



Profis Anchor 2.7.5

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4.3 Pryout Strength (Concrete Breakout Strength controls)

$$V_{cp} = k_{cp} \left[\left(\frac{A_{Nc}}{A_{Nc0}} \right) \psi_{ed,N} \psi_{c,N} \psi_{cp,N} N_b \right] \quad \text{ACI 318-11 Eq. (D-40)}$$

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

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

$$A_{Nc0} = 9 h_{ef}^2 \quad \text{ACI 318-11 Eq. (D-5)}$$

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

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

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

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

Variables

k_{cp}	h_{ef} [in.]	$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	$C_{a,min}$ [in.]
2	14.000	0.000	0.000	4.000
$\psi_{c,N}$	C_{ac} [in.]	k_c	λ_a	f_c [psi]
1.000	34.701	17	1.000	3500

Calculations

A_{Nc} [in. ²]	A_{Nc0} [in. ²]	$\psi_{ec1,N}$	$\psi_{ec2,N}$	$\psi_{ed,N}$	$\psi_{cp,N}$	N_b [lb]
470.83	1764.00	1.000	1.000	0.757	1.000	52684

Results

V_{cp} [lb]	$\phi_{concrete}$	ϕV_{cp} [lb]	V_{ua} [lb]
21294	0.700	14906	667

Approved AsNoted

BY: Ken Upmal

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