Beus Facade Consulting & Engineering
www.beusfacade.com
info@beusfacade.com

BEAM ANALYSIS REPORT

For preliminary sizing; the final design must be checked and approved by a competent engineer to relevant standards.

Project	BEUS FACADE Sample Project	**Subject**	Vertical Profile Structural Design
Prepared by	Civil Engineer	**Approved by**	MSc Civil Engineer
Date	8/16/2025		

1) Inputs

L (mm)	14000	**E (MPa)**	70000
I (cm^4)	200.00	**W (cm^3)**	40.00
Material	aluminum	**Note**	Aluminum X.X
fy (MPa)	160	**$\sigma_{allow,d}$ (ULS) MPa**	145.5 (γM=1.1)

2) Loads

UDL (Uniformly Distributed Load)

#	w (kN/m)	x_1 (mm)	x_2 (mm)
1	-1.50	–	3500
2	-1.50	7000	14000

Point Loads

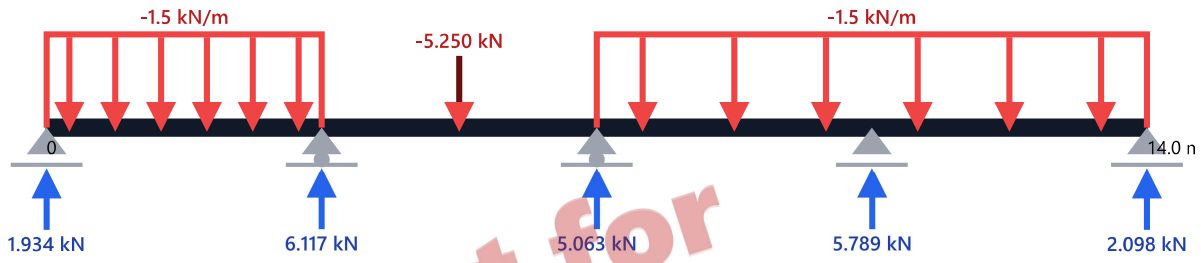
#	P (kN)	x (mm)
1	-5.25	5250

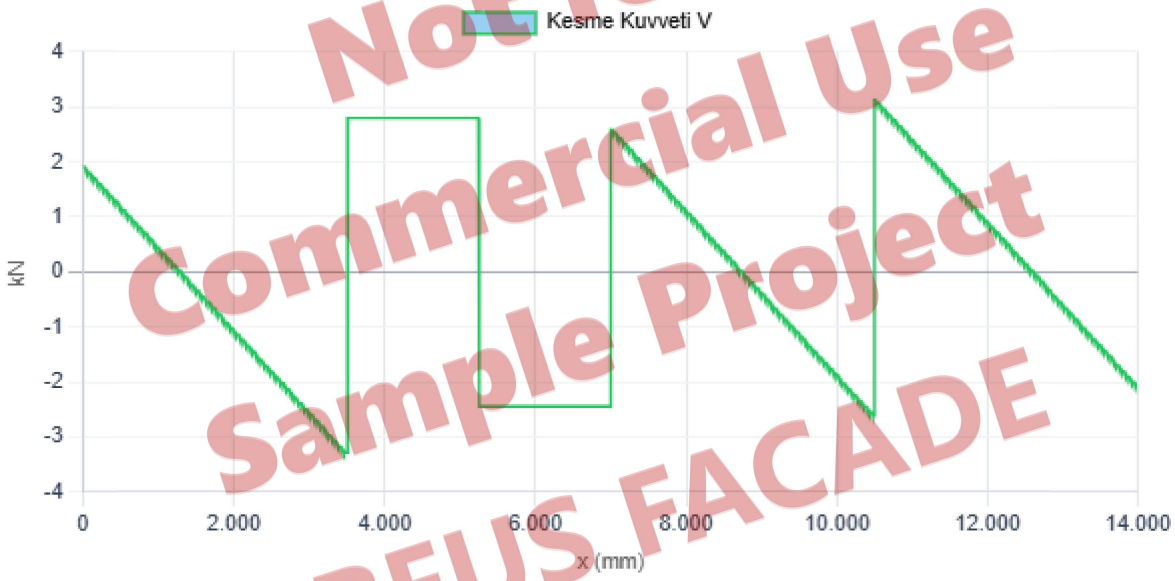
3) Supports

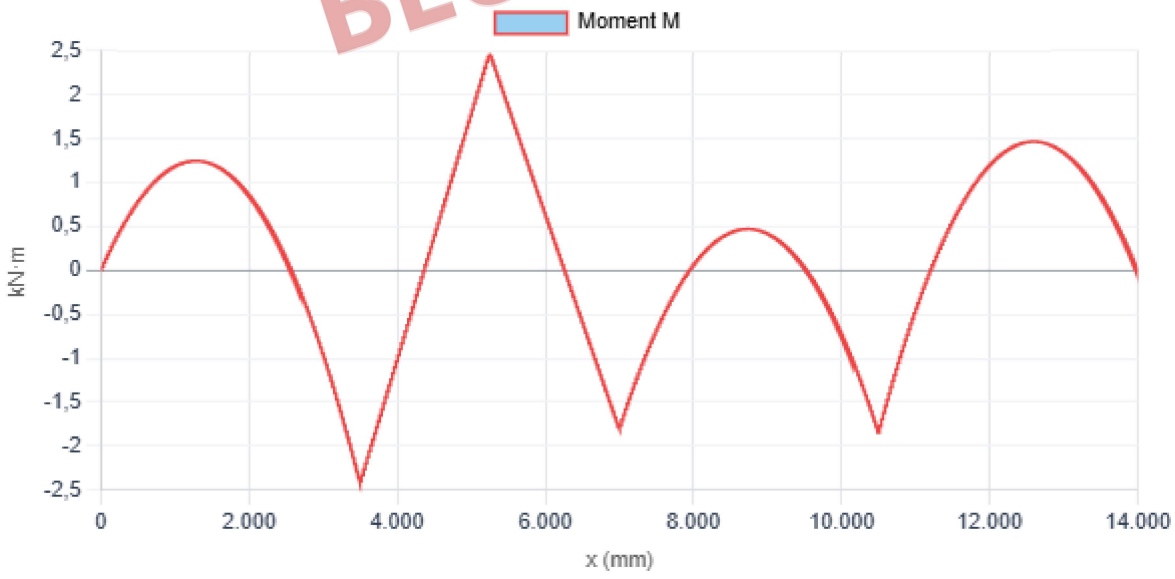
#	Type	x (mm)	Constraints
1	pinned	–	u=0 v=0 θ free
2	roller	3500	u free v=0 θ free

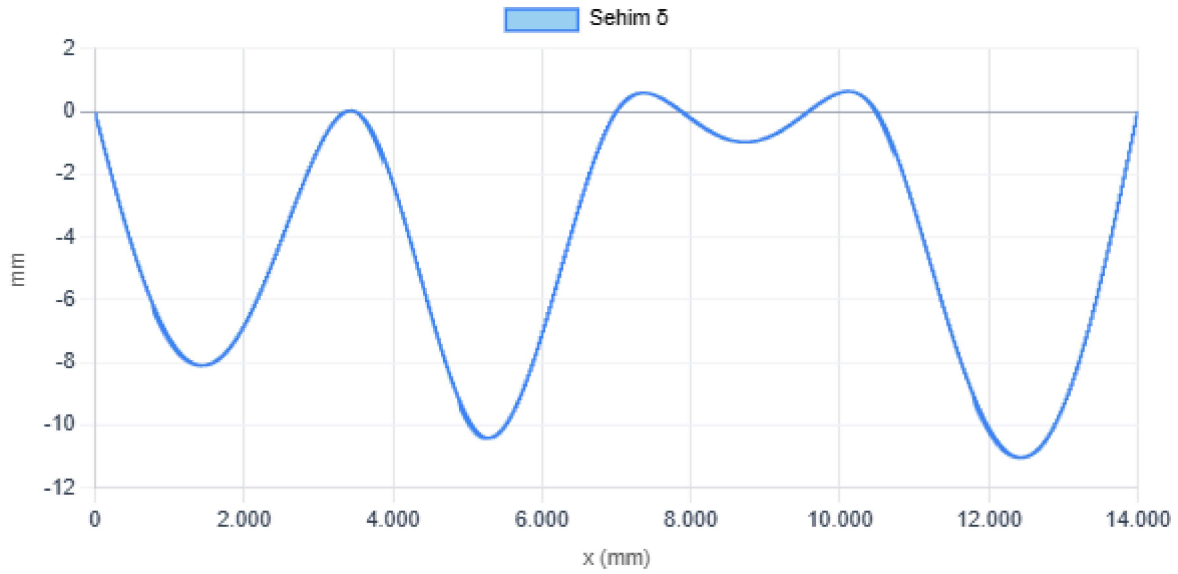
#	Type	x (mm)	Constraints
3	roller	7000	u free v=0 θ free
4	pinned	10500	u=0 v=0 θ free
5	pinned	14000	u=0 v=0 θ free

4) Figures









5) Reactions

#	Type	x (mm)	Reaction V (kN)
1	pinned	0	1.934
2	roller	3500	6.117
3	roller	7000	5.063
4	pinned	10500	5.789
5	pinned	14000	2.098

6) Static Results

$\|V\|_{max}$	3.290 kN	$\|M\|_{max}$	2.481 kN·m
$\|\delta\|_{max}$	11.026	σ_{max}	62.04 MPa

SLS — ✅ OK

Δ_{max} = 11.03 mm | sınır = 16.67 mm | kullanılan L_{eff} = 3500 mm | I_{req} = 132.31 cm^4

ULS — ✅ OK

σ_d = 93.04 MPa | limit = 145.45 MPa (γ=1.1) | M_d = 3.721 kN·m

7) Notes

The model is solved using the **Finite Element Method** (matrix displacement).
The element's **self-weight** is not included; you can add it as a UDL if needed.
EN 13830 SLS limits: Mullion → L≤3000: L/200; 3000–7500: 5 mm + L/300; L≥7500: L/250.
Transom → min(L/500, 3 mm).