AN ROINN OIDEACHAIS

LEAVING CERTIFICATE EXAMINATION, 1993

# TECHNICAL DRAWING - HIGHER LEVEL
# PAPER II(B) - BUILDING APPLICATIONS

MONDAY, 21 JUNE - MORNING 9.30 to 12.30

(200 Marks)

## INSTRUCTIONS

(a) **Answer four questions.**
(b) **All questions carry equal marks.**
(c) **Construction lines must be shown on all solutions.**
(d) **Write the number of the question, distinctly, on the answer paper.**
(e) **First or third angle projection may be used.**
(f) **All measurements are given in metres.**

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1. Draw a perspective view of the structure shown in Fig. 1. The picture plane passes through the corner A, the spectator S is 7.5m from the corner A and the horizon line is 8.5 m above the ground line.
Use auxiliary vanishing points where appropriate.

Scale 1 : 100

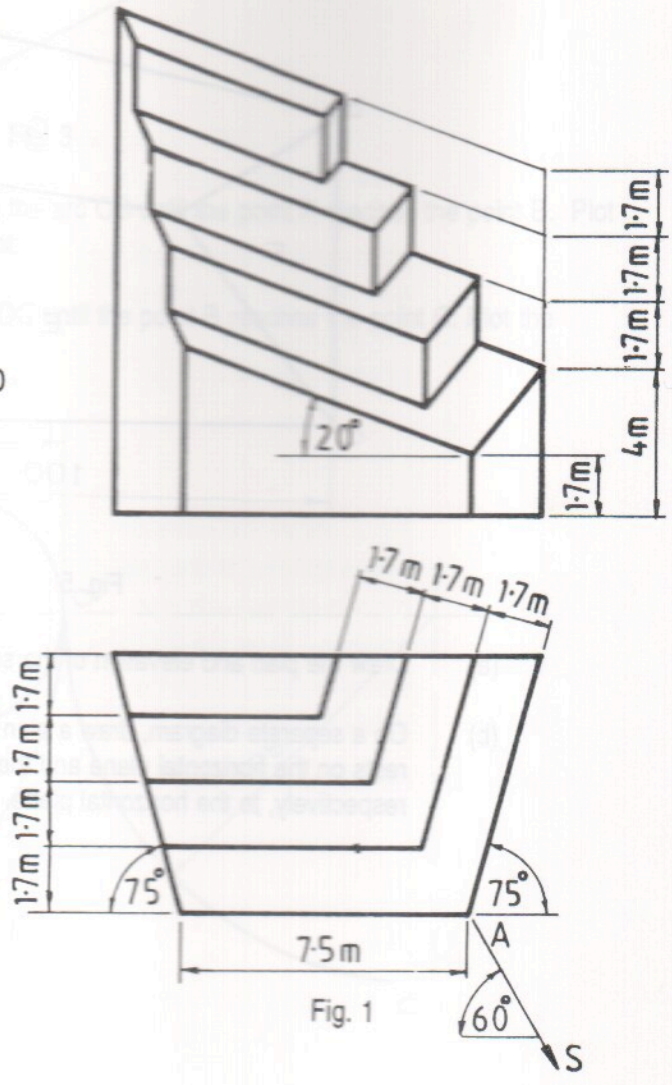



Fig. 1

2. Fig 2 shows the outline plan and elevation of roof surfaces and a dormer window. The surface C has a pitch of 40° and the surfaces A and B have a pitch of 35°. The line of intersection between the surfaces C and D has a true inclination of 30° to the horizontal plane. The dihedral angle between the surface D and the dormer surface E is 135°.

(a) Draw the given plan and elevation.

(b) Determine the dihedral angle between the surfaces B and C.

Scale 1 : 100

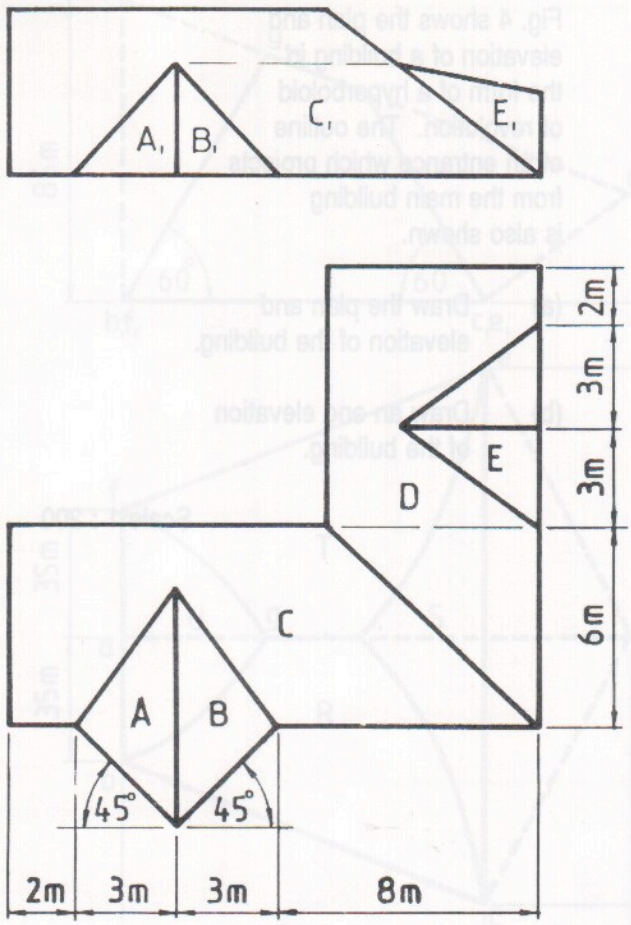



Fig. 2.

3. Fig. 3 shows the outline plan and elevation of a monument. It is in the form of a spherical dome on a cylindrical base and is positioned on a raised surface.

Draw the given views and determine the shadows and shade in plan and elevation when the direction of the light is as shown in the figure.

Scale 1 : 100

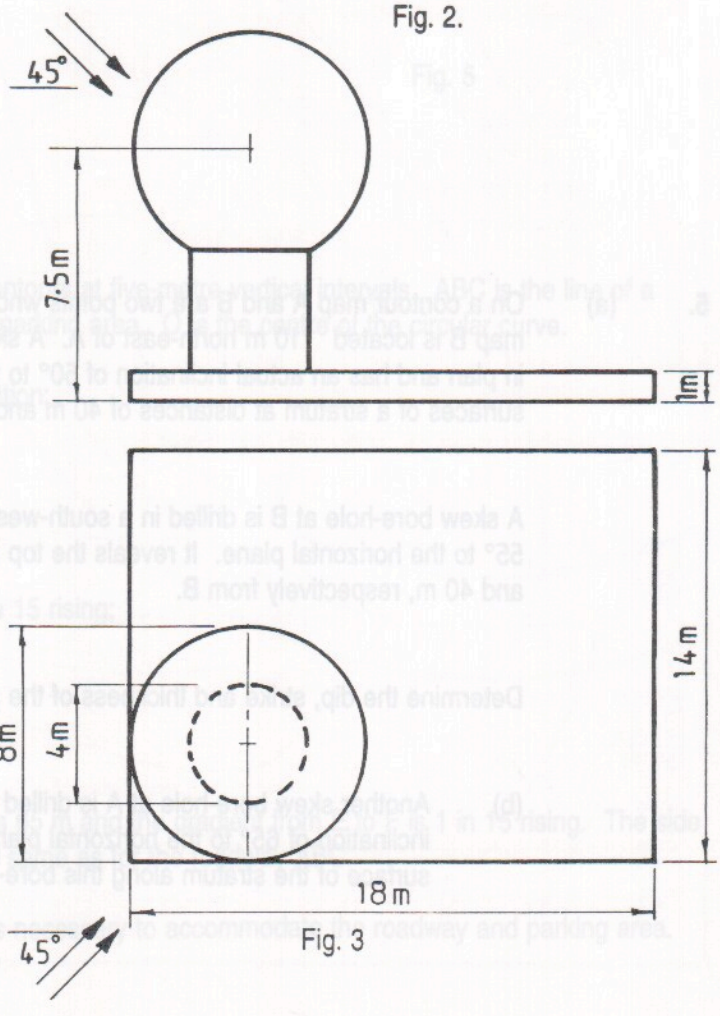



Fig. 3

4. Fig. 4 shows the plan and elevation of a building in the form of a hyperboloid of revolution. The outline of an entrance which projects from the main building is also shown.

(a) Draw the plan and elevation of the building.

(b) Draw an end elevation of the building.

Scale 1 : 200

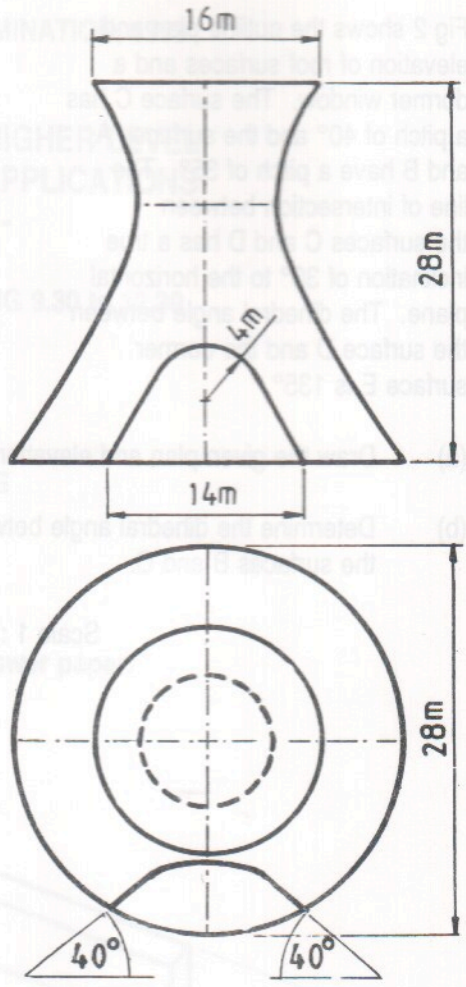






Fig. 4

5. (a) On a contour map A and B are two points whose altitudes are 75 m and 95 m, respectively. On the map B is located 110 m north-east of A. A skew bore-hole at A is drilled in a south-easterly direction in plan and has an actual inclination of 50° to the horizontal plane. It reveals the top and bottom surfaces of a stratum at distances of 40 m and 65 m, respectively from A.

A skew bore-hole at B is drilled in a south-westerly direction in plan and has an actual inclination of 55° to the horizontal plane. It reveals the top and bottom surfaces of the stratum at distances of 15 m and 40 m, respectively from B.

Determine the dip, strike and thickness of the stratum.

(b) Another skew bore-hole at A is drilled in a south-westerly direction in plan and has an actual inclination of 65° to the horizontal plane. Determine the distance from A to the bottom surface of the stratum along this bore-hole.

Scale 1 : 1000

6. Fig. 5 shows the outline plan and elevation of a roof. The hyperbolic paraboloid surfaces R and T are parts of the larger hyperbolic paraboloid surfaces ABCD and ADEF, respectively, as shown by the dotted lines. The roof surfaces U and S have a pitch of 60°.

(a) Using six elements in each direction on the larger hyperbolic paraboloid surfaces, draw the given plan and elevation.

(b) Determine the plane director for the edges AB and DC.

(c) Determine the curvature of the roof surface R along a line from C to G.

Scale 1 : 1000

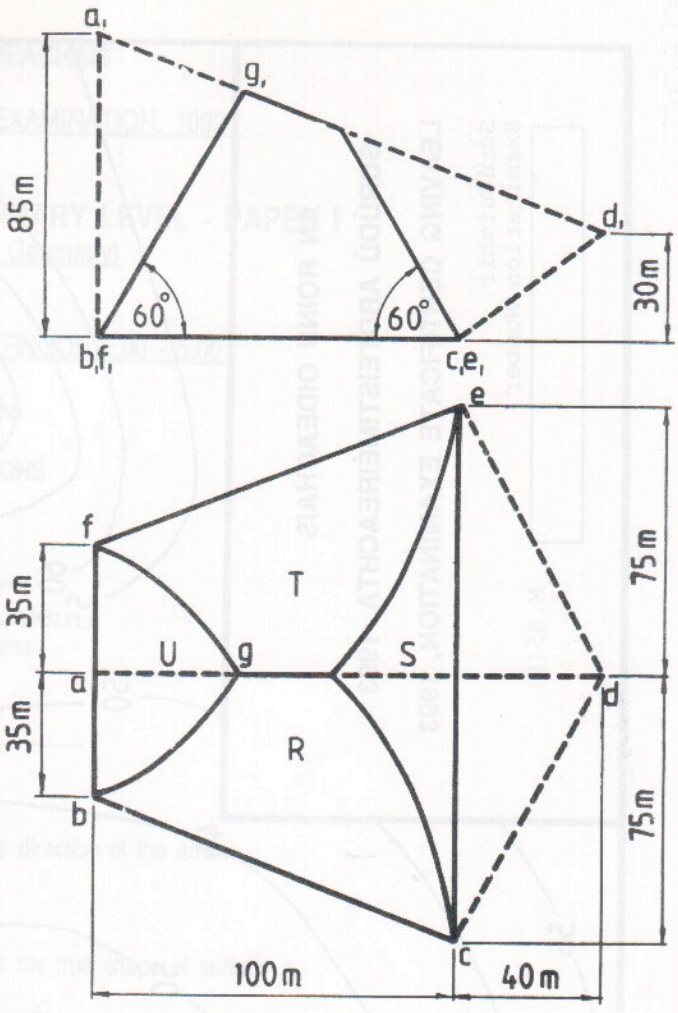



Fig. 5

7. The accompanying drawing shows ground contours at five-metre vertical intervals. ABC is the line of a proposed roadway and DEFG is a proposed parking area. O is the centre of the circular curve.

The roadway ABC has the following specification:

(i) formation width is 14 m;

(ii) formation level at B is 65 m;

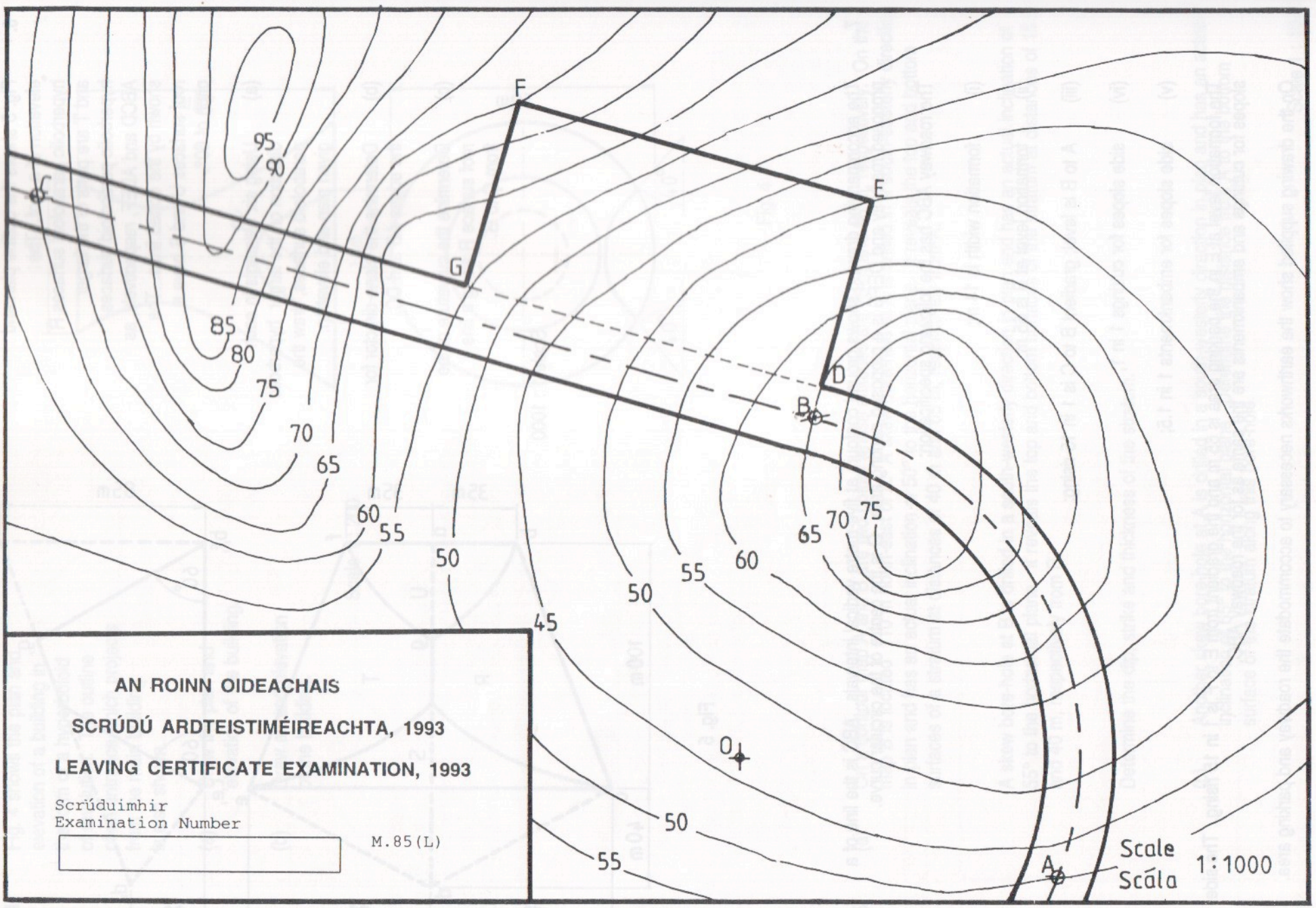
(iii) A to B is level; gradient B to C is 1 in 15 rising;

(iv) side slopes for cuttings 1 in 1;

(v) side slopes for embankments 1 in 1.5;

The formation level at E in the parking area is 65 m and the gradient from E to F is 1 in 15 rising. The side slopes for cuttings and embankments are the same as for the roadway ABC.

On the drawing supplied show the earthworks necessary to accommodate the roadway and parking area.




**AN ROINN OIDEACHAIS**

**SCRÚDÚ ARDTEISTIMÉIREACHTA, 1993**

**LEAVING CERTIFICATE EXAMINATION, 1993**

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Examination Number

M.85(L)