**THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING**

CIVL 1100 Discovering Civil and Environmental Engineering



**Report on Geotechnical Engineering Experiment**

**Spring 2024**

Name of student :

Student ID number :

Date of experiment :

Group number :

Date of submission :

Total marks : /50

Submit your lab report electronically to CANVAS by 11:59pm on May 7 – For sessions on April 30; or 11:59pm on May 14 for sessions on May 7.

**OBJECTIVES AND TEST PROCEDURES**

* 1. Introduce the objectives of the laboratory soil liquefaction test. *(2 marks)*
  2. Summarize the procedures of sample preparation and the earthquake-shaking experiment.

(*Please use your own words!*) *(4 marks)*

* 1. During the laboratory test, a few factors influencing the soil liquefaction potential were studied. Please fill in the table with relevant factors and their SI units. *(5 marks)*

*Hints:*

*1. You may find the answers from the PPT presented and your own observations during the lab session*

*2. The slope is NOT a factor that will influence the potential of liquefaction*

|  |  |
| --- | --- |
| Factor | Unit [ ] |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

**CALCULATION AND OBSERVATIONS**

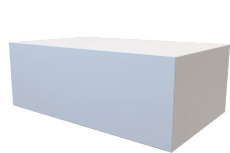
1. Calculate the gravimetric water content (w) and volumetric water content () of the soil sample in your group. *(6 marks)*

(*Apply the described assumption and use the following equations. Please also indicate your group number.*)

Assumption: *Mass of water: 1 kg/litre*

Equations: ,

Group number:



H mm

H mm

W mm

L mm

W mm

L mm

1. Please describe your observation during the lab session **BRIEFLY**.

(e.g.: What happened to the sample, water, and the pile foundation?) *(12 marks)*

Test 1 (Water = 2400 mL; Intensity = 9 m/s2; Without slope)

Test 2 (Water = 2600 mL; Intensity = 9 m/s2; Without slope)

Test 3 (Water = 2600 mL; Intensity = 9 m/s2; With slope)

Test 4 (Water = 2600 mL; Intensity = 12 m/s2; With slope)

**DISCUSSION**

1. Compare results of the experiment of your group with those of others. Discuss the differences in properties of soil samples and results observed during the earthquake shaking. *(9 marks)*

*Hint: If the relation between the parameters and the liquefaction potential of 2 tests is not clear, just write down “NOT CLEAR” in the “Potential” box.*

|  |  |  |  |
| --- | --- | --- | --- |
| Comparison between | Differences in parameters, effects on liquefaction potential | | Discussion  (Difference in results and possible reasons) |
|  | *Parameters* | *Potential* | *------* |
| *Example:*  *Test X, Test Y* | *w* | *Test X >Test Y* | *…… (Your own discussion)* |
| *Intensity* | *Same* |
| *Slope* | *NOT CLEAR* |
| *Test 1, 2* | *w* |  |  |
| *Intensity* |  |
| *Slope* |  |
| *Test 2, 3* | *w* |  |  |
| *Intensity* |  |
| *Slope* |  |
| *Test 3,4* | *w* |  |  |
| *Intensity* |  |
| *Slope* |  |

1. Please carry out small research on slope reinforcement methods. Provide **at least 2 solutions** for slope reinforcement and describe how they work **BRIEFLY**. (*Use ~150 words*) *(12 marks)*