



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

ENGINEERING GRAPHICS AND DESIGN

GUIDELINES FOR PRACTICAL ASSESSMENT TASKS

GRADE 12

2021

These guidelines consist of 26 pages.

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1. INTRODUCTION

The 18 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, Technical Mathematics
- **SERVICES:** Consumer Studies, Hospitality Studies, Tourism
- **TECHNOLOGY:** Engineering Graphics and Design, Civil Technology, Electrical Technology and Mechanical Technology

A practical assessment task (PAT) 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, and is essentially the **third NSC examination paper** for EGD. All the presentation requirements must therefore be adhered to and, with the exception of the required research, be **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

However, with the inclusion of research as a fundamental component of the design process, content and concepts that are not included in the CAPS may be included in the PAT. The EGD PAT is therefore designed to develop a learner's ability to integrate and apply taught and self-acquired 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 also 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 THREE parts:

- **PART A (Phase 1):** The design process
- **PART B (Phase 2):** The working and pictorial drawings
- **PART C (Phase 3):** Creating a PAT file/portfolio

PART A and PART C 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-evaluation during the development of the PAT.
- Create a PAT file/portfolio

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 design process	25%
The correctness of the working and pictorial drawings	50%
The drawing methods (freehand, instrument and CAD)	25%
TOTAL	100%

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 (i.e. pages 8 to 26) of this 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 Term 1)
- PHASE 2: Presentation drawings (completed by the end of Term 2)
- PHASE 3: Completion of file/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.

The teacher must conduct ALL formal assessment and record the results on the official mark sheets. The marks of each learner **must** also be indicated on the official 2021 SUMMATIVE ASSESSMENT SHEET, i.e. page 25 of this document, and be included in the learner's PAT file/portfolio.

The final formal assessment must be completed before the commencement of provincial/final moderation or, at the latest, before the preparatory examinations in 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, i.e. average.
 - 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, i.e. very good.
- **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/are **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 on the SUMMATIVE ASSESSMENT SHEET (see page 25) and the mark sheet.

4.2 Moderation

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 DBE (national) and/or Umalusi moderation, or by the end of the third week of Term 4, i.e. mid-October.

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

NOTE: A **tolerance range** of only **5%** is permissible between the **average assessed mark** and the **average moderated mark** of the PATs selected for moderation. Only once moderation has been completed, must the more than 5% difference between the average marks of the moderated PATs be applied to the remainder of the PATs.

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: The official 2021 SUMMATIVE ASSESSMENT SHEET, the completed DECLARATION OF AUTHENTICITY and the relevant CHECKLIST must be included in the learner's completed PAT file/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 formal national 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 task, with an electrical component
 - PAT 2: A mechanical design task
- 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 entire 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 timeframe 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 ASSESSMENT CRITERIA AND CHECKLIST FOR THE 2021 EGD PAT (i.e. pages 14 and 15 or pages 21 and 22) must be used to provide clear evidence of your own continuous self-assessment and the meeting of deadlines during the development of the PAT.
 - 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

Your client owns STAND 82, a property situated on top of a steep embankment overlooking a river which lies on the south-eastern side. The river forms the boundary between your client's property and a nature reserve on the opposite side of the river. All the properties on the north-western side of the river are ideally situated to observe the animals as they come down to the river to drink.

The client is in the final stages of acquiring STAND 81 and STAND 83, the two adjacent properties to STAND 82. These three properties will form part of an upmarket timeshare resort in the near future. Before the timeshare units for the resort are developed, your client wants you to design an enclosed single-story brick structure containing the general reception area for the resort and a day spa, which will initially be used to attract potential investors. In this project the structure will forthwith be referred to as the **building**.

The proposed new building must be sited between the municipal sewerage line and the south-eastern building line, and it must have a modern entrance with a large door(s) that face(s) Blesbok Street. The large door(s) must lead into the general reception area, which must have ceilings that are at least 4 m high and a floor area of no less than 65 m². To create one larger open area where guests can sit to enjoy eats and drinks, the reception area must have aluminium stacking doors that open onto an 80 m² timber deck which overlooks the river below. The timber deck must have a secure railing of 1 m high on all sides, and to ensure that the building is disability friendly, all the floors and the timber deck must be on the same level.

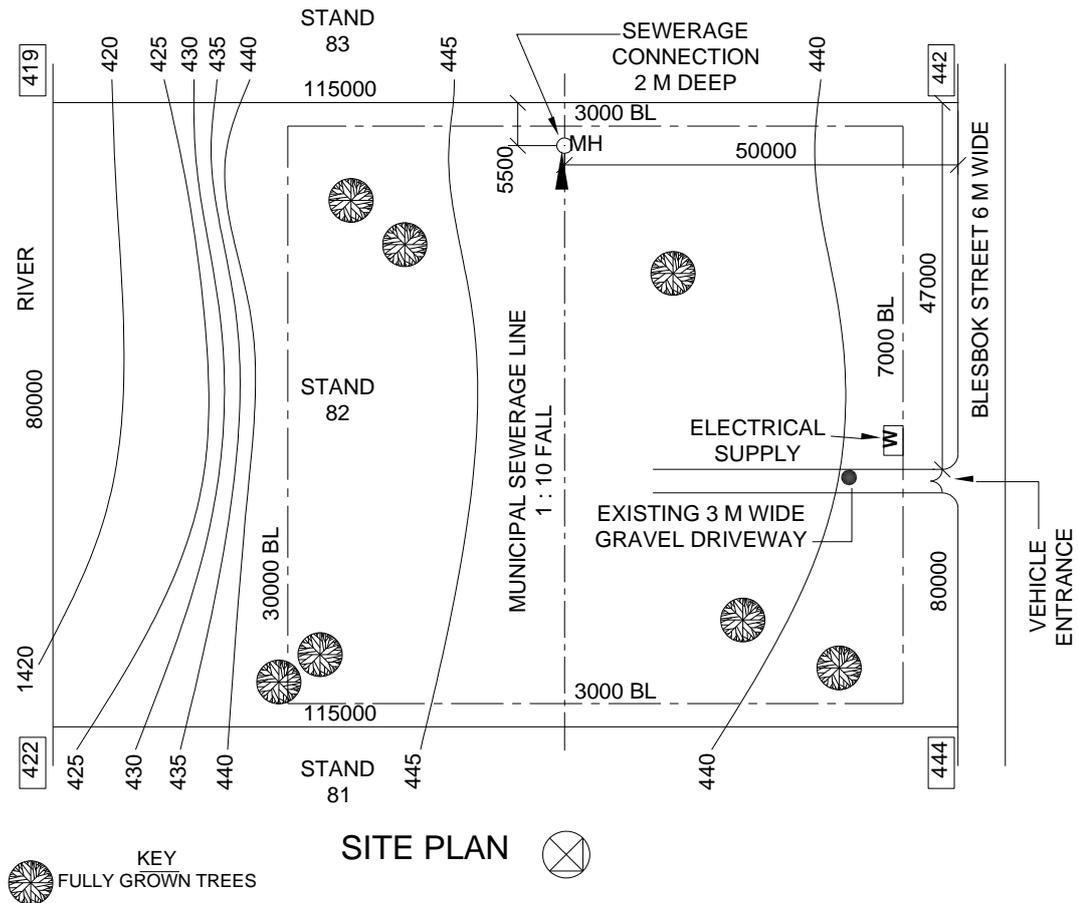
Leading off the general reception area must be a small coffee shop, an administration office for the resort, male and female toilet facilities as well as the entrance to the day spa. Using standard-sized aluminium stacking doors, the small coffee shop must open into the reception area. As the coffee shop will only be selling non-alcoholic beverages and pre-prepared 'food-on-the-go', it only requires space for a large display fridge, preparation and serving counters and a double sink, and may therefore not exceed 12 m². The female toilet facility must have a toilet and a hand-wash basin, and the male toilet facility must have a toilet, a single wall-mounted urinal and a hand-wash basin.

The total area of the day spa section of the building, which will be expanded at a later stage, may not exceed 100 m². It must consist of an open area with a small indoor pool, a treatment room of at least 12 m², a small staffroom with a built-in counter and a single sink, as well as a change room. The open area must be large enough to also serve as a reception and seating area exclusively for the clients of the day spa. The change room must have a separate toilet, a hand-wash basin, a shower, a wall-mounted bench, four lockers and ample space to change.

The building must have a pitched roof designed in such a way that it will also cover half of the timber deck. Due to the high humidity levels next to the river, the roof covering must be of aluminium sheeting, and aluminium window and door frames must be used throughout.

All the rooms and areas in the building must have sufficient electrical lighting and switched socket outlets, and ALL the rooms facing outwards must have windows that will let in ample natural light. All sewerage and wastewater pipes from the building must be connected to the existing municipal sewerage line on the property.

The entire building, including the timber deck, **may NOT exceed 280 m²**.



Given: The site plan of STAND 82

PHASE 1 PRESENTATION REQUIREMENTS

- Analyse the given scenario and formulate a design brief in two paragraphs:
 - The first paragraph must, in your own words, give a brief background to the project, as well as a detailed 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 complete 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:**

- A list of a minimum of TWENTY specifications
 - A list of a minimum of FIVE possible constraints
 - A management plan, which specifies target dates for the completion of each presentation requirement
- Conduct research on:
 - Designs and construction detail of aluminium stacking doors
 - Designs and construction detail of large timber decks and railings
 - Designs of small indoor pools

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 file/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. a floor plan, of TWO possible design solutions for the proposed new building. Each freehand drawing must show the correct presentation of ALL the building features, the permanent fixtures, the timber deck, the roof lines as well as the primary dimensions and labels. The calculations for the floor area of the reception area, the total area of the day spa facility and the total area of the entire building, including the timber deck, must be clearly shown in a table on the drawing sheet of each freehand drawing.

NOTE:

- **Grid/Graph paper must be used** to generate the freehand drawings so that ALL features and fixtures are drawn to proportion. The **grid/graph paper used must be included** in the PAT file/portfolio.
 - Electrical fittings and waste-water disposal systems are NOT required on the freehand drawings.
 - 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, compare and evaluate 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 your selected freehand solution. The summary must also include whether there were any late changes made to the selected freehand solution, or not. If there were, they must be clearly described.

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 drawing sheet showing the floor plan and elevation (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 has been attained in the following TWO 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 working drawings and pictorial drawing (i.e. 5.1, 5.2 and 5.3) using drawing instruments and in pencil.
- The title panel and ALL the working drawings must comply with the *SANS 10143 Guidelines*.

- 5.1 Draw, to a suitable scale, detailed layout drawings of the selected freehand solution of the complete building, including the timber deck, clearly showing all the required building features.

The layout drawings must show the following orthographic views:

5.1.1 The complete **FLOOR PLAN**

5.1.2 **TWO ELEVATIONS**, drawn to the same scale as the floor plan, with one showing the front entrance and the other showing a side view of the building and timber deck in relation to the slope of the STAND

NOTE: Draw the elevations that would be required for the perspective.

5.1.3 A **DETAILED SECTION(S)**, drawn to scale 1 : 20, showing all the detail of the foundation, walls, a 1½ m section of the timber deck (outward from the wall), the stacking doors that open onto the timber deck, a window and the roof

NOTE: Use break lines to divide the detailed section into TWO or more parts, each representing a width of ±2 m.

Include the following on ALL relevant views:

- ALL exterior features, including door and window detail
- NOTE:** Windows and door frames must be shown in the TWO elevations.
- The roof detail, including all rainwater items and roof lines
- ALL permanent fixtures
- 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 task.

Include the following:

- ALL the given general site details and features for STAND 82
- The complete proposed new building and timber deck
- Driveways, parking areas and the landscaping layout
- ALL sewerage detail and the 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** that shows the front entrance and a side view of the building that includes a portion of the timber deck. The horizon line (HL) must be $\pm 1,8$ m above the ground line (GL).

Evidence of the following must be included:

- All views/drawings 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 file/portfolio.

PHASE 3 PRESENTATION REQUIREMENTS

Create a PAT file/portfolio containing:

- A complete cover page
- An index
- The 2021 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 correct sequence in the PAT file/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. The ASSESSMENT CRITERIA AND CHECKLIST FOR THE 2021 EGD CIVIL PAT (see pages 14 and 15), which must provide clear evidence of your own continuous self-assessment and the meeting of deadlines 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 2021 EGD Civil PAT

- The SUMMATIVE ASSESSMENT SHEET on page 25 of this 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 out of 100.
 - The working drawings and the pictorial drawing, i.e. presentation requirement number 5, will contribute 50 marks out of 100.
 - Drawing methods, drawing skills and presentation, which should be assessed according to ANNEXURE A, will contribute 25 marks out of 100.

ASSESSMENT CRITERIA AND CHECKLIST FOR THE 2021 EGD CIVIL PAT								
1-mark level descriptive	0	Requirement not met or presented incorrectly			Checked	Maximum mark	Comments	
	1	Requirement has been met and/or presented correctly						
2-mark level descriptive	0	Requirement not met, or less than 30% evidence of knowledge shown (very poor)						
	1	Requirement included and at least 30%+ evidence of knowledge shown (avg.)						
	2	Presentation shows at least 80% or more evidence of knowledge (very good)						
1.	Design brief							
	1.1	1 st paragraph: background and comprehensive description of what to design				2		
	1.2	2 nd 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		
					TOTAL	10		
2.	Research (This should be restricted to a maximum of FOUR A4 or TWO A3 pages per topic.)							
Relevant and usable research on:	2.1	Designs and construction detail of aluminium stacking doors				2		
	2.2	Designs and construction detail of timber decks and railings				2		
	2.3	Designs of small indoor pools				2		
				Clear evidence that the research has been used in your proposed design solutions		2		
				A list of ALL references (Bibliography)		2		
					TOTAL	10		
3.	Freehand drawings of TWO possible design solutions				Final mark for each solution			
Assess each freehand solution as follows:	ALL the building features, including the timber deck			1	Solution 1	10		
	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	Solution 2	10		
	Primary labels (1) + primary dimensions (1) (1 + 1 = 2)			2				
	3 x area calculations shown and within the specifications (3 x 1 = 3)			3				
	Design: functionality and effective utilisation of space			2				
Subtotal = 15 ÷ 1,5 = TOTAL				15				
(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.	Selecting the best freehand solution (This must be a separate presentation.)							
Table created for the selection process						2		
Minimum of SIX descriptive criteria to compare and evaluate						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 with reasons for selected solution, incl. if there were late changes, or not						2		
					TOTAL	10		
5.	Layout drawings and a pictorial drawing of selected solution							
Drawing sheet preparation								
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 drawing sheet (5.1)						7		
NOTE: Use the 7-mark simplified rubric on page 45 of the EGD CAPS.					TOTAL	10		
5.1	Detailed layout drawings of the proposed new building and timber deck							
5.1.1	FLOOR PLAN showing:							
	Correlation with selected freehand solution and selection process summary					2		
	ALL internal and external walls					2		
	ALL rooflines					2		
	ALL doors and windows					2		
	ALL permanent fixtures, including the small indoor pool					2		
	ALL electrical fittings and the wiring detail					2		
	Title, labels and notes (2) + detailed dimensioning (2)			(2 + 2 = 4)		4		
	Hatching detail (1) + cutting plane (1)			(1 + 1 = 2)		2		
	Suitable scale selected and correctly indicated (1) + north point (1)			(1 + 1 = 2)		2		
					Subtotal = 20 ÷ 2 = TOTAL	10		

ASSESSMENT CRITERIA AND CHECKLIST FOR THE 2021 EGD CIVIL PAT				
5.1.2	TWO ELEVATIONS , that shows the front entrance and a side view of the building and timber deck			
	Prescribed views shown		1	
	External walls and ALL other external features, including the slope of the STAND		2	
	Door and window detail, including the door and window frames		2	
	Roof detail, including rainwater items		2	
	Waste-water disposal system (sewerage)		2	
	Elevations drawn to same scale as the floor plan		1	
			TOTAL	10
5.1.3	DETAILED SECTION(S)			
	Section(s) correct according to the indicated cutting plane(s)		2	
	Foundation, slab and wall detail		2	
	Detail of 1½ m section of the timber deck against the wall		2	
	Stacking door detail		2	
	Window detail		2	
	Roof detail, showing side of roof and sections of roof above stacking doors and window		2	
	Labels and notes		2	
	Detailed dimensioning		2	
	ALL hatching detail		2	
	Scale 1 : 20 used and indicated correctly (1) + break lines (1)		2	
			Subtotal = 20 ÷ 2 = TOTAL	10
5.2	Detailed SITE PLAN			
	Site correctly drawn and ALL the given site features included		2	
	Complete proposed new building and timber deck, correctly sited and shaded		2	
	ALL sewerage detail and the electrical supply		2	
	Dimensions, including the setting-out dimension and corner heights		2	
	Suitable scale selected and indicated correctly		1	
	North point		1	
			TOTAL	10
5.3	PERSPECTIVE DRAWING showing the entrance and side view of the building, including a portion of the timber deck			
	Evidence of the views, as well as construction and projections used to prepare the drawing		1	
	Correct orientation of the building with the HL at the correct height		2	
	Correctness of perspective drawing (NOTE: Use the 7-mark rubric on page 45 of the EGD CAPS.)		7	
			TOTAL	10
6.	Continuous self-evaluation and the meeting of deadlines			
	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	
			TOTAL	10
7.	Presentation of the complete PAT file/portfolio			
	Complete 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 file/portfolio, e.g. binding, appearance, etc.	(mark out of 10 ÷ 2)	5	
			TOTAL	10
Assessment of drawing methods, drawing skills and presentation				
a.	Freehand drawings			
	Freehand drawing methods and skills	(See ANNEXURE A on page 23.)	10	
	NOTE: No evidence of grid/graph paper used = max. 7 marks, even if drawn excellently.			
	Neatness (2) + correct line types used (2) + line consistency (2) + printing/writing (2) + dimensioning (2)	(Also see ANNEXURE A on page 23.)	10	
b.	Instrument drawings			
	Use of drawing instruments, drawing methods and skills	(See ANNEXURE A on page 23.)	10	
	Neatness (2) + correct line types used (2) + line consistency (2) + printing/writing (2) + dimensioning (2)	(Also see ANNEXURE A on page 23.)	10	
c.	CAD drawings			
	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 by a mechanical design firm that specialises in improving the design and function of small mechanical devices. Currently they are working on design solutions to improve non-digital or non-electronic SCALES, which incorporate, amongst others, mechanical mechanisms, gears, springs and/or similar mechanical components. Examples of these scales, as shown below, include, but are not limited to, kitchen scales, bathroom scales, hanging-type scales, pull-type scales etc.



You are tasked with investigating and analyse the design features of existing non-digital or non-electronic scales, and then to design (an) improvement(s) to the scales, which could be, but is not limited to, one or more of the following:

- Improved efficiency
- To strengthen its design
- Modify its design
- Adapt its design to fit a new application

The PAT requires the following stages:

- The FIRST stage involves finding or selecting a suitable scale which is not digital or electronic. The scale **must** incorporate, amongst others, mechanical mechanisms, gears, springs and/or similar mechanical components. The selected scale will forthwith be referred to as the **selected scale** in this project.

NOTE: You are NOT required to purchase a new scale. The selected scale should therefore be one that is readily available to you.

- The SECOND stage involves the dismantling of the selected scale so that all the components, mechanisms, gears etc., are revealed and can be investigated and measured.
- The THIRD stage requires the identification of ONE of the main moving mechanical components (excluding the indication needle), or a combination of moving mechanical components of the selected scale, which could be modified, improved or re-designed in some way. This will necessitate the application of the design process, as stipulated below in the presentation requirements.

Requirements for and specifications of the selected scale:

- Each learner must have **his/her own selected scale** for the PAT.
- Your own selected scale **must be submitted as part of your PAT presentation**. It must therefore **be small enough** to be submitted.
- The selected scale must, amongst other, incorporate mechanical mechanisms, gears, springs and/or similar mechanical components.

- **Digital or electronic scales may NOT be used.**
- Your teacher must approve the scale that you have selected. This is 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, give a brief background to the project, as well as a detailed 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 complete design process that you are going to follow to arrive at a proposed solution.

From the given 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 scale**
 - Your own list of at least THREE constraints for the **selected scale**
 - A management plan, which specifies target dates for the completion of each presentation requirement
2. Conduct **research** on:
 - The material that is used for each individual component of the **selected scale**
 - The specific design features and/or function/purpose of each individual component of the **selected scale**
 - The design, components, mechanical mechanisms etc. of at least ONE other similar type of scale, i.e. has the same function/purpose as the **selected scale**

NOTE:

- The research must be relevant and should therefore be in the form of graphic material, i.e. pictures and illustrations.
 - ALL the required research material must be included in the PAT file/portfolio.
 - The presentation of the research material must 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 ONE other similar scale 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 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 of the identified main component(s) of the selected scale.

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 are drawn to proportion. The **grid/graph paper used must be included** in the PAT file/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, compare and evaluate 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 your selected freehand solution. The summary must also include if there were any late changes made to the selected freehand solution, or not. If there were, they must be clearly described.

PHASE 2 PRESENTATION REQUIREMENTS

5. Present the selected scale 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 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 has been attained in the following TWO drawing methods:
 - Instrument drawing
 - CAD (Computer-aided Drawing/Design)

NOTE:

- ONE entire working drawing (i.e. 5.1 **OR** 5.2) must be prepared using drawing instruments and the other using a CAD program.
- The isometric drawing (5.3) may be prepared either 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 scale, clearly showing all the parts **before any** improvements, modifications or re-designs have been affected.

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 dimensions
- 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 mechanical scale, clearly showing the selected improved/modified/re-designed component(s).

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 selected scale 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 file/portfolio.

PHASE 3 PRESENTATION REQUIREMENTS

Create a PAT file/portfolio containing:

- A complete cover page
- An index
- The 2021 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 correct sequence in the PAT file/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. The ASSESSMENT CRITERIA AND CHECKLIST FOR THE 2021 EGD MECHANICAL PAT (see pages 21 and 22), which must provide clear evidence of your own continuous self-assessment and the meeting of deadlines 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 2021 EGD MECHANICAL PAT

- The SUMMATIVE ASSESSMENT SHEET on page 25 of this 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 out of 100.
 - The working drawings and the pictorial drawing, i.e. presentation requirement number 5, will contribute 50 marks out of 100.
 - Drawing methods, drawing skills and presentation, which should be assessed according to ANNEXURE A, will contribute 25 marks out of 100.

ASSESSMENT CRITERIA AND CHECKLIST FOR THE 2021 EGD MECHANICAL PAT								
1-mark level descriptive	0	Requirement not met or presented incorrectly			Checked	Maximum mark	Comments	
	1	Requirement has been met and/or presented correctly						
2-mark level descriptive	0	Requirement not met, or less than 30% evidence of knowledge shown (very poor)						
	1	Requirement included and at least 30%+ evidence of knowledge shown (avg.)						
	2	Presentation shows at least 80% or more evidence of knowledge (very good)						
1.	Design brief							
	1.1	1 st paragraph: background and comprehensive description of what to design				2		
	1.2	2 nd paragraph: your role and the design process you are going to follow				2		
	1.3	A list of ALL the specifications of the selected mechanical scale device				2		
	1.4	A list of at least THREE constraints of the selected mechanical scale device				2		
	1.5	A management plan with target dates for ALL the presentation requirements				2		
					TOTAL	10		
2.	Research (This should be restricted to a maximum of THREE A4 or TWO A3 pages per research topic.)							
Relevant and usable research on:	2.1	Materials used for each component of the selected scale				2		
	2.2	Design features/function/purpose of each component of the selected scale				2		
	2.3	The design, components, mechanisms, etc. of another similar scale				2		
	Clear evidence that the research has been used in your proposed design solutions				2			
A list of ALL references (Bibliography)				2				
					TOTAL	10		
3.	Freehand drawings of TWO possible design solutions				Final mark for each solution			
Assess each freehand solution as follows:	Relevant orthographic views of the component(s)		2	Solution 1		10		
	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	Solution 2		10		
	Dimensioning		2					
	Description of improvement/modification/re-design		2					
	Functionality of improvement/modification/re-design		2					
Subtotal = 15 ÷ 1,5 = TOTAL			15					
(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.	Selecting the best freehand solution (This must be a separate presentation.)							
	Table created for 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 aspects of each criterion				2			
	Comprehensive summary with reasons for selected solution, incl. if there were late changes, or not				2			
					TOTAL	10		
5.	Working drawings and a pictorial drawing of the selected scale							
	Drawing sheet preparation							
	Appropriately sized drawing sheets				1			
	Borders on all the drawing sheets of working drawings				2			
	Appropriate and complete mechanical title block on the first working drawing (5.1)				7			
NOTE: Use the 7-mark simplified rubric on page 45 of the EGD CAPS.					TOTAL	10		
5.1	ASSEMBLY DRAWING of the selected scale , before any improvements/modifications/re-designs							
	5.1.1	FRONT VIEW before any changes						
		ALL the parts included and drawn correctly according to the actual selected scale				2		
		ALL hatching detail or, if not sectioned, ALL external features				2		
		ALL bolts and nuts and other fastening methods correct in ALL views				2		
		Labels and notes on ALL views				2		
		Projection symbol				1		
		Suitable scale selected and indicated correctly for ALL views				1		
					TOTAL	10		

ASSESSMENT CRITERIA AND CHECKLIST FOR THE 2021 EGD MECHANICAL PAT				
5.1.2 Second PRIMARY VIEW before any changes				
	ALL the parts included and drawn correctly according to the actual selected scale		2	
	All hatching detail or, if not sectioned, external features		2	
	Dimensions for ALL views		2	
	ALL centre lines on ALL views		2	
	ALL views drawn correctly in third-angle orthographic projection		2	
TOTAL			10	
5.1.3 TWO other SECONDARY VIEWS before any changes				
	Appropriate secondary views selected		2	
	ALL the parts included and drawn correctly according to the actual selected scale		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	
TOTAL			10	
5.2 DETAILED DRAWING of the selected improvement/modification/re-design				
	Appropriate view selected as the FRONT VIEW, and is drawn correctly		2	
	TWO other relevant VIEWS selected, and drawn correctly		2	
	Improvement/Modification/Re-design correlates with selected freehand solution		2	
	Comprehensive explanatory labels and notes		2	
	Detailed dimensions		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	
Subtotal = 20 ÷ 2 = TOTAL			10	
5.3 Detailed ISOMETRIC DRAWING				
	Suitable SCALE selected and indicated correctly		1	
	Evidence of ALL auxiliary views and constructions used for the drawing		2	
	Isometric drawing/answer (NOTE: Use 7-mark rubric on page 45 of the EGD CAPS.)		7	
TOTAL			10	
6. Continuous self-evaluation and the meeting of deadlines				
	Checklist completed as evidence of continuous self-assessment	(mark out of 10 ÷ 2)	5	
	The meeting of ALL the deadlines during the development	(mark out of 10 ÷ 2)	5	
TOTAL			10	
7. Presentation of the complete PAT file/portfolio				
	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 file/portfolio, e.g. binding, appearance etc.	(mark out of 10 ÷ 2)	5	
TOTAL			10	
Assessment of drawing methods, drawing skills and presentation				
a. Freehand drawings				
	Freehand drawing methods and skills	(See ANNEXURE A on page 23.)	10	
	NOTE: No evidence of grid/graph paper used = max. 7 marks, even if drawn excellently.			
	Neatness (2) + correct line types used (2) + line consistency (2) + printing/writing (2) + dimensioning (2)	(Also see ANNEXURE A on page 23.)	10	
b. Instrument drawings				
	Use of drawing instruments, drawing methods and skills	(See ANNEXURE A on page 23.)	10	
	Neatness (2) + correct line types used (2) + line consistency (2) + printing/writing (2) + dimensioning (2)	(Also see ANNEXURE A on page 23.)	10	
c. CAD drawings				
	Competence displayed in using a CAD program	(See ANNEXURE A on page 23.)	10	
	Layout and correctness of the drawing 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 correct freehand drawing methods and skills as well as the method used to ensure good proportion and size .	NOTE: No evidence of grid/graph paper used = maximum 7 marks, even if excellent drawing methods and skills are displayed!				The drawings display poor drawing methods and skills and there is little to no evidence of the method used which resulted in poor proportion and size .			The drawings display very poor drawing methods and skills and no method was used to ensure correct proportion .				
			The drawings display excellent drawing methods and skills and the method used to ensure outstanding proportion and size .		The drawings display satisfactory drawing methods and skills and the method used to ensure satisfactory proportion and size .									
		Final drawing presentation is neat and the line types used, line constancy/quality, printing and dimensioning are correct .	Neatness (2) + correct line types used (2) + line quality/consistency (2) + compliant printing/writing (2) + compliant dimensioning (2)											
			ADDITIONAL DESCRIPTORS/GUIDELINES: The drawings are very neat and all line work/line quality, printing and dimensioning are outstanding and consistent .			The drawings are neat and line work/line quality, printing and dimensioning are generally good and mostly consistent .			The drawings are untidy with inconsistent line work/line quality, printing and dimensioning .			The line work/line quality, printing and dimensioning are unacceptable .		
Instrument drawing	METHODS AND SKILLS	The drawings display the correct use of drawing instruments, drawing methods and skills .	The drawings display the correct use of drawing instruments and an outstanding application of drawing methods and skills .			The drawings display the correct use of drawing instruments and a satisfactory and mostly correct application of drawing methods and skills .			The drawings display poor use of drawing instruments and a poor and incorrect application of drawing methods and skills .			The drawings display an incorrect use of drawing instruments with incorrect applications of drawing methods and skills .		
			Neatness (2) + correct line types used (2) + line quality/consistency (2) + compliant printing/writing (2) + compliant dimensioning (2)											
		Final drawing presentation is neat and the line types used, line constancy/quality, printing and dimensioning are correct .	ADDITIONAL DESCRIPTORS/GUIDELINES: The drawings are very neat and all line work/line quality, printing and dimensioning are outstanding and consistent .			The drawings are neat and the line work/line quality, printing and dimensioning are generally good and mostly consistent .			The drawings are untidy , and the line work/line quality, printing and dimensioning are inconsistent .			The line work/line quality, printing and dimensioning are unacceptable .		
CAD drawing	METHODS AND SKILLS	The level of competence displayed in using a CAD program	Displays a high level of skills, knowledge and ability in using a CAD program .			Displays a satisfactory level of skills, knowledge and ability in using a CAD program .			Displays a poor level of skills, knowledge and ability in using a CAD program .			Shows little to no skills , knowledge or ability in using a CAD program .		
		Layout of the final drawing is correct and the line work, printing and dimensioning are compliant and consistent .	The layout of the drawings is correct and the line work, printing and dimensioning are compliant and consistent .			The layout of the drawings is acceptable and the line work, printing and dimensioning are mostly compliant and consistent .			The layout of the drawings is very poor and the line work, printing and dimensioning are not compliant and inconsistent .			The layout, line work, printing and dimensioning are unacceptable .		

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.

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

10. PAT 2021: SUMMATIVE ASSESSMENT SHEET

**PAT 2021
SUMMATIVE ASSESSMENT SHEET**

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.	
2	Evidence of relevant and usable research with the inclusion of a bibliography		Orthographic drawings Assess each view's accuracy and correctness according to the selected solution/device, the stipulated requirements and drawing principals	5.1.1	View 1 PAT 1: Plan PAT 2: Front view			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			5.1.2	View 2 PAT 1: Elevation PAT 2: Top view		Instrument drawing: ANNEXURE A METHOD		The drawings display the correct use of drawing instruments, drawing methods and skills.
	2nd Solution			5.1.3	View 3 PAT 1: Section (x 2) PAT 2: Secondary view (x 2)			The final drawing presentation is neat and there is consistency of line work/line quality, printing and dimensioning.	
4	Selecting the best solution which demonstrates a clear understanding of the design brief			5.2	PAT 1: Site plan PAT 2: Detailed drawing		CAD drawing: ANNEXURE A METHOD		The level of competence is displayed in using a CAD program.
6	Clear evidence of evaluation and the meeting of deadlines of all the requirements		Pictorial Drawing 5.3	The correct drawing method and presentation of the pictorial drawing PAT 1: Perspective PAT 2: Isometric				The layout of the final drawing is correct and the line work, printing and dimensioning is compliant and consistent.	
7	The presentation of the complete PAT file/portfolio								NO CAD drawings
SUBTOTAL		/ 70	SUBTOTAL		/ 60	With CAD drawings		/ 60	
CALCULATION		x 0.36	CALCULATION		x 0.84	CALCULATION without CAD		x 0.63	
Teacher's TOTAL			Teacher's TOTAL			CALCULATION with CAD		x 0.42	
TOTAL: A		/ 25	TOTAL: B		/ 50	Teacher's TOTAL			
Moderated TOTAL			Moderated TOTAL			TOTAL: C		/ 25	
TOTAL: A		/ 25	TOTAL: B		/ 50	Moderated TOTAL			
TOTAL: C		/ 25	TOTAL: B		/ 50	TEACHER:		MODERATOR:	
TEACHER'S TOTAL:		A + B + C =			/ 100	Initial		Initial	
MODERATED TOTAL:		A + B + C =			/ 100				

11. DECLARATION OF AUTHENTICITY

DECLARATION OF AUTHENTICITY

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

NAME OF SCHOOL:

NAME OF LEARNER:
(SURNAME AND INITIALS)

I hereby declare that all the contents of the practical assessment task (PAT) 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

____/____/2021
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 submitted is his/her own work.

SIGNATURE OF TEACHER

____/____/2021
DATE (DD/MM/YYYY)

