PRELIMINARY COLUMN DESIGN REPORT

Element: Column 1

Design Code: BS EN 1992-1-1:2004 | Date: 27 October 2026

REFERENCE	CALCULATIONS	OUTPUT
EN 1992-1-1:2004 Material Properties	**MATERIAL PROPERTIES** Concrete Strength, f_{ck} = 30.0 N/mm² Concrete Grade = C30/37 Fire Resistance = 2.0 hours Reinforcement Dia: φ = 16.0 mm	**f_{ck} = 30.0 N/mm²** **Grade: C30/37** **Fire: R2.0** **φ = 16.0 mm**
Table 4.3N Structural Class	**STRUCTURAL CLASS** Exposure Class = XC1 Design Working Life = 50.0 years Structural Class per Table 4.3N with modifications: Design working life = 50 years → Initial structural class = S4 Concrete strength fck = 30.0 MPa (≥ 30 MPa) and exposure class XC1 → Reduce structural class by 1 (S4 → S3) Column geometry (not slab) → No reduction No special quality control → No reduction → Final Structural Class: **S3**	**Exposure: XC1** **Life: 50.0 yrs** **Class: S3**
Table 4.4N EN 1992-1-1 §4.4.1 Concrete Cover	**CONCRETE COVER** **Durability Cover:** For structural class = S3 and exposure class: XC1 $C_{min,dur}$ = 10 mm (Table 4.4N) **Bond Cover:** $C_{min,b}$ = 1.0 × φ $C_{min,b}$ = 1.0 × 16.0 = 16.0 mm **Minimum Cover:** $c_{min} = \max(c_{min,b}, c_{min,dur} + \Delta c_{dur}, 10$ $c_{min} = \max(10, 16.0, 10) = 16.0mm$ **Nominal Cover:** $c_{nom} = c_{min} + \Delta c_{dev} = 16.0 + 10.0 = 26.0mm$ **Adopted Cover = 30.0 mm**	**$C_{min,dur}$ = 10 mm** **$C_{min,b}$ = 16.0 mm** **c_{min} = 16.0 mm** **c_{nom} = 26.0 mm** **Cover = 30.0 mm**
EN 1992-1-1 §5.8.3.1 Column Sizing	**COLUMN DIMENSIONS** Clear height: l_o = 3000.0 mm $l_e = l_o \cdot \beta = 3000.0 \times 0.59 = 1770.0mm$ For stocky columns: $\frac{l_e}{h} \leq 15$ $h \geq \frac{l_e}{15} = \frac{1770.0}{15} = 118.0mm$ $h \leq 4b = 4 \times 300.0 = 1200.0mm$ ∴ 118.0 mm ≤ h ≤ 1200.0 mm **Adopted: b = 300.0 mm, h = 300.0 mm**	**l_e = 1770.0 mm** **h ≥ 118.0 mm** **b = 300.0 mm** **h = 300.0 mm**