



MND410: Assignment

Marks: 10,

{Email}: yashwanthkg@iitism.ac.in

{Instructor}: Assistant Prof. Yashwanth Kr. Gujjala, PhD

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I. PROBLEM STATEMENT

BUILD an ".EXE" file or any executable file using any coding language of your choice to estimate the probable penetration rate for a

- 1) Rotary Percussive drilling machine
- 2) Rotary drilling machine

As discussed in the class, the number of algorithm options should be showcased to the user via instruction display. The algorithms to be considered are as follow:

a Rotary Percussive:

- USBM, 1969
- Norway, 1979
- Benaola, 1985

b Rotary:

- Bauer and Calder, 1967
- Baurer, 1971
- Calder and Workman, 1994

A. User Instructions

The user must first be presented with the options to select any of the two drilling methods. Thereafter, empirical options for each of this category as discussed in the earlier section must be provided. Once the user selects a option, he/she shall be required to provide the input parameters like thrust value, rotation speed, etc. Obviously the order of units have to be mentioned.

The required figures for solving this problem is illustrated in the attached figures.

II. TASK

PREPARE a hand written report of the same with all the algorithms involved and also provide Pseudo-code of the same. Your report should also illustrate a sample input and sample output page driven from your code. Modification and innovation in the code is encouraged.

Hint: There are image processing tools available online. Use them to determine the function of curves.

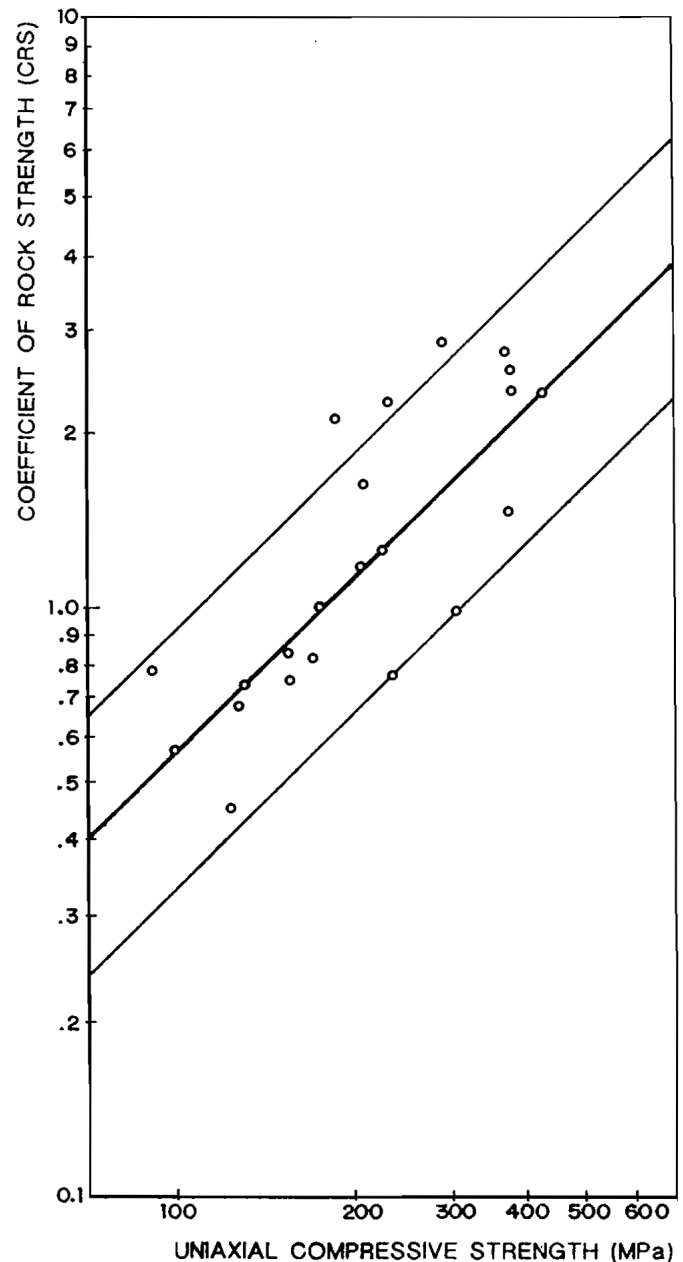


Fig. 1. Variation of UCS of rock with Rock strength coefficient. (Used in USBM algorithm)

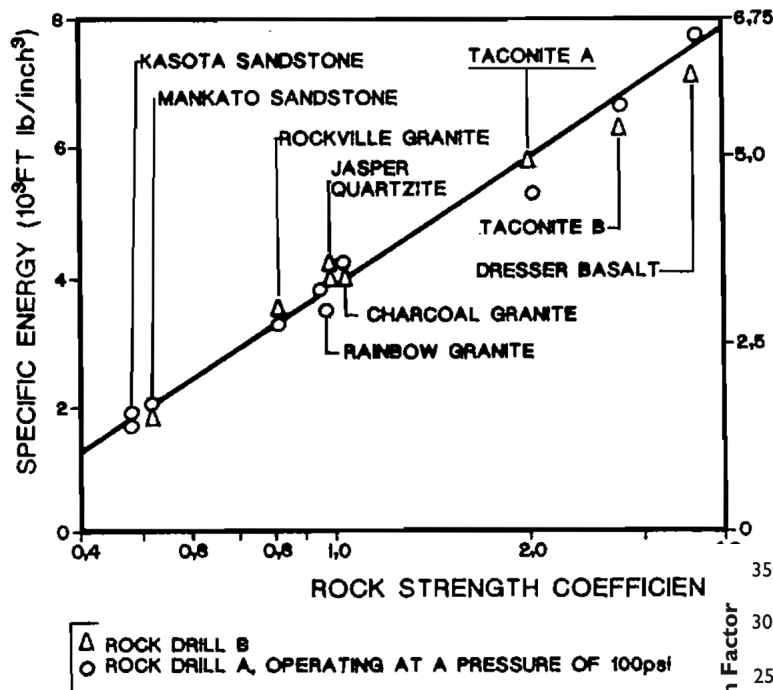


Fig. 2. Variation of rock strength coefficient with specific energy. (Used in USBM algorithm)

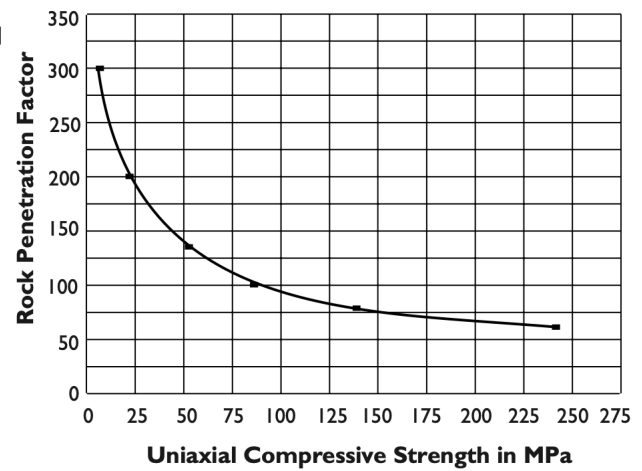


Fig. 4. Variation of UCS and Rock penetration factor. (Used in Calder and Workman approach)

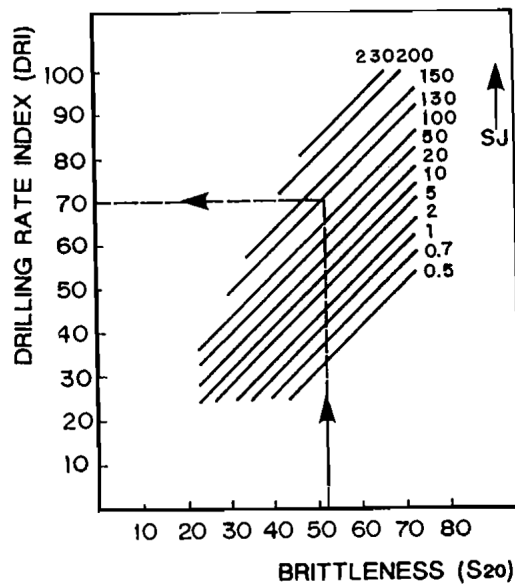


Fig. 3. Variation of Drilling Rate Index with Brittleness (S_{20}) (used in Norway algorithm)