

## Shear Characteristics of Peat Consolidated under Cyclic Loading

*Masaru IGARASHI*

Diaconsultants, Ltd.

Saitama, Japan

*Masaki TSUSHIMA*

Dept. of Civil Eng., Akita National College of Technology

Akita, Japan

*Hiroshi OIKAWA, Toshihiro OGINO*

Dept. of Civil and Environmental Eng., Akita University

Akita, Japan

### ABSTRACT

A series of test simulating repeated loading due to the change of groundwater level and traffic load on the peat deposit is performed with stress condition of anisotropic consolidation and swelling. After anisotropic consolidation under cyclic loading for undisturbed peat, the effect of cyclic consolidation history on the shear characteristics is examined under undrained triaxial and unconfined compression tests.

**KEY WORDS:** undisturbed peat; anisotropic consolidation; overconsolidation; cyclic consolidation; suction; triaxial compression test; unconfined compression test.

### INTRODUCTION

The ground that consists of fibrous organic matter is well known in comparison with the cohesive soil as the most typical example of soft ground. Therefore, it seems that shear behavior is shown to be effect greatly by repeated loading due to the change of groundwater level and traffic load on the peat deposit. And the peat sample will be subjected to stress release and mechanical disturbance during the course from sampling to laboratory testing under cyclic loading.

Kamiya (1990) performed a series of consolidation test for studying the effect of loading conditions on repeated cyclic loading of peat using consolidation test apparatus, and proposed at examining settlement behavior due to repeated cyclic loading of peat.

In the study, a series of test simulating repeated loading due to the change of groundwater level and traffic load on the peat deposit is performed with stress condition of anisotropic consolidation and swelling. After anisotropic consolidation under cyclic loading for undisturbed peat, the effect of cyclic consolidation history on the shear characteristics is examined under undrained triaxial and unconfined compression tests.

### EXPERIMENTS

The samples used in the experiments are undisturbed peat retrieved from a site in the vicinity of Akita City, index properties of which are given in Table 1. The sample used in this study is undisturbed peat obtained by forcing sampling tubes of 70mm in diameter and 300mm in

length with man power into peat layer. Samples extruded from sampling tubes were carefully trimmed by cutting top and bottom surfaces only by using implements such as cutter knives and wire saws to make specimens of 70mm in diameter and 160mm in height. Conventional triaxial test apparatus with a ceramic disc, air entry value of which is 220kPa, assembled in pedestal as shown in Figure 1 was used for the test series in this study.

As shown in Figure 2, anisotropic consolidation was first performed,

Table 1 Index properties of peat sample

Sample	Density of soil particle $\rho_s(\text{g/cm}^3)$	Ignition loss Li(%)	Degree of Decomposition H(%)
Peat	1.69 -1.75	60 - 70	80 - 90

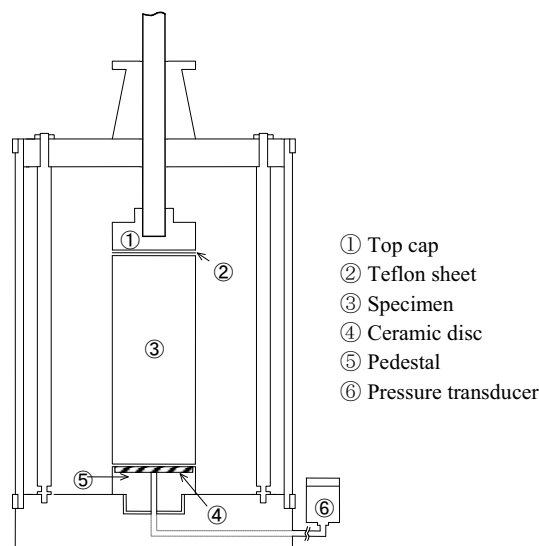


Fig.1 Triaxial test apparatus with a ceramic disc assembled in pedestal