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Section :- "B"

Semester :- "Six"

Submitted to :- Engr Liaqat Sir

Quiz No :- 01

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QNo 1:- write a note on different surface which are used in geotechnical engineering?

Ans:- Following are the different surface used in geotechnical engineering?

① Deep Natural Reality Surface for Deep Frictionals:-

This is the first surface fully integrated with a design software package for automatic model generation.

For the first time use can easily translate to your clients what your work is all about before putting a single shovel in the ground.

- ⇒ Single button integration from deep 2003.
- ⇒ multiple stages in same model.
- ⇒ multiple support types.
- ⇒ view walls and footings.
- ⇒ multiple well types.

② ALP - LATERAL - LOADED PILES ANALYSIS SOFTWARE:-

enable you to analysis laterally loaded with ease producing outputs such as composition - graphs in mines. The software predicts the process horizontal

moment, Shear Force and bending moment. included in a pile when subjected to lateral load, bending moments and imposed Soil displacement lateral load and bending moment can be applied at any point down the pile, as well as partial or full lateral or bending moment restraints.

③ Am Retains Software:- It is a software of checking single or double retaining walls made of Arcelex or Astals, sheet, It has been developed by Terrasol for Arcelex mitted and is based on commercial software K-Rra.

⇒ Am Retains calculation is based on the subgrade reaction calculation method, but also included 3 checks according to the French standard NF P94-282

(i) Failure on the passive side -

(ii) Balance of vertical forces -

(iii) Krang

It also enable the calculation of double wall and near wall.

Result :-

Terzaghi and SPT Valve Based :-

S No	Reformation Marking	Bulk density (Ref)	MC	L.L	P.L	classification of soil depth	Safe Bearing Capacity (TSF)	
1	B.H 1	106.5	11.2	23.7	20.9	ML	0.44	0.8
2	B.H 2	105.8	10.5	23.5	20.7	ML	0.49	1.0
3	B.H 3	103.7	11.6	19.4	19.4	ML	0.47	0.5
4	B.H 4	104.1	7.5	21.4	21.4	ML	0.43	0.42
5	B.H 5	105.3	12.5	22.5	20.0	ML	0.45	0.33

BH / TP ID	BH-1	BH-2	BH-3	BH-4	BH-5	TP-1	TP-2	TP-3
$W_1 = \text{wt of core cutter + soil}$	1.949	1.894	1.945	1.927	1.916	0.485	0.478	0.481
$W_2 = \text{wt of core cutter (lbs)}$	0.969	0.941	0.971	0.969	0.947	0.185	0.185	0.295
$W_3 = \text{wt Soil } (W_1 - W_2) \text{ (lbs)}$	0.980	0.954	0.974	0.958	0.969	0.299	0.293	0.295
$\text{Vol of core cutter (CA)}$	0.0092	0.0072	0.0092	0.0092	0.0092	0.0028	0.0023	0.0028
$\text{Density} = W_3 / \text{Vol (lbs/CA)}$	106.5	105.8	103.7	104.1	105.5	106.7	104.6	105.4

BH ID	BH-1	BH-2	BH-3	BH-4	BH-5
$w_1 = \text{wt wet soil} + \text{Cont (g)}$	37.91	47.00	33.20	42.19	27.60
$w_2 = \text{wt of dry soil} + \text{Cont (g)}$	35.20	43.70	31.10	39.00	25.90
$w_3 = \text{wt of Container (g)}$	11.10	12.30	13.00	1.40	12.30
$w_w = \text{wt of water (g)}$	2.71	3.30	2.10	3.19	1.70
$w_s = \text{wt of dry soil } (w_2 - w_3) \text{ (g)}$	24.10	31.40	18.10	37.60	13.60
$C = w_w / w_s \times 100 (\%)$	11.2	10.5	11.6	8.5	12.5

NATURAL Moisture Content

BH/TP ID	TP-1	TP-2	BH-02
Shrinkage limit	20.8	23.23	27.175
Shrinkage Ratio	1.8	2.0	1.6

Shrinkage Limit

Borehole ID	Material	Soil Compressibility				
		Compression Index	Swell Index	Co-efficient of Secondary Compression	Re-compression Index	Co-efficient A Consolidation (cm^2/sec)
BH-02	Silt	0.256	0.0501	0.052	0.05	0.669
BH-01	Clay	0.153	0.255	0.03	0.0255	0.0022

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Ques write a geotechnical report of any engineering project which is closed to your hometown?

Ans Introduction :- This report is carried out for geotechnical investigation of boundary wall BOQ is Peshawar Cantt. The purpose of this investigation was to evaluate the surface conditions on the site in the area of the proposed building and to provide geotechnical bearing capacity and recommendation for the construction.

Project Description :- The 2331 Kanal property is located in a under developed region of BOQ Peshawar Cantt. The project will include construction of a new boundary wall occupying the entire property.

Geologic Overview :- The project site is located in the Peshawar road near Cantt.
 → It is an alluvial plain of 3000 km² and its catchment extent Khutab range, Hind Kush range. The mountains bordering the alluvial plain are mostly composed of late tertiary age thrust, assumed that these rocks extend as basement rock Solwala group. During the upper Miocene and Pliocene the basin has

(b)

Filled with silty clay, sand and gravels.

Seismicity:-

⇒ This construction site belong to seismic zone BA with peak horizontal acceleration varying from 0.07 to 0.14g

Sub surface:-

Five exploratory borings and three pits were excavated in the area of the proposed boundary wall. In general, our exploratory borings encountered predominantly silt upto 6ft depth and upper clayey soil upto 22ft depth.

Laboratory test:-

unconfined compression test, Direct shear test and consolidation test were performed on undisturbed soil specimens obtained from boreholes and test pits using Shelby tube and block sampler. Additionally Atterberg limit test. Sieve analysis, moisture content tests were conducted on disturbed samples for classification purpose.

Ground water: - Ground Seepage water table was encountered in borehole No 3 and 4 at 31ft depth from ground level.

Conclusion And Recommendation: - Keeping in view results of the field and lab tests. It is constructed that bearing capacity of 0.60 TSP may be adopted for strip foundation at 6th depth for the construction of boundary wall BOQ Peshawar Cantt.

-> Since the shrinkage value of foundation lies between 30-37, which shows soil class of very poor quality. It is recommended to replace the foundation soil with well graded gravel and properly compact it.

=> There is no risk of chemical attack on concrete as the chemical content of soil is in permissible range.

=> In case of masonry wall provide Rec column of soft interval and strap beam at the top of foundation Rec slab of reduce differential settlement