

Geotechnical Assessment Executive Summary

INTRODUCTION

The geotechnical assessment aims to identify all potentially significant ground engineering problems and assess the extent and significance of landslide hazards on natural terrain and man-made slopes associated with the proposed North East New Territories New Development Areas (NDAs) Development, recommend options to mitigate the risk, recommend solutions to render those areas underlying by unsuitable materials capable of sustaining the Development and associated infrastructure, and identify additional site investigation (SI) and laboratory tests (LT) for further assessment.

DESK-TOP STUDY

Previous Study Reports

- The desk-top study was carried out by comprehensively reviewing on the geotechnical assessment of the previous study, existing ground investigation and laboratory testing records, aerial photos and published geological records.
- The desk-top study finds that the soft materials such as alluvial clay/silt and pond deposit present in the NDAs will be subject to settlement problem and high groundwater level within the NDAs may pose risk on the proposed underground works.

Reported Landslide Incidents

- A total of 24 nos. of landslide incident reports have been identified for man-made slopes or disturbed terrain areas within the Study Area.
- The landslide incidents mainly occurred on soil cut slope and comprised minor failures and washouts.
- A total of 24 nos. of Enhanced Natural Terrain Landslide Inventory (ENTLI) natural landslides have been identified within the KTN NDA, 2 within the FLN NDA and 22 within the PC/TKL NDA.
- All KTN ENTLI landslides occurred at the Tai Shek Mo hilltop, where the proposed service reservoirs are located. The ENTLI landslides in PC/TKL NDA, on the other hand, concentrate on the north-facing hillslopes of Ma Tau Leng.

GROUND INVESTIGATION FIELDWORK AND LABORATORY TESTS

Walk over surveys were carried out in the three NDAs to preliminarily confirm the findings from the desk-top study and also define the scope of the ground investigation fieldwork under the Study.

The GI fieldwork, comprising 73 vertical drillholes, and associated laboratory test were carried out. Parameters for the soil and rock are derived based on the GI fieldwork under the Study. The parameters are similar to those adopted in the previous studies.

Groundwater monitoring has been carried out for at least one year in the three NDAs and the records show that the water level varies at 2m to 6.5m below the existing ground.

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Design groundwater levels of 1m to 4m below the existing ground are adopted in site formation design to address the high groundwater level.

GEOTECHNICAL ASSESSMENT

In KTN NDA, significant fill bodies are localised at west and north to Fung Kong Shan. The soft superficial/alluvial deposits are present on both sides of Sheung Yue River, lowland, fish pond areas and western part of the NDA. They are highly compressible materials and would cause varied degree of settlement. The tuffaceous bedrock underlies much of the area while the meta-sedimentary bedrock is encountered in the central and western of the area of KTN NDA. The anticipated rockhead level is quite deep and would be varied significantly, particularly in the proximity of San Tin Fault zone.

The FLN NDA is generally underlain by fill and alluvial deposits at most of the low-lying area, possibly causing settlement. These superficial deposits are then underlain by relatively thick residual soil and decomposed tuff and metamorphosed tuff. A local zone of corestones would be encountered. Tuffaceous and metamorphic rocks are encountered in most of the area but the type and property of rock likely vary at the north-eastern area. The anticipated rockhead level varies across the area.

The PC/TKL NDA is underlain by fill and alluvium, and pockets of colluvium are locally found near the hillside areas. These superficial deposits are then underlain by decomposed tuff/phyllite. Tuff is encountered in most part of the area while the anticipated rockhead level varies across the area.

In general, the three NDAs mainly encounter soft alluvial deposits which are generally low in bearing resistance would cause settlement, high groundwater level and various rockhead level.

Based on the currently proposed development layout, hillside catchments in the three NDAs have been identified. Other areas of natural terrain within or abutting the NDA are found to either fall outside the Alert Criteria screening zone or to have existing facilities, which could consider as potential buffers, between the hillside areas and the proposed developments. Further detailed study including field mapping and hazard assessment are recommended to assess the possible impact of such features.

By implementation of engineering measures such as better allocation of design loadings, comprehensive site investigation, appropriate ground treatment works, adequate monitoring and design considerations in the site formation level, the above limitations/constraints encountered in the three NDAs could be overcome. Therefore, it is concluded that the proposed development at KTN, FLN and PC/TKL NDAs is geotechnically feasible.