

## Appendix-A

### Test apparatus

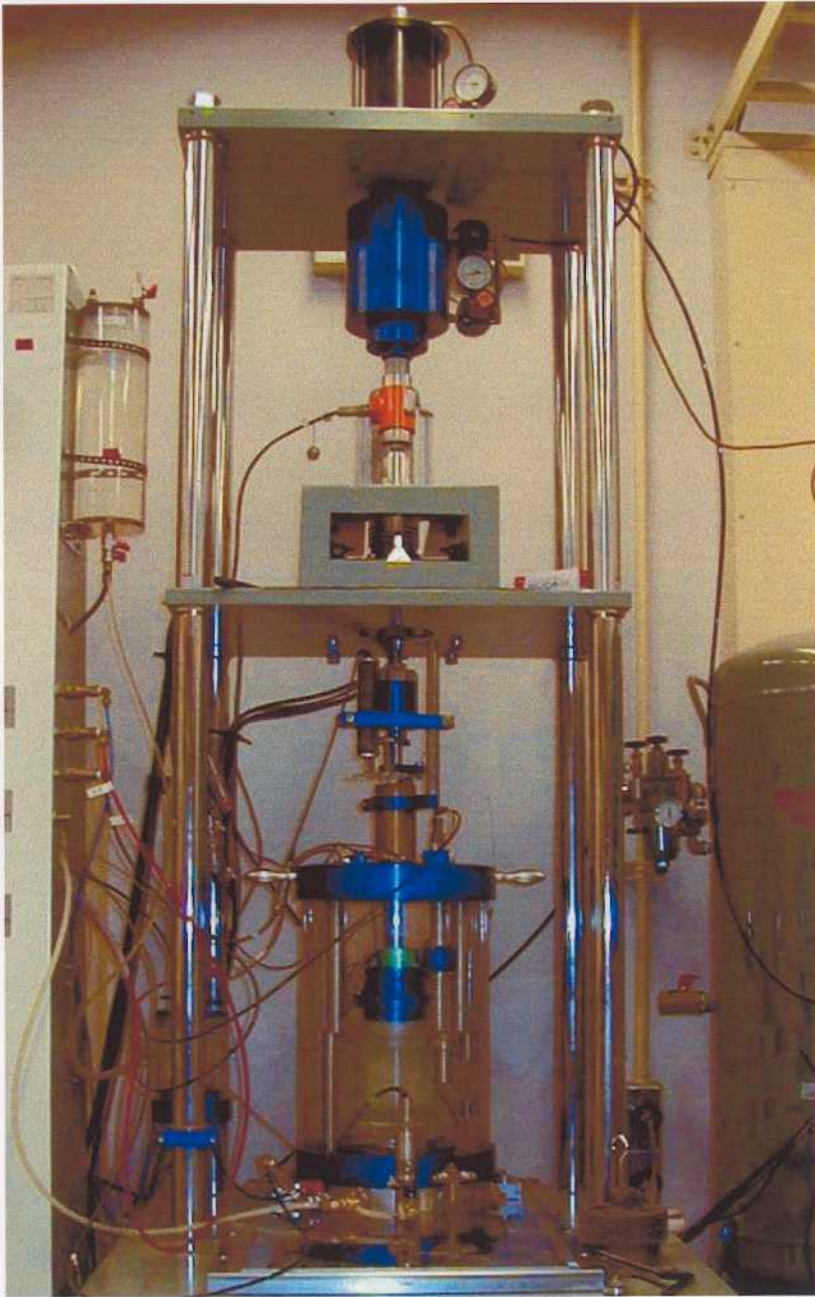


Fig. A-1 Cyclic torsional shear loading test apparatus.

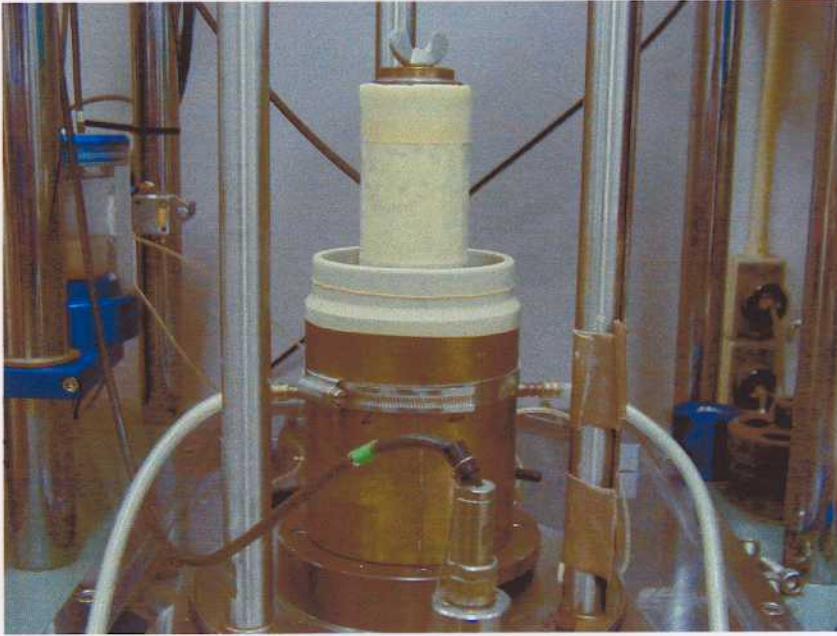


Fig. A-2 Inner and outer molds installed on pedestal of triaxial chamber.

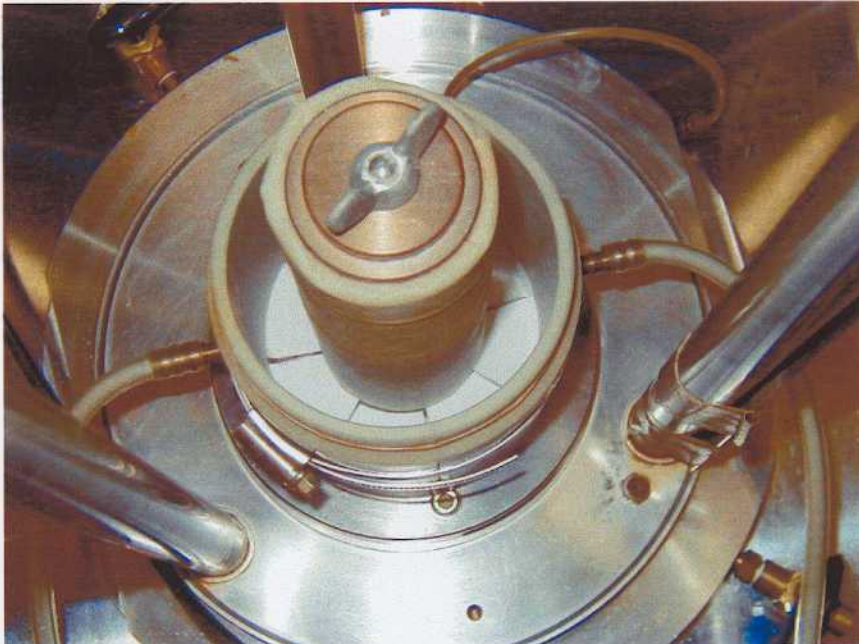


Fig. A-3 The molds shown with segmented filter paper placed on porous stone of pedestal.



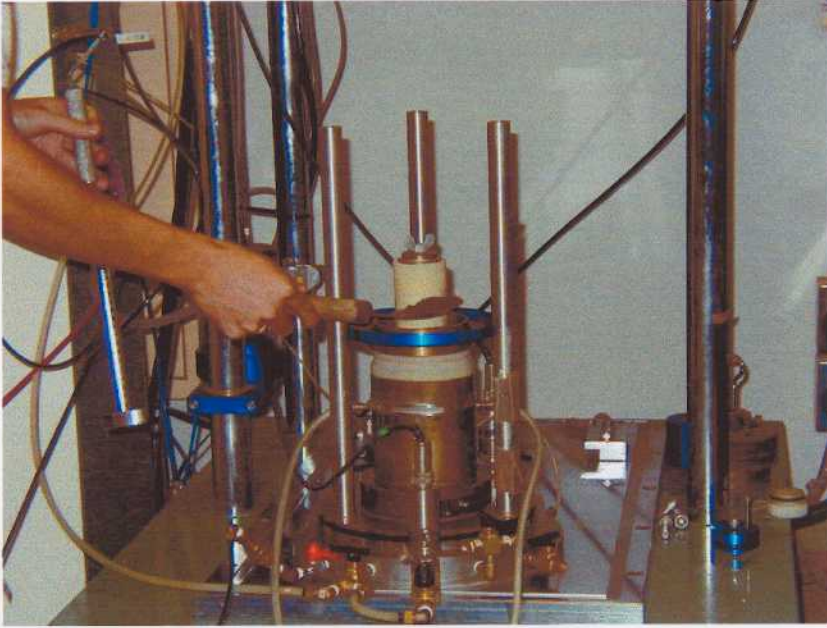


Fig. A-4 The molds with soil filled into their space for preparation of soil specimen.

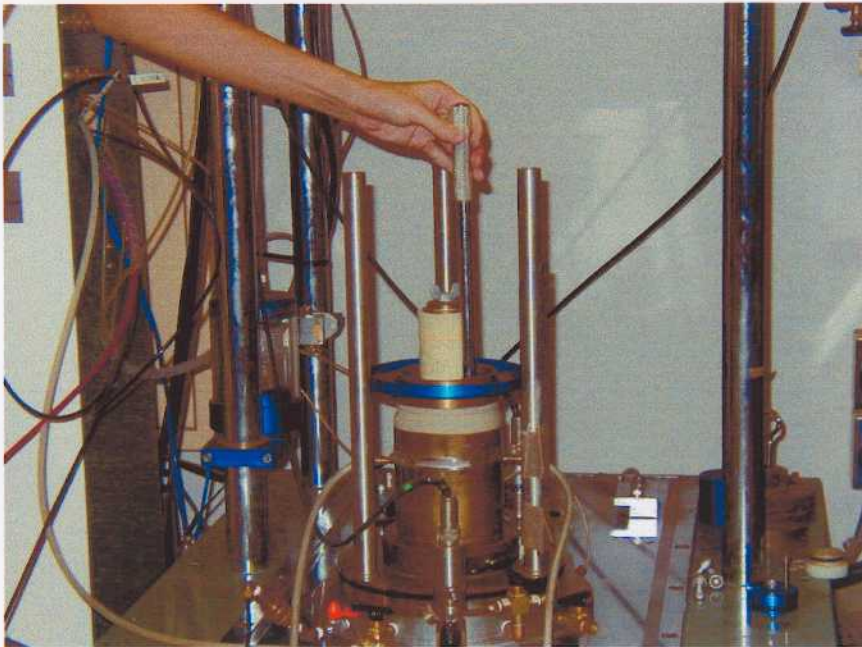


Fig. A-5 Rammer used to compact soil specimen.

## Appendix-B

Example of soil specimen after test



Fig. B-1 Soil specimen after tested and dried in oven.



Fig. B-2 Another view of above soil specimen.

## Appendix-C

Selected results of cyclic torsional shear stress, strain  
and pore water pressure recorded

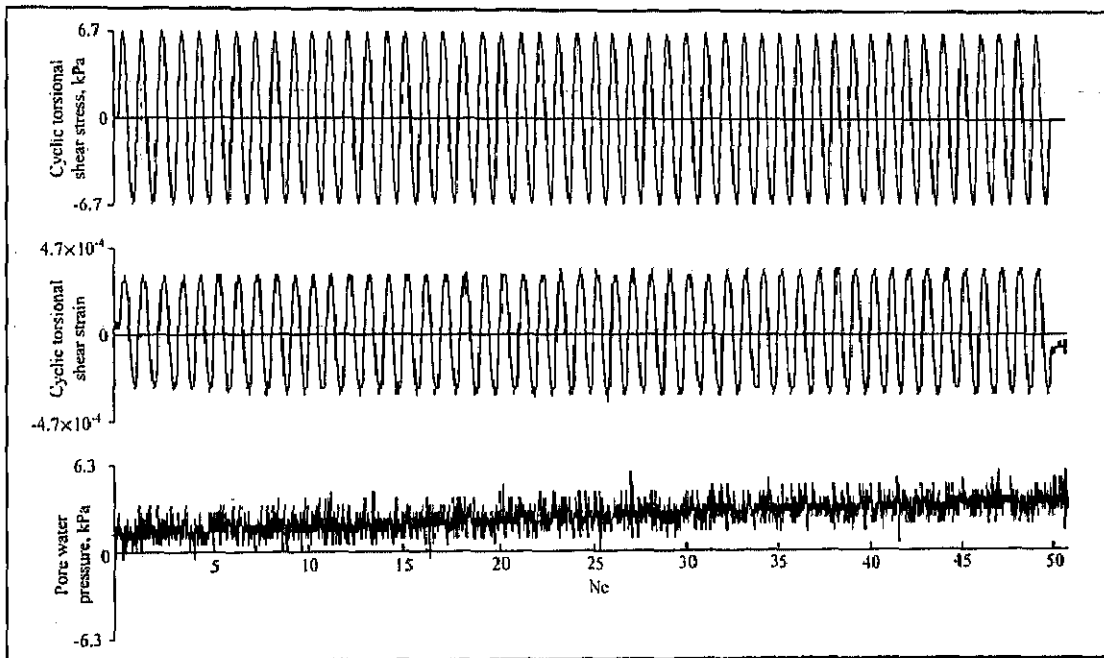


Fig. C-1 Cyclic torsional shear stress, strain and pore water pressure  
versus  $N_c$  ( $\rho = 1.0 \text{ Mg/m}^3$ ,  $f = 0.5 \text{ Hz}$ ).

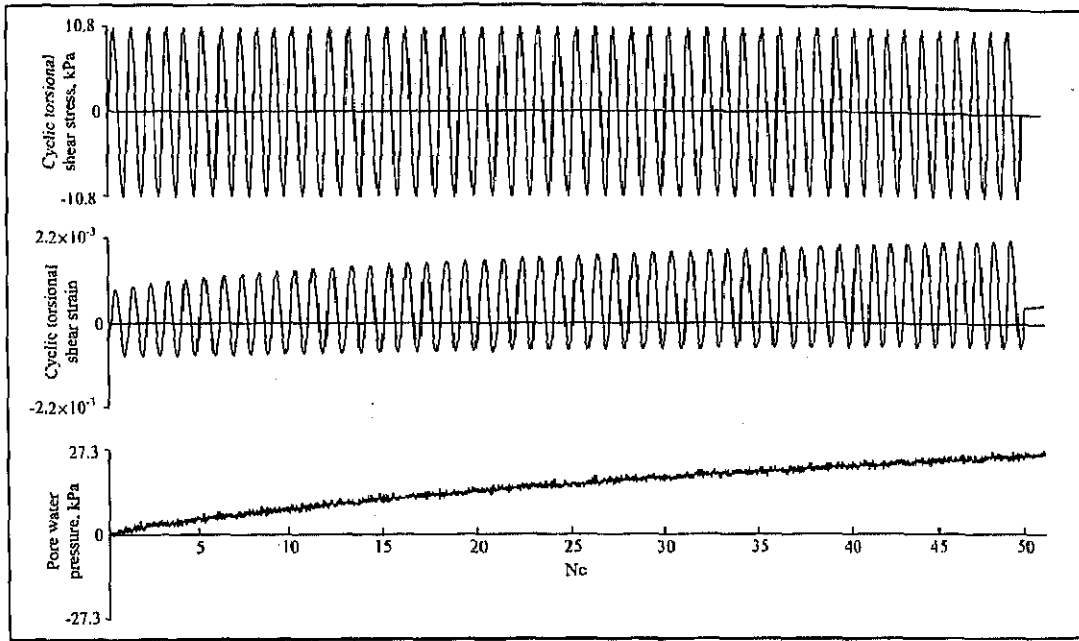


Fig. C-2 Cyclic torsional shear stress, strain and pore water pressure versus  $N_c$  ( $\rho = 0.8 \text{ Mg/m}^3$ ,  $f = 0.2 \text{ Hz}$ ).

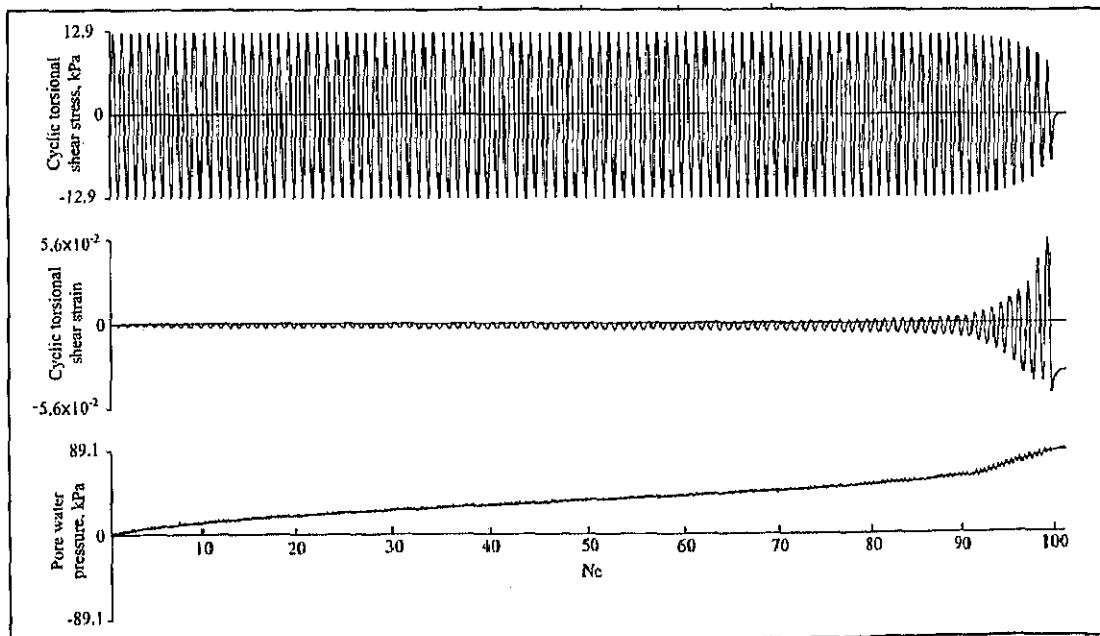


Fig. C-3 Cyclic torsional shear stress, strain and pore water pressure versus  $N_c$  ( $\rho = 1.0 \text{ Mg/m}^3$ ,  $f = 0.2 \text{ Hz}$ ).

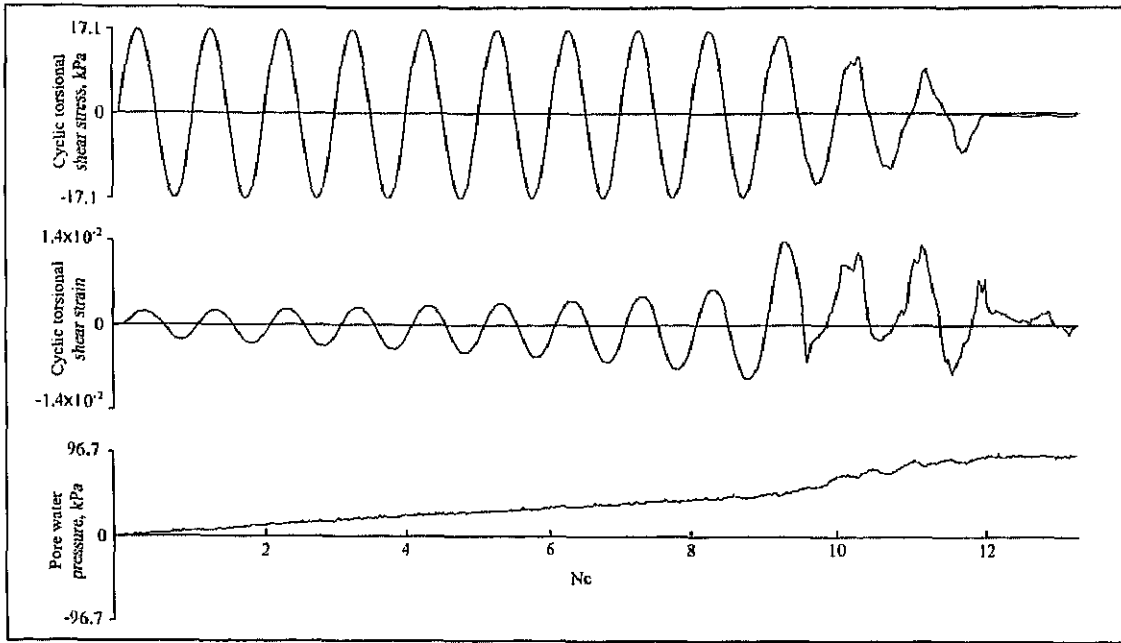


Fig. C-4 Cyclic torsional shear stress, strain and pore water pressure versus  $N_c$  ( $\rho = 1.0 \text{ Mg/m}^3$ ,  $f = 0.2 \text{ Hz}$ ).

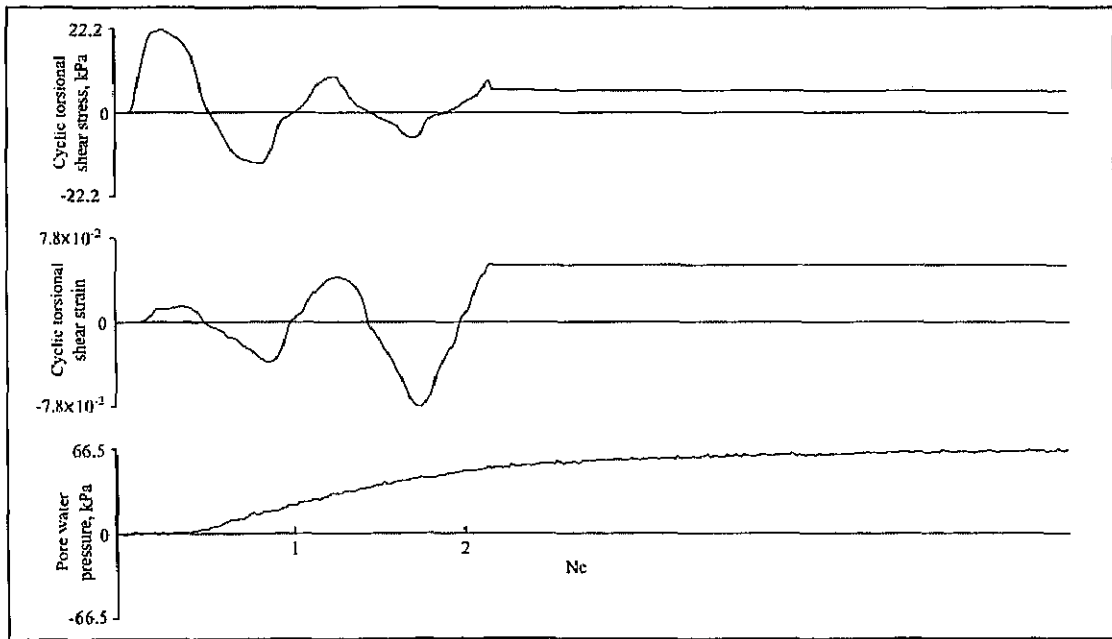


Fig. C-5 Cyclic torsional shear stress, strain and pore water pressure versus  $N_c$  ( $\rho = 0.8 \text{ Mg/m}^3$ ,  $f = 0.2 \text{ Hz}$ ).