

**REPUBLIC OF SOUTH AFRICA
DEPARTMENT OF MINERAL RESOURCES
EXAMINATION FOR THE MINE SURVEYORS CERTIFICATE OF COMPETENCY**

DATE: 12 April 2012
TIME: 12:30 to 15:30 (3 Hours)

TOTAL MARKS: **100**
TO PASS: **50**

SURVEY III

- Note:**
- (1) Work to 1 second of arc and 0,001m.
 - (2) Trigonometrical functions must be shown to six (6) decimal places.
 - (3) **All steps** and **CHECKS** must be shown.
 - (4) All **calculations** and **answers** to be **shown clearly**.
 - (5) Sketches have been reduced and are not to scale and attached herewith.
 - (6) The make and model number of your calculator **must** be written on the front cover of your answer book.

A new discard dump needs to be constructed on a piece of ground with the natural ground level sloping evenly from east to west at an inclination of $-1:47,247\text{m}$. On the eastern side of the proposed dump is a steep incline and the start of the dump should be 40m west of this incline. The discard dump must be constructed in different terraces with sides at 37 degrees, height from one terrace to another is 10,0m and the flat portion between the terraces must be 20,0m. The final height of the dump on the western side must be 30,0m and on the eastern side 20,0m.

Following are field notes from the survey field book:

1. Angle CAB = 87:41:08
2. Angle DAB = 31:44:34
3. Angle CBA = 59:15:38
4. Angle DBA = 112:13:13
5. Co ordinates of A: Y = 361,628 X = 811,226
6. Co ordinates of B: Y = 111,863 X = 1 237,560

Points C and D are situated on the top of the dump while B is situated on the bottom of the dump.

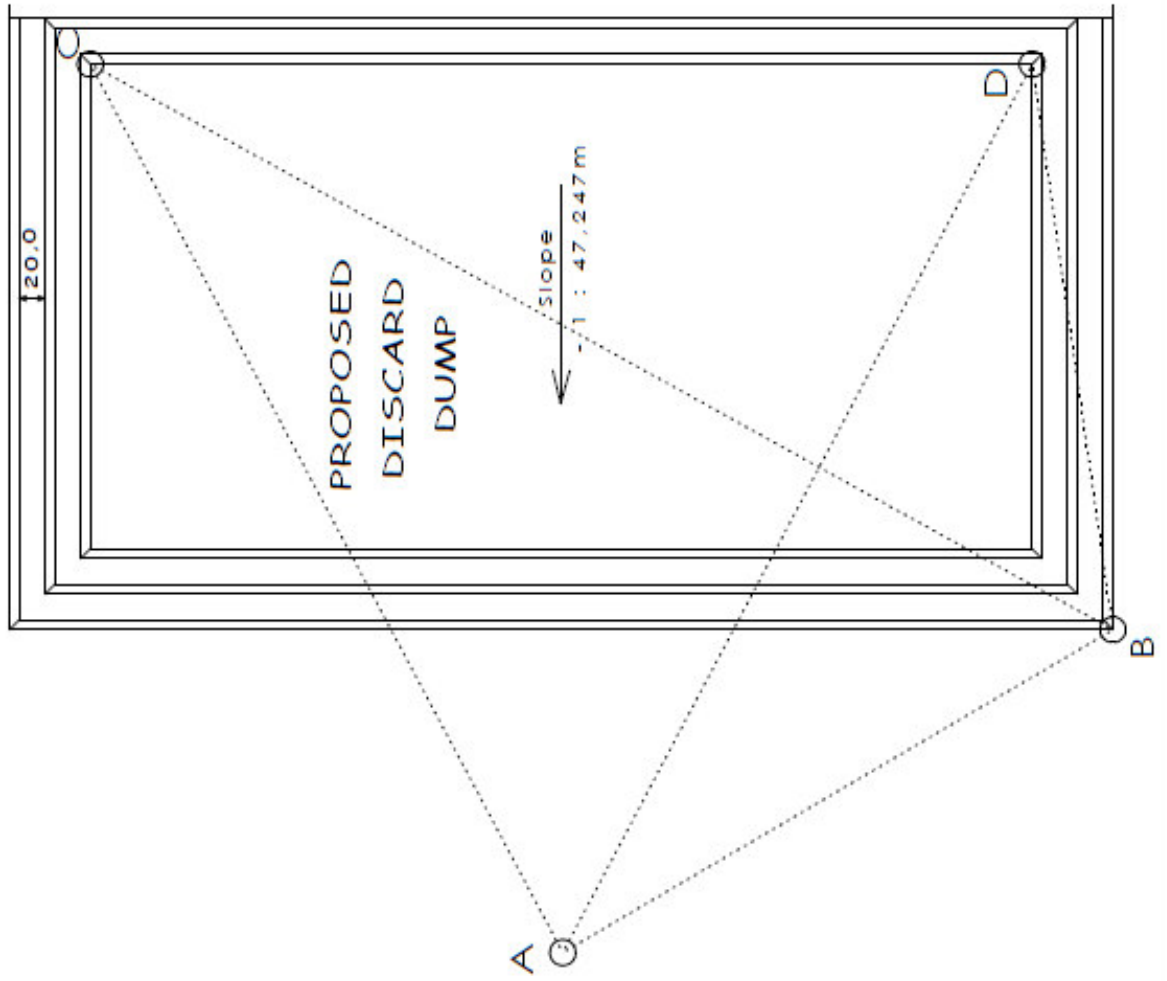
It is proposed to create a slurry dam of 275,0m by 630,0m and 15,0m high within the discard dump. The sides of the slurry dam must have a slope of $-1:1,327\text{m}$.

Calculate the final volume for the proposed discard dump in cubic metres to the nearest 1 decimal place.

[100 marks]

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SURVEY III - APRIL 2012



PLAN - NOT TO SCALE

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SECTION EAST WEST - INCL. SLURRY DAM

SLURRY DAM



PLAN - NOT TO SCALE