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Pull-out and push-in tests of bonded steel strands.
Paper by Faria DMV, Lúcio VJG and Phino Ramos A
Magazine of Concrete Research, 2011, **63**(9), 689-705

Discussion by Martí-Vargas JR
Associate Professor
ICITECH, Institute of Concrete Science and Technology
Universitat Politècnica de València, Valencia, Spain

An interesting study on strands for structural strengthening use is presented. However, some questions should be clarified on the local bond-slip relationship.

Figure 27. The authors propose Equation 2, including C = 13·4 and b = 0·175 for strands (15·2 mm), and factors of 1·25 and 0·75 to obtain the upper and lower bounds, respectively. Equation 2a is Eq. (7) in Balazs (1992), with C = 13 and b = 0·25 for strands 12·8 mm. Moreover in Balazs (1992), the bond stresses were related to concrete strength (Eq. (9a)), and factors of 1·35 and 0·65 for bounds of bond stresses were proposed (Eq. (9b)) resulting transmission length (L_t) bound values of $0{\cdot}79L_t$ and $1{\cdot}41L_t$, -see other L_t bound values in Martí-Vargas *et al.* (2007a)-. Therefore:

a) Does it mean than C is independent of strand diameter?
b) What concrete strength was used?
c) Why factors 1·25 and 0·75? It seems than the upper bound can be reduced.
d) Could the authors provide bound values of L_t?

Theoretical procedure by Balazs. It seems than only Equation 3 was given by Balazs. However, it should be clarified that most equations were given by Balazs (1992): Equation 4 is Eq. (10) in Balazs (1992), Equation 5 is Eq. (12), Equation 7 is Eq. (13), and Equation 9 is Eq. (17). The authors' contribution is λ which is not applicable to obtain L_t. Moreover, it seems than some errata/mistakes and the subsequent comparisons should be clarified/revised:

a) The ratio nominal/actual strand area is missing in the A parameter, Equation 7 and Equation 9.
b) In A, the ± symbol.
c) In λ, simplify [2/(1-b)] and [(1-b)/2].
d) Exponents: [2b/(1-b)] in Equation 5; [(1-b)/(1+b)] in Equation 9.
e) Equations 7 and 9: A^b instead of A.
f) Equation 9: $\sigma_s(\xi = 0)$ instead of σ_s.
g) Equation 10: $s(\xi = l_t/d)$ instead of $\delta(\xi = l_t)$.

State-of-the art. Relevant-complete-recent references as Martí-Vargas *et al.* (2007b) have not been considered in this paper. In spite of this fact, it seems there are some coincidences between them:

a) Conclusion 5 from Martí-Vargas *et al.* (2007b) coincides with an idea of a "false perception determining transmission length", which appears in the main text, as a conclusion and in the abstract. This coincidence enhances the validity of the conclusion on a subject with no consensus (Palmer *et al.* 2011, 2012).

b) A particular manner of adding the strand stress characterisation to define α values is used in both works.
c) Based on the results using the ECADA test method (Martí-Vargas *et al.*, 2006), α = 2·44 for Guyon's expression (Guyon, 1953) is proposed in Martí-Vargas *et al.* (2007b) for strands 12·7 mm. Moreover, α = 2·44 appears directly in Figure 32 while it has not been mentioned/substantiated in the related text. On the other hand, as $\alpha = 2/(1-b)$ (Balazs, 1993), if b = 0·175 then α = 2·42 (strands 15·2 mm) -not 2·44, then b = 0·18-. Does this coincidence mean than b is independent to strand diameter?

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