



**basic education**

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Department:  
Basic Education  
**REPUBLIC OF SOUTH AFRICA**

# **ENGINEERING GRAPHICS AND DESIGN**

## **GUIDELINES FOR PRACTICAL ASSESSMENT TASKS**

**GRADE 12**

**2020**

**These guidelines consist of 26 pages.**

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## 1. INTRODUCTION

The 17 Curriculum and Assessment Policy Statement subjects which contain a practical component all include a practical assessment task (PAT):

- **AGRICULTURE:** Agricultural Management Practices, Agricultural Technology
- **ARTS:** Dance Studies, Design, Dramatic Arts, Music, Visual Arts
- **SCIENCES:** Computer Applications Technology, Information Technology and Technical Sciences
- **SERVICES:** Consumer Studies, Hospitality Studies, Tourism
- **TECHNOLOGY:** Engineering Graphics and Design, Civil Technology, Electrical Technology and Mechanical Technology

A practical assessment task (PAT) mark is a compulsory component of the final promotion mark for all candidates offering subjects that have a practical component and counts 25% (100 marks) of the end-of-year examination mark. The PAT is implemented across the first three terms of the school year. This is broken down into different phases or a series of smaller activities that make up the PAT. The PAT allows for learners to be assessed on a regular basis during the school year and it also allows for the assessment of skills that cannot be assessed in a written format, e.g. test or examination. It is therefore important that schools ensure that all learners complete the practical assessment tasks within the stipulated period to ensure that learners are resulted at the end of the school year. The planning and execution of the PAT differs from subject to subject.

## SECTION A (TEACHER GUIDELINES)

### 2. STRUCTURE OF THE PAT FOR EGD

As the Engineering Graphics and Design (EGD) **PAT** is a **compulsory national formal assessment task** that contributes 25% (i.e. 100 marks) towards a learner's final NSC mark, it is essentially the **third NSC examination paper** of EGD. All the presentation requirements must therefore be adhered to and, with the exception of the required research, completed at school, under the supervision of the EGD teacher. Each learner must complete the PAT individually and ALL the presentations must be his/her own original work.

The primary purpose of the EGD PAT is to assess content and concept topics which are not assessed in the examination papers. These are:

- The design process
- The application of the design process
- The quality and neatness of free-hand, instrument and CAD drawings

The EGD PAT is therefore designed to develop a learner's ability to integrate and apply knowledge and to demonstrate acquired levels of skills and competency.

With the inclusion of the PAT into EGD, the learner is given an opportunity to apply acquired knowledge in a creative way through the design process.

The learner is given an opportunity to complete the PAT in an environment which is more conducive to the creative processes. This environment should therefore provide the learner with easier access to, and a wider variety of, resource material than would be available in a formal examination.

The various components of the EGD PAT give the learner an opportunity to demonstrate the level of drawing skill that has been attained in all the appropriate drawing methods through the presentation of the required drawings. Each EGD PAT consists of TWO parts:

- **PART A:** The design process
- **PART B:** The working and pictorial drawings

PART A of both PATs requires that the learner demonstrates a clear understanding of, and is able to apply, the design process. As part of the design process, the learner must be able to do the following:

- Analyse the given scenario and formulate a design brief. Include a list of specifications, constraints and a management plan as part of the design brief
- Conduct relevant research
- Use the research in generating a number of ideas/concepts/solutions, analytically and graphically, through comprehensive freehand drawings
- Select a final solution that demonstrates a clear understanding of the design brief
- Provide clear evidence of continuous self-assessment during the development of the PAT

PART B of both PATs requires that the learner demonstrates and provides evidence of a high level of knowledge and understanding of the concepts and content of Engineering Graphics and Design through the presentation of orthographic working drawings and pictorial drawings.

PART A and PART B of both PATs give the learner the opportunity to demonstrate a level of competency and skill that has been attained in the following drawing methods:

- **Freehand drawings**, prepared in pencil
- **Instrument drawings**, prepared in pencil
- **CAD drawings**, prepared using a CAD program

TWO practical assessment tasks (PATs) are included in this document:

- PAT 1 is a task in the context of civil technology, with an electrical component
- PAT 2 is a task in the context of mechanical technology

Each learner must, with the guidance of the teacher, select **ONE** of the PATs.

### Elements that make up the PAT mark for Engineering Graphics and Design

ELEMENTS OF THE MARK FOR THE PRACTICAL ASSESSMENT TASK	
The <b>design process</b>	25%
The <b>correctness</b> of the <b>working and pictorial drawings</b>	50%
The <b>drawing methods</b> (freehand, instrument and CAD)	25%
<b>TOTAL</b>	<b>100%</b>

### 3. ADMINISTRATION OF THE PAT

At the beginning of the academic year the teacher must ensure that every Grade 12 learner receives a copy of the entire SECTION B of the PAT document.

Each phase must be completed prior to commencement of phase moderation in the second and third terms, and provincial moderation in the third and fourth terms.

The phases of the PAT must therefore be completed within the following times:

- PHASE 1: Design process (completed by the end of the Term 1)
- PHASE 2: Presentation drawings (completed by the end of the Term 2)
- PHASE 3: Completion of portfolio (before the commencement of provincial moderation in Term 3 or at the latest before the commencement of the preparatory examinations)

Although the phases could be done either **cyclically** or in **block times**, as indicated in the CAPS, it is recommended that **one entire day** per term, e.g. as an extra paper during the June examinations, be allocated for each phase.

The teaching time that may be allocated for the completion of all three phases of the PAT is between 12 hours and 16 hours. However, additional non-teaching time may also be allocated for the completion of the PAT at the school, but the total maximum time for the completion of all the phases of the PAT should NOT exceed 20 hours.

To ensure that the PAT is completed within the stipulated timeframe, it is essential that the teacher draws up a pacesetter/management plan with target dates. This will help learners to monitor their own progress and teachers to set up intervention programmes.

#### NOTE:

- ALL the presentation requirements of the selected PAT must be adhered to and, with the exception of the required research, **completed at school under the guidance and supervision of the teacher**. Not adhering to this instruction will be deemed as an examination irregularity.
- It is the **teacher's responsibility** to ensure that each learner's PAT is of an appropriate Grade 12 level and complexity.

## 4. ASSESSMENT AND MODERATION OF THE PAT

### 4.1 Assessment

**The assessment of the PAT must be done according to the included relevant assessment criteria and checklist.**

Frequent developmental feedback is needed to guide and give support, and to ensure that each learner is on the right track. Both formal and informal assessment should therefore be conducted throughout the development of the PAT. Informal assessment can be conducted by the learner, a peer or by the teacher.

However, the teacher must conduct ALL the formal assessment and record the results on the official mark sheets. The marks of each learner **must**, however, also be indicated on the official 2020 SUMMATIVE ASSESSMENT SHEET, i.e. page 25 of this document, in the learner's PAT portfolio.

The final formal assessment must be completed before the commencement of provincial/final moderation or, at the latest, before the preparatory examinations in the Term 3.

Once ALL the PATs have been assessed and moderated, the teacher **must** retain ALL the PATs for the purpose of external moderation. ALL the PATs must also be retained at the school for the period of time as stipulated by the provincial departments of education.

#### **Clarification of level descriptors and the verification of marks:**

- **1-mark level descriptor:**  
This level descriptor is used for **elementary/basic presentation requirements and/or drawing features**, and must be applied as follows:
  - '0' (zero) must be allocated for the requirement not met, or if the presentation thereof is incorrect.
  - 1 mark may **only** be allocated if the requirement has been fully met and the presentation thereof is correct.
- **2-mark level descriptor:**
  - '0' (zero) must be allocated if the requirement has not been included/shown, or if the presentation of the requirement shows **less than 30%** evidence of knowledge, or when the requirement is very poor.
  - 1 mark must be allocated if the presentation of the requirement shows at least **30% or more** evidence of knowledge, or the requirement is NOT complete or completely correct, compliant and/or clear.
  - 2 marks may only be allocated if the presentation of the requirement shows at least **80% or more** evidence of knowledge and the requirement is complete and correct, compliant and clear.
- **7-mark level descriptor**  
Refer to the 7-mark rubric on page 45 of the CAPS document for the level descriptors. This implies that a **'7' can only be allocated** if the presentation requirement(s) is **100% correct/compliant**, i.e. outstanding and error-free.
- **Verification of ALL final marks out of 10:**  
Each final mark out of 10 must be verified according to the descriptors contained in the rubric on page 24 of this document. This implies that a **'10' can only be allocated** if the presentation requirement/s is **100% correct/compliant**, i.e. perfect and error-free.

- **Rounding off of marks:**

Each mark out of 10 must be rounded off **before** being captured.

#### 4.2 Moderation

The moderation of the PAT must be done according to the included relevant Assessment Criteria and Checklists.

Monitoring and/or moderation of the PAT can take place **at any stage of the process**. ALL completed presentation requirements of the PAT must always be available at the school. However, to facilitate provision for intervention programmes, the following school-based and provincial moderation must be done during Terms 2 and 3:

- Phase 1: Design process (beginning of Term 2 before the commencement of PHASE 2 or the June examinations)
- Phase 2: Presentation drawings (beginning of Term 3 before the commencement of PHASE 3)

Provincial moderation must be concluded **before** the commencement of national/Umalusi moderation, or the end of the third week of Term 4.

During the moderation process the moderator will randomly select the PAT portfolios that have to be moderated. To assist the process of final provincial moderation, the teacher must supply the moderator with a completed mark sheet(s) and a merit list(s).

During the moderation process learners may be called upon to explain the functions and principles of operating a CAD program, and to demonstrate drawing skills through performing capability tasks.

#### 4.3 Declaration of Authenticity

Prior to the final submission of the PAT, ALL the learners and the teacher must complete the Declaration of Authenticity, as set out on page 26 of this document.

**NOTE:**

Only the official 2020 SUMMATIVE ASSESSMENT SHEET, the completed DECLARATION OF AUTHENTICITY and relevant CHECKLIST may be included in the learner's completed PAT portfolio.

### 5. CONCLUSION

On completion of the practical assessment task, learners should be able to demonstrate their understanding of the design process, enhance their knowledge, skills, values and reasoning abilities as well as establish connections to life outside the classroom and address real-world challenges. The PAT furthermore develops learners' life skills and provides opportunities for learners to engage in their own learning.

**SECTION B (LEARNER TASKS)****General information and instructions:**

- The EGD PAT is a compulsory national formal assessment task that contributes 100 marks towards your final National Senior Certificate (NSC) mark.
- This document contains the following TWO PAT scenarios:
  - PAT 1: A civil design project, with an electrical component
  - PAT 2: A mechanical design project
- You, the learner, with the guidance of your teacher, must select and complete ONE of the PAT scenarios contained in this document.
- ALL the presentation requirements of the selected PAT must be adhered to and, with the exception of the research, be completed at school, under the guidance and supervision of your teacher.
- Although the sharing of knowledge and information is permissible, the PAT must be completed individually and ALL the presentations, including the front page and index, must be your own original work.
- The PAT must be completed in phases and within the given time frame of your teacher's PAT pacesetter/management plan.
- ALL freehand drawings and instrument drawings must be prepared in pencil.
- The PAT must be of an appropriate higher-order Grade 12 complexity.
- The PAT will be assessed according to the relevant assessment criteria and checklists, which are included in this PAT document.
- The relevant checklist must be used to provide clear evidence of continuous self-assessment.
- Untidy and messy work, as well as the late submission of presentation requirements, will be penalised.



## 6. PRACTICAL ASSESSMENT TASK 1 (PAT 1)

### A civil design project

#### Scenario

A small portion of a farm next to District Road 45, PLOT 17, has been rezoned to residential. As the farm is near to many tourist attractions and a town with major new industrial developments, the client who purchased the portion of the farm intends to build TWO similar self-catering houses on the property. The houses should be designed for families that are not only just visiting the area, but also for families that intend staying there for an extended period of time while they set up permanent residence the town.

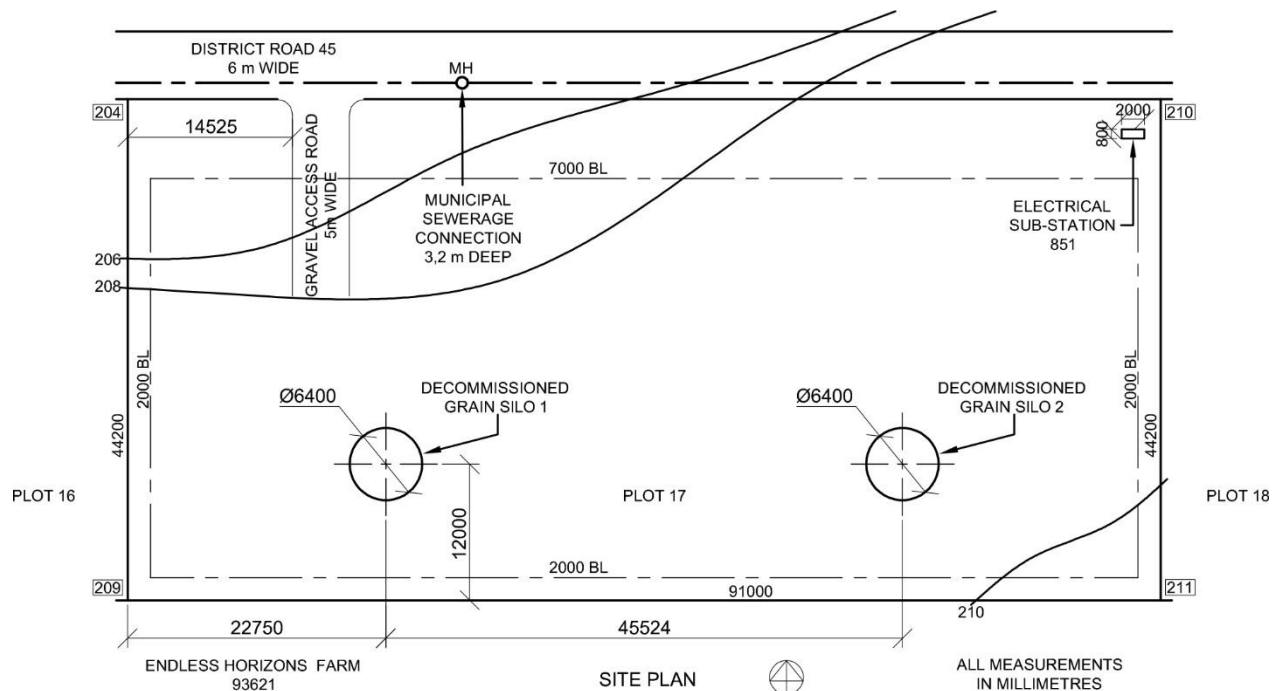
There are two old decommissioned silos (cylindrical structures that were used to store grain) on the property. These silos are made of 200 mm thick brick walls and are 7 m high with an outer diameter of 6,4 m. The client has requested that the silos be incorporated into the design of the houses. To aesthetically fit in with the design of the houses, the height of the silos should be reduced to a height of no less than 4 m. Window and door openings may be cut into the walls of the silos.

As the client wants the two houses to be mirror images of each other, you have been commissioned to provide a proposed design solution for only ONE of the houses and according to the given specifications.

The main entrances of both houses must face north. Each house must consist of three bedrooms, two bathrooms and a large area for an open plan kitchen and lounge. The silo may only be accessed from the lounge and must be used as an entertainment area and contain a built-in fire pit. A covered and raised wooden veranda must run the full length of the north-facing side of the house and continue along one of the sides. The lounge and main bedroom must have sliding doors that open onto the veranda. There must be built-in cupboards in each of the bedrooms. A carport for two cars must be attached to the house. The house and silo must have an appropriately designed roof with a corrugated-iron finish. The total area of the house, including the silo and the veranda, but excluding the carport, may not exceed 180 m<sup>2</sup>.

The kitchen must have built-in cupboards and sufficient work surfaces for appliances and the preparation of food. There must be space for a gas stove and a fridge. Provision must also be made for a surface or area where six or more people can sit down to eat. The one bathroom must be en suite to the main bedroom and the other must service the two smaller bedrooms. Both bathrooms must consist of a shower, washbasin, toilet and bath. All the rooms and areas must have sufficient electrical lighting and switched socket outlets. Clean water will be supplied to the site via the main municipal feeder line, and the waste-water from the two houses will be discharged into the main sewerage line that runs under the district road.

The client also requested that a detailed layout of the entertainment area, which shows all fixtures and furniture, must be included on the floor plan of the design solution.



**Given:** The site plan of PLOT 17

## PHASE 1 PRESENTATION REQUIREMENTS

1. Analyse the given scenario and formulate a design brief in two paragraphs:
  - The first paragraph must, in your own words, include a brief background to the project, as well as a detailed and comprehensive description of what has to be designed.
  - The second paragraph must, in your own words, give a clear overview of your role in the project, as well as the design process that you are going to follow to arrive at a proposed solution.

From the scenario and your teacher's management plan, **include the following as part of the design brief:**

- Identify and list a minimum of TWENTY specifications.
- List a minimum of FIVE possible constraints.
- A management plan, which specifies target dates for the completion of each presentation requirement.

2. Conduct research on:
  - Layouts and designs of open plan kitchens and lounge areas
  - Designs and construction detail of slightly raised wooden verandas with roofs
  - Layouts and designs of entertainment areas with built-in fire pits

**NOTE:**

- The research must be relevant and should therefore be primarily in the form of graphic material, i.e. pictures and/or illustrations.
- Evidence of ALL the required research material must be included in the PAT portfolio.

- The presentation of the research material should be aesthetically presented and may NOT exceed FOUR A4 or TWO A3 pages per topic.
  - There must be clear evidence that the research has been used in your proposed design solution.
  - Include a list of ALL references used. (Bibliography)
3. Prepare neat detailed freehand drawings of the layout, i.e. floor plan, of TWO possible design solutions for ONE of the proposed new houses. Each freehand drawing must show the correct presentation of ALL the building features, the permanent fixtures, the veranda, the carport, the roof lines as well as the primary dimensions and labels. The calculation of the total area of the house, which must include the silo and veranda, must be shown clearly in a table on the drawing sheet of each freehand drawing.

**NOTE:**

- Electrical fittings and waste-water disposal systems are NOT required on the freehand drawings.
  - Grid/Graph paper must be used to generate the freehand drawings so that ALL features and fixtures are drawn to proportion. Evidence of the grid/graph paper used must be included in the PAT portfolio.
  - All the drawings must comply with the *SANS 10143 Guidelines*.
  - These drawings must provide clear evidence that a high level of competency has been attained in **freehand drawing**.
4. Select the best solution, which demonstrates an in-depth understanding of the scenario within the context of the design brief, specifications and constraints.

On a separate page, evaluate and compare the TWO freehand solutions by:

- Creating a table with a minimum of SIX descriptive criteria
- Creating and applying a simple rating scale to score each solution against each criterion
- Justifying each score by describing the positive and/or negative aspects of each solution against each criterion

Complete the process by writing a comprehensive summary giving reasons for the selected freehand solution. The summary must also include whether there were any late changes made to the selected freehand solution.

**PHASE 2 PRESENTATION REQUIREMENTS**

5. Present the selected solution as a set of working drawings and a pictorial drawing (5.1, 5.2 and 5.3) that meet the following criteria:
- All the working drawings must be presented on appropriately sized drawing sheets, set up with correct borders. ONLY the first working drawing's drawing sheet (i.e. for 5.1.1) must be set up with a complete civil title panel.
  - The drawings must provide clear evidence that a high level of competency had been attained in the following required drawing methods:
    - Instrument drawing
    - CAD (Computer-aided Drawing/Design)

**NOTE:**

- ONE entire working drawing (i.e. 5.1.1, 5.1.2 and 5.1.3 or 5.2) must be prepared using drawing instruments and the other using a CAD program.
- The perspective drawing (5.3) may be prepared either by using drawing instruments or by using a CAD program.
- Schools that do not have CAD facilities must prepare all the required drawings (5.1, 5.2 and 5.3) using drawing instruments.
- The title panel and ALL the working drawings must comply with the *SANS 10143 Guidelines*.

- 5.1 Draw, to a suitable scale(s), detailed layout drawings of the selected freehand solution of the complete house, which includes the silo, veranda and carport, clearly showing all the required building features.

**The layout drawings must show the following FOUR orthographic views:**

5.1.1 The FLOOR PLAN

5.1.2 A SECTIONAL ELEVATION(S), showing the detail of a door, a window and the wooden veranda

5.1.3 TWO ELEVATIONS, showing the north-facing side and either the west-  
**or** the east-facing side of the house

**Include the following on ALL relevant views:**

- The roof detail of the house, the silo and the veranda, as well as the roof lines
- ALL permanent fixtures
- A detailed layout of the entertainment area inside the silo
- ALL electrical fittings and the wiring detail
- Waste-water disposal systems (sewerage)
- Titles, labels and notes
- Scale(s)
- Detailed dimensioning
- Cutting plane(s)
- All hatching detail
- North point

- 5.2 Draw, to a suitable scale, a detailed SITE PLAN for the project.

**Include the following:**

- ALL the given general site details and features of PLOT 17
- The position of both new houses
- ALL driveways and the landscaping layout
- ALL sewerage detail
- Electrical supply
- Scale
- Dimensions, including the setting-out dimensions and corner heights
- North point

- 5.3 Draw a **detailed human eye view** TWO-POINT PERSPECTIVE DRAWING of one of the houses, clearly showing the north elevation, the covered veranda and the silo. The horizon line (HL) must be **±1,8 m** above the ground line (GL).

**Evidence of the following must be included:**

- All views used to produce the perspective drawing
- The construction method used to produce the perspective drawing

**NOTE:**

Use a **copy** of the perspective drawing, which may contain artistic features, as the picture for the cover page of the PAT portfolio.

**PHASE 3 PRESENTATION REQUIREMENTS****Create a PAT portfolio containing:**

- A complete cover page
- An index
- The 2020 SUMMATIVE ASSESSMENT SHEET (see page 25)
- The completed DECLARATION OF AUTHENTICITY (see page 26)

**Include the following PHASE 1 and PHASE 2 presentation requirements in the PAT portfolio after the DECLARATION OF AUTHENTICITY:**

1. ALL the design brief requirements
2. Evidence of ALL the resource material used for the required research
3. The TWO freehand drawings of the possible design solutions
4. ALL the evidence of the selection of the best solution
5. ALL the required working drawings (5.1 and 5.2) and the perspective drawing (5.3)
6. Using the included checklist (assessment criteria), clear evidence of continuous self-assessment and the meeting of deadlines, in accordance with the management plan, during the development of the PAT

**NOTE:**

Include the following on each page:

- Clear numbering according to the numbers of the presentation requirements
- Your (the learner's) name
- The date of completion and submission

**Assessment criteria and checklist for the 2020 EGD Civil PAT**

- The SUMMATIVE ASSESSMENT SHEET on page 25 of the PAT document must be used to indicate the final totals out of 10 for each assessment criterion.
- The contribution of each aspect of the PAT is as follows:
  - The design process, i.e. presentation requirements numbers 1, 2, 3, 4, 6 and 7, will contribute 25 marks to the final PAT mark out of 100
  - The working drawings and the pictorial drawing, i.e. presentation requirement number 5, will contribute 50 marks to the final PAT mark out of 100
  - Drawing methods, drawing skills and presentation, which should be assessed according to ANNEXURE A, will contribute 25 marks to the final PAT mark out of 100

ASSESSMENT CRITERIA AND CHECKLIST FOR THE 2020 EGD CIVIL PAT								
1-mark level descriptive	0	Requirement not met or presented incorrectly				Checked	Suggested mark allocation	Own marks/notes/comments
	1	Requirement has been met and/or presented correctly						
2-mark level descriptive	0	Requirement not met, or <b>less than 30%</b> evidence of knowledge shown (poor)						
	1	Requirement included and <b>at least 30%+</b> evidence of knowledge shown (avg.)						
	2	Presentation shows <b>at least 80% or more</b> evidence of knowledge (very good)						
1.	<b>Design Brief</b>							
	1.1	1 <sup>st</sup> paragraph: background and comprehensive description of what to design					2	
	1.2	2 <sup>nd</sup> paragraph: your role and the design process that you are going to follow					2	
	1.3	A list of a minimum of TWENTY of the given specifications from the scenario					2	
	1.4	A list of FIVE possible constraints from the scenario					2	
	1.5	A management plan with target dates for ALL the presentation requirements					2	
						<b>TOTAL</b>	<b>10</b>	
2.	<b>Research</b> (This should be restricted to a <b>maximum</b> of FOUR A4 or TWO A3 pages per topic.)							
<b>Relevant and usable research on:</b>	2.1	Layouts and designs of open plan kitchens and lounge areas					2	
	2.2	Designs & const. detail of slightly raised wooden verandas with roofs					2	
	2.3	Layouts & designs of entertainment areas with built-in fire pits					2	
	Clear evidence that the research has been used in your proposed design solutions					2		
	A list of ALL references (Bibliography)					2		
						<b>TOTAL</b>	<b>10</b>	
3.	<b>Freehand drawings of TWO possible design solutions</b>					<b>Final mark for each solution</b>		
Assess each freehand solution as follows:	ALL the building features, including veranda and car port	1	<b>Solution 1</b>		<b>10</b>			
	Correct presentation of all building features	2						
	ALL fixtures included	1						
	Correct presentation of all fixtures according to SANS 10143	2						
	Relative size/proportion of ALL features to each other	2	<b>Solution 2</b>	<b>10</b>				
	Primary labels (1) + primary dimensions (2) (1 + 2 = 3)	3						
	Area calculation clearly shown and within the constraint	2						
	Design: functionality and effective utilisation of space	2						
	<b>Subtotal = 15 ÷ 1,5 = TOTAL</b>		<b>15</b>					
(1 = 1; 2 = 1; 3 = 2; 4 = 3; 5 = 3; 6 = 4; 7 = 5; 8 = 5; 9 = 6; 10 = 7; 11 = 7; 12 = 8; 13 = 9; 14 = 9; 15 = 10)								
4.	<b>Selecting the best freehand solution</b> (This must be a separate presentation.)							
	Table created for an easily understandable presentation of the selection process					2		
	Minimum of SIX descriptive criteria to evaluate and compare					2		
	Simple rating scale created and used to score each solution against each criterion					2		
	Each score justified by describing the positive or negative aspects of each criterion					2		
	Comprehensive summary giving reasons for the selected freehand solution					2		
						<b>TOTAL</b>	<b>10</b>	
5.	<b>Layout drawings and a pictorial drawing of selected solution</b>							
	<b>Drawing sheet preparation</b>							
	Appropriately sized drawing sheets used					1		
	Correct borders on all the drawing sheets of all the working drawings					2		
	Complete SANS 10143 compliant civil title panel on first working drawing's drawing sheet					7		
						<b>TOTAL</b>	<b>10</b>	
<b>NOTE: Use the 7-mark simplified rubric on page 45 of the EGD CAPS.</b>								
5.1	<b>Detailed layout drawings of the proposed new building</b>							
	5.1.1	<b>FLOOR PLAN</b> showing:						
		Correlation with selected freehand solution & selection process summary					1	
		ALL internal and external walls, incl. ALL hatching detail and the rooflines					2	
		ALL doors and windows					2	
		ALL permanent fixtures					2	
		Detailed layout of the entertainment area inside the silo					2	
		ALL electrical fittings and the wiring detail					2	
		Waste-water disposal systems (sewerage)					2	
		Title, labels and notes (2) + detailed dimensioning (2) (2 + 2 = 4)					4	
		Suitable scale selected & correctly indicated (1) + cutting plane (1) + north point (1)					3	
						<b>Subtotal = 20 ÷ 2 = TOTAL</b>	<b>10</b>	

<b>ASSESSMENT CRITERIA AND CHECKLIST FOR THE 2020 EGD CIVIL PAT</b>				
5.1.2	<b>SECTIONAL ELEVATION</b> showing:			
	Section correct according to the indicated cutting plane(s)		2	
	Foundation, slab and wall detail, including the wooden veranda detail		2	
	Door(s) and window(s) detail		2	
	Roof detail of the house and the veranda		2	
	Labels and notes		2	
	Suitable scale selected and indicated correctly		1	
	Detailed dimensioning		2	
	ALL hatching detail		2	
<b>Subtotal = 15 ÷ 1,5 = TOTAL</b>			<b>10</b>	
(1 = 1 ; 2 = 1 ; 3 = 2 ; 4 = 3 ; 5 = 3 ; 6 = 4 ; 7 = 5 ; 8 = 5 ; 9 = 6 ; 10 = 7 ; 11 = 7 ; 12 = 8 ; 13 = 9 ; 14 = 9 ; 15 = 10)				
5.1.3	<b>TWO ELEVATIONS</b> , showing the <b>north-facing side</b> and <b>either the west- or east-facing side of the house</b>			
	Prescribed views shown		1	
	External walls and ALL other external features, including the veranda and the FFL		2	
	Door and window detail		2	
	Roof detail, including rainwater items, of the house and the veranda		2	
	Waste-water disposal system (sewerage)		2	
	Elevations drawn to same scale as the floor plan		1	
	<b>TOTAL</b>		<b>10</b>	
5.2	<b>Detailed SITE PLAN</b>			
	Site correctly drawn and ALL the <b>given</b> site detail/features are included		2	
	The complete proposed new houses		2	
	ALL sewerage detail		2	
	Dimensions, including the setting-out dimension and corner heights		2	
	Suitable scale selected and indicated correctly		1	
	North point		1	
	<b>TOTAL</b>		<b>10</b>	
5.3	<b>Detailed PERSPECTIVE DRAWING of one house</b> , clearly showing the <b>north elevation</b> , <b>covered veranda</b> and <b>silo</b>			
	Evidence of views and construction/method used for the drawing		1	
	Correct orientation showing the main entrance (1) and the correct HL height (1)		2	
	Perspective drawing/answer ( <b>NOTE: Use 7-mark rubric on page 45 of the EGD CAPS.</b> )		7	
	<b>TOTAL</b>		<b>10</b>	
6.	<b>Continuous self-assessment and the meeting of deadlines</b>			
	Completed checklist as evidence of continuous self-assessment	(mark out of 10 ÷ 2)	5	
	Meeting ALL the deadlines during the development	(mark out of 10 ÷ 2)	5	
	<b>TOTAL</b>		<b>10</b>	
7.	<b>Presentation of the complete PAT portfolio</b>			
	Cover page with a copy of the perspective drawing		1	
	Index		1	
	Summative assessment sheet and declaration		1	
	Correct sequencing of ALL presentation requirements		1	
	Name and numbering on the presentation requirements		1	
	General impression of portfolio, e.g. binding, appearance, etc.	(mark out of 10 ÷ 2)	5	
	<b>TOTAL</b>		<b>10</b>	
<b>Assessment of drawing methods, drawing skills and presentation</b>				
a.	<b>Freehand drawings</b>			
	Freehand drawing methods and skills	(See ANNEXURE A on page 23)	10	
	Neatness, line work/line quality and printing	(See ANNEXURE A on page 23)	10	
b.	<b>Instrument drawings</b>			
	Use of drawing instruments, drawing methods and skills	(See ANNEXURE A on page 23)	10	
	Neatness, line work/line quality and printing	(See ANNEXURE A on page 23)	10	
c.	<b>CAD drawings</b>			
	Competence displayed in using a CAD program	(See ANNEXURE A on page 23)	10	
	Layout and correctness of the drawings presentation	(See ANNEXURE A on page 23)	10	

## 7. PRACTICAL ASSESSMENT TASK 2 (PAT 2)

### A mechanical design project

#### Scenario

You are employed as a draughtsperson at a mechanical consulting firm that is currently working on improving the designs of SWIVEL CASTER WHEELS with BRAKES. Examples of these devices can be found in many industrial applications.



You are tasked with investigating and analysing the design features of existing swivel caster wheels with brakes and are required to design an improvement(s) to the devices, which could be one or more of the following:

- Improved efficiency
- To strengthen its current design
- To simplify its application

#### The PAT requires the following stages:

- The FIRST stage involves finding a suitable swivel caster wheel with a brake, that consists of a minimum of FOUR components, of which ONE or more must involve movement, other than the rotation of the wheel, as part of the operation/function.

**NOTE:** You are NOT required to purchase a new swivel caster wheel with a brake. The device should be one that is readily available to you.

- The SECOND stage involves dismantling the swivel caster wheel with a brake so that all the components can be investigated and measured.
- The THIRD stage requires the identification of ONE of the main components, or a combination of the components of the swivel caster wheel with a brake, which could be improved, modified or re-designed in some way. This will necessitate the application of the design process, as stipulated below in the presentation requirements.

#### Requirements and specifications of the swivel caster wheel with a brake:

- The swivel caster wheel with a brake that you have selected, **must be submitted as part of your PAT presentation.**
- It must be an assembly consisting of a minimum of FOUR separate components that includes movement, other than the rotation of the wheel, as part of its operation/function.
- Your teacher must approve the swivel caster wheel with a brake that you have selected to ensure that it meets the requirements, and that a PAT of an appropriate higher-order Grade 12 complexity can be produced.



**PHASE 1 PRESENTATION REQUIREMENTS**

1. Analyse the given scenario and formulate a design brief in two paragraphs.
  - The first paragraph must, in your own words, include a brief background to the project, as well as a detailed and comprehensive description of what has to be designed.
  - The second paragraph must, in your own words, give a clear overview of your role in the project, as well as the design process that you are going to follow to arrive at a proposed solution.

From the scenario and your teacher's management plan, **include the following as part of the design brief:**

- Your own list of ALL the specifications for the selected swivel caster wheel with a brake.
  - Your own list of at least THREE constraints for the selected swivel caster wheel with a brake.
  - A management plan, which specifies target dates for the completion of each presentation requirement.
2. Conduct your own **research** on:
    - The material that is used for each individual component of the swivel caster wheel with a brake
    - The specific design features and/or function/purpose of each individual part of the swivel caster wheel with a brake
    - The design, components and mechanical movement of at least ONE other swivel caster wheel with brake

**NOTE:**

- The research must be relevant and should therefore be primarily in the form of graphic material, i.e. pictures and/or illustrations.
  - Evidence of ALL the required research material must be included in the PAT portfolio.
  - The presentation of the research material should be aesthetically presented and may not exceed FOUR A4 or TWO A3 pages per topic.
  - The first two research requirements will be primarily hands-on investigative research, which can be presented by using the comprehensive set of detailed photographs taken during the second stage, with labels and/or notes indicating the material and the function (purpose) of each individual part/component.
  - The evidence of the other caster wheel with a brake may be in the form of a comprehensive set of pictures, illustrations and/or photographs, together with explanatory labels and notes.
  - There must be clear evidence that the research has been used in your proposed design solution.
  - Include a list of ALL references used. (Bibliography)
3. Prepare TWO sets of neat detailed freehand drawings of TWO possible solutions of the proposed improvement, modification or re-design to the identified main component(s) of the swivel caster wheel with a brake that you have selected.

Each set of freehand drawings must consist of relevant orthographic views and an isometric drawing(s) that show dimensions, labels and explanatory notes, as well as the correct presentation of ALL the features. Include a short explanation of the possible improvement, modification or re-design.

**NOTE:**

- Grid/Graph paper must be used to generate the freehand drawings so that ALL features and fixtures are drawn to proportion. Evidence of the grid/graph paper used must be included in the PAT portfolio.
- All the drawings must comply with the *SANS 10111 Guidelines*.
- These drawings must provide clear evidence that a high level of competency has been attained in **freehand drawing**.

4. Select the best solution, which demonstrates an in-depth understanding of the scenario within the context of the design brief, specifications and constraints.

On a separate page, evaluate and compare the TWO freehand solutions by:

- Creating a table with a minimum of FOUR descriptive criteria
- Creating and applying a simple rating scale to score each solution against each criterion
- Justifying each score by describing the positive and/or negative aspects of each solution against each criterion

Complete the process by writing a comprehensive summary giving reasons for the selected freehand solution. The summary must include whether there were any late changes made to the selected freehand solution.

**PHASE 2 PRESENTATION REQUIREMENTS**

5. Present the selected swivel caster wheel with a brake and the selected improvement/modification/re-design as a set of working drawings and a pictorial drawing (5.1, 5.2 and 5.3) that meet the following criteria:

- All the working drawings must be presented on appropriately sized drawing sheets, set up with correct borders. ONLY the first working drawing's drawing sheet (i.e. for 5.1) must be set up with an appropriate and complete mechanical title block as presented in the NSC Paper 2 analytical questions.
- The drawings must provide clear evidence that a high level of competency had been attained in the following TWO required drawing methods:
  - Instrument drawing
  - CAD (Computer-aided Drawing/Design)

**NOTE:**

- ONE entire working drawing (i.e. 5.1 or 5.2) must be prepared by using drawing instruments and the other using a CAD program.
- The isometric drawing (5.3) may be prepared either by using drawing instruments or by using a CAD program.
- Schools that do not have CAD facilities must prepare all the required drawings (5.1, 5.2 and 5.3) by using drawing instruments
- ALL the working drawings must comply with the *SANS 10111 Guidelines*.

- 5.1 Draw, to a suitable scale and in third-angle orthographic projection, an ASSEMBLY DRAWING of the selected swivel caster wheel with a brake, clearly showing all the parts before any improvements, modifications or re-designs have been effected.

**The assembly drawing must show the following FOUR views:**

5.1.1 The FRONT VIEW

5.1.2 A SECOND PRIMARY VIEW

5.1.3 Any other TWO SECONDARY VIEWS

**NOTE:** TWO of the views must be sectioned or contain types of sections.

**Include the following:**

- Scale
- Detailed dimensioning
- Labels and notes
- Cutting planes
- ALL hatching detail
- Projection symbol

- 5.2 Draw, to a suitable scale and in third-angle orthographic projection, a DETAILED DRAWING of the identified component(s) of the swivel caster wheel with a brake, clearly showing the selected improvement, modification or re-design.

**The detailed drawing must show the following THREE views:**

5.2.1 The FRONT VIEW

5.2.2 Any other TWO VIEWS

**NOTE:** ONE of the views must be sectioned or contain a type of section.

**Include the following:**

- Comprehensive explanatory labels and notes
- Relevant welding and/or machining symbols (if required)
- Relevant tolerances (if required)
- Scale
- Detailed dimensioning
- Cutting plane(s)
- ALL hatching detail

- 5.3 Draw, to a suitable scale, a detailed ISOMETRIC DRAWING of the swivel caster wheel with brake, or of the improved, modified or re-designed component(s), that is of an appropriate Grade 12 level of complexity.

**NOTE:**

- Evidence of ALL auxiliary views and constructions used to produce the drawing must be clearly shown.
- Use a copy of the isometric drawing, which may contain artistic features, as the picture for the cover page of the PAT portfolio.

### **PHASE 3 PRESENTATION REQUIREMENTS**

**Create a PAT portfolio containing:**

- A complete cover page
- An index
- The 2020 SUMMATIVE ASSESSMENT SHEET (see page 25)
- The completed DECLARATION OF AUTHENTICITY (see page 26)

**Present the following PHASE 1 and PHASE 2 presentation requirements in the PAT portfolio after the DECLARATION OF AUTHENTICITY:**

1. ALL the design brief requirements
2. Evidence of ALL the resource material used for the research
3. The TWO freehand drawings of the possible design solutions
4. ALL the evidence of the selection of the best solution
5. ALL the required working drawings (5.1 and 5.2) and the isometric drawing (5.3)
6. Using the included checklist (assessment criteria), clear evidence of continuous self-assessment and the meeting of deadlines, in accordance with the management plan, during the development of the PAT.

**NOTE:**

Include the following on each page of each presentation requirement:

- Clear numbering according to the numbers of the presentation requirements
- Your (the learner's) name
- The date of completion and submission

**Assessment criteria and checklist for the 2020 EGD Mechanical PAT**

- The SUMMATIVE ASSESSMENT SHEET on page 25 of the PAT document must be used to indicate the final totals out of 10 for each assessment criterion.
- The contribution of each aspect of the PAT is as follows:
  - The design process, i.e. presentation requirements numbers 1, 2, 3, 4, 6 and 7, will contribute 25 marks to the final PAT mark out of 100.
  - The working drawings and the pictorial drawing, i.e. presentation requirement number 5, will contribute 50 marks to the final PAT mark out of 100.
  - Drawing methods, drawing skills and presentation, which should be assessed according to ANNEXURE A, will contribute 25 marks to the final PAT mark out of 100.

ASSESSMENT CRITERIA AND CHECKLIST FOR THE 2020 EGD MECHANICAL PAT												
1-mark level descriptive		0	Requirement not met or presented incorrectly					Checked	Suggested mark allocation	Own marks/ notes/ comments		
		1	Requirement has been met and/or presented correctly									
2-mark level descriptive		0	Requirement not met, or <b>less than 30%</b> evidence of knowledge shown (poor)									
		1	Requirement included and <b>at least 30%+</b> evidence of knowledge shown (avg.)									
		2	Presentation shows <b>at least 80% or more</b> evidence of knowledge (very good)									
1.	<b>Design Brief</b>											
	1.1	1 <sup>st</sup> paragraph: background and comprehensive description of what to design						2				
	1.2	2 <sup>nd</sup> paragraph: your role and the design process that you are going to follow						2				
	1.3	A list of ALL the specifications of the selected swivel caster wheel with a break						2				
	1.4	A list of at least THREE constraints of the selected swivel caster wheel with a break						2				
	1.5	A management plan with target dates for ALL the presentation requirements						2				
							<b>TOTAL</b>	<b>10</b>				
2.	<b>Research</b> (This should be restricted to a maximum of FOUR A4 or TWO A3 pages per research topic.)											
Relevant and usable research on:	2.1	Materials used for each component of the selected swivel caster						2				
	2.2	Design features and/or function/purpose of each component						2				
	2.3	The design and components of another swivel caster with a break						2				
	Clear evidence that the research has been used in your proposed design solutions						2					
	A list of ALL references (Bibliography)						2					
							<b>TOTAL</b>	<b>10</b>				
3.	<b>Freehand drawings of TWO possible design solutions</b>						<b>Final mark for each solution</b>					
Assess each freehand solution as follows:		Relevant orthographic views of the component(s)			2	<b>Solution 1</b>		<b>10</b>				
		Isometric drawing of the component(s)			2							
		Correct presentation of ALL the features			1							
		The relative size of all features and fixtures to each other			2							
		Labels and explanatory notes			2	<b>Solution 1</b>		<b>10</b>				
		Dimensioning			2							
		Description of improvement, modification or re-design			2							
		Functionality of improvement, modification or re-design			2							
				<b>Subtotal = 15 ÷ 1,5 = TOTAL</b>		<b>10</b>						
(1 = 1 ; 2 = 1 ; 3 = 2 ; 4 = 3 ; 5 = 3 ; 6 = 4 ; 7 = 5 ; 8 = 5 ; 9 = 6 ; 10 = 7 ; 11 = 7 ; 12 = 8 ; 13 = 9 ; 14 = 9 ; 15 = 10)												
4.	<b>Selecting the best freehand solution</b> (This must be a separate presentation.)											
	Table created for an easily understandable presentation of the selection process						2					
	Minimum of FOUR descriptive criteria to evaluate and compare						2					
	Simple rating scale created and used to score each solution against each criterion						2					
	Each score justified by describing the positive or negative against each criterion						2					
	Comprehensive summary giving reasons for the selected freehand solution						2					
							<b>TOTAL</b>	<b>10</b>				
5.	<b>Working drawings and a pictorial drawing of caster wheels with top swivel plate</b>											
	<b>Drawing sheet preparation</b>											
	Appropriately sized drawing sheets						1					
	Borders on all the drawing sheets of working drawings						2					
	Appropriate and complete mechanical title block on first working drawing (5.1)						7					
							<b>TOTAL</b>	<b>10</b>				
5.1	<b>ASSEMBLY DRAWING</b> of the <b>complete swivel caster wheel with a brake</b> , before any improvements/ modifications/re-designs											
5.1.1	<b>FRONT VIEW</b> before any changes:											
	ALL the parts included and drawn correctly according to the actual device						2					
	ALL hatching detail or, if not sectioned, ALL external features						2					
	ALL bolts and nuts and other fastening methods correct in ALL FOUR views						2					
	Labels and notes for ALL FOUR views						2					
	Projection symbol						1					
	Suitable scale selected and indicated correctly for ALL FOUR views						1					
							<b>TOTAL</b>	<b>10</b>				

<b>ASSESSMENT CRITERIA AND CHECKLIST FOR THE 2020 EGD MECHANICAL PAT</b>				
5.1.2	<b>TOP VIEW</b> before any changes			
	ALL the parts included and drawn correctly according to the actual device		2	
	All hatching detail or, if not sectioned, external features		2	
	Detailed dimensioning for ALL FOUR views		2	
	ALL centre lines on ALL FOUR views		2	
	ALL FOUR views drawn correctly in third-angle orthographic projection		2	
	<b>TOTAL</b>		<b>10</b>	
5.1.3	<b>TWO</b> other <b>SECONDARY VIEWS</b> before any changes			
	Appropriate secondary views selected		2	
	ALL the parts included and drawn correctly according to the actual device		2	
	ALL hatching detail or, if not sectioned, external features		2	
	TWO views sectioned or contain types of sections		2	
	Correct cutting planes for the TWO sectional views and/or types of sections		2	
	<b>TOTAL</b>		<b>10</b>	
5.2	<b>DETAILED DRAWING</b> of the selected <b>improvement/modification/re-design</b>			
	Appropriate view selected as the front view, and is drawn correctly		2	
	TWO other relevant views selected, and are drawn correctly		2	
	Improvement/Modification/Re-design correlates with selected freehand solution & summary		2	
	Comprehensive explanatory labels and notes		2	
	Detailed dimensioning		2	
	ONE view sectioned, or contain types of sections, and drawn correctly		2	
	Cutting plane(s)		1	
	ALL hatching detail		2	
	Relevant welding symbols and/or machining symbols and/or tolerances		2	
	Projection symbol		1	
	Suitable scale selected and indicated correctly		1	
	Drawing is in third-angle orthographic projection		1	
	<b>Subtotal = 20 ÷ 2 = TOTAL</b>		<b>10</b>	
5.3	<b>Detailed ISOMETRIC DRAWING</b>			
	Suitable scale selected and indicated correctly		1	
	Evidence of ALL auxiliary views and constructions used for the drawing		2	
	Isometric drawing/answer ( <b>NOTE: Use 7-mark rubric on page 45 of the EGD CAPS.</b> )		7	
	<b>TOTAL</b>		<b>10</b>	
6.	<b>Continuous self-assessment and the meeting of deadlines</b>			
	Completed checklist as evidence of continuous self-assessment (mark out of <b>10 ÷ 2</b> )		5	
	The meeting of ALL the deadlines during the development (mark out of <b>10 ÷ 2</b> )		5	
	<b>TOTAL</b>		<b>10</b>	
7.	<b>Presentation of the complete PAT portfolio</b>			
	Cover page with a copy of the isometric drawing		1	
	Index		1	
	Summative assessment sheet and declaration		1	
	Correct sequencing of ALL presentation requirements		1	
	Name and numbering on ALL the presentation requirements		1	
	General impression of portfolio, e.g. binding, appearance, etc. (mark out of <b>10 ÷ 2</b> )		5	
	<b>TOTAL</b>		<b>10</b>	
<b>Assessment of drawing methods, drawing skills and presentation</b>				
a.	<b>Freehand drawings</b>			
	Freehand drawing methods and skills (See ANNEXURE A on page 23)		10	
	Neatness, line work/line quality and printing (See ANNEXURE A on page 23)		10	
b.	<b>Instrument drawings</b>			
	Use of drawing instruments, drawing methods and skills (See ANNEXURE A on page 23)		10	
	Neatness, line work/line quality and printing (See ANNEXURE A on page 23)		10	
c.	<b>CAD drawings</b>			
	Competence displayed in using a CAD program (See ANNEXURE A on page 23)		10	
	Layout and correctness of the drawings presentation (See ANNEXURE A on page 23)		10	

## 8. ANNEXURE A: ASSESSMENT RUBRIC

## ASSESSING DRAWING METHODS, DRAWING SKILLS AND PRESENTATION

LEVELS OF PERFORMANCE													
MARK ALLOCATION			10	9	8	7	6	5	4	3	2	1	0
			100%	99%–90%	89%–80%	79%–70%	69%–60%	59%–50%	49%–40%	39%–30%	29%–20%	19%–1%	0%
Freehand drawing	METHODS AND SKILLS	The drawings display <b>correct freehand drawing methods and skills</b> as well as the method used to <b>ensure good proportion and size</b>	The drawings display <b>excellent drawing methods and skills</b> and the <b>method used to ensure outstanding proportion and size</b> .			The drawings display <b>satisfactory drawing methods and skills</b> and the <b>method used to ensure satisfactory proportion and size</b> .			The drawings display <b>poor drawing methods and skills</b> and there is little to no evidence of the method used which resulted in <b>poor proportion and size</b> .		The drawings display very <b>poor drawing methods and skills</b> and <b>no method</b> was used to ensure <b>correct proportion</b> .		
	Final drawing <b>presentation</b> is <b>neat</b> and there is consistency of <b>line work/line quality, printing and dimensioning</b>		The drawings are <b>very neat</b> and all <b>line work/line quality, printing and dimensioning</b> are <b>outstanding</b> and <b>consistent</b> .			The drawings are <b>neat</b> and <b>line work/line quality, printing and dimensioning</b> are <b>generally good</b> and <b>mostly consistent</b> .			The drawings are <b>untidy</b> with <b>inconsistent line work/line quality, printing and dimensioning</b> .		The <b>line work/line quality, printing and dimensioning</b> are <b>unacceptable</b> .		
Instrument drawing	METHODS AND SKILLS	The drawings display the <b>correct use of drawing instruments, drawing methods and skills</b> .	The drawings display the correct use of <b>drawing instruments</b> and an <b>outstanding</b> application of <b>drawing methods and skills</b> .			The drawings display the correct use of drawing <b>instruments</b> and a <b>satisfactory</b> and <b>mostly correct</b> application of <b>drawing methods and skills</b> .			The drawings display poor use of drawing <b>instruments</b> and a <b>poor</b> and <b>incorrect</b> application of <b>drawing methods and skills</b> .		The drawings display an incorrect use of drawing <b>instruments</b> with <b>incorrect</b> applications of <b>drawing methods and skills</b> .		
	Final drawing <b>presentation</b> is <b>neat</b> and there is consistency of <b>line work/line quality, printing and dimensioning</b>		The drawings are <b>very neat</b> and all <b>line work/line quality, printing and dimensioning</b> are <b>outstanding</b> and <b>consistent</b> .			The drawings are <b>neat</b> and the <b>line work/line quality, printing and dimensioning</b> are <b>generally good</b> and <b>mostly consistent</b> .			The drawings are <b>untidy</b> and the <b>line work/line quality, printing and dimensioning</b> are <b>inconsistent</b> .		The <b>line work/line quality, printing and dimensioning</b> are <b>unacceptable</b> .		
CAD drawing	METHODS AND SKILLS	The <b>level of competence</b> displayed in <b>using a CAD program</b>	Displays a <b>high level</b> of skills, knowledge and ability in using a <b>CAD program</b>			Displays a <b>satisfactory level</b> of skills, knowledge and ability in using a <b>CAD program</b>			Displays a <b>poor level</b> of skills, knowledge and ability in using a <b>CAD program</b>		Shows <b>little to no skills</b> , knowledge or ability in using a <b>CAD program</b>		
	<b>Layout</b> of the final drawing is <b>correct</b> and the <b>line work, printing and dimensioning</b> <b>are</b> <b>compliant</b> and <b>consistent</b>		The <b>layout</b> of the drawings is <b>correct</b> and the <b>line work, printing and dimensioning</b> are <b>compliant</b> and <b>consistent</b> .			The <b>layout</b> of the drawings is <b>acceptable</b> and the <b>line work, printing and dimensioning</b> are <b>mostly compliant</b> and <b>consistent</b> .			The <b>layout</b> of the drawings is <b>very poor</b> and the <b>line work, printing and dimensioning</b> are <b>not compliant</b> and <b>inconsistent</b> .		The <b>layout, line work, printing and dimensioning</b> are <b>unacceptable</b> .		

**9. SIMPLIFIED RUBRIC FOR ALLOCATION AND VERIFICATION OF MARKS****NOTE:**

- The final mark out of 10 of each assessment criterion, i.e. the overall level of achievement according to the presentation requirement, **must be verified according to this rubric.**
- This rubric must also be used to allocate marks for all aspects of the assessment criteria which require a mark out of 10.

<b>VERIFICATION AND MARK ALLOCATION</b>			
<b>DESCRIPTION FOR MARK</b>	<b>GENERAL INDICATOR</b>	<b>± %</b>	<b>MARK</b>
<b>ALL/MORE than ALL</b> the REQUIREMENTS are met. <b>- PERFECT -</b>	<b>Error-free</b>	<b>100%</b>	<b>10</b>
<b>ALL (ALMOST ALL)</b> the REQUIREMENTS are met. <b>- OUTSTANDING -</b>	<b>Very few errors</b>	<b>90% +</b>	<b>9</b>
<b>ALMOST ALL (MOST OF)</b> the REQUIREMENTS are met. <b>- VERY GOOD -</b>	<b>Few errors</b>	<b>80% +</b>	<b>8</b>
The REQUIREMENTS are met <b>SUBSTANTIALY.</b> <b>- GOOD -</b>	<b>Some errors</b>	<b>70% +</b>	<b>7</b>
The REQUIREMENTS are met <b>ADEQUATELY.</b> <b>- SATISFACTORY -</b>		<b>60% +</b>	<b>6</b>
The REQUIREMENTS are met <b>MODERATELY.</b> <b>- ACCEPTABLE -</b>	<b>Many errors</b>	<b>50% +</b>	<b>5</b>
<b>ONLY SOME</b> of the REQUIREMENTS are met. <b>- UNACCEPTABLE -</b>		<b>40% +</b>	<b>4</b>
<b>VERY FEW</b> of the REQUIREMENTS are met. <b>- NOT ACHIEVED -</b>	<b>Mostly wrong</b>	<b>30% +</b> Only a few correct features	<b>3</b>
The REQUIREMENTS are <b>NOT</b> met. <b>- VERY POOR -</b>	<b>Completely wrong</b>	<b>29% and LESS</b>	<b>2</b>
		Something done incorrectly/ poorly	<b>1</b>
<b>NOT DONE</b>	<b>No work handed in!</b>	<b>Nothing to mark!</b>	<b>0</b>



## 10. PAT 2020: SUMMATIVE ASSESSMENT SHEET

<b>PAT 2020</b> <b>SUMMATIVE ASSESSMENT SHEET</b>												
NAME OF SCHOOL: .....					DISTRICT: .....							
NAME OF LEARNER: ..... (NAME AND SURNAME)												
NAME OF TEACHER: ..... (NAME AND SURNAME)												
NAME OF MODERATOR: ..... (NAME AND SURNAME)      DATE: .....												
PART A: Design Process				PART B: Working and pictorial drawings				Drawing competency and skill				
CRITERIA			MARK	CRITERIA			MARK	CRITERIA		MARK		
1	A design brief demonstrating a clear understanding of the scenario and the specifications, constraints and a management plan			All drawing sheets are appropriately set up with a border and an appropriate title block/panel.					Freehand drawing: ANNEXURE A	METHOD	The drawings display correct freehand drawing methods and skills and the method used to ensure proportion and size.	
	Evidence of relevant and usable research with the inclusion of a bibliography									METHOD	The final drawing presentation is neat and there is consistency of line work/line quality, printing and dimensioning.	
2									Instrument drawing: ANNEXURE A	METHOD	The drawings display the correct use of drawing instruments, drawing methods and skills.	
										METHOD	The final drawing presentation is neat and there is consistency of line work/line quality, printing and dimensioning.	
3	TWO detailed freehand drawings of possible solutions	1st Solution							CAD drawing: ANNEXURE A	METHOD	The level of competence is displayed in using a CAD program.	
		2nd Solution								METHOD	The layout of the final drawing is correct and the line work, printing and dimensioning is compliant and consistent.	
4	Selecting the best solution which demonstrates a clear understanding of the design brief								NO CAD drawings			/ 40
									With CAD drawings			/ 60
6	Clear evidence of evaluation and the meeting of deadlines of all the requirements								CALCULATION without CAD			X 0.63
									CALCULATION with CAD			X 0.42
7	The presentation of the complete PAT portfolio								Teacher's TOTAL			
									TOTAL: A			
SUBTOTAL			/ 70	SUBTOTAL			/ 60	Teacher's TOTAL				
CALCULATION			X 0.36	CALCULATION			X 0.84	TOTAL: B				/ 50
Teacher's TOTAL				Teacher's TOTAL				Moderated TOTAL				
TOTAL: A				/ 25	TOTAL: B			/ 50	TOTAL: C			/ 25
Moderated TOTAL				Moderated TOTAL				Moderated TOTAL				
TOTAL: A				/ 25	TOTAL: B			/ 50	TOTAL: C			/ 25
TEACHER'S TOTAL:			A + B + C =		/ 100		TEACHER:		MODERATOR:			
MODERATED TOTAL:			A + B + C =		/ 100		Initial		Initial			

**11. DECLARATION OF AUTHENTICITY****DECLARATION OF AUTHENTICITY**

To be submitted with each learner's practical assessment task portfolio

NAME OF THE SCHOOL: .....

NAME OF LEARNER: .....  
(SURNAME AND INITIALS)

**I hereby declare that all the contents of the practical assessment task submitted by myself for assessment is my own original work and has not been plagiarised, copied from someone else or previously submitted for assessment.**

\_\_\_\_\_  
**SIGNATURE OF LEARNER**

\_\_\_\_/\_\_\_\_/2020  
**DATE** (DD/MM/YYYY)

NAME OF TEACHER: .....  
(SURNAME AND INITIALS)

**As far as I know, the above declaration by the candidate is true and I accept that the PAT offered is his/her own work.**

\_\_\_\_\_  
**SIGNATURE OF TEACHER**

\_\_\_\_/\_\_\_\_/2020  
**DATE** (DD/MM/YYYY)

**SCHOOL STAMP**