Iqra National University

Department of CIVIL ENGINEERING

Assignment

Geotechnical & Foundation Engineering

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Q: Write a Geotechnical Report on any Civil Engineering Project near to your home town.

Geotechnical Report on Tanda Dam:

Introduction:

Tanda Dam or **Tanda Lake** is a small dam and also a lake view park located in Kohat District of Khyber Pakhtunkhwa the province of Pakistan. The dam supplies water for irrigation to Jurma, Shahpur and many villages by means of canals from Tanda Lake.

It became operational on 17 July 1967, though it was inaugurated by President Ayub Khan in 1962. Covering an area of 405 hectares, the initial capacity of Tanda Dam was to store 65,000 acre feet of water and provide a perennial supply of 260 cusecs of water for irrigation.

Tests Performed on Dam site for Soil Investigation:

Following tests shows their result that are performed on Dam site for the Investigation of Soil of that area that helps in preparing a Geotechnical Report.

1- **Sieve Analysis of Soil**
2- **Determination of Moisture Content of Soil**
3- **Analysis Specific Gravity of Soil**
4- **Determination of Free Swell Index of Soil**
5- **Determination of Liquid Limit of Soil**
6- **Determination The Plastic Limit of Soil**
7- **California Bearing Ratio Test (CBR)**
8- **Unconfined Compression Strength**

Test Results

Soil Type	Silty Clay
AASHTO Classification	A-7-5
% Passing Sieve No.200	25.40
Liquid Limit (L.L) %	26.5
Plastic Limit (P.L) %	31.0
Plasticity Index (P.I) %	5.5
Optimum Moisture Content	10.7
Maximum Dry Density (MDD) (Kg/m^3)	1.94
California Bearing Ratio (CBR) %	10.42
Unconfined Compression Strength (KN/m^2)	209.18
Natural Moisture Content	13.4
Specific Gravity	2.7

Obtained Curve of Liquid Limit is as shown below: (**L.L= 26.5**)
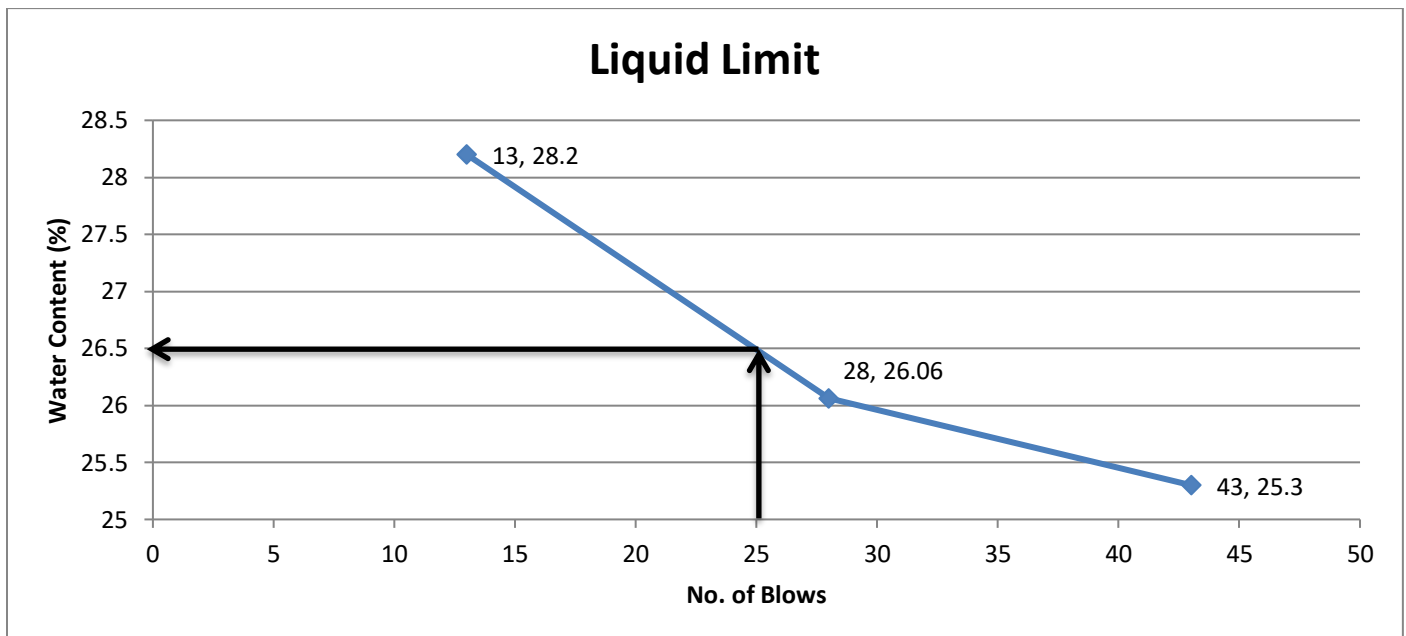
<u>Quiz</u>

Softwares used in Geotechnical Engineering:

A high variety of geotechnical software can be found in this category. **Geotechnical software** is defined as software designed especially in order to deal with geotechnical issues such as slope stability, seismic analysis, foundations, etc. The famous softwares used in the field of Geotechnical Engineering are mentioned below-

1- 3DEEP:
This software is fully integrated with a design software package for automatic model generation. It is a virtual reality software for deep excavations.

2- GEO5
It can be used for Excavation design, Shallow foundation and deep foundation design, stability analysis, settlement analysis and for various other field tests.

GEO STUDIO:
The GeoStudio suite includes eight products which can be used for analysing slope stability, ground water seepage, stress deformations and various other geotechnical problems

3- PLAXIS
PLAXIX 2D , Plaxis 3D is a finite element package intended for the two dimensional and 3 dimensional analysis of deformation and stability of soil structures, as well as groundwater and heat flow, in geo-engineering applications such as excavation, foundations, embankments and tunnels.

4- FLAC3D
It is used in advanced geotechnical analysis of soil, rock, and structural support in three dimen*sions. FLAC3D* is used in analysis, testing, and design by geotechnical, civil, and mining engineers.

5- **<u>EDUSHAKE</u>**

It is normally used for earthquake and Geo Technical analysis,

6- **<u>MATLAB</u>**

It uses mathematical simulation for analyzing structural and foundation problems using series of arrays.

7- **<u>ALLPILE</u>** **<u>(Pile Analysis)</u>**

AllPile is a Windows-based analysis program that handles virtually all types of piles, including steel pipes, H-piles, pre-cast concrete piles, auger-cast piles, drilled shafts, timber piles, jetted piles, tapered piles, piers with bell, micropiles (minipiles), uplift anchors, uplift plate, and shallow foundations.

8- **<u>DARTISLAB</u>**

Dartis Lab is a geotechnical software for easily processing lab test data. Dartis Lab features Water content, Index, Specific gravity, Particle size and USCS classification of soil.

9- <u>DEEPX</u>

DeepXcav is a software program for the design of embedded earth retaining walls with limit-equilibrium and advanced non linear elastoplastic analysis methods. DeepXcav offers a one-stop complete geotechnical and structural solution for deep excavation.

10-<u>DEEPFND</u>

DeepFND is a powerful interactive software for deep foundation and pile design. Axial, lateral, settlement, structural and geotechnical analysis options.

11-<u>Qult</u>

Bearing Capacity analysis for shallow foundations

.Some other simple softwares are: **SEEP2D, STABL, SVFlux, SVSlope, UTEXAS.** These are simple progammes and are not much versatile as compared to the above mentioned softwares.