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Elite precast concrete block retaining walls – Design Statement

Elite Duo, Legato and Vee blocks stacked to form a retaining structure are designed as follows:-

The walls are designed as a 'mass or gravity' retaining wall this means that the stability of the wall is based on the self weight of the wall, and no tensile forces are present on the inside retained face of the wall.

Overturning and sliding forces on the wall are calculated thus:-

1. Pressures due to retained materials:-

- The forces exerted on the walls are calculated using 'Rankines Formula' this is a widely recognised method for calculating retaining forces and takes into consideration the following elements:-
    - The density of the retained material.
    - The natural angle of repose of the material i.e. the angle at which the material will stand up unsupported.
    - The height of the retained material
    - The surcharge load – i.e. the uniformly distributed load on top of the retained material.
    - The angle at which the material is to be stored (the angle of the material at the top of the wall).

2. Pressure due to Impact Loads:-

- Standard recognised formula are used to calculate the impact load on the wall based on:-
    - Vehicle speed
    - Vehicle mass
    - Total anticipated deflection, both from the vehicle and the wall combined.

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The stability of the wall is then calculated thus:-

3. *Overturning* – Each block and the wall as a whole is calculated for overturning based on standard equilibrium calculations which are dependent on the blocks width and weight.
4. *Sliding* – Each individual block sliding over one another is resisted by the 'nibs' on the blocks. Overall sliding resistance is calculated using a conservative widely accepted 'friction factor' of 0.5 combined with the weight of the wall.
5. *Bearing Pressure* – The bearing pressure directly beneath the walls are calculated and passed on to the client. The walls are constructed on numerous different types of ground/foundations, therefore it is made clear to the client that they are responsible for ensuring that the ground/foundation is suitable to safely support the calculated pressures.
6. *Factor of Safety* - A minimum factor of safety of 1.5 is required for the overturning of each block, overturning of the wall as a whole, and sliding of the wall as a whole.

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Director

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