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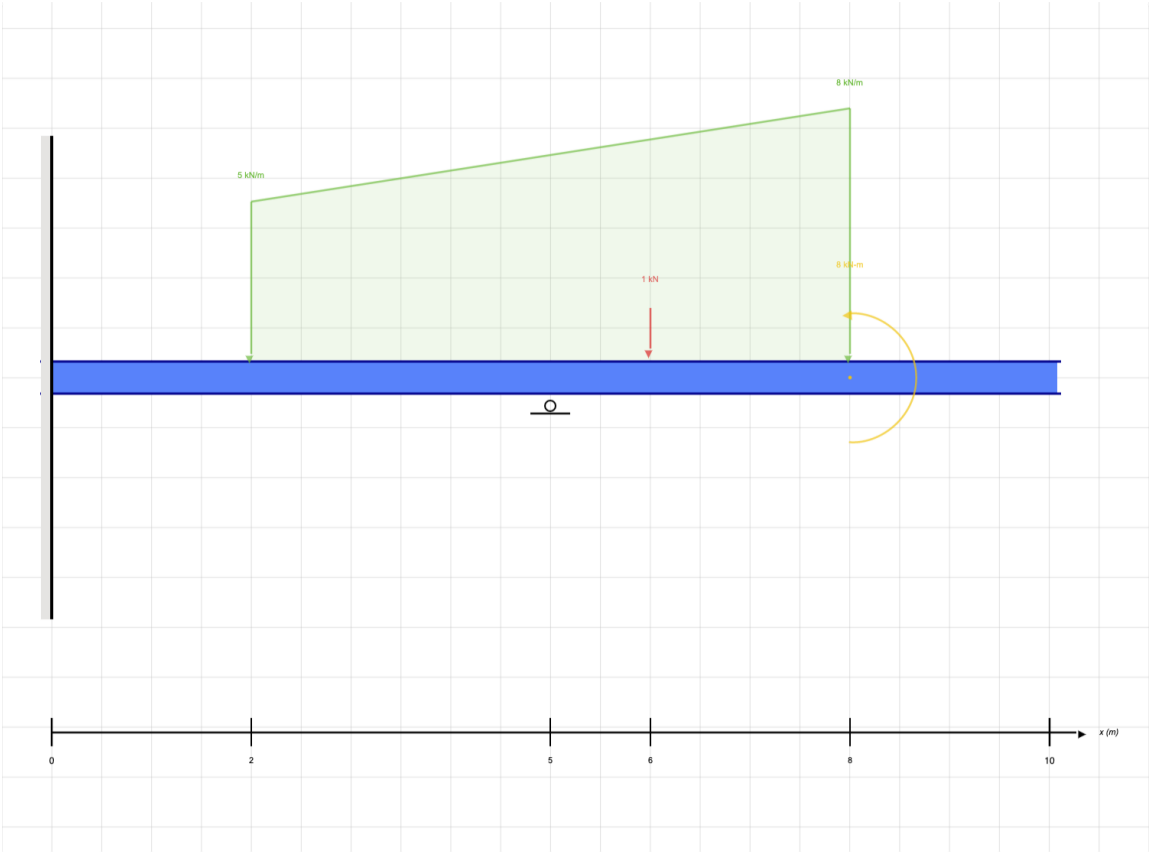
SKYCIV BEAM ANALYSIS REPORT

Load Combination: DL



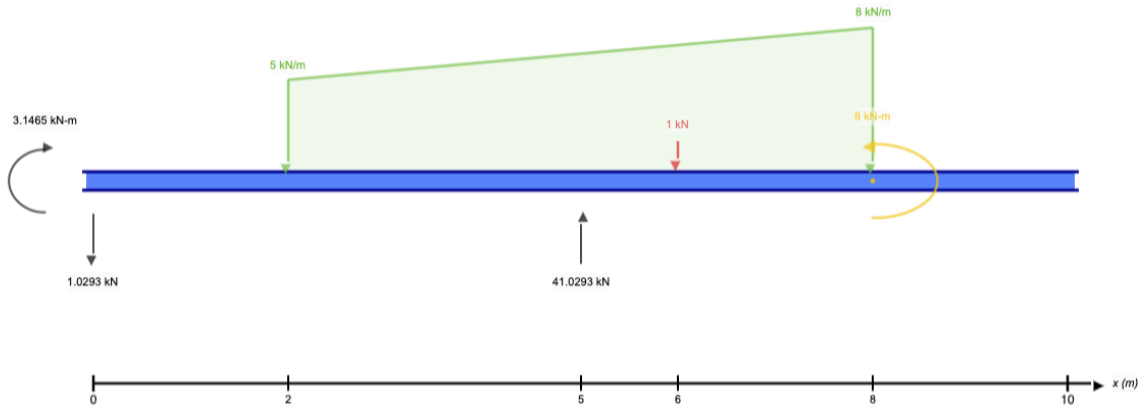
Software: SkyCiv Beam v3.0.0
Tue Feb 23 2021 12:24:53 GMT+1100 (Australian Eastern Daylight Time)

Project Info

File Name: MDM-2
Engineer/Designer: Sam Carigliano (Sam)
Company: SkyCiv Engineering

Included in this Report:

FREE BODY DIAGRAM



ANALYSIS SUMMARY

Deflection Summary

Status:	Limit:	Ratio:	Max:
FAIL	L/250	2.0161	L/124

Member Stress Summary

Status:	Limit:	Ratio:	Max:
FAIL	20 MPa	6.8951	137.9025 MPa

Material Yield Summary

Status:	Limit:	Ratio:	Max:
PASS	260 MPa	0.5304	137.9025 MPa

Material Strength Summary

Status:	Limit:	Ratio:	Max:
PASS	410 MPa	0.3363	137.9025 MPa

ANALYSIS RESULTS

Reactions

Results Verified

Support at	X	Y	Mx
0	0 kN	-1.0293 kN	-3.1465 kN-m
5	0 kN	41.0293 kN	0 kN-m

Force Extremes

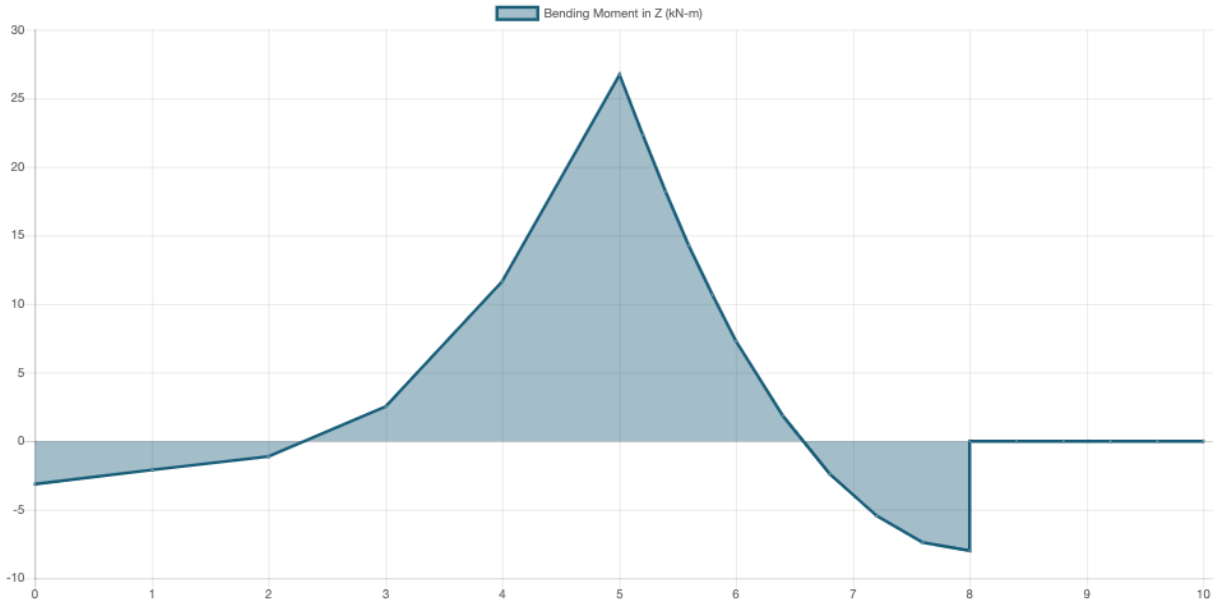
Result	Max	Min
Bending Moment	8 kN-m	-26.75 kN-m
Shear	22.75 kN	-18.2793 kN
Displacement	2.6843 mm	-42.6732 mm

Stress Extremes

Result	Max	Min
Bending Stress	41.2419 MPa	-137.9025 MPa
Shear Stress	18.5964 MPa	-14.9419 MPa
Combined Stress	41.2419 MPa	-137.9025 MPa

DIAGRAMS

Bending Moment Diagram



Bending Moment Equations

$M_1(x) = 1.0293x - 3.1465$ for $0 \leq x \leq 2$

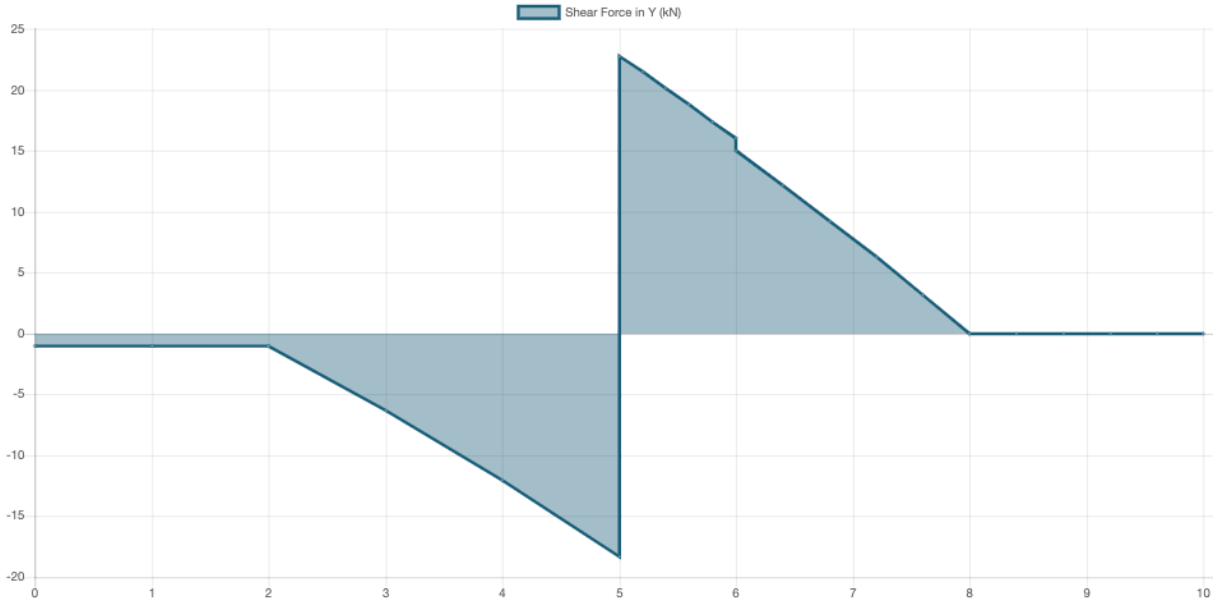
$M_2(x) = 0.0833x^3 + 2x^2 - 7.9707x + 6.1868$ for $2 \leq x \leq 5$

$M_3(x) = 0.0833x^3 + 2x^2 - 48.9997x + 211.3318$ for $5 \leq x \leq 6$

$M_4(x) = 0.0833x^3 + 2x^2 - 47.9997x + 205.3318$ for $6 \leq x \leq 8$

$M_5(x) = 0.0003x - 0.0015$ for $8 \leq x \leq 10$

Shear Force Diagram



Shear Force Equations

$V_1(x) = -1.0293$ for $0 \leq x \leq 2$

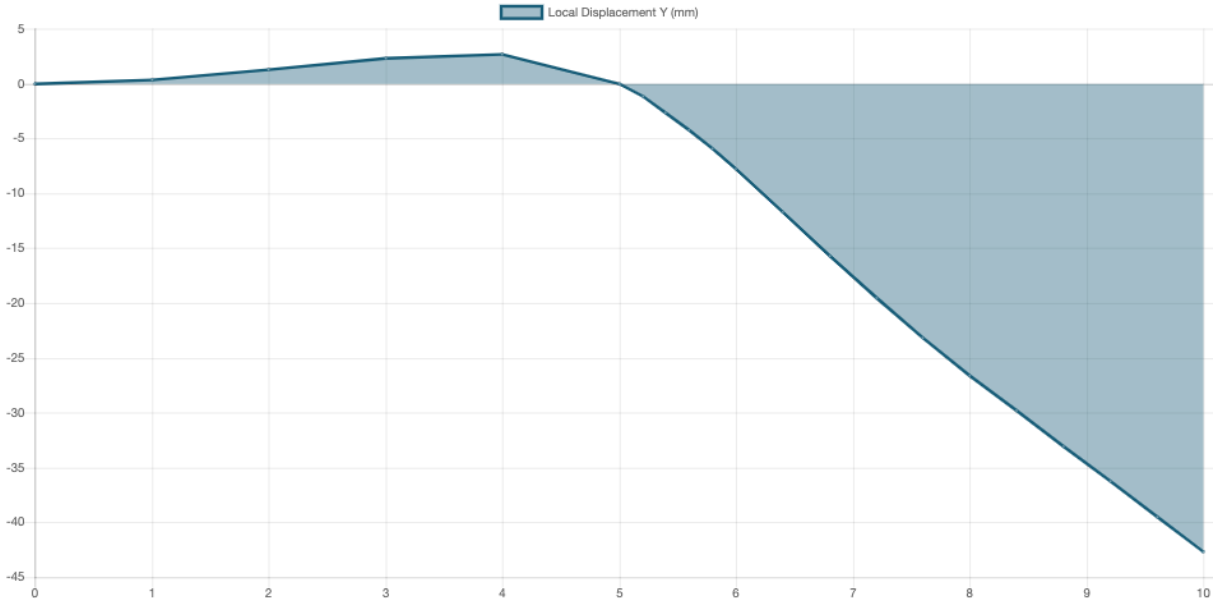
$V_2(x) = -0.25x^2 - 4x + 7.9707$ for $2 \leq x \leq 5$

$V_3(x) = -0.25x^2 - 4x + 48.9997$ for $5 \leq x \leq 6$

$V_4(x) = -0.25x^2 - 4x + 47.9997$ for $6 \leq x \leq 8$

$V_5(x) = 0$ for $8 \leq x \leq 10$

Displacement



Deflection Equations

$u_1(x) = -0.5147x^2 + 3.1465x$ for $0 \leq x \leq 2$

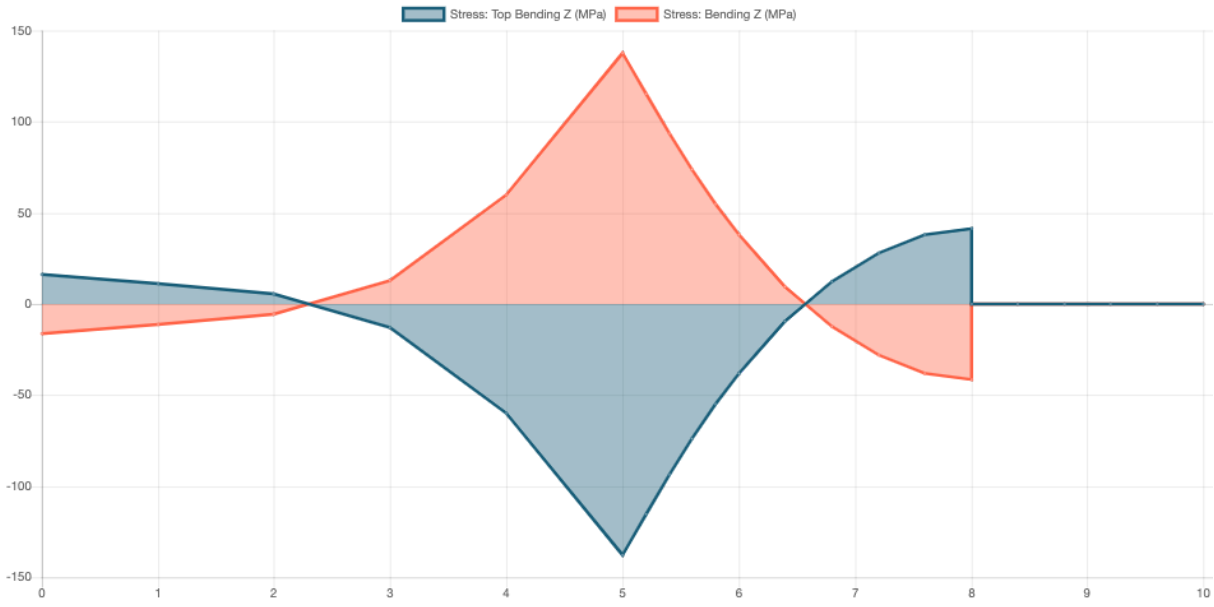
$u_2(x) = -0.6667x^3 + 3.9853x^2 - 6.1868x + 6.3333$ for $2 \leq x \leq 5$

$u_3(x) = -0.6667x^3 + 24.4999x^2 - 211.3318x + 519.1958$ for $5 \leq x \leq 6$

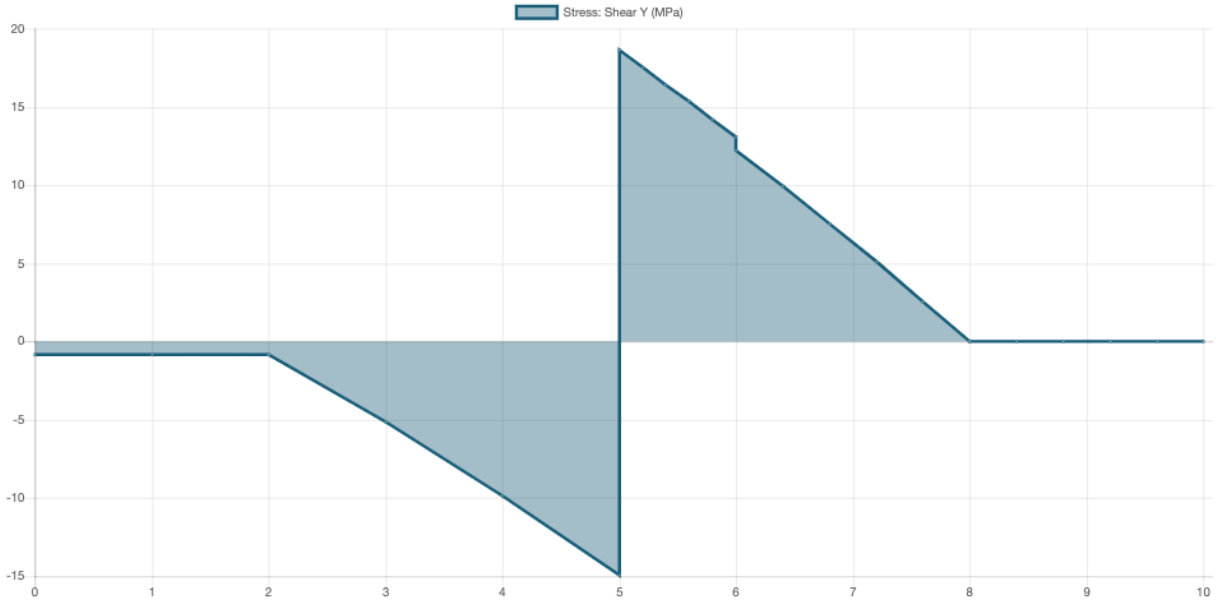
$u_4(x) = -0.6667x^3 + 23.9999x^2 - 205.3318x + 501.1958$ for $6 \leq x \leq 8$

$u_5(x) = -0.0001x^2 + 0.0015x - 32.1375$ for $8 \leq x \leq 10$

Bending Stress



Shear Stress


Stress: Shear Y (MPa)
20
15
10
5
0
-5
-10
-15
0
1
2
3
4
5
6
7
8
9
10