



EXAMINATIONS AND ASSESSMENT CHIEF DIRECTORATE

Home of Examinations and Assessment, Zone 6, Zwelitsha, 5600

REPUBLIC OF SOUTH AFRICA, Website: www.ecdoe.gov.za

2023 NSC CHIEF MARKER'S REPORT

SUBJECT	ENGINEERING GRAPHICS AND DESIGN		
QUESTION PAPER	1 X	2	3
DURATION OF QUESTION PAPER	3 HOURS		
PROVINCE	EASTERN CAPE		
DATES OF MARKING	4 – 20 DECEMBER 2023		

SECTION 1: (General overview of Learners Performance in the question paper as a whole)

Learners performed poorly. Only 2 percent of learners achieved a level 7 and 28 percent achieved a level 1. The lower order of the paper was attempted by all learners. The middle and higher order questions were poorly answered or not attempted at all. The learners focus on question 1 and 4, then question 3 and 2.

SECTION 2: Comment on candidates' performance in individual questions

QUESTION 1
(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?
GENERAL COMMENTS: Although line work and line quality is not assessed, the learners ignore line types. Line types are the language of EGD and must be adhered to. Neatness is integral to EGD, neat work is easier to read, assess and benefits the learners. Time management is a challenge. To complete the paper a well prepared candidate must draw 1.1 marks per minute.
QUESTION 1: ANALYTICAL (a) The question was attempted by all learners, the lower order was well answered, and middle and higher order was poorly answered.
QUESTION 2: SOLIDS Many learners did not attempt the question at all. The question was answered very poorly.
QUESTION 3: PERSPECTIVE Most learners attempted the question, the vanishing points could be determined by most learners, however the rest of the question was poorly answered.
QUESTION 4: CIVIL All learners attempted this question the floorplan was answered by all learners although not well, many learners left out the elevation. In the section there were many attempts, many of those left out the roof detail and the part of the building that is visible behind the cutting plane.

(b) Provide suggestions for improvement in relation to Teaching and Learning

GENERAL COMMENTS:

First teach the concepts, use examples, let the learners do the concept under your supervision. Do regular small class tests. Plan your term that the learners can write larger tests. Plan your year that learners can write examinations in June.

QUESTION 1: ANALYTICAL

Questions 1.1 – 1.9 are lower order. The information for the answers is on the site plan and the title block. It requires careful reading to find the answers. The answer should be copied exactly as it is given.

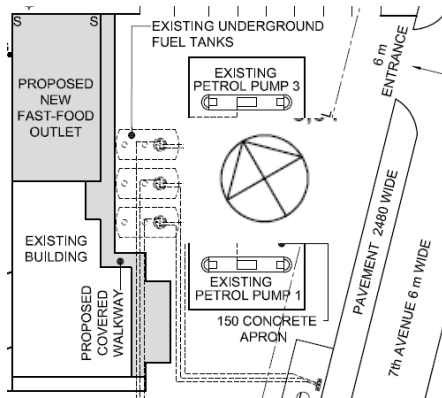
Questions 1.10 – 1.16 & 1.19 are middle order. These are knowledge and application questions. The theory that is tested in these questions are from textbooks and the SANS10143. Take care not to use information from other subjects as the SANS 10143 is very specific to EGD and MUST be adhered to. The questions may refer to features and information on the drawings.

Question 1.10 is an example where, although lower order the answer requires some thinking. $2,5 \text{ m} \times 1000 = 2500 \text{ mm}$.

Question 1.17, 1.18, 1.20 & 1.21 are higher order. These answers require analysis and application of knowledge among other skills.

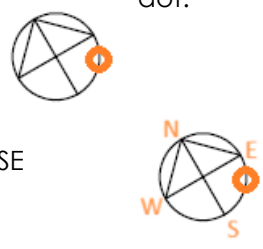
Question 1.17

17 Which elevation of the new fast-food outlet faces 7th Avenue?



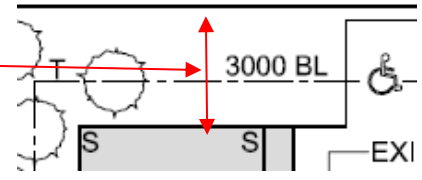
7th Avenue is to the right of the fast-food outlet.; on the symbol mark the position with a dot.

Write in the compass directions.



The write the answer Southeast or SE

In the case of Q1.18 the dimension 4,8 m should first be converted to mm (4800 mm) then the dimension on the drawing should be taken and subtracted: $4800 - 3000 = 1800 \text{ mm}$

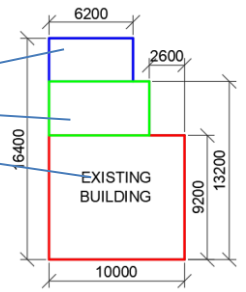


Q1. 19 (middle order) and Q1.20 (higher order) **FIRST CONVERT THE DIMENSIONS TO METERS**

ANSWER 19
 Show ALL calculations.
 APPLYING CORRECT FORMULA ✓
 $P = AB + BC + CD + DE + EF$
 $= 40 + 48 + 23,34 + 7,5 + 44,56$
 $= 163,4 \text{ m}$ ✓ **ANSWER IN METRES** ✓

For Q1.20 the building is divided into rectangles

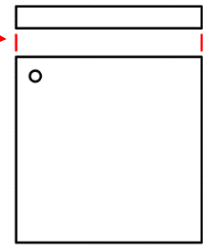
ANSWER 20
 Show ALL calculations.
 APPLYING CORRECT FORMULA ✓
 $A = (10 \times 9,2) + (7,4 \times 4) + (6,2 \times 3,2)$
 $= 92 + 29,6 + 19,84$
 $= 141,44 \text{ m}^2$ **ANSWER IN SQUARE METRES** ✓



Q1.21a is directly from SANS 10143 and should be drawn in FAOP and NEATLY

Use projection lines from FV to TV.

Take care when drawing the symbols and conventions in free hand, freehand is not scribbling it MUST be neat.

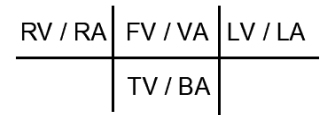


QUESTION 2: SOLIDS

In gr 10 learners are introduced to solids and sectioning as well as true shapes, the objects are placed perpendicular, at angles and inclines, cutting planes are perpendicular and inclined. This question is one grade 10 exercise. In grade 11 solids are drawn with holes through. Then sectioned. Grade 12 the solids are combined. The learners should be able to do each one separately.

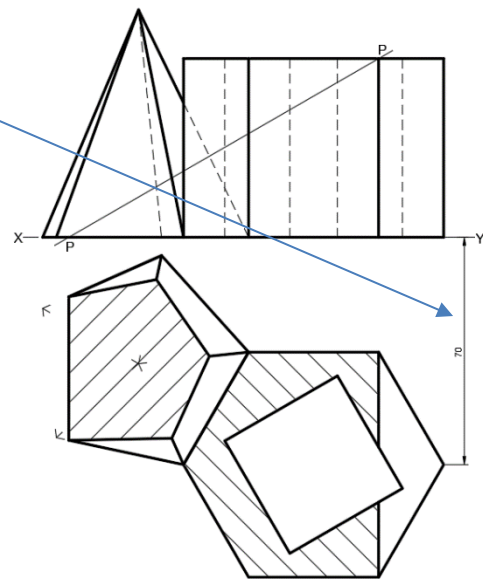
The use of FAOP only is very important. The page layout is as shown. The learners should sketch the diagram near the question before they read the details of the question. (planning the answer)

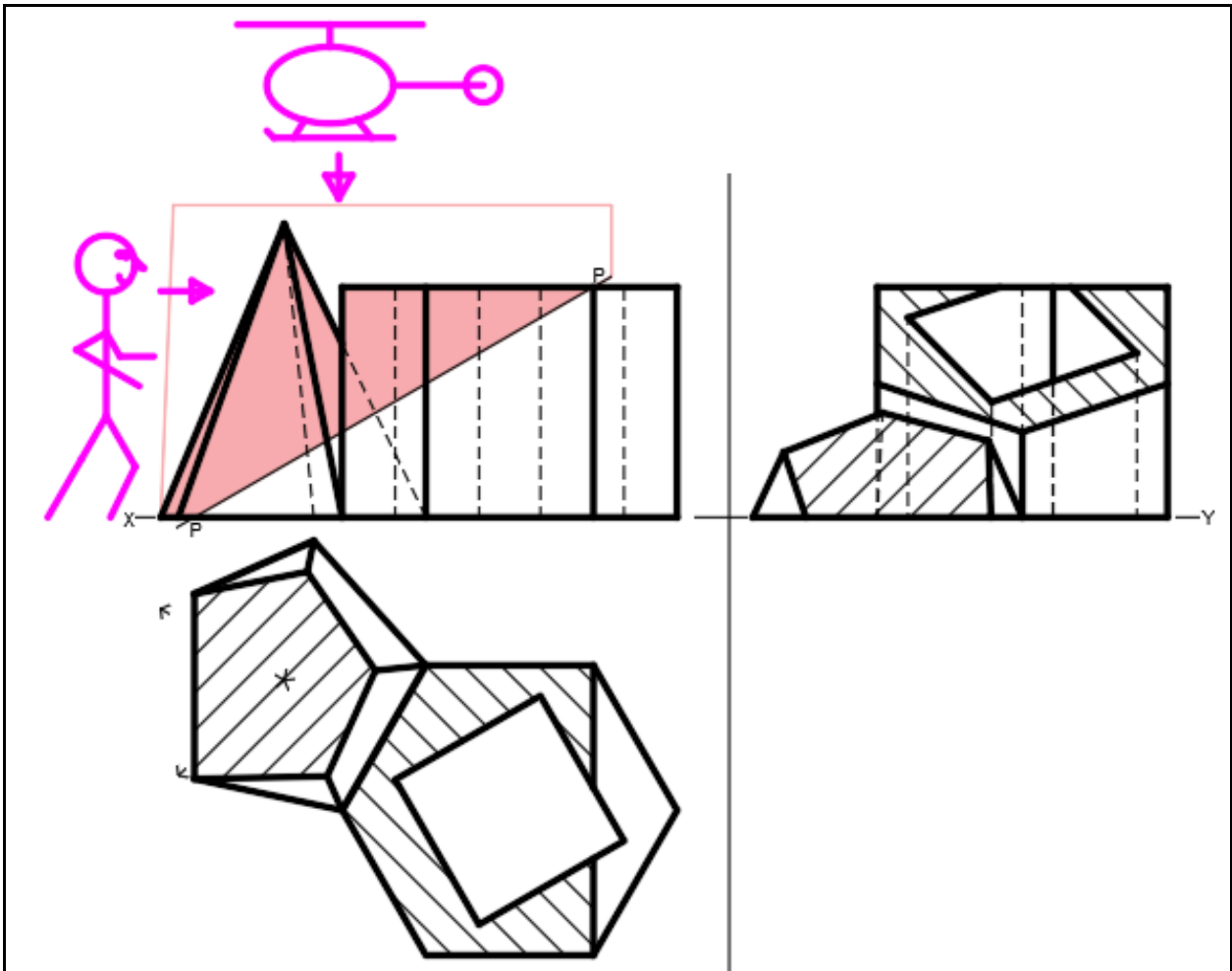
As they read the question sections, they indicate what is required of them.



The next step is to draw (in construction) the base of the solid, starting with the hexagon, Care must be taken when placing the hexagon – the dimension for placement is given. Then the square and pentagon, in the top view. It is good practice to label the corners. Project to the FV then the LV. Project the WHOLE object in construction lines. Place the cutting plane in the front view. Draw the section of the solid in the TV (the features between the observer and the cutting plane are “removed”).

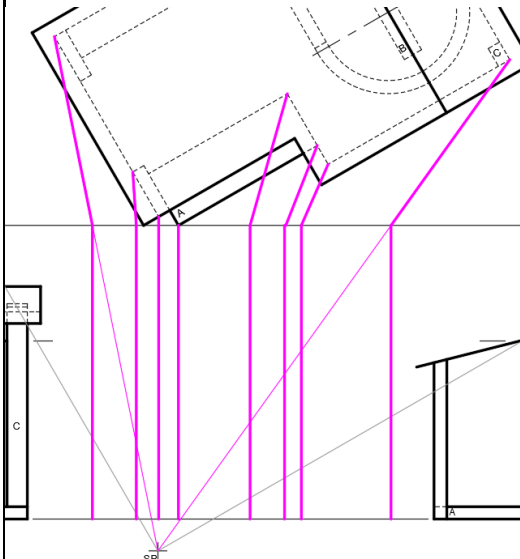
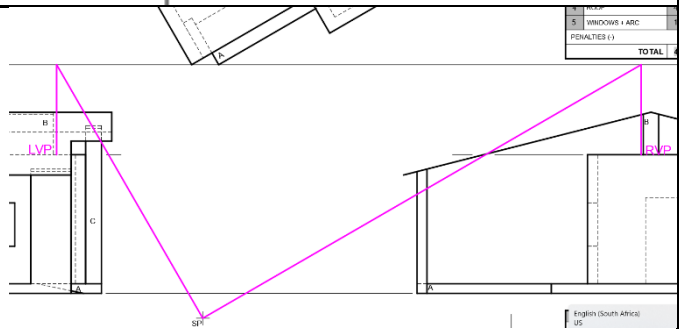
From the FV project the section to the LV, use the cutting plane and complete the sections. Draw the hidden lines and outlines and hatch each section (use mechanical hatching and each part in opposite directions). NO CONSTRUCTIONS MUST BE ERASED. The use of projection lines and labelling of the corners is very important.





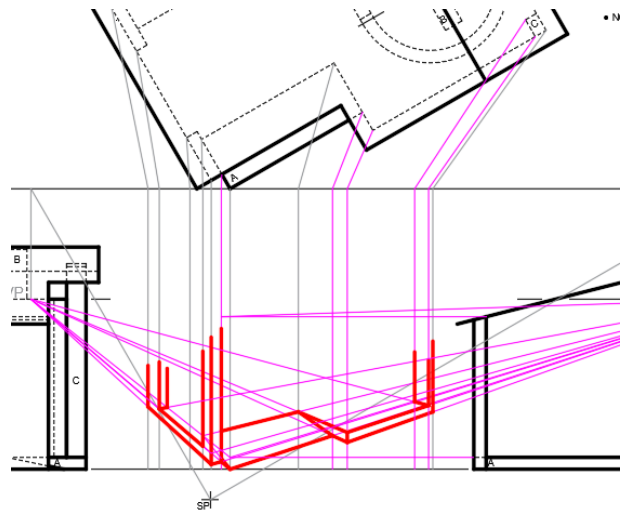
QUESTION 3: PERSPECTIVE

Although many learners could determine the VP's, there are still many who could not do this. The VP's should be labelled close to where they are on the horizon line. The process is explained in many YouTube videos and support material to the textbooks. In short: from the SP parallel to the sides of the building draw lines to the PP. From the PP perpendicular to the HL draw lines and label as LVP and RVP.



The next step is from the corners top view to the SP draw lines that stop on the PP. From these points on the PP perpendicular lines are drawn to determine the corners of the object. These steps count for 6 marks.

There are two methods for drawing the features of the object: i.e. the block method for the features such as walls and openings



and the height line method for features such as roofs.

The first objects to draw are those on the PP, the heights are then from the views and from the TV. These lines create the height lines for both the block method and the height line method.

- Determine and label the vanishing points.
- Show ALL construction.
- Show depth at the window.
- Show ALL interior detail as seen through the window.
- NO hidden detail is required. [40]

ASSESSMENT CRITERIA		
1	CONSTRUCTION	6
2	FLOOR	11
3	WALLS	8
4	ROOF	4
5	WINDOWS + ARC	10
PENALTIES (-)		
TOTAL		40

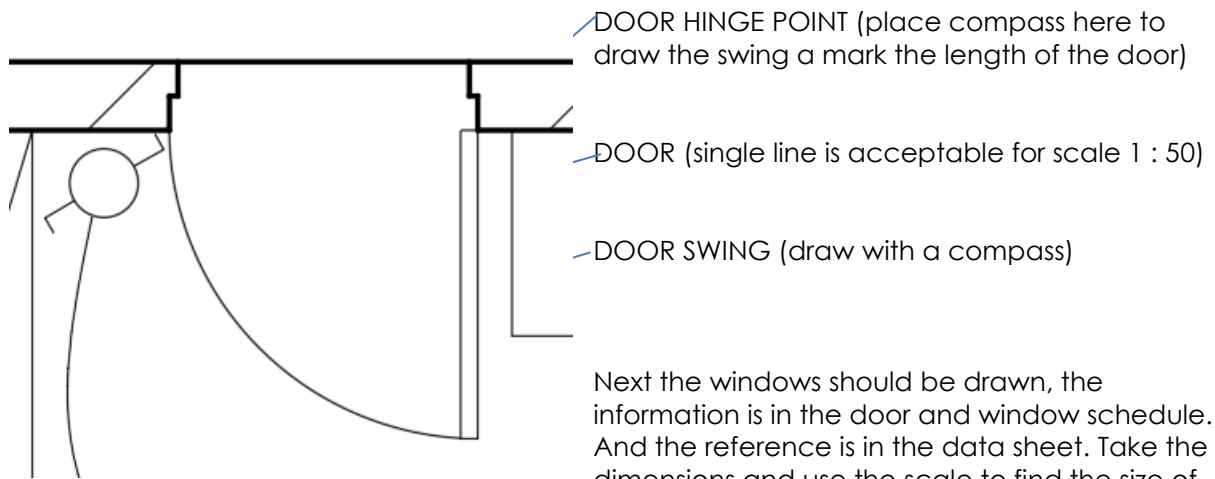
EXAMINATION NUMBER

QUESTION 4: CIVIL

Candidate must read the question. While they read, they must work through the datasheet. When answering the question, they should use the assessment criteria as a guideline.

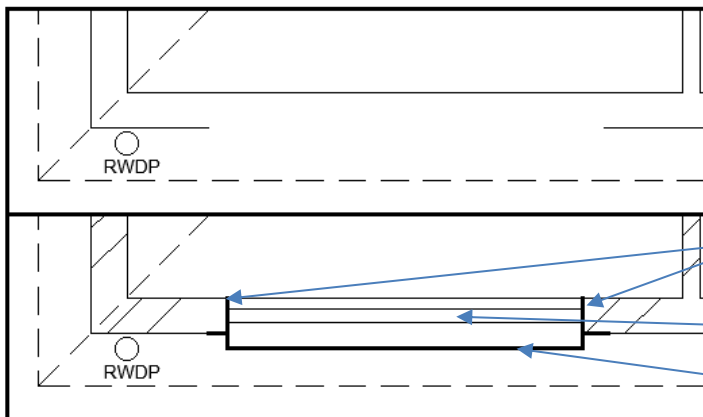
Floorplan:

Start by drawing the doors, use the information in the data sheet and the given floorplan. The doors must fit to the opening. Take note of where the hinge of the door is in the diagram.



Next the windows should be drawn, the information is in the door and window schedule. And the reference is in the data sheet. Take the dimensions and use the scale to find the size of

the window to draw. (divide by 50) THE GIVEN GAP IS LARGER THAN WHAT MUST BE DRAWN.



Do not merely fill the opening with the window. The frame of the window is in the middle of the wall, the sill must extend 50 mm (1 mm) outside the wall.

GIVEN DETAIL

REVEAL (LENGTH OF WINDOW)

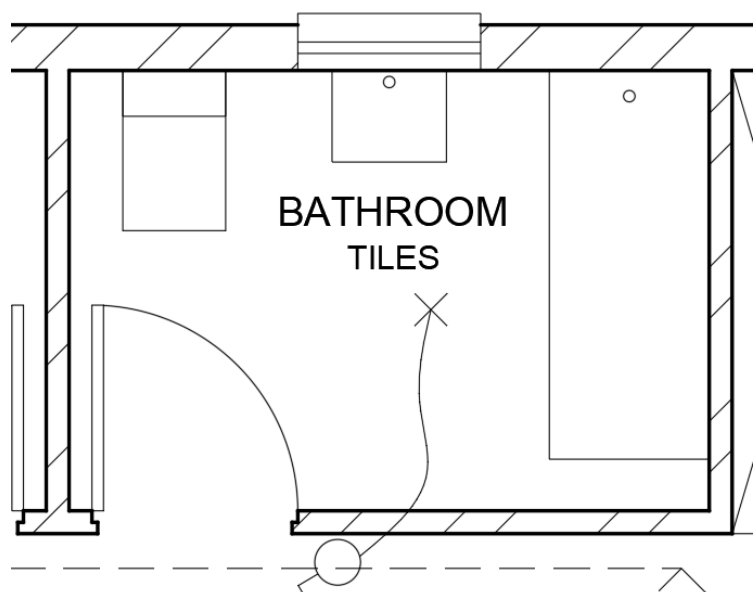
WINDOW FRAME (FROM SCHEDULE)

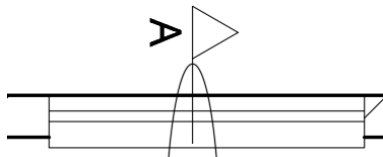
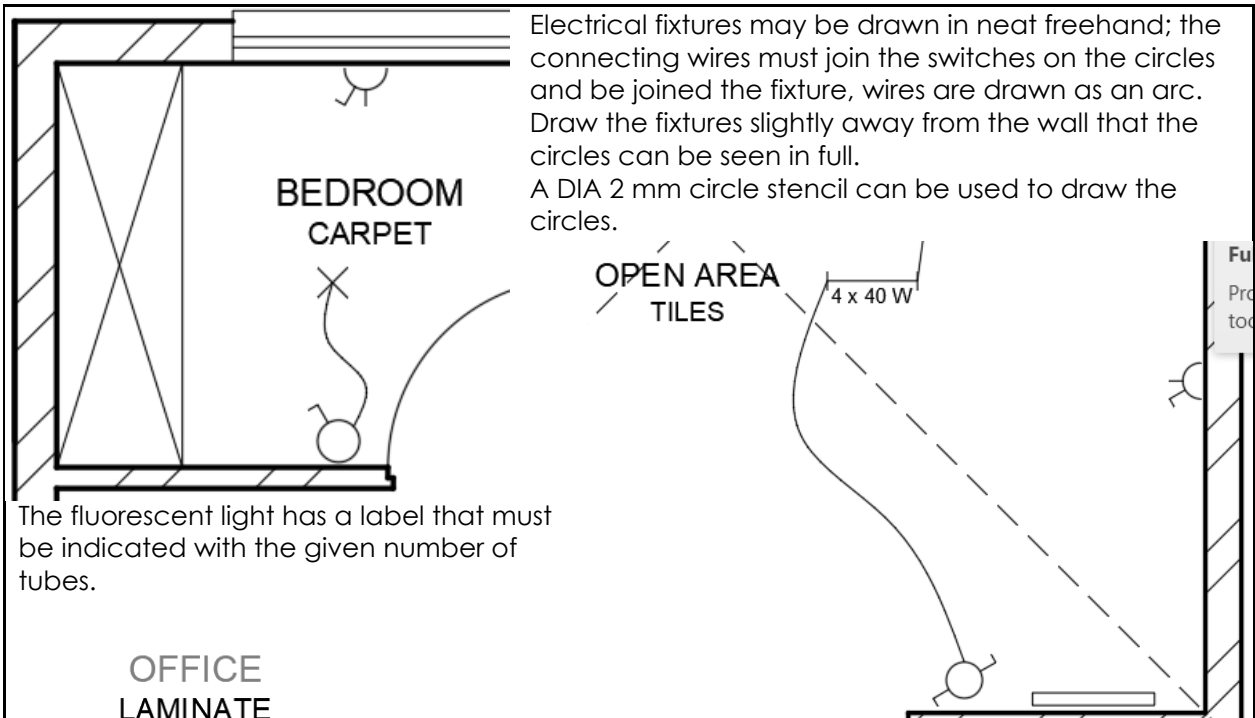
WINDOWSILL (FROM SCHEDULE)

Once the doors and windows are completed the hatching is filled in, ensure that all the walls are hatched, BEWARE NOT TO HATCH FEATURES SUCH AS STEPS.

Fixtures given in the drawing must not be copied, use the dimensions, and draw to scale the symbols. The SANS 10143 symbols must be used. Place the symbol exactly where the letter indicates. The rotation of letters indicates the direction of placement. Place the back of the fixtures against the wall.

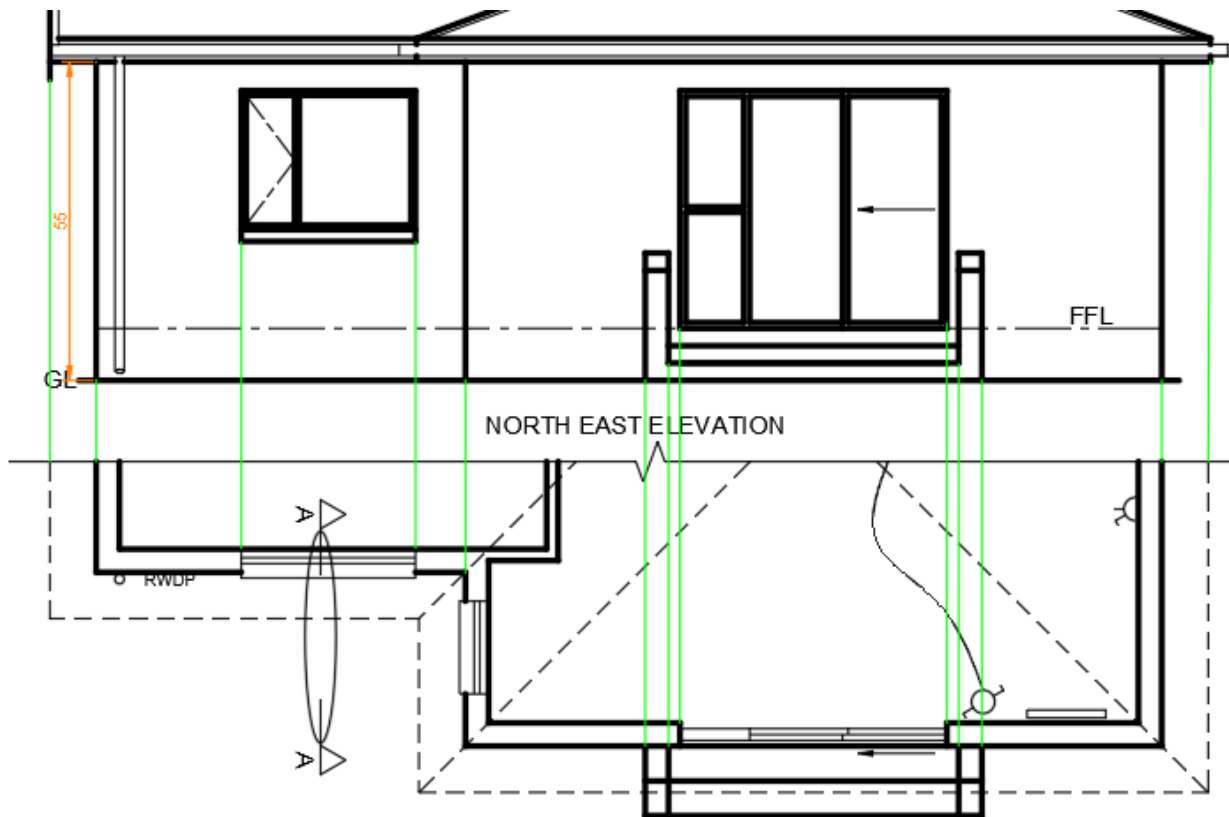
Special note: The sides of the WC and hand wash basins do not work well when placed against the walls.





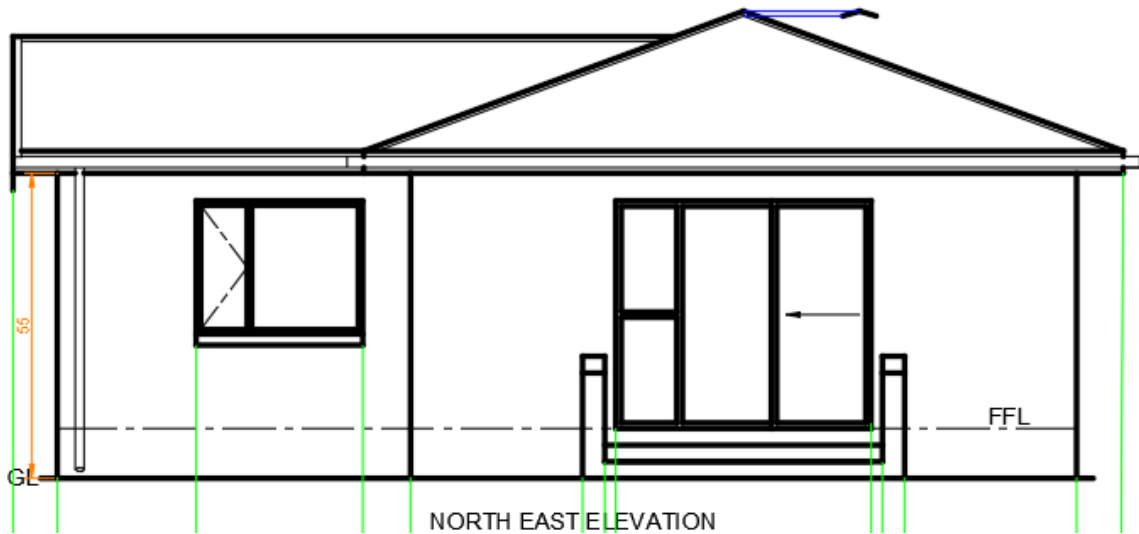
NORTHEAST ELEVATION

Project the elevation walls from the floorplan. Read the height of the finished floor level from the ground line and calculate the scaled dimension. The finished floor level is drawn as a centreline.

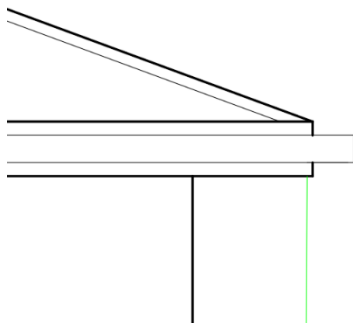


Project features such as doors, windows, and steps from the floorplan. The height of the top of

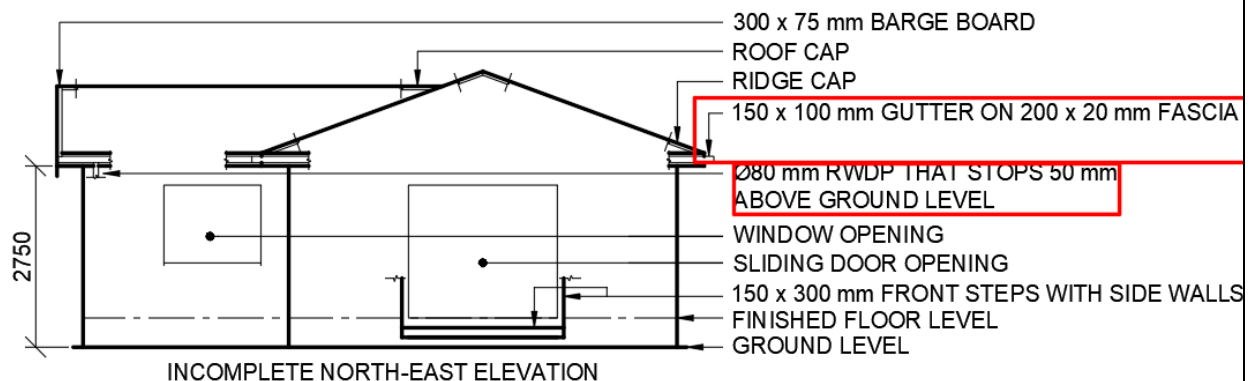
the door is taken from the schedule. In the Northeast elevation that is drawn to scale 1 : 50 the door and window frames can be drawn as single lines. Doors and windows are drawn as though they are closed in the elevations. The opening window is indicated with hidden or centre lines to indicate that you can see through the window (clear glass). Below the window remember to add the windowsill, the gap of 2-3 mm is sufficient.



The bottom of the fascia board is given in the incomplete view (calculate the scaled dimension) the gutter is drawn above and the roof edge is drawn above the gutter.



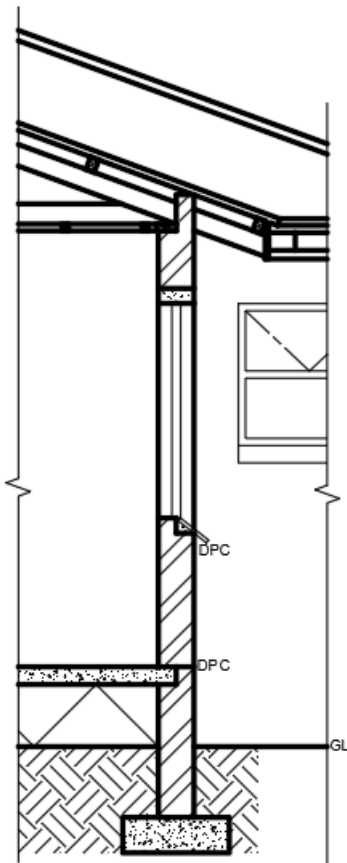
Form the floorplan project the roofline, add the fascia thickness (20 mm < 1 mm) and the width of the gutter (150 mm – 3 mm).



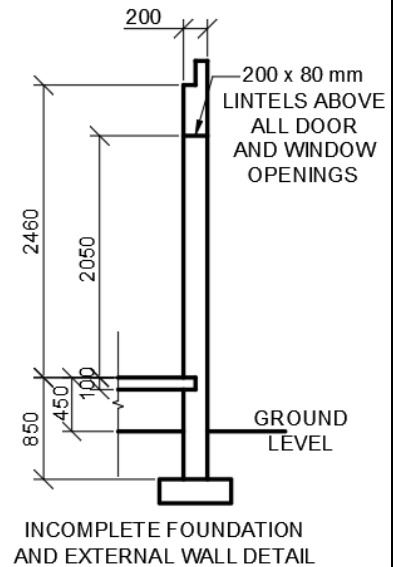
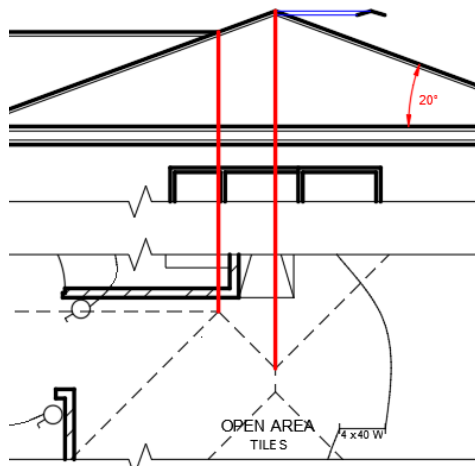
The corner that is found between the horizontal and vertical lines of the fascia is the starting point for the roof. Draw on either side lines to 20° and project from the floorplan to find the intersecting points. Once the roof is down add the roof cap line below the lines a gap of 1 – 2 mm is sufficient.

The final step is to add the labels FFL for the finished floor level and the title of the elevation i.e. SOUTH ELEVATION.

DETAILED SECTION



Start drawing from the given foundation. The detail in the 1 :



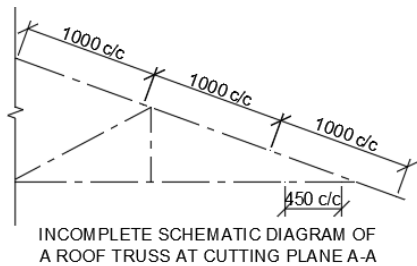
50 floorplan must use by multiplying the dimension from the drawing x 50 then dividing to scaled dimensions. The 200 mm walls will be 10 mm on the drawing.

Follow the dimensions on the incomplete foundation and external wall detail diagram. The section must close the entire width to the break lines.

The diagram shows the height where the ceiling board will be drawn.

The roof details must close the entire width from the wall to the break lines.

To draw the features the in the roof notes and diagram followed.



ROOF NOTES:
20° ROOF PITCH

114 x 40 mm ROOF TRUSSES ON
114 x 40 mm WALL PLATES

400 mm ROOF OVERHANG TO END OF
ROOF TRUSS

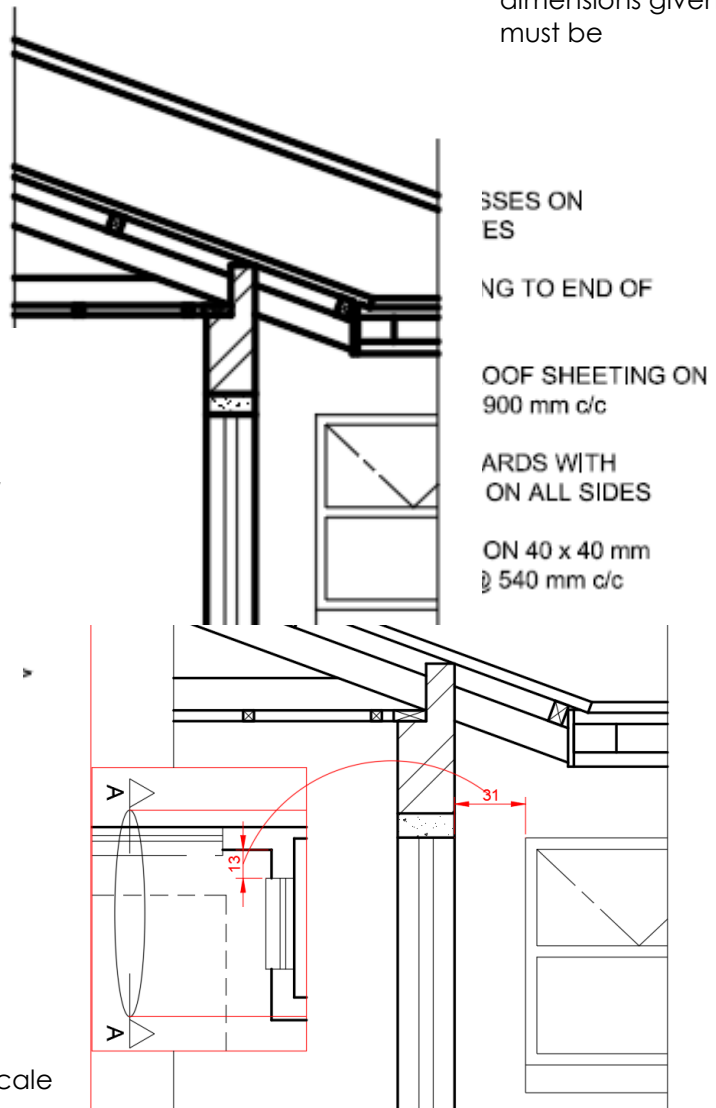
40 mm CORRUGATED ROOF SHEET ON
75 x 50 mm PURLINS @ 1000 mm c/c

300 x 75 mm BARGE BOARD ON GABLE ENDS AND
200 x 20 mm FASCIA BOARD WITH
150 x 100 mm GUTTERS ON ALL SIDES

10 mm CEILING BOARD ON 40 x 40 mm
BRANDING STRIPS @ 450 mm c/c

The diagram above shows the 1 : 50 scale changed to 1 : 20 to complete the detailed section

dimensions given must be



(d) Describe any other specific observations relating to responses of learners and comments that are useful to teachers, subject advisors, teacher development etc.

GENERAL:

THERE IS VERY FEW OR NO KNOWLEDGABLE SUBJECT ADVISORS FOR EGD. THERE IS VERY LITTLE SUPPORT FOR THE SUBJECT THAT IS STEADILY GROWING IN NUMBERS. THIS SEVERLY IMPACTS ON THE RESULTS FOR THE SUBJECT IN THE PROVINCE.

In the classroom the learners must draw exercises against time in one period the learner must finish for example a solid geometry drawing, of gr 12 standard. A civil drawing examination should take 3 to 4 periods in total. Basic knowledge and skills must be drilled by using simple drawings and then increasing the difficulty. Regular marking and feedback to learners to show how they progress. Problems are identified much sooner.

QUESTION 1: ANALYTICAL

Teachers must teach the content; regular class tests must be used to ensure that learners know the content. Use old exam papers as source for the questions. Work through the paper that the learners know how to approach the question.

During the reading time before the start of the examination time the learners must work through the question and find the answers. This saves time when answering the questions.

QUESTION 2: SOLIDS

Practice often. Use single solids in different positions, Use old exam papers as questions.

QUESTION 3: PERSPECTIVE

Old exam papers are an excellent source for exercises. The learners must do many exercises to be skilled in perspective drawings. To improve visualisation, use freehand sketching, where candidates do quick conversions from orthographic views to any 3D format

QUESTION 4: CIVIL

Use the features in the classroom to explain the concepts, e.g. The structure around a door and where the hinge point is. The structure around windows. These are all real-life examples of their drawings.