

GUIDELINES FOR DUCTILE DETAILING USING EUROCODE 8

The Column and Tie Beam Detailing Norms for Ductility:

SL No.	DESCRIPTION (read with fig 1)	DUCTILE DETAILING NORMS	REFERENCES as per EN 1998-1
1	For primary seismic column at beam-column joint (see fig:1)	Critical seismic region l_{cr} $l_{cr} = \max\{h_c; l_{cl} / 6; 0,45\}$	Cl.5.4.3.2.2.(4)
2	Spacing of hoops (in critical seismic region) (see fig:1)	$s = \min\{b_o/2; 175; 8d_{bL}\}$	Cl.5.4.3.2.2.(11a)
3	Maximum spacing of longitudinal bars (see fig:2)	Not more than 150 mm	Cl.5.4.3.2.2.(11b)
4	Diameter of hoops (in critical seismic region) (see fig:2)	Not less than 6 mm	Cl.5.4.3.1.2.(6a)
5	Spacing of hoops in lap zone for primary seismic columns (see fig:3)	Least of the following 3 distances - 20 times the minimum diameter of the longitudinal bars - The lesser dimension of the column - 400 mm	Cl.5.4.3.2.2.(11b)
6	Width of primary seismic columns (see fig:2)	Not less than 250 mm	Cl.5.5.1.2.2.(1)
7	Max diameter of longitudinal bars for anchorage for interior beam-column joints	$\frac{d_{bL}}{h_c} \leq \frac{7,5 \cdot f_{ctm}}{\gamma_{Rd} \cdot f_{yd}} \cdot \frac{1 + 0,8 \cdot v_d}{1 + 0,75k_D \cdot \rho' / \rho_{max}}$	Cl.5.6.2.2(2)
8	Max diameter of longitudinal bars for anchorage for exterior beam-column joints	$\frac{d_{bL}}{h_c} \leq \frac{7,5 \cdot f_{ctm}}{\gamma_{Rd} \cdot f_{yd}} \cdot (1 + 0,8 \cdot v_d)$	Cl.5.6.2.2(2)
9	Minimum width of tie beams	Not less than 250 mm	Cl.5.8.2.(3)
10	Minimum depth of tie beams	Not less than 400 mm (buildings with ≤ 3 storey) and Not less than 500 mm (buildings with ≥ 4 storey)	Cl.5.8.2.(3)
11	Minimum longitudinal reinforcement % in tie beams	Not less than 0.4 % for both top and bottom bars	Cl.5.8.2.(5)



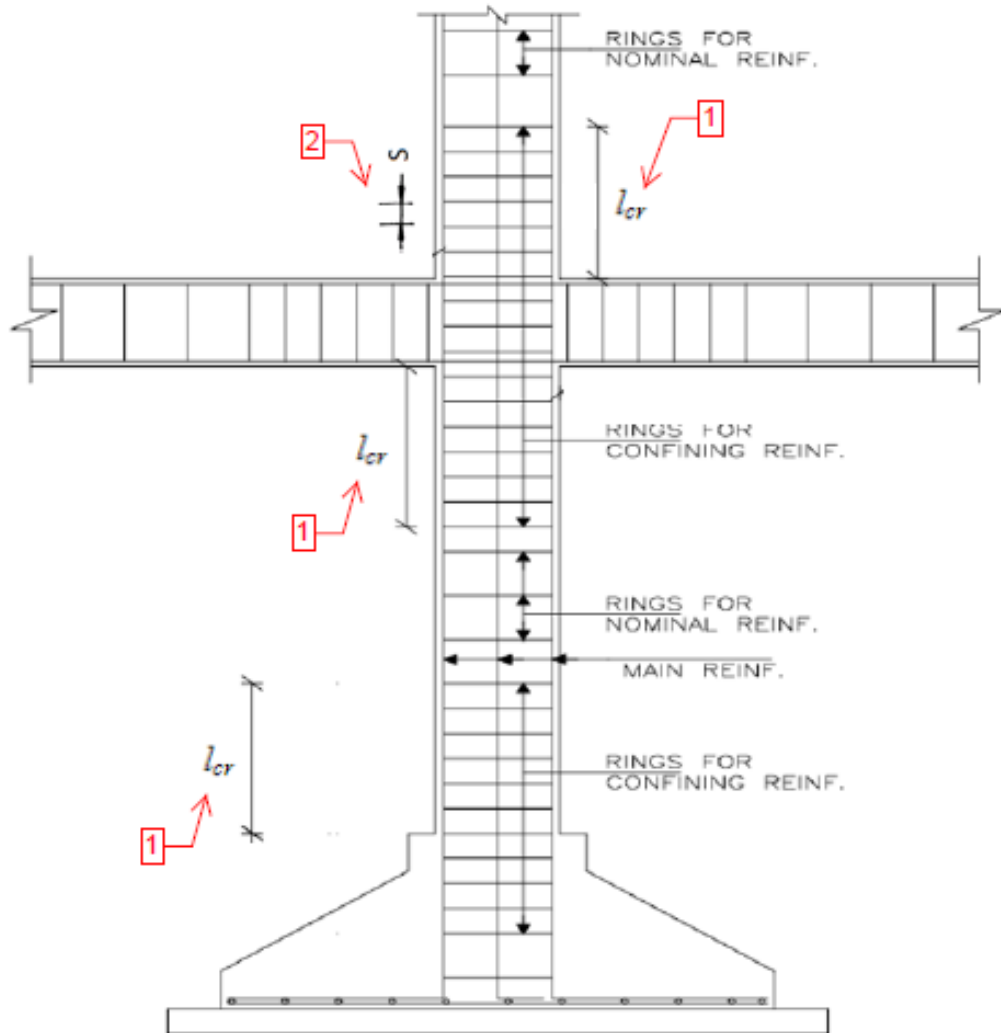


Fig 1: Reinforcement Details for Column



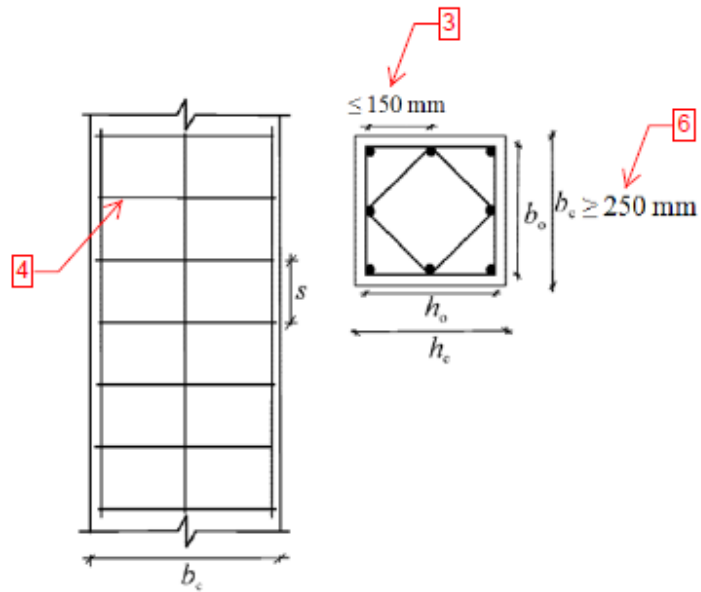


Fig 2: Hoop Reinforcement for Column

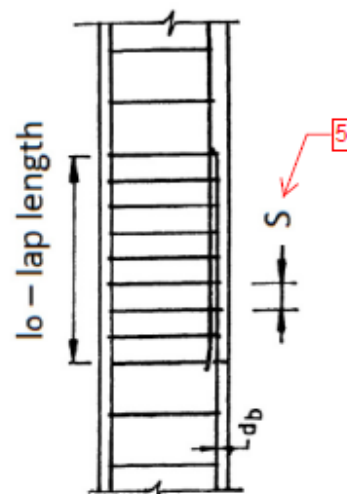


Fig 3: Lap/Splice in Column



REFERENCES	
1	EN 1998-1 Eurocode 8: Design of structures for earthquake resistance- Part 1: General rules, seismic actions and rules for buildings
2	BS EN 1992-1-1:2004 Eurocode 2: Design of concrete structures – Part 1-1: General rules and rules for buildings

