

UNIVERSITY OF PRETORIA
DEPARTMENT OF GEOLOGY
ENGINEERING GEOLOGY GLY363

EXAMINATION: JUNE 2008

Examiners: Internal: Prof J L van Rooy
External: Mr D H Wessels

Time: 90min
Marks: 75

ANSWER ALL THE QUESTIONS / *BEANTWOORD AL DIE VRAE*

QUESTION 1

Explain how the mode of transport of the following transported soils as well as the climate may influence their engineering geological properties:

- 1.1 Colluvium - *gravity* (9)
- 1.2 Alluvium - *river* (7)
- 1.3 Aeolian soils - *wind* (4)

[20]

QUESTION 2

List the typical mode of slope failure that may be expected in the following soils/rocks and explain the reasons for this failure mode:

- 2.1 Residual granite near Nelspruit (3)
- 2.2 Pietermaritzburg shale - *disturb* (3)
- 2.3 Strubenkop shale - *bedding plane* (3)
- 2.4 Table Mountain sandstone (3)
- 2.5 Drakensberg basalt (3)

[15]

QUESTION 3

A road must be constructed between Bela Bela and Pretoria. Describe the expected soil profile on each bedrock type encountered along the road centerline and give your opinion on the foundation conditions in the different surficial materials and the suitability of the different materials in the soil profile for possible use in highway construction.

The rock types occurring along the centerline are:

- 3.1 Rooiberg Felsite - 12km (6)
- 3.2 Karoo basalt - 40km (4)
- 3.3 Lebowa granite - 2km (7)
- 3.4 Karoo sandstone and shale - 2km (8)
- 3.5 Magaliesberg quartzite - 2km (6)
- 3.6 Marico diabase - 0,5km (4)
- 3.7 Silverton shale - 8km (5)

Sub-base low infiltration = high run off

*Good foundation
Aggregate & concrete*

[40]

TOTAL: [75]