

NAME: SARMA M ELMOOD

ID: 7828

SECTION: A

SUBJECT: GEOTECHNICAL  
ENGINEERING.

SUBMITTED TO: ENGR. LIAQUAT - ALI,

# ASSIGNMENT.

"Qs # 01"

Q: Write a geotechnical report of any civil engineering project which is close to your home town?

Ans: Physio-chemical properties of soils in Kohat and Bannu districts of North-West Frontier Province (NWFP), Pakistan were determined for better management. Soil samples were collected from two depths i.e., 0-15 and 15-45 cm, respectively from 86 locations in Kohat and 73 in Bannu during 2004. Soil samples were analyzed various soil properties - Results showed that soils of Kohat district varied from clay to sandy loam at both depths with saturation percentage from 25.15 to 71.76 and 16.60 to 82.64% in upper subsurface respectively. Bulk density of the surface soil ranged from 1.10 to 1.759  $\text{cm}^{-3}$ . Soil pH was found to be alkaline in both the depths. Electrical

conductivity of these soils showed 14% area as saline - soils were found to be slightly strongly calcareous in both the depths. Organic matter content of the surface soil showed that 25% samples were medium, where as 75% were low - In Bannu District, soil texture in both the samples depths ranged from clay to loamy sand. Saturation water percentage of the surface soils and subsoils ranged from 23.98 to 76.81 and 24.37 to 76.81 % respectively. Bulk density of the surface soil ranged from 1.01 to 1.62 with an average of 1.31  $g\ cm^{-3}$ . Soil pH showed alkaline reaction in both the depths. According to ECE and SAR, 21% of soils were classified as saline and 4.1% sodic in nature. Soils of both the depths were moderately to strongly calcareous. 26% of surface soil were low and 74% medium in organic matter.

# "Quiz"

## "Qs: 01"

Q: Write a note on different softwares which are used in geotechnical engineering.

(1) 3DEEP:

This software is fully integrated with a design software package, for automatic model generation.

It is virtual reality software for deep excavations.

- Unlimited walls and number of excavations
- Multiple stages in same model.
- Single button integration from DEEP 2008.
- Automatic topographical triangulation: simply enter your survey points and 3DEEP does the rest.
- Multiple support types.
- Design opposite walls with grutls from DEEP 2008 export to 3DEEP.
- View walls and footings.

- Automatic model generation and wizard from deep 2008 -
- Multiple wall type.
- Text editor model generator with easy to use commands.

#### (v) ACCECLAC:

The programme analyses the behaviour of the rock slopes under seismic conditions. It evaluates the displacements of a rock block subject to dynamic forces, on the basis of a given accelerogram.

The use of a calculation method based on a given accelerogram for rock slope stability analysis allows one to take into account the duration of the intensity of the accelerogram itself (this not being the case with the normally used limit equilibrium methods).

This allows a more realistic estimation of the effects of a seismic event on a potentially unstable rock block.

The programme requires the shape of the rock slope face, the geometrical parameters of the rock mass, the shape of the sliding surface and an option, of the water

table.

In order to create a synthetic accelerogram, one should define the end maximum value of the foreseen seismic acceleration, the number of waves and their characteristic period. A recorded real accelerogram can also be used.

### (3) ADONIS:-

Adonis is free finite element software for geo-engineers. The goal of the ADONIS development is to improve the modeling and computational simulations in geo-technical engineering.

ADONIS is easy to use yet powerful geo-technical engineering tool for the linear and non-linear analysis of geotechnical problems.

### (4) ALL PILE:

Allpile is a Windows-based analysis programme 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, micropile (mini piles), uplift anchors, uplift plate

and shallow foundations.

(5) ALP:-

The easy way to analyse soil structure interaction of a laterally loaded pile when it comes with ~~the only one in class~~ to laterally loaded pile design software, Alp makes things simple. This laterally loaded pile analysis software models soil shear failure and non-linear soil behaviour, calculating deflection down the pile together with moments and shear forces within the pile.

6) ALP 99:-

Axially loaded pile: Elastic pile supported with elasto-plastic springs.

7) AMRETAIN:-

AMRetain is a software for checking single or double retaining walls made of Arcelor Mittal sheet piles.

It has been developed by Terrasol for Arcelor Mittal, and is based on the commercial software k-Rea (also developed by Terrasol). AMRetain is distributed by Terrasol,

but the licenses requests should be sent to ArcelorMittal.

### (7) ROCK PLANE:

Rockplane is a software tool for the evaluation of localized instability rocky elements affected by seismic movements and / or by presence of water pressures by within intersurface features. The software provides slide and overturning risk safety factors that enable verification of the stability of the block and as required the design of stabilization of works using active or passive anchors and nails.

### (8) APILE:

Apile is used to compute the axial capacity, as a function of depth, for a driven pile in clay, sand or mixed soil profiles.

### (9) AXILTR:

Program AXILTR, Axial Load-transfer, consists of a main routine and two sub-routines. The main routine feeds in the input data, calculates the input effective overburden stress, and determines whether the load is axial down-directed



pullouts or if uplift/down drag forces develop from swelling or consolidating soil. The main routine also prints out the computations. Subroutine BASEL calculates the displacement at the base for given applied down-directed loads at the base. Subroutine SHAPL evaluates the load transferred to and from the shaft for relative displacements between the shaft and soil. An iteration scheme is used to cause the calculated applied loads at the top (butt) to converge within 10 percent of the input load applied at the top of the shaft.