conferenceseries.com

Olivia Mirza et al., J Steel Struct Constr 2017, 3:2 (Suppl)
DOI: 10.4172/2472-0437-C1-002

4th International Conference on
ADVANCED STEEL STRUCTURES
November 09-10, 2017 Singapore

Experimental investigation of an existing and new retrofitted steel bridge girder due to fatigue failure

Olivia Mirza, Lachlan Milner and Fidelis Mashiri
Western Sydney University, Australia

This research paper investigates an innovative retrofitting technique when an existing steel bridge girder is subjected to fatigue failure. This is an alternative method other than replacing the failed existing bridge structures. The experimental study is focused on rehabilitating steel bridge girders through retrofitting to their original design capacities that have incurred fatigue cracking within the bottom flange. Fatigue is an increasing issue as many steel structures reach the end of their design life each year. Steel structures reaching the end of their design life each year coupled with increased loadings, deterioration due to weathering, climate change and human error also negatively impact the design life. Hence a solution to rehabilitation of the existing steel bridge girders is required to provide a sustainable future. This paper focuses on retrofitting steel bridge girders to further extend their service life. Experimental studies have been conducted on a 120-year-old girder and a new 610UB113 equivalent girder. The results from the experimental test showed that if steel bridge girders have experienced fatigue cracking within the bottom flange, they can be retrofitted with the designed retrofit rehabilitating the girders to their original design loading capacities. Overall it was determined that steel bridge girders can be rehabilitated with the innovative retrofitting technique. Furthermore, this innovative technique enforces that the existing structures do not need to be replaced, instead of using a simple retrofitting technique is sufficient in restoring the existing steel bridge girders to increase their service life to provide a sustainable future.

Figure-1: Retrofitted section for RMS 120-year-old girder.

Figure-2: Retrofitted section for new 610UB113 equivalent girder.

Recent Publications

1.W H Kang, R B Ramesh, O Mirza, S Senaratne, V Tam, D Wigg (2017) Reliability Based Design of RC Beams With Recycled Aggregate and Steel Fibres. *Structures*; 11: 135-145.

2.S Senaratne, G Lambrousis, O Mirza, V W Y Tam and W H Kang (2017) Recycled concrete in structural applications for sustainable construction practices in Australia. *Procedia Engineering*; 180: 751-758.

Biography

Olivia Mirza was a Golden Jubilee Scholarship holder at University of New South Wales in 2000. She has graduated in Bachelors (Civil and Environmental) in 2002. She has worked as a Structural Engineer for 8 years before pursuing her academic career. She has worked for Leighton Contractors, Australia Consulting Engineers and Cardno Group. She is currently a Senior Lecturer in School of Computing, Engineering and Mathematics. She is also Academic Course Advisor for Postgraduate Fire Safety Engineering Program. She has published more than 25 papers in reputed journals and has been serving as an Editorial Board Member of repute.

o.mirza@westernsydney.edu.au