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G.T. Williams, B.M. Kennedy, T.M. Wilson, R.H. Fitzgerald, K. Tsunematsu, A. Teissier



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Buildings vs. Ballistics: Quantifying the vulnerability of buildings to volcanic ballistic impacts using field studies and pneumatic cannon experiments

G.T. Williams ^{a,*} B.M. Kennedy ^a, T.M. Wilson ^a, R.H. Fitzgerald ^a, K. Tsunematsu ^b, A. Teissier ^a,

^a *Department of Geological Sciences, University of Canterbury, Private Bag 4800, Christchurch, New Zealand*

^b *Mount Fuji Research Institute, 5597-1 Kenmarubi Kamiyoshida, Fujiyoshida-shi, Yamanashi 9403-0005, Japan*

ABSTRACT

Recent casualties in volcanic eruptions due to trauma from blocks and bombs necessitates more rigorous, ballistic specific risk assessment. Quantitative assessments are limited by a lack of experimental and field data on the vulnerability of buildings to ballistic hazards. An improved, quantitative understanding of building vulnerability to ballistic impacts is required for informing appropriate life safety actions and other risk reduction strategies. We assessed ballistic impacts to buildings from eruptions at Usu Volcano and Mt. Ontake in Japan and compiled available impact data from eruptions elsewhere to identify common damage patterns from ballistic impacts to

* Corresponding author. Tel: +64 3 322 7373
E-mail address: gtw24@uclive.ac.nz

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