Slender strut (column) buckling

i Calculation without errors.

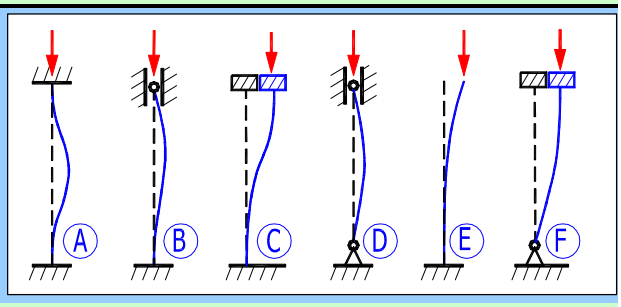
ii Project information

? Input section

1.0 Strut (column) mounting

1.1 Calculation units: Imperial (lbf, in, HP....)

1.2 Type of strut mounting: B. Clamped - Hinged



1.3 Effective length coeficient		
1.4 Theoretical value	0,70	
1.5 Engeneering value	0,80	
1.6 Value used for calculation	0,80	☑

2.0 Static values of the profile and material values

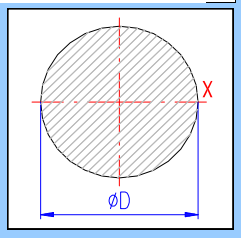
2.1 **Strut (column) profile**

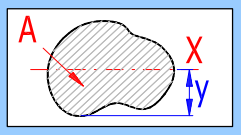
2.2 Profile type: 08...Circle (Calculated)

2.3 Profile dimensions: Empty table

2.4 User's parameters of the profile: No

D 2,28 [in]





2.5 Area	A	4,0837E+00	[in^2]
2.6 Quadr. moment of inertia	Ix	1,3271E+00	[in^4]
2.7 Max. distance of fibre	y	1,140	[in]
2.8 Radius of gyration	r	0,570	[in]

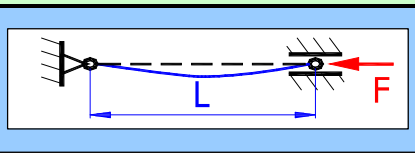
2.9 **Column material**

2.10 List of materials: Structural steel 36 KSI / Sy=36000 psi ☑

				Recomendet values
2.11 Modulus of elasticity in tension	E	29007000	[psi]	
2.12 Yield strength	Sy	36000	[psi]	
2.13 Limiting slenderness ratio (intermediate/long)	SRc (lc)	126		126
2.14 Limiting slenderness ratio (short/intermediate)	SRcs (lcs)	20		20

3.0 Calculation and check of buckling

3.1 Actual strut length	L	100,00	[in]
3.2 Axial load (force)	F	10000,00	[lbf]
3.3 Effective length	Leff	80,00	[in]
3.4 Slenderness ratio	SR(l)	140,34	



3.5 **Design of profile dimensions (Secant)**

3.6 Safety coefficient	SF	5,00
3.7 Excentricity ratio	m	0,25

3.8 **Euler (elastic buckling)**

3.9 Critical stress	Sc	14536,82	[psi]
3.10 Critical force	Fcr	59364	[lbf]
3.11 Safety coefficient	SF	**5,94**	

3.12 **Linear formula, Tetmajer**

3.13 Critical stress	Sc	14536,82	[psi]
3.14 Critical force	Fcr	59364	[lbf]
3.15 Safety coefficient	SF	**5,94**	

3.16 **Parabolic formula, Johnson**

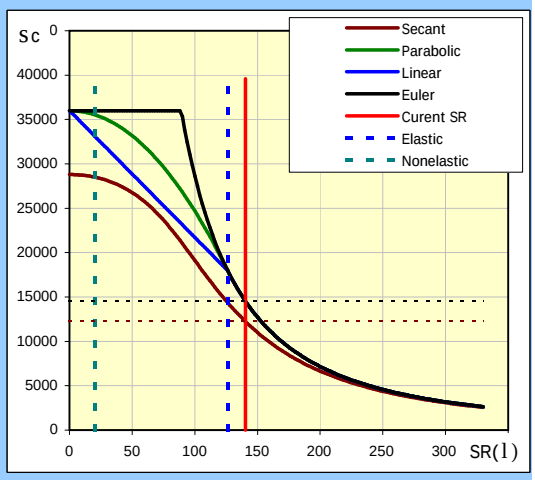
3.17 Critical stress	Sc	14536,82	[psi]
3.18 Critical force	Fcr	59364	[lbf]
3.19 Safety coefficient	SF	**5,94**	

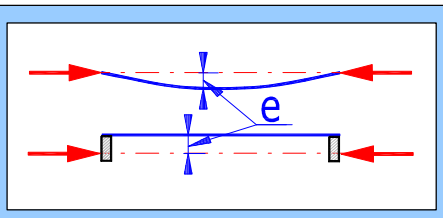
3.20 **Secant formula**

3.21 Eccentricity	e	0,07	[in] ☐
3.22 Max. fibre distance	y	1,140127532	[in]
3.23 Eccentricity ratio	m	0,25	
3.24 Stress in column	S	3214,66406	[psi]
3.25 Critical stress	Sc	12243,7165	[psi]
3.26 Critical force	Fcr	50000	[lbf]
3.27 Safety coefficient	SF	**5,00**	

3.28 **Pure pressure**

3.29 Compressive stress	S	2448,74	[psi]
3.30 Critical force	Fcr	147014	[lbf]
3.31 Safety coefficient	SF	**14,70**	





3.32 **Calculation of the max. force**

3.33 Safety coefficient	SF	5,00	☑
3.34 Max.F (Euler)	Fmax	11873	[lbf]
3.35 Max.F (Parabolic)	Fmax	11873	[lbf]
3.36 Max.F (Secant)	Fmax	10000	[lbf]