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17. LANDSLIP AT WILLIAM STREET, ULVERSTONE

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During recent weeks a landslip on a hill behind Housing Department residences in William Street, Ulverstone has caused some concern to that Department.

The area was inspected on 19th September, 1963, in order to determine the cause of the movement and to outline remedial measures.

The area affected is a fairly steep hill at the rear of Nos. 50 and 52 William Street. Most of the slip material is situated on the vacant allotments to the rear of these houses, but some has flowed onto the back of the blocks destroying some fencing. The slip is an earthflow comprising about 1000 yards of completely waterlogged soft clay. It has the bulbous toe and tension cracks around the heel of the mass characteristic of this type of movement.

CAUSE OF THE SLIDE

Basalt slopes along the North West Coast are particularly prone to landslips and several movements which have affected or endangered property have been noted in the past few years. However, although these slopes are inherently unstable, individual landslips may be localized by human agencies such as overloading, poor drainage, &c.

It is noted that although the remainder of the hillside behind William Street is equally as steep as the slide area no other movements have been reported and a local influence for this particular slip is therefore sought. The hillside behind the two affected houses has been cleared of all vegetation during the last few years and vegetable gardens developed. A number of abandoned hoses and a temporary pipeline suggest that these gardens have been kept thoroughly watered. The effect of this has been twofold:—

(1) The removal of vegetation has allowed a very much greater proportion of the rainfall to pass into the surface soil.

(2) Excessive watering has added greatly to the amount of water available to pass into the soil.

The fact that the slip is confined totally to the cultivated areas is an additional sure indication that the localization of this slip is due to these gardening activities.

REMEDIAL MEASURES

Two factors must influence the possible remedial measures which may be adopted here. These are:—

(1) The value of the property involved compared with the cost of the remedial measures.

(2) The slip material is at present so saturated that it will not support a person's weight. It is therefore impracticable to suggest the use of earthmoving machinery on the slip until it has dried out.

Although the slip is likely to move again at any time, particularly during periods of heavy rainfall, only temporary measures can be adopted until it has dried out sufficiently to work. For the time being the following is suggested:—

(1) Drainage around the toe of the slip to allow the water issuing from it to escape freely.

(2) A cut-off drain across the slope above the slip to prevent any surface water from entering the tension cracks around the top of the slip.

On a longer term basis the following steps are recommended:—

(1) The slope should be trimmed back to an even batter.

(2) A permanent cut-off drain should be provided above the slip.

(3) Permanent and effective drainage should be provided from the base of the slope to the stormwater drainage system.

(4) The slope should be planted with grass and deep rooted shrubs in order to increase surface run-off and to consolidate the surface layers of soil.

(5) Gardening on the slope should be absolutely forbidden.

(6) Watering on the slope should also be forbidden.

(7) A series of shallow surface drains over the slope may assist in encouraging the surface runoff. They should be connected to the toe drains ((3) above).

(8) As soon as possible the septic tanks at these houses should be disconnected.

CONCLUSIONS

(1) The present slip is thoroughly saturated and likely to move again with heavy rains.

(2) Only temporary measures are practicable until the slip material has dried out.

(3) Since the slip has already developed on a considerable scale and has seriously disturbed the stability of the hillside no assurance can be given that the measures proposed will completely stabilize it. However, they will certainly improve the stability considerably.

(4) More elaborate remedial measures such as retaining walls or piling appear to be uneconomical with regard to the value of the property involved.

(5) A very serious view should be taken of further attempts to develop gardens on this hillside and the use of hoses on the slope should be firmly discouraged.