

Section 2—Engineering Geology

TRD-88-90

14. INTERIM REPORT ON SITE CONDITIONS AT COSGROVE PARK, LAUNCESTON

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INTRODUCTION

A preliminary report on geological conditions at this site was submitted previously (Jennings, 1963). In that report it was recommended that 3 diamond drill holes and 4 test pits should be put down at the site of the proposed building. The diamond drilling has now been completed and this report summarizes the results obtained.

Four holes totalling 306 feet 4 inches of drilling have been completed. Of these Holes Nos. 1 and 1b were put down within a foot or so of each other in order to obtain a more complete core. A summary description of the material encountered in these holes is given below.

Hole No. 1.—Depth: 104 feet. Recovery: 62.5%.

This hole encountered clay and fine grained sandstone sediments with a few interbedded quartz sand bands and numerous thin bands of hard limonite. Many of the clay layers encountered were soft and plastic. The circulating water was lost at 99 feet indicating a relatively highly permeable layer in that vicinity. At 69 feet 6 inches a claystone band showed smooth gliding faces indicating previous slippage or shear failure. A large proportion of the core was not recovered due to the unconsolidated nature of the sediments.

Hole No. 1b.—Depth: 38 feet. Recovery: 59%.

The first 7 feet of this hole was in surface filling and soil. Below this the hole penetrated soft clayey sand and plastic clay interbedded with firmer mudstone and sandstone bands. The limonite bands encountered in No. 1 hole were also present and no doubt contributed to the poor core recovery.

Hole No. 2.—Depth: 100 feet 6 inches. Recovery: 59%.

This hole encountered a series of soft waterlogged feldspathic sandstone beds interbedded with plastic clay, siltstone and fine grained sandstone. Zones of movement indicated by polished gliding faces on the core were encountered at 27 feet and 55 feet. Some clay pellet breccia was present. Some limonite bands were also encountered but they were not as plentiful as in Holes 1 and 1b.

Hole No. 3.—Depth: 63 feet 10 inches. Recovery: 71.4%.

The first 10 feet of this hole was in surface soil and silty clay with organic material. Below this the hole penetrated a sequence of interbedded clay, silty sand and siltstone including some highly

plastic clay layers. Slip planes were noted in clays at a depth of about 60 feet; the circulating water was lost in very soft material at 53 feet.

GENERAL

All the holes drilled encountered only Tertiary sediments and no indications of the harder basement rocks were disclosed. The drilling carried out so far indicates that the proposed building site is underlain by more than a 100 feet of sand, silt, and clay which vary widely in bearing capacity. The material in the cores varies from almost a clay slurry up to firm, jointed claystone. These deposits apparently occur as a series of disconnected lenses of small lateral extent as indicated by the important sequences of soft feldspathic sand encountered in Hole No. 2 but not in any of the other bores.

The general core recovery was only fair which indicates the generally soft nature of the ground. However, part of the loss of core was undoubtedly due to the hard limonite bands which created difficult drilling conditions. In the core the bedding is generally flat or at shallow angles relative to the core except for the last few feet of Hole No. 1 where dips up to 35° to the core were recorded. In the absence of useful surface outcrops and test pits it is impossible to determine the direction of dip at this stage.

CONCLUSIONS

The drilling has indicated that the proposed site is underlain by variable, relatively soft Tertiary sediments which contain a significant proportion of soft plastic clay and porous sandstone. At least 2 zones capable of transmitting relatively large quantities of water were encountered. In every hole some of the claystone bands showed indications of having already been subjected to shear failure or slippage. The drill foreman described the sediments in Hole No. 1 as essentially similar to those encountered whilst drilling the Lawrence Vale landslip area but the core from that drilling is not available to the writer for comparison.

RECOMMENDATIONS

(1) The foundation conditions disclosed by this drilling indicate that siting a major building at this point entails a high degree of risk. It is therefore recommended that the site be abandoned.

(2) The site could be utilized for light cottage-type development similar to that bordering Lithgow Street and Normanstone Road.

(3) The closest safe foundation conditions for a building of the size envisaged is located on the western side of the gully behind the Motel on Westbury Road. Abundant solid dolerite outcrops in that vicinity indicate that no serious foundation problems would be met.

(4) I am informed that for administrative economy and convenience it is desirable to site the new building as close to the existing facilities as possible and within the same grounds. In view of this a new site on top of the hill and close to the

existing home has been selected for investigation. Two diamond drill holes each 100 feet deep and two test pits each about 10 feet deep are recommended to explore this site. The new site overcomes the problem of relatively steep side slopes but is slightly closer to the landslips along Westbury Road. There is no reason to assume that the foundation material will be significantly better than the site already explored.

REFERENCE

- JENNINGS, I., 1963.—Geological factors affecting proposed building at Cosgrove Park, Launceston. *Tech. Rep. Dep. Min. Tas.*, 7, 87-89.