

Title	Research Report 435: Improved simplified response to blast loading	
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Executive Summary	<p>The most widely applied SDOF model has so far been that of Biggs, which suffers from the following shortcomings:</p> <ol style="list-style-type: none"> 1) It does not account for different moment capacities and rotational stiffnesses at the two supports 2) It ignores the catenary effect, which has a significant influence on the large displacement member response in the presence of axial restraint at the supports. 3) It ignores the influence of material rate-sensitivity 4) It ignores the influence of strain-hardening, through assuming elastic perfectly-plastic material and cross-sectional responses. 5) It does not account for the beam-column effect in load-bearing members that sustain significant compressive axial forces. <p>Theoretical developments to address the first two shortcomings were carried out previously and are outlined in an earlier document [1]. The present work addresses the third shortcoming and provides the theoretical background as well as a step-by-step procedure for solving SDOF models with strain-rate effects. The model was validated by comparison against results from the software ADAPTIC. The results between the SDOF model and ADAPTIC exhibited good agreement.</p>	
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