



TRANSOM (HORIZONTAL MULLION) – GLASS LOAD REPORT

Prepared for preliminary design purposes only; final design must be approved by a competent engineer in accordance with relevant standards.

Project	Sample Project
Subject	Transom Structural Design
Prepared by	Civil/Structural Engineer
Approved by	Senior Structural Engineer
Date	13/08/2025
Material note	Aluminum X.X

1) Inputs

t_{total} (mm)	12	G (cm)	120
L (cm)	150	a (cm)	15
E (GPa)	70	Material	Aluminum
f_y (MPa)	160	$\sigma_{\text{allow,d}}$ (MPa)	145.5 ($\gamma_M=1.1$)
W (cm ³)	4	I (cm ⁴)	16

2) SLS — Deflection (Serviceability)

w (kN/m)	0.360	L (m)	1.500
E (GPa)	70	f_{limit} (mm)	3.00
I_{req} (cm ⁴)	5.35	Δ_{max} (mm)	1.00
Compliance	☒ OK ($\Delta_{\text{max}}/f_{\text{limit}} = 33\%$)		

$$\Delta = P \cdot a \cdot (3L^2 - 4a^2) / (24 \cdot E \cdot I)$$

3) ULS — Strength (Ultimate)

$Y_{Q,\text{wind}}$	1.5	M_d (kN·m)	0.055
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σ_d (MPa)	13.67	Allowable (MPa)	145.45
Compliance	 OK ($\sigma_d/\text{Allowable} = 9\%$)		

5) Formulas Used

$$W_{\text{glass}} = 0.025 \cdot t \cdot L \cdot G \quad ; \quad P = W_{\text{glass}}/2$$

$$M_{\text{max}} = P \cdot a \quad ; \quad \Delta = P \cdot a \cdot (3L^2 - 4a^2) / (24 \cdot E \cdot I)$$

$$I_{\text{req}} = P \cdot a \cdot (3L^2 - 4a^2) / (24 \cdot E \cdot f_{\text{allow}})$$

$$\text{ULS: } P_d = \gamma_G \cdot P \quad ; \quad \sigma_d = M_d / W$$