

BUCKLING REVIEW REQUIRED

max utilisation 14% of yield, max deflection 0.44 mm

Load: 500 kg payload on 6 member(s) + self-weight

Supports: 4 fixed node(s)

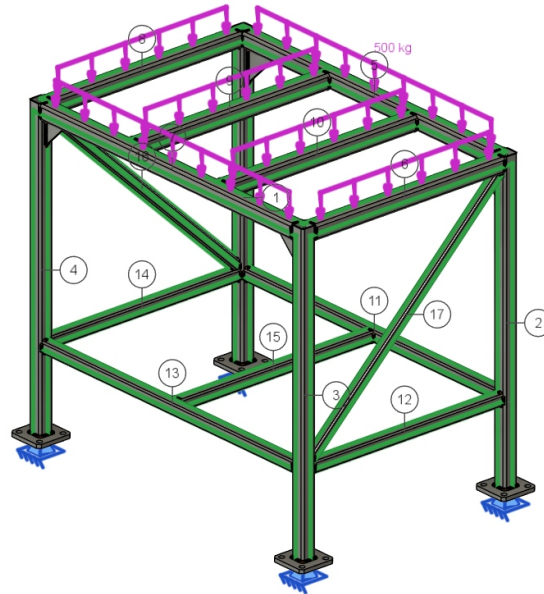
Material: Steel S235 (fy 235 MPa, E 210000 MPa)

Deflection limit: L/250

Euler reference: K=1 for every member; effective length and frame stability are unverified.

Cantilever: a fixed-free column has K=2, giving one quarter of the shown reference load.

Overview (Fusion viewport): member numbers and stress utilisation; magenta loads; blue supports



■ < 50% ■ < 80% ■ < 100% ■ >= 100% utilisation = equivalent stress / yield strength

Members by utilisation (worst first). N<0: compression. M: bending. T: torque. SIGMA/TAU: MPa. EULER: K=1 reference P/Pcr.

#	MEMBER	L mm	N (N)	M (N.m)	T (N.m)	SIGMA	TAU	UTIL	DEFL mm	L/d	EULER	STATUS
■ 3	G1-SHS 40x40x3	800	-1317	112.0	0.9	32.9	0.1	14%	0.09	8787	0%	BUCKLING REVIEW REQUIRED
■ 1	G1-SHS 40x40x3	800	-1317	112.0	0.9	32.9	0.1	14%	0.09	8787	0%	BUCKLING REVIEW REQUIRED
■ 2	G1-SHS 40x40x3	800	-1296	108.6	0.3	32.4	0.0	14%	0.08	9556	0%	BUCKLING REVIEW REQUIRED
■ 4	G1-SHS 40x40x3	800	-1296	108.6	0.3	32.4	0.0	14%	0.08	9556	0%	BUCKLING REVIEW REQUIRED
■ 7	G2-SHS 40x40x3	900	-267	115.7	8.6	25.9	1.0	11%	0.42	2131	0%	BUCKLING REVIEW REQUIRED
■ 5	G2-SHS 40x40x3	900	-267	115.7	8.6	25.9	1.0	11%	0.42	2131	0%	BUCKLING REVIEW REQUIRED
■ 9	G2-SHS 40x40x3	600	6	45.8	0.1	9.8	0.0	4%	0.44	1358	0%	WITHIN SCREENED LIMITS
■ 10	G2-SHS 40x40x3	600	6	45.8	0.1	9.8	0.0	4%	0.44	1358	0%	WITHIN SCREENED LIMITS
■ 16	G4-SHS 25x25x2	835	-26	8.1	1.7	9.5	0.8	4%	0.09	9206	0%	BUCKLING REVIEW REQUIRED
■ 17	G4-SHS 25x25x2	835	-26	8.1	1.7	9.5	0.8	4%	0.09	9206	0%	BUCKLING REVIEW REQUIRED
■ 8	G2-SHS 40x40x3	600	-67	32.7	0.4	7.3	0.0	3%	0.07	9044	0%	BUCKLING REVIEW REQUIRED

Linear-static beam screening with rigid joints. Euler K=1 is a reference, not verified buckling resistance. Effective length, frame stability, local/lateral buckling, weld strength, fatigue and code compliance are not verified.

FRAME CHECK REPORT

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Members by utilisation (worst first), continued

#	MEMBER	L mm	N (N)	M (N.m)	T (N.m)	SIGMA	TAU	UTIL	DEFL mm	L/d	EULER	STATUS
■ 6	G2-SHS 40x40x3	600	-67	32.7	0.4	7.3	0.0	3%	0.07	9044	0%	BUCKLING REVIEW REQUIRED
■ 13	G3-SHS 30x30x2	900	491	3.8	0.3	4.8	0.1	2%	0.02	45719	0%	WITHIN SCREENED LIMITS
■ 11	G3-SHS 30x30x2	900	491	3.8	0.3	4.8	0.1	2%	0.02	45719	0%	WITHIN SCREENED LIMITS
■ 12	G3-SHS 30x30x2	600	125	1.6	0.1	1.7	0.0	1%	0.01	79090	0%	WITHIN SCREENED LIMITS
■ 14	G3-SHS 30x30x2	600	125	1.6	0.1	1.7	0.0	1%	0.01	79090	0%	WITHIN SCREENED LIMITS
■ 15	G3-SHS 30x30x2	600	-2	0.5	0.1	0.3	0.0	0%	0.02	30693	0%	BUCKLING REVIEW REQUIRED

Linear-static beam screening with rigid joints. Euler K=1 is a reference, not verified buckling resistance. Effective length, frame stability, local/lateral buckling, weld strength, fatigue and code compliance are not verified.

Member details: peak forces along each member; stress components at the governing point.

#3 G1-SHS 40x40x3

BUCKLING REVIEW REQUIRED

GEOMETRY & MATERIAL

Length: 800 mm
Start (x, y, z): (900, 0, 600) mm
End (x, y, z): (900, 800, 600) mm
Material: Steel S235
fy: 235 MPa E: 210000 MPa

SECTION PROPERTIES

Area A: 420.8 mm²
Iy: 9.327e+04 mm⁴ Iz: 9.327e+04 mm⁴
Torsion J: 1.52e+05 mm⁴

DEFLECTION

Deflection: 0.09 mm (L/8787)

FORCES & MOMENTS

Axial N: -1317 N (compression)
Shear Vy: 263 N Vz: 65 N
Bending My: 27.48 N.m Mz: 111.99 N.m
Torque T: 0.90 N.m

STRESS AT GOVERNING POINT

Governing point x = 800 mm from start
Axial 3.0 + bending 29.9 = 32.9 MPa
Torsion shear: 0.1 MPa
Equivalent: 32.9 MPa = 14% of fy

EULER K=1 REFERENCE

P/Pcr: 0.4% Pcr: 302.1 kN
Effective length and stability unverified.

#1 G1-SHS 40x40x3

BUCKLING REVIEW REQUIRED

GEOMETRY & MATERIAL

Length: 800 mm
Start (x, y, z): (0, 0, 0) mm
End (x, y, z): (0, 800, 0) mm
Material: Steel S235
fy: 235 MPa E: 210000 MPa

SECTION PROPERTIES

Area A: 420.8 mm²
Iy: 9.327e+04 mm⁴ Iz: 9.327e+04 mm⁴
Torsion J: 1.52e+05 mm⁴

DEFLECTION

Deflection: 0.09 mm (L/8787)

FORCES & MOMENTS

Axial N: -1317 N (compression)
Shear Vy: 263 N Vz: 65 N
Bending My: 27.48 N.m Mz: 111.99 N.m
Torque T: 0.90 N.m

STRESS AT GOVERNING POINT

Governing point x = 800 mm from start
Axial 3.0 + bending 29.9 = 32.9 MPa
Torsion shear: 0.1 MPa
Equivalent: 32.9 MPa = 14% of fy

EULER K=1 REFERENCE

P/Pcr: 0.4% Pcr: 302.1 kN
Effective length and stability unverified.

#2 G1-SHS 40x40x3

BUCKLING REVIEW REQUIRED

GEOMETRY & MATERIAL

Length: 800 mm
Start (x, y, z): (900, 0, 0) mm
End (x, y, z): (900, 800, 0) mm
Material: Steel S235
fy: 235 MPa E: 210000 MPa

SECTION PROPERTIES

Area A: 420.8 mm²
Iy: 9.327e+04 mm⁴ Iz: 9.327e+04 mm⁴
Torsion J: 1.52e+05 mm⁴

DEFLECTION

Deflection: 0.08 mm (L/9556)

FORCES & MOMENTS

Axial N: -1296 N (compression)
Shear Vy: 256 N Vz: 69 N
Bending My: 28.53 N.m Mz: 108.63 N.m
Torque T: 0.26 N.m

STRESS AT GOVERNING POINT

Governing point x = 800 mm from start
Axial 3.0 + bending 29.4 = 32.4 MPa
Torsion shear: 0.0 MPa
Equivalent: 32.4 MPa = 14% of fy

EULER K=1 REFERENCE

P/Pcr: 0.4% Pcr: 302.1 kN
Effective length and stability unverified.

FRAME CHECK REPORT

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Member details: peak forces along each member; stress components at the governing point.

#4 G1-SHS 40x40x3

BUCKLING REVIEW REQUIRED

GEOMETRY & MATERIAL

Length: 800 mm
Start (x, y, z): (0, 0, 600) mm
End (x, y, z): (0, 800, 600) mm
Material: Steel S235
fy: 235 MPa E: 210000 MPa

SECTION PROPERTIES

Area A: 420.8 mm²
Iy: 9.327e+04 mm⁴ Iz: 9.327e+04 mm⁴
Torsion J: 1.52e+05 mm⁴

DEFLECTION

Deflection: 0.08 mm (L/9556)

FORCES & MOMENTS

Axial N: -1296 N (compression)
Shear Vy: 256 N Vz: 69 N
Bending My: 28.53 N.m Mz: 108.63 N.m
Torque T: 0.26 N.m

STRESS AT GOVERNING POINT

Governing point x = 800 mm from start
Axial 3.0 + bending 29.4 = 32.4 MPa
Torsion shear: 0.0 MPa
Equivalent: 32.4 MPa = 14% of fy

EULER K=1 REFERENCE

P/Pcr: 0.4% Pcr: 302.1 kN
Effective length and stability unverified.

#7 G2-SHS 40x40x3

BUCKLING REVIEW REQUIRED

GEOMETRY & MATERIAL

Length: 900 mm
Start (x, y, z): (900, 800, 600) mm
End (x, y, z): (0, 800, 600) mm
Material: Steel S235
fy: 235 MPa E: 210000 MPa

SECTION PROPERTIES

Area A: 420.8 mm²
Iy: 9.327e+04 mm⁴ Iz: 9.327e+04 mm⁴
Torsion J: 1.52e+05 mm⁴

DEFLECTION

Deflection: 0.42 mm (L/2131)

FORCES & MOMENTS

Axial N: -267 N (compression)
Shear Vy: 904 N Vz: 10 N
Bending My: 2.65 N.m Mz: 115.73 N.m
Torque T: 8.58 N.m

STRESS AT GOVERNING POINT

Governing point x = 900 mm from start
Axial 0.6 + bending 25.2 = 25.9 MPa
Torsion shear: 1.0 MPa
Equivalent: 25.9 MPa = 11% of fy

EULER K=1 REFERENCE

P/Pcr: 0.1% Pcr: 238.7 kN
Effective length and stability unverified.

#5 G2-SHS 40x40x3

BUCKLING REVIEW REQUIRED

GEOMETRY & MATERIAL

Length: 900 mm
Start (x, y, z): (0, 800, 0) mm
End (x, y, z): (900, 800, 0) mm
Material: Steel S235
fy: 235 MPa E: 210000 MPa

SECTION PROPERTIES

Area A: 420.8 mm²
Iy: 9.327e+04 mm⁴ Iz: 9.327e+04 mm⁴
Torsion J: 1.52e+05 mm⁴

DEFLECTION

Deflection: 0.42 mm (L/2131)

FORCES & MOMENTS

Axial N: -267 N (compression)
Shear Vy: 904 N Vz: 10 N
Bending My: 2.65 N.m Mz: 115.73 N.m
Torque T: 8.58 N.m

STRESS AT GOVERNING POINT

Governing point x = 900 mm from start
Axial 0.6 + bending 25.2 = 25.9 MPa
Torsion shear: 1.0 MPa
Equivalent: 25.9 MPa = 11% of fy

EULER K=1 REFERENCE

P/Pcr: 0.1% Pcr: 238.7 kN
Effective length and stability unverified.

Member details: peak forces along each member; stress components at the governing point.

#9 G2-SHS 40x40x3

WITHIN SCREENED LIMITS

GEOMETRY & MATERIAL

Length: 600 mm
Start (x, y, z): (300, 800, 0) mm
End (x, y, z): (300, 800, 600) mm
Material: Steel S235
fy: 235 MPa E: 210000 MPa

SECTION PROPERTIES

Area A: 420.8 mm²
Iy: 9.327e+04 mm⁴ Iz: 9.327e+04 mm⁴
Torsion J: 1.52e+05 mm⁴

DEFLECTION

Deflection: 0.44 mm (L/1358)

FORCES & MOMENTS

Axial N: 6 N (tension)
Shear Vy: 361 N Vz: 2 N
Bending My: 0.61 N.m Mz: 45.77 N.m
Torque T: 0.12 N.m

STRESS AT GOVERNING POINT

Governing point x = 300 mm from start
Axial 0.0 + bending 9.8 = 9.8 MPa
Torsion shear: 0.0 MPa
Equivalent: 9.8 MPa = 4% of fy

EULER K=1 REFERENCE

P/Pcr: 0.0% Pcr: 537.0 kN
Effective length and stability unverified.

#10 G2-SHS 40x40x3

WITHIN SCREENED LIMITS

GEOMETRY & MATERIAL

Length: 600 mm
Start (x, y, z): (600, 800, 0) mm
End (x, y, z): (600, 800, 600) mm
Material: Steel S235
fy: 235 MPa E: 210000 MPa

SECTION PROPERTIES

Area A: 420.8 mm²
Iy: 9.327e+04 mm⁴ Iz: 9.327e+04 mm⁴
Torsion J: 1.52e+05 mm⁴

DEFLECTION

Deflection: 0.44 mm (L/1358)

FORCES & MOMENTS

Axial N: 6 N (tension)
Shear Vy: 361 N Vz: 2 N
Bending My: 0.61 N.m Mz: 45.77 N.m
Torque T: 0.12 N.m

STRESS AT GOVERNING POINT

Governing point x = 300 mm from start
Axial 0.0 + bending 9.8 = 9.8 MPa
Torsion shear: 0.0 MPa
Equivalent: 9.8 MPa = 4% of fy

EULER K=1 REFERENCE

P/Pcr: 0.0% Pcr: 537.0 kN
Effective length and stability unverified.

#16 G4-SHS 25x25x2

BUCKLING REVIEW REQUIRED

GEOMETRY & MATERIAL

Length: 835 mm
Start (x, y, z): (0, 220, 0) mm
End (x, y, z): (0, 800, 600) mm
Material: Steel S235
fy: 235 MPa E: 210000 MPa

SECTION PROPERTIES

Area A: 173.7 mm²
Iy: 1.484e+04 mm⁴ Iz: 1.484e+04 mm⁴
Torsion J: 2.433e+04 mm⁴

DEFLECTION

Deflection: 0.09 mm (L/9206)

FORCES & MOMENTS

Axial N: -26 N (compression)
Shear Vy: 11 N Vz: 13 N
Bending My: 8.08 N.m Mz: 3.11 N.m
Torque T: 1.73 N.m

STRESS AT GOVERNING POINT

Governing point x = 835 mm from start
Axial 0.1 + bending 9.4 = 9.5 MPa
Torsion shear: 0.8 MPa
Equivalent: 9.6 MPa = 4% of fy

EULER K=1 REFERENCE

P/Pcr: 0.1% Pcr: 44.2 kN
Effective length and stability unverified.

Member details: peak forces along each member; stress components at the governing point.

#17 G4-SHS 25x25x2

BUCKLING REVIEW REQUIRED

GEOMETRY & MATERIAL

Length: 835 mm
Start (x, y, z): (900, 220, 600) mm
End (x, y, z): (900, 800, 0) mm
Material: Steel S235
fy: 235 MPa E: 210000 MPa

SECTION PROPERTIES

Area A: 173.7 mm²
Iy: 1.484e+04 mm⁴ Iz: 1.484e+04 mm⁴
Torsion J: 2.433e+04 mm⁴

DEFLECTION

Deflection: 0.09 mm (L/9206)

FORCES & MOMENTS

Axial N: -26 N (compression)
Shear Vy: 11 N Vz: 13 N
Bending My: 8.08 N.m Mz: 3.11 N.m
Torque T: 1.73 N.m

STRESS AT GOVERNING POINT

Governing point x = 835 mm from start
Axial 0.1 + bending 9.4 = 9.5 MPa
Torsion shear: 0.8 MPa
Equivalent: 9.6 MPa = 4% of fy

EULER K=1 REFERENCE

P/Pcr: 0.1% Pcr: 44.2 kN
Effective length and stability unverified.

#8 G2-SHS 40x40x3

BUCKLING REVIEW REQUIRED

GEOMETRY & MATERIAL

Length: 600 mm
Start (x, y, z): (0, 800, 600) mm
End (x, y, z): (0, 800, 0) mm
Material: Steel S235
fy: 235 MPa E: 210000 MPa

SECTION PROPERTIES

Area A: 420.8 mm²
Iy: 9.327e+04 mm⁴ Iz: 9.327e+04 mm⁴
Torsion J: 1.52e+05 mm⁴

DEFLECTION

Deflection: 0.07 mm (L/9044)

FORCES & MOMENTS

Axial N: -67 N (compression)
Shear Vy: 366 N Vz: 5 N
Bending My: 1.88 N.m Mz: 32.67 N.m
Torque T: 0.39 N.m

STRESS AT GOVERNING POINT

Governing point x = 301 mm from start
Axial 0.2 + bending 7.1 = 7.3 MPa
Torsion shear: 0.0 MPa
Equivalent: 7.3 MPa = 3% of fy

EULER K=1 REFERENCE

P/Pcr: 0.0% Pcr: 537.0 kN
Effective length and stability unverified.

#6 G2-SHS 40x40x3

BUCKLING REVIEW REQUIRED

GEOMETRY & MATERIAL

Length: 600 mm
Start (x, y, z): (900, 800, 0) mm
End (x, y, z): (900, 800, 600) mm
Material: Steel S235
fy: 235 MPa E: 210000 MPa

SECTION PROPERTIES

Area A: 420.8 mm²
Iy: 9.327e+04 mm⁴ Iz: 9.327e+04 mm⁴
Torsion J: 1.52e+05 mm⁴

DEFLECTION

Deflection: 0.07 mm (L/9044)

FORCES & MOMENTS

Axial N: -67 N (compression)
Shear Vy: 366 N Vz: 5 N
Bending My: 1.88 N.m Mz: 32.67 N.m
Torque T: 0.39 N.m

STRESS AT GOVERNING POINT

Governing point x = 301 mm from start
Axial 0.2 + bending 7.1 = 7.3 MPa
Torsion shear: 0.0 MPa
Equivalent: 7.3 MPa = 3% of fy

EULER K=1 REFERENCE

P/Pcr: 0.0% Pcr: 537.0 kN
Effective length and stability unverified.

Member details: peak forces along each member; stress components at the governing point.

#13 G3-SHS 30x30x2

WITHIN SCREENED LIMITS

GEOMETRY & MATERIAL

Length: 900 mm
Start (x, y, z): (900, 220, 600) mm
End (x, y, z): (0, 220, 600) mm
Material: Steel S235
fy: 235 MPa E: 210000 MPa

SECTION PROPERTIES

Area A: 213.7 mm²
Iy: 2.723e+04 mm⁴ Iz: 2.723e+04 mm⁴
Torsion J: 4.39e+04 mm⁴

DEFLECTION

Deflection: 0.02 mm (L/45719)

FORCES & MOMENTS

Axial N: 491 N (tension)
Shear Vy: 11 N Vz: 2 N
Bending My: 0.67 N.m Mz: 3.82 N.m
Torque T: 0.31 N.m

STRESS AT GOVERNING POINT

Governing point x = 0 mm from start
Axial 2.3 + bending 2.5 = 4.8 MPa
Torsion shear: 0.1 MPa
Equivalent: 4.8 MPa = 2% of fy

EULER K=1 REFERENCE

P/Pcr: 0.0% Pcr: 69.7 kN
Effective length and stability unverified.

#11 G3-SHS 30x30x2

WITHIN SCREENED LIMITS

GEOMETRY & MATERIAL

Length: 900 mm
Start (x, y, z): (0, 220, 0) mm
End (x, y, z): (900, 220, 0) mm
Material: Steel S235
fy: 235 MPa E: 210000 MPa

SECTION PROPERTIES

Area A: 213.7 mm²
Iy: 2.723e+04 mm⁴ Iz: 2.723e+04 mm⁴
Torsion J: 4.39e+04 mm⁴

DEFLECTION

Deflection: 0.02 mm (L/45719)

FORCES & MOMENTS

Axial N: 491 N (tension)
Shear Vy: 11 N Vz: 2 N
Bending My: 0.67 N.m Mz: 3.82 N.m
Torque T: 0.31 N.m

STRESS AT GOVERNING POINT

Governing point x = 0 mm from start
Axial 2.3 + bending 2.5 = 4.8 MPa
Torsion shear: 0.1 MPa
Equivalent: 4.8 MPa = 2% of fy

EULER K=1 REFERENCE

P/Pcr: 0.0% Pcr: 69.7 kN
Effective length and stability unverified.

#12 G3-SHS 30x30x2

WITHIN SCREENED LIMITS

GEOMETRY & MATERIAL

Length: 600 mm
Start (x, y, z): (900, 220, 0) mm
End (x, y, z): (900, 220, 600) mm
Material: Steel S235
fy: 235 MPa E: 210000 MPa

SECTION PROPERTIES

Area A: 213.7 mm²
Iy: 2.723e+04 mm⁴ Iz: 2.723e+04 mm⁴
Torsion J: 4.39e+04 mm⁴

DEFLECTION

Deflection: 0.01 mm (L/79090)

FORCES & MOMENTS

Axial N: 125 N (tension)
Shear Vy: 7 N Vz: 2 N
Bending My: 0.82 N.m Mz: 1.56 N.m
Torque T: 0.12 N.m

STRESS AT GOVERNING POINT

Governing point x = 0 mm from start
Axial 0.6 + bending 1.1 = 1.7 MPa
Torsion shear: 0.0 MPa
Equivalent: 1.7 MPa = 1% of fy

EULER K=1 REFERENCE

P/Pcr: 0.0% Pcr: 156.8 kN
Effective length and stability unverified.

Member details: peak forces along each member; stress components at the governing point.

#14 G3-SHS 30x30x2

WITHIN SCREENED LIMITS

GEOMETRY & MATERIAL

Length: 600 mm
Start (x, y, z): (0, 220, 600) mm
End (x, y, z): (0, 220, 0) mm
Material: Steel S235
fy: 235 MPa E: 210000 MPa

SECTION PROPERTIES

Area A: 213.7 mm²
Iy: 2.723e+04 mm⁴ Iz: 2.723e+04 mm⁴
Torsion J: 4.39e+04 mm⁴

DEFLECTION

Deflection: 0.01 mm (L/79090)

FORCES & MOMENTS

Axial N: 125 N (tension)
Shear Vy: 7 N Vz: 2 N
Bending My: 0.82 N.m Mz: 1.56 N.m
Torque T: 0.12 N.m

STRESS AT GOVERNING POINT

Governing point x = 0 mm from start
Axial 0.6 + bending 1.1 = 1.7 MPa
Torsion shear: 0.0 MPa
Equivalent: 1.7 MPa = 1% of fy

EULER K=1 REFERENCE

P/Pcr: 0.0% Pcr: 156.8 kN
Effective length and stability unverified.

#15 G3-SHS 30x30x2

BUCKLING REVIEW REQUIRED

GEOMETRY & MATERIAL

Length: 600 mm
Start (x, y, z): (450, 220, 0) mm
End (x, y, z): (450, 220, 600) mm
Material: Steel S235
fy: 235 MPa E: 210000 MPa

SECTION PROPERTIES

Area A: 213.7 mm²
Iy: 2.723e+04 mm⁴ Iz: 2.723e+04 mm⁴
Torsion J: 4.39e+04 mm⁴

DEFLECTION

Deflection: 0.02 mm (L/30693)

FORCES & MOMENTS

Axial N: -2 N (compression)
Shear Vy: 5 N Vz: 0 N
Bending My: 0.02 N.m Mz: 0.47 N.m
Torque T: 0.05 N.m

STRESS AT GOVERNING POINT

Governing point x = 0 mm from start
Axial 0.0 + bending 0.3 = 0.3 MPa
Torsion shear: 0.0 MPa
Equivalent: 0.3 MPa = 0% of fy

EULER K=1 REFERENCE

P/Pcr: 0.0% Pcr: 156.8 kN
Effective length and stability unverified.