

STRENGTHENING OF BRIDGE BEAMS BY POST-TENSIONING WITH ANCHORAGES BY BONDING

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State of the art:

Study of the performance of bridge beams strengthening with externally prestressing, Strengthening through the using of post-tensioning with anchorages by bonding



Fig.1:Externally prestressing in structures (By Lúcio,V 2017)

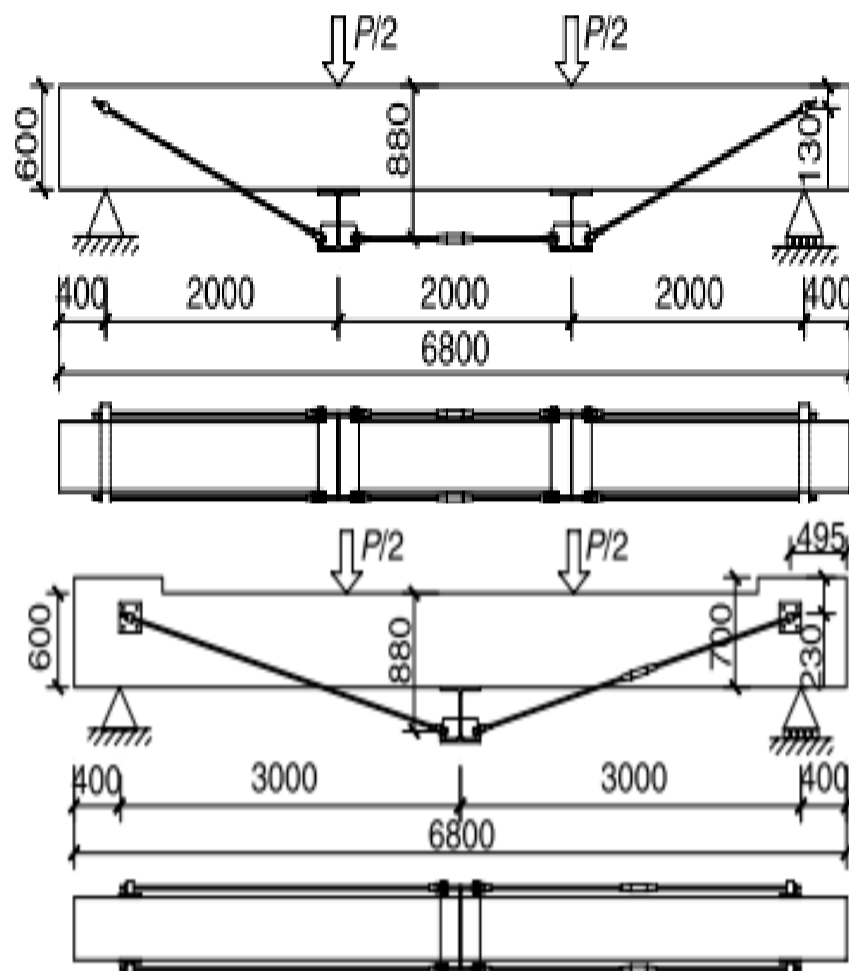


Fig.2: Models:Proposed by Shin e Lee 2012



Fig.3: Set-up, test of RC Beam (By Monteiro, A 2014)

Proposed equations:ULS

ACI 440.4R-04

$$f_p = f_{pe} + \Omega_u E_p \epsilon_{cu} \left(\frac{d_p}{c_u} - 1 \right)$$

Shin e Lee 2012

$$\Delta P_{HT} = E_{st} \times A_{ps} \times \left(\frac{4 \sin^2 \theta}{2L_1 + L_2 \cos^2 \theta} \right) \times \Delta \delta_{HT}$$

Hong Kong Code

$$f_{pb} = f_{pe} + \frac{7000 \lambda_1}{l/d} \left(1 - 0.7 \lambda_2 \frac{f_{pu} A_{ps}}{f_{cu} b d} \right)$$

Dall'asta et al 2007

$$T_u(\theta_u) = T_0 + A_t \sigma_t(\epsilon_{tu}(\theta_u)) = T_0 + \Delta T_u(\theta_u)$$



Fig.4:Set-up of long-term bond test (By Faria,V 2011)

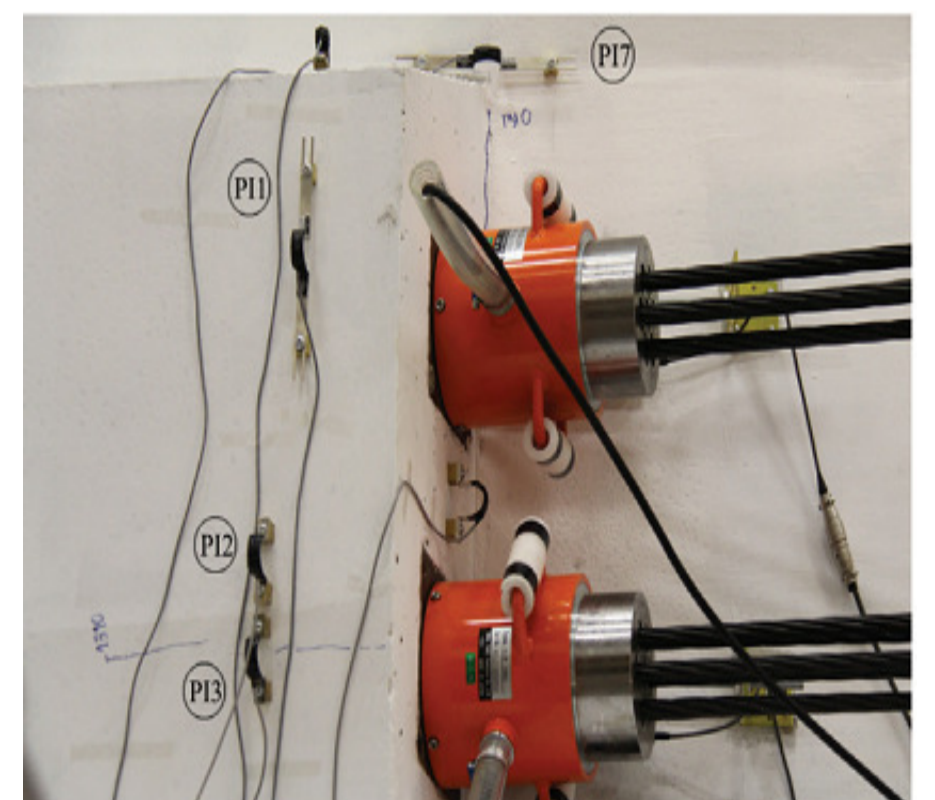


Fig.5: Anchorage blister (By Marchão et al 2016)