EOSC 433 –Lab #2

Problem Set Assignment: Intact and Rock Mass Properties

Term 1 (2017/18) - Due date Sep. 29, 2017

1. **Consulting and referencing a minimum of four sources, compile a set of tables reporting typical laboratory properties for intact rock, including: density, porosity, Young's modulus, Poisson's ratio, Uniaxial Compressive Strength (UCS), tensile strength, cohesion and friction angle. Include any other additional parameters you think may be important for carrying out rock engineering calculations.**

   Do so for a range of common rocks (e.g. granite, sandstone, etc.), dividing the tables into igneous, metamorphic and sedimentary rock types. Structure the tables so that they can serve as a quick look-up resource for use in the field or office when you are required to come up with a quick rough estimate.

   Make sure to consult multiple sources (textbooks, journal papers, etc. – the more the better) to obtain a range of typical values and include foot notes fully referencing the source for each value or those contributing to a range of values.

2. **Develop an Excel spreadsheet using the set of equations that appear in Hoek et al. 2002*, and report the Hoek-Brown and equivalent Mohr-Coulomb rock mass properties you calculate for the following scenarios:**

   i) A 200-m deep tunnel in blocky limestone, where the joints were mapped as having good to fair joint conditions. The rock requires more than one hammer blow to break it.

   ii) A tunnel with 1500 m of overburden in the same rock.

   iii) A 100 m rock slope in weathered granite where the joint conditions are mapped as having clay infill.

   * E. Hoek, C.T. Carranza-Torres, B. Corkum, 2002. Hoek-Brown failure criterion - 2002 edition. In: R.E. Hammah et al. (Eds.), Proceedings of the Fifth North American Rock Mechanics Symposium (NARMS-TAC), Toronto, University of Toronto Press, vol. 1, pp. 267-273.