

AD 480:

Correction to P399 Appendix F Worked Example

It has been brought to our attention that in the worked example presented in SCI publication P399 Design of steel [portal frame](#) buildings to Eurocode 3, the position of the intermediate lateral restraint determined in section F3.5.4 *Plastic verification of the haunch*, has been miscalculated.

In section F3.5.4 the necessary steps in the verification of the haunched part of the portal frame rafter are presented, assuming a plastic hinge is present in the rafter at the sharp end of the haunch. The verification assumes a torsional restraint at the plastic hinge and finds the position of a second torsional restraint to the haunch at a distance L_s from the plastic hinge. An intermediate lateral restraint to the top (tension) flange is

required between the torsional restraints at a distance L_m from the plastic hinge. Further tension flange restraints may also be required.

Finding L_m involves satisfying equation BB.9 in BS EN 1993-1-1 para. BB.3.2.1:

$$L_m = \frac{38i_z}{\sqrt{\frac{1}{57.4} \left(\frac{N_{ed}}{A} \right) + \frac{1}{756C_1^2} \left(\frac{W_{ply}^2}{AI_T} \right) \left(\frac{f_y}{235} \right)^2}}$$

Parameter A is defined as the cross sectional area in mm² at the location where the quotient $\left(\frac{W_{ply}^2}{AI_T} \right)$ is a maximum of the tapered member (ie in the length L_s).

$\left(\frac{W_{ply}^2}{AI_T} \right)$ is defined as the maximum value in the

segment (ie in the length L_m).

Finding L_m involves iteratively assuming a trial length to determine the parameters in the equation and comparing the calculated value with the trial value. In the example, in determining the length L_m , the quotient $\left(\frac{W_{ply}^2}{AI_T} \right)$ was taken as the value at the position defined by L_s in error. The value of the quotient should be taken as that at the trial length L_m . Adopting the value at L_s results in a smaller value of L_m which is on the safe side.

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