Fatigue-loading effect on RC beams strengthened with externally bonded FRP

Titre	Fatigue-loading effect on RC beams strengthened with externally bonded FRP
Type de publication	Article de revue
Auteur	Ferrier, Emmanuel [1], Bigaud, David [2], Clément, J. C [3], Hamelin, P. [4]
Type	Article scientifique dans une revue à comité de lecture
Année	2011
Langue	Anglais
Date	2011/02
Numéro	2
Pagination	539 - 546
Volume	25
Titre de la revue	Construction and Building Materials
ISSN	0950-0618
Mots-clés	CFRP [5], fatigue [6], Interface [7], RC [8]
Résumé en anglais	External bonding of fiber-reinforced polymers (FRP) on concrete beams is particularly attractive for the strengthening of civil engineering structures in order to increase their strength and stiffness. Principles for design of such strengthening methods are now established and many guidelines exist. However, fatigue design procedure is still an ongoing research topic.This paper focuses on the damage behavior of FRP-strengthened reinforced concrete (RC) structures subjected to fatigue loading. In order to design bonded reinforcements, an iterative computational method based on section equilibrium and material properties (concrete, steel, adhesive and composite) has been previously developed by authors [1–3]. In the present study, this method is extended to describe the fatigue behavior of RC beams. A specific modeling coupled with an experimental investigation on large-scale beams made it possible to compare the theoretical and experimental fatigue behaviors of RC beams with and without composite reinforcements. The model is developed and calibrated using data of the literature or recorded during experiments specifically carried out for this study. Results showed that the beam deflection and the strain in each material could be calculated with a sufficient accuracy, so that the fatigue behavior of the FRP-strengthened beams was correctly estimated by the model.
URL de la notice	http://okina.univ-angers.fr/publications/ua1441 [9]
DOI	10.1016/j.conbuildmat.2010.07.035 [10]
Lien vers le document	http://dx.doi.org/10.1016/j.conbuildmat.2010.07.035 [10]

Liens

[1] http://okina.univ-angers.fr/publications?f[author]=1844
[2] http://okina.univ-angers.fr/d.bigaud/publications
[3] http://okina.univ-angers.fr/publications?f[author]=2028
[4] http://okina.univ-angers.fr/publications?f[author]=2029
[5] http://okina.univ-angers.fr/publications?f[keyword]=4535
[6] http://okina.univ-angers.fr/publications?f[keyword]=3468
[7] http://okina.univ-angers.fr/publications?f[keyword]=3469
[8] http://okina.univ-angers.fr/publications?f[keyword]=4538
[9] http://okina.univ-angers.fr/publications/ua1441
[10] http://dx.doi.org/10.1016/j.conbuildmat.2010.07.035