Province of the
EASTERN CAPE
EDUCATION

ASSESSMENT & EXAMINATIONS
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NSC 2015 CHIEF MARKER'S REPORT

SUBJECT	CIVIL TECHNOLOGY

PAPER	1

DATE OF EXAMINATION:	18/11/2015	DURATION:	3 HOURS

This report is aimed at providing valuable feedback to schools, subject advisors, teachers and learners about common errors committed by candidates in the answering of questions, to assist teachers and subject advisors to identify areas that need to be given special attention in the teaching and learning of the subject in 2016.

Your responses will be based on two parts:

Section 1: General overview of Learner performance in the question paper as a whole

Section 2: Comment on candidates' performance on individual questions (Detailed explanations must be provided **per question** as follows: (You may include sub questions where necessary)

(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

(b) Why the question was poorly answered?

(c) Provide suggestion for improvement in relation to teaching and learning

(d) Describe any other specific observations relating to responses of learners

(e) Any other comments useful to teachers, subject advisors, teacher development

SECTION 1:

(General overview of Learner Performance in the question paper as a whole)

A variety of performances was obtained in the 2015 question paper.
A couple of centres obtained good to very good results. Although the paper was set up reasonably fair, a large number of centres perform poorly.
Many candidates obtained high marks in some questions but scored less marks in other questions indicating that not all the content was covered.
There are, but few those who managed to make it throughout the whole question paper.
In analyzing the type of answers in the papers of the centrums who performed poorly, it indicates to a knowledge gap in especially in construction processes, civil services, applied mechanics and poor drawing skills.
These challenges could be caused by not enough fixation of work, poor mathematical skills and insufficient guidance.
The graphic communication question indicates an improvement.

The averages per question:	**2015**
Q.1: Construction processes:	**26%**
Q.2: Advance construction processes:	**22%**
Q.3: Civil services:	**27%**
Q.4: Materials and quantities:	**39%**
Q.5: Applied mechanics:	**30%**
Q.6: Graphic communication:	**32%**

As a whole, the learner performance in this question paper indicate mark of 29% and with a 52% in a code rating 1.

Teachers must also emphasise the meaning of the different questioning terms.

Purpose:	**Use:**	**Identify:**
Advantage:	**Disadvantage:**	**Indicate:**
Construction method:	**Describe:**	**Analyze:**
State:	**Name:**	**Explain:**
Calculate:	**Determine:**	**Convert:**
Deduse:	**Proof:**	

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SECTION 2:

Comment on candidates' performance in individual questions
(It is expected that a comment will be provided for each question on a separate sheet).

QUESTION 1 Knowledge of construction processes was tested in this question with emphasis on (1) safety, (2) excavations, (3) paint, (4) roof construction and (5) brick construction.
(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?
Question 1 was adequately answered by most learners although some centrums struggled with questions on brickwork. The drawing skills off a number of learners were untidy. Only a few learners knew how to draw the end view and T-junction of brickwork.
(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.
Question 1.1 This question was answered reasonably well. Some learners answered general safety rules instead of specific measures as was shown in the sketch.
Question 1.2. Most learners knew one safety rule for the crosscut saw but guessed the other one.
Question 1.3 Most learners knew the safety rules for excavations
Question 1.4 Most learners chose spray paint but some struggled to motivate their choice.
Question 1.5
Learners knew how to the draw the steel beams, though some drawings were very untidy.
Question 1.6 Few learners knew the admixtures of concrete. Cement and sand is not an admixture in concrete.
Question 1.8/9 (thatched roof & roof covering) 1.10 (Drawing – flashing) Learners must name the roof covering and not the type of material used.

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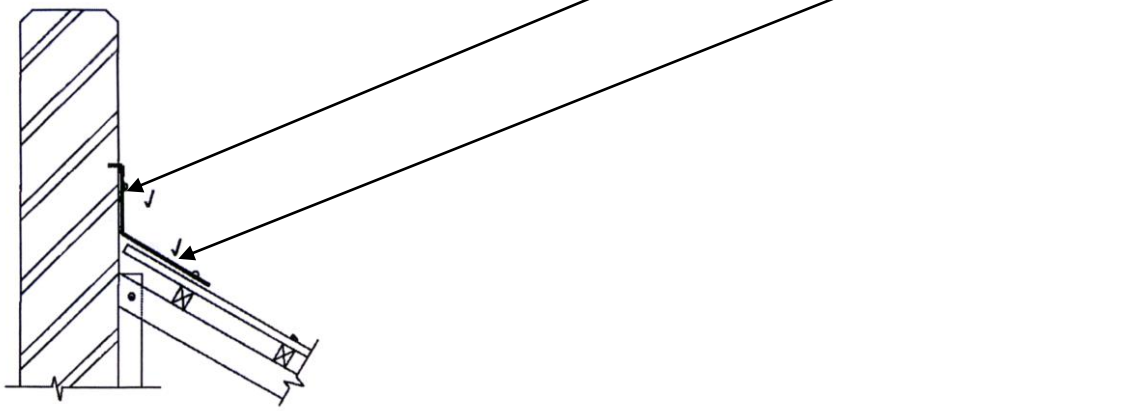
(c) Provide suggestions for improvement in relation to Teaching and Learning

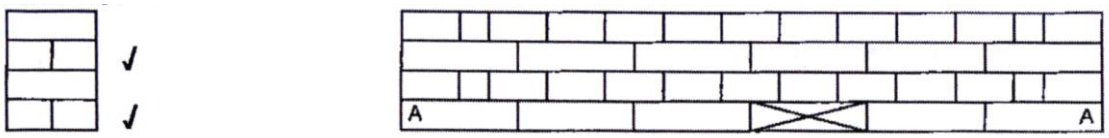
(d) Describe any other specific observations relating to responses of learners

(e) Any other comments useful to teachers, subject advisors, teacher development etc.

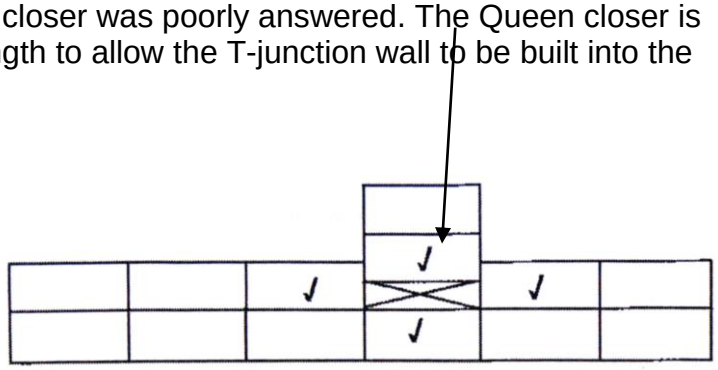
1.10.1 The flashing must cover the opening as well be fixed to the wall.
The flashing must cover a sufficient area <u>against the wall</u> and <u>over the roof</u> covering.



1.11.4 The end view of the English bond was not adequately answered.
The top layer is in header bond (with the head of the brick to the front) and the alternative layer is in stretcher bond with the stretcher side to the front.



1.11.5 The T-junction of the English bond was also not adequately answered.
The placing of the Queen closer was poorly answered. The Queen closer is a brick cut in half of its length to allow the T-junction wall to be built into the wall.



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QUESTION 2

Knowledge of advance construction processes was tested in this question with emphasis on (1) Machines (2) Reinforcement, (3) Rib and block construction,(4) Formwork for concrete staircase, (5) Cavity wall and foundation.

(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

Question 2 was answered reasonably well by some learners but poorly by other learners.

Many learners did not know where to draw the DPC and wall ties as were asked.

Many learners did not know the labels for the formwork at the concrete staircase.

Many learners did not know the transparent pipe level transfer method

(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

Question 2.1 (Mitre saw)

Some learners thought it was the cross cut saw. They answered to cut wood instead of cutting wood at different angles.

Question 2.2 few learners could get the correct explanation how to transfer levels with a transparent pipe.

Question 2.4 9 (Spacers)

Many learners answered to keep the bars together instead of maintaining the cover depth and to keep bars in position.

Question 2.5 (Rib and block floor)

Most learners knew the rib & block floor but was not familiar with using polystyrene blocks instead of concrete blocks.

Rib-and-block floors are cheaper and easier to install comparing to insito concrete floors

- Learners say: stronger an durable

Question 2.9 (Formwork & concrete staircase)

Few learners could label all four parts correctly. The identification of some of the formwork parts was not well answered

Question 2.10

The position of the DPC and weep hole was a problem for many learners.

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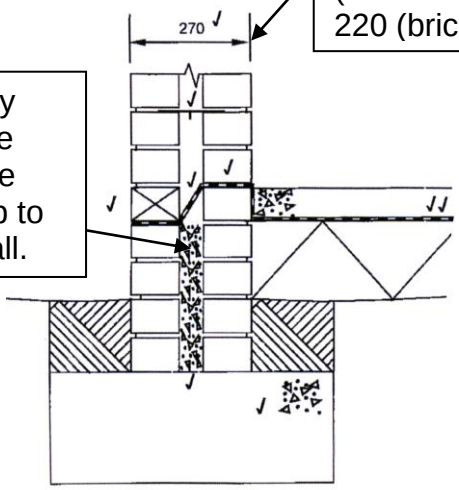
(c) Provide suggestions for improvement in relation to Teaching and Learning
(d) Describe any other specific observations relating to responses of learners
(e) Any other comments useful to teachers, subject advisors, teacher development etc.

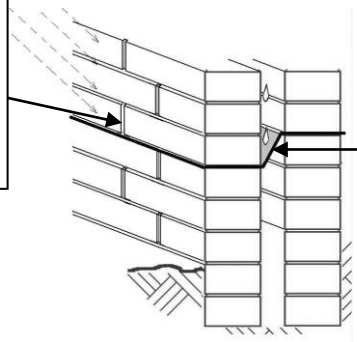
Question 2.10 Section view of cavity wall:
A number of learners do not know where to draw the damp proof course in the wall.

The thickness of the cavity wall is 220 (brick thickness) + 50 (cavity width) + 220 (brick thickness) = 270 mm

The concrete in the cavity must be casted below the DPC. Concrete above the DPC will cause the damp to penetrate to the inner wall.



A weep hole is an open vertical mortar joint just above the DPC between every 4th brick. It allows the damp which penetrate into the cavity to escape to the outside.



In a cavity wall a step DPC is used.

More practical demonstrations of methods and observing on actual sites are important. Try and show the physical product discussed.

QUESTION 3

Knowledge and application of civil services was tested in this question with emphasis on (1) sewerage systems, (2) abbreviations and symbols, (3) water supply and (4) electricity supply.

(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

Question 3 was answered poorly by most learners.

(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

Question 3.1 Identification of correct answer for description – Some learners didn't complete this section, not even guess the answer.

Question 3.2 Most learners answered that there will be a blockage if not installing a gully but did not write the consequence of overflowing.

Question 3.3/4/5 was answered adequately by most learners.

Question 3.5 was answered adequately by most learners.

3.6 Shower water supply: Adequately answered with variations.

3.8 Storm water: Fairly well answered

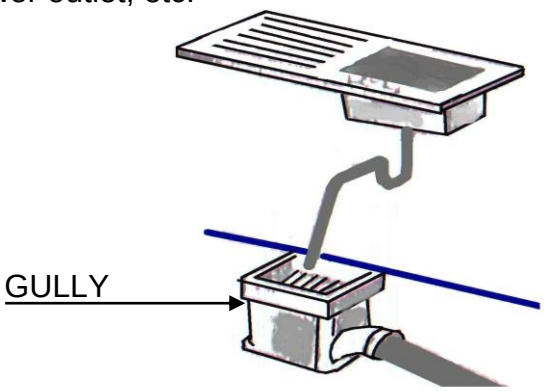
3.9 Electrical lay-out: Fairly well answered

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

(d) Describe any other specific observations relating to responses of learners

3.2.1 Sewerage system: Predict the consequence of not installing a gully.

Answ: If the sewerage system is blocked, water will flow out through the first outlet e.g: sink, bath, shower outlet, etc.



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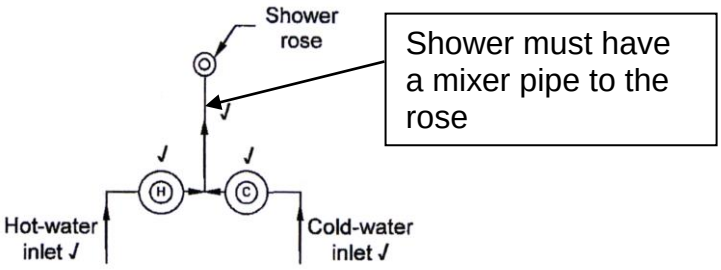
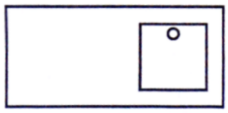
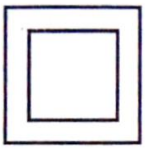
3.6 Shower water supply:



3.7.1 This symbol indicates a "Single-bowl sink", and not a sink. "Single-bowl" must be included.



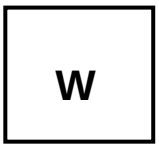
3.7.2 Manhole is not correct. - Gully.



3.7.3 Electric light is not correct. - Water meter.

3.9 Most learners indicated a good general knowledge of the electrical layout of a house as it was illustrated in the sketch. Many wrote main box at D, instead of distribution box.

3.9.5 Drawing of electrical symbol:
Poorly answered indicating a poor knowledge of symbols.
When a rectangle symbol is drawn, it can indicate a number of parts, therefore, the symbol for the distribution board must be indicated with the abbreviation.
The SANS document must be used for reverence to the correct symbols



(e) Any other comments useful to teachers, subject advisors, teacher development etc.

- Learners shouldn't leave open spaces for answers, they must at least try or guess.
- Learners must read the question carefully, before answering.
- Learners must understand that all sub-questions are related to the main question.
  Ex. 3.9 Electricity: 3.9.1 to 3.9.5 are all questions related to electricity, not water.

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QUESTION 4

The skill to calculate materials and quantities and knowledge of materials was tested in this question with emphasis on (1) materials, (2) timber and (3) calculating quantities.

Question 4 was answered adequately by most learners but a number of learners struggled with the calculations for the store room.

(a) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

Question 4.1 was answered reasonably well by most learners where they had to complete the cutting list.

Question 4.2 Some learners guessed the correct answer out of the possible options that were given.

4.3 (calculate quantities) Some learners calculated in mm and gave their answers in m and some did not use units. Many learners knew how to calculate the areas but could not work out the total number of ceiling boards needed.

Use the same unit throughout the calculation.

When the internal measurements are calculated, learners must subtract 2 x wall thickness (220): Wall thicknesses on both sides. (That is = 440 not 4040!!!!!)

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

(d) Describe any other specific observations relating to responses of learners

(e) Any other comments useful to teachers, subject advisors, teacher development etc.

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4.3 Calculate areas and quantities:
Most learners did the calculations but did not use the quantity list correctly.
EXAMPLE

	A	B	C	D
4.3.1				Internal measurements of:
				Long walls = 5 240 ✓ – 2/220 mm ✓
				= 4 800 mm ✓
				Short walls = 4 040 ✓ – 2/220 mm ✓
				= 3 600 mm ✓
	1/	4, 8 ✓		Internal area of the store room.
4.3.2		3, 6 ✓	17, 28 m^2 ✓	
				Number of ceiling boards.
	1/	2, 4 ✓		Area of one ceiling board (CB):
		0, 9 ✓	2, 16 m^2 ✓	One ceiling board is 2 400 mm x 900 mm
4.3.3				Area is 2, 16 m^2
				Ceiling boards needed $= \frac{\text{Area of room}}{\text{Area of CB}}$
				$= \frac{17,28}{2,16}$ ✓✓
				= 8 Ceiling boards are needed ✓

Column A is the multiplication column indicating the number of items which must be multiplied.
Column B is the measurement column indicating the measurements of the item, below each other and must be multiplied.
Column C is the result column indicating the result (answer) of the calculations from column B and A.
Column D is the description column indicating the description of the work that was done in column A, B and C and the description of the total.
Teachers must put more emphasis on the use of units as an integral part of the calculations. The standard unit for leveling calculations is meter (m).
In column A, B and C, the calculations are done in meter, but the units are not indicated.
In column D, the units must be indicated. Ex. Height = 2,6**m** or area = 2 **m²**

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QUESTION 5 Understanding of applied mechanics principals was tested in this question with emphasis on (1) force diagrams, (2) shear forces + bending moments and (3) centre of a lamina.
(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?
Question 5 (applied mechanics)
This question was answered poorly by most learners.
(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.
Question 5.1: To determine the areas and centroid of a lamina was answered poorly by learners. Some learners were able to calculate the area of the square and the triangle but could not calculate the position of the centroid. Question 5.2: Develop the vector diagram. Learners must transfer the lines (truss parts) to the vector diagram with the same angle as the according line (part) in the space diagram. Question 5.3: Was poorly answered by learners. Some learners were unable to use the scale for the shear-force diagram.
(c) Provide suggestions for improvement in relation to Teaching and Learning
(d) Describe any other specific observations relating to responses of learners
(e) Any other comments useful to teachers, subject advisors, teacher development etc.

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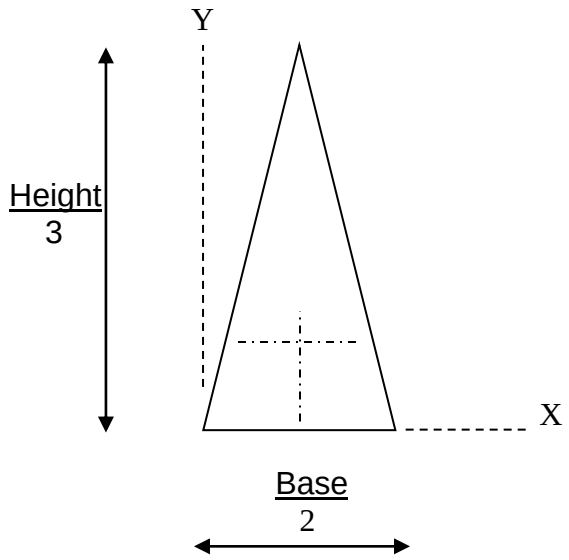
5.1 Calculate position of centroid:

A number of candidates had done the calculations incorrectly, although the formula were provided.

In an isosceles triangle the centroid for the X-axis is: base÷2 and the Y-axis: height÷3.



Teachers must firstly teach the learners the meaning of each formula and than, how to apply it according to the values.

Learners must be taught to use the same unit size through-out the calculation.

Learners must indicate the **UNITS** of the answers and know how to convert it from meter to mm.

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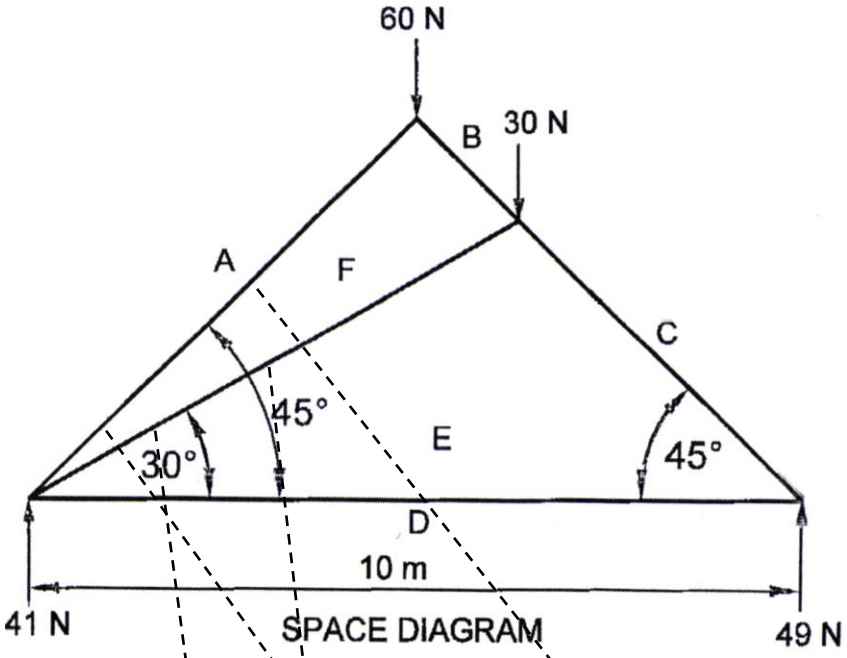
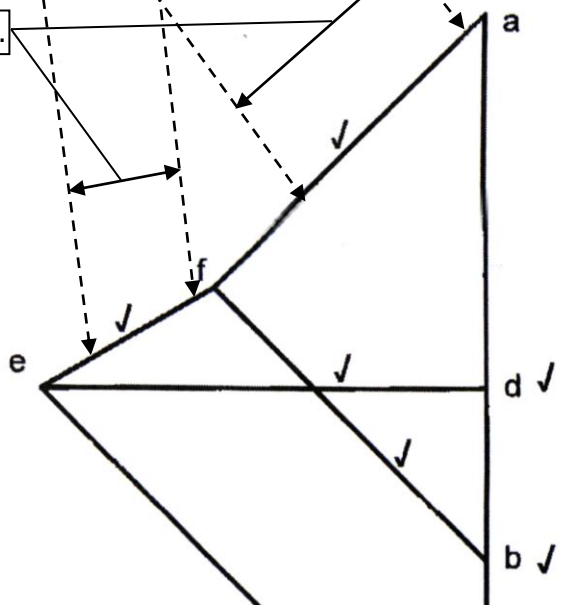
5.2 Develop the vector diagram. Learners must transfer the lines (truss parts) to the vector diagram with the same angle as the according line (part) in the space diagram.



Same angle as in space diagram.



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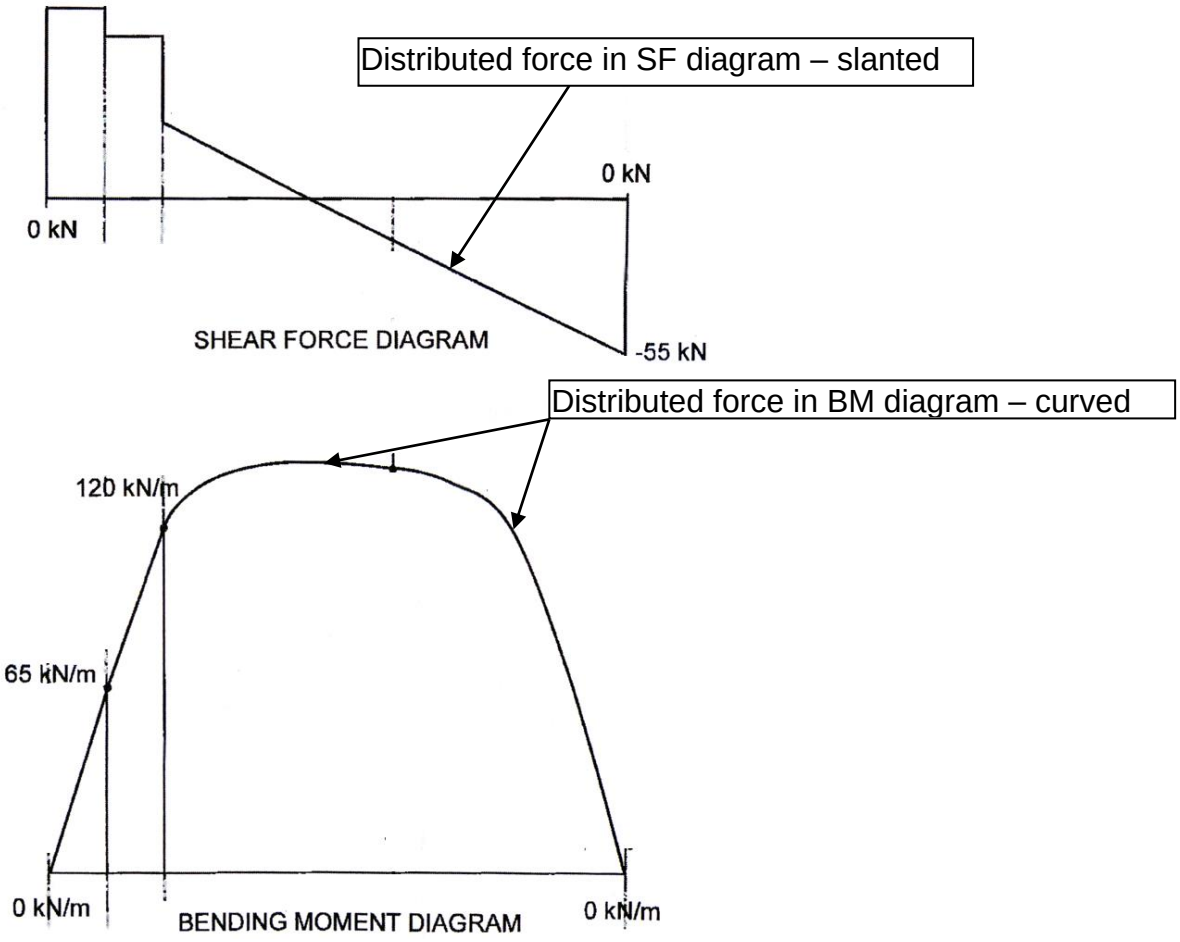
5.3 Shear force and bending moment diagram:
Learners must indicate the **UNITS** of the answers.
The mathematical skills of learners must attend to by means of repetition and working through examples.
Teachers must also emphasise the meaning of the different questioning terms such as convert, **deduce**, determine and prove.
In the shear force diagram, the distributed force is indicated by a slanted line and in the bending moment diagram, indicated by a curved line.



Repetition work and working through a number of examples will help the learners to understand this work.

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QUESTION 6

The skill to communicate by means of graphic communication was tested in this question with emphasis on interpretation of building drawing practice in (1) drawing of eave with roof construction and (2) elevation drawing.

6.1 Analyse building drawing parts

6.2 Drawing of the south elevation

(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

Question 6 (graphic communication)

Question 6.1 illustration of the closed eave construction was answered poorly.

Question 6.2 was answered well by most learners. Some drawings were untidy and did not comply to the scale.
Poor drawing techniques has been used.

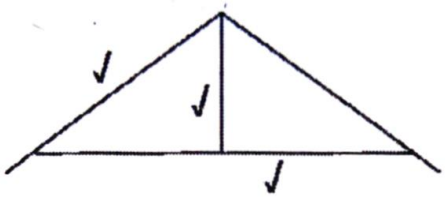
(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

Question 6.1 (closed eave construction) Most learners could not name this type of eave construction.

6.1.3: The standard measurements of the wall plate is the same as the roof truss parts: 114 x 38.

6.1.9: According to the spacing of the purlines, only sheeting can be used, not tiles.

6.1.13: Drawing of king post roof truss: Indicates only the king post, rafter and tie beam with no other parts such as queen posts and struts.

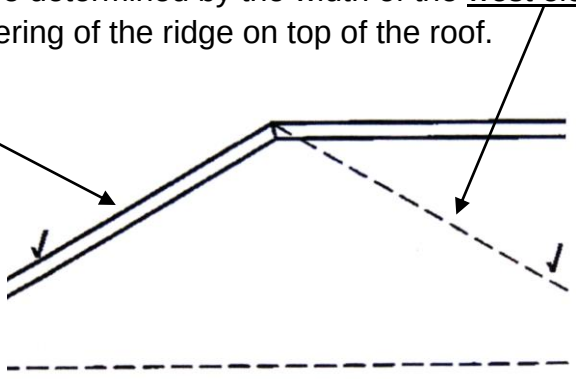


Question 6.2 (elevation drawing)

Most learners were able to draw the elevation drawing but some struggled with the roof lines. Some drawings were untidy and not to scale.

The height of the roof must be determined by the width of the west elevation.

The ridge capping is the covering of the ridge on top of the roof.



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(c)	Provide suggestions for improvement in relation to Teaching and Learning
(d)	Describe any other specific observations relating to responses of learners
(e)	Any other comments useful to teachers, subject advisors, teacher development etc.

6.2 Drawing of elevations
Teachers must emphasise the Building Drawing Practice requirements.
Building drawings must be done in pencil.
Using the correct scale must be emphasized.
Drawing skills need to be improved, most of the building industry communicates by means of drawings.

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SCRIPTS MODERATED Chief Marker – Mr. P. Els				
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52	4051023	026211264-6	4150510230001	
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54	4051023	026211264-6	4150510230009	
55	4051023	026211264-6	4150510230019	
56	4051023	026211264-6	4150510230022	
57	4171044	026226141-2	4151710440014	
58	4101052	026226034-3	4151010520021	
59	4061027	026226859-0	4150610270185	
60	4061027	026226859-0	4150610270234	
61	4061027	026226859-0	4150610270242	
62	4061027	026226859-0	4150610270274	
63	4151008	026232206-3	4151510080042	
64	4121011	026226060-2	4151210110021	
65	4121011	026226060-2	4151210110034	
66	4121011	026226060-2	4151210110038	
67	4121011	026226060-2	4151210110042	
68	4121012	026198774-6	4151210120032	
69	4121012	026198774-6	4151210120033	
70	4121012	026198774-6	4151210120037	
71	4171031	026208599-1	4151710310024	
72	4171031	026208599-1	4151710310025	
74	4171044	026208297-6	4151710440017	
75	4171044	026208297-6	4151710440022	
76	4111005	026209752-3	4151110050010	
77	4111005	026209752-3	4151110050011	
78	4081020	026217172-3	4150810200034	
79	4081020	026217172-3	4150810200036	
80	4231002	026189707-7	4152310020049	
81	4231002	026189707-7	4152310020052	