐力 (kN)

階	h_i (m)	方向	Q_i/P_i (地震時)	δi (cm)	γ_{si}	
2	2.46	X	0.926	1.520	161.9	≥ 150 OK
		Y	0.601	0.986	249.7	≥ 150 OK
1	2.75	X	0.900	1.651	166.6	≥ 150 OK
		Y	0.915	1.677	164.0	≥ 150 OK

3.11. 土台アンカーボルトの設計

D Fir-L 2級

土台材厚 $L = 90$ (mm)基準圧縮強度 $F_c = 18.4$ (N/mm²)アンカーボルト径 $d = 12$ (mm)鋼材の基準圧縮強度 $F = 235.0$ (N/mm²)

$$M_y = (F \times d^3) / 6 = 67680.0 \text{ (N}\cdot\text{mm)}$$

$$C = (d / L) \times \sqrt{(4 \times M_y) / (F_c \times d^3)} = 0.389$$

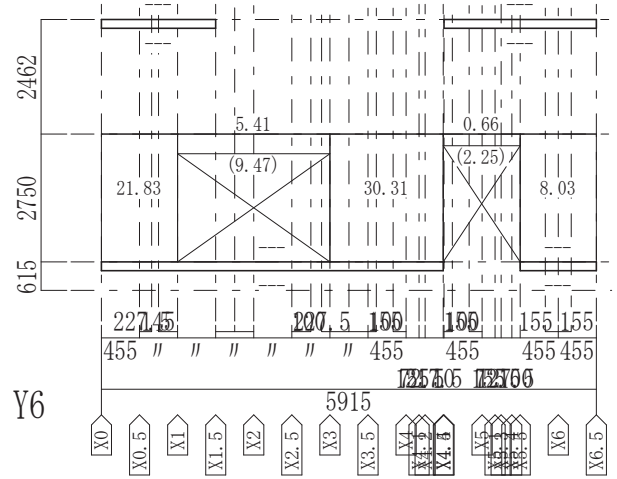
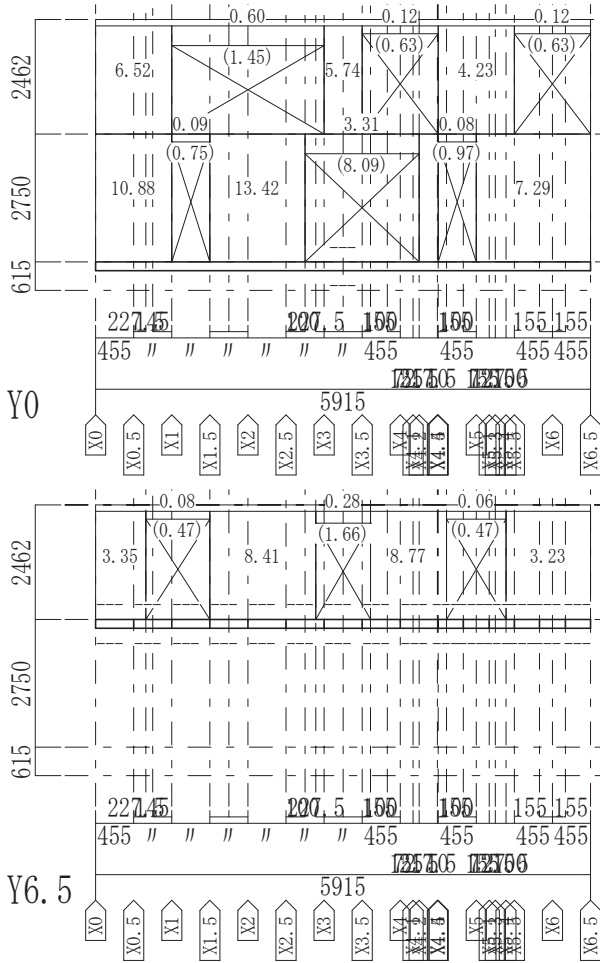
$$q = C \times F_c \times d \times L = 7731.4 \text{ (N/本)}$$

$$P_a = (2 / 3) \times q = 5154.3 \text{ (N/本)}$$

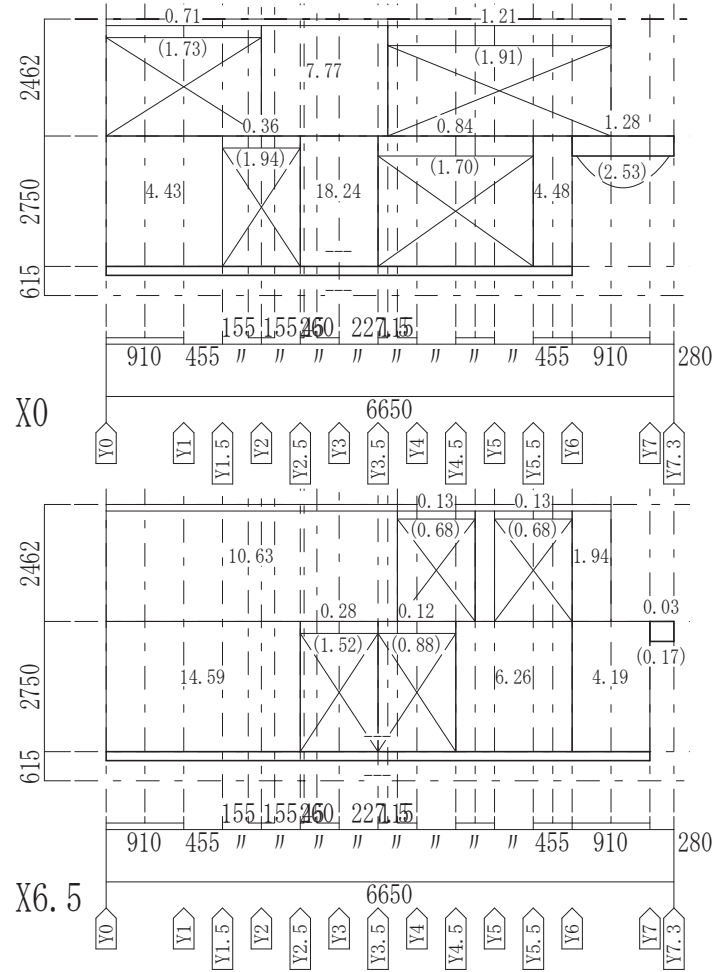
方向	通り	負担地震力 (kN)	本数	負担風圧力 (kN)	本数	必要本数
X	Y0	24.086	5	17.744	4	5
	Y6	22.410	5	16.509	4	5
Y	X0	20.393	4	14.434	3	4
	X6.5	26.103	6	18.475	4	6

凡例 (単位 : kN, kN・m)
 ●まぐさ 上段 : 曲げモーメント
 下段 : MAXせん断力
 ●壁 軸力

4.1. 鉛直荷重時応力

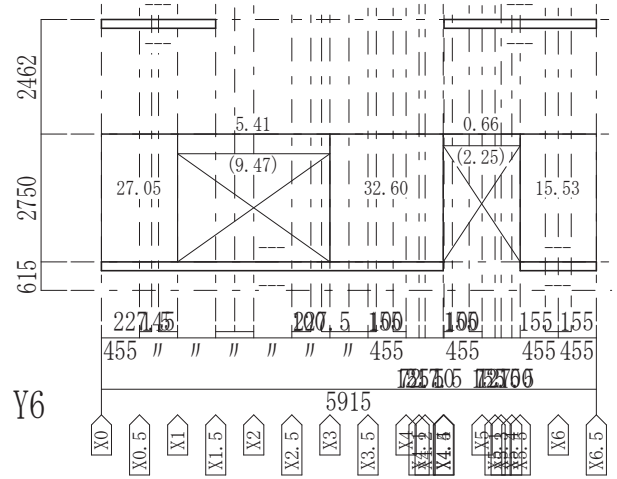
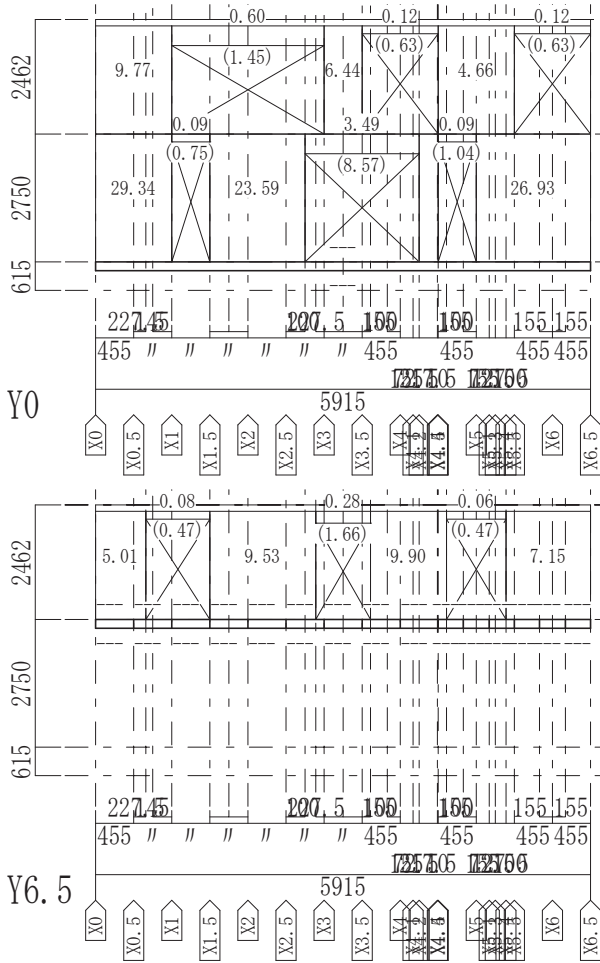


凡例 (単位 : kN, kN・m)
 ●まぐさ 上段 : 曲げモーメント
 下段 : MAXせん断力
 ●壁 軸力

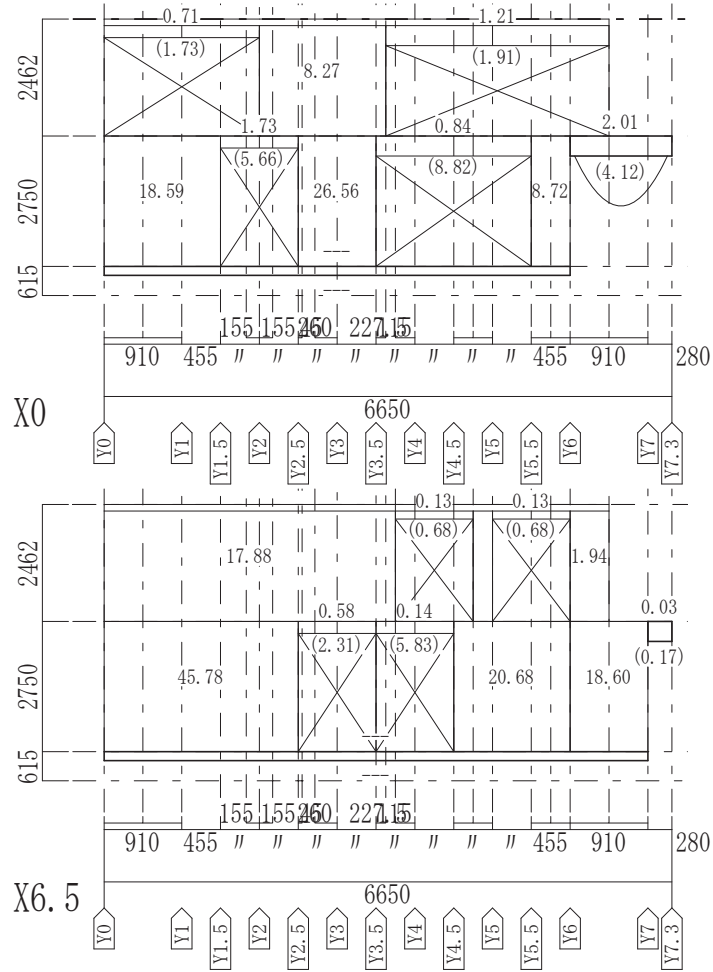


凡例 (単位 : kN, kN・m)
 ●まぐさ 上段 : 曲げモーメント
 下段 : MAXせん断力
 ●壁 軸力

4.2. 水平荷重時応力



凡例 (単位 : kN, kN・m)
 ●まぐさ 上段 : 曲げモーメント
 下段 : MAXせん断力
 ●壁 軸力

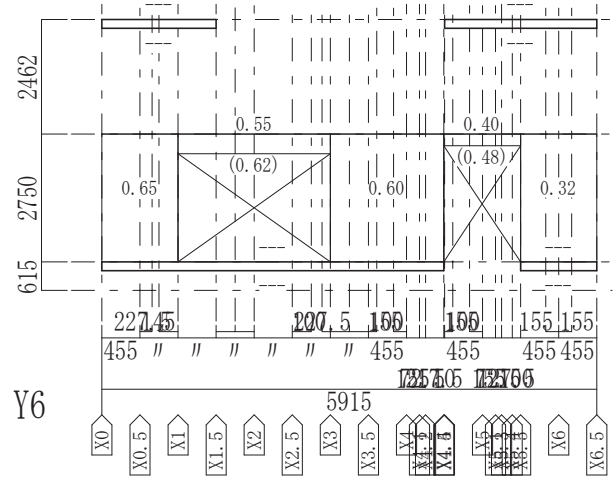
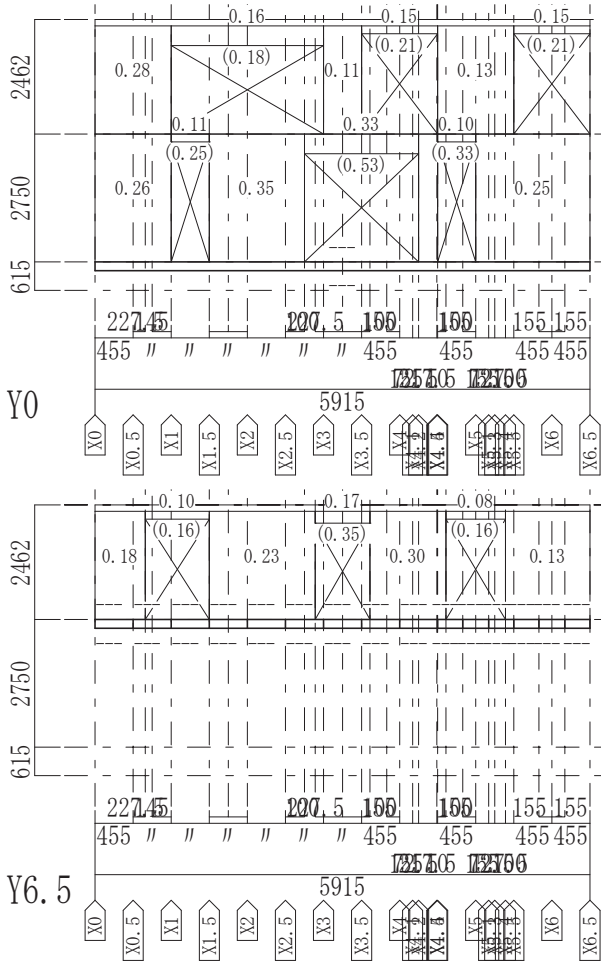


凡例

- まぐさ 上段：曲げモーメント検定比
下段：MAX せん断検定比
- 壁 軸力検定比

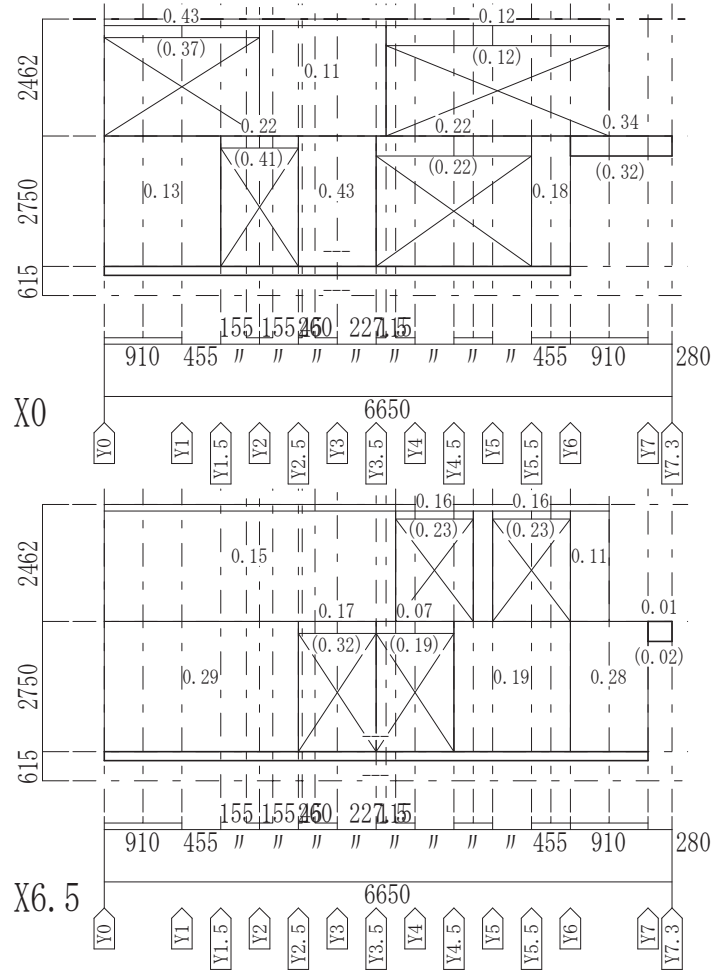
5. 断面検定比図

5.1. 長期荷重時断面検定比図



凡例

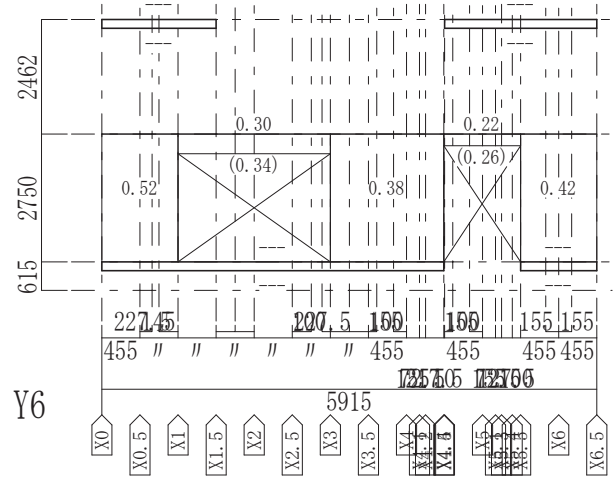
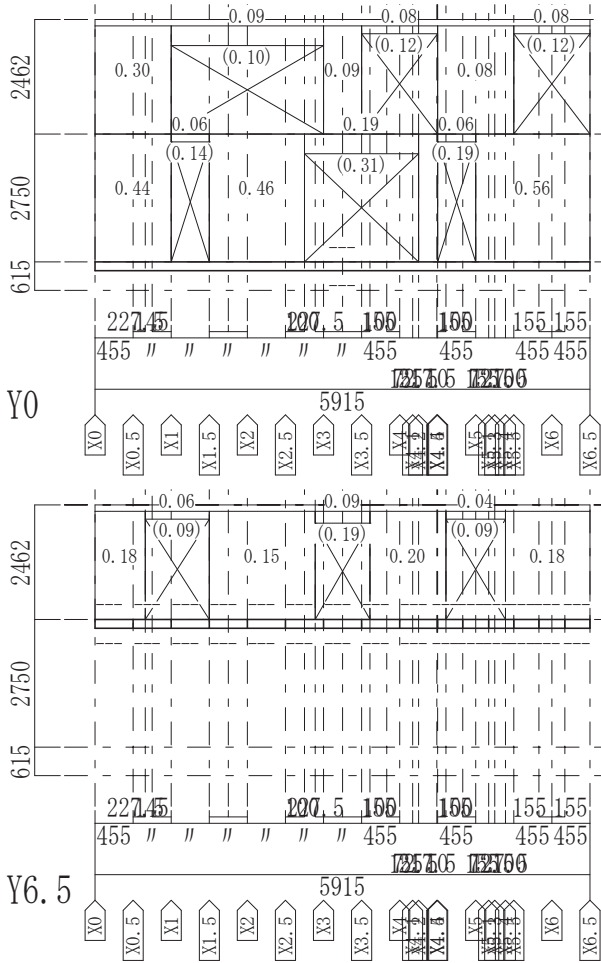
- まぐさ 上段：曲げモーメント検定比
下段：MAX せん断検定比
- 壁 軸力検定比



凡例

- まぐさ 上段： 曲げモーメント検定比
下段： MAX セン断検定比
- 壁 軸力検定比

5. 2. 短期荷重時断面検定比図



凡例

- まぐさ 上段： 曲げモーメント検定比
下段： MAX せん断検定比
- 壁 軸力検定比

