Consider equation 1.6 of Crisfield;

$$N = EA\varepsilon = EA\left(\left(\frac{z}{l}\right)\left(\frac{w}{l}\right) + \frac{1}{2}\left(\frac{w}{l}\right)^2\right) \qquad (1.6)$$

In the abobe equation,
When w = - 25 mm

It can be seen that N ≠ 0

Now, considering, equation 1.10 of Crisfield, we have; stiffness Kt:

$$= \frac{EA}{l}\left(\frac{z}{l}\right)^2 + \frac{EA}{l}\left(\frac{2zw + w^2}{l^2}\right) + \frac{N}{l} \qquad (1.10)$$

Z = 25 mm and w = -25 mm

We see that expressions 1 and 2 above cancel out ; but N ≠ 0 at w = - 25 mm, we have seen above;

So, at w = -25; Kt ≠ 0; so; how can the load be “0” at w = -25mm (when the bar becomes horizontal?)

IS Crisfield’s expression wrong?