Let Tension in the cable be denoted by T.

The profile of the cable is a parabola defined by the expression

$$y = \frac{w * x^2}{2T}$$

where

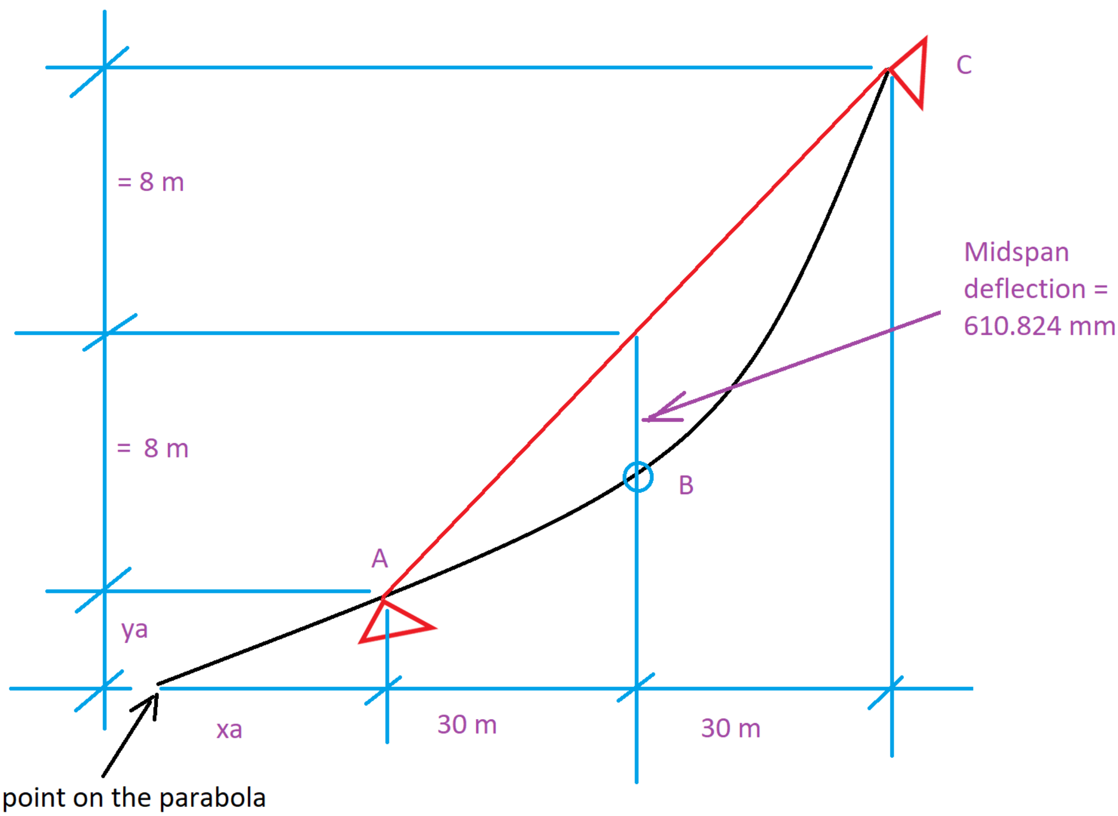
y = distance to that point along the y axis from the lowest point on the parabola

x = distance to that point along the x axis from the lowest point on the parabola

w is the magnitude of the uniform distributed load

T is the tension in the cable at that point

For the model provided by the user, the diagram can be plotted as



$$ya = \frac{w * xa^2}{2T}$$

$$ya + 8 - 0.6108 = \frac{w * (xa + 30)^2}{2T}$$

$$ya + 16 = \frac{w * (xa + 60)^2}{2T}$$

Where

w = uniform distributed load on the cable = Density * Area = 76.82 * 0.001257 = 0.096532 sq.m

Thus, we have 3 equations and 3 unknowns, which are xa, ya and T.

Solving these 3 equations, we get

T = 71.1188 kN

xa = 166.4637 m

ya = 18.80597 m

The tension value calculated above matches with the value reported by STAAD.Pro. The tension in the lowermost segment of the cable (beam 1) is 70.399 KN

The support reaction is T x Cos θ = 70.399 x Cos 14.93 = 68 KN (approx.) …. Where θ is the angle made by the cable with the horizontal at the base.