ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
ΙΟΝΙΟ ΠΑΝΕΠΙΣΤΗΜΙΟ

ΔΙΕΥΘΥΝΣΗ ΤΕΧΝΙΚΩΝ ΥΠΗΡΕΣΙΩΝ

ΕΡΓΟ :

ΚΤΙΡΙΟ ΤΜΗΜΑΤΟΣ ΜΟΥΣΙΚΩΝ ΣΠΟΥΔΩΝ ΣΤΟ ΟΙΚΟΠΕΔΟ Ε.Α.Σ.Κ.

ΘΕΣΗ ΕΡΓΟΥ :

9η ΠΑΡΟΔΟΣ Δ. ΘΕΟΤΟΚΗ ,
ΠΕΡΙΟΧΗ ΠΑΛΛΑΔΑ - Ο.Τ. 379 , ΚΕΡΚΥΡΑ

ΣΤΑΔΙΟ ΜΕΛΕΤΗΣ :	**ΣΤΑΤΙΚΗ ΜΕΛΕΤΗ ΕΦΑΡΜΟΓΗΣ**	ΣΤΑ.
ΘΕΜΑ ΤΕΥΧΟΥΣ :	ΤΕΥΧΟΣ ΣΤΑΤΙΚΩΝ ΥΠΟΛΟΓΙΣΜΩΝ ΜΕΤΑΛΛΙΚΗΣ ΚΑΤΑΣΚΕΥΗΣ ΑΝΑΡΤΗΣΗΣ ΚΕΝΤΡΙΚΗΣ ΚΛΙΜΑΚΑΣ - ΚΤΙΡΙΟ Β	Τ.11

ΑΡΧΙΤΕΚΤΟΝΙΚΗ ΜΕΛΕΤΗ	ΣΤΑΤΙΚΗ ΜΕΛΕΤΗ	ΜΕΛΕΤΗ Η/Μ ΕΓΚΑΤΑΣΤΑΣΕΩΝ	ΗΜΕΡΟΜΗΝΙΑ
Δ. ΒΑΣΙΛΟΠΟΥΛΟΣ & ΣΥΝΕΡΓΑΤΕΣ Ε.Ε. ΣΥΝΕΡΓΑΤΕΣ ΑΡΧΙΤΕΚΤΟΝΕΣ : Σ.ΚΟΛΟΒΟΥ, Ε. ΝΤΟΥΡΜΑ, Χ. ΣΟΥΛΙΩΤΗ, Φ. ΓΕΡΟΝΤΑΚΗΣ.	ΑΡΤΕΜΙΣ ΣΥΜΒΟΥΛΟΙ ΜΗΧΑΝΙΚΟΙ Ε.Π.Ε.	Η-Μ ΣΧΕΔΙΑΣΜΟΣ Κ. ΓΕΩΡΓΑΚΟΠΟΥΛΟΣ- Σ. ΤΣΑΝΤΕΣ & ΣΙΑ Ε.Ε.	ΣΕΠΤΕΜΒΡΙΟΣ 2019
ΣΥΜΒΟΥΛΟΣ ΑΚΟΥΣΤΙΚΗΣ ΜΕΛΕΤΗΣ: Ι. ΜΑΡΙΝΟΣ	ΓΕΩΤΕΧΝΙΚΗ ΜΕΛΕΤΗ: Ν. ΔΕΡΕΚΑΣ		

ΣΦΡΑΓΙΔΕΣ - ΥΠΟΓΡΑΦΕΣ

ΑΡΤΕΜΙΣ ΣΥΜΒΟΥΛΟΙ ΜΗΧΑΝΙΚΟΙ ΕΠΕ
ΕΤΑΙΡΕΙΑ ΣΤΑΤΙΚΩΝ ΜΕΛΕΤΩΝ
ΛΟΥΚΑΡΕΩΣ 57-59 114 75 ΑΘΗΝΑ
ΤΗΛ.: 210 6450349, ΦΑΞ: 210 6450745
ΑΦΜ: 099841348, ΔΟΥ: ΙΣΤ' ΑΘΗΝΩΝ

	Ποιότητα Υλικών	
1	Σκυρόδεμα φ.ο. κτιρίων	C25/30
3	Σκυρόδεμα φ.ο. φρεατοπασσάλων	C25/30
4	Εκτοξευόμενο σκυρόδεμα επί φρεατοπασσάλων	C25/30
5	Σκυρόδεμα καθαριότητας θεμελίων	C12/15
6	Σκυρόδεμα ελαφρά ωπλισμένων δαπέδων	C20/25
7	Χάλυβας κυρίως οπλισμού	B500C
8	Χάλυβας συνδετήρων	B500C
9	Χάλυβας δομικών πλεγμάτων	B500A
10	Δομικός χάλυβας μεταλλικών κατασκευών	S235, S275
11	Ποιότητα κοχλιών	8.8
12	Φυσική ξυλεία δαπέδων	C24

	Σεισμολογικά στοιχεία		
1	Οριζόντια σεισμική επιτάχυνση	A_h=	0,24g
2	Κατακόρυφη σεισμική επιτάχυνση	A_v=	0,7*0,24g=0,168g
3	Σπουδαιότητα κτιρίου		Σ3
4	Συντελεστής Σπουδαιότητας	γ=	1,15
5	Συντελεστής θεμελίωσης	θ=	1
6	Συντελεστής συμπεριφοράς οριζόντιας σεισμικής δράσης	q_h=	3,5
7	Συντελεστής συμπεριφοράς κατακόρυφης σεισμικής δράσης	q_v=	0,5q=1,75
8	Συντελεστής Φασματικής Ενίσχυσης	β_0=	2,5
9	Κατηγορία Εδάφους		Γ
10	Χαρακτηριστικές περίοδοι εδάφους	T1=0,20sec	T2=0,80sec
11	Συντελεστής κρίσιμης απόσβεσης για ρηγματωμένο σκυρόδεμα	ζ=	5%
17	Συντελεστής συνδυασμού δράσεων ανάλογα με τα φορτία χρήσης (πιν. 4.1 ΕΑΚ2000, 1.2)	ψ_2=	0,50

	Μόνιμα Φορτία		
1	Ειδικό βάρος ωπλισμένου σκυροδέματος	25,00	kN/m^3
2	Ειδικό βάρος χάλυβα οπλισμού	78,90	kN/m^3
3	Δρομικές οπτοπλινθοδομές	2,10	kN/m^2
4	Μπατικές Οπτοπλινθοδομές	3,60	kN/m^2
5	Συμπαγείς Οπτοπλινθοδομές (πάχος 20cm)	3,80	kN/m^2
6	Συμπαγείς Οπτοπλινθοδομές (πάχος 30cm)	5,80	kN/m^2
5	Ελαφρά Χωρίσματα πάχους 10cm	0,45	kN/m^2
6	Επιστρώσεις δαπέδων εσωτερικών χώρων	2,00	kN/m^2
7	Επιστρώσεις κλιμάκων, πλατύσκαλων, εξωστών	3,50	kN/m^2
8	Επικάλυψη δωμάτων	3,50	kN/m^2
9	Επικάλυψη στεγάστρων, στεγών	0,25	kN/m^2
10	Επικάλυψη αιθρίου με γυαλί	1.00	kN/m^2
11	Ειδικό βάρος χώματος φύτευσης	20,00	kN/m^3
12	Ειδικό βάρος γεμίσματος δαπέδων εσωτερικών χώρων	10,00	kN/m^3
13	Ειδικό βάρος ύδατος (δεξαμενή πυρόσβεσης)	10,00	kN/m^3

	Μεταβλητά Φορτία		
1	Ωφέλιμο φορτίο γραφείων	3,50	kN/m^2
2	Ωφέλιμο φορτίο αιθουσών διδασκαλίας	3,50-5,00	kN/m^2
3	Ωφέλιμο φορτίο αιθουσών εκδηλώσεων/ αμφιθεάτρων	7,50	kN/m^2
4	Ωφέλιμο φορτίο δαπέδων εξωστών	5,00	kN/m^2
5	Ωφέλιμο φορτίο κλιμάκων, πλατύσκαλων, χώρων κυκλοφορίας	5,00	kN/m^2
6	Ωφέλιμο φορτίο θέσεων στάθμευσης και κυκλοφορίας οχήματων στο δάπεδο υπογείου	5,00	kN/m^2
7	Ωφέλιμο φορτίο μη βατών δωμάτων	2,00	kN/m^2
8	Ωφέλιμο φορτίο βατών δωμάτων	5,00	kN/m^2
9	Ωφέλιμο φορτίο Η/Μ εγκαταστάσεων στο δώμα	2,00	kN/m^2
10	Ωφέλιμο φορτίο Η/Μ εγκαταστάσεων στο υπόγειο	10,00	kN/m^2
11	Ωφέλιμο φορτίο αποθηκευτικών χώρων υπογείου	10,00	kN/m^2
12	Ανεμοπίεση στους υποφορείς από δομικό χάλυβα	u=	33m/sec
13	Φορτίο Χιονιού	0,60	kN/m^2

	Εδαφολογικά στοιχεία		
1	Κατηγορία Εδάφους (από Γεωτεχνική Έρευνα-Μελέτη, Αύγουστος 2007)	Γ	
2	Περίοδοι φάσματος (κατά ΕΑΚ 2000)	Τ1=0,20sec	Τ2 =0,80sec
3	Συντελεστής θεμελίωσης (κατά ΕΑΚ 2000)	θ=	1
	Επιτρεπόμενη τάση (βάσει Γεωτεχνικής, Αυγούστου 2007)	σεπ=	100 kPa
4	Επιτρεπόμενη τάση που λήφθηκε υπόψη στους υπολογισμούς (προσαύξηση λόγω εμβάθυνσης θεμελίωσης)	σεπ=	190 kPa
5	Δείκτης εδάφους (από Γεωτεχνική Έρευνα-Μελέτη, Αύγουστος 2007)	K_v=	33.000 kN/m^3
6	Φαινόμενο βάρος γαιών	γ=	20-24 KN/m^3

	Συντελεστές ασφάλειας υλικών	
1	Σκυρόδεμα	1,50
2	Χάλυβας οπλισμού	1,15
3	Δομικού χάλυβα	1,10
4	Συγκολλήσεων, κοχλιώσεων	1,25

	Επικαλύψεις κύριων οπλισμών φερόντων δομικών στοιχείων • *Παρ.5.1 ΕΚΩΣ2000, Παραθαλάσσιο Περιβάλλον* • *Κανονισμός πυροπροστασίας για πυραντίσταση 60 λεπτών στους υπέργειους ορόφους και 90 λεπτών στο υπόγειο (εκπαιδευτήρια)*	
1	Συμπαγείς πλάκες	4,5cm
3	Δοκοί υπογείου	4,5cm
4	Δοκοί λοιπών σταθμών	4,5cm
5	Υποστυλώματα	4,5cm
6	Θεμελίωση	5,0cm

Data - Bars
Data - Sections
Loads - Cases
Loads - Values
Displacements SLS: global extremes
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Project: ionio

Author :

Data - Bars

Bar	Node 1	Node 2	Section	Material	Length (m)	Gamma (Deg)	Type
47	4025	4039	HE120A	S 275	7.80	0.0	_Simple bar
51	4025	4026	HE120A	S 275	1.05	0.0	_Simple bar
52	4027	4028	HE120A	S 275	1.05	0.0	_Simple bar
53	4029	4030	HE120A	S 275	1.05	0.0	_Simple bar
54	4031	4032	HE120A	S 275	1.05	0.0	_Simple bar
56	4033	4034	HE120A	S 275	1.05	0.0	_Simple bar

57	4035	4036	HE120A	S 275	1.05	0.0	_Simple bar
58	4037	4038	HE120A	S 275	1.05	0.0	_Simple bar
60	4039	4040	HE120A	S 275	1.05	0.0	_Simple bar
62	4041	4044	HE120A	S 275	7.80	0.0	_Simple bar
63	4041	4045	HE120A	S 275	1.45	0.0	_Simple bar
64	4046	4047	HE120A	S 275	1.45	0.0	_Simple bar
65	4042	4048	HE120A	S 275	1.45	0.0	_Simple bar
66	4043	4049	HE120A	S 275	1.45	0.0	_Simple bar
67	4050	4051	HE120A	S 275	1.45	0.0	_Simple bar
68	4102	4053	HE120A	S 275	1.45	0.0	_Simple bar
69	4054	4055	HE120A	S 275	1.45	0.0	_Simple bar
70	4044	4056	HE120A	S 275	1.45	0.0	_Simple bar
72	4043	4031	HE120A	S 275	1.90	0.0	_Simple bar
73	4050	4033	HE120A	S 275	1.90	0.0	_Simple bar
74	4102	4035	HE120A	S 275	1.90	0.0	_Simple bar
75	4054	4037	HE120A	S 275	1.90	0.0	_Simple bar
76	4044	4039	HE120A	S 275	1.90	0.0	_Simple bar
77	4042	4029	HE120A	S 275	1.90	0.0	_Simple bar
78	4046	4027	HE120A	S 275	1.90	0.0	_Simple bar
79	4041	4025	HE120A	S 275	1.90	0.0	_Simple bar
108	4104	4103	Φ20	S235	3.34	0.0	Simple bar
109	4105	4106	Φ20	S235	3.67	0.0	Simple bar
110	4107	4108	Φ20	S235	4.01	0.0	Simple bar
111	4109	4110	Φ20	S235	4.34	0.0	Simple bar
112	4111	4112	Φ20	S235	4.68	0.0	Simple bar
113	4113	4114	Φ20	S235	5.01	0.0	Simple bar
114	4115	4116	Φ20	S235	5.35	0.0	Simple bar
115	4117	4118	Φ20	S235	5.68	0.0	Simple bar
116	4119	4120	Φ20	S235	6.01	0.0	Simple bar
117	4121	4122	Φ20	S235	6.35	0.0	Simple bar
118	4123	4124	Φ20	S235	3.34	0.0	Simple bar
119	4125	4126	Φ20	S235	3.67	0.0	Simple bar
120	4127	4128	Φ20	S235	4.01	0.0	Simple bar
121	4129	4130	Φ20	S235	4.34	0.0	Simple bar
122	4131	4132	Φ20	S235	4.68	0.0	Simple bar
123	4133	4134	Φ20	S235	5.01	0.0	Simple bar
124	4135	4136	Φ20	S235	5.35	0.0	Simple bar
125	4137	4138	Φ20	S235	5.68	0.0	Simple bar
126	4139	4140	Φ20	S235	6.01	0.0	Simple bar
127	4141	4142	Φ20	S235	6.35	0.0	Simple bar

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Data - Sections

Section name	Bar list	AX (cm2)	AY (cm2)	AZ (cm2)	IX (cm4)	IY (cm4)	IZ (cm4)
HE120A	47 51to54 56to58 60 62to70 72to79	25.34	18.70	6.13	5.63	606.15	230.90
Φ20	108to127	3.14	2.65	2.65	1.57	0.79	0.79

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Loads - Cases

Case	Label	Case name	Nature	Analysis type
1	DL1	DL1	Structural	Nonlinear Static
2	LL1	LL1	Category A	Nonlinear Static
3	1.35G+1.5Q	1.35G+1.5Q	Structural	Nonlinear Static
4	SEIS1	SEIS1	seismic	Nonlinear Static
5	SEIS2	SEIS2	seismic	Nonlinear Static
6	SEIS3	SEIS3	seismic	Nonlinear Static
7	SEIS4	SEIS4	seismic	Nonlinear Static
8		ULS/1=1*1.35 + 2*1.50	Structural	Nonlin. Combination
9		ULS/2=1*1.35	Structural	Nonlin. Combination
10		ULS/3=1*1.00 + 2*1.50	Structural	Nonlin. Combination
11		ULS/4=1*1.00	Structural	Nonlin. Combination
12		SLS:CHR/1=1*1.00 + 2*1.00	dead	Nonlin. Combination
13		SLS:CHR/2=1*1.00	dead	Nonlin. Combination
14		SLS:FRE/3=1*1.00 + 2*0.50	dead	Nonlin. Combination
15		SLS:FRE/4=1*1.00	dead	Nonlin. Combination
16		SLS:QPR/5=1*1.00 + 2*0.30	dead	Nonlin. Combination
17		SLS:QPR/6=1*1.00	dead	Nonlin. Combination
18		ACC:SEI/1=1*1.00 + 2*0.30 + 4*1.00	dead	Nonlin. Combination

19		ACC:SEI/2=1*1.00 + 4*1.00	dead	Nonlin. Combination
20		ACC:SEI/3=1*1.00	dead	Nonlin. Combination
21		ACC:SEI/4=1*1.00 + 2*0.30 + 5*1.00	dead	Nonlin. Combination
22		ACC:SEI/5=1*1.00 + 5*1.00	dead	Nonlin. Combination
23		ACC:SEI/6=1*1.00 + 2*0.30 + 6*1.00	dead	Nonlin. Combination
24		ACC:SEI/7=1*1.00 + 6*1.00	dead	Nonlin. Combination
25		ACC:SEI/8=1*1.00 + 2*0.30 + 7*1.00	dead	Nonlin. Combination
26		ACC:SEI/9=1*1.00 + 7*1.00	dead	Nonlin. Combination
27		ACC:SEI/10=1*1.00 + 2*0.30 + 4*-1.00	dead	Nonlin. Combination
28		ACC:SEI/11=1*1.00 + 4*-1.00	dead	Nonlin. Combination
29		ACC:SEI/12=1*1.00 + 2*0.30 + 5*-1.00	dead	Nonlin. Combination
30		ACC:SEI/13=1*1.00 + 5*-1.00	dead	Nonlin. Combination
31		ACC:SEI/14=1*1.00 + 2*0.30 + 6*-1.00	dead	Nonlin. Combination
32		ACC:SEI/15=1*1.00 + 6*-1.00	dead	Nonlin. Combination
33		ACC:SEI/16=1*1.00 + 2*0.30 + 7*-1.00	dead	Nonlin. Combination
34		ACC:SEI/17=1*1.00 + 7*-1.00	dead	Nonlin. Combination

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Loads - Values

- Cases: 1to34

Case	Load type	List	Load values
1	self-weight	19 47 51to54 56to58 60 62to70 72to79 108to127	PZ Negative Factor=1.00
1	(FE) uniform	19	PZ=-3.50(kN/m2)
2	(FE) uniform	19	PZ=-5.00(kN/m2)
3	(FE) uniform	19	PZ=-12.22(kN/m2)
4	(FE) uniform	19	PX=1.13(kN/m2) PY=3.75(kN/m2)
5	(FE) uniform	19	PX=3.75(kN/m2) PY=1.13(kN/m2)
6	(FE) uniform	19	PX=1.13(kN/m2) PY=-3.75(kN/m2)
7	(FE)	19	PX=3.75(kN/m2)

	uniform		PY=-1.13(kN/m2)

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Displacements SLS: global extremes

- Cases: 1to7

	UX (mm)	UY (mm)	UZ (mm)	RX (Rad)	RY (Rad)	RZ (Rad)
MAX	0.5	0.0	1.1	0.000	0.000	0.000
Node	1792	826	1792	1613	124	200
Case	5	4	7	3	5	3
MIN	-0.4	-0.0	-1.0	-0.000	-0.000	-0.000
Node	829	914	829	200	858	1613
Case	3	6	3	3	3	3

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Reactions ULS: global extremes

in the coordinate system: global - Cases: 1to11

	FX (kN)	FY (kN)	FZ (kN)	MX (kNm)	MY (kNm)	MZ (kNm)
MAX	6.12	1.73	28.92	0.26	2.79	0.10
Node	1852	1801	4034	1850	1857	1975
Case	4	6	8	8	8	8
MIN	-7.05	-1.73	-2.65	-0.26	-2.41	-0.10
Node	1852	1800	1974	1975	1800	1850
Case	6	4	6	8	8	8

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Member Verification

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 47 _Simple bar_47 **POINT:** 1 **COORDINATE:** x = 0.54 L = 4.20 m

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LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S 275 (S 275) fy = 275.00 MPa



SECTION PARAMETERS: HE120A
h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2
tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -0.63 kN My,Ed = -2.79 kN*m Mz,Ed = 0.00 kN*m Vy,Ed = 0.00 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Mz,pl,Rd = 16.18 kN*m Vy,T,Rd = 343.52 kN
My,c,Rd = 32.86 kN*m Mz,c,Rd = 16.18 kN*m Vz,Ed = 20.00 kN
MN,y,Rd = 32.86 kN*m MN,z,Rd = 16.18 kN*m Vz,T,Rd = 134.26 kN
Mb,Rd = 16.92 kN*m Tt,Ed = -0.00 kN*m
Class of section = 1





LATERAL BUCKLING PARAMETERS:
z = 0.00 Mcr = 21.92 kN*m Curve,LT - a XLT = 0.51
Lcr,low=7.80 m Lam_LT = 1.22 fi,LT = 1.36

BUCKLING PARAMETERS:



About y axis:

About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.00 < 1.00 (6.2.3.(1))
(My,Ed/MN,y,Rd)^ 2.00 + (Mz,Ed/MN,z,Rd)^1.00 = 0.01 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.15 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Global stability check of member:
My,Ed/Mb,Rd = 0.16 < 1.00 (6.3.2.1.(1))

Section OK !!!

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STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 51 _Simple bar_51 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.00 m
---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S 275 (S 275) fy = 275.00 MPa

SECTION PARAMETERS: HE120A
h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2
tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:

N,Ed = -0.90 kN My,Ed = 0.08 kN*m Mz,Ed = -0.03 kN*m Vy,Ed = -0.03 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Mz,pl,Rd = 16.18 kN*m Vy,T,Rd = 343.52 kN
My,c,Rd = 32.86 kN*m Mz,c,Rd = 16.18 kN*m Vz,Ed = -0.07 kN
MN,y,Rd = 32.86 kN*m MN,z,Rd = 16.18 kN*m Vz,T,Rd = 134.26 kN
Mb,Rd = 31.90 kN*m Tt,Ed = -0.00 kN*m
Class of section = 1





LATERAL BUCKLING PARAMETERS:
z = 0.00 Mcr = 305.14 kN*m Curve,LT - a XLT = 0.97
Lcr,upp=1.05 m Lam_LT = 0.33 fi,LT = 0.57

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.00 < 1.00 (6.2.3.(1))
(My,Ed/MN,y,Rd)^ 2.00 + (Mz,Ed/MN,z,Rd)^1.00 = 0.00 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Global stability check of member:
My,Ed/Mb,Rd = 0.00 < 1.00 (6.3.2.1.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 52 _Simple bar_52 **POINT:** 6 **COORDINATE:** x = 1.00 L = 1.05 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S 275 (S 275) fy = 275.00 MPa



SECTION PARAMETERS: HE120A
h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2
tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -12.76 kN My,Ed = -0.00 kN*m Vy,Ed = -0.03 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Vy,T,Rd = 343.51 kN
My,c,Rd = 32.86 kN*m Vz,Ed = -0.41 kN
MN,y,Rd = 32.86 kN*m Vz,T,Rd = 134.26 kN
Tt,Ed = -0.00 kN*m
Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.02 < 1.00 (6.2.3.(1))
My,Ed/My,c,Rd = 0.00 < 1.00 (6.2.5.(1))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 53 _Simple bar_53 **POINT:** 6 **COORDINATE:** x = 1.00 L = 1.05 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S 275 (S 275) fy = 275.00 MPa



SECTION PARAMETERS: HE120A
h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2
tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -15.75 kN My,Ed = 0.00 kN*m Vy,Ed = -0.03 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Vy,T,Rd = 343.51 kN
My,c,Rd = 32.86 kN*m Vz,Ed = 0.38 kN
MN,y,Rd = 32.86 kN*m Vz,T,Rd = 134.26 kN
Tt,Ed = 0.00 kN*m
Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.02 < 1.00 (6.2.3.(1))
My,Ed/My,c,Rd = 0.00 < 1.00 (6.2.5.(1))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 54 _Simple bar_54 **POINT:** 6 **COORDINATE:** x = 1.00 L = 1.05 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S 275 (S 275) fy = 275.00 MPa



SECTION PARAMETERS: HE120A
h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2
tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -20.88 kN My,Ed = -0.00 kN*m Vy,Ed = -0.03 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Vy,T,Rd = 343.51 kN
My,c,Rd = 32.86 kN*m Vz,Ed = -0.41 kN
MN,y,Rd = 32.86 kN*m Vz,T,Rd = 134.26 kN
Tt,Ed = -0.00 kN*m
Class of section = 1

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:

About y axis:

About z axis:

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nt,Rd = 0.03 < 1.00 (6.2.3.(1))
My,Ed/My,c,Rd = 0.00 < 1.00 (6.2.5.(1))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 56 _Simple bar_56 **POINT:** 6 **COORDINATE:** x = 1.00 L = 1.05 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S 275 (S 275) fy = 275.00 MPa

SECTION PARAMETERS: HE120A
h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2

tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -28.92 kN My,Ed = -0.00 kN*m Vy,Ed = -0.03 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Vy,T,Rd = 343.52 kN
My,c,Rd = 32.86 kN*m Vz,Ed = -0.11 kN
MN,y,Rd = 32.86 kN*m Vz,T,Rd = 134.26 kN
Tt,Ed = -0.00 kN*m
Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.04 < 1.00 (6.2.3.(1))
My,Ed/My,c,Rd = 0.00 < 1.00 (6.2.5.(1))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 57 _Simple bar_57 **POINT:** 6 **COORDINATE:** x = 1.00 L = 1.05 m

---

LOADS:

Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S 275 (S 275) fy = 275.00 MPa



SECTION PARAMETERS: HE120A
h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2
tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -23.15 kN My,Ed = 0.00 kN*m Vy,Ed = -0.03 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Vy,T,Rd = 343.52 kN
My,c,Rd = 32.86 kN*m Vz,Ed = 0.25 kN
MN,y,Rd = 32.86 kN*m Vz,T,Rd = 134.26 kN
Tt,Ed = 0.00 kN*m
Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.03 < 1.00 (6.2.3.(1))
My,Ed/My,c,Rd = 0.00 < 1.00 (6.2.5.(1))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 58 _Simple bar_58 **POINT:** 6 **COORDINATE:** x = 1.00 L = 1.05 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S 275 (S 275) fy = 275.00 MPa



SECTION PARAMETERS: HE120A
h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2
tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -13.40 kN My,Ed = 0.00 kN*m Vy,Ed = -0.03 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Vy,T,Rd = 343.52 kN
My,c,Rd = 32.86 kN*m Vz,Ed = 0.19 kN
MN,y,Rd = 32.86 kN*m Vz,T,Rd = 134.26 kN
Tt,Ed = 0.00 kN*m
Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nt,Rd = 0.02 < 1.00 (6.2.3.(1))
My,Ed/My,c,Rd = 0.00 < 1.00 (6.2.5.(1))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 60 _Simple bar_60 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:

Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:

S 275 (S 275) fy = 275.00 MPa



SECTION PARAMETERS: HE120A

h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2
tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:

N,Ed = -1.87 kN My,Ed = -0.20 kN*m Mz,Ed = -0.03 kN*m Vy,Ed = -0.03 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Mz,pl,Rd = 16.18 kN*m Vy,T,Rd = 343.52 kN
My,c,Rd = 32.86 kN*m Mz,c,Rd = 16.18 kN*m Vz,Ed = 0.19 kN
MN,y,Rd = 32.86 kN*m MN,z,Rd = 16.18 kN*m Vz,T,Rd = 134.26 kN
Mb,Rd = 31.90 kN*m Tt,Ed = 0.00 kN*m
Class of section = 1





LATERAL BUCKLING PARAMETERS:
z = 0.00 Mcr = 305.14 kN*m Curve,LT - a XLT = 0.97
Lcr,low=1.05 m Lam_LT = 0.33 fi,LT = 0.57

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.00 < 1.00 (6.2.3.(1))
(My,Ed/MN,y,Rd)^ 2.00 + (Mz,Ed/MN,z,Rd)^1.00 = 0.00 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Global stability check of member:
My,Ed/Mb,Rd = 0.01 < 1.00 (6.3.2.1.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 62 _Simple bar_62 **POINT:** 1 **COORDINATE:** x = 0.54 L = 4.20 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S 275 (S 275) fy = 275.00 MPa



SECTION PARAMETERS: HE120A
h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2
tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -0.38 kN My,Ed = -2.75 kN*m Mz,Ed = 0.00 kN*m Vy,Ed = 0.00 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Mz,pl,Rd = 16.18 kN*m Vy,T,Rd = 343.51 kN
My,c,Rd = 32.86 kN*m Mz,c,Rd = 16.18 kN*m Vz,Ed = 19.78 kN
MN,y,Rd = 32.86 kN*m MN,z,Rd = 16.18 kN*m Vz,T,Rd = 134.26 kN
Mb,Rd = 16.92 kN*m Tt,Ed = -0.00 kN*m
Class of section = 1





LATERAL BUCKLING PARAMETERS:
z = 0.00 Mcr = 21.92 kN*m Curve,LT - a XLT = 0.51
Lcr,low=7.80 m Lam_LT = 1.22 fi,LT = 1.36

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.00 < 1.00 (6.2.3.(1))
(My,Ed/MN,y,Rd)^ 2.00 + (Mz,Ed/MN,z,Rd)^1.00 = 0.01 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.15 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Global stability check of member:
My,Ed/Mb,Rd = 0.16 < 1.00 (6.3.2.1.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 63 _Simple bar_63 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S 275 (S 275) fy = 275.00 MPa



SECTION PARAMETERS: HE120A
h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2
tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -0.86 kN My,Ed = 0.07 kN*m Mz,Ed = 0.04 kN*m Vy,Ed = 0.03 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Mz,pl,Rd = 16.18 kN*m Vy,T,Rd = 343.52 kN
My,c,Rd = 32.86 kN*m Mz,c,Rd = 16.18 kN*m Vz,Ed = -0.05 kN
MN,y,Rd = 32.86 kN*m MN,z,Rd = 16.18 kN*m Vz,T,Rd = 134.26 kN
Mb,Rd = 31.06 kN*m Tt,Ed = -0.00 kN*m
Class of section = 1





LATERAL BUCKLING PARAMETERS:
z = 0.00 Mcr = 178.64 kN*m Curve,LT - a XLT = 0.95
Lcr,upp=1.45 m Lam_LT = 0.43 fi,LT = 0.62

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.00 < 1.00 (6.2.3.(1))
(My,Ed/MN,y,Rd)^ 2.00 + (Mz,Ed/MN,z,Rd)^1.00 = 0.00 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Global stability check of member:
My,Ed/Mb,Rd = 0.00 < 1.00 (6.3.2.1.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 64 _Simple bar_64 **POINT:** 6 **COORDINATE:** x = 1.00 L = 1.45 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S 275 (S 275) fy = 275.00 MPa



SECTION PARAMETERS: HE120A
h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2
tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -12.69 kN My,Ed = -0.00 kN*m Vy,Ed = 0.03 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Vy,T,Rd = 343.51 kN
My,c,Rd = 32.86 kN*m Vz,Ed = -0.25 kN
MN,y,Rd = 32.86 kN*m Vz,T,Rd = 134.26 kN
Tt,Ed = -0.00 kN*m
Class of section = 1

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:

About y axis:

About z axis:

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nt,Rd = 0.02 < 1.00 (6.2.3.(1))
My,Ed/My,c,Rd = 0.00 < 1.00 (6.2.5.(1))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 65 _Simple bar_65 **POINT:** 6 **COORDINATE:** x = 1.00 L = 1.45 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S 275 (S 275) fy = 275.00 MPa

SECTION PARAMETERS: HE120A
h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2

tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -15.81 kN My,Ed = 0.00 kN*m Vy,Ed = 0.03 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Vy,T,Rd = 343.51 kN
My,c,Rd = 32.86 kN*m Vz,Ed = 0.21 kN
MN,y,Rd = 32.86 kN*m Vz,T,Rd = 134.26 kN
Tt,Ed = 0.00 kN*m
Class of section = 1

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:

About y axis:

About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.02 < 1.00 (6.2.3.(1))
My,Ed/My,c,Rd = 0.00 < 1.00 (6.2.5.(1))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 66 _Simple bar_66 **POINT:** 6 **COORDINATE:** x = 1.00 L = 1.45 m

---

LOADS:

Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S 275 (S 275) fy = 275.00 MPa



SECTION PARAMETERS: HE120A
h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2
tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -20.71 kN My,Ed = -0.00 kN*m Vy,Ed = 0.03 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Vy,T,Rd = 343.51 kN
My,c,Rd = 32.86 kN*m Vz,Ed = -0.24 kN
MN,y,Rd = 32.86 kN*m Vz,T,Rd = 134.26 kN
Tt,Ed = -0.00 kN*m
Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.03 < 1.00 (6.2.3.(1))
My,Ed/My,c,Rd = 0.00 < 1.00 (6.2.5.(1))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 67 _Simple bar_67 **POINT:** 6 **COORDINATE:** x = 1.00 L = 1.45 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S 275 (S 275) fy = 275.00 MPa



SECTION PARAMETERS: HE120A
h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2
tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -28.76 kN My,Ed = -0.00 kN*m Vy,Ed = 0.03 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Vy,T,Rd = 343.52 kN
My,c,Rd = 32.86 kN*m Vz,Ed = -0.06 kN
MN,y,Rd = 32.86 kN*m Vz,T,Rd = 134.26 kN
Tt,Ed = -0.00 kN*m
Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.04 < 1.00 (6.2.3.(1))
My,Ed/My,c,Rd = 0.00 < 1.00 (6.2.5.(1))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 68 _Simple bar_68 **POINT:** 6 **COORDINATE:** x = 1.00 L = 1.45 m
---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S 275 (S 275) fy = 275.00 MPa



SECTION PARAMETERS: HE120A
h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2
tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -23.07 kN My,Ed = 0.00 kN*m Vy,Ed = 0.03 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Vy,T,Rd = 343.52 kN
My,c,Rd = 32.86 kN*m Vz,Ed = 0.15 kN
MN,y,Rd = 32.86 kN*m Vz,T,Rd = 134.26 kN
Tt,Ed = 0.00 kN*m
Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nt,Rd = 0.03 < 1.00 (6.2.3.(1))
My,Ed/My,c,Rd = 0.00 < 1.00 (6.2.5.(1))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 69 _Simple bar_69 **POINT:** 6 **COORDINATE:** x = 1.00 L = 1.45 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S 275 (S 275) fy = 275.00 MPa



SECTION PARAMETERS: HE120A
h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2
tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -13.39 kN My,Ed = 0.00 kN*m Vy,Ed = 0.03 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Vy,T,Rd = 343.52 kN
My,c,Rd = 32.86 kN*m Vz,Ed = 0.12 kN
MN,y,Rd = 32.86 kN*m Vz,T,Rd = 134.26 kN
Tt,Ed = 0.00 kN*m
Class of section = 1

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:

About y axis:

About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.02 < 1.00 (6.2.3.(1))
My,Ed/My,c,Rd = 0.00 < 1.00 (6.2.5.(1))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 70 _Simple bar_70 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S 275 (S 275) fy = 275.00 MPa



SECTION PARAMETERS: HE120A
h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2
tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -1.83 kN My,Ed = -0.18 kN*m Mz,Ed = 0.04 kN*m Vy,Ed = 0.03 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Mz,pl,Rd = 16.18 kN*m Vy,T,Rd = 343.52 kN
My,c,Rd = 32.86 kN*m Mz,c,Rd = 16.18 kN*m Vz,Ed = 0.12 kN
MN,y,Rd = 32.86 kN*m MN,z,Rd = 16.18 kN*m Vz,T,Rd = 134.26 kN
Mb,Rd = 31.06 kN*m Tt,Ed = 0.00 kN*m
Class of section = 1





LATERAL BUCKLING PARAMETERS:
z = 0.00 Mcr = 178.64 kN*m Curve,LT - a XLT = 0.95
Lcr,low=1.45 m Lam_LT = 0.43 fi,LT = 0.62

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.00 < 1.00 (6.2.3.(1))
(My,Ed/MN,y,Rd)^ 2.00 + (Mz,Ed/MN,z,Rd)^1.00 = 0.00 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Global stability check of member:
My,Ed/Mb,Rd = 0.01 < 1.00 (6.3.2.1.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 72 _Simple bar_72 **POINT:** 4 **COORDINATE:** x = 0.60 L = 1.14 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S 275 (S 275) fy = 275.00 MPa



SECTION PARAMETERS: HE120A
h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2
tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -0.03 kN My,Ed = 0.08 kN*m Mz,Ed = -0.00 kN*m Vy,Ed = 0.00 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Mz,pl,Rd = 16.18 kN*m Vy,T,Rd = 343.51 kN
My,c,Rd = 32.86 kN*m Mz,c,Rd = 16.18 kN*m Vz,Ed = -0.04 kN
MN,y,Rd = 32.86 kN*m MN,z,Rd = 16.18 kN*m Vz,T,Rd = 134.26 kN
Mb,Rd = 30.10 kN*m Tt,Ed = 0.00 kN*m
Class of section = 1





LATERAL BUCKLING PARAMETERS:
z = 0.00 Mcr = 118.53 kN*m Curve,LT - a XLT = 0.92
Lcr,upp=1.90 m Lam_LT = 0.53 fi,LT = 0.67

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.00 < 1.00 (6.2.3.(1))
(My,Ed/MN,y,Rd)^ 2.00 + (Mz,Ed/MN,z,Rd)^1.00 = 0.00 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Global stability check of member:
My,Ed/Mb,Rd = 0.00 < 1.00 (6.3.2.1.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 73 _Simple bar_73 **POINT:** 4 **COORDINATE:** x = 0.60 L = 1.14 m
---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S 275 (S 275) fy = 275.00 MPa



SECTION PARAMETERS: HE120A
h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2
tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -0.03 kN My,Ed = 0.08 kN*m Mz,Ed = 0.00 kN*m Vy,Ed = -0.00 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Mz,pl,Rd = 16.18 kN*m Vy,T,Rd = 343.52 kN

My,c,Rd = 32.86 kN*m Mz,c,Rd = 16.18 kN*m Vz,Ed = -0.05 kN
MN,y,Rd = 32.86 kN*m MN,z,Rd = 16.18 kN*m Vz,T,Rd = 134.26 kN
Mb,Rd = 30.10 kN*m Tt,Ed = 0.00 kN*m
Class of section = 1





LATERAL BUCKLING PARAMETERS:
z = 0.00 Mcr = 118.53 kN*m Curve,LT - a XLT = 0.92
Lcr,upp=1.90 m Lam_LT = 0.53 fi,LT = 0.67

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.00 < 1.00 (6.2.3.(1))
(My,Ed/MN,y,Rd)^ 2.00 + (Mz,Ed/MN,z,Rd)^1.00 = 0.00 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Global stability check of member:
My,Ed/Mb,Rd = 0.00 < 1.00 (6.3.2.1.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 74 _Simple bar_74 **POINT:** 4 **COORDINATE:** x = 0.60 L = 1.14 m

---

LOADS:

Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S 275 (S 275) fy = 275.00 MPa



SECTION PARAMETERS: HE120A
h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2
tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -0.03 kN My,Ed = 0.08 kN*m Mz,Ed = 0.00 kN*m Vy,Ed = -0.00 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Mz,pl,Rd = 16.18 kN*m Vy,T,Rd = 343.52 kN
My,c,Rd = 32.86 kN*m Mz,c,Rd = 16.18 kN*m Vz,Ed = -0.04 kN
MN,y,Rd = 32.86 kN*m MN,z,Rd = 16.18 kN*m Vz,T,Rd = 134.26 kN
Mb,Rd = 30.10 kN*m Tt,Ed = -0.00 kN*m
Class of section = 1





LATERAL BUCKLING PARAMETERS:
z = 0.00 Mcr = 118.53 kN*m Curve,LT - a XLT = 0.92
Lcr,upp=1.90 m Lam_LT = 0.53 fi,LT = 0.67

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.00 < 1.00 (6.2.3.(1))
(My,Ed/MN,y,Rd)^ 2.00 + (Mz,Ed/MN,z,Rd)^1.00 = 0.00 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Global stability check of member:

My,Ed/Mb,Rd = 0.00 < 1.00 (6.3.2.1.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 75 _Simple bar_75 **POINT:** 4 **COORDINATE:** x = 0.60 L = 1.14 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S 275 (S 275) fy = 275.00 MPa



SECTION PARAMETERS: HE120A
h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2
tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -0.03 kN My,Ed = 0.08 kN*m Mz,Ed = 0.00 kN*m Vy,Ed = -0.00 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Mz,pl,Rd = 16.18 kN*m Vy,T,Rd = 343.52 kN
My,c,Rd = 32.86 kN*m Mz,c,Rd = 16.18 kN*m Vz,Ed = -0.04 kN
MN,y,Rd = 32.86 kN*m MN,z,Rd = 16.18 kN*m Vz,T,Rd = 134.26 kN
Mb,Rd = 30.10 kN*m Tt,Ed = -0.00 kN*m
Class of section = 1





LATERAL BUCKLING PARAMETERS:
z = 0.00 Mcr = 118.53 kN*m Curve,LT - a XLT = 0.92
Lcr,upp=1.90 m Lam_LT = 0.53 fi,LT = 0.67

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.00 < 1.00 (6.2.3.(1))
(My,Ed/MN,y,Rd)^ 2.00 + (Mz,Ed/MN,z,Rd)^1.00 = 0.00 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Global stability check of member:
My,Ed/Mb,Rd = 0.00 < 1.00 (6.3.2.1.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 76 _Simple bar_76 **POINT:** 4 **COORDINATE:** x = 0.60 L = 1.14 m
---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S 275 (S 275) fy = 275.00 MPa



SECTION PARAMETERS: HE120A
h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2
tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:

N,Ed = -0.03 kN My,Ed = 0.08 kN*m Mz,Ed = 0.00 kN*m Vy,Ed = -0.00 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Mz,pl,Rd = 16.18 kN*m Vy,T,Rd = 343.52 kN
My,c,Rd = 32.86 kN*m Mz,c,Rd = 16.18 kN*m Vz,Ed = -0.04 kN
MN,y,Rd = 32.86 kN*m MN,z,Rd = 16.18 kN*m Vz,T,Rd = 134.26 kN
Mb,Rd = 30.10 kN*m Tt,Ed = -0.00 kN*m
Class of section = 1





LATERAL BUCKLING PARAMETERS:
z = 0.00 Mcr = 118.53 kN*m Curve,LT - a XLT = 0.92
Lcr,upp=1.90 m Lam_LT = 0.53 fi,LT = 0.67

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.00 < 1.00 (6.2.3.(1))
(My,Ed/MN,y,Rd)^ 2.00 + (Mz,Ed/MN,z,Rd)^1.00 = 0.00 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Global stability check of member:
My,Ed/Mb,Rd = 0.00 < 1.00 (6.3.2.1.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 77 _Simple bar_77 **POINT:** 4 **COORDINATE:** x = 0.60 L = 1.14 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S 275 (S 275) fy = 275.00 MPa



SECTION PARAMETERS: HE120A
h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2
tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -0.03 kN My,Ed = 0.08 kN*m Mz,Ed = -0.00 kN*m Vy,Ed = 0.00 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Mz,pl,Rd = 16.18 kN*m Vy,T,Rd = 343.52 kN
My,c,Rd = 32.86 kN*m Mz,c,Rd = 16.18 kN*m Vz,Ed = -0.04 kN
MN,y,Rd = 32.86 kN*m MN,z,Rd = 16.18 kN*m Vz,T,Rd = 134.26 kN
Mb,Rd = 30.10 kN*m Tt,Ed = -0.00 kN*m
Class of section = 1





LATERAL BUCKLING PARAMETERS:
z = 0.00 Mcr = 118.53 kN*m Curve,LT - a XLT = 0.92
Lcr,upp=1.90 m Lam_LT = 0.53 fi,LT = 0.67

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.00 < 1.00 (6.2.3.(1))
(My,Ed/MN,y,Rd)^ 2.00 + (Mz,Ed/MN,z,Rd)^1.00 = 0.00 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)

Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Global stability check of member:
My,Ed/Mb,Rd = 0.00 < 1.00 (6.3.2.1.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 78 _Simple bar_78 **POINT:** 4 **COORDINATE:** x = 0.60 L = 1.14 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S 275 (S 275) fy = 275.00 MPa



SECTION PARAMETERS: HE120A
h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2
tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -0.03 kN My,Ed = 0.08 kN*m Mz,Ed = -0.00 kN*m Vy,Ed = 0.00 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Mz,pl,Rd = 16.18 kN*m Vy,T,Rd = 343.51 kN
My,c,Rd = 32.86 kN*m Mz,c,Rd = 16.18 kN*m Vz,Ed = -0.04 kN
MN,y,Rd = 32.86 kN*m MN,z,Rd = 16.18 kN*m Vz,T,Rd = 134.26 kN
Mb,Rd = 30.10 kN*m Tt,Ed = 0.00 kN*m
Class of section = 1





LATERAL BUCKLING PARAMETERS:
z = 0.00 Mcr = 118.53 kN*m Curve,LT - a XLT = 0.92
Lcr,upp=1.90 m Lam_LT = 0.53 fi,LT = 0.67

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.00 < 1.00 (6.2.3.(1))
(My,Ed/MN,y,Rd)^ 2.00 + (Mz,Ed/MN,z,Rd)^1.00 = 0.00 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Global stability check of member:
My,Ed/Mb,Rd = 0.00 < 1.00 (6.3.2.1.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 79 _Simple bar_79 **POINT:** 4 **COORDINATE:** x = 0.60 L = 1.14 m
---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S 275 (S 275) fy = 275.00 MPa



SECTION PARAMETERS: HE120A
h=11.4 cm gM0=1.00 gM1=1.00
b=12.0 cm Ay=21.64 cm2 Az=8.46 cm2 Ax=25.34 cm2
tw=0.5 cm Iy=606.15 cm4 Iz=230.90 cm4 Ix=5.63 cm4
tf=0.8 cm Wply=119.50 cm3 Wplz=58.85 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -0.03 kN My,Ed = 0.08 kN*m Mz,Ed = -0.00 kN*m Vy,Ed = 0.00 kN
Nt,Rd = 696.74 kN My,pl,Rd = 32.86 kN*m Mz,pl,Rd = 16.18 kN*m Vy,T,Rd = 343.52 kN
My,c,Rd = 32.86 kN*m Mz,c,Rd = 16.18 kN*m Vz,Ed = -0.04 kN
MN,y,Rd = 32.86 kN*m MN,z,Rd = 16.18 kN*m Vz,T,Rd = 134.26 kN
Mb,Rd = 30.10 kN*m Tt,Ed = 0.00 kN*m
Class of section = 1





LATERAL BUCKLING PARAMETERS:
z = 0.00 Mcr = 118.53 kN*m Curve,LT - a XLT = 0.92
Lcr,upp=1.90 m Lam_LT = 0.53 fi,LT = 0.67

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.00 < 1.00 (6.2.3.(1))
(My,Ed/MN,y,Rd)^ 2.00 + (Mz,Ed/MN,z,Rd)^1.00 = 0.00 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Global stability check of member:
My,Ed/Mb,Rd = 0.00 < 1.00 (6.3.2.1.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 108 Simple bar_108 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S235 (S235) fy = 235.00 MPa



SECTION PARAMETERS: Φ20
h=2.0 cm gM0=1.00 gM1=1.00
Ay=2.00 cm2 Az=2.00 cm2 Ax=3.14 cm2
tw=1.0 cm Iy=0.79 cm4 Iz=0.79 cm4 Ix=1.57 cm4
Wply=1.33 cm3 Wplz=1.33 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -1.44 kN
Nt,Rd = 73.83 kN
Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.02 < 1.00 (6.2.3.(1))

Section OK !!!

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 109 Simple bar_109 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S235 (S235) fy = 235.00 MPa



SECTION PARAMETERS: Φ20
h=2.0 cm gM0=1.00 gM1=1.00
Ay=2.00 cm2 Az=2.00 cm2 Ax=3.14 cm2
tw=1.0 cm Iy=0.79 cm4 Iz=0.79 cm4 Ix=1.57 cm4
Wply=1.33 cm3 Wplz=1.33 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -7.61 kN
Nt,Rd = 73.83 kN
Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.10 < 1.00 (6.2.3.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 110 Simple bar_110 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S235 (S235) fy = 235.00 MPa



SECTION PARAMETERS: Φ20
h=2.0 cm gM0=1.00 gM1=1.00
Ay=2.00 cm2 Az=2.00 cm2 Ax=3.14 cm2
tw=1.0 cm Iy=0.79 cm4 Iz=0.79 cm4 Ix=1.57 cm4
Wply=1.33 cm3 Wplz=1.33 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -12.11 kN
Nt,Rd = 73.83 kN
Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.16 < 1.00 (6.2.3.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 111 Simple bar_111 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.00 m
---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S235 (S235) fy = 235.00 MPa



SECTION PARAMETERS: Φ20
h=2.0 cm gM0=1.00 gM1=1.00
Ay=2.00 cm2 Az=2.00 cm2 Ax=3.14 cm2
tw=1.0 cm Iy=0.79 cm4 Iz=0.79 cm4 Ix=1.57 cm4
Wply=1.33 cm3 Wplz=1.33 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -17.25 kN
Nt,Rd = 73.83 kN
Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.23 < 1.00 (6.2.3.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 112 Simple bar_112 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S235 (S235) fy = 235.00 MPa



SECTION PARAMETERS: Φ20
h=2.0 cm gM0=1.00 gM1=1.00
Ay=2.00 cm2 Az=2.00 cm2 Ax=3.14 cm2
tw=1.0 cm Iy=0.79 cm4 Iz=0.79 cm4 Ix=1.57 cm4
Wply=1.33 cm3 Wplz=1.33 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -16.72 kN
Nt,Rd = 73.83 kN
Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.23 < 1.00 (6.2.3.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 113 Simple bar_113 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.00 m
---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S235 (S235) fy = 235.00 MPa



SECTION PARAMETERS: Φ20
h=2.0 cm gM0=1.00 gM1=1.00
Ay=2.00 cm2 Az=2.00 cm2 Ax=3.14 cm2
tw=1.0 cm Iy=0.79 cm4 Iz=0.79 cm4 Ix=1.57 cm4
Wply=1.33 cm3 Wplz=1.33 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -17.98 kN
Nt,Rd = 73.83 kN
Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.24 < 1.00 (6.2.3.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 114 Simple bar_114 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S235 (S235) fy = 235.00 MPa



SECTION PARAMETERS: Φ20
h=2.0 cm gM0=1.00 gM1=1.00
Ay=2.00 cm2 Az=2.00 cm2 Ax=3.14 cm2
tw=1.0 cm Iy=0.79 cm4 Iz=0.79 cm4 Ix=1.57 cm4
Wply=1.33 cm3 Wplz=1.33 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -15.69 kN
Nt,Rd = 73.83 kN
Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.21 < 1.00 (6.2.3.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 115 Simple bar_115 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S235 (S235) fy = 235.00 MPa



SECTION PARAMETERS: Φ20
h=2.0 cm gM0=1.00 gM1=1.00
Ay=2.00 cm2 Az=2.00 cm2 Ax=3.14 cm2
tw=1.0 cm Iy=0.79 cm4 Iz=0.79 cm4 Ix=1.57 cm4
Wply=1.33 cm3 Wplz=1.33 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -12.00 kN
Nt,Rd = 73.83 kN
Class of section = 1

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:

About y axis:

About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.16 < 1.00 (6.2.3.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 116 Simple bar_116 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S235 (S235) fy = 235.00 MPa



SECTION PARAMETERS: Φ20
h=2.0 cm gM0=1.00 gM1=1.00
Ay=2.00 cm2 Az=2.00 cm2 Ax=3.14 cm2
tw=1.0 cm Iy=0.79 cm4 Iz=0.79 cm4 Ix=1.57 cm4
Wply=1.33 cm3 Wplz=1.33 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -7.70 kN
Nt,Rd = 73.83 kN
Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.10 < 1.00 (6.2.3.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 117 Simple bar_117 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S235 (S235) fy = 235.00 MPa



SECTION PARAMETERS: Φ20
h=2.0 cm gM0=1.00 gM1=1.00
Ay=2.00 cm2 Az=2.00 cm2 Ax=3.14 cm2
tw=1.0 cm Iy=0.79 cm4 Iz=0.79 cm4 Ix=1.57 cm4
Wply=1.33 cm3 Wplz=1.33 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -2.21 kN
Nt,Rd = 73.83 kN
Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.03 < 1.00 (6.2.3.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 118 Simple bar_118 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S235 (S235) fy = 235.00 MPa



SECTION PARAMETERS: Φ20
h=2.0 cm gM0=1.00 gM1=1.00
Ay=2.00 cm2 Az=2.00 cm2 Ax=3.14 cm2
tw=1.0 cm Iy=0.79 cm4 Iz=0.79 cm4 Ix=1.57 cm4
Wply=1.33 cm3 Wplz=1.33 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -1.48 kN
Nt,Rd = 73.83 kN
Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.02 < 1.00 (6.2.3.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 119 Simple bar_119 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S235 (S235) fy = 235.00 MPa



SECTION PARAMETERS: Φ20
h=2.0 cm gM0=1.00 gM1=1.00
Ay=2.00 cm2 Az=2.00 cm2 Ax=3.14 cm2
tw=1.0 cm Iy=0.79 cm4 Iz=0.79 cm4 Ix=1.57 cm4
Wply=1.33 cm3 Wplz=1.33 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -7.75 kN
Nt,Rd = 73.83 kN
Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:

N,Ed/Nt,Rd = 0.10 < 1.00 (6.2.3.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 120 Simple bar_120 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S235 (S235) fy = 235.00 MPa



SECTION PARAMETERS: Φ20
h=2.0 cm gM0=1.00 gM1=1.00
Ay=2.00 cm2 Az=2.00 cm2 Ax=3.14 cm2
tw=1.0 cm Iy=0.79 cm4 Iz=0.79 cm4 Ix=1.57 cm4
Wply=1.33 cm3 Wplz=1.33 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -12.26 kN
Nt,Rd = 73.83 kN
Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.17 < 1.00 (6.2.3.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 121 Simple bar_121 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S235 (S235) fy = 235.00 MPa



SECTION PARAMETERS: Φ20
h=2.0 cm gM0=1.00 gM1=1.00
Ay=2.00 cm2 Az=2.00 cm2 Ax=3.14 cm2
tw=1.0 cm Iy=0.79 cm4 Iz=0.79 cm4 Ix=1.57 cm4
Wply=1.33 cm3 Wplz=1.33 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -17.37 kN
Nt,Rd = 73.83 kN
Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.24 < 1.00 (6.2.3.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 122 Simple bar_122 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.00 m
---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S235 (S235) fy = 235.00 MPa



SECTION PARAMETERS: Φ20
h=2.0 cm gM0=1.00 gM1=1.00
Ay=2.00 cm2 Az=2.00 cm2 Ax=3.14 cm2
tw=1.0 cm Iy=0.79 cm4 Iz=0.79 cm4 Ix=1.57 cm4
Wply=1.33 cm3 Wplz=1.33 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -16.91 kN
Nt,Rd = 73.83 kN
Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.23 < 1.00 (6.2.3.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 123 Simple bar_123 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S235 (S235) fy = 235.00 MPa



SECTION PARAMETERS: Φ20
h=2.0 cm gM0=1.00 gM1=1.00
Ay=2.00 cm2 Az=2.00 cm2 Ax=3.14 cm2
tw=1.0 cm Iy=0.79 cm4 Iz=0.79 cm4 Ix=1.57 cm4
Wply=1.33 cm3 Wplz=1.33 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -18.19 kN
Nt,Rd = 73.83 kN

Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.25 < 1.00 (6.2.3.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 124 Simple bar_124 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S235 (S235) fy = 235.00 MPa



SECTION PARAMETERS: Φ20
h=2.0 cm gM0=1.00 gM1=1.00
Ay=2.00 cm2 Az=2.00 cm2 Ax=3.14 cm2
tw=1.0 cm Iy=0.79 cm4 Iz=0.79 cm4 Ix=1.57 cm4

Wply=1.33 cm3 Wplz=1.33 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -15.86 kN
Nt,Rd = 73.83 kN
Class of section = 1

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:

About y axis:

About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.21 < 1.00 (6.2.3.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 125 Simple bar_125 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S235 (S235) fy = 235.00 MPa



SECTION PARAMETERS: Φ20
h=2.0 cm gM0=1.00 gM1=1.00
Ay=2.00 cm2 Az=2.00 cm2 Ax=3.14 cm2
tw=1.0 cm Iy=0.79 cm4 Iz=0.79 cm4 Ix=1.57 cm4
Wply=1.33 cm3 Wplz=1.33 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -12.11 kN
Nt,Rd = 73.83 kN
Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.16 < 1.00 (6.2.3.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 126 Simple bar_126 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:
S235 (S235) fy = 235.00 MPa



SECTION PARAMETERS: Φ20
h=2.0 cm gM0=1.00 gM1=1.00
Ay=2.00 cm2 Az=2.00 cm2 Ax=3.14 cm2
tw=1.0 cm Iy=0.79 cm4 Iz=0.79 cm4 Ix=1.57 cm4
Wply=1.33 cm3 Wplz=1.33 cm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = -7.78 kN
Nt,Rd = 73.83 kN
Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.11 < 1.00 (6.2.3.(1))

Section OK !!!

STEEL DESIGN

CODE: *EN 1993-1:2005/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:

MEMBER: 127 Simple bar_127 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:

Governing Load Case: 8 ULS/1=1*1.35 + 2*1.50 1*1.35+2*1.50

MATERIAL:

S235 (S235) fy = 235.00 MPa



SECTION PARAMETERS: Φ20

h=2.0 cm gM0=1.00 gM1=1.00
Ay=2.00 cm2 Az=2.00 cm2 Ax=3.14 cm2
tw=1.0 cm Iy=0.79 cm4 Iz=0.79 cm4 Ix=1.57 cm4
Wply=1.33 cm3 Wplz=1.33 cm3

INTERNAL FORCES AND CAPACITIES:

N,Ed = -2.25 kN
Nt,Rd = 73.83 kN
Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About z axis:

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nt,Rd = 0.03 < 1.00 (6.2.3.(1))

Section OK !!!