

ASSIGNMENT & QUIZ

SUBJECT: Geotechnical Engineering

SECTION : B

MODULE : 6th

ID : 7857

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QUESTION :

Write a geotechnical report on any civil engineering project near your area?

Geotechnical Report on Reconstruction of Road

ABSTRACT:

This is the geotech report of reconstruction of Road and the objective of this is to describe the process / progress and the work plan.

- This report also indicates standard of skills, workshop and reporting to be applied.

INTRODUCTION:

The document of the project has been prepared to assist in the planning and reporting of Geotechnical investigation of Reconstruction of road.

OBJECTIVE AND SCOPE:

The objective for their guideline are as

- To describe the process of work
- To indicate standard of skills and reporting.
- The following things need to be considered to assess the number, location and depth of the test.

- 2) Expected Sub-surface Conditions.
- 2) Requirement to minimize contractor and NHA risk of changes during the construction program due to variation in sub-surface condition.

STAGES OF INVESTIGATION:

1. Field Reconnaissance Surveys:

It is necessary for F.R.S to be conducted as the 1st stage of geo-investigation.

Information on the following should be obtained :

- Legal and physical aspect of access to site.
- Availability of any source, service or supplies of water, electricity and earthwork plant.
- Buried or overhead service.
- Photograph of surface condition.
- Traffic control requirement.

2. Desk Top Study :

Every desk top study should contain following.

- Design Drawing of previous structure.
- Previous investigation report, bore holes, penetrometer result etc.

- Geological map, survey data and records.
- Hydrological data
- Aerial photographs.
- Local knowledge and resources.

3. SITE INVESTIGATION:

A comprehensive report on characteristics, nature and variability of material should be carried out

→ The investigation should include sampling of soil, logging of existing cut slope and excavation, field and laboratory testing

4. Embankment and Foundation:

The embankment investigation considered the following issues.

- The range of materials in embankment foundation and where appropriate the pavement subgrade.
- Settlement potential
- Stability
- Hydrology, moisture regime and drainage requirements
- Special construction requirement.

5) Cutting In Soil:

The cutting investigation should contain the following issues.

- The range of material in cutting and pavement subgrade.
- Slope stability and subgrade strength.
- Suitability of cut material for base course and sub-base.

6. Soft/Wet Areas:

Where soft/wet soil are found, particularly in the vicinity of low embankment or in shallow cutting, additional investigation sampling and testing should be carried out.

- The location and characteristics of any soft/wet areas or spring should be recorded and reported.
- The treatment required to enable construction on these kind of roads across or through these areas should also be recommended.

7. Embankment Material:

The suitability of material within the cutting should be assessed for embankment or pavement construction. It should be made as to the use of selected fill material within one meter of pavement subgrade level.

B. Road Reconstruction and Widening:

The investigation should include

- Falling weigh Deflectometer testing for assessing the structural adequacy of existing pavement.
- Sampling and testing of existing pavement material
- In-situ test on the subgrade using peith sand Penetrometer or Dynamic cone penetrometer
- Subgrade Sampling for moisture content determination.

GROUND WATER :

Ground water must be investigated to determine.

- Level of W.T
- Occurance of perched water table condition and its level.
- The presence of Sub-Arterian conditions.

GEOTECHNICAL REPORT :

The report should provided sufficient information to allow tenders to prepare bids and to manage the principles disk on any subsequent contractual claims. The alignment, together with the location and result of all investigation sampling and testing should be detailed in Report.

- The report should identify the extenty nature and variability of all soil types and shall draw particular attention to the following matter.

QUESTION:

Write a note on software which are used in geotechnical Engineering?

ANSWER:

A 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.

1. 3 DEEP:

(Software by Deep Excavation LLC)

This software is fully integrated with a design software package for automatic model generation. It is virtual reality software for deep excavations. Ultimate walls and number of excavations multiple stages in same model.

2. ADONIS:

(Software by Roozbeh Geraili Mikola, PhD).

ADONIS is free finite element software for Geo-Engineers. The goal of the ADONIS development is to improve the modeling and computational simulation in geotechnical engineering. ADONIS is an easy to use yet powerful geotechnical engineering tool.

3. ACCECALC:

(software by geo and soft international)

The program 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.

4. ALLPILE:

(software by civiltch, Inc)

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, piles with bell, micropiles.

5. ALP :

(software by Oasys).

The easy way to analysis soil structure interaction of a laterally-loaded pile. When it comes to laterally loaded pile design software, Alp makes thing simple. This laterally loaded pile analysis software models soil shear failure and non linear.

6. ALP 99:

(Software by Arnold Verweij)

Axially loaded pile. Elastic pile supported by elastoplastic springs.

7. AMRETAIN:

(Software by Terrasol)

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

8. Analysis Of Rocky Elements - Rock Plane:

(Software by Geostru Software)

RockPlane is a software tool for the evaluation of localized instability rocky elements affected by seismic movements and/or by presence of water pressures within intersurface fractures. The software provides slide and overturning risk safety factors

9. APILE:

(Software by Ensoft Inc)

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

20. AXILTR :

(software by vulcanhammer)

Program AXILTR, Axial Load-Transfer, consists of a main routine and two subroutines. The main routine feeds in the input data, calculates the effective overburden stress and determines whether the load is axial down-directed, pullout or uplift / down drag.