"A ""TAILORED"" SHOCK TUNNEL FOR INVESTIGATING SHOCK WAVE PROPAGATION IN SOILS AND FOAMS"

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The propagation of a blast wave through soil has in the past been examined by impulsively loading the soil sample with an incident shock wave of known strength and measuring the consequent shock amplitude and velocity through the soil sample.

A new facility at RMCS has been commissioned which provides not only a step impulse of known pressure but by the use of a driver-gas mixture and operation in the "tailored" shock tube mode provides a quasi-steady pressure step free from extraneous compression or rarefaction waves whilst the incident shock wave is in passage through the soil or foam sample. The paper describes its design, commissioning and calibration. In brief the facility comprises a driver and driven section of 3 m length and internal diameter 66 mm. The driver tube uses double diaphragm control and employs a driver gas mixture of helium and nitrogen to generate step pressures ranging up to 10 bar of duration 5 ms. in operation the facility is fitted with a 2 m long containment tube through which the one dimensional shock wave propagates. This tube is instrumented with wall and sting mounted pressure transducers.

Calibration was carried out with the driven tube closed by an end plate and incident and reflected shock wave velocities and strengths measured with piezoelectric pressure transducers. The performance of the facility is compared with theoretical estimates.