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**University of Southampton**

**The excel file contains experimental data for the paper. In particular:**

**Figure 1.** Schematic diagram of local instrumentation.

**Figure 2.** Typical axial and shear stress cycles, 90<sup>0</sup> degrees out of phase.

**Figure 3.** Permanent axial strain accumulation during undrained cyclic shear stress increases for Materials A-D (7%-24% clay).

**Figure 4.** Residual pore pressure changes during undrained cyclic shear stress increases for Materials A-D (7%-24% clay).

**Figure 5.** Excess pore pressure ratio as a function of the logarithm of axial strain for Materials A-D (7%-24% clay).

**Figure 6.** Excess pore pressure ratio against (a) intergranular and (b) global void ratio for axial strain excursions of 0.25%, 0.75% and 1.00%.

**Figure 7.** Changes in Resilient Young's Modulus during undrained cyclic stress increases for (a) Material B (11% clay), (b) Material C (14% clay), (c) Material D (24% clay).

**Figure 8.** Stress paths ( $q/M$  vs  $p'$ ) for Materials A-D (7%-24% clay): test stages causing failure (UA8.5, UB11.5, UC14.5 and UD14.5 respectively) relative to critical state lines reported by Gräbe and Clayton (2009).

**Date of data collection:** from December 2011 – May 2012

**Information about geographic location of data collection:** University of Southampton, U.K.

**Date that the file was created:** September 2017