basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

ENGINEERING GRAPHICS AND DESIGN

GUIDELINES FOR PRACTICAL ASSESSMENT TASKS

GRADE 12

2022

These guidelines consist of 27 pages.

TABLE OF CONTENTS

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, Technical Sciences, Technical Mathematics
- SERVICES: Consumer Studies, Hospitality Studies, Tourism
- TECHNOLOGY: Engineering Graphics and Design, Civil Technology, Electrical Technology, 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

The Engineering Graphics and Design (EGD) **PAT** is a **compulsory national formal assessment task** that contributes 100 marks (25%) towards a learner's final NSC mark. It is therefore regarded as a **third NSC examination paper**.

The purpose of the PAT is to assess topics, content and concepts, which are contained in the CAPS, but not assessed in tests or examinations. These are:

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

With the inclusion of the research component as part of the design process, content and concepts that are not included in the CAPS may be included in the PAT. The PAT is therefore designed to develop a learner's ability to integrate and apply knowledge that is taught and self-acquired, and to demonstrate attained levels of skills and competency.

The PAT gives the learner an opportunity to apply 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 otherwise be available in a formal test or examination.

The PAT is divided into THREE PHASES:

- PHASE 1: The design process
- PHASE 2: Preparing working and pictorial drawings
- PHASE 3: Creating the PAT file/portfolio

The three PHASES require 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 that includes a list of specifications, constraints and a management plan
- Conduct relevant and usable research
- Use the research in generating ideas/concepts/solutions, analytically and graphically, using freehand drawings
- Select a final solution that demonstrates a clear understanding of the design brief
- Present the final solution as a set of working drawings and a pictorial (3D) drawing
- Provide clear evidence of continuous self-evaluation during the development of the PAT
- Create a PAT file/portfolio

PHASE 1 and PHASE 2 of the PAT have been designed to 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 using a pencil and grid/graph paper only
- **Instrument drawings**, prepared in pencil and using drawing instruments
- **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

With the guidance of the teacher, each learner must, select and complete **ONE** PAT **only**.

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. INSTRUCTIONS FOR THE ADMINISTRATION OF THE PAT

The teacher must **provide a copy of** and **mediate** the **entire SECTION B** (pages 9 to 27) of **this 2022 PAT document** to all Grade 12 learners **no later than Week 5** of **Term 1**.

Each phase must be completed and assessed prior to commencement of phase moderation in Terms 2 and 3, and provincial moderation in Terms 3 and 4.
The phases of the PAT must therefore be completed within the following timeframes:

- PHASE 1: Design process (completed **before** the commencement of **Term 2**)
- PHASE 2: Presentation drawings (completed **before** the commencement of **Term 3**)
- PHASE 3: Completion of ALL presentation tasks and creation of file/portfolio (completed **in Term 3 before** the commencement of the **final provincial moderation**, or **at the latest**, **before** the commencement of the **preparatory examinations**).

Although the PHASES could be completed either **cyclically** or during **block times**, as indicated in the CAPS, it is recommended that **one entire day per term** be allocated to each PHASE (e.g. as an extra paper during the June examinations).

Teaching time allocated for the preparation and completion of all three PHASES of the PAT may not exceed **16 hours**. However, **additional non-teaching** time **may also be allocated** for the completion of the PAT at the school, but the **total time** allocated 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 timeframes, it is essential that the teacher prepares and communicates a management plan/pacesetter with target dates. This will help learners monitor their own progress, and for the teacher to implement intervention programmes.

NOTE:
To ensure the integrity of the PAT as a **'third NSC examination paper'**, the following additional instructions **must be adhered to**. **Non-compliance with any of these and afore-mentioned instructions will be deemed a serious irregularity.**

- It is the **responsibility** of the **teacher** to ensure that each learner's PAT is of an **appropriate Grade 12 level and complexity**.
- **ALL presentation requirements** of the selected PAT **must be adhered to strictly**.
- Except for the required research component, **ALL the presentation requirements** of the PAT **must be completed at school under the supervision of the teacher**.
- **Explanatory examples**, e.g. graphical illustration, best practices from previous years' PATs, etc., may **ONLY be presented** to the learners **during the initial mediation** of the PAT. As the explanatory examples may not be given to the learners or left for them to view after the initial mediation, learners must be encouraged to take notes during the initial mediation, but **may NOT take any photographs or videos**.
- Although the sharing of knowledge and ideas between learners is permissible, no presentation may be shared or copied as **the entire PAT must be completed individually**. **ALL the presentations**, including the front page, table of contents, management plan etc., **must be** the **learner's own original work**.

- Except for clean A4 and A3 drawing sheets and grid/graph paper, **NO templates**, **pre-prepared pages/drawing sheets**, **redrawn examples of the site plan etc.**, **may be provided to the learners** in any form or format.
- **NO examples** of **possible or suggested solutions** of any component of the PAT **may be provided to, or procured for, the learners in any form or format**. This includes, but is not limited to, **examples developed** by any **individual**, **group**, **department**, **institution**, **organisation** or **business**.
- ALL learners must be encouraged to **work on their own**, with **minimal intervention**. **Developmental feedback** and **guidance** may ONLY be given **on presentations or a PHASE** that **has already been prepared/completed**, or when the learner requests it.
- The DECLARATIONS OF AUTHENTICITY, as set out on page 27 of this document, must be completed and signed by learner and the teacher prior to the final assessment.
- The SUMMATIVE ASSESSMENT SHEET, as set out on page 26 of this document, must be completed in full for each learner following the final assessment of the PAT.
- The teacher must ensure that ONLY the completed SUMMATIVE ASSESSMENT SHEET, DECLARATION OF AUTHENTICITY and relevant CHECKLIST are included after the table of contents in each learners completed PAT file/portfolios.

4. ASSESSMENT AND MODERATION OF THE PAT

4.1 Assessment

Assessment of the PAT must be done according to the included and relevant ASSESSMENT CRITERIA AND CHECKLIST.

As frequent developmental feedback is needed to determine and provide guidance and support to the learner, as well as to ensure that they are on the right track ('assessment for learning'), both formal and informal assessment must be conducted throughout the development of the PAT. **Informal assessment** may be conducted by either 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 SUMMATIVE ASSESSMENT SHEET (see page 26), **which must be included** in the learner's PAT file/portfolios.

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

Once the PATs have been assessed and moderated, the teacher/school **must retain** ALL the PATs for external moderation. ALL the PATs must also be retained at school for a 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 is **incorrect**.
  - 1 mark may **only** be allocated if the requirement has been met fully and the presentation 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 **NOT completely correct**, **NOT 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 more than 80% complete**, **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 **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 26) and the recording/mark sheet.

4.2 Moderation

Moderation of the PAT must be done according to the included relevant ASSESSMENT CRITERIA AND CHECKLISTS.

As monitoring and/or moderation of the PAT can take place **at any stage during the development of the PAT**. **ALL completed presentation requirements of ALL the PATs must always be available at the school**.

To facilitate intervention programmes and processes, the following school-based and cluster/district moderation must be done during Terms 2 and 3:

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

Final provincial moderation must be concluded **before** the commencement of **DBE and/or Umalusi moderation**, or **at the latest** by the end of **Week 3** of **Term 4**.

To assist the moderator with the moderation process, the teacher must supply a complete set of updated mark sheets and merit lists.

At the beginning of the moderation process the moderator must randomly **select 10%**, with a **minimum of THREE** and a **maximum of SIX PAT files/portfolios**. The selected PATs must be:
▪ No. 1 – a high/highest mark; ▪ No. 2 – an average/middle mark; ▪ No. 3 – a low mark;
▪ No. 4 – an average/middle mark; ▪ No. 5 – a high mark; ▪ No. 6 – a low mark.
If the selected PATs do not provide a consistent result, THREE additional PATs, i.e. a high-, an average/middle- and a low-mark PAT, must be selected and moderated to obtain more consistent results.

If a school has **more than ONE Grade 12 EGD teacher**, **THREE PATs**, i.e. a high-, an average/middle- and a low-mark PAT, **must be selected from each teacher**.

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 PAT's.

5. CONCLUSION

On completion of the practical assessment task, learners should be able to demonstrate their understanding of the design process, their enhanced 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 PAT is a **compulsory national formal assessment task** that contributes 100 marks (25%) 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 tasks contained in this document.
- ALL the presentation requirements of the selected PAT must be **strictly adhered to** and, with the exception of the research component, be **completed at school**, **under the supervision of your teacher**.
- Although the sharing of knowledge and ideas is permissible, no presentations may be shared or copied. The **entire PAT must be completed individually and ALL the presentations**, including the front page, table of contents, management plan etc., **must be your own original work.**
- The PAT must be completed in phases and within the given time frames of your teacher's 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 PAT (i.e. either pages 15 and 16 or pages 22 and 23) must be used to provide clear evidence of your own continuous self-evaluation and the meeting of the deadlines during the development of the PAT.
- Prior to the final submission of your complete PAT, you must complete and sign the DECLARATION OF AUTHENTICITY, as set out on page 27 of this document.
- ONLY the 2022 SUMMATIVE ASSESSMENT SHEET, your completed and signed DECLARATION OF AUTHENTICITY, the completed 2022 CHECKLIST and ALL your presentations must be included in the correct sequence in your PAT file/portfolio.
- You are not permitted to use any of the photographs/pictures and/or websites contained in this PAT document.
- 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 non-governmental organisation (NGO), whose purpose it is to source funds to help schools that need additional facilities, identified a school in your area that needs a new building consisting of a media centre, a kitchen and toilet facilities. The NGO has decided to broaden its mandate and is running a competition requiring design solutions for the building. The design firm that you work for has decided to enter the competition and has tasked you to come up with and submit a suggested design solution.

The brief for the competition states that the new building must be a freestanding 'L-shaped' or a 'T-shaped' single-storey brick structure with a double-pitched hip and valley roof with a corrugated iron finish.

The new building will forthwith simply be referred to as the **building** in this project.

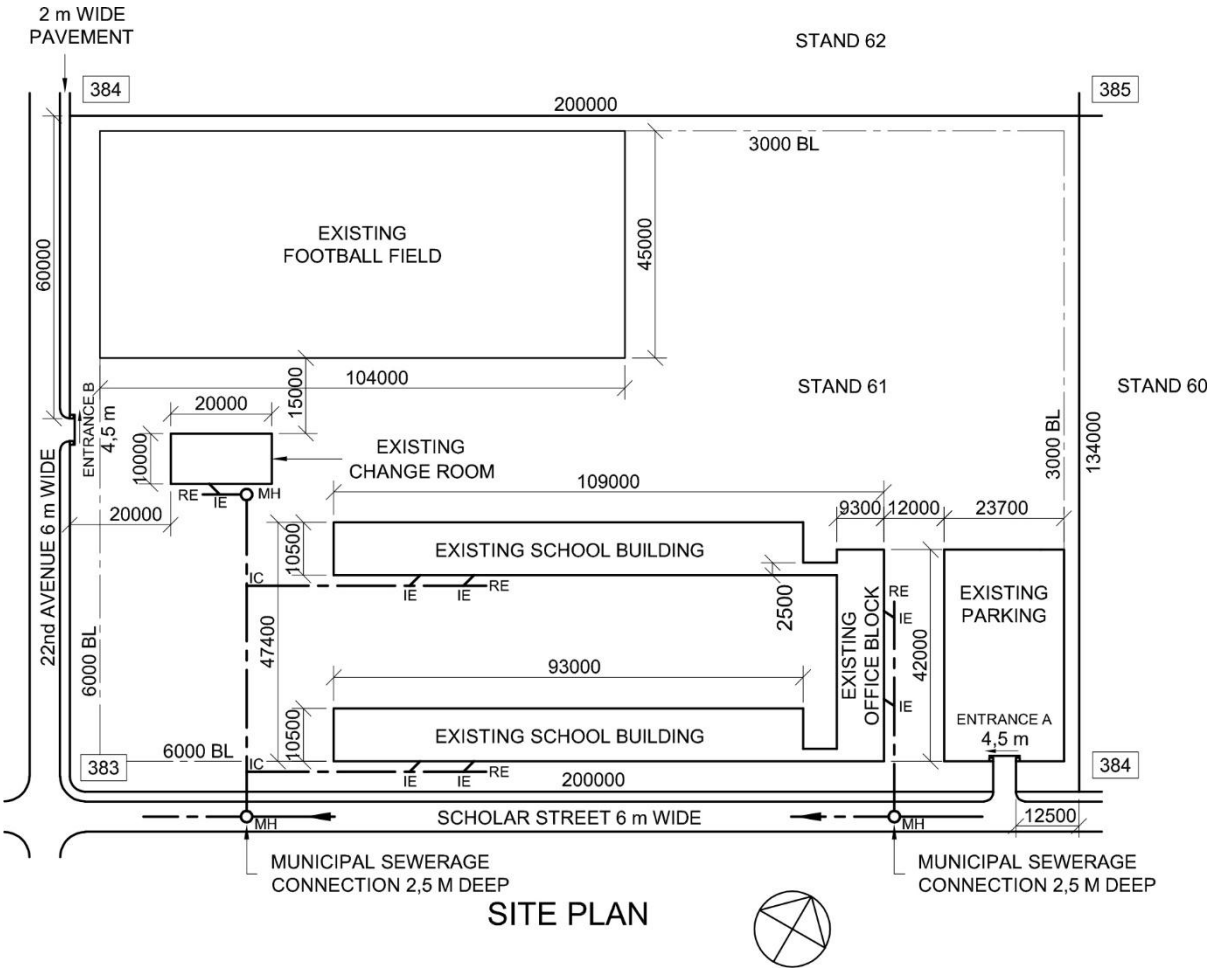
To support the Read to Lead campaign, the media-centre section of the building must consist of a small modern library, as well as a separate computer room with TEN built-in computer stations. The entire media-centre section of the building must have a floor area of at least 180 m², with only one entrance in the form of double aluminium and glass swing doors. The library and the computer room must have a common glass-walled office of approximately 15 m², from where all activities and movement in both the library and the computer room can be monitored. The office must also be accessible from both the library and the computer room. The media centre must have an 18 m² storeroom with no windows and a roll-up door for security purposes. There must be a built-in issuing desk situated near the entrance of the library to record the issuing and returning of books as well as ample built-in bookshelves along all the walls The greater part of the library must be an open space for additional freestanding bookshelves and magazine racks, as well as tables and chairs where learners can sit and read books.

Adjacent to the media centre must be a kitchen with a total area of at least 70 m² where food will be prepared for the school's feeding scheme. The kitchen must have sufficient work surfaces for the preparation of food as well as two double sinks and space for two industrial stoves and two industrial fridges. There must be a 4 m wide serving hatch with a roll-up door in one of the outer walls. Inside the kitchen there must also be an 18 m² pantry, which must be placed close to a 3 m wide delivery doorway with a roll-up door. The kitchen must have one external door, and for safety purposes, an emergency exit door to the media centre.

The building must include separate male and female toilet facilities, which must cater for learners in wheelchairs, and be accessible from the outside only. The female toilet facility must have a hand-wash basin and two separate toilets, and the male toilet facility a hand-wash basin, a separate toilet and a single wall-mounted urinal.

The building must include undercover walkways that run along the outside of the building, linking the toilet facilities and the kitchen's serving hatch to the entrance of the media centre. An undercover walkway must extend from the entrance of the media centre to the existing school buildings. As the school caters for disabled learners, the undercover walkways must be wide enough to allow two wheelchairs to pass comfortably.

There must be sufficient electrical lighting and switched socket outlets in all the rooms and areas in the building. There should also be sufficient windows to let in as much natural light as possible. All sewerage and waste-water from the building must be connected to the existing sewerage lines on the school property. The entire building **may not exceed 280 m²**.



SITE PLAN

Given: The site plan of the school

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 a description of the complete design process that you are going to implement to complete this project (PAT).

   From the scenario and your teacher's management plan, **include the following as part of the design brief**:
   - A list of at least 20 of the given specifications.
   - A list of at least FIVE possible constraints. However, the specifications that you have listed may not be repeated or reworded as possible constraints.
   - Your own management plan that specifies target dates for the completion of each presentation requirement.

2. **Conduct research** on:
   - Designs and floor-plan layouts of small modern libraries and media centres
   - THREE examples of hip and valley roofs and THREE examples of covered walkways
   - Designs and construction/drawing details of roll-up doors for serving hatches

NOTE:

- The research must be usable and should therefore be in the form of graphic material, i.e. of relevant pictures and/or illustrations for each topic.
- Evidence of at least FIVE different examples of each research topic must be included in the PAT file/portfolio, unless otherwise stated.
- 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 floor-plan layout 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 roofline, the undercover walkway, as well as the primary dimensions and labels. The calculations for the total floor area of the media centre and the total area of the entire building, **excluding** the walkways, must be clearly shown in a table on the drawing sheet of each freehand drawing.

   NOTE:

   - **Grid/Graph paper must be used** to assist with the preparation of 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.
   - **ALL aspects of the freehand drawing**, including dimensions, tables, labels and possible information blocks **must be prepared using a pencil ONLY**. The use of any other drawing instruments, e.g. a ruler and compass, will be penalised.
   - NO borders or title panels are required for the drawing sheets, and electrical fittings and waste-water disposal systems are NOT required on the freehand drawings.
   - The drawings may be prepared on either A4 or A3 drawing sheets and must comply with the guidelines and graphical symbols contained in the *SANS 10143*.
   - The drawings must provide clear evidence that a high level of competency has been attained in the **freehand** drawing method.

4. **Select the best solution** that 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 any late changes were 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 prepared on appropriately sized drawing sheets, set up with correct borders. **ONLY ONE** of the drawing sheets 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 using either drawing instruments or 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 a pencil and drawing instruments.
   - The title panel and ALL aspects of all drawings must comply with the guidelines, drawing symbols, graphical symbols and representations contained in the *SANS 10143*.

5.1 Draw **detailed LAYOUT DRAWINGS** of the selected freehand solution of the complete building, including a 3 m section of the extended undercover walkway to the existing buildings, clearly showing all the required building features.

The layout drawings must show the following orthographic views:

5.1.1 The complete **FLOOR PLAN**, drawn to a suitable scale, but preferably not smaller than scale of 1 **:** 75.

5.1.2 **TWO ELEVATIONS**, drawn to the same scale as the floor plan, with one view showing the front entrance to the media centre, and the other showing a side view. Both views must include detail of the undercover walkways.

5.1.3 A **DETAILED SECTION(S)**, drawn to scale 1 **:** 20, showing all the detail from the foundation to the roof, on a cutting plane that passes through the serving hatch, and either an internal door, an external door or a window.
NOTE: Use break lines to divide the detailed section into TWO or more parts, each representing a width of ±1½ m.

Include the following on ALL relevant views:

- ALL exterior features, including door and window detail.
  NOTE: ALL window 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
- Scales used
- Detailed dimensioning
- Cutting plane(s)
- All hatching detail
- North point

5.2 Draw, to a suitable scale, a complete detailed **SITE PLAN** of STAND 61.
Include the following:
- ALL the given general site details and features of STAND 61
- Existing school buildings, driveways, parking areas and sports field
- The proposed new building and complete walkway
- ALL sewerage detail
- Dimensions, including the reference/setting-out dimension and corner heights
- Scale
- North point

5.3 Draw a **detailed 'bird's-eye view' TWO-POINT PERSPECTIVE DRAWING** of the building that shows the entrance to the media centre and the 3-metre section of the undercover walkway to the existing buildings. The horizon line (HL) must be at the same height as (i.e. in line with) the top of the roof of the building.

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 your PAT file/portfolio.

PHASE 3: PRESENTATION REQUIREMENTS

Create a PAT file/portfolio containing the following in the given sequence:
- A complete cover page
- An table of contents
- The 2022 SUMMATIVE ASSESSMENT SHEET *(see page 26)*
- The completed DECLARATION OF AUTHENTICITY *(see page 27)*

Include the following PHASE 1 and PHASE 2 presentation requirements 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 2022 CIVIL PAT' *(see pages 15 and 16)*, which must provide clear evidence of your own continuous self-evaluation and the meeting of the 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 2022 Civil PAT
- The SUMMATIVE ASSESSMENT SHEET on page 26 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 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 2022 EGD CIVIL PAT

			Checked	Maximum mark	Comments
1-mark level descriptive	0	Requirement not met or presented incorrectly			
	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	1st paragraph: background and comprehensive description of what to design		2		
	1.2	2nd paragraph: your role and description of the design process you are going to use		2		
	1.3	A list of at least 20 given specifications in the scenario		2		
	1.4	A list of at least FIVE possible constraints in the scenario		2		
	1.5	A management plan with possible 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 floor plan layouts of small modern libraries and media centre		2		
		2.2 THREE hip and valley roofs, and THREE covered walkways		2		
		2.3 Designs and construction/drawing detail of roll-up doors for a serving hatch		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:	The new building showing all the rooms/areas and the walkways	2	**Solution 1**		**10**	
		Correct presentation of building features (roofline, walls, doors etc.)	2				
		ALL fixtures (toilets, hand-wash basins, built-in counters, etc.)	2				
		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 (2) + primary dimensions (2) (2 + 2 = 4)	4				
		2 x area calculations shown and within the specifications (2 + 2 = 4)	4				
		Design: functionality and effective utilisation of space	2				
		Subtotal = 20 ÷ 2 = TOTAL	**20**				

4.	**Selecting the best freehand solution** (This must be a separate presentation.)				
	A table created for the selection process			2	
	A minimum of **SIX descriptive** criteria to compare and evaluate			2	
	A simple rating scale created, and used to score each solution against each criterion			2	
	Each score justified by describing the positive and/or negative aspects against each criterion			2	
	Comprehensive summary with reasons for selected solution (including possible late changes)			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 ONE of working drawing's drawing sheet			7	
	NOTE: *Use the 7-mark simplified rubric on page 45 of the CAPS.*		**TOTAL**	**10**	
5.1	Detailed **layout drawings** of the **proposed new building and covered walkway**				
	5.1.1	**FLOOR PLAN** showing:			
		Correlation with selected freehand solution and selection process summary		2	
		ALL internal and external walls, walkways and rooflines		2	
		ALL doors and windows		2	
		ALL permanent fixtures including bookshelves and computer stations		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	
		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 2022 EGD CIVIL PAT					
	5.1.2	**TWO ELEVATIONS**, that show the front entrance and a side view of the building			
		Prescribed views, i.e. front entrance to media centre and a side view, shown		1	
		External walls and features, incl. detail of the 3 m section of walkway to the existing buildings		2	
		Door and window detail, including the door and window frames		2	
		Hip and valley 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)		1	
		Foundation, slab and wall detail		2	
		Serving hatch and roller door detail			
		Internal/External door **or** window detail		2	
		Roof detail		2	
		Labels and notes		2	
		Detailed dimensioning		2	
		ALL hatching detail		2	
		Scale 1 **:** 20 used and indicated correctly (1) + Break lines (1)		2	
	(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)		**Subtotal = 15 ÷ 1,5 = TOTAL**	**10**	
5.2	Detailed **SITE PLAN**				
	Site plan correctly drawn with ALL the **given** site features			2	
	Complete proposed new building and complete walkway to existing buildings			2	
	ALL sewerage detail			2	
	Dimensions, including the setting-out dimensions and corner heights			2	
	Suitable scale selected and indicated correctly			1	
	North point			1	
			TOTAL	**10**	
5.3	**TWO-POINT PERSPECTIVE DRAWING** showing the entrance to the media centre and the 3 m section of walkway				
	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 same height as the top of roof			**2**	
	Detail and correctness of the perspective drawing			**7**	
	NOTE: *Use the 7-mark simplified rubric on page 45 of the CAPS.*		**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 (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	
	Table of contents			1	
	Summative assessment sheet and declaration			1	
	Correct sequencing of ALL presentation requirements			1	
	Name and numbering on the presentation requirements			1	
	Final presentation of the portfolio, e.g. binding, general 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)* ***NOTE:*** • ***No evidence*** *of* ***grid/graph paper*** *used* = ***max. 7 marks****, even if drawn excellently* • ***Not drawn in freehand*** = ***0 marks, & some evidence of instruments used*** = ***max. 5 marks***			10	
	Neatness (2) + correct line types used (2) + line consistency (2) + printing (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 (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)

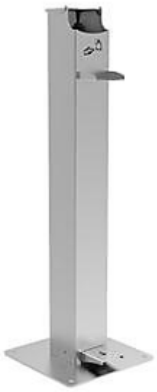
A mechanical design project

Scenario

During the Covid-19 pandemic we have all become accustomed to various types of sanitiser dispensers that are used wherever we go. A mechanical design firm that specialises in improving the design and function of mechanically operated devices is currently working on design solutions to improve **PEDESTAL-TYPE FOOT-OPERATED HAND SANITISER DISPENSERS** that incorporates mechanical components and mechanisms.

Examples of some of these pedestal-type foot-operated sanitiser dispensers are shown below.

[Source: PRICEPULSE]



[Source: www.archiexpo.com]

[Source: scottguardusa.com]

As a design consultant for the mechanical design firm, you have been tasked with investigating and analysing the design features of **existing pedestal-type foot-operated sanitiser dispensers** and to come up with an improvement(s) that could be, but is not limited to, one or more of the following:

- Improved efficiency
- To strengthen its design
- Modify its design

Your investigation, analysis and solution require the following stages:

- The FIRST stage involves finding or selecting a suitable **pedestal type foot operated sanitiser dispenser**. The dispenser must be a mechanically-operated device that incorporates a mechanical mechanism(s). The pedestal-type foot-operated sanitiser dispensers that you have selected will forthwith be referred to as the **selected dispenser** in this project (PAT).
  NOTE: You are NOT required to purchase a dispenser. The selected dispenser should therefore be one that is readily available to you.
- The SECOND stage involves the dismantling of the selected dispenser so that all the individual components/parts and mechanical mechanism(s) are revealed and can be investigated, measured and photographed.
- The THIRD stage requires the identification of ONE of the main moving mechanical components/parts, or a combination of moving mechanical components/parts of the selected dispenser, which could be improved, strengthened or modified in some way.
- This will necessitate the application of the design process, as stipulated below in the presentation requirements.

Requirements and specifications for the **selected dispenser:**

- Each learner must have **his/her own selected dispenser** for the PAT.
- Your own selected dispenser **must be submitted as part of your PAT presentation**. If the selected dispenser is still being used, then photographs must be taken of the entire dispenser, as well as ALL the different components/parts. **A neat presentation of the photographs must then be prepared, and submitted as part of the design brief in your PAT file/portfolio.**
- The selected dispenser **must be a mechanically-operated device** that **incorporates a mechanical mechanism(s)**.
- **Digital or electronic dispensers may <u>NOT</u> be used.**
- Your teacher must approve your selected dispenser. 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 a description of the complete design process that you are going to implement to complete this project (PAT).

   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 of your selected dispenser
   - Your own list of at least THREE constraints of your selected dispenser
   - Your own management plan, which specifies target dates for the completion of each presentation requirement

2. **Conduct research** on:
   - The material used for each individual component/part of your selected dispenser
   - The specific design features and/or function/purpose of each individual component/ part of your selected dispenser
   - The design, components/parts and mechanical mechanism(s) of at least ONE other pedestal-type foot-operated sanitiser dispenser that is similar to your selected dispenser

   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 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 must be presented using a comprehensive set of detailed photographs taken during the second stage. Include labels and/or notes indicating the material and the function (purpose) of each individual part/component.
   - The evidence of the ONE other similar dispenser 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 was 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, strengthening or modification of the identified main component(s)/parts of your selected dispenser.

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

   NOTE:
   - **Grid/Graph paper** must be used to assist in preparing 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 as evidence.
   - **ALL aspects of the freehand drawing**, including dimensions, labels, tables and possible information blocks must be prepared **using a pencil ONLY**. The use of any other drawing instruments, e.g. a ruler and compass, will be penalised.
   - NO borders or title blocks are required for the drawing sheets.
   - The drawings may be prepared on either A4 or A3 drawing sheets, and must comply with the *SANS 10111* Guidelines.
   - These drawings must provide clear evidence that a high level of competency has been attained in the **freehand** drawing method.

4. **Select the best solution**, which demonstrates an in-depth understanding of the scenario within the context of the design brief.
   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 whether there are any late changes made to the selected freehand solution, or not. If there are, they must be clearly described.

PHASE 2: PRESENTATION REQUIREMENTS

5. Present your selected dispenser, and the selected improvement/strengthening/ modification 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 prepared 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 a complete mechanical title block as presented in the EGD 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 using either drawing instruments or 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 aspects of all drawings must comply with the guidelines and conventional representations contained in the *SANS 10111*.

5.1 Draw, to a suitable scale and in third-angle orthographic projection, an **ASSEMBLY DRAWING** of your **selected dispenser**, clearly showing all the parts **before** any improvements, strengthening or modifications have been affected.
NOTE: Use relevant S-breaks/break lines to shorten the height of your selected dispenser in the assembly drawings, so that a larger scale can be used.

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 plane(s)
- 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)/part(s)** of **your selected dispenser**, clearly **showing the selected improvement/strengthening/modification**.

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(s)
- Detailed dimensioning
- Cutting plane(s)
- ALL hatching detail

5.3 Draw, to a suitable scale, a **detailed ISOMETRIC DRAWING** of your selected dispenser or of the improved, strengthened or modified component(s)/parts(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 your PAT file/portfolio.

PHASE 3: PRESENTATION REQUIREMENTS

Create a PAT file/portfolio containing the following in the given sequence:

- A complete cover page
- An table of contents
- The 2022 SUMMATIVE ASSESSMENT SHEET *(see page 26)*
- The completed DECLARATION OF AUTHENTICITY *(see page 27)*

Include the following PHASE 1 and PHASE 2 presentation requirements 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 isometric drawing (5.3)
6. The 'ASSESSMENT CRITERIA AND CHECKLIST FOR THE 2022 MECHANICAL PAT' *(see pages 21 and 22)*, which must provide clear evidence of your own continuous self-evaluation and the meeting of the 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 2022 EGD MECHANICAL PAT

- The SUMMATIVE ASSESSMENT SHEET on page 26 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 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 2022 EGD MECHANICAL PAT

			Checked	Maximum mark	Comments
1-mark level descriptive	0	Requirements not met or presented incorrectly			
	1	Requirements has been met and/or presented correctly			
2-mark level descriptive	0	Requirements not met, or **less than 30%** evidence of knowledge shown (poor)			
	1	Requirements 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	1st paragraph: background and comprehensive description of what to design		2	
	1.2	2nd paragraph: your role and description of complete design process you are going to use		2	
	1.3	A list of ALL the specifications of your selected dispenser		2	
	1.4	A list of at least THREE constraints of your selected dispenser		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 your selected dispenser		2	
		2.2 Design features/function/purpose of each component of your dispenser		2	
		2.3 The design, components, mechanisms, etc. of another similar dispenser		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)/part(s)	2	**Solution 1**		**10**	
		Isometric drawing of the component(s)/part(s)	2				
		Correct presentation of ALL the components and features	1				
		The relative size of all features and fixtures	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)				
	A table created for the selection process			2	
	A minimum of FOUR descriptive criteria to evaluate and compare			2	
	A simple rating scale created and used to score each solution against each criterion			2	
	Each score justified by describing the positive or negative aspects against each criterion			2	
	Comprehensive summary with reasons for selected solution (including possible late changes)			2	
			TOTAL	**10**	
5	**Working drawings and a pictorial drawing of your selected dispenser, and/or selected change(s)**				
	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 CAPS.		**TOTAL**	**10**	
5.1	A**SSEMBLY DRAWING** of your **selected dispenser, before any changes**				
	5.1.1	**FRONT VIEW** before any changes			
		ALL the parts included and drawn correctly according to the actual selected dispenser		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 on ALL views		1	
			TOTAL	**10**	

ASSESSMENT CRITERIA AND CHECKLIST FOR THE 2022 EGD MECHANICAL PAT					
	5.1.2	**Second PRIMARY VIEW** before any changes			
		ALL the parts included and drawn correctly according to the actual selected dispenser		2	
		All hatching detail or, if not sectioned, external features		2	
		Dimensions for ALL views		2	
		ALL centre lines on ALL views		2	
		ALL FOUR 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 dispenser		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 component(s),** clearly **showing** the selected **improvement/modification/redesign**				
	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			7	
	NOTE: Use the 7-mark simplified rubric on page 45 of the CAPS.		**TOTAL**	**10**	
6	**Continuous self-evaluation** and the **meeting** of **deadlines**				
	Checklist completed as evidence of continuous self-evaluation (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	
	Table of contents			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)* ***NOTE:*** • ***No evidence*** *of* ***grid/graph paper*** *used =* ***max. 7 marks****, even if drawn excellently* • ***Not drawn in freehand*** *=* ***0 marks, & some evidence of instruments used*** *=* ***max. 5 marks***			10	
	Neatness (2) + correct line types used (2) + line consistency (2) + printing (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 (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	

8. ANNEXURE A: ASSESSMENT RUBRIC

ASSESSING DRAWING METHODS, DRAWING SKILLS AND PRESENTATION

<table>
<tr><th colspan="4">LEVELS OF PERFORMANCE</th></tr>
<tr><th colspan="3" rowspan="2">MARK ALLOCATION</th><th>10</th><th>9</th><th>8</th><th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th><th>0</th></tr>
<tr><th>100%</th><th>99%–90%</th><th>89%–80%</th><th>79%–70%</th><th>69%–60%</th><th>59%–50%</th><th>49%–40%</th><th>39%–30%</th><th>29%–20%</th><th>19%–1%</th><th>0%</th></tr>
<tr><td rowspan="4">Freehand drawing</td><td>METHODS AND SKILLS</td><td>The drawings display correct freehand drawing methods and skills. as well as the method used to ensure good proportion and size</td><td colspan="6">NOTE:
• No evidence of grid/graph paper used = max. <u>7 marks</u>, even if excellent drawing methods and skills are displayed!
• Not drawn in freehand, i.e. completely drawn with instruments, = <u>0 marks</u>
• If instruments were used for, or to assist with, some aspect = max. <u>5 marks</u>, even if excellent drawing methods and skills are displayed.
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.</td><td colspan="2">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.</td><td colspan="3">The drawings display very poor drawing methods and skills and no method was used to ensure correct proportion.</td></tr>
<tr><td colspan="2" rowspan="3">Final drawing presentation is neat, and the line types used, line constancy/quality, printing and dimensioning is correct.</td><td colspan="8">Neatness (2) + correct line types used (2) + line quality/consistency (2) + compliant printing/writing (2) + compliant dimensioning (2)</td></tr>
<tr><td colspan="8">Additional descriptors/guidelines:</td></tr>
<tr><td colspan="2">The drawings are very neat and all line work/line quality, printing and dimensioning are outstanding and consistent.</td><td colspan="2">The drawings are neat and line work/line quality, printing and dimensioning are generally good and mostly consistent.</td><td colspan="2">The drawings are untidy with inconsistent line work/line quality, printing and dimensioning.</td><td colspan="2">The line work/line quality, printing and dimensioning are unacceptable.</td></tr>
<tr><td rowspan="4">Instrument drawing</td><td>METHODS AND SKILLS</td><td>The drawings display the correct use of drawing instruments, drawing methods and skills.</td><td colspan="2">The drawings display the correct use of drawing instruments and an outstanding application of drawing methods and skills.</td><td colspan="2">The drawings display the correct use of drawing instruments and a satisfactory and mostly correct application of drawing methods and skills.</td><td colspan="2">The drawings display poor use of drawing instruments and a poor and incorrect application of drawing methods and skills.</td><td colspan="3">The drawings display an incorrect use of drawing instruments with incorrect applications of drawing methods and skills.</td></tr>
<tr><td colspan="2" rowspan="3">Final drawing presentation is neat, and the line types used, line constancy/quality, printing and dimensioning is correct.</td><td colspan="8">Neatness (2) + correct line types used (2) + line quality/consistency (2) + compliant printing/writing (2) + compliant dimensioning (2)</td></tr>
<tr><td colspan="8">Additional descriptors/guidelines:</td></tr>
<tr><td colspan="2">The drawings are very neat and all line work/line quality, printing and dimensioning are outstanding and consistent.</td><td colspan="2">The drawings are neat and the line work/line quality, printing and dimensioning are generally good and mostly consistent.</td><td colspan="2">The drawings are untidy, and the line work/line quality, printing and dimensioning are inconsistent.</td><td colspan="2">The line work/line quality, printing and dimensioning are unacceptable.</td></tr>
<tr><td rowspan="2">CAD drawing</td><td>METHODS AND SKILLS</td><td>The level of competence displayed in using a CAD program</td><td colspan="2">Displays a high level of skills, knowledge and ability in using a CAD program</td><td colspan="2">Displays a satisfactory level of skills, knowledge and ability in using a CAD program</td><td colspan="2">Displays a poor level of skills, knowledge and ability in using a CAD program</td><td colspan="3">Shows little to no skills, knowledge or ability in using a CAD program</td></tr>
<tr><td colspan="2">Layout of the final drawing is correct and the line work, printing and dimensioning are compliant and consistent</td><td colspan="2">The layout of the drawings is correct and the line work, printing and dimensioning are compliant and consistent.</td><td colspan="2">The layout of the drawings is acceptable and the line work, printing and dimensioning are mostly compliant and consistent.</td><td colspan="2">The layout of the drawings is very poor and the line work, printing and dimensioning are not compliant and inconsistent.</td><td colspan="3">The layout, line work, printing and dimensioning are unacceptable.</td></tr>
</table>

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.

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

10. PAT 2022: SUMMATIVE ASSESSMENT SHEET

PAT 2022
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

	CRITERIA		MARK
1	A **design brief** demonstrating a clear understanding of the scenario and the specifications, constraints and a management plan		
2	Evidence of **relevant** and **usable research** with the inclusion of a bibliography		
3	**TWO** detailed **freehand drawings** of possible solutions	**1st Solution**	
		2nd Solution	
4	**Selecting** the **best solution** which demonstrates a clear **understanding** of the **design brief**		
6	Clear evidence of **evaluation** and the meeting of **deadlines** of **all** the **requirements**		
7	The **presentation** of the **complete PAT portfolio**		

SUBTOTAL	/ 70	
CALCULATION	*X 0.36*	
Teacher's TOTAL		
TOTAL: A	**/ 25**	
Moderated TOTAL		
TOTAL: A	**/ 25**	

PART B: Working and pictorial drawings

	CRITERIA			MARK
All drawing sheets are appropriately set up with a **border** and an **appropriate title block/panel**.				
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**	
		5.1.2	**View 2** PAT 1: **Elevations (x2)** PAT 2: **2nd main view**	
		5.1.3	**View 3** PAT 1: **Detailed section(s)** PAT 2: **Secondary views (x2)**	
		5.2	PAT 1: **Site plan** PAT 2: **Detailed drawing**	
Pictorial Drawing	**5.3**		The correct **drawing method** and **presentation** of the pictorial drawing. **PAT 1**: Perspective **PAT 2**: Isometric	

SUBTOTAL	**/ 60**	
CALCULATION	*X 0.84*	
Teacher's TOTAL		
TOTAL: B	**/ 50**	
Moderated TOTAL		
TOTAL: B	**/ 50**	

Drawing competency and skill

		CRITERIA	MARK
Freehand drawing: ANNEXURE A	**METHOD**	The drawings display **correct freehand drawing methods and skills** and the **method used** to ensure **proportion** and **size**.	
		The final drawing **presentation** is **neat** and there is consistency of **line work/line quality, printing** and **dimensioning**.	
Instrument drawing: ANNEXURE A	**METHOD**	The drawings display the **correct use of drawing instruments, drawing methods** and **skills**.	
		The final drawing **presentation** is **neat** and there is consistency of **line work/line quality, printing** and **dimensioning**.	
CAD drawing: ANNEXURE A	**METHOD**	The **level** of **competence** is displayed in **using** a **CAD program**.	
		The **layout** of the final drawing is **correct** and the **line work, printing and dimensioning** is **compliant** and **consistent**.	

NO CAD drawings	/ 40
With CAD drawings	/ 60
CALCULATION **without** CAD	*X 0.63*
CALCULATION **with** CAD	*X 0.42*
Teacher's TOTAL	
TOTAL: C	**/ 25**
Moderated TOTAL	
TOTAL: C	**/ 25**

TEACHER'S TOTAL:	A + B + C =	**/ 100**
MODERATED TOTAL:	A + B + C =	**/ 100**

TEACHER: Initial	**MODERATOR: 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 (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.

_____ ___/___/2022
SIGNATURE OF LEARNER **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.

_____ ___/___/2022
SIGNATURE OF TEACHER **DATE** (DD/MM/YYYY)

SCHOOL STAMP