48 GDS Helpsheet

World Leaders in Computer Controlled Testing Systems for Geotechnical Engineers and Geologists

Hardware

Triaxial Testing Systems

Setting the Datum of Pressure Measurement

1. Introduction

There are four identical pressure transducers in the Bishop & Wesley cell-based system. There are one each in the three pressure controllers as follows:

- Lower chamber pressure controller
- Cell pressure controller
- Back pressure controller.

In addition, there is a fourth transducer measuring pore pressure. Naturally there will be small differences between measurements of the same pressure made by these transducers. This is because they have slightly different accuracy's (their specified deviation from a standard value) and calibrations (actual relationships between a standard value and the read value). This is quite normal and should be taken into account when interpreting your results because you do not have any control over these inherent discrepancies.

You do, however, have control over setting the common zero or datum of pressure measurement. This is so that all four pressure measuring systems (i.e. the transducers and their associated analogue-digital conversion) measure pressure from the same "base line". This is how you do it.

First you need to set up your datum of pressure measurement. Normally this will be an elevation equal to the mid-height of the triaxial test specimen. Probably the best way of doing this is to connect a short length (say 300mm)of small bore nylon tubing to the back pressure connector of the cell. This is the connection to the top cap drain. Fill the cell with water. *You will not have a test specimen in place for this procedure.* Apply a small positive cell pressure using the cell pressure controller. You can do this by setting a target pressure. Open the valve to the back pressure line. Water will flow out of the cell from your short tube. Stop pumping when the tube is full of water and water drips out of the open end. Fix the open end of the water-filled tube at an elevation corresponding to the mid-height of the test specimen (or the base of the test specimen if you prefer)

Now the water in the cell is at a pressure corresponding to this elevation head. Connect your back pressure controller to the base pedestal pore water port and open the valve. Now the cell pressure controller, back pressure controller and pore pressure transducer all share the same pressure set by the external tube. You can now zero the displays of these values. The lower chamber pressure controller can also be zeroed at this time. Now all four displays of pressure are zeroed to the same datum of pressure measurement.