

EFFECTS OF BLAST LOADING ON BUCKLING RESTRAINED BRACES

Rais Ahmad, Frank Chavarin and Oshman Charco

California State University Northridge, USA

Buckling restrained braced frames (BRBF) are being used all around the world to resist lateral loads on structures. They are used due to their high ductility after yielding and the ability to absorb energy. Due to emerging use of BRBFs as a major seismic or lateral force-resisting system, it has generated lots of interests among researchers to investigate its behaviour under different loading conditions like blast loading. The threat of blast can be catastrophic as the effects can lead to loss of life and failure of the building. In this research, investigations were carried out on how buildings which were originally designed with BRBFs as primary lateral force resisting system, behaves under the impact of blast loading. Particular focus was set on how the behaviour of the frame was influenced by the brace thickness, compressive strength of the concrete fill of the BRBs under blast loading. Investigations were also carried out to understand the interaction between the brace plates, surrounding concrete and the steel casing. Different brace orientations such as single bay Chevron and V-Brace were examined in this study. The study also investigated how the collapse starts in the BRBF's and which are the critical elements that are vulnerable inside the BRB braces under blast loading

Biography

Rais Ahmad is an Associate Professor in the Civil Engineering and Construction Management Department at California State University, Northridge (CSUN). He has received his PhD in "Guided Wave Techniques to Detect Defects in Underground Pipes" from the University of Arizona. His research interests include Advanced Material Behaviour, Wave Propagation and Non-destructive Testing (NDT), Earthquake Engineering, Steel and Concrete Design. His research interests are in the fields of Acoustic Modelling, Wave Propagation and Blast Loading Analysis. He has authored more than 40 papers in various journals, conference proceedings etc. He is a Licenced Professional Engineer (PE) in the states of California and North Carolina, USA. He is the ASCE-CSUN Faculty Advisor.

rais.ahmad@csun.edu
rahmad@csun.edu