



**ASSESSMENT & EXAMINATIONS**

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## **NSC 2011 CHIEF MARKER'S REPORT**

<b>SUBJECT</b>	<b>ENGINEERING GRAPHICS AND DESIGN</b>
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<b>PAPER</b>	<b>1</b>
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<b>DATE OF EXAMINATION:</b>	<b>NOVEMBER 2011</b>	<b>DURATION:</b>	<b>3 HRS</b>
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### **SECTION 1:**

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

Generally the question paper was of a fair standard and was definitely within the capability of the candidates who worked consistently throughout the year. Some centres performed exceptionally well while others were mediocre. The time allocated to complete the paper was sufficient if candidates were thoroughly prepared. The paper covered most of the grade 12 content and concepts as prescribed by the NCS guidelines. Enough content and concepts were tested despite the fact that there were only four questions.

The choice of questions were well thought through and no candidate can complain about the type of questions asked. Similar questions had been asked in the past and in the supplementary exams. Candidates should have had no trouble in understanding, reading or interpreting the questions.

All the questions could have been completed within the time frame that correlates with the mark allocation of the question.

Overall the question paper is of a good standard for Gr.12. All the drawings and written information was clear accurate and very neatly presented.

The quality of the reproduction of the question paper was neat and of a high standard and neatly presented

## 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).**

<b>QUESTION 1</b>
<b>(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?</b>
<p>Overall this question was answered fairly well and candidates who knew their basic work obtained good marks. The questions posed were to the point and reasonably easy. This was a fair question and candidates could have obtained more marks if they had worked through the past examination papers and applied themselves during the year. However, many candidate still have difficulty with the simple calculation, similar to that of last year, to determine the perimeter and area of the medical centre. The space provided for the candidate to show his calculations was sufficient. Showing the formula and determining the perimeter and the area of a simple rectangle should be second nature by now as this had been asked in all past question papers. Some candidates from the random sample obviously did not see the space provided to draw a freehand sketch of the symbol for the north point according to the SABS 0143. However, candidates showed good knowledge identifying the various components of the wall and roof section. Enough lower- and medium-level questions were incorporated in this question in order to obtain a good mark.</p>
<b>(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.</b>
<p>This question was not poorly answered but unnecessary marks were forfeited because the simple calculation of finding the perimeter and the area of the stand was in many cases poorly done. The units M and M<sup>2</sup> must accompany the answer, these were often omitted. Candidates must read the question properly. Question 14 required the candidate to draw FREEHAND in the space provided the symbol of the north point according to the SABS 0143. Unnecessary marks were lost because the symbol was not drawn in freehand and in some cases the incorrect symbol was drawn. Another common mistake was that the exit of the property is in Rocky Road not Hospital Road.</p>
<b>(c) Provide suggestions for improvement in relation to Teaching and Learning</b>
<p>Candidates must be taught to read the question cautiously and study the given drawings before haphazardly begin to answer the questions. Neglecting to do so can be seen in the careless mistakes made. These short questions are valuable and can be use effectively in class and for class tests. Many of these examples are available and as many as possible should be worked out in order to get exposure to the unfamiliar civil terminology. A thorough knowledge of the features pertaining to civil drawings must be covered by the teacher.</p>
<b>(d) Describe any other specific observations relating to responses of learners</b>
<p>Learners must be encouraged to print neatly and legibly when answering this type of question. Answers must be written with a pencil and not with a pen. The letters should be formed according to the SABS code of practice. The answers must be placed in the appropriate space provided.</p>

<p><b>(e) Any other comments useful to teachers, subject advisors, teacher development etc.</b></p>
<p>Cluster meetings can be used more productively in discussing the content of the exam paper and the report on the learners' responses. Weaker schools will benefit a great deal from this discussion. Many queries and challenges can be resolved by these informal discussions. The subject constitutes a Civil as well as a Mechanical component. The expertise who have formal Civil training can be used fruitfully and give capacity to those who need it.</p>
<p><b>QUESTION 2</b></p>
<p><b>(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?</b></p>
<p>This question was poorly answered by most candidates. However, there were some very good answers where candidates obtained full marks. Candidates could have obtained an easy 10 marks by simply copying the given views. Many, however, received these 10 marks.</p> <p>The development of the transmission piece was very poorly answered. If the candidates recognised that line ab was a true length and the back surface a true shape, that would have been a good start to the development.</p> <p>Even though this question had been poor answered by many candidates it still remains a good innovative question and definitely within the ability of a Gr. 12 learner.</p>
<p><b>(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.</b></p>
<p>This question was poorly answered because:</p> <p>(1) Candidates are unfamiliar with solving this problem with the triangulation method. The quadrilateral was not converted to a triangle using a diagonal.</p> <p>(2) Determining the true length of lines in order to draw the development proved to be a problem to many. Without the correct true lengths the development cannot be drawn correctly.</p> <p>(3) The instructions clearly stated that edge AB is the seam, which means that the development must start with the back surface using AB as the starting line.</p> <p>(4) It is evident that at some centers this part of the syllabus had not been done of covered comprehensively.</p>
<p><b>(c) Provide suggestions for improvement in relation to Teaching and Learning</b></p>
<p>More examples of a different variety must be done by the learners. The various methods and techniques of solving this type question must be carefully explained to the learners. There is not enough time in the class room to do enough of these examples so as to entrench it in the minds of the learners. Therefore learners must be prepared to also work at home if they wish to master this type of problem. The various techniques can be applied to the different types of examples.</p>
<p><b>(d) Describe any other specific observations relating to responses of learners</b></p>
<p>When being confronted with this type of question learners must be taught to look for certain clues e.g. true length lines and true shapes of planes which are given, as well as perpendicular angles and similar triangles. In this case many did not recognize the given true length and that the true shape of the back plane was given.</p>

<b>(e) Any other comments useful to teachers, subject advisors, teacher development etc.</b>
A good knowledge of Plane Geometry – determining the true lengths of lines and true shapes of plane figures forms the basis in answering this type of question. This section of the work should therefore not be neglected by the teachers in grades 10 and 11. Teachers who are not conversant with this section of the syllabus should seek advice from teachers who have knowledge on this work. This is the type of examples that can be presented at cluster meetings.
<b>QUESTION 3</b>
<b>(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?</b>
This question was a fair and reasonable for a grade level question. The question was answered fairly well by many candidates. To start this question the two vanishing points must be correctly determined. This was not the case revealed in some candidates work. This resulted that the complete drawing was not according to the requirements. However, if candidates determined the vanishing points incorrectly the rest of the question was marked according to his/her vanishing points. Surely by doing similar of these type of questions from Grade 11 candidates should by now be capable of finding the vanishing points. Finding these points are essential if the drawing is to be correct. This same problem occurs every year and candidates forfeit unnecessary marks for the incorrect determining of the vanishing points. In most cases the position of the roof, the front of the building and the staircase was reasonable well done. Finding the position of the chimney was not done as should be expected.
<b>(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.</b>
Although this question was answered fairly well by most centres the following points need attention: (1) The construction lines to determine the VP'S must be clearly seen. (2) The other construction lines to the VP'S and the SP to draw the house must be neat, light but visible. (3) Determining the position and the correct height of the chimney was a challenge to many.
<b>(c) Provide suggestions for improvement in relation to Teaching and Learning</b>
This part of the syllabus already starts in Grade 11. Teachers must ensure that the work done in Gr. 11 is not neglected as they are being prepared for Grade. 12. A good number of two point perspectives of appropriate standard must be done in Grades. 11 and 12.
<b>(d) Describe any other specific observations relating to responses of learners</b>
Although many learners displayed knowledge and understanding in this question particular attention must be paid to accuracy and neatness. This question contains a large number of construction lines that must not be erased as valuable marks can be lost. These construction lines assist the markers is slightly inaccurate
<b>(e) Any other comments useful to teachers, subject advisors, teacher development etc.</b>
The only way to improve the marks in this question is by working consistently throughout the year. There are many examples available from past exam papers that could be used to entrench the principles required to draw good accurate perspective drawings.

## QUESTION 4

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

This question was answered reasonably well and most candidates obtained a good mark. This question comprised of three sections. Completing the floor plan, drawing a north elevation and a sectional elevation through a cutting plane.

#### FLOOR PLAN

The floor plan was given and the candidate just had to fill in the missing features such as the windows, doors, sanitary fixtures and electrical circuits. This was the easiest part of the drawing and candidates obtained good marks for this section.

#### NORTH ELEVATION

This was an easy view and most candidates fared reasonably well answering this question. However, careless mistakes were made by not spacing the windows correctly and adding required detail, not showing the finished floor level and not labelling the required features. Determining the height of the roof proved a problem to many candidates.

#### SECTIONAL ELEVATION

Candidates did not fair very well in this section of the drawing. The foundation, wall and slab detail is work that had been covered from Grade 10 level. Therefore candidates should have had no misconceptions and difficulty completing this part of the drawing. Again careless mistakes were made by omitting to insert the fixtures, door and window detail.

The roof truss on this sectional drawing was a challenge to many candidates. Even though a schematic diagram of the roof truss was given many candidates drew the King Post type roof truss.

The inner wall showing the opening was often omitted.

In general candidates performed reasonably well in this question.

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

Although this question was answered fairly well a number of thoughtless mistakes were made viz:

#### FLOOR PLAN

(1) Labels were often omitted and placed in the incorrect position. The title and scale should be placed beneath the drawing and in the left hand corner of the A3 page. Only the labels that were asked must be inserted. Some candidates labelled almost every feature resulting in a very messy drawing.

(2) The electrical circuits were inserted very untidily and not placed at the correct places as stipulated. Incorrect symbol were often used.

(3) Conventions for the sanitary fixtures were required but not always used resulting in marks being deducted.

(4) The window sill was omitted in many cases, the door opened to the outside which is incorrect as the door frame won't allow the door to open outwards. Good learners lost marks because the swing of the door was not shown, but instead a diagonal line was drawn. This method is not in the SABS code of practice therefore was taken as incorrect.

#### NORTH ELEVATION

(1) The FFL line and the labels were often omitted.

(2) The scale was often incorrect and the drawing inaccurate.

(3) The height of the roof which should have been taken from the sectional view was in most cases incorrect.

(4) A number of careless mistakes were made by some learners when drawing the windows:

- The window sills were omitted.
- The height of the windows were incorrect.
- The lines indicating the opening were incorrect or simply left out.
- A single line for the frame instead of a double line was drawn.

#### SECTIONAL ELEVATION

(1) The cutting plane in the plan view was interpreted incorrectly as in many cases the roof and/or building was mirrored. Two marks were deducted if candidates gave a mirror image of this view. In many cases this view was also rotated which is incorrect and candidates were as a result penalized for this.

(2) Although a schematic diagram of the roof truss was given, many candidates drew a King Post roof truss. Half the marks for the roof were then immediately forfeited.

(3) The finer detail such as the fascia board, wall plates and gutter were often omitted.

(4) The incorrect number of purlins and the placing thereof were often inaccurately drawn.

(5) Although the sectioning for the walls and foundation is covered from grade 10 it is expected that candidates are by now conversant with this part of the work preventable mistakes were made viz.

- The scale was incorrect. This could easily be seen from the thickness of the walls and the width of the building.
- The sub-structure hatching was untidy and often incorrect.
- Mechanical hatching was often used for the walls instead of civil hatching.

(6) The window detail was poorly presented.

(7) Labels were often omitted or placed inappropriately.

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

In addition to the specific problems mentioned in (b) above the teacher must inculcate the following facts into the minds of the learners:

(1) Learners must be taught how to interpret the given schematic diagrams correctly and to read and carry out the instructions required on the paper. Many unnecessary mistakes were made due to the fact that learners could not interpret the given information correctly.

(2) Learners must have a thorough knowledge of sectioning from foundation to roof.

(3) Although the plan view was given to assist the learners to obtain the other two views, learners did not take advantage of this and wasted time by not simply projecting to complete the other required views.

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

Many learners do not understand that the principle of first angle orthographic should be applied when projecting views. This was clearly evident in scripts where learners where rotated and mirrored the sectional view. The finer detail of the roof was inaccurate and in many cases not even shown.

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

Enough practice should be given to the drawing of the roof components to ensure that learners are familiar with the use of various scales e.g. 1:50, 1:40 etc. Even though the components appear small on a scale of 1:50 marks are allocated for these items. Teachers are encouraged to make or acquire models of civil structures and roof trusses to assist in their visualisation of the various components.

**SIGNATURE OF CHIEF MARKER:** \_\_\_\_\_



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