CTICM
LTBeam

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Version 1.0.10

Beam

Total length	L	=	6.85	m
Number of elements	N	=	100	

Steel

Young modulus	E	=	210000	MPa
Poisson's coefficient	ν	=	0.3	
Shear modulus	G	=	80769	MPa

Section - In Catalogue

Selected Profile		=	IPE 400	
Weak flexural inertia	Iz	=	1317.8	cm4
Torsional constant	It	=	50.267	cm4
Warping constant	Iw	=	492149	cm6
Wagner factor	ßz	=	0	mm

Lateral Restraints

Left End

Position of Restraint /S	z	=	0	mm
Lateral restraint	v	=	Fixed	
Torsional restraint	θ	=	Fixed	
Flexural restraint	v'	=	Free	
Warping restraint	θ ′	=	Free	

Right End

Position of Restraint /S	z	=	0	mm
Lateral restraint	v	=	Fixed	
Torsional restraint	θ	=	Fixed	
Flexural restraint	v'	=	Free	
Warping restraint	θ ′	=	Free	

No intermediate lateral restraint

Loading

Supports at Ends in the Plane of Bending

Hinged at both ends

External End Moments

Left end moment	M1	=	0	kN.m
Right end moment	M2	=	-67	kN.m
End moments ratio (-M1/M2)	ψ	=	0.000	

Distributed load

Value at the origin	q1	=	-0.5	kN/m
Value at the end	q2	=	-0.5	kN/m
Abscissa/L at the origin	xf1	=	0	
Abscissa/L at the end	xf2	=	1	
Position /S	z	=	200	mm

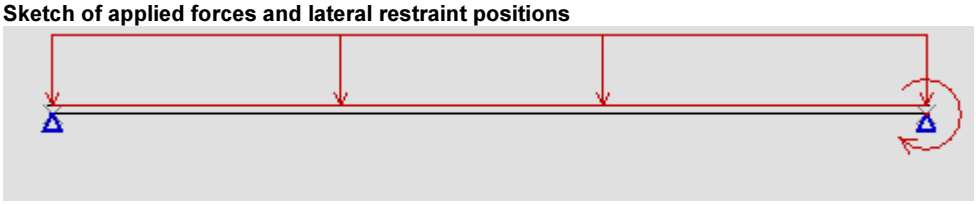
Point load

Value	F	=	-52.5	kN
Abscissa/L	xf	=	0.33	
Position /S	z	=	200	mm

Point load

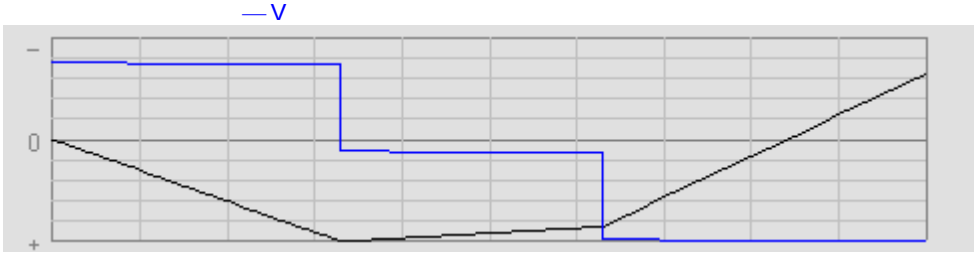
Value	F	=	-52.5	kN
Abscissa/L	xf	=	0.63	
Position /S	z	=	200	mm

Sketch of applied forces and lateral restraint positions



Bending and shear diagrams

— M — V



Maximum moment	Mmax	=	103.91	kN.m
Abscissa/L	xf	=	0.330	

Critical Moment

Eigenvalue solving

Dichotomic process on determinant				
Convergence tolerance	ε	=	0.0001	
Number of iterations performed	nit	=	19	
Convergence achieved				
Eigenvalue obtained	μ	=	1.4868	

Critical Moment

Critical value of maximum moment	Mcr	=	154.49	kN.m
Abscissa/L	xf	=	0.330	

Eigenmode

— v — θ — v' — θ '