

**REPUBLIC OF SOUTH AFRICA
DEPARTMENT OF MINERALS AND ENERGY
EXAMINATION FOR THE MINE SURVEYORS CERTIFICATE OF COMPETENCY**

DATE: 11 April 2003 (Friday)
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) All steps and checks must be shown.
 - (3) Logs and functions must be shown to six (6) decimal places.
 - (4) Sketch are not drawn to scale and attached herewith.
 - (5) The make and model number of your calculator must be written on the front cover of your answer book.

QUESTION 1

B and C are points surveyed on the outcrop of a quarry. D is a point on the intersection of the footwall and the highwall face of the quarry. A is a point on the intersection of the surface and the highwall of the quarry. It is required to make the highwall safe by blasting at a dip of 14° to the horizontal from G to H and filling the quarry with blasted material at the same dip.

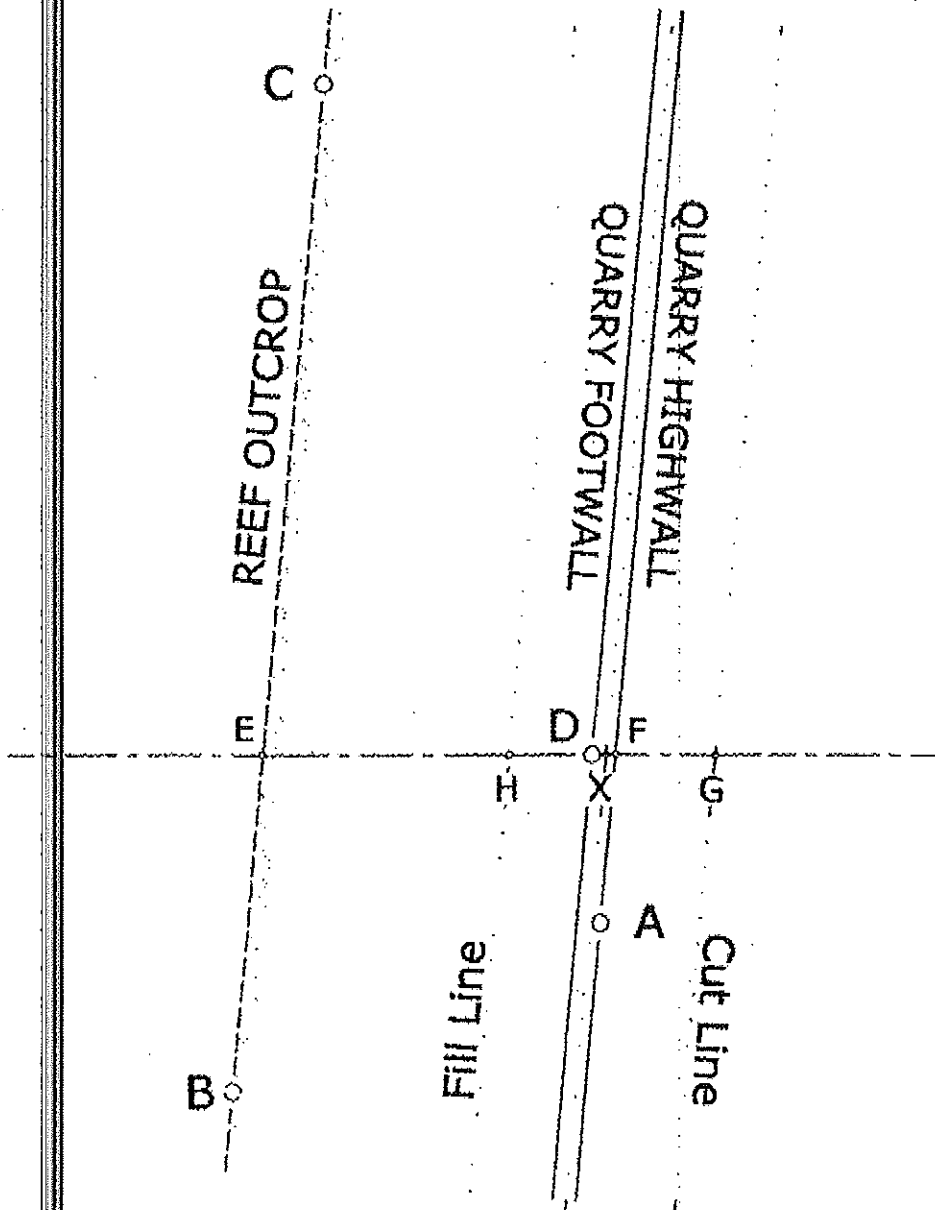
Point	Co-ordinates		Elevation
	Y	X	
A	+789.214	+23.588	+1144.863
B	+1012.160	+123.588	+1142.667
C	+959.666	-476.412	+1133.411
D	+794.662	-76.412	+1104.316

Assume the reef and surface planes are evenly dipping.
Assume the highwall height has been maintained throughout the area shown.

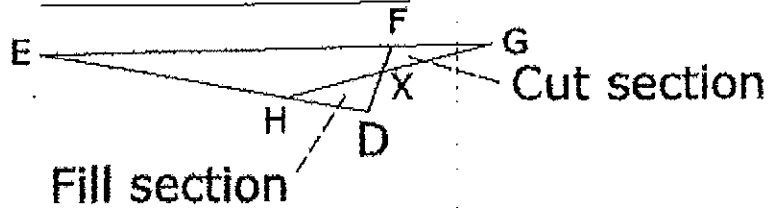
- (a) Calculate the co-ordinates of E and F, on the section EDF along the direction of true dip, intersecting the outcrop and highwall respectively.
- (b) Calculate the co-ordinates of points G, X and H if the bulking of the blasted material is 35%.
- (c) Calculate the percentage that the width (section) of the quarry will be increased to make it safe.

[100 marks]

PLAN (NOT TO SCALE)



SECTION (NOT TO SCALE)



Survey III April 2003