



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

ENGINEERING GRAPHICS AND DESIGN

GUIDELINES FOR PRACTICAL ASSESSMENT TASKS

GRADE 12

2024

These guidelines consist of 27 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, Technical Sciences and 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

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, which includes a list of specifications, constraints and a management plan
- Conduct relevant and usable research
- Use the research in developing 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 2024 PAT document** to every Grade 12 learner **no later than Week 7 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 for each PHASE, e.g. as an extra paper during the May/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 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 to 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 to any of these, and aforementioned instructions, will be deemed a serious examination irregularity**.

- Except for clean A4 and A3 drawing sheets and grid/graph paper, **NO templates, tables, pre-prepared pages/drawing sheets, redrawn examples of the site plan, etc., may be given or made available 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, procured for, or demonstrated to the learners in any form or format**. This includes, but is not limited to, **examples developed**, or **demonstrations presented** by any **individual, group, department, institution, organisation or business**.
- **Explanatory examples**, such as graphical illustrations, best practices from previous years' PATs, etc., **may ONLY be presented** to the learners **during the initial mediation** of the PAT. As these examples may not be given to the learners or left for them to view indefinitely after the initial mediation, learners must be encouraged to take notes during the mediation, but **may NOT take any photographs or videos**.

- 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 strictly adhered to**.
- Except for the required research component, **ALL the presentation requirements** of the PAT **must be completed at school under the supervision of the teacher**.
- 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, index/table of contents, management plan, tables, drawing sheet preparation, etc., **must be each learner's own original work**.
- **ALL freehand drawings and instrument drawings** must be **prepared in pencil**.
- **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 attempted/prepared/completed**, or when the learner requests it.
- When **learners prepare drawings in CAD**, the following **must be adhered to**:
 - The school **must provide the facilities**, including the **CAD program and computers**. The **school must hold the licenses of ALL the CAD programs used by the learners**, and **NO other programs may be used** by any of the learners.
 - **ALL CAD drawings** must be **prepared at school under the supervision of the teacher**.
 - The opportunity to be trained using a CAD program must be made **available to ALL learners**, regardless of whether they make use of it or not.
 - As the teacher remains responsible for assessing both the competence displayed in using a CAD program and the layout and correctness of the drawing presentations, **he/she must have sufficient knowledge of and skills in the CAD program used**.
 - **Electronic and hard copy evidence** of the **history** of the **stage-by-stage development** of each learner's CAD drawings **must be retained at school** for a period of time as stipulated by the Department of Basic Education (DBE).
 - 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.
- The DECLARATION OF AUTHENTICITY, given on page 27 of this document, must be completed and signed by the learner and teacher **just prior to the final assessment**.
- The SUMMATIVE ASSESSMENT SHEET, given 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 used by the learner **are included after the index** in each learner's 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 2024 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**. Where a school has more than one Grade 12 EGD teacher, the teachers must assist one another by conducting PAT assessment as a team. This will ensure a consistent standard of assessment across all the learners.

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 (PEDs).

Clarification of level descriptors and the verification of marks:

- **1-mark level descriptor:**

There is **NO percentage (%)** for the 1-mark level descriptor, and it 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 **met fully** 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 may only be allocated** if the presentation of the requirement shows **at least 30% or more** evidence of knowledge, or if 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 25 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. A mark of 9,5 must, however, remain 9 as the 0,5 is an indication of a mistake. The final mark out of 25, 50 and 25 for each of the three complete sections of the PAT must also be rounded off after being calculated.

4.2 Moderation

Moderation of the PAT must be conducted using the included 2024 ASSESSMENT CRITERIA AND CHECKLISTS, and according to the same level descriptors used for assessing the PATs.

As monitoring and/or moderation of the PAT can take place **at any stage during the development of the PAT, ALL completed and unfinished presentations 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 mid-year examinations)
- Phase 2: Presentation drawings (beginning of Term 3 before the commencement of PHASE 3)

NOTES on the final provincial Grade 12 PAT moderation:

- **ALL the schools in ALL the provinces must be moderated.**
- The moderation **must be conducted by officially appointed, trained and authorised provincial PAT moderators.** Peer, cluster, PLC or district moderation may therefore NOT be implemented to conduct the moderation.
- **PEDs must ensure** that the moderation **commences early enough** so that it can 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 a more constant result.

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.**

The concept of '**benchmarking**' should be applied when moderating the PATs. This requires that a **PAT with a highest mark**, but preferably the PAT with the **highest mark, must be moderated first** to **establish a standard** against which all the other PATs of the school can be benchmarked.

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 rest of the PATs.

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 project, with an electrical component
 - PAT 2: A mechanical design projectYou, the learner, with the guidance of your teacher, must select and complete **only 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, none of the presentations may be shared or copied. The **entire PAT must be completed individually and ALL the presentations**, including the front page, index/table of contents, management plan, tables, drawing sheet preparation, etc. **must be your own original work.**
- The PAT must be of an **appropriate higher-order Grade 12 complexity.**
- **ALL freehand drawings and instrument drawings** must be **prepared in pencil.**
- The PAT must be completed in phases and within the given time frames of your teacher's pacesetter/management plan.
- The PAT will be assessed according to the relevant **ASSESSMENT CRITERIA AND CHECKLISTS**, which are included in this PAT document.
- The relevant 2024 **ASSESSMENT CRITERIA AND CHECKLIST** for the PAT (i.e. either pages 15 and 16 or 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.
- Just prior to the final submission of your complete PAT, you must complete and sign the **DECLARATION OF AUTHENTICITY**, given on page 27 of this document.
- **ONLY** the 2024 **SUMMATIVE ASSESSMENT SHEET**, given on page 26 of this document, your completed and signed **DECLARATION OF AUTHENTICITY**, your completed 2024 **ASSESSMENT CRITERIA and CHECKLIST** with **ALL** your own prepared 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

The National Monuments Council of South Africa recently restored historically significant buildings on a wine estate on Plot 36 of 61 and declared them national monuments. To cater for visitors, permission was granted by the National Monuments Council to build a **new restaurant** and **small museum** on the estate. You have been tasked by the National Monuments Council to submit a proposed design solution for the **proposed new restaurant and small museum**, which will forthwith simply be referred to as the **restaurant and museum**.

The restaurant must be a single-storey brick structure with a maximum total area of 200 m². The roof must be a gabled design with a 500 mm overhang on all sides, with corrugated steel roof sheeting, and finished with fascia boards, gutters and rainwater downpipes on the sides, and barge boards on the ends. The restaurant must consist of a large open inside dining area of no less than 110 m², a large kitchen with a separate scullery and a separate pantry, unisex toilet facilities, and a toilet facility for disabled people. In the dining area there must be a dedicated section with a large countertop for serving a buffet lunch on Sundays, and for the display and sale of over-the-counter eats and refreshments on all other days. There must be wide wooden multipanel sliding doors, with three or more panels, along two adjacent walls of the dining area leading out onto an adjoining 3 m wide veranda which runs along the same two adjacent walls of the restaurant. The veranda, which is not included in the 200 m² of the restaurant, must be covered by wooden pergolas, as it will be used as additional outside dining space.

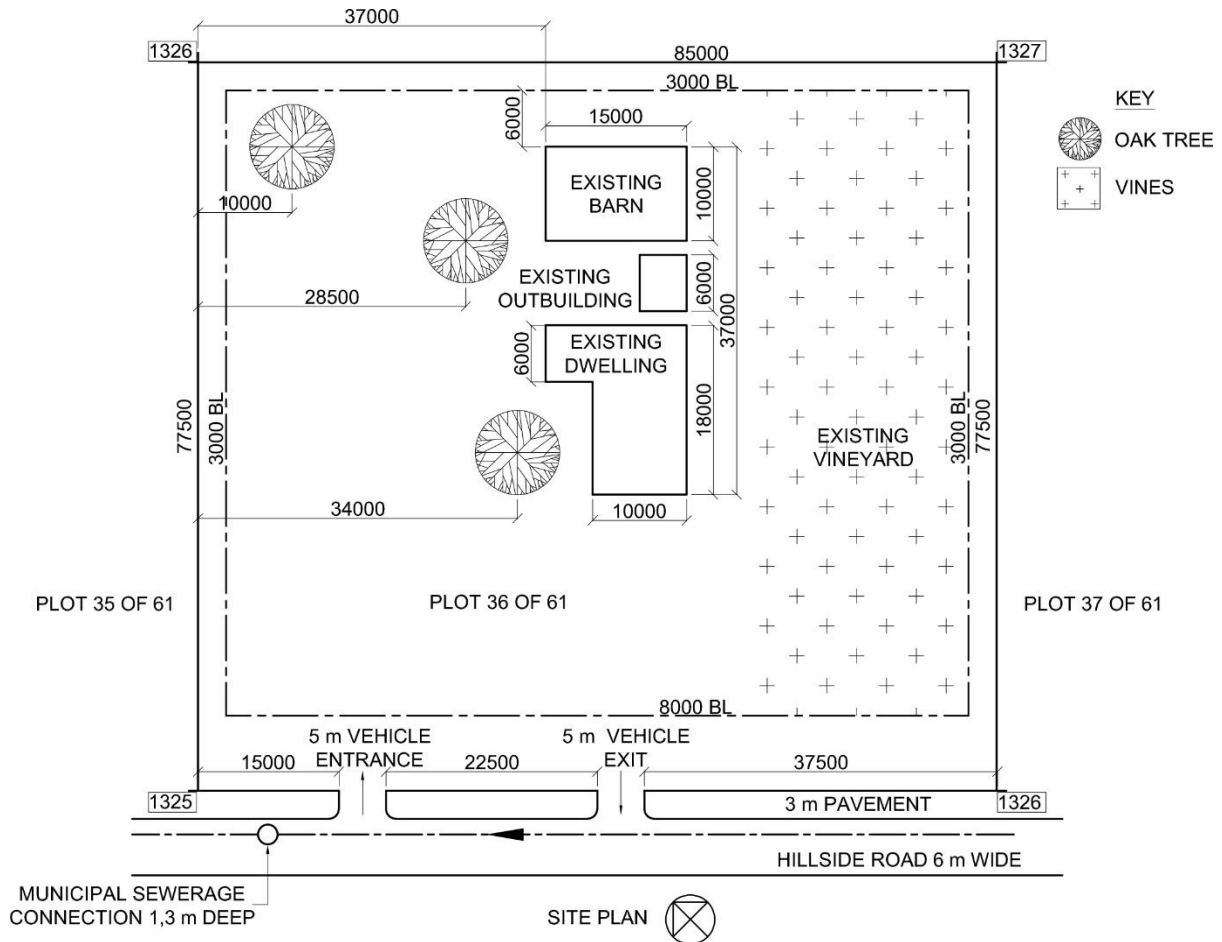
The kitchen must have a floor area of no less than 35 m² and be situated at the back of the restaurant. The kitchen must be separated from the dining area by a brick wall, with a single 180° swing door leading into the kitchen and a single 180° swing door leading out of the kitchen into the dining area. There must be a single sink, built-in cupboards and sufficient work surfaces for the preparation of food and placing of kitchen appliances, as well as space for two large refrigerators and two large industrial stoves in the kitchen. Leading off the kitchen must be a separate scullery with two double sinks and space for two dishwashers, as well as a separate lockable pantry. The scullery and the pantry must each have floor areas of approximately 10 m². Both the kitchen and the scullery must have an exterior door and windows.

The unisex toilet facility must be directly accessible from the inside dining area of the restaurant. The facility must consist of FIVE separate cubicles, each with a toilet, a wash basin and its own small window. One of the cubicles must have a larger door and more space to accommodate people in wheelchairs.

The building for the museum must be a single-story semi-detached 6 x 8 m brick structure that stands adjacent to, and shares a common wall with the restaurant. The museum must be accessible off the veranda, but must have no direct access into any part of the restaurant. To complement the heritage of the estate, the entrance to the museum must have a typical centrally placed decorative Cape Dutch facade above a double wooden door with sash windows on either side. The museum must have a gabled roof with a corrugated steel roof sheeting finish.

The new restaurant and museum must have sufficient electrical lighting and switched socket outlets in all the rooms and areas. All sewage and waste-water from the restaurant must be connected to the manhole on the municipal sewerage line in Hillside Road.

Included in the design must be driveways and a parking area with 10 standard-size parking bays and, situated close to the restaurant, two parking bays for disabled people.



Given: The site plan of the wine estate

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 **comprehensive description of what has to be designed**.
 - The **second paragraph** must, in your own words, give a clear overview of **your role in the project**, as well as a **description of the complete design process** that you are going to implement to complete this project.

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

- A list of TWENTY of the given specifications for the restaurant and museum
 - A list of FIVE possible constraints. Note that the specifications 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
- Conduct research on:**
 - Examples and construction details of wooden multipanel sliding doors with THREE or more panels
 - Examples and construction details of wooden pergolas
 - THREE examples of gabled roof designs and THREE examples of Cape Dutch gable facades with timber doors and sash windows

NOTE:

- The research must be relevant and should therefore be in the form of graphic material, i.e. pictures and illustrations.
 - Evidence of **at least FIVE** different examples that covers all the requirements of each research topic must be included in the PAT file/portfolio, unless otherwise stated.
 - The research material must 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 design solution.
 - Include a list of ALL references used (Bibliography), directly after the research.
3. **Prepare neat detailed freehand drawings** of the floor-plan layout of TWO possible design solutions for the proposed new **restaurant and museum**, including the veranda. Each freehand drawing must show the correct presentation of ALL the building features, the permanent fixtures, the rooflines, as well as the primary dimensions and labels. The **calculation** for the **total area** of the **restaurant**, excluding the veranda and the **museum**, and the **floor area** of the **kitchen**, must be clearly shown in a table on the drawing sheet as part 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, labels, tables and possible information blocks, **must be prepared using a pencil ONLY**. The use of any other drawing instruments, e.g. a ruler or compass, will be penalised.
 - The electrical layout and the waste-water disposal systems are NOT required on the freehand drawings.
 - The freehand drawings may be prepared on **either A4 or A3 drawing sheets**.
 - **NO borders or title panels are required** for the freehand drawings.
 - ALL the freehand drawings 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.

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

- **Creating a table** with a minimum of **SIX relevant** and **self-explanatory descriptive criteria** that will facilitate measurable comparisons
- **Creating and applying a simple, self-explanatory 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 include whether any late changes were made to the selected freehand solution, **or not**. If there were late changes, 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 SANS 10143 compliant 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 a pencil and drawing instruments, and the other using a CAD program.
 - The perspective drawing (5.3) may be prepared using a pencil and 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.
 - ALL aspects of all drawings must comply with the guidelines, drawing symbols, the title panel, graphical symbols and representations contained in the *SANS 10143*.
- 5.1 Draw **detailed LAYOUT DRAWINGS** of the selected freehand solution of the **complete restaurant and museum**, including the **veranda** and **pergolas**, 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, **preferably** not smaller than scale 1 : 75.
- 5.1.2 **TWO ELEVATIONS**, drawn to the same scale as the floor plan, with one elevation including the **front entrance to the museum**, and the other including a **side view of the museum**. Both views must also show the veranda and wooden pergolas. It is recommended that you draw the elevations that would be required for the two-point perspective drawing.
- 5.1.3 A **DETAILED SECTION** drawn to scale 1 : 20, showing detail from the foundation to the roof, on a cutting plane that passes through a wooden multipanel sliding door, the veranda and wooden pergola.
- NOTE:** By using break lines, the detailed section only needs to be wide enough to show the complete multipanel sliding door, the end of the roof, including rainwater items, and a 1½ m section of the veranda and pergola.

Include the following on ALL relevant views:

- ALL exterior features, including door, window and veranda 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 layout
- Waste-water disposal systems (sewerage)
- Titles, labels and notes
- Scales used
- Detailed dimensioning
- Cutting plane
- All hatching detail
- North point

5.2 Draw, to a suitable scale, a complete detailed **SITE PLAN** of Plot 36 of 61.

Include the following:

- ALL given site details and features, including ALL existing buildings
- The proposed new restaurant and museum, parking area and driveways
- ALL sewerage detail, with ALL labels and notes included
- Dimensions, including the reference dimensions and corner heights
- Scale
- North point

5.3 Draw a **detailed 'bird's-eye view' TWO-POINT PERSPECTIVE DRAWING** of the **entire restaurant and museum**, including the **veranda**, without the pergolas. Orientate the perspective drawing so that it will clearly show the **entrance to the museum** and the **entire veranda**. The horizon line (HL) must be ± 1 m above the top of the roof.

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** that includes your school's name, your full name and surname, your grade and class group, your teacher's initials and surname, and a copy of your own two-point perspective drawing (5.3) for this task.
- A complete **index (table of contents)**
- The **2024 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 2024 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 name** and the date of completion and submission

Assessment criteria and checklist for the 2024 Civil PAT

- The SUMMATIVE ASSESSMENT SHEET on page 26 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 2024 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 is to be designed				2	
	1.2	2 nd paragraph: your role and description of the design process you are going to follow				2	
	1.3	A list of TWENTY given specifications from the scenario				2	
	1.4	A list of FIVE possible constraints from 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	Examples and construction details of wooden multipanel sliding doors				2	
	2.2	Examples and construction details of wooden pergolas				2	
	2.3	THREE gabled roof designs (1) + THREE Cape Dutch gable facades (1)				2	
				Clear evidence that the research was used in design solutions		2	
				A list of ALL references used (Bibliography)		2	
					TOTAL	10	
3. Freehand drawings of TWO possible design solutions				Final mark for each solution			
Assess each freehand solution as follows:	Restaurant with ALL rooms/areas, features and rooflines			2	Solution 1	10	
	Museum with features and rooflines (1) + veranda with pergolas (1)			2			
	Correct presentation of all building features (walls, doors, etc.)			2			
	ALL fixtures included (toilets, sinks, counters, etc.)			2			
	Correct presentation of all fixtures according to SANS 10143			2			
	The relative size and proportion of ALL features to each other			2	Solution 2	10	
	Primary labels (1) + primary dimensions (1)			2			
	2 x calculations shown and within the specifications (2 + 2 = 4)			4			
	Design, functionality and effective space utilisation			2			
	Subtotal = 20 ÷ 2 = TOTAL			20			
4. Selecting the best freehand solution (This must be a separate presentation.)							
A suitable table created for the selection process					2		
A minimum of SIX relevant and descriptive criteria that will facilitate measurable comparisons					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. Layout drawings and a pictorial drawing of selected solution							
Drawing sheet preparation							
Appropriately sized drawing sheets					1		
Borders on all the drawing sheets of all the working drawings					2		
Complete SANS 10143 compliant CIVIL TITLE PANEL on ONE 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 restaurant and museum, incl. the veranda with pergolas							
5.1.1	FLOOR PLAN showing:						
	Correlation with selected freehand solution				2		
	ALL external and internal walls, veranda with pergolas and rooflines				2		
	ALL doors, including the multipanel sliding doors and windows				2		
	ALL permanent fixtures				2		
	ALL electrical fittings and the wiring layout				2		
	Waste-water disposal systems (sewerage)				2		
	Title, labels and notes				2		
	Detailed dimensioning				2		
	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 2024 CIVIL PAT				
5.1.2	TWO ELEVATIONS that show the restaurant and museum , incl. the veranda with pergolas			
	Prescribed views: one with entrance to museum + one with side view of the museum		1	
	External walls, veranda and pergolas		2	
	Museum's Cape Dutch facade with double wooden door + sash windows on either side		2	
	Detail, incl. frames, of all doors and windows		2	
	Gable roof detail, including all rainwater items		2	
	Elevations drawn to the same scale as the floor plan		1	
			TOTAL	10
5.1.3	DETAILED SECTION			
	The section is according to the indicated cutting plane		1	
	Foundation, slab and wall detail, including the correct hatching thereof		2	
	Wooden multipanel sliding door detail		2	
	Detail of 1½ m section of veranda and wooden pergola		2	
	Roof detail, including all rainwater items, and the correct hatching of the wood		2	
	Titles, labels and notes		2	
	Detailed dimensioning		2	
Scale 1 : 20 used and correctly indicated (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, including ALL given site features and detail		2	
	The proposed new restaurant and museum, including parking area and driveways		2	
	ALL sewerage detail, with labels and notes included		2	
	Dimensions, including new building's reference dimensions and corner heights		2	
	Suitable scale indicated correctly		1	
	North point		1	
			TOTAL	10
5.3	TWO-POINT PERSPECTIVE DRAWING showing the restaurant, museum and veranda, but without the pergolas			
	Evidence of the views and construction used to prepare the drawing		1	
	Orientation showing entrance to museum and entire veranda (1) and HL ±1 m above the roof (1)		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			
	Checklist completed as evidence of continuous self-evaluation	(mark out of 10 ÷ 2)	5	
	Meeting ALL the submission deadlines	(mark out of 10 ÷ 2)	5	
	NOTE: Use the 10-mark simplified rubric on page 25 of this PAT document.		TOTAL	10
7.	Presentation of the complete PAT file/portfolio			
	Complete cover page with a copy of the perspective drawing		1	
	Complete index (table of content)		1	
	Completed 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	
	NOTE: Use the 10-mark simplified rubric on page 25 of this PAT document.		TOTAL	10
Assessment of drawing methods, drawing skills and presentation				
a.	Freehand drawings			
	Freehand drawing methods and skills	(See ANNEXURE A on page 24)	10	
	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			
	Neatness (2) + correct line types used (2) + line consistency (2) + printing (2) + dimensioning (2)	(Also see ANNEXURE A on page 24)	10	
b.	Instrument drawings			
	Use of drawing instruments, drawing methods and skills	(See ANNEXURE A on page 24)	10	
	Neatness (2) + correct line types used (2) + line consistency (2) + printing (2) + dimensioning (2)	(Also see ANNEXURE A on page 24)	10	
c.	CAD drawings			
	Competence displayed in using a CAD program	(See ANNEXURE A on page 24)	10	
	Layout and correctness of the drawings presentation	(See ANNEXURE A on page 24)	10	

7. PRACTICAL ASSESSMENT TASK 2 (PAT 2)

A mechanical design project

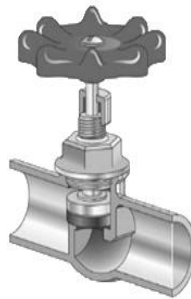
SCENARIO

A valve is a device used to control the flow of liquids or gas through a pipe allowing movement in one direction only.

You are employed at a design consulting firm that is subcontracted by the Department of Water and Sanitation. The department is looking for solutions to improve the efficiency of **manually operated VALVES that control the flow of liquids or gasses** in the agricultural, manufacturing and construction industries. Examples of valves include, but are not limited to, gate valves, globe valves, needle valves, ball valves, butterfly valves, check valves, diaphragm valves and float valves. Examples of some of these **valves** are shown below.



Butterfly valve



Globe valve



Gate valve

[Source: valvesonline.com.au]

As one of the design consulting firm's designers you have been tasked with investigating and analysing the design features of **existing control valves**, and to then design an improvement(s), which could be, but is not limited to, one or more of the following:

- Improved efficiency
- To strengthen its design
- To modify its design

Your investigation, analysis and solution require the following stages:

- The **FIRST stage** involves **finding a suitable valve** that controls the flow of liquids or gasses. The **valve must** be a **manually operated** device that incorporates **mechanical movement** and consists of a **minimum of FOUR parts**.

The **valve that you have selected** will simply be referred to as **the valve** from now on.

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

- The **SECOND stage** involves the **dismantling of the valve** so that ALL the individual parts can be investigated, measured and photographed.
- The **THIRD stage** requires the **identification of ONE of the complex main parts**, or a **combination of parts of the valve**, which could be improved, strengthened and/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 valve:

- Each learner **must have his/her own valve** for the PAT.
- **The valve must be submitted as part of your PAT presentation.**
- **The valve** must incorporate **manually operated mechanical movement**, with a **minimum of FOUR separate parts**.
- **Taps** or **electrical, electronic** or **pneumatic** valves may **NOT be used**.
- Your teacher **must approve the valve**. 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 **comprehensive description of what has to be designed**.
 - The **second paragraph** must, in your own words, give a **clear overview of your role in the project**, as well as a **description** of the **complete design process** that you are going to implement to complete this project.

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 the valve**
- Your own list of at least **THREE constraints of the valve**
- 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 part of **the valve**
- The **specific design features** and/or **function/purpose** of each individual part of **the valve**
- The design and components of at least **ONE other valve that is similar to the valve that you have selected**.

NOTE:

- The research must be relevant and should therefore be in the form of graphic material, i.e. pictures and illustrations.
- Evidence of ALL the required research material must be included in the PAT file/portfolio.
- 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 primarily be 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 component.
- The evidence of the **ONE** other similar valve 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), directly after the research.

3. **Prepare neat detailed freehand drawings** of **TWO** possible design solutions of the proposed improvement, strengthening and/or modification of **only the complex main part**, or a **combination of parts** of **the valve**, as identified during the third stage.

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

NOTE:

- **Grid/Graph paper must be used** to assist in preparing the freehand drawings so that ALL features 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 or compass, will be penalised.
- The drawings may be prepared **on either A4 or A3 drawings sheets**.
- **NO borders or title blocks are required** for the freehand drawings.
- ALL the freehand drawings must comply with the guidelines and conventional representations contained in the *SANS 10111*.
- 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** that demonstrates an in-depth understanding of the scenario.

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

- **Creating a table** with a minimum of **FOUR relevant and self-explanatory descriptive criteria** that will facilitate measurable comparisons
- **Creating and applying a simple, self-explanatory 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 include whether any late changes were made to the selected freehand solution, **or not**. If there were late changes, they must be clearly described.

PHASE 2: PRESENTATION REQUIREMENTS

5. Present **the valve** that you selected during the first stage, and the selected improvement, strengthening and/or modification thereof 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 NSC EGD 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 a pencil and drawing instruments, and the other using a CAD program.
- The isometric drawing (5.3) may be prepared using either a pencil and 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.
 - 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 **ASSEMBLED DRAWING** of the valve, clearly showing **ALL the parts before** any improvements, strengthening and/or modifications have been affected.
- NOTE:** If the valve is excessively long or high, use relevant break lines to shorten the length/height of the valve in the assembly drawing, 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:

- Title, labels and notes
- Scale
- Detailed dimensions
- Cutting plane(s)
- ALL hatching detail
- Relevant hidden detail that would provide clarity
- Projection symbol

- 5.2 Draw, to a suitable scale and in third-angle orthographic projection, a **DETAILED DRAWING** of **ONLY** the **identified complex main part, or combination of parts of the valve, clearly showing the selected improvement, strengthening and/or modification** thereof.

The detailed drawing must show the following THREE views:

5.2.1 The **FRONT VIEW**

5.2.2 Any **TWO** other **VIEWS**

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

Include the following:

- Title, as well as 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
- Relevant hidden detail that would provide clarity
- Projection symbol

- 5.3 Draw, to a suitable scale, a **detailed ISOMETRIC DRAWING** of the valve, or of the improved, strengthened and/or modified **complex main part**, or **combination of parts**, that is of **an appropriate Grade 12 level of complexity**.

NOTE:

- Evidence of ALL auxiliary views and construction 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**, that includes your school's name, your full name and surname, your grade and class group, your teacher's initials and surname and a copy of your own isometric drawing (5.3) for this task.
- A complete **index (table of contents)**
- The **2024 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 2024 MECHANICAL PAT' (see pages 22 and 23), **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 name** and the date of completion and submission

Assessment criteria and checklist for the 2024 MECHANICAL PAT

- The SUMMATIVE ASSESSMENT SHEET on page 26 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 2024 MECHANICAL PAT						
1-mark level descriptive	0	Requirements not met or presented incorrectly		Checked	Maximum mark	Comments
2-mark level descriptive	1	Requirements have been met and/or presented correctly				
	0	Requirements not met, or less than 30% evidence of knowledge shown (very 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		1 st paragraph: background and comprehensive description of what has to be designed			2	
1.2		2 nd paragraph: your role and description of complete design process you are going to follow			2	
1.3		A list of ALL the specifications of the valve			2	
1.4		A list of at least THREE constraints of the valve			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 research topic.)						
Relevant and usable research on:	2.1	Materials used for each component of the valve			2	
	2.2	Design features/function/purpose of each component of the valve			2	
	2.3	The components of another similar valve			2	
	Clear evidence that the research was used in your 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:	Third-angle orthographic views of the identified part(s)		2	Solution 1	10	
	Isometric drawing of the identified part(s)		2			
	Correct presentation of ALL the parts and features		1			
	Relative proportion of ALL parts and features to each other		2			
	Labels and explanatory notes		2	Solution 2	10	
	Dimensioning		2			
	Description of improvement/modification/re-design		2			
	Functionality of improvement/strengthening/modification		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.)						
An appropriate table created for the selection process					2	
A minimum of FOUR relevant and descriptive criteria that will facilitate measurable comparisons					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 valve and/or selected change(s)						
Drawing sheet preparation						
Appropriately sized drawing sheets					1	
Borders on all drawing sheets of all the working drawings					2	
Complete EGD NSC P2 Q1 compliant MECHANICAL TITLE BLOCK on the drawing sheet of 5.1					7	
NOTE: Use the 7-mark simplified rubric on page 45 of the CAPS.					TOTAL	10
5.1 ASSEMBLY DRAWING of your selected valve, before any changes						
5.1.1	FRONT VIEW before any changes					
	ALL the parts included and drawn correctly according to the actual valve				2	
	All hatching detail or, if not sectioned, ALL external features				2	
	ALL fasteners drawn correctly in ALL views				2	
	Labels and notes on ALL views				2	
	Projection symbol				1	
	Suitable scale selected and indicated correctly				1	
					TOTAL	10

ASSESSMENT CRITERIA AND CHECKLIST FOR THE 2024 MECHANICAL PAT				
5.1.2	Second PRIMARY VIEW before any changes			
	ALL the components included and drawn correctly according to the actual valve		2	
	All hatching detail or, if not sectioned, external features		2	
	Dimensions on ALL views		2	
	ALL centre lines included on ALL views		2	
	ALL FOUR views prepared correctly in third-angle orthographic projection		2	
		TOTAL	10	
5.1.3	TWO further SECONDARY VIEWS before any changes			
	Appropriate secondary views selected		2	
	ALL the components included and drawn correctly according to the actual valve		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/Strengthening/Modification correlates with selected freehand solution		2	
	Title, as well as comprehensive explanatory labels and notes		2	
	Detailed dimensions		2	
	ONE view sectioned, or contain types of sections, and prepared 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		1	
	Evidence of ALL auxiliary views and construction used for the drawing		2	
	Detail and correctness of the isometric 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			
	Checklist completed as evidence of continuous self-evaluation	(mark out of 10 ÷ 2)	5	
	The meeting of ALL the submission deadlines	(mark out of 10 ÷ 2)	5	
	NOTE: Use the 10-mark simplified rubric on page 25 of this PAT document.			
		TOTAL	10	
7.	Presentation of the complete PAT file/portfolio			
	Complete cover page with a copy of the isometric drawing		1	
	Complete index (table of content)		1	
	Completed 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	
	NOTE: Use the 10-mark simplified rubric on page 25 of this PAT document.			
		TOTAL	10	
Assessment of drawing methods, drawing skills and presentation				
a.	Freehand drawings			
	Freehand drawing methods and skills	(See ANNEXURE A on page 24)		
	NOTE: • No evidence of grid/graph paper used = max. 7 marks, even if drawn excellently		10	
	• Not drawn in freehand = 0 marks, & some evidence of instruments used = max. 5 marks			
	Neatness (2) + correct line types used (2) + line consistency (2) + printing (2) + dimensioning (2)	(Also see ANNEXURE A on page 24)	10	
b.	Instrument drawings			
	Use of drawing instruments, drawing methods and skills	(See ANNEXURE A on page 24)	10	
	Neatness (2) + correct line types used (2) + line consistency (2) + printing (2) + dimensioning (2)	(Also see ANNEXURE A on page 24)	10	
c.	CAD drawings			
	Competence displayed in using a CAD program	(See ANNEXURE A on page 24)	10	
	Layout and correctness of the drawing presentation	(See ANNEXURE A on page 24)	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 = max. 7 marks, even if excellent drawing methods and skills are displayed! • Not drawn in freehand, i.e. completely drawn with instruments, = 0 marks • If instruments were used for, or to assist with, some aspect = max. 5 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 is correct.		Neatness (2) + correct line types used (2) + line quality/consistency (2) + compliant printing/writing (2) + compliant dimensioning (2) <i>Additional descriptors/guidelines:</i> 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) <i>Additional descriptors/guidelines:</i> 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.										
	Final drawing presentation is neat , and the line types used, line constancy/quality, printing and dimensioning is correct.												
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.		

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 2024: SUMMATIVE ASSESSMENT SHEET

**PAT 2024
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 2nd Solution			5.1.2	View 2 PAT 1: Elevations (x2) PAT 2: 2nd main view		Instrument drawing: ANNEXURE A METHOD		The drawings display the correct use of drawing instruments, drawing methods and skills.
				5.1.3	View 3 PAT 1: Detailed section(s) PAT 2: Secondary views (x2)			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 portfolio							NO CAD drawings	/ 40
SUBTOTAL		/ 70	SUBTOTAL		/ 60	With CAD drawings		/ 60	
CALCULATION		x 0,36	CALCULATION		x 0,84	CALCULATION without CAD		x 0,63	
CALCULATION			CALCULATION			CALCULATION with CAD		x 0,42	
Teacher's TOTAL			Teacher's TOTAL			Teacher's TOTAL			
TOTAL: A		/ 25	TOTAL: B		/ 50	TOTAL: C		/ 25	
Moderated TOTAL			Moderated TOTAL			Moderated TOTAL			
TOTAL: A		/ 25	TOTAL: B		/ 50	TOTAL: C		/ 25	
TEACHER'S TOTAL:			A + B + C =		/ 100	TEACHER: Initial		MODERATOR: Initial	
MODERATED TOTAL:			A + B + C =		/ 100				

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.

SIGNATURE OF LEARNER

____/____/2024
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

____/____/2024
DATE (DD/MM/YYYY)

