

重塑黏性土固有压缩特性的探讨

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LABORATORY TESTS ON INTRINSIC COMPRESSION BEHAVIOR OF RECONSTITUTED CLAYS

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摘要 Burland于1990年提出重塑土的固有压缩特性,为定量评价天然沉积结构性黏性土的力学性质提供参考依据。通过对四种液限的重塑土进行大量的室内一维固结试验,重塑土样的初始含水率调整扩大为液限的0.7~2.0倍,探讨了初始含水率,液限对重塑土固有压缩特性的影响。结果表明:重塑土压缩曲线不仅与土的液限有关,还受初始含水率的影响;在较低固结压力下,采用Burland引入的孔隙指数不能将不同初始含水率的重塑土压缩曲线归一化,但当固结压力超过约25kPa时,各种压缩曲线均可较好地归一化至重塑土的固有压缩曲线(ICL);此外,重塑土固有压缩参数并非仅与土的液限有关,试验实测的结果显示出与Burland的固有压缩参数经验有一定的偏离,结合试验结果对其进行了修正。

关键词: 重塑黏性土 初始含水率 液限 固有压缩特性

Abstract: Research on quantitative evaluation of the compression behavior for reconstituted clays usually provides a reference framework for interpreting the corresponding characteristics of natural sedimentary clays. The intrinsic compression line (ICL) was proposed by Burland in 1990. The void index was introduced for normalizing the compression curves of various reconstituted clays having an initial water content of 1.0~1.5 times (preferably 1.25 times) the liquid limit. The properties of reconstituted clays were also termed 'intrinsic' properties since they were inherent to the soil and independent of the natural state. In this paper, extensive oedometer tests are carried out on four different clays. They are reconstituted and extended to 0.7~2.0 times the liquid limits. The test results suggest that the compression behavior for reconstituted clays is in fact not the 'intrinsic' properties proposed by Burland, which is not only affected by soil liquid limit but also affected by soil initial water content. A modification based on the test data is presented on the expressions of e^*_{100} and C^*_c defined by Burland. Extensive oedometer test data are also collected on various reconstituted soils with distinct liquid limits and initial water contents to verify the validity and applicability of modified expressions.

Key words: Reconstituted clays Initial water content Liquid limit Intrinsic compression behavior



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