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Design of Retaining Wall at No 4 Maes Y Cornel, Rhos for Mr M Cronin

Inspection of the site shows that part has been previously excavated to create a car parking space. At this location, there is a near vertical face approx. 1.2m high. It is understood that this was excavated some 4 years ago which indicated the material forming the bank is very stable. The material forming the bank appears to be boulder clay.

The criteria for assessing the pressure exerted by boulder clay is set out in Tables 16 & 17 of "Reinforced Concrete Designers Handbook" tenth edition (see attached copy). Using the formulae for Active Pressure Any Slope and the properties of boulder clay in Table 17 :-

Very stiff boulder clay $\theta=16$ & $C=170$ gives α with a value of the square root of a negative number and therefore the value of k cannot be calculated. Similarly when $\theta=5$ and $C=35$ the same result occurs. Because of this it is proposed to use the value of k_2 with the addition of a 10kN/sq. m surcharge. The natural slope of the bank shows a max. slope of approx. 30 degrees which reflects long term stability. Therefore $k_2=0.333$.

The max. active pressure at the root of the 1.4m high wall is $0.333 \times 1.4 \times 20 = 9.3 \text{ kN/sq.m}$ plus the surcharge pressure of 3.33 kN/sq.m. The calculation of wall stability is shown on the attached sheet.

The factor of safety for a 1.4m high wall is 1.7. Similarly the F of S for a 1.2m high wall is 2.2.

The proposed sections at the critical points on the wall are shown in Sections 1 & 2 and the section locations are shown on the Floor Plan of Garage and are marked on the topographic survey. The Floor Plan of Garage also shows the proposed construction phases which will minimise the risk to the slope stability during construction.