



Profis Anchor 2.7.5

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3.3 Concrete Breakout Strength

$$N_{cbg} = \left(\frac{A_{Nc}}{A_{Nco}} \right) \psi_{ec,N} \psi_{ed,N} \psi_{c,N} \psi_{cp,N} N_b \quad \text{ACI 318-11 Eq. (D-4)}$$

$$\phi N_{cbg} \geq N_{ua} \quad \text{ACI 318-11 Table D.4.1.1}$$

$$A_{Nc} \text{ see ACI 318-11, Part D.5.2.1, Fig. RD.5.2.1(b)}$$

$$A_{Nco} = 9 h_{ef}^2 \quad \text{ACI 318-11 Eq. (D-5)}$$

$$\psi_{ec,N} = \left(\frac{1}{1 + \frac{2 e_N}{3 h_{ef}}} \right) \leq 1.0 \quad \text{ACI 318-11 Eq. (D-8)}$$

$$\psi_{ed,N} = 0.7 + 0.3 \left(\frac{C_{a,min}}{1.5 h_{ef}} \right) \leq 1.0 \quad \text{ACI 318-11 Eq. (D-10)}$$

$$\psi_{cp,N} = \text{MAX} \left(\frac{C_{a,min}}{C_{ac}}, \frac{1.5 h_{ef}}{C_{ac}} \right) \leq 1.0 \quad \text{ACI 318-11 Eq. (D-12)}$$

$$N_b = k_c \lambda_a \sqrt{f'_c} h_{ef}^{1.5} \quad \text{ACI 318-11 Eq. (D-6)}$$

Variables

h_{ef} [in.]	$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	$C_{a,min}$ [in.]	$\psi_{c,N}$
14.000	0.717	0.000	4.000	1.000

C_{ac} [in.]	k_c	λ_a	f'_c [psi]
34.701	17	1.000	3500

Calculations

A_{Nc} [in. ²]	A_{Nco} [in. ²]	$\psi_{ec1,N}$	$\psi_{ec2,N}$	$\psi_{ed,N}$	$\psi_{cp,N}$	N_b [lb]
3375.00	1764.00	0.967	1.000	0.757	1.000	52684

Results

N_{cbg} [lb]	$\phi_{concrete}$	ϕN_{cbg} [lb]	N_{ua} [lb]
73800	0.650	47970	35050

Approved AsNoted

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