



N C K U
NATIONAL CHENG KUNG UNIVERSITY
DEPARTMENT OF CIVIL ENGINEERING

SEMINAR/演講通知

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Hui-En Auditorium/懷恩講堂, 10:00am-11:00am

Elastomeric Polymers for Protective Application of Concrete Structures subjected to Impulsive Loadings

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Abstract

Infrastructures across the globe are facing increased risk of extreme impulsive loadings (of blast and impact) due to numerous accidental and man-made disasters. Capacity enhancement for a new structure to resist such loads can be achieved without much complications during the design stage. However, for an existing structure, this may be a complex issue since most of these structures were not designed to withstand such extreme loading events. As a result, the necessity to identify feasible protective solutions becomes essential in order to protect these critical infrastructures and to mitigate the damage resulting from such human-caused or accidental disasters. This presentation will highlight the work undertaken by the speaker, on utilising elastomeric polymers for protective application of concrete structures subjected to impulsive loadings of blast and impact. Experimental investigations were undertaken to evaluate the characteristics of elastomeric polymers at enhanced strain rates, and subsequently, constitutive equations were developed to characterise the dynamic increase factor (DIF) of their mechanical properties. Experimental blast trials were also conducted on unretrofitted and polymer-coated panels. The experimental findings were then validated by using a non-linear finite element (FE) code. The verified FE models were subsequently used as the foundation to perform the parametric analysis to evaluate and identify the main parameters contributing towards the overall effectiveness of the retrofitting scheme. The findings of this work indicated that polymer coatings could contribute positively towards reducing the damage of the structural elements due to these extreme dynamic effects.

Short Bio

Dr. Sudharshan N. Raman is an Associate Professor in the Department of Civil Engineering, School of Engineering, Monash University Malaysia; where he also co-founded and jointly leads the interdisciplinary Research Node, the Monash Construction Circularity Node (Monash-ConCerN). Dr. Raman was the President of the Malaysian Chapter of the American Concrete Institute (Malaysia Chapter – ACI) for the 2018-2020 Session, and is currently serving as the Immediate Past President. He is a Fellow of the Chartered Association of Building Engineers (CABE), UK; a Member of the American Society of Civil Engineers (ASCE); a Member of American Concrete Institute (ACI); and a Committee Member of the Civil & Structural Engineering Technical Division of The Institution of Engineers, Malaysia (IEM). Over the years, Dr. Raman has built his reputation as a researcher in concrete structures and materials, and infrastructure protective technologies; has served as a Reviewer for prestigious journals in Civil & Structural Engineering, and Built Environment; and currently sits on the Editorial Boards of three international journals.

