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Basic Education
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GRADE 12

ENGINEERING GRAPHICS AND DESIGN P1

NOVEMBER 2013

MARKS: 100

TIME: 3 hours

This question paper consists of 6 pages.

INSTRUCTIONS AND INFORMATION

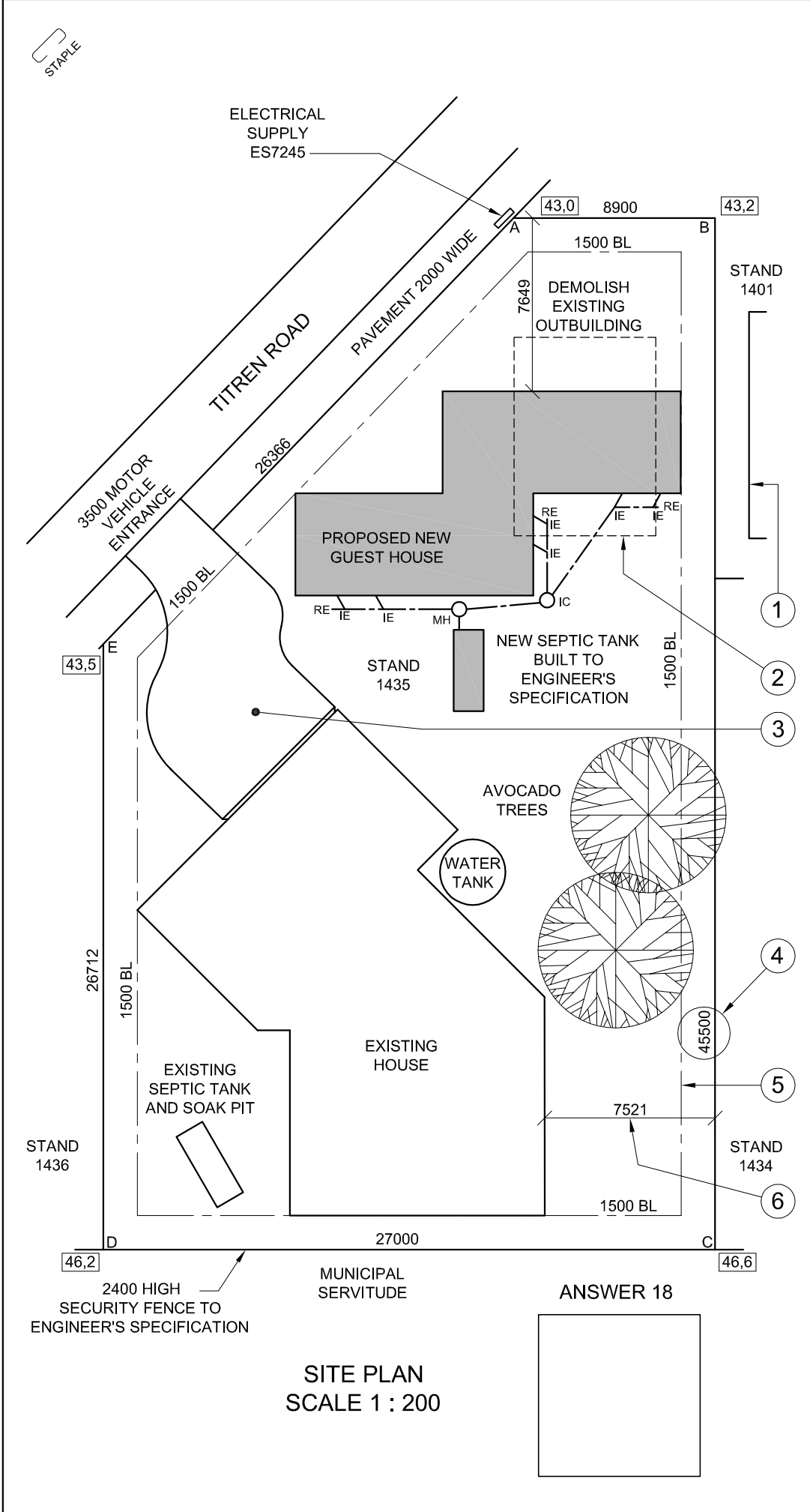
- 1. This question paper consists of FOUR questions.
- 2. Answer ALL the questions.
- 3. ALL drawings are in first-angle orthographic projection, unless otherwise stated.
- 4. ALL drawings must be completed using instruments, unless otherwise stated.
- 5. ALL answers must be drawn accurately and neatly.
- 6. ALL the questions must be answered on the QUESTION PAPER as instructed.
- 7. ALL the pages must be re-stapled in numerical sequence, irrespective of whether the question was attempted.
- 8. Time management is essential in order to complete all the questions.
- 9. Print your examination number in the block provided on every page.
- 10. Any details or dimensions not given must be assumed in good proportion.

FOR OFFICIAL USE ONLY									
QUESTION	MARKS OBTAINED			½	SIGN	MODERATED			½
1									
2									
3									
4									
TOTAL									
	2	0	0			2	0	0	

FINAL CONVERTED MARK	CHECKED BY
100	

COMPLETE THE FOLLOWING:
CENTRE NUMBER
CENTRE NUMBER
EXAMINATION NUMBER
EXAMINATION NUMBER





QUESTION 1: ANALYTICAL (CIVIL)

Given:
The site plan for a proposed new guest house, a title panel and a table of questions. The drawing has not been prepared to the indicated scale.

Instructions:
Complete the table below by neatly answering the questions, which all refer to the accompanying drawing and title panel.

QUESTIONS		ANSWERS	
1	How many revisions have been made to the drawing?	1	
2	How many signatures are required on the site plan?	1	
3	What is the project number?	1	
4	How wide is the motor vehicle entrance in metres?	1	
5	What does the abbreviation <i>MH</i> stand for?	1	
6	How high is the security fence in metres?	1	
7	What does the feature at 1 indicate?	1	
8	What does the line at 2 indicate?	1	
9	Name the feature at 3.	1	
10	What does the number at 4 indicate?	1	
11	What does the line at 5 indicate?	1	
12	If scale 1 : 50 was used for the site plan, what would the dimension at 6 read?	1	
13	What is the reference number of the electrical supply?	1	
14	What type of tree is found on the stand?	1	
15	In what SI unit are the dimensions?	1	
16	Is corner C of stand 1435 higher or lower than Titren Road?	2	
17	What is the shortest distance in metres from the proposed new guest house to Titren Road?	2	
18	If the side of the existing house that faces Titren Road is the south-west elevation, draw, in the space provided below the site plan and in neat freehand, a correctly orientated <i>SANS 10143</i> north-point symbol.	4	
19	In the space provided in the title panel, draw, in neat freehand, the front view and top view of the <i>SANS 10143</i> graphical symbol (convention) for a single kitchen sink.	4	
20	In the space below, determine the perimeter of the new guest house in metres.	3	
ANSWER 20 Show ALL calculations.		TOTAL	30

NEW GUEST HOUSE

10500

9000

17000

4500

4500

EXAMINATION NUMBER

EXAMINATION NUMBER

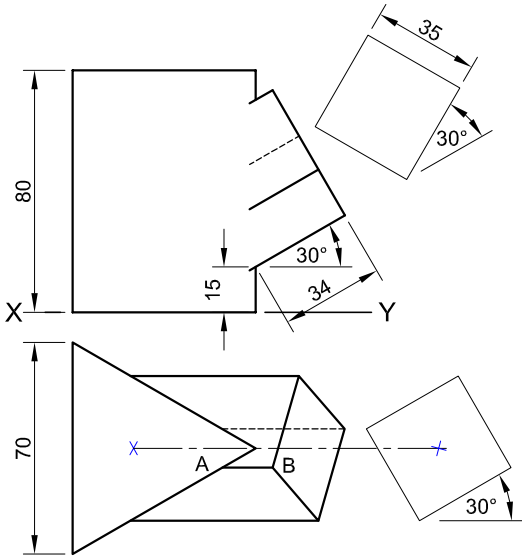


QUESTION 2: INTERPENETRATION AND DEVELOPMENT

- Given:**
- The incomplete front view and top view of a right square prism that has been shaped to fit around a right equilateral triangular prism. The axes of both prisms lie in a common vertical plane.
 - The auxiliary views of the square prism.

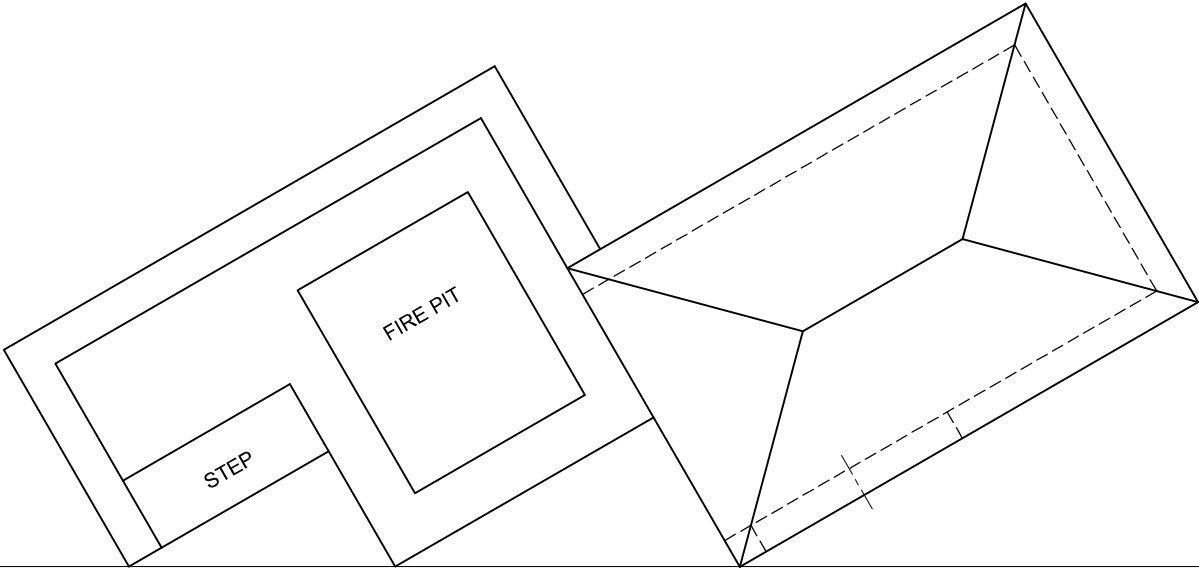
- Instructions:**
- Draw, to scale 1 : 1, the following:
- 2.1 The given top view
 - 2.2 The complete front view clearly showing the curve of interpenetration
 - 2.3 The development of the surface of the square prism.
Make **AB** the seam.

- Show ALL hidden detail.
- Show ALL necessary construction and fold lines. [33]



AB IS THE SEAM.

ASSESSMENT CRITERIA					
1	TOP VIEW	7½			
2	FRONT VIEW	14			
3	DEVELOPMENT	11½			
TOTAL		33			
EXAMINATION NUMBER					
EXAMINATION NUMBER					3



QUESTION 3: PERSPECTIVE

Given:
Two views of a recreational area and the information needed to draw a two-point perspective drawing.
PP – Picture plane
HL – Horizon line
GL – Ground line
SP – Station point

Instructions:
Complete the perspective drawing.

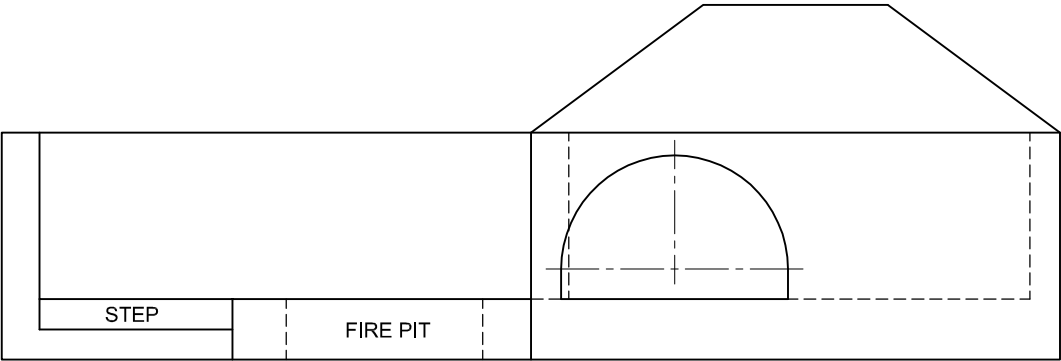
- Align the drawing sheet with the ground line (GL).
- Determine and label the vanishing points.
- Show ALL necessary construction.
- NO hidden detail is required.

[41]

PP

HL

GL



SP

ASSESSMENT CRITERIA					
1	CONSTRUCTION + VPs	7			
2	WALLS	13½			
3	BUILDING + ROOF	9			
4	ARCH + CONSTR' + PIT	11½			
TOTAL		41			
EXAMINATION NUMBER					
EXAMINATION NUMBER					4

DOOR AND WINDOW SCHEDULE

2000

500

500

1500

450

WINDOW (W1)

NOTE: 175 x 20 FIBRE CEMENT SILL UNDER ALL WINDOWS

TO FIT

425

425

75

2100

1550

752

FRONT AND LEFT VIEW OF FRONT DOOR FRAME WITH SIDE PANELS (D2)

TO FIT

2100






INTERNAL DOOR AND FRAME (D1)


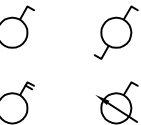
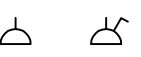



TO FIT

2100

TO FIT

FRONT DOOR (D2)

ROOF COMPONENTS	
75 x 50 PURLINS	
200 x 20 FASCIA BOARD	
114 x 38 WALL PLATE	
125 x 100 GUTTER	
ROOF CAP	

ELECTRICAL SYMBOLS







SANITARY FIXTURES

180

850

400

550

WASHBASIN (WB)

450

780

400

650

TOILET (WC)

TO FIT

600

BUILT-IN CUPBOARD (BIC)

200 x 20 BARGE BOARD

125 x 100 GUTTER

Ø100 mm RWDP

W1 WINDOW

FRONT DOOR

FLOOR LEVEL

GROUND LEVEL

SOUTH-EAST ELEVATION

INCOMPLETE FLOOR PLAN

SCHEMATIC DIAGRAM OF A ROOF TRUSS

INCOMPLETE FOUNDATION AND EXTERNAL WALL DETAIL

INCOMPLETE FOUNDATION AND INTERNAL WALL DETAIL

ROOM DESIGNATIONS WITH FLOOR FINISHES

FIXTURES

D1 INTERIOR DOOR OPENINGS

D2 FRONT DOOR OPENING

W1 WINDOW OPENINGS

WC TOILET

WB WASHBASIN

BIC BUILT-IN CUPBOARD

ELECTRICAL FITTINGS

1. SINGLE-POLE LIGHT SWITCH

2. CEILING LIGHT

3. 2 x 40 W FLUORESCENT TUBES

4. SWITCH SOCKET OUTLET

NOTE: THE ARROW SHOWS THE LIGHT CONNECTION TO THE SWITCH.

ROOF NOTES:

ROOF COVER 15 mm CORRUGATED IRON ON 75 x 50 mm PURLINS @ 1800 c/c

114 x 38 mm ROOF TRUSSES ON 114 x 38 mm WALL PLATES

ROOF PITCH 20° WITH 200 x 20 mm FASCIA BOARD ON BOTH ENDS

125 x 100 mm GUTTER ON BOTH ENDS

PLASTER CEILING BOARD ON 6 STRIPS OF 38 x 38 mm BRANDERING, EVENLY SPACED

FLOOR FINISH

ROOM 1: CARPET

ROOM 2: CARPET

TOILET: WOOD

RECEPTION: WOOD

QUESTION 4: CIVIL DRAWING

Given:

- The complete south-east elevation of new **consulting rooms**, showing the walls, the window, the front door, the roof and notes
- The incomplete floor plan, showing the walls, position of the windows, doors, fixtures and the electrical fittings
- Roof notes and a schematic diagram of a roof truss
- Incomplete foundation and wall detail
- The floor finishes and a diagram showing the room designations
- A door and window schedule
- A table of roof components
- A table of electrical symbols
- A table of sanitary fixtures
- The incomplete floor plan of the new **consulting rooms**, drawn to scale 1 : 50, on page 6

Instructions:

- Answer this question on page 6.
- Using the given incomplete floor plan, draw, in first-angle orthographic projection and to scale 1 : 50, the following views of the new **consulting rooms**:
 - 4.1 The complete floor plan
 - 4.2 A sectional elevation on cutting plane A-A
 - 4.3 The north-east elevation
- ALL drawings must comply with the **guidelines** and **graphical symbols** contained in the *SANS 10143*.

SPECIFICATIONS:

THE FLOOR PLAN

Add the following features to the drawing:

- ALL doors and windows
- ALL the sanitary fixtures as indicated by the abbreviations
- ALL the electrical fittings as indicated by the numbers
- ALL hatching detail

THE SECTIONAL ELEVATION

Show the following features on the drawing:

- The complete foundation, wall, slab, roof and ceiling detail
- The window detail, with a double lintel, and the door detail
- The sanitary fixtures
- ALL hatching detail

THE NORTH-EAST ELEVATION

Show the following features on the drawing:

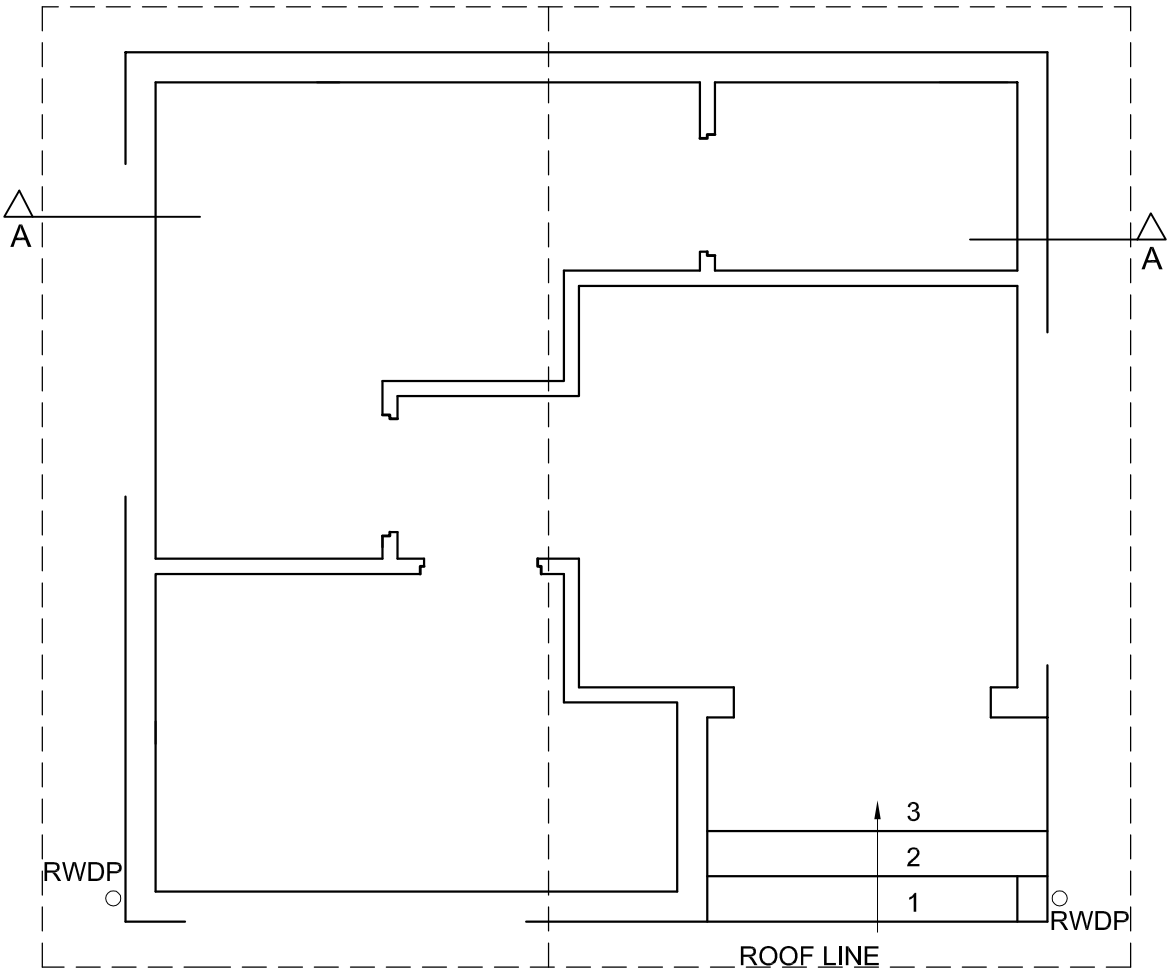
- The outside walls and finished floor level
- The roof detail, including the gutter, fascia board and rain-water downpipe
- The window detail

Label the following:

- The room designations with floor finishes
- The sectional elevation and north-east elevation
- Using the correct abbreviations, label the following features in the correct view: ground level and damp-proof course.

NOTE:

- ALL substructure hatching may be drawn in freehand. [96]



FLOOR PLAN
SCALE 1 : 50



ASSESSMENT CRITERIA					
FLOOR PLAN					
		POSSIBLE	OBTAINED	SIGN	MODERATED
1	LABELS	4			
2	ELECTRICAL	11			
3	FITTINGS	6			
4	DOORS + WINDOWS	14			
5	HATCHING	3			
SUBTOTAL		38			
SECTIONAL ELEVATION					
1	ROOF	16			
2	WALLS + FLOOR + FOUNDATIONS	11			
3	WINDOW	2			
4	LABELS	3			
5	HATCHING	6			
6	FIXTURES	4			
SUBTOTAL		42			
NORTH-EAST ELEVATION					
1	WALLS + FFL	5			
2	ROOF + GUTTER + RWDP	5			
3	WINDOW	5			
4	LABELS	1			
SUBTOTAL		16			
TOTAL		96			
EXAMINATION NUMBER					
EXAMINATION NUMBER					6