

# Settlement prediction of Kansai International Airport

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## ABSTRACT

In the first part of this paper, the characteristics of the relationships between liquidity index  $I_L$  vs effective overburden pressure  $p_0$ , and  $I_L$  vs consolidation pressure  $p$  are made clear. The existence of equi-strain rate lines in the  $\epsilon$  vs  $\log p$  curves is verified by a number of consolidation tests. The field  $\epsilon$  vs  $\log p$  curve obtained at the monitoring point of the first phase reclamation of KIA fill is presented.

In a second part of this paper, a series of elasto-viscoplastic FE analyses is performed to assess the deformation of the marine foundation due to construction of KIA island. Attention is paid to assessing the effect of adjacent reclamation on the existing reclaimed land, and two-dimensional analysis is adopted.

## 1 INTRODUCTION

The first author of this paper has joined in the committee to investigate the various problems on the geotechnical engineering for about 30 years since the commencement of geotechnical investigation around the Kansai International Airport. He expresses his sincere gratitude for having the opportunity to participate this big project.

The main problems are summarized in the following four items, to , among several problems which make the estimation of settlements in KIA difficult. For reference, the arrangement of the first phase island and the second phase island of the Airport, and locations of borings performed so far are shown in Figure 1. The locations of monitoring points, I-1, I-4 and II-2, the boring at pilot fill (the point K), and geotechnical subsoil sections, B - B, D - D and G' - G' lines, mentioned in the later sections, are also shown in the same figure.

Soft subsoil: The soft alternate layers composed of Holocene clay/ Pleistocene clay/sand, are deposited as shown in the soil profile of Figure 2. Since the soil improvement using the sand drain method was carried out for the Holocene clay layer close to the seabed, the consolidation was expected to

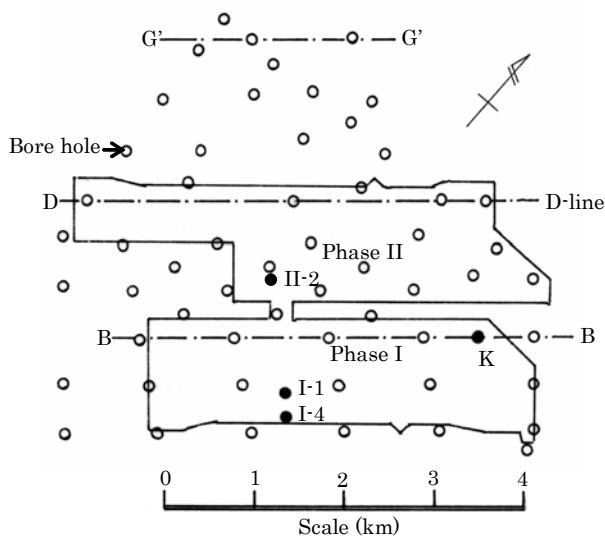


Figure 1. Plan view of the KIA and location of Bore holes

be brought to an end at the early stage. For the Pleistocene clay layers deeper than it, however, quite a few problems on

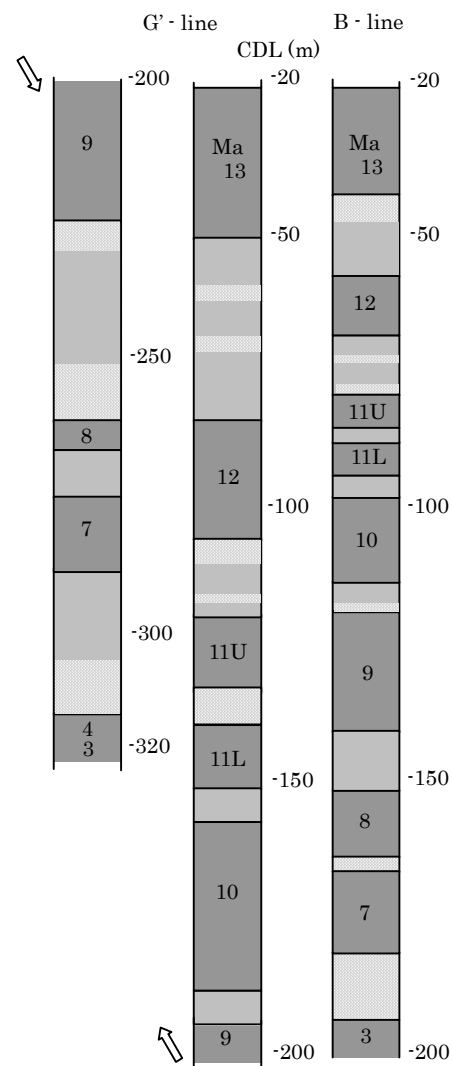


Figure 2. Soil profiles at two sections