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1976/68. Marine erosion at Taroona.

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Two examples of marine erosion in the Taroona area have been examined at the request of the Kingborough Council. In each case concern had been expressed about the stability of the foreshore and nearby residences following recent storms.

Taroona Beach

Midway between the beach reserve and the siltstone cliffs to the west [EN282441], where several houses front directly onto the foreshore, a steep slope (averaging approximately 30°) is being steadily undercut.

The beach is composed of coarse sand and dolerite boulders, ranging in size from a few centimetres to more than two metres across. These boulders represent the remains of old landslides and creep from the hills to the north. The original matrix of soil and weathered material has been separated and removed by the sea at beach level. Some sand remains and overlies boulders, boulder clay and clay. Thick coatings of dolerite soil and clay with smaller fragments drape the slope and generally conceal expansive Tertiary clay which is exposed in small excavations on the slope and in the undercut at its foot. At the time of observation, fissures were weeping water and discontinuous drains were compounding this problem. Residents might be advised of this risk contributing factor.

Clay of this type and age, including the dolerite soils, are normally subject to creep and slip failure where slopes of this magnitude are present. This does not seem to be a problem on a small scale although consideration of the entire locality may indicate that the whole zone is creeping seaward and exacerbating the marine erosional problem. Failure in the underlying clay has almost certainly assisted the movement of the dolerite - derived materials and some boulders are admixed with the clay as a result.

Some previous attempts at stabilising the foreshore zone have been made and a disrupted, cemented boulder wall which had been plastered over the critical erosional level may be observed nearby. Such walls, with little mass or foundation, are as readily undercut as the slope. Outward push from the slope, if it is occurring, would aid failure.

Problems of this type are difficult to control in any circumstance and only one suggestion is possible here. A backhoe trench should be excavated in the beach at least two metres from the slope/beach boundary and dug below water level as far into the underlying clays as possible. This presumes that there is no unusual thickness of sand in the area. Some large boulders may be encountered and utilised as a base. The trench must be filled with the largest boulders available, subject to ability to move them, and the use of a heavy bulldozer is recommended. These boulders should stand as far above the original level as possible (at least 60 cm). Smaller boulders may be added as fill between the main wall and the slope. Cementing is an extra but not absolutely necessary addition.

The value of such walls relies on the diminution of wave energy before it can reach any sensitive zone. This also minimises the draining energy, leaving the material intact. However, the continued use of the breakwater depends on its ability to withstand collapse by block removal or undercutting. It is for these reasons that the main slabs must be large and set as deeply as possible. Large, broken concrete slabs serve well if they are available

and can be moved to the site. Placement of the boulder wall clear of the slope, which may itself be subject to movement, will extend the life of the wall and add to its effectiveness as an energy absorber.

Foreshore north of the Taroona High School

Cliffs of interbedded Tertiary conglomerate, sandstone and claystone present steep faces up to 10 m high north of Taroona High School [EN290456]. Discolouration of the water near the cliffs indicates the removal of matrix and clay components which ultimately lead to failure. Several fallen blocks are visible on the foreshore but few represent recent falls. Most are of conglomerate, other lithologies being easily broken down. The process is the result of cliff attrition due to wave refraction about the nearby point. No treatment is possible.

The rate of erosion appears to be low and the faces are relatively stable. Each fall is of the order of 1 m^3 and on inspection only one further piece seemed subject to fail in the next few months. Seepages of water suggest future problem areas and apart from suggesting that residents in the region properly drain their garden no further recommendation can be made.

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