DESIGN OF A PARTIALLY CONFINED SPLIT HOPKINSON PRESSURE BAR

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ABSTRACT

Split Hopkinson pressure bar (SHPB) experiments have been utilised by many researchers to characterise the properties of materials at the high strain rates experienced during blast and impact events. This paper presents the design of a modified SHPB which permits soil specimens to be partially confined through use of a reservoir filled with water initially at atmospheric pressure. A pressure gauge located in the wall of the reservoir allows lateral restraining stresses to be quantified. In contrast to experiments where a hydrostatic pressure is applied before the dynamic loading, this method allows the lateral confinement of the specimen to develop during the deviatoric phase, and is more representative of the loading experienced in explosive events. Examples of the results from sand specimens are provided, and show that lateral stress measurements are successfully recorded.