CivilKit Beams

Analysis report
2026-06-03 13:22

Raw (unfactored) loads

MODEL

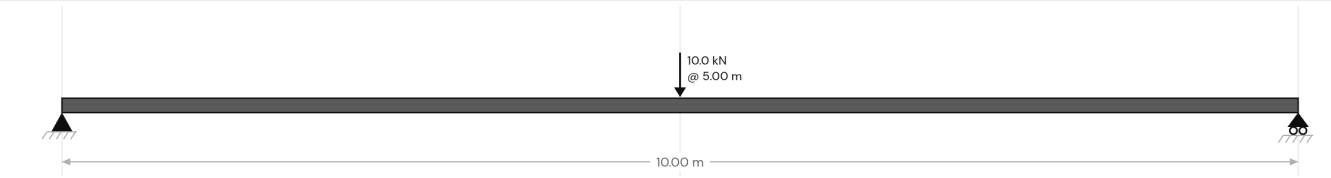
Span **10.00 m** Section **250UB31.4** E **200.00 GPa** I_x **44.50 ×10⁶ mm⁴** A **4010.00 mm²**
Z **354.00 ×10³ mm³**

Support	Location
Pinned	0.00 m
Roller	10.00 m

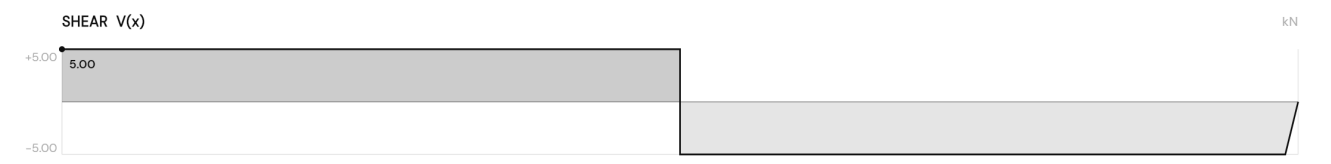
Load	Detail
Point	10.00 kN @ 5.00 m

DIAGRAMS

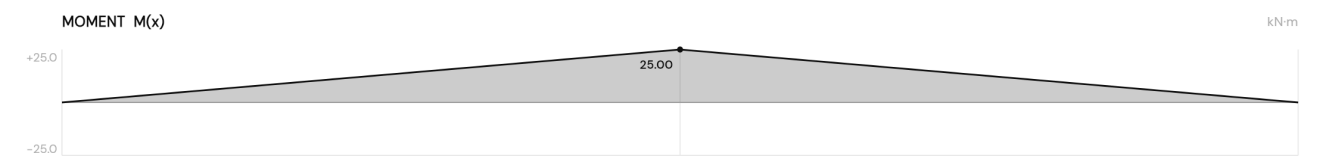
BEAM SCHEMATIC



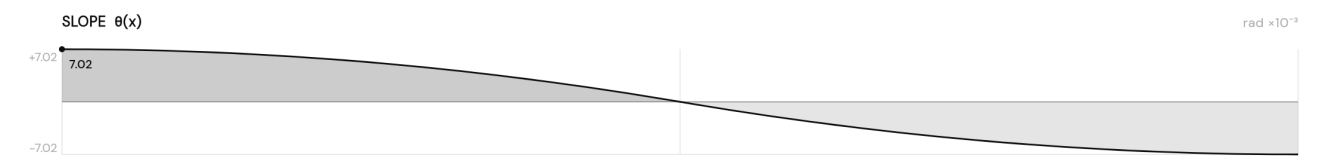
SHEAR



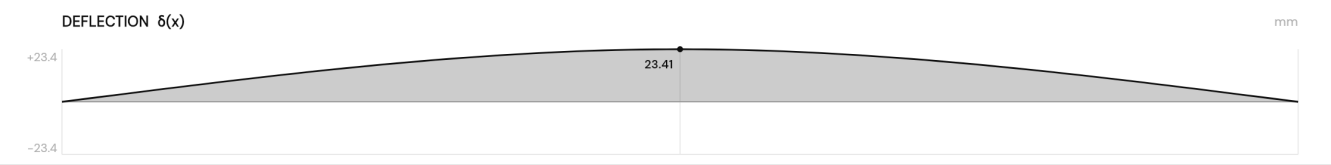
MOMENT



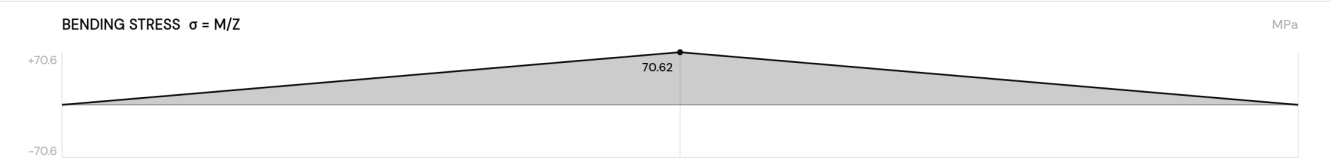
SLOPE



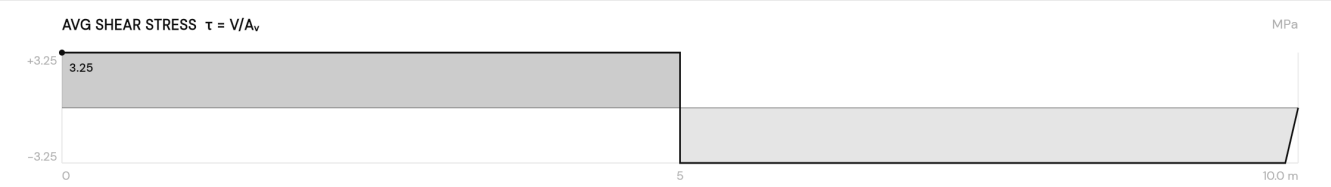
DEFLECTION



BENDING STRESS



AVERAGE SHEAR STRESS



REACTIONS

Location	Vertical	Moment
0.00 m	5.00 kN	—
10.00 m	5.00 kN	—

MAXIMA

Quantity	Value
Max shear |V|	5.00 kN
Max moment |M|	25.00 kN·m
Max deflection |δ|	23.408 mm
Max bending stress |σ|	70.62 MPa
Max shear stress |τ|	3.25 MPa

DESIGN CHECK · AS 4100

fy = 300 MPa, ϕ = 0.9.

Check	Demand / Capacity	Utilisation	Verdict
Bending M / ϕMs	25.00 / 95.58 kN·m	26%	OK
Shear V / ϕVv	5.00 / 249.03 kN	2%	OK
Deflection δ / (L/250)	23.41 / 40.00 mm	59%	OK

NOTES & LIMITATIONS

- Solver: CivilKit Beams v0.4.0 — direct stiffness, Euler-Bernoulli (transverse only). Validated against 103 closed-form / verification cases. mageengineering.com.au/civilkit-beams
- Design check: AS 4100 — Steel structures. Section moment capacity ϕMs = ϕ·Ze·fy (cl 5.2) and section shear capacity ϕVv = ϕ·0.6·fy·Aw (cl 5.11), assuming a compact bisymmetric section. Member moment capacity ϕMb (lateral-torsional buckling, cl 5.6) and combined-actions checks are not yet included.
- No plastic modulus S on this section — Ze is taken as Z, so the reported ϕMs is conservative (low by ~10–15% for typical I-sections).
- Section data: indicative — properties should be cross-checked against the relevant national standard and a current manufacturer catalogue before professional use.
- Inclined loads: only the vertical component is analysed; axial components are reported in the warnings and ignored by this transverse-only solver.