Symbol	Meaning	Often used units		
γ	generic factor of safety	[-]		
$\gamma = 1.35$	safety factor self-weight	[-]		
$\gamma = 1.5$	safety factor external load	[-]		
γ_M	safety factor material	[-]		
σ	generic stress	[N/mm² = MPa]; [kN/cm²]		
ε	generic strain	[mm/mm]		
F	generic force	[kN]	F_i	(optional for subsystems)
N	internal tension force	[kN]	red or a plus for calculations	
N	internal compression force	[kN]	blue or a minus for calculations	
P	prestress force	[kN]	P_i	(optional for subsystems)
Q	live load	[kN]	Q_i	(optional for subsystems)
G	dead load	[kN]	G_i	(optional for subsystems)
q	linear live load	[kN/m]	q_i	(optional for subsystems)
	area dead load	[kN/m²]		
g	linear dead load	[kN/m]	g_i	(optional for subsystems)
	area dead load	[kN/m²]		
R	Resultant force	[kN]	R_i	(optional for subsystems)
A, B, C, …Z	Reaction force	[kN]	A_1	(optional for subsystems)
			$A_{1,h}$	(horizontal)
			$A_{1,V}$	(vertical)
I ,II,V, …	nodes in diagrams (where necessary)			
1, 2, 3, 4, ...	subsystems (force elements where necessary)			
A	area	[m²]; [mm²]		
l	length	[m]		
b	width	[m]		

h	depth	[m]
t	thickness	[m]
E	Elastic/Young's modulus	[N/mm²]
f	generic strength of material	[N/mm²]
ϱ	density	[kg/m³]
I	moment of inertia	[m⁴]; [mm⁴]

Basic formulas showing the relationship between area, stress, strain, force and Elastic modulus

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$$\sigma = \frac{N}{A} \qquad \sigma = E \bullet \varepsilon = E \bullet \frac{\Delta l}{l} \qquad \frac{N}{A} = E \bullet \frac{\Delta l}{l} \rightarrow \Delta l = \frac{N \bullet l}{A \bullet E}$$

Material specific properties in tension and compression for different materials and directions

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ε_y	yield strain	[mm/mm]
ε_u	ultimate strain	[mm/mm]
$f_d = \frac{f}{\gamma_M}$	design strength of material	[N/mm²]

Strength notation

$$f_{Material\ Direction, Design}^{Tension/Compression}$$

Material

s	**steel**
c	**concrete**
t	**timber**
m	**masonry**
a	**aluminium**
r	**stone, rock, granite etc.**

Direction

1	principal direction 1(for s, c)		
2	principal direction 2 (for s, c)		
3	principal direction 3 (for s, c)		
x	cartesian directions (for m)		
y	cartesian directions (for m)		
z	cartesian directions (for m)		
$\|\|$	parallel to the fibers (for t)	equivalent:	0 degree
$\perp$	perpendicular to the fibers (for t)	equivalent:	90 degree

Design

d	strength of material on design level $f_d = \frac{f}{\gamma_M}$
u	ultimate strength
_	characteristic value

Tension/Compression

+	Tension
-	Compression

Examples

$f_{s1,d}$	strength of steel in tension and compression, principal direction 1, design value
$f_{t\perp,d}$ -	strength of timber in compression, perpendicular to fibers, design value
$f_{my,d}$ -	strength of masonry in compression, direction y, design value