FrameAI Composite Beam Calculation Note

EN 1994-1-1 Sec.5.4 Composite Beams with Shear Connectors
Client: Bouwcombinatie NL, Amsterdam NL
Project: Office Floor Composite Slab, 3 Floors
Date: 2026-06-08
Designer: H. van den Berg

SECTION PROPERTIES
Section: IPE 360, S355
A_a = 80.77 cm2, I_y = 16270 cm4, W_el,y = 903.6 cm3
Steel grade S355, f_yk = 355 N/mm2, gamma_M0 = 1.0

SLAB: ComFlor 60, 130mm C30/37 concrete
Effective slab width: b_eff = 2000 mm (full slab width)
Studs: 16mm dia x 100mm, 32 per beam at 150mm spacing
V_l,Rd = 98 kN per stud (EN 1994-1-1 Table 6.1)

LOADS
G_k = 5.2 kN/m2 (slab self-weight incl. deck)
Q_k = 2.5 kN/m2 (office live load EN 1991-1-1)
Partial factors: gamma_G = 1.35, gamma_Q = 1.50

DESIGN MOMENT M_Ed = 485 kNm
Maximum utilisation: 78.4% PASS

SLS: Deflection L/312 (short-term, without shear interaction)
Final deflection with full interaction: L/398 < L/300 PASS

FIRE DESIGN EN 1994-1-2
R90 required 130mm slab provides adequate fire resistance
Composite action maintained at 90-min fire PASS

Full calculation available in FrameAI app
https://frameai-structural.polsia.app/examples/office-floor-composite

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