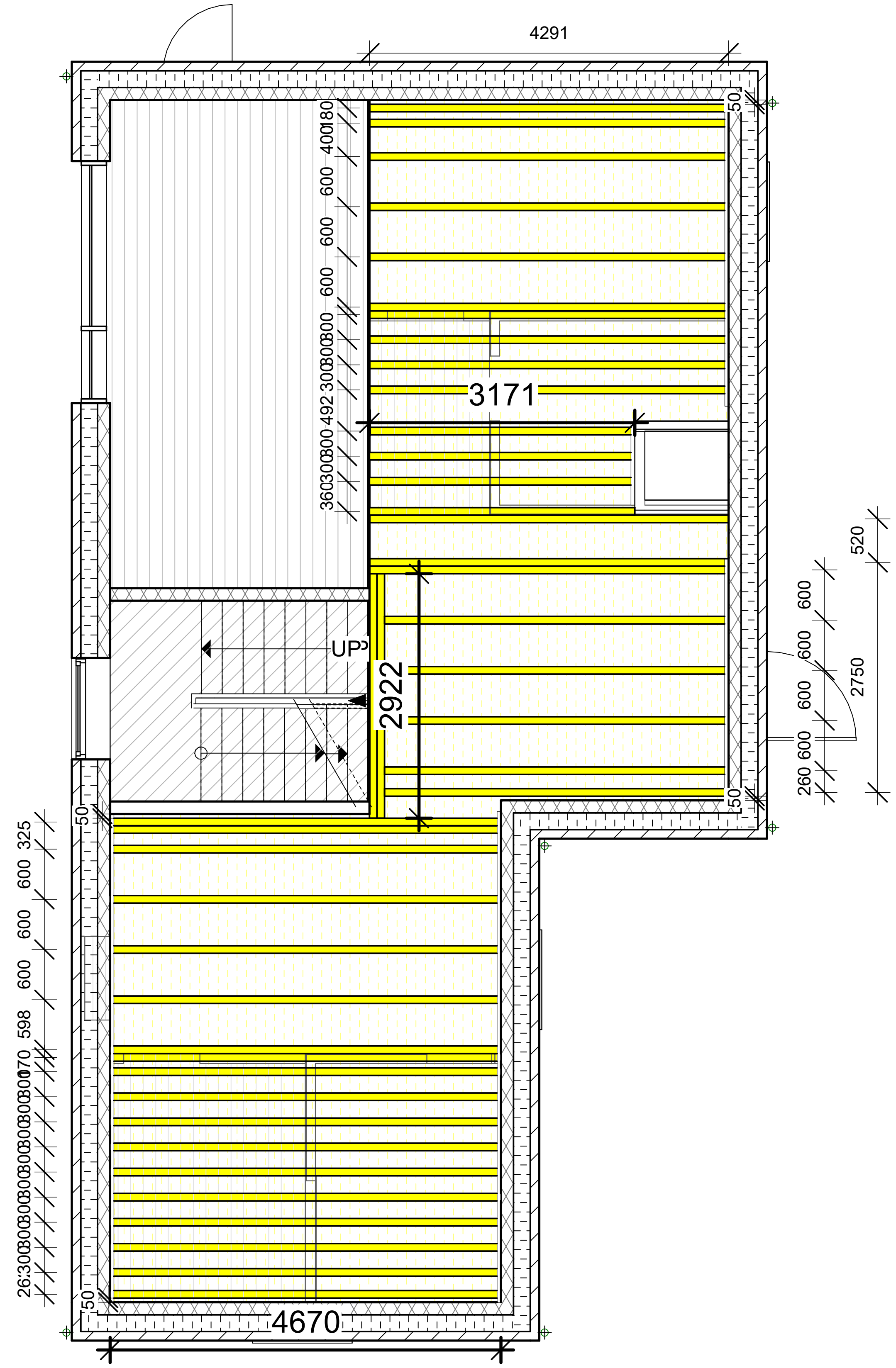
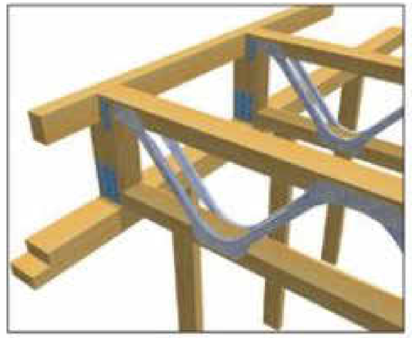


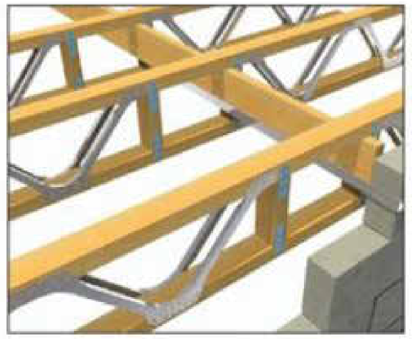
Muligheder for fremføring af alle former for installationer og specielt egnet til genvex i tagbjælken.



Vederlags/endeløsning ved vægafslutning. Både ved tunge og lette vægge.

Vederlagsløsning mod limtræsbjælke, trævægge, beton eller murværk.

Vederlagsløsning på bærende væg eller bjælke som mellemunderstøtning.



Løsning med tværafstivningsbjælke på langs af bygningen.

Bjælken kan leveres færdig isoleret fra fabrik. Herved spares arbejde og tid på byggepladsen.

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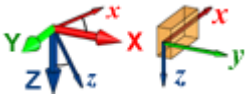
Campus Horsens

PROJECT: 2 storey house with basement	DATE: 11/30/22	IXX_K01_TXX_H1_EX_N12
SUBJECT: Wood Open Web Joist Plan	SCALE: 1 : 75	
DRAWN BY: Dimtrian Cebotaru	CLASS: AH21-22S	

The following member analysis is only valid for the engineering data below.
The actual length of the structural member might be different to the engineering length shown.

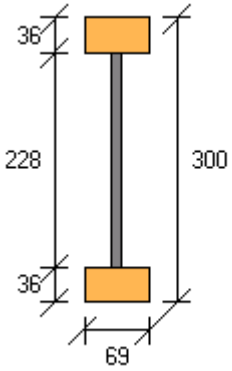
Finnwood 3.0 UK (2.4.089)
UK public (17.09.2021)
Structural design without fire/accidental cases



PROJECT INFORMATION:

C:\Users\DimitrianC\OneDrive - ViaUC\Skrivebord\Joists finnwood\with overhang.s01

STRUCTURAL INFORMATION:



Type of structure:	Floor beam		
Profile:	FJI 69x300-36 (B=69 mm, H=300 mm)		
Web stiffeners:	Never		
Service class:	1		
Spacing:	600 mm (for surface loads)		

Cantilever/span lengths:			
Cantilever/Span:	Horizontal [mm]:		
Left cantilever	1346.0		
Span 1	2945.0		
Total:	4291.0		

Support:	Position x [mm]:	Width [mm]:	Type:
1:	1346	150	Pinned support (X,Z)
2:	4291	150	Pinned support (Z)

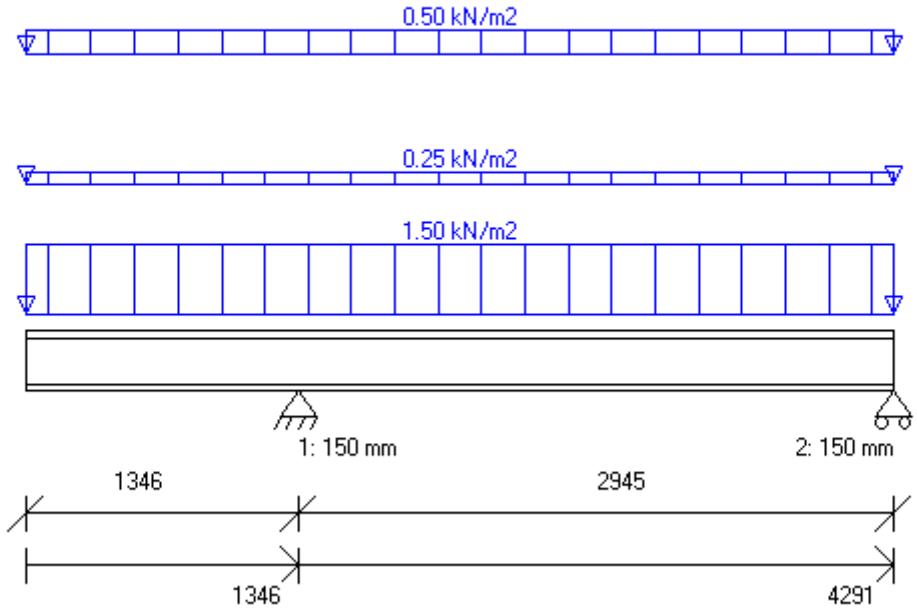
My,k:	18.33 kNm
Mz,k:	1.20 kNm
Vz,k:	16.02 kN
Vy,k:	6.51 kN
Nt,k:	66.70 kN
Nc,k:	66.70 kN
EIy:	1196.88 kNm2
EIz:	13.59 kNm2
GAz:	4860.00 kN
GAy:	2858.40 kN
EA:	65743.20 kN

Partial factor, flange:	1.20	
Partial factor, web	1.20	
Load duration class:	kmod,flange:	kmod,web:

Permanent:	0.600	0.400
Long-term:	0.700	0.500
Medium-term:	0.800	0.700
Short-term:	0.900	0.900
Instantaneous:	1.100	1.100

---

kdef,flange:	0.600
kdef,web:	1.500



LOADING INFORMATION:

Self-weight (Self-weight, Permanent):

Self-weight:	QZ = 0.039 kN/m	x = 0 - 4291 mm
Surface load: 1:	QZ = 0.500 kN/m2	x = 0 - 4291 mm

Partition load (Partition load, Permanent, ULS/SLS-movability = 100.0 %):

Surface load: 1:	QZ = 0.250 kN/m2	x = 0 - 4291 mm

Imposed load (A, domestic, residential areas, Medium-term, ULS/SLS-movability = 100.0 %):

Surface load: 1:	QZ = 1.500 kN/m2	x = 0 - 4291 mm

LOAD COMBINATIONS:

Combination 1 (ULS, Permanent)

1.35*Self-weight + 1.35*Partition load

Combination 2 (ULS, Medium-term)
1.35*Self-weight + 1.35*Partition load + 1.50*0.70*Imposed load
---
Combination 10 (ULS, Medium-term)
1.25*Self-weight + 1.25*Partition load + 1.50*Imposed load

Combination 11 (ULS, Permanent)
1.25*Self-weight + 1.25*Partition load

Combination 17 (ULS, Medium-term)
1.25*Self-weight + 1.25*Partition load + 1.50*0.70*Imposed load
---
Combination 24 (ULS, Permanent)
1.00*Self-weight + 1.00*Partition load

Combination 25 (ULS, Medium-term)
1.00*Self-weight + 1.00*Partition load + 1.50*Imposed load

Combination 32 (ULS, Medium-term)
1.00*Self-weight + 1.00*Partition load + 1.50*0.70*Imposed load
---
Combination 39 (SLS, Characteristic)
1.00*Self-weight + 1.00*Partition load

Combination 40 (SLS, Characteristic)
1.00*Self-weight + 1.00*Partition load + 1.00*Imposed load

Combination 47 (SLS, Characteristic)
1.00*Self-weight + 1.00*Partition load + 1.00*0.70*Imposed load

DESIGN RESULTS:

Norm/Standard:		BS EN 1995-1-1:2004+A1:2008 and UK NA
Maximum utilization rate:		30.4 %

DESIGN PARAMETERS:

Allowed Wnet,fin:	L/250	(characteristic)
Allowed Winst:	L/350 and 12.00 mm	(characteristic)
Factor for left cantilever:		2.00
Factor for right cantilever:		2.00

NOTE! SLS design limits above are set by the user and can differ to BS EN 1995-1-1:2004+A1:2008
Buckling is prevented on both directions (y and z)
Lateral torsional buckling for bending My about the y-axis:
Distance between supports above the beam: Lk1 = 300.00 mm

Distance between supports below the beam: Lk2 = 300.00 mm
NOTE! Lk1 is used when My>0 and Lk2 when My<0

VIBRATION DESIGN PARAMETERS:

Floor width:	5 m
Structure above:	Custom floor stiffness (defined below)
Transverse stiffness of floor structure:	1907 Nm2/m
Minimum frequency allowed:	8 Hz
Frequency f1 is calculated according:	Eurocode 5
Deflection limit with 1 kN:	As per BS NA to EC5
Type of the beam:	Joist

GOVERNING DESIGN RESULTS:

Check:	Actual:	Allowable:	% allowable:	Location x:	
Shear (z):	2.76 kN	9.34 kN	29.5 %	1721 mm	Comb. 10/1, Medium-term
Bending (My):	1.94 kNm	12.22 kNm	15.9 %	2896 mm	Comb. 10/4, Medium-term
(without kcrit):	1.94 kNm	12.22 kNm	15.9 %	2896 mm	Comb. 10/4, Medium-term
Bearing, support 1:	6.13 kN	20.18 kN	30.4 %	1346 mm	Comb. 10/1, Medium-term
Bearing, support 2:	2.76 kN	17.79 kN	15.5 %	4291 mm	Comb. 10/4, Medium-term
Left cant., Wz,inst:	1.8 mm	7.7 mm	23.9 %	0 mm	Comb. 40/2 (characteristic)
Left cant., Wz,net,fin:	2.5 mm	10.8 mm	23.3 %	0 mm	Comb. 40/2 (characteristic)
Span 1, Wz,inst:	1.3 mm	8.4 mm	15.5 %	2789 mm	Comb. 40/3 (characteristic)
Span 1, Wz,net,fin:	1.8 mm	11.8 mm	15.7 %	2896 mm	Comb. 40/3 (characteristic)
Deflection U:	0.27 mm	1.80 mm	15.0%	(Vibration check)	
Frequency f1:	34.20 Hz	8.00 Hz	23.4%	(Vibration check)	
velocity v:	0.0192 m/(Ns2)	0.2429 m/(Ns2)	7.9%	(Vibration check)	

GOVERNING DESIGN RESULT COMBINATIONS:

Combination 10/1 (Medium-term):
1.25*Self-weight + 1.25*Partition load, Left cant. + 1.25*Partition load, span 1 + 1.50*Imposed load, Left cant. + 1.50*Imposed load, span 1
Combination 10/4 (Medium-term):
1.25*Self-weight + 1.25*Partition load, span 1 + 1.50*Imposed load, span 1
Combination 40/2 (characteristic):
1.00*Self-weight + 1.00*Partition load, Left cant. + 1.00*Imposed load, Left cant.
Combination 40/3 (characteristic):
1.00*Self-weight + 1.00*Partition load, span 1 + 1.00*Imposed load, span 1

EXTREME FORCES:

Result:	Maximum value:	Location x:
Vz,max	3.49 kN	1346 mm
My,max	1.94 kNm	2896 mm

SUPPORT REACTIONS:

Support:	ULSmax:	ULSmin:	SLSmax:	SLSmin:	Rd/A:

1:	6.13 kN	1.06 kN	4.34 kN	1.06 kN	0.59 N/mm2
2:	2.76 kN	-0.07 kN	1.94 kN	0.07 kN	0.27 N/mm2

- Upplift occurs, make sure of the anchoring
- SLS support reactions are for reference use only

NOTES:

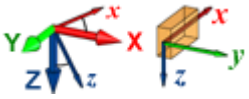
- Design is done in accordance with BS EN 1995-1-1 2004+A1 (2008)+A2 (2014) and UK NA (Oct 2012) and PD 6693-1 (2012)
- ULS = Ultimate Limit State, SLS = Serviceability Limit State
- Permanent load consists of dead load and partition load
- Self-weight according to BS EN 1991-1-1 (Table A.3) or calculated as the mean density times the acceleration of gravity
- SLS design limits used are set by the user and can differ from BS EN 1995-1-1:2004+A1:2008
- *) The percentage value of the checking of the combined actions stands for the ratio of design value and design resistance, not the actual utilization rate
- Bearing resistance of the structure underneath shall be separately checked
- Design calculations do not take into account upward deflection of cantilevers less than 4.0 mm
- Deflection checking is not carried out for cantilevers shorter than 350 mm.
- Second order analysis/loading was not taken into account
- Shear deflection was taken into account in the SLS design
- Shear deflection was taken into account when calculating the ULS forces
- Reduction of shear force is taken into account close to supports, and loads are assumed to act on the opposite side of the structure than the support area
- Shear force reduction is made to the shear force curve of the load combinations at the distance of H from the edge of the support

---

These calculations do not take into account loads or moisture conditions during construction. The need for additional bracing during construction has to be checked separately. The overall stability of the building and horizontal loads have not been considered. The building designer, main structural engineer or other person responsible for the structural behaviour of the whole building has to check separately the applicability of the structural member to the building.

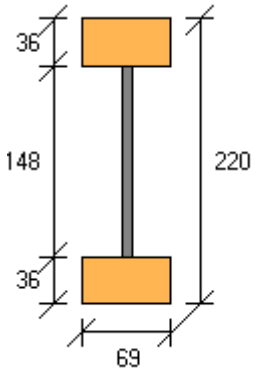
The following member analysis is only valid for the engineering data below.
The actual length of the structural member might be different to the engineering length shown.

Finnwood 3.0 UK (2.4.089)
UK public (17.09.2021)
Structural design without fire/accidental cases



PROJECT INFORMATION:

STRUCTURAL INFORMATION:



Type of structure:	Floor beam
Profile:	FJI 69x220-36 (B=69 mm, H=220 mm)
Web stiffeners:	Never
Service class:	1
Spacing:	300 mm (for surface loads)

Cantilever/span lengths:	
Cantilever/Span:	Horizontal [mm]:
Left cantilever	1346.0
Span 1	2945.0
Total:	4291.0

Support:	Position x [mm]:	Width [mm]:	Type:
1:	1346	150	Pinned support (X,Z)
2:	4291	150	Pinned support (Z)

My,k:	12.74 kNm
Mz,k:	1.20 kNm
Vz,k:	11.13 kN
Vy,k:	6.51 kN
Nt,k:	66.70 kN
Nc,k:	66.70 kN
Ely:	580.85 kNm2
Elz:	13.59 kNm2
GAz:	3564.00 kN
GAy:	2858.40 kN
EA:	65743.20 kN

Partial factor, flange:	1.20	
Partial factor, web	1.20	
Load duration class:	kmod,flange:	kmod,web:
Permanent:	0.600	0.400
Long-term:	0.700	0.500

Medium-term:	0.800	0.700
Short-term:	0.900	0.900
Instantaneous:	1.100	1.100

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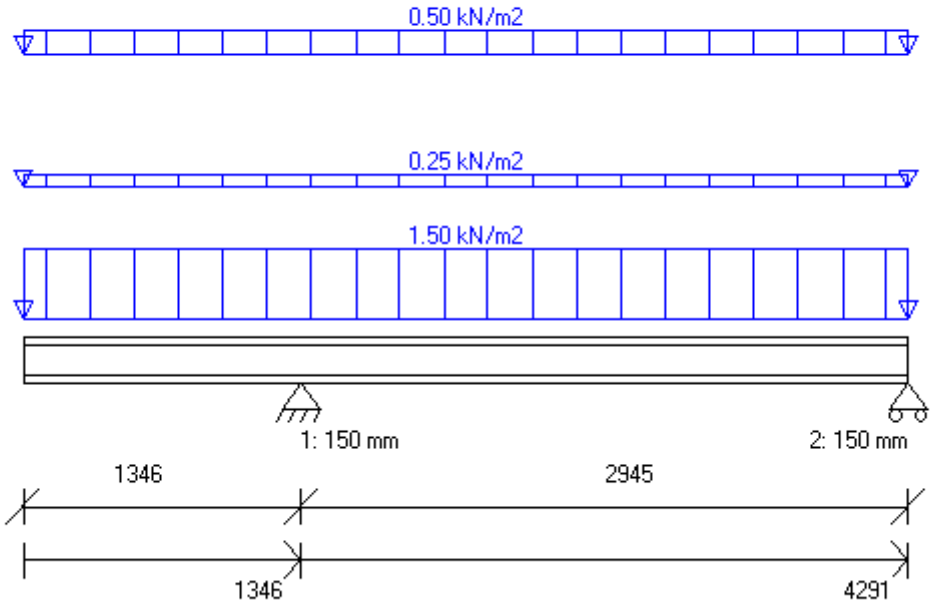
kdef,flange:	0.600
kdef,web:	1.500



LOADING INFORMATION:

Self-weight (Self-weight, Permanent):

Self-weight:	QZ = 0.034 kN/m	x = 0 - 4291 mm
Surface load: 1:	QZ = 0.500 kN/m2	x = 0 - 4291 mm

Partition load (Partition load, Permanent, ULS/SLS-movability = 100.0 %):

Surface load: 1:	QZ = 0.250 kN/m2	x = 0 - 4291 mm

Imposed load (A, domestic, residential areas, Medium-term, ULS/SLS-movability = 100.0 %):

Surface load: 1:	QZ = 1.500 kN/m2	x = 0 - 4291 mm

LOAD COMBINATIONS:

Combination 1 (ULS, Permanent)
1.35*Self-weight + 1.35*Partition load

Combination 2 (ULS, Medium-term)
1.35*Self-weight + 1.35*Partition load + 1.50*0.70*Imposed load
---
Combination 10 (ULS, Medium-term)
1.25*Self-weight + 1.25*Partition load + 1.50*Imposed load

Combination 11 (ULS, Permanent)
1.25*Self-weight + 1.25*Partition load

Combination 17 (ULS, Medium-term)
1.25*Self-weight + 1.25*Partition load + 1.50*0.70*Imposed load
---
Combination 24 (ULS, Permanent)
1.00*Self-weight + 1.00*Partition load

Combination 25 (ULS, Medium-term)
1.00*Self-weight + 1.00*Partition load + 1.50*Imposed load

Combination 32 (ULS, Medium-term)
1.00*Self-weight + 1.00*Partition load + 1.50*0.70*Imposed load
---
Combination 39 (SLS, Characteristic)
1.00*Self-weight + 1.00*Partition load

Combination 40 (SLS, Characteristic)
1.00*Self-weight + 1.00*Partition load + 1.00*Imposed load

Combination 47 (SLS, Characteristic)
1.00*Self-weight + 1.00*Partition load + 1.00*0.70*Imposed load

DESIGN RESULTS:

Norm/Standard:		BS EN 1995-1-1:2004+A1:2008 and UK NA
Maximum utilization rate:		35.0 %

DESIGN PARAMETERS:

Allowed Wnet,fin:	L/250	(characteristic)
Allowed Winst:	L/350 and 12.00 mm	(characteristic)
Factor for left cantilever:		2.00
Factor for right cantilever:		2.00

NOTE! SLS design limits above are set by the user and can differ to BS EN 1995-1-1:2004+A1:2008
Buckling is prevented on both directions (y and z)
Lateral torsional buckling for bending My about the y-axis:
Distance between supports above the beam: Lk1 = 300.00 mm
Distance between supports below the beam: Lk2 = 300.00 mm
NOTE! Lk1 is used when My>0 and Lk2 when My<0

VIBRATION DESIGN PARAMETERS:

Floor width:	5 m
Structure above:	Custom floor stiffness (defined below)
Transverse stiffness of floor structure:	1907 Nm2/m
Minimum frequency allowed:	8 Hz
Frequency f1 is calculated according:	Eurocode 5
Deflection limit with 1 kN:	As per BS NA to EC5
Type of the beam:	Joist

GOVERNING DESIGN RESULTS:

Check:	Actual:	Allowable:	% allowable:	Location x:	
Shear (z):	1.48 kN	6.49 kN	22.9 %	1641 mm	Comb. 10/1, Medium-term
Bending (My):	0.98 kNm	8.49 kNm	11.6 %	2896 mm	Comb. 10/4, Medium-term
(without kcrit):	0.98 kNm	8.49 kNm	11.6 %	2896 mm	Comb. 10/4, Medium-term
Bearing, support 1:	3.12 kN	20.18 kN	15.5 %	1346 mm	Comb. 10/1, Medium-term
Bearing, support 2:	1.40 kN	17.79 kN	7.9 %	4291 mm	Comb. 10/4, Medium-term
Left cant., Wz,inst:	1.8 mm	7.7 mm	23.0 %	0 mm	Comb. 40/2 (characteristic)
Left cant., Wz,net,fin:	2.4 mm	10.8 mm	22.0 %	0 mm	Comb. 40/2 (characteristic)
Span 1, Wz,inst:	1.3 mm	8.4 mm	14.9 %	2896 mm	Comb. 40/3 (characteristic)
Span 1, Wz,net,fin:	1.7 mm	11.8 mm	14.8 %	2896 mm	Comb. 40/3 (characteristic)
Deflection U:	0.56 mm	1.80 mm	30.9%	(Vibration check)	
Frequency f1:	22.84 Hz	8.00 Hz	35.0%	(Vibration check)	
velocity v:	0.0226 m/(Ns2)	0.0878 m/(Ns2)	25.7%	(Vibration check)	

GOVERNING DESIGN RESULT COMBINATIONS:

Combination 10/1 (Medium-term):
1.25*Self-weight + 1.25*Partition load, Left cant. + 1.25*Partition load, span 1 + 1.50*Imposed load, Left cant. + 1.50*Imposed load, span 1

Combination 10/4 (Medium-term):
1.25*Self-weight + 1.25*Partition load, span 1 + 1.50*Imposed load, span 1

Combination 40/2 (characteristic):
1.00*Self-weight + 1.00*Partition load, Left cant. + 1.00*Imposed load, Left cant.

Combination 40/3 (characteristic):
1.00*Self-weight + 1.00*Partition load, span 1 + 1.00*Imposed load, span 1

EXTREME FORCES:

Result:	Maximum value:	Location x:
Vz,max	1.78 kN	1346 mm
My,max	0.98 kNm	2896 mm

SUPPORT REACTIONS:

Support:	ULSmax:	ULSmin:	SLSmax:	SLSmin:	Rd/A:
1:	3.12 kN	0.58 kN	2.22 kN	0.58 kN	0.30 N/mm2
2:	1.40 kN	-0.02 kN	0.99 kN	0.05 kN	0.14 N/mm2

- Upplift occurs, make sure of the anchoring
- SLS support reactions are for reference use only

NOTES:

- Design is done in accordance with BS EN 1995-1-1 2004+A1 (2008)+A2 (2014) and UK NA (Oct 2012) and PD 6693-1 (2012)
- ULS = Ultimate Limit State, SLS = Serviceability Limit State
- Permanent load consists of dead load and partition load
- Self-weight according to BS EN 1991-1-1 (Table A.3) or calculated as the mean density times the acceleration of gravity
- SLS design limits used are set by the user and can differ from BS EN 1995-1-1:2004+A1:2008
- *) The percentage value of the checking of the combined actions stands for the ratio of design value and design resistance, not the actual utilization rate
- Bearing resistance of the structure underneath shall be separately checked
- Design calculations do not take into account upward deflection of cantilevers less than 4.0 mm
- Deflection checking is not carried out for cantilevers shorter than 350 mm.
- Second order analysis/loading was not taken into account
- Shear deflection was taken into account in the SLS design
- Shear deflection was taken into account when calculating the ULS forces
- Reduction of shear force is taken into account close to supports, and loads are assumed to act on the opposite side of the structure than the support area
- Shear force reduction is made to the shear force curve of the load combinations at the distance of H from the edge of the support

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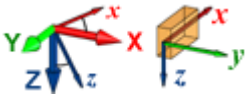
These calculations do not take into account loads or moisture conditions during construction. The need for additional bracing during construction has to be checked separately. The overall stability of the building and horizontal loads have not been considered. The building designer, main structural engineer or other person responsible for the structural behaviour of the whole building has to check separately the applicability of the structural member to the building.

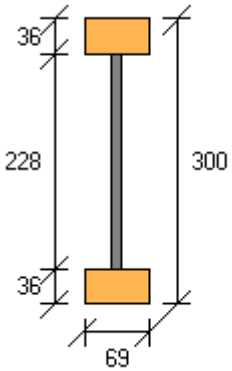
The following member analysis is only valid for the engineering data below.
The actual length of the structural member might be different to the engineering length shown.

Finnwood 3.0 UK (2.4.089)
UK public (17.09.2021)
Structural design without fire/accidental cases



PROJECT INFORMATION:

STRUCTURAL INFORMATION:



Type of structure:	Floor beam		
Profile:	FJI 69x300-36 (B=69 mm, H=300 mm)		
Web stiffeners:	Never		
Service class:	1		
Spacing:	600 mm (for surface loads)		

Cantilever/span lengths:			
Cantilever/Span:	Horizontal [mm]:		
Span 1	4291.0		
Total:	4291.0		

Support:	Position x [mm]:	Width [mm]:	Type:
1:	0	150	Pinned support (X,Z)
2:	4291	150	Pinned support (Z)

My,k:	18.33 kNm
Mz,k:	1.20 kNm
Vz,k:	16.02 kN
Vy,k:	6.51 kN
Nt,k:	66.70 kN
Nc,k:	66.70 kN
EIy:	1196.88 kNm2
EIz:	13.59 kNm2
GAz:	4860.00 kN
GAy:	2858.40 kN
EA:	65743.20 kN

Partial factor, flange:	1.20	
Partial factor, web	1.20	
Load duration class:	kmod,flange:	kmod,web:
Permanent:	0.600	0.400
Long-term:	0.700	0.500
Medium-term:	0.800	0.700

Short-term:	0.900	0.900
Instantaneous:	1.100	1.100

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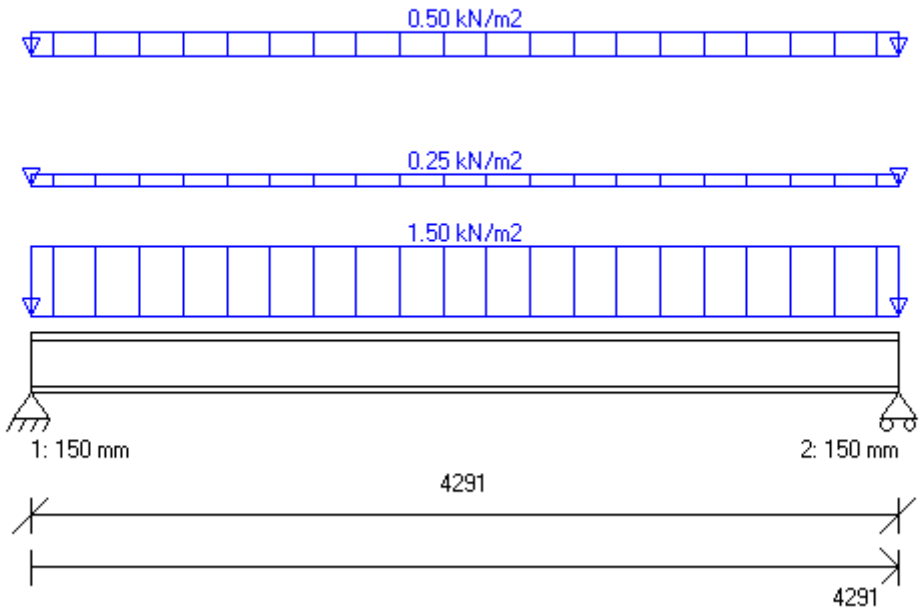
kdef,flange:	0.600
kdef,web:	1.500



LOADING INFORMATION:

Self-weight (Self-weight, Permanent):

Self-weight:	QZ = 0.039 kN/m	x = 0 - 4291 mm
Surface load: 1:	QZ = 0.500 kN/m2	x = 0 - 4291 mm

Partition load (Partition load, Permanent, ULS/SLS-movability = 100.0 %):

Surface load: 1:	QZ = 0.250 kN/m2	x = 0 - 4291 mm

Imposed load (A, domestic, residential areas, Medium-term, ULS/SLS-movability = 100.0 %):

Surface load: 1:	QZ = 1.500 kN/m2	x = 0 - 4291 mm

LOAD COMBINATIONS:

Combination 1 (ULS, Permanent)

1.35*Self-weight + 1.35*Partition load

Combination 2 (ULS, Medium-term)

1.35*Self-weight + 1.35*Partition load + 1.50*0.70*Imposed load
---
Combination 10 (ULS, Medium-term)
1.25*Self-weight + 1.25*Partition load + 1.50*Imposed load

Combination 11 (ULS, Permanent)
1.25*Self-weight + 1.25*Partition load

Combination 17 (ULS, Medium-term)
1.25*Self-weight + 1.25*Partition load + 1.50*0.70*Imposed load
---
Combination 24 (ULS, Permanent)
1.00*Self-weight + 1.00*Partition load

Combination 25 (ULS, Medium-term)
1.00*Self-weight + 1.00*Partition load + 1.50*Imposed load

Combination 32 (ULS, Medium-term)
1.00*Self-weight + 1.00*Partition load + 1.50*0.70*Imposed load
---
Combination 39 (SLS, Characteristic)
1.00*Self-weight + 1.00*Partition load

Combination 40 (SLS, Characteristic)
1.00*Self-weight + 1.00*Partition load + 1.00*Imposed load

Combination 47 (SLS, Characteristic)
1.00*Self-weight + 1.00*Partition load + 1.00*0.70*Imposed load

DESIGN RESULTS:

Norm/Standard:		BS EN 1995-1-1:2004+A1:2008 and UK NA
Maximum utilization rate:		49.7 %

DESIGN PARAMETERS:

Allowed Wnet,fin:	L/250	(characteristic)
Allowed Winst:	L/350 and 12.00 mm	(characteristic)
Factor for left cantilever:		2.00
Factor for right cantilever:		2.00

NOTE! SLS design limits above are set by the user and can differ to BS EN 1995-1-1:2004+A1:2008
Buckling is prevented on both directions (y and z)
Lateral torsional buckling for bending My about the y-axis:
Distance between supports above the beam: Lk1 = 300.00 mm
Distance between supports below the beam: Lk2 = 300.00 mm
NOTE! Lk1 is used when My>0 and Lk2 when My<0

VIBRATION DESIGN PARAMETERS:

Floor width:	5 m
Structure above:	Custom floor stiffness (defined below)
Transverse stiffness of floor structure:	1907 Nm2/m
Minimum frequency allowed:	8 Hz
Frequency f1 is calculated according:	Eurocode 5
Deflection limit with 1 kN:	As per BS NA to EC5
Type of the beam:	Joist

GOVERNING DESIGN RESULTS:

Check:	Actual:	Allowable:	% allowable:	Location x:	
Shear (z):	3.47 kN	9.34 kN	37.2 %	3916 mm	Comb. 10/1, Medium-term
Bending (My):	4.51 kNm	12.22 kNm	36.9 %	2146 mm	Comb. 10/1, Medium-term
(without kcrit):	4.51 kNm	12.22 kNm	36.9 %	2146 mm	Comb. 10/1, Medium-term
Bearing, support 1:	4.21 kN	17.79 kN	23.7 %	0 mm	Comb. 10/1, Medium-term
Bearing, support 2:	4.21 kN	17.79 kN	23.7 %	4291 mm	Comb. 10/1, Medium-term
Span 1, Wz,inst:	5.8 mm	12.0 mm	48.2 %	2146 mm	Comb. 40/1 (characteristic)
Span 1, Wz,net,fin:	8.0 mm	17.2 mm	46.6 %	2146 mm	Comb. 40/1 (characteristic)
Deflection U:	0.81 mm	1.67 mm	48.5%	(Vibration check)	
Frequency f1:	16.11 Hz	8.00 Hz	49.7%	(Vibration check)	
velocity v:	0.0182 m/(Ns2)	0.0462 m/(Ns2)	39.5%	(Vibration check)	

GOVERNING DESIGN RESULT COMBINATIONS:

Combination 10/1 (Medium-term):

1.25*Self-weight + 1.25*Partition load + 1.50*Imposed load

Combination 40/1 (characteristic):

1.00*Self-weight + 1.00*Partition load + 1.00*Imposed load

EXTREME FORCES:

Result:	Maximum value:	Location x:
Vz,max	4.21 kN	4291 mm
My,max	4.51 kNm	2146 mm

SUPPORT REACTIONS:

Support:	ULSmax:	ULSmin:	SLSmax:	SLSmin:	Rd/A:
1:	4.21 kN	0.73 kN	2.98 kN	0.73 kN	0.41 N/mm2
2:	4.21 kN	0.73 kN	2.98 kN	0.73 kN	0.41 N/mm2

- SLS support reactions are for reference use only

NOTES:

- Design is done in accordance with BS EN 1995-1-1 2004+A1 (2008)+A2 (2014) and UK NA (Oct 2012) and PD 6693-1 (2012)
- ULS = Ultimate Limit State, SLS = Serviceability Limit State
- Permanent load consists of dead load and partition load

- Self-weight according to BS EN 1991-1-1 (Table A.3) or calculated as the mean density times the acceleration of gravity
- SLS design limits used are set by the user and can differ from BS EN 1995-1-1:2004+A1:2008
- *) The percentage value of the checking of the combined actions stands for the ratio of design value and design resistance, not the actual utilization rate
- Bearing resistance of the structure underneath shall be separately checked
- Design calculations do not take into account upward deflection of cantilevers less than 4.0 mm
- Deflection checking is not carried out for cantilevers shorter than 350 mm.
- Second order analysis/loading was not taken into account
- Shear deflection was taken into account in the SLS design
- Shear deflection was taken into account when calculating the ULS forces
- Reduction of shear force is taken into account close to supports, and loads are assumed to act on the opposite side of the structure than the support area
- Shear force reduction is made to the shear force curve of the load combinations at the distance of H from the edge of the support

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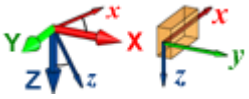
These calculations do not take into account loads or moisture conditions during construction. The need for additional bracing during construction has to be checked separately. The overall stability of the building and horizontal loads have not been considered. The building designer, main structural engineer or other person responsible for the structural behaviour of the whole building has to check separately the applicability of the structural member to the building.

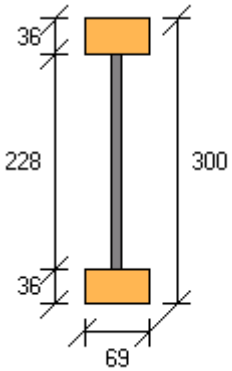
The following member analysis is only valid for the engineering data below.
The actual length of the structural member might be different to the engineering length shown.

Finnwood 3.0 UK (2.4.089)
UK public (17.09.2021)
Structural design without fire/accidental cases



PROJECT INFORMATION:

STRUCTURAL INFORMATION:



Type of structure:	Floor beam		
Profile:	FJI 69x300-36 (B=69 mm, H=300 mm)		
Web stiffeners:	Never		
Service class:	1		
Spacing:	600 mm (for surface loads)		

Cantilever/span lengths:			
Cantilever/Span:	Horizontal [mm]:		
Span 1	4670.0		
Total:	4670.0		

Support:	Position x [mm]:	Width [mm]:	Type:
1:	0	150	Pinned support (X,Z)
2:	4670	150	Pinned support (Z)

My,k:	18.33 kNm
Mz,k:	1.20 kNm
Vz,k:	16.02 kN
Vy,k:	6.51 kN
Nt,k:	66.70 kN
Nc,k:	66.70 kN
EIy:	1196.88 kNm2
EIz:	13.59 kNm2
GAz:	4860.00 kN
GAy:	2858.40 kN
EA:	65743.20 kN

Partial factor, flange:	1.20	
Partial factor, web	1.20	
Load duration class:	kmod,flange:	kmod,web:
Permanent:	0.600	0.400
Long-term:	0.700	0.500
Medium-term:	0.800	0.700

Short-term:	0.900	0.900
Instantaneous:	1.100	1.100

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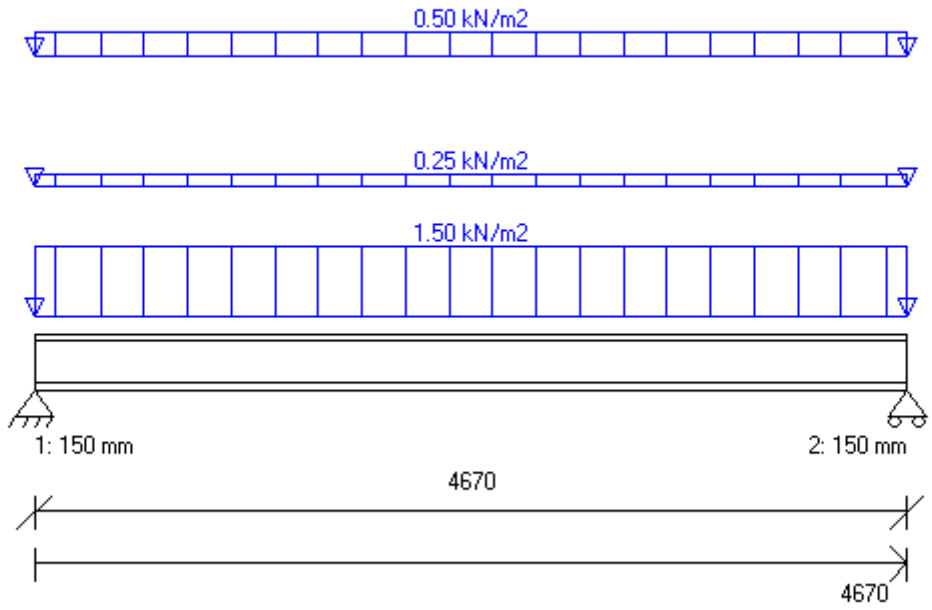
kdef,flange:	0.600
kdef,web:	1.500



LOADING INFORMATION:

Self-weight (Self-weight, Permanent):

Self-weight:	QZ = 0.039 kN/m	x = 0 - 4670 mm
Surface load: 1:	QZ = 0.500 kN/m2	x = 0 - 4670 mm

Partition load (Partition load, Permanent, ULS/SLS-movability = 100.0 %):

Surface load: 1:	QZ = 0.250 kN/m2	x = 0 - 4670 mm

Imposed load (A, domestic, residential areas, Medium-term, ULS/SLS-movability = 100.0 %):

Surface load: 1:	QZ = 1.500 kN/m2	x = 0 - 4670 mm

LOAD COMBINATIONS:

Combination 1 (ULS, Permanent)

1.35*Self-weight + 1.35*Partition load

Combination 2 (ULS, Medium-term)

1.35*Self-weight + 1.35*Partition load + 1.50*0.70*Imposed load
---
Combination 10 (ULS, Medium-term)
1.25*Self-weight + 1.25*Partition load + 1.50*Imposed load

Combination 11 (ULS, Permanent)
1.25*Self-weight + 1.25*Partition load

Combination 17 (ULS, Medium-term)
1.25*Self-weight + 1.25*Partition load + 1.50*0.70*Imposed load
---
Combination 24 (ULS, Permanent)
1.00*Self-weight + 1.00*Partition load

Combination 25 (ULS, Medium-term)
1.00*Self-weight + 1.00*Partition load + 1.50*Imposed load

Combination 32 (ULS, Medium-term)
1.00*Self-weight + 1.00*Partition load + 1.50*0.70*Imposed load
---
Combination 39 (SLS, Characteristic)
1.00*Self-weight + 1.00*Partition load

Combination 40 (SLS, Characteristic)
1.00*Self-weight + 1.00*Partition load + 1.00*Imposed load

Combination 47 (SLS, Characteristic)
1.00*Self-weight + 1.00*Partition load + 1.00*0.70*Imposed load

DESIGN RESULTS:

Norm/Standard:		BS EN 1995-1-1:2004+A1:2008 and UK NA
Maximum utilization rate:		67.2 %

DESIGN PARAMETERS:

Allowed Wnet,fin:	L/250	(characteristic)
Allowed Winst:	L/350 and 12.00 mm	(characteristic)
Factor for left cantilever:		2.00
Factor for right cantilever:		2.00

NOTE! SLS design limits above are set by the user and can differ to BS EN 1995-1-1:2004+A1:2008
Buckling is prevented on both directions (y and z)
Lateral torsional buckling for bending My about the y-axis:
Distance between supports above the beam: Lk1 = 300.00 mm
Distance between supports below the beam: Lk2 = 300.00 mm
NOTE! Lk1 is used when My>0 and Lk2 when My<0

VIBRATION DESIGN PARAMETERS:

Floor width:	5 m
Structure above:	Custom floor stiffness (defined below)
Transverse stiffness of floor structure:	1907 Nm2/m
Minimum frequency allowed:	8 Hz
Frequency f1 is calculated according:	Eurocode 5
Deflection limit with 1 kN:	As per BS NA to EC5
Type of the beam:	Joist

GOVERNING DESIGN RESULTS:

Check:	Actual:	Allowable:	% allowable:	Location x:	
Shear (z):	3.84 kN	9.34 kN	41.1 %	4295 mm	Comb. 10/1, Medium-term
Bending (My):	5.35 kNm	12.22 kNm	43.8 %	2335 mm	Comb. 10/1, Medium-term
(without kcrit):	5.35 kNm	12.22 kNm	43.8 %	2335 mm	Comb. 10/1, Medium-term
Bearing, support 1:	4.58 kN	17.79 kN	25.7 %	0 mm	Comb. 10/1, Medium-term
Bearing, support 2:	4.58 kN	17.79 kN	25.7 %	4670 mm	Comb. 10/1, Medium-term
Span 1, Wz,inst:	8.0 mm	12.0 mm	66.4 %	2335 mm	Comb. 40/1 (characteristic)
Span 1, Wz,net,fin:	11.0 mm	18.7 mm	58.7 %	2335 mm	Comb. 40/1 (characteristic)
Deflection U:	1.02 mm	1.52 mm	67.2%	(Vibration check)	
Frequency f1:	13.60 Hz	8.00 Hz	58.8%	(Vibration check)	
velocity v:	0.0172 m/(Ns2)	0.0352 m/(Ns2)	48.8%	(Vibration check)	

GOVERNING DESIGN RESULT COMBINATIONS:

Combination 10/1 (Medium-term):

1.25*Self-weight + 1.25*Partition load + 1.50*Imposed load

Combination 40/1 (characteristic):

1.00*Self-weight + 1.00*Partition load + 1.00*Imposed load

EXTREME FORCES:

Result:	Maximum value:	Location x:
Vz,max	4.58 kN	4670 mm
My,max	5.35 kNm	2335 mm

SUPPORT REACTIONS:

Support:	ULSmax:	ULSmin:	SLSmax:	SLSmin:	Rd/A:
1:	4.58 kN	0.79 kN	3.24 kN	0.79 kN	0.44 N/mm2
2:	4.58 kN	0.79 kN	3.24 kN	0.79 kN	0.44 N/mm2

- SLS support reactions are for reference use only

NOTES:

- Design is done in accordance with BS EN 1995-1-1 2004+A1 (2008)+A2 (2014) and UK NA (Oct 2012) and PD 6693-1 (2012)
- ULS = Ultimate Limit State, SLS = Serviceability Limit State
- Permanent load consists of dead load and partition load

- Self-weight according to BS EN 1991-1-1 (Table A.3) or calculated as the mean density times the acceleration of gravity
- SLS design limits used are set by the user and can differ from BS EN 1995-1-1:2004+A1:2008
- *) The percentage value of the checking of the combined actions stands for the ratio of design value and design resistance, not the actual utilization rate
- Bearing resistance of the structure underneath shall be separately checked
- Design calculations do not take into account upward deflection of cantilevers less than 4.0 mm
- Deflection checking is not carried out for cantilevers shorter than 350 mm.
- Second order analysis/loading was not taken into account
- Shear deflection was taken into account in the SLS design
- Shear deflection was taken into account when calculating the ULS forces
- Reduction of shear force is taken into account close to supports, and loads are assumed to act on the opposite side of the structure than the support area
- Shear force reduction is made to the shear force curve of the load combinations at the distance of H from the edge of the support

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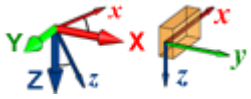
These calculations do not take into account loads or moisture conditions during construction. The need for additional bracing during construction has to be checked separately. The overall stability of the building and horizontal loads have not been considered. The building designer, main structural engineer or other person responsible for the structural behaviour of the whole building has to check separately the applicability of the structural member to the building.

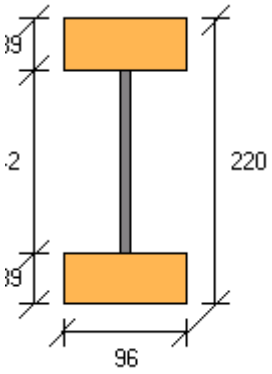
The following member analysis is only valid for the engineering data below.
The actual length of the structural member might be different to the engineering length shown.

Finnwood 3.0 UK (2.4.089)
UK public (17.09.2021)
Structural design without fire/accidental cases



PROJECT INFORMATION:

STRUCTURAL INFORMATION:



Type of structure:	Floor beam		
Profile:	FJI 96x220 (B=96 mm, H=220 mm)		
Web stiffeners:	Never		
Service class:	1		
Spacing:	300 mm (for surface loads)		

Cantilever/span lengths:			
Cantilever/Span:	Horizontal [mm]:		
Span 1	4670.0		
Total:	4670.0		

Support:	Position x [mm]:	Width [mm]:	Type:
1:	0	150	Pinned support (X,Z)
2:	4670	150	Pinned support (Z)

My,k:	18.94 kNm
Mz,k:	2.42 kNm
Vz,k:	13.63 kN
Vy,k:	9.89 kN
Nt,k:	101.26 kN
Nc,k:	101.26 kN
EIy:	848.85 kNm2
EIz:	39.67 kNm2
GAz:	3564.00 kN
GAy:	4339.80 kN
EA:	99815.40 kN

Partial factor, flange:	1.20	
Partial factor, web	1.20	
Load duration class:	kmod,flange:	kmod,web:
Permanent:	0.600	0.400
Long-term:	0.700	0.500
Medium-term:	0.800	0.700

Short-term:	0.900	0.900
Instantaneous:	1.100	1.100

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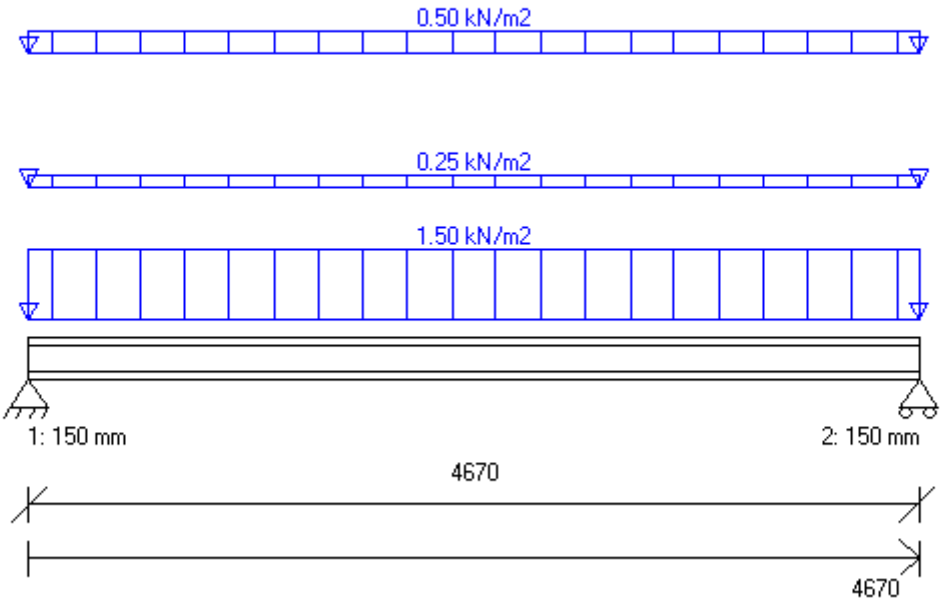
kdef,flange:	0.600
kdef,web:	1.500



LOADING INFORMATION:

Self-weight (Self-weight, Permanent):

Self-weight:	QZ = 0.047 kN/m	x = 0 - 4670 mm
Surface load: 1:	QZ = 0.500 kN/m2	x = 0 - 4670 mm

Partition load (Partition load, Permanent, ULS/SLS-movability = 100.0 %):

Surface load: 1:	QZ = 0.250 kN/m2	x = 0 - 4670 mm

Imposed load (A, domestic, residential areas, Medium-term, ULS/SLS-movability = 100.0 %):

Surface load: 1:	QZ = 1.500 kN/m2	x = 0 - 4670 mm

LOAD COMBINATIONS:

Combination 1 (ULS, Permanent)

1.35*Self-weight + 1.35*Partition load

Combination 2 (ULS, Medium-term)

1.35*Self-weight + 1.35*Partition load + 1.50*0.70*Imposed load
---
Combination 10 (ULS, Medium-term)
1.25*Self-weight + 1.25*Partition load + 1.50*Imposed load

Combination 11 (ULS, Permanent)
1.25*Self-weight + 1.25*Partition load

Combination 17 (ULS, Medium-term)
1.25*Self-weight + 1.25*Partition load + 1.50*0.70*Imposed load
---
Combination 24 (ULS, Permanent)
1.00*Self-weight + 1.00*Partition load

Combination 25 (ULS, Medium-term)
1.00*Self-weight + 1.00*Partition load + 1.50*Imposed load

Combination 32 (ULS, Medium-term)
1.00*Self-weight + 1.00*Partition load + 1.50*0.70*Imposed load
---
Combination 39 (SLS, Characteristic)
1.00*Self-weight + 1.00*Partition load

Combination 40 (SLS, Characteristic)
1.00*Self-weight + 1.00*Partition load + 1.00*Imposed load

Combination 47 (SLS, Characteristic)
1.00*Self-weight + 1.00*Partition load + 1.00*0.70*Imposed load

DESIGN RESULTS:

Norm/Standard:		BS EN 1995-1-1:2004+A1:2008 and UK NA
Maximum utilization rate:		94.3 %

DESIGN PARAMETERS:

Allowed Wnet,fin:	L/250	(characteristic)
Allowed Winst:	L/350 and 12.00 mm	(characteristic)
Factor for left cantilever:		2.00
Factor for right cantilever:		2.00

NOTE! SLS design limits above are set by the user and can differ to BS EN 1995-1-1:2004+A1:2008
Buckling is prevented on both directions (y and z)
Lateral torsional buckling for bending My about the y-axis:
Distance between supports above the beam: Lk1 = 300.00 mm
Distance between supports below the beam: Lk2 = 300.00 mm
NOTE! Lk1 is used when My>0 and Lk2 when My<0

VIBRATION DESIGN PARAMETERS:

Floor width:	5 m
Structure above:	Custom floor stiffness (defined below)
Transverse stiffness of floor structure:	1907 Nm2/m
Minimum frequency allowed:	8 Hz
Frequency f1 is calculated according:	Eurocode 5
Deflection limit with 1 kN:	As per BS NA to EC5
Type of the beam:	Joist

GOVERNING DESIGN RESULTS:

Check:	Actual:	Allowable:	% allowable:	Location x:	
Shear (z):	2.07 kN	7.95 kN	26.0 %	295 mm	Comb. 10/1, Medium-term
Bending (My):	2.77 kNm	12.63 kNm	21.9 %	2335 mm	Comb. 10/1, Medium-term
(without kcrit):	2.77 kNm	12.63 kNm	21.9 %	2335 mm	Comb. 10/1, Medium-term
Bearing, support 1:	2.37 kN	18.70 kN	12.7 %	0 mm	Comb. 10/1, Medium-term
Bearing, support 2:	2.37 kN	18.70 kN	12.7 %	4670 mm	Comb. 10/1, Medium-term
Span 1, Wz,inst:	5.8 mm	12.0 mm	48.5 %	2335 mm	Comb. 40/1 (characteristic)
Span 1, Wz,net,fin:	8.1 mm	18.7 mm	43.2 %	2335 mm	Comb. 40/1 (characteristic)
Deflection U:	1.43 mm	1.52 mm	94.3%	(Vibration check)	
Frequency f1:	10.55 Hz	8.00 Hz	75.8%	(Vibration check)	
velocity v:	0.0156 m/(Ns2)	0.0266 m/(Ns2)	58.9%	(Vibration check)	

GOVERNING DESIGN RESULT COMBINATIONS:

Combination 10/1 (Medium-term):

1.25*Self-weight + 1.25*Partition load + 1.50*Imposed load

Combination 40/1 (characteristic):

1.00*Self-weight + 1.00*Partition load + 1.00*Imposed load

EXTREME FORCES:

Result:	Maximum value:	Location x:
Vz,max	2.37 kN	0 mm
My,max	2.77 kNm	2335 mm

SUPPORT REACTIONS:

Support:	ULSmax:	ULSmin:	SLSmax:	SLSmin:	Rd/A:
1:	2.37 kN	0.46 kN	1.69 kN	0.46 kN	0.16 N/mm2
2:	2.37 kN	0.46 kN	1.69 kN	0.46 kN	0.16 N/mm2

- SLS support reactions are for reference use only

NOTES:

- Design is done in accordance with BS EN 1995-1-1 2004+A1 (2008)+A2 (2014) and UK NA (Oct 2012) and PD 6693-1 (2012)
- ULS = Ultimate Limit State, SLS = Serviceability Limit State
- Permanent load consists of dead load and partition load

- Self-weight according to BS EN 1991-1-1 (Table A.3) or calculated as the mean density times the acceleration of gravity
- SLS design limits used are set by the user and can differ from BS EN 1995-1-1:2004+A1:2008
- *) The percentage value of the checking of the combined actions stands for the ratio of design value and design resistance, not the actual utilization rate
- Bearing resistance of the structure underneath shall be separately checked
- Design calculations do not take into account upward deflection of cantilevers less than 4.0 mm
- Deflection checking is not carried out for cantilevers shorter than 350 mm.
- Second order analysis/loading was not taken into account
- Shear deflection was taken into account in the SLS design
- Shear deflection was taken into account when calculating the ULS forces
- Reduction of shear force is taken into account close to supports, and loads are assumed to act on the opposite side of the structure than the support area
- Shear force reduction is made to the shear force curve of the load combinations at the distance of H from the edge of the support

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These calculations do not take into account loads or moisture conditions during construction. The need for additional bracing during construction has to be checked separately. The overall stability of the building and horizontal loads have not been considered. The building designer, main structural engineer or other person responsible for the structural behaviour of the whole building has to check separately the applicability of the structural member to the building.
