PRELIMINARY FOOTING DESIGN REPORT

Element: Footing 1

Design Code: BS EN 1992-1-1:2004 | Date: 28 October 2026

REFERENCE	CALCULATIONS	OUTPUT
EN 1992-1-1:2004 Material Properties	**MATERIAL PROPERTIES** Concrete Strength, f_{ck} = 25.0 N/mm² Concrete Grade = C25/30 Fire Resistance = 2.0 hours Reinforcement Dia: φ = 16.0 mm	**f_{ck} = 25.0 N/mm²** **Grade: C25/30** **Fire: R2.0** **φ = 16.0 mm**
Table 4.3N Structural Class	**STRUCTURAL CLASS** Exposure Class = XC2 Design Working Life = 50.0 years Structural Class per Table 4.3N with modifications: Design working life = 50 years → Initial structural class = S4 For Concrete strength fck = 25.0 MPa and exposure class XC2 → No reduction Footing has slab geometry → Reduce structural class by 1 (S4 → S3) No special quality control → No reduction → Final Structural Class: **S3**	**Exposure: XC2** **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: XC2 $C_{min,dur}$ = 20 mm (Table 4.4N) **Bond Cover:** $C_{min,b}$ = 1.0 × φ $C_{min,b}$ = 1.0 × 16.0 = 16.0 mm **Minimum Cover (foundations ≥ 40 mm):** $c_{min} = \max(c_{min,b}, c_{min,dur} + \Delta c_{dur}, 40$ $c_{min} = \max(20, 16.0, 40) = 40mm$ **Nominal Cover:** $c_{nom} = c_{min} + \Delta c_{dev} = 40 + 10.0 = 50.0mm$ **Adopted Cover = 50.0 mm**	**$C_{min,dur}$ = 20 mm** **$C_{min,b}$ = 16.0 mm** **c_{min} = 40 mm** **c_{nom} = 50.0 mm** **Cover = 50.0 mm**
EN 1992-1-1 §6.4.3 Punching Shear & Footing Depth	**FOOTING DEPTH** **Maximum Shear Stress at Column Face:** $v_{Rd,max} = 0.5\left(0.6\left(1 - \frac{f_{ck}}{250}\right)\right)\frac{f_{ck}}{1.5} = 4.5N/mm^2$ $Applied shear: v_{Ed,face} = \frac{\beta N_{Ed}}{u_0 d}$ $Setting: v_{Ed,face} = v_{Rd,max}$ For an isolated footing with a column centered, β = 1.15 $d_{min} \geq \frac{\beta N_{Ed}}{u_0 v_{Rd,max}} = 1.15 \times \frac{472.0 \times 10^3}{1200.0 \times 4.5} = 101.0mm$ **Minimum Footing Depth:** $H_{min} \geq d_{min} + c_{nom} + \frac{\phi}{2} = 101.0 + 50.0 + \frac{16.0}{2} = 159.0mm$ H_{min} ≥ max(159.0, 300) mm **Adopted Depth: H = 350.0 mm**	**$v_{Rd,max}$ = 4.5 N/mm²** **d_{min} ≥ 101.0 mm** **H_{min} ≥ 159.0 mm** **H = 350.0 mm**