

**BEHAVIOUR OF CARBON FIBRE REINFORCED
POLYMER RETROFITTED, OUT OF PLANE CURVED
REINFORCED CONCRETE BEAM FAILED IN
FLEXURE**

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Degree of Master of Science

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University of Moratuwa

Sri Lanka

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A thesis submitted in partial fulfilment of the requirements for the degree Master of Science
in Civil Engineering

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DECLARATION

I declare that this is my work and this thesis does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other university or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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The above candidate has carried out research for the Masters under my supervision

Name of the supervisor: Prof. (Mrs.) J.C.P.H. Gamage

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ABSTRACT

Due to their superior qualities in contrast with the alternatives, Carbon Fibre Reinforced Polymer (CFRP) strengthening techniques have proven great performance in externally strengthening Reinforced Concrete (RC) elements. The behavior of externally CFRP strengthened RC elements has been the subject of numerous studies. However, to the authors' view, whereas the majority of studies have concentrated on externally reinforcing straight RC beams with CFRP, none have focused on strengthening horizontally curved RC beams. The use of curved beams was significantly increased due to development of infrastructure and high concerns on aesthetical appearance. Hence, curved beams naturally respond to shear, torsion and flexural effect. In a similar way, the industry need to be more focused on the way to respond in flexural failure in such a case. As a result, it's crucial to investigate the possibility of the retrofit when a beam failed in flexural effect.

The experimental approach was carried out in order to reduce the aforesaid research need. A series of 2m and 4m radii beam specimens were tested in 2 stages with CFRP shear strengthen and retrofit the beams which are failed due to flexural effect.

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