



# **basic education**

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

## **ENGINEERING GRAPHICS AND DESIGN**

### **GUIDELINES FOR PRACTICAL ASSESSMENT TASKS**

**2012**

**These guidelines consist of 22 pages.**

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## INTRODUCTION

The seventeen National Curriculum Statement subjects which contain a practical component all include a Practical Assessment Task (PAT). These subjects are:

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

A PAT allows the teacher to directly and systematically observe applied competence. The PAT comprises the application of knowledge and values and the demonstration and performance of skills particular to that subject and counts 25% (i.e. 100 marks) of the total promotion/certification mark out of 400 for Engineering Graphics and Design.

The Grade 12 PAT is implemented across the first three terms of the school year and should be undertaken as one extended task, which is broken down into different phases or a series of smaller activities that make up the PAT. The planning and execution of the PAT differ from subject to subject.

SECTION A is the guidelines to the teacher, describing the structure and the administration of the PAT, while SECTION B contains the tasks and the assessment tools for both the learner and the teacher.

## **SECTION A (Teacher Guidelines)**

### **1. The structure of the Practical Assessment Task (PAT) for EGD**

A Practical Assessment Task is designed to develop a learner's ability to integrate and apply knowledge and to demonstrate acquired levels of skills and competency.

With the inclusion of the PAT into Engineering Graphics and Design, the learner is given an opportunity to apply acquired knowledge, skills and values in a creative way through the design process as outlined in LO2 in the National Curriculum Statement. The learner is given an opportunity to complete the PAT in an environment which is more conducive to the creative processes. This environment should therefore provide the learner with easier access to, and a wider variety of, resource material than would be available in a formal examination.

The various components of the Engineering Graphics and Design PAT gives the learner an opportunity to demonstrate the level of drawing skill that has been attained in all the appropriate drawing methods through the presentation of the required drawings.

Each Engineering Graphics and Design Practical Assessment Task consists of two parts:

Part A: The Design Process

Part B: Required Presentation Drawings

Three assessable components, namely the design process, drawing presentation and drawing method, are covered within the two parts of both PATs.

Part A of both PATs focuses on LO2 and requires that the learner demonstrates a clear understanding of, and is able to apply, the design process. As part of the design process the learner must be able to:

- Identify the problem and formulate a design brief with specifications and constraints
- Conduct and make use of relevant external research in an appropriate way
- Generate a number of own ideas/concepts/solutions analytically and graphically
- Select a final solution(s) that demonstrates a clear understanding of the design brief within the context of the specifications and constraints
- Develop presentation drawings of the selected solution(s)
- Provide clear evidence of continuous self-evaluation during the development of the PAT

Part B of both PATs focuses on LO3 and LO4 and requires that the learner demonstrates and provides evidence of a high level of knowledge and understanding of the concepts and content of Engineering Graphics and Design through the presentation of orthographic drawings and pictorial drawings.

Part A and Part B of both PATs also give the learner the opportunity to demonstrate that a high level of competency and skill has been attained in all the required drawing methods. The methods include:

- Freehand drawings
- Instrument drawings
- Using a CAD (Computer-aided Drawing/Design) system

Two Practical Assessment Tasks (PATs) are included in this document:

- PAT 1 is a design task in the context of civil technology.
- PAT 2 is a design task in the context of mechanical technology.

Each learner must, with the guidance of the teacher, **select ONE** of the PATs contained in this document. Should the learner choose to complete both PATs, only ONE will be considered for summative assessment and promotion purposes.

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

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

## 2. Administration of the PAT

At the beginning of the academic year, the teacher must ensure that every Grade 12 learner receives a copy of the entire SECTION B of the PAT document, including the assessment criteria (ANNEXURES A, B, C and D), the 2012 summative assessment form and the declaration of authenticity form.

ALL the completed PATs (Part A and Part B) must, however, be submitted in time for summative assessment to be done before the commencement of provincial moderation in the **third term**. However, the **teaching/period time** that may be allocated for the completion of the PAT is 12 hours to a maximum of 16 hours. Additional non-teaching time may, however, be allocated at the school.

It is therefore recommended that the PATs be completed in phases during the first three terms:

- **Phase 1:** Design Process (completed by the end of the **1<sup>st</sup> term**)
- **Phase 2:** Presentation Drawings (completed by the end of the **2<sup>nd</sup> term**)
- **Phase 3:** Completion of portfolio (before the commencement of moderation in the **3<sup>rd</sup> term**)

To ensure that the PAT is completed within the stipulated time, it is essential that the teacher draw up a **pace setter** for the learners at the beginning of the year. Attached to the pace setter must be target dates for the completion of the different components of the different phases of the PAT. This will help learners to assess their own progress and teachers to set up intervention programmes should they see that the learners are falling behind with their work.

### NOTE:

- **ALL the presentation requirements of the PAT must be completed under controlled conditions at school, under guidance and supervision from the Engineering Graphics and Design teacher, who must observe the learners' progress at all times.**
- **It is the teacher's responsibility to ensure that each learner's PAT is of an appropriate higher order Grade 12 complexity!**
- **All the completed presentation requirements of the PAT must always be available for monitoring and moderation purposes.**

### 3. Assessment and moderation of the PAT

The Practical Assessment Task for Grade 12 is externally set, internally assessed and externally moderated.

It is therefore the duty and responsibility of the teacher to administer assessment and record the progress in instances where formal assessment is required.

#### 3.1 Assessment

Frequent developmental feedback is needed to guide and give support to each learner and to ensure that each learner is on the right track.

Both formal and informal assessment should be conducted throughout the development of the PAT. Informal assessment can be conducted by the learner, a peer, a group of learners or by the teacher. The teacher must conduct ALL the formal assessment and record the results on the official summative assessment form for promotion and moderation purposes.

The completed PAT must be submitted in time for final formal assessment to be done before the commencement of provincial moderation. **Once the PAT has been formally assessed, the teacher must retain the PAT for the purpose of external moderation.** All the PATs must also be retained at the school for the period of time as prescribed by the Provincial Departments of Education.

#### 3.2 Moderation

Moderation of the PAT can take place at any time during the development of the PAT and all completed stages of the PAT must therefore always be available. During a moderation process, the moderator will randomly select the PAT files/portfolios that will be moderated. To assist the process of the final provincial moderation, the teacher must supply the moderator with a completed mark sheet(s) and a merit list(s).

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

#### 3.3 Declaration of authenticity

Prior to the final submission of the PAT for formative assessment, the learners and teacher must complete the Declaration of Authenticity as laid out on the final page of this document.

#### NOTE:

**Only the official 2012 SUMMATIVE ASSESSMENT SHEET (page 21) and the completed DECLARATION OF AUTHENTICITY form (page 22) of this document must be included in the front of the learner's completed PAT file/portfolio.**

**SECTION B (Learner Tasks)****PRACTICAL ASSESSMENT TASK 1****A CIVIL DESIGN PROJECT**

**This PAT covers LO1, LO2, LO3 and LO4.**

**SCENARIO**

A sports club owns a facility, situated on a large piece of land, with a football pitch, two pavilions, which have been enclosed underneath, and a large, secure parking area. The facility is the pride of the community, but expensive to maintain.

However, during the initial construction of the facility, two conference rooms, which could be used to generate funding, were prepared under the western pavilion. Although many businesses and individuals have expressed an interest in hiring the conference rooms for functions or meetings, they could not be accommodated because there are no kitchen facilities. The sports club therefore decided to approach the South African National Lottery (LOTTO) to fund an **additional building** which must contain a **kitchen**, which will be able to serve the two conference rooms, and a **tuck shop**, which could be used during matches and functions. To comply with the rules set out by LOTTO, the plans for the proposed building have to be submitted for approval before any money would be released.

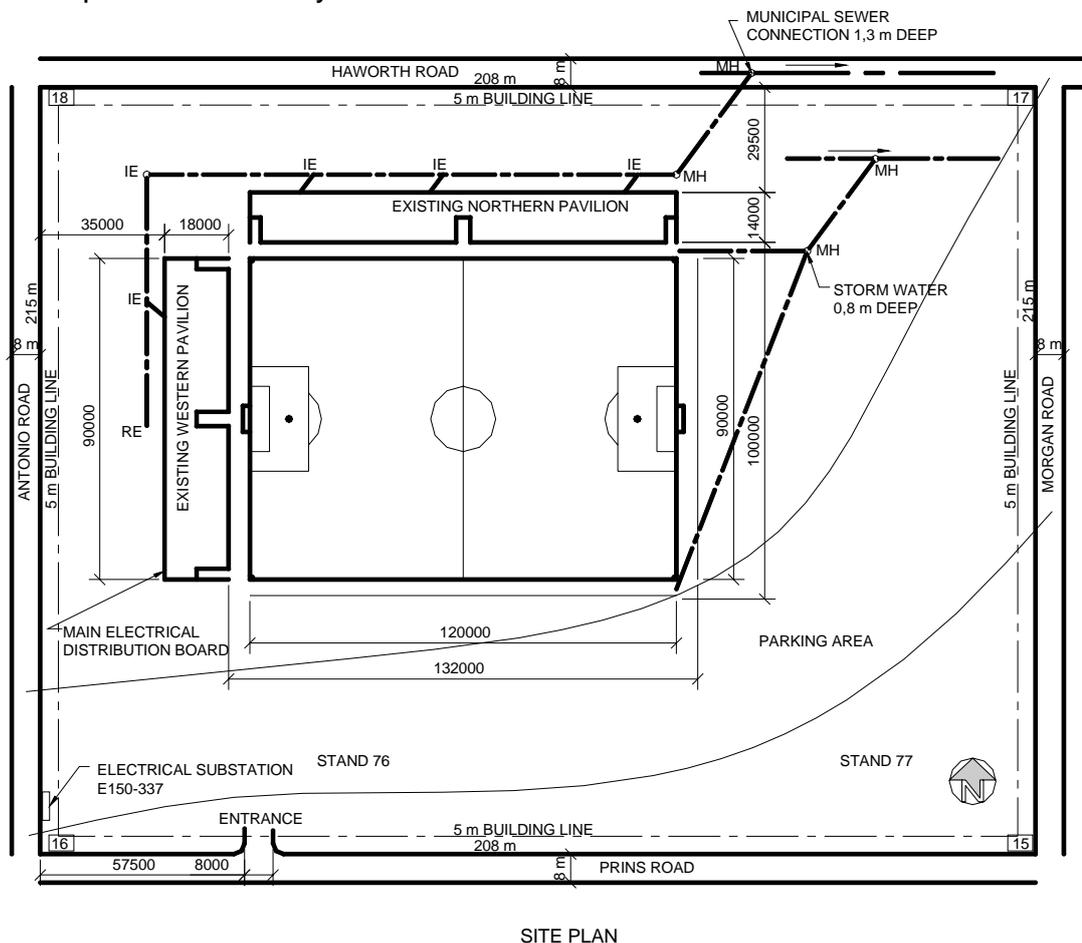
The development committee of the sports club has asked you to provide them with **ideas for the proposed building** and to **draw the plans**.

**Specifications of the existing facility:**

- A football pitch
- TWO pavilions, which have been enclosed underneath
- **Two conference rooms, which can accommodate 80 people each, under the western pavilion**
- Two change rooms under the northern pavilion
- Ladies and gents toilets under the northern pavilion
- A store room under the northern pavilion
- A large, secure parking area
- The site has a fall of 3 metres from northwest to southeast, as indicated by the contours on the site plan.

**Given:**

The incomplete site plan of the facility:



SITE PLAN

**Specifications for the proposed kitchen and tuck-shop building:**

Size of the kitchen and tuck shop:

- To reduce costs, the total area of the building may not exceed 120 m<sup>2</sup>.

Features of the kitchen and tuck shop:

- A kitchen large enough to service both conference rooms and the tuck shop simultaneously
- The kitchen must be separate, yet accessible, from the tuck shop.
- TWO change rooms for the people who will be working in the kitchen and the tuck shop. Each change room must have lockers, toilets and hand washbasins.
- Sufficient display and storage space in the tuck shop
- The kitchen must be equipped with the following:
  - Deep fryers
  - **Gas** stoves and ovens
  - **Gas** grillers/'braaiers'
  - A heat and smoke extraction system(s)
  - A walk-in fridge/cold room
  - A walk-in cupboard for all the groceries, crockery and cutlery
  - A separate storage area for all cleaning equipment and materials
  - Dishwashing facility
- Sufficient security

**Presentation requirements for the PAT:**

Create a PAT file/portfolio containing:

- A complete **cover page**
- An **index**
- The **2012 SUMMATIVE ASSESSMENT SHEET** (see page 21)
- The completed **DECLARATION OF AUTHENTICITY** (see page 22)

The following must be presented in the PAT file/portfolio after the DECLARATION:

1. A **design brief** with a comprehensive list of the **specifications** and **constraints**
2. **Relevant research**, showing proof of resource material, on the following:
  - Using gas and relevant gas equipment
  - Extraction systems
  - Quantity and suitability of the kitchen appliances required
  - Workflow diagrams, taking placement of equipment and appliances into consideration**NOTE:** There must be clear evidence that the research has been used.
3. Detailed self-explanatory **freehand drawings** of at least **THREE possible designs** for the proposed kitchen and tuck shop. The freehand drawings must **show dimensions, labels and notes**, as well as the **correct presentation** of ALL the **features**.
4. The process of **selecting a final solution(s)** that demonstrates a clear understanding of the design brief within the context of the specifications and constraints
5. The **minimum required presentation drawings**, as stipulated below in 5.1, 5.2 and 5.3, of the final solution(s)
6. Clear evidence of **continuous self-evaluation** during the development of the PAT
7. A **list** of ALL **reference material** used (**bibliography**)

Include the following on each page of each presentation requirement:

- Clear **numbering** in accordance with the numbers of all the presentation requirements
- The **learner's name**
- The **date of completion** and **submission**

5. The **minimum required presentation drawings** of the final solution(s):
- 5.1 A detailed **working drawing** of the proposed kitchen and tuck-shop building, clearly showing all the features. The drawing must show a **minimum of FOUR** orthographic views drawn to a suitable scale.  
The views must include:
- 5.1.1 A **floor plan**
  - 5.1.2 **TWO elevations**, showing the **front view** and a **side view**
  - 5.1.3 A **sectional elevation**
- The following must be included on all relevant views:**
- ALL kitchen and tuck-shop fixtures
  - ALL electrical fixtures and wiring detail
  - Extraction system(s)
  - Waste-water disposal systems (sewerage)
  - The production/workflow diagram
  - Dimensions
  - Scale(s)
  - Labels, notes and fixture codes
  - Cutting plane(s)
  - All hatching detail in accordance with the *SABS 0143 guidelines*
- 5.2 A detailed **site plan** drawn to a suitable scale.  
**The following must be included:**
- ALL new and existing structures
  - ALL services, sewerage and drainage connections
  - Electrical supply to the kitchen and tuck shop
  - Corner heights and contours
  - Driveways
  - Dimensions
  - Scale
  - Labels, notes and fixture codes
- NOTE:** The site plan may contain artistic features or it may be rendered.
- 5.3 A detailed **perspective drawing** showing the most descriptive interior view of the kitchen.  
**Evidence of the following must be included with the perspective drawing:**
- All necessary views
  - All necessary construction
  - Relevant labels and notes
- NOTE:** The perspective drawing may contain artistic features or it may be rendered.

All the drawings must be presented on appropriately sized drawing sheets, correctly set up with borders and **appropriate civil title panels**.

Untidy and messy work, as well as the late submission of the presentation requirements, will be penalised.

**NOTE:**

All drawings must comply with the guidelines contained in the *SABS 0143 Code of Practice for Building Drawings*.

## Drawing methods

The PAT must provide clear evidence that a high level of competency has been attained by the learner in **all three** of the following **drawing methods**:

- **Freehand drawing**: ALL preliminary design drawings and diagrams produced during the design process (3)
- **Instrument drawing(s)**: The site plan (5.2) and/or perspective drawing (5.3)
- **CAD (Computer-aided Drawing/Design)**: The working drawing (5.1). Either the site plan (5.2) or the perspective drawing (5.3) may also be drawn with CAD.

### NOTE:

**Schools that do not have CAD facilities must complete all the required presentation drawings (5.1, 5.2 and 5.3) as instrument drawings.**

## Assessment criteria

The following assessment tools will be used to assess the PAT:

1. The rubric in ANNEXURE A for assessing the **design process** and meeting **deadlines**. This mark will contribute **25 marks** to the final PAT mark.
2. The rubric in ANNEXURE B for assessing the **correctness** of the presentation drawings. This mark will contribute **50 marks** to the final PAT mark.
3. The rubric in ANNEXURE C for assessing drawing **presentation, drawing methods**, quality of **line work, printing** and **dimensioning**. This mark will contribute **25 marks** to the final PAT mark.

**PRACTICAL ASSESSMENT TASK 2****A MECHANICAL DESIGN PROJECT**

This PAT covers LO1, LO2, LO3 and LO4.

**SCENARIO**

You are a member of a team of industrial designers that are employed by a firm that specialises in providing mechanical and industrial design services on **mechanical parts** contained within **products** for the **DOMESTIC APPLIANCE INDUSTRY**.

The designers are tasked with investigating and analysing the design features of an existing product and to come up with new or improved ideas. The improvement(s) to the product could be one or more of the following:

- To improve efficiency
- To simplify its current design
- To make it lighter without compromising its strength
- To change its application

The project (PAT) consists of five stages:

- The first stage involves finding a suitable **product**, which must have **mechanical movement**, from the **DOMESTIC APPLIANCE INDUSTRY**. The product must be an assembly consisting of a **minimum** of **FOUR different** manufactured **parts**, e.g. can openers, bread slicers, corkscrews, coffee grinders, food processors, mincers, floor cleaners/mops with self-rinsing mechanisms, biltong carvers, hand-driven vacuum cleaners, etc.

**NOTE:**

- A new product may not be purchased and must therefore be something that is **already available** to the learner!
  - Your **teacher** must **approve** the **product** you intend to use for the project (PAT) in order to ensure that it **complies** with all the requirements and that it is of an **appropriate higher order Grade 12 complexity**.
  - **The product must be submitted as part of the PAT presentation.**
- The second stage involves the **dismantling** of the product so that **all the parts** can be **revealed, investigated** and **measured**.
  - The third stage involves identifying **ONE** of the **main components** or **combination of components** of the product which can be **improved, modified** or **redesigned** in some way. This will necessitate the applications of the following **design process** requirements:
    - The formulation of a **comprehensive design brief** that must give a detailed explanation of the function and design features of the product, as well as the problem/idea and the proposed alteration(s) to the design
    - A comprehensive list of **specifications** and **constraints** as part of the design brief
    - Thorough **research** in terms of all the materials used, the specific design features and/or the function (purpose) of each individual part of the product as well as **THREE** other products that have the same function, but that differ in terms of design

- Detailed self-explanatory **freehand drawings** of at least **THREE** different possible improvements, modifications or redesigns of the identified component(s)
- The fourth stage requires producing an **assembly drawing** of the mechanical product in its current design.
- The final stage involves producing a **detailed drawing** of the proposed improvement, modification or redesign of the identified component(s).

### Specifications of the mechanical product:

- The product must be an assembly or sub-assembly consisting of a **minimum** of **FOUR** different manufactured **parts**.
- The product must have **mechanical movement**.

#### NOTE:

- **Your teacher must approve the product you intend to use for the project (PAT) in order to ensure that it complies with all the requirements and that it is of an appropriate higher order Grade 12 complexity.**
- **The product must be submitted as part of the PAT presentation.**

### Presentation requirements for the PAT:

Create a PAT file/portfolio containing:

- A complete **cover page**
- An **index**
- The **2012 SUMMATIVE ASSESSMENT SHEET** (see page 21)
- The completed **DECLARATION OF AUTHENTICITY** (see page 22)

The following must be presented in the PAT file/portfolio after the DECLARATION:

1. A **design brief** with a comprehensive list of the **specifications** and **constraints**
  2. **Relevant research**, showing proof of resource material, on the following:
    - All the materials that are used for the parts of the product
    - Specific design features and/or function (purpose) of each individual part of the product
    - **THREE** other products that have the same function, but that differ in terms of design
- NOTE:** There must be clear evidence that the research has been used.
3. Detailed **freehand drawings** of at least **THREE possible improvements, modifications or redesigns**. The freehand drawings must **show dimensions, labels and notes**, as well as the **correct presentation** of ALL the **features**.
  4. The process of **selecting a final solution(s)** that demonstrates a clear understanding of the design brief within the context of the specifications and constraints
  5. The **minimum required presentation drawings**, as stipulated below in 5.1, 5.2 and 5.3, of the product and the final solution(s)
  6. Clear evidence of **continuous self-evaluation** during the development of the PAT
  7. A **list** of ALL **reference material** used (**bibliography**)

Include the following on each page of each presentation requirement:

- Clear **numbering** in accordance with the numbers of all the presentation requirements
- The **learner's name**
- The **date of completion** and **submission**

5. The **minimum required presentation drawings** of the product and final solution(s):
- 5.1 A detailed **assembly drawing** showing all the parts of the product before any improvements, modifications or redesigns. The drawing must show a **minimum of FOUR appropriate** orthographic views drawn to a suitable scale.  
The views must include:
- 5.1.1 The **front view**
  - 5.1.2 A **second primary (main) view**
  - 5.1.3 Any **TWO** other **secondary views**
- NOTE: At least ONE of the primary views must be sectioned.**  
**The following must be included:**
- Dimensions
  - Scale
  - Labels and notes
  - Cutting plane(s)
  - All hatching detail
- 5.2 A **detailed drawing** of the selected improvement, modification or redesign of the main component or combination of components. The drawing must show a **minimum of THREE appropriate** orthographic views drawn to a suitable scale.  
**NOTE:**
- **One of the views must be the front view.**
  - **At least ONE of the views must be sectioned or contain sections.**
- The following must be included:**
- A comprehensive list of explanatory labels and notes
  - Relevant welding and/or machining symbols
  - Dimensions
  - Scale
  - Cutting plane(s)
  - All hatching detail
- 5.3 A detailed **isometric drawing** of a combination of the improved, modified or redesigned components of the product, drawn to a suitable scale.  
**NOTE: The drawing must be of an appropriate higher order Grade 12 complexity.**  
**The following must be included:**
- All necessary construction
  - Relevant labels and notes
- NOTE: The isometric drawing may contain artistic features and/or it may be rendered.**

All the drawings must be presented on appropriately sized drawing sheets, correctly set up with borders and **appropriate mechanical title blocks**.

Untidy and messy work, as well as the late submission of the presentation requirements, will be penalised.

**NOTE:**

All drawing must comply with the guidelines contained in the *SABS 0111 Code of Practice for Engineering Drawings*.

## Drawing methods

The PAT must provide clear evidence that a high level of competency has been attained by the learner in **all three** of the following **drawing methods**:

- **Freehand drawing:** ALL preliminary design drawings and diagrams produced during the design process (3)
- **Instrument drawing(s):** The detailed drawing (5.2) and/or isometric drawing (5.3)
- **CAD (Computer-aided Drawing/Design):** The assembly drawing (5.1). Either the detailed drawing (5.2) or the isometric drawing (5.3) may also be drawn with CAD.

### NOTE:

**Schools that do not have CAD facilities must complete all the required presentation drawings (5.1, 5.2 and 5.3) as instrument drawings.**

## Assessment criteria

The following assessment tools will be used to assess the PAT:

1. The rubric in ANNEXURE A for assessing the **design process** and meeting **deadlines**. This mark will contribute **25 marks** to the final PAT mark.
2. The rubric in ANNEXURE B for assessing the **correctness** of the presentation drawings. This mark will contribute **50 marks** to the final PAT mark.
3. The rubric in ANNEXURE C for assessing drawing **presentation, drawing methods, quality of line work, printing and dimensioning**. This mark will contribute **25 marks** to the final PAT mark.

**A SIMPLIFIED RUBRIC FOR THE ALLOCATION OF MARKS**

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

**ANNEXURE A**

**RUBRIC FOR ASSESSING THE DESIGN PROCESS**

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%
1. A <b>design brief</b> demonstrating a clear understanding of the scenario with a list of the <b>specifications</b> and <b>constraints</b>	The <b>design brief</b> with a <b>comprehensive</b> list of the <b>specifications</b> and the <b>constraints</b> demonstrating an <b>in-depth</b> and <b>comprehensive</b> understanding of the scenario	The <b>design brief</b> with a <b>complete</b> or <b>incomplete</b> list of the <b>specifications</b> and the <b>constraints</b> demonstrating a <b>satisfactory</b> understanding of the scenario			The <b>design brief</b> with the possibility of an incomplete list of the <b>specifications</b> and/or the <b>constraints</b> demonstrating an <b>elementary</b> understanding of the scenario			A <b>design brief</b> with either a very vague or no list of <b>specifications</b> and/or <b>constraints</b> demonstrating <b>little</b> or <b>no</b> understanding of the scenario			
2. Evidence of <b>relevant 'external' research</b>	Shows evidence of <b>in-depth</b> and <b>thorough relevant 'external' research</b> that is used within the <b>final solution</b>			Shows evidence of <b>satisfactory relevant 'external' research</b> of which <b>some</b> is used within the <b>final solution</b>			Shows evidence of <b>limited research</b> of which <b>little to none</b> is used within the <b>final solution</b>			Shows <b>very little</b> evidence of any <b>research</b> or research that is <b>inappropriate</b>	
3. A record of at least <b>THREE</b> possible <b>detailed freehand drawing solutions</b>	A <b>wide range</b> of <b>possible solutions</b> , which are clearly, logically and comprehensively presented with <b>dimensions</b> and <b>notes</b> with <b>ALL</b> the <b>features presented correctly</b>			A <b>satisfactory</b> number of <b>possible solutions</b> , which are clearly recorded and presented with <b>dimensions</b> and <b>notes</b> with most <b>features presented correctly</b>			A <b>limited number</b> of <b>possible solutions</b> , which are recorded and presented with no <b>dimensions</b> and <b>notes</b> with only some <b>features presented correctly</b>			Shows <b>little to no</b> possible solutions	
4. <b>Selecting a final solution</b> that demonstrates a clear <b>understanding</b> of the <b>design brief</b> (correctness/functionality /practicality of design)	A <b>thorough selection process</b> and a <b>final solution</b> that demonstrates a clear <b>in-depth</b> and <b>comprehensive</b> understanding of the <b>design brief</b>			A <b>substantial selection process</b> and a <b>final solution</b> that demonstrates a <b>satisfactory</b> understanding of the <b>design brief</b>			An <b>incomplete</b> or <b>no selection process</b> and a <b>final solution</b> that demonstrates a <b>limited</b> understanding of the <b>design brief</b>			<b>No selection process</b> and a <b>final solution</b> that demonstrates <b>little to no</b> understanding of the <b>design brief</b>	
6. Clear evidence of continuous <b>self-evaluation</b> and the <b>meeting of deadlines</b> of all the requirements of the PAT	Clear evidence of continuous <b>comprehensive self-evaluation</b> of all the requirements of the PAT and all the requirements were <b>handed in</b> on the <b>due dates</b>			Evidence of <b>satisfactory self-evaluation</b> of most of the requirements of the PAT and most of the requirements were <b>handed in</b> by the <b>extension date</b>			Evidence of <b>limited self-evaluation</b> of some of the requirements of the PAT and <b>few</b> deadlines were <b>met</b> . <b>Extension dates were missed</b> but <b>most stages</b> were <b>handed in</b> .			<b>Little</b> or <b>no</b> evidence of any <b>self-evaluation</b> shown and <b>none</b> of the <b>deadlines</b> were met	
7. The <b>presentation</b> of the <b>complete PAT file/portfolio</b> with the inclusion of a <b>bibliography</b>	<b>All</b> the <b>required presentations</b> of the PAT are <b>complete</b> and <b>neatly presented</b> in a <b>logical</b> and <b>orderly sequence</b> in the <b>PAT file/portfolio</b> that also contains a <b>comprehensive bibliography</b>			<b>Most</b> of the <b>required presentations</b> of the PAT are <b>complete</b> and <b>neatly presented</b> in an <b>orderly sequence</b> in the <b>PAT file/portfolio</b> that also contains a <b>satisfactory bibliography</b>			<b>Some</b> of the <b>required presentations</b> of the PAT are <b>complete</b> and <b>presented</b> in a <b>PAT file/portfolio</b> that contains a <b>limited bibliography</b>			<b>Very few</b> of the <b>required presentations</b> are <b>complete</b> and poorly <b>presented</b> in the <b>PAT file/portfolio</b> that contains a <b>little to no bibliography</b>	

**ANNEXURE B**

**RUBRIC FOR ASSESSING CORRECTNESS OF THE PRESENTATION DRAWING**

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%
All drawing sheets are appropriately set up with a <b>border</b> and a <b>appropriate title block/panel</b> .		All drawing sheets are appropriately set up with <b>more than the minimum requirements</b> .			Most of the drawing sheets are appropriately set up <b>with the minimum requirements</b> .			Only <b>some</b> of the drawing sheets are set up <b>with less than the minimum requirements</b> .		Little or no page set up is evident.		
Orthographic drawings	PAT 1: Assess each view's 'design' and correctness of the presentation according to the specifications and constraint, the stipulated requirements and EGD drawing principals PAT 2: Assess each view's accurate reflection of the product and the correctness of the presentation according to the stipulated requirements and EGD drawing principals											
	5.1	5.1.1	View 1 PAT 1: Plan PAT 2: Front view	The view meets the <b>minimum requirements</b> and has <b>no/a few errors</b> .	The view meets most of the <b>minimum requirements</b> but contains <b>some errors</b> .	The view contains <b>less than the minimum requirements</b> and contains <b>many errors</b> .	Little or no evidence of the required view					
		5.1.2	View 2 PAT 1: Section PAT 2: 2 <sup>nd</sup> main view	The view meets the <b>minimum requirements</b> and has <b>no/a few errors</b> .	The view meets most of the <b>minimum requirements</b> but contains <b>some errors</b> .	The view contains <b>less than the minimum requirements</b> and contains <b>many errors</b> .	Little or no evidence of the required view					
		5.1.3	View 3 PAT 1: 2 elevations PAT 2: 2 secondary views	The views meet the <b>minimum requirements</b> and have <b>no/a few errors</b> .	The views meet most of the <b>minimum requirements</b> but contain <b>some errors</b> .	The views contain <b>less than the minimum requirements</b> and contain <b>many errors</b> .	Little or no evidence of the required view					
	5.2	PAT 1 and PAT 2: Assess each view's 'design' and correctness of the presentation according to the specifications and constraints, the stipulated requirements and EGD drawing principals.										
		PAT 1: Site plan PAT 2: Detailed drawing	The site plan/detailed drawing meets the <b>minimum requirements</b> and has <b>no/a few errors</b> .	The site plan/detailed drawing meets the <b>minimum requirements</b> but contains <b>some errors</b> .	The site plan/detailed drawing contains <b>less than the minimum requirements</b> and contains <b>many errors</b> .	Little or no evidence of required views						
Pictorial drawing	5.3	The <b>correct drawing method</b> and <b>presentation</b> PAT 1: 2-point perspective PAT 2: Isometric	<b>Thorough</b> knowledge of the correct pictorial <b>drawing method</b> and the answer meets the requirements and reflects the <b>correct size and proportion</b> of all the features and has <b>no/a few errors</b> and the presentation is very good/ <b>outstanding</b> .	<b>Satisfactory</b> knowledge of the correct pictorial <b>drawing method</b> and the answer meets the requirements and reflects the <b>correct size and proportion</b> of most of the features but contains <b>some errors</b> and the <b>presentation is satisfactory</b> .	<b>Some</b> knowledge of the pictorial <b>drawing method</b> is shown, but the answer reflects poor or incorrect <b>size and proportion</b> and many of the features contain <b>many errors</b> and the <b>presentation is poor</b> .	Little or no evidence of required drawings						

**ANNEXURE C**

**RUBRIC FOR ASSESSING DRAWING METHOD, 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	TECHNIQUE	The drawings display good <b>proportion</b> and <b>size</b> .	The features show <b>outstanding proportion</b> and <b>size</b> .			The features show <b>satisfactory proportion</b> and <b>size</b> .			The features show <b>poor proportion</b> and <b>size</b> .			The features show <b>very little or no proportion</b> .	
		Final drawing presentation is <b>neat</b> and there is consistency of <b>line work/line quality</b> and <b>printing</b> .	Drawings are <b>very neat</b> and all line work/line quality, printing and dimensioning are <b>outstanding</b> and <b>consistent</b> .			Drawings are <b>neat</b> and line work/line quality, printing and dimensioning are <b>generally good</b> and <b>mostly consistent</b> .			Drawings are <b>untidy</b> with <b>inconsistent</b> line work/line quality, printing and dimensioning.			The line work/line quality, printing and dimensioning are <b>unacceptable</b> .	
Instrument drawing	TECHNIQUE	The drawings display the <b>correct use</b> of <b>drawing instruments, drawing methods and techniques</b> .	The drawings display the correct use of drawing <b>instruments</b> and an <b>outstanding</b> application of <b>drawing methods and techniques</b> .			The drawings display the correct use of drawing <b>instruments</b> and a <b>satisfactory</b> and <b>mostly correct</b> application of <b>drawing methods and techniques</b> .			The drawings display the correct use of drawing <b>instruments</b> and a <b>poor</b> and <b>often incorrect</b> application of <b>drawing methods and techniques</b> .			The drawings display an incorrect use of drawing <b>instruments</b> with <b>incorrect</b> applications of <b>drawing methods and techniques</b> .	
		The final drawing presentation is <b>neat</b> and there is consistency of <b>line work/line quality</b> and <b>printing</b> .	Drawings are <b>very neat</b> and all line work/line quality, printing and dimensioning are <b>outstanding</b> and <b>consistent</b> .			Drawings are <b>very neat</b> and the line work/line quality, printing and dimensioning are <b>generally good</b> and <b>mostly consistent</b> .			Drawings are <b>untidy</b> and the line work/line quality, printing and dimensioning are <b>inconsistent</b> .			The line work/line quality, printing and dimensioning are <b>unacceptable</b> .	
CAD drawing	<b>(ANNEXURE D) RUBRIC FOR ASSESSING CAD DRAWING SKILLS, KNOWLEDGE AND ABILITY</b>												
	TECHNIQUE	The <b>level of competence</b> displayed in <b>using</b> a <b>CAD system</b>	Displays a <b>high level</b> of skills, knowledge and ability in using a <b>CAD system</b>			Displays a <b>satisfactory level</b> of skills, knowledge and ability in using a <b>CAD system</b>			Displays a <b>poor level</b> of skills, knowledge and ability in using a <b>CAD system</b>			Shows <b>little to no skills, knowledge or ability</b> in using a <b>CAD system</b>	
	The <b>layout and correctness</b> of the final drawing presentation	100%–80%	79%–70%	69%–60%	59%–50%	49%–40%	39%–30%	29%–0%					

**ANNEXURE D****RUBRIC FOR ASSESSING CAD DRAWING SKILLS, KNOWLEDGE AND ABILITY**

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%	
Set up a drawing interface	Is able to set up a drawing interface without any assistance, displaying a high level of skills, knowledge and ability			Is able to set up a drawing interface with a little assistance, displaying a satisfactory level of skills, knowledge and ability			Is able to set up a drawing interface with some assistance displaying a lack of skills, knowledge and ability		Shows little to no understanding of setting up a drawing interface			
Set up a 2-D/3-D drawing environment	Is able to set up a 2-D/3-D drawing environment without any assistance, displaying a high level of skills, knowledge and ability			Is able to set up a 2-D/3-D drawing environment with a little assistance, displaying a satisfactory level of skills, knowledge and ability			Is able to set up a 2-D/3-D drawing environment with some assistance, displaying a lack of skills, knowledge and ability		Shows little to no understanding of setting up a 2-D/3-D drawing environment			
Set up layers with properties assigned to each layer	Is able to set up layers and assign properties to each layer without any assistance displaying a high level of skills, knowledge and ability			Is able to set up layers and assign properties to each layer with a little assistance, displaying a satisfactory level of skills, knowledge and ability			Is able to set up layers and assign properties to each layer with some assistance, displaying a lack of skills, knowledge and ability		Shows little to no ability to set up layers and assign properties to each layer			
Set up a drawing sheet with a border and a title block	Is able to set up a drawing sheet with a border and a title block without any assistance, displaying a high level of skills, knowledge and ability			Is able to set up a drawing sheet with a border and a title block with some assistance, displaying a satisfactory level of skills, knowledge and ability			Is able to set up a drawing sheet with a border and a title block with some assistance, displaying a lack of skills, knowledge and ability		Shows little to no ability to set up a drawing sheet with a border and a title block			
Show evidence of the correct use of the drawing tools	Thorough and detailed evidence is shown of using the drawing tools correctly.			Satisfactory evidence is shown of using the drawing tools correctly.			Limited evidence is shown of using the drawing tools correctly.		Little to no evidence is shown of using the drawing tools correctly.			
Show ability to save and retrieve work	Is able to save and retrieve work without any assistance, displaying a high level of skills, knowledge and ability			Is able to save and retrieve work with a little assistance, displaying a satisfactory level of skills, knowledge and ability			Is able to save and retrieve work with some assistance, displaying a lack of skills, knowledge and ability		Shows little to no ability to save/retrieve work			
Show ability to plot a drawing	Is able to plot a drawing without any assistance, displaying a high level of skills, knowledge and ability			Is able to plot a drawing with a little assistance, displaying a satisfactory level of skills, knowledge and ability			Is able to plot a drawing with some assistance, displaying a lack of skills, knowledge and ability		Shows little to no ability to plot work			
The <b>layout</b> and <b>correctness</b> of the final <b>drawing presentation</b>	100%–80%		79%–70%		69%–60%		59%–50%		49%–40%		39%–30%	29%–0%

## PRACTICAL ASSESSMENT TASK 2012 SUMMATIVE ASSESSMENT SHEET

SCHOOL: .....

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

EXAMINATION NUMBER: .....

PART A: Design Process		PART B: Presentation Drawings				Drawing competency and skill		
CRITERIA		CRITERIA		CRITERIA		MARK		
ANNEXURE A	1	A <b>design brief</b> with a comprehensive list of the <b>specifications</b> and <b>constraints</b> demonstrating a <b>clear understanding</b> of the <b>scenario</b>		All drawing sheets are appropriately set up with a <b>border</b> and a <b>appropriate title block/panel</b> .		Freehand drawings ANNEXURE C	METHOD	The drawings display good <b>proportion</b> and <b>size</b> .
	2	Evidence of <b>relevant 'external' research</b>		Orthographic drawing ANNEXURE B	View 1		The final drawing presentation is <b>neat</b> and there is consistency of <b>line work/line quality, printing</b> and <b>dimensioning</b> .	
	3	A record of at least <b>THREE possible detailed freehand drawing solutions</b>		Assess the following: PAT 1: The design and correctness PAT 2: The accuracy and correctness	5.1.1	PAT 1: <b>Plan</b> PAT 2: <b>Front view</b>		
	4	<b>Selecting a final solution</b> that demonstrates a <b>clear understanding</b> of the <b>design brief</b>			5.1.2	PAT 1: <b>Section</b> PAT 2: <b>2<sup>nd</sup> main view</b>		
	6	Clear evidence of continuous <b>self-evaluation</b> and the <b>meeting of deadlines</b> of <b>all the requirements</b> of the <b>PAT</b>			5.1.3	PAT 1: <b>2 elevations</b> PAT 2: <b>2 secondary views</b>		
	7	The <b>presentation</b> of the <b>complete PAT portfolio</b> with the inclusion of a <b>bibliography</b>		5.2	PAT 1: <b>Site plan</b> PAT 2: <b>Detailed drawing</b>	Instrument drawings ANNEXURE C	METHOD	The drawings display the <b>correct use of drawing instruments, drawing methods</b> and <b>techniques</b> .
	Criteria Total		Criteria Total		Criteria Total		CAD drawings ANNEXURE D	METHOD
CALCULATION		CALCULATION		CALCULATION		The final drawing presentation is <b>neat</b> and there is consistency of <b>line work/line quality, printing</b> and <b>dimensioning</b> .		
Teacher's TOTAL		Teacher's TOTAL		Teacher's TOTAL		The layout and <b>correctness</b> of the final drawing presentation		
TOTAL: A / 25		TOTAL: B / 50		TOTAL: C / 25		TOTAL without CAD		
Moderated TOTAL		Moderated TOTAL		Moderated TOTAL		TOTAL with CAD		
TOTAL: A / 25		TOTAL: B / 50		TOTAL: C / 25		CALCULATION without CAD		
TOTAL: A / 25		TOTAL: B / 50		TOTAL: C / 25		CALCULATION with CAD		
TOTAL: A / 25		TOTAL: B / 50		TOTAL: C / 25		Teacher's TOTAL		
TOTAL: A / 25		TOTAL: B / 50		TOTAL: C / 25		TOTAL: C / 25		
TOTAL: A / 25		TOTAL: B / 50		TOTAL: C / 25		Moderated TOTAL		
TOTAL: A / 25		TOTAL: B / 50		TOTAL: C / 25		TOTAL: C / 25		
TEACHER'S TOTAL:		A + B + C =		/ 100		ASSESSOR: Initial		
MODERATED TOTAL:		A + B + C =		/ 100		MODERATOR: Initial		

## DECLARATION OF AUTHENTICITY

To be submitted with each learner's Practical Assessment Task portfolio

NAME OF SCHOOL: .....

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

EXAMINATION NUMBER: .....

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

\_\_\_\_\_  
SIGNATURE OF CANDIDATE

\_\_\_ / \_\_\_ / 2012  
DATE (DD/MM/YY)

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

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

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

\_\_\_ / \_\_\_ / 2012  
DATE (DD/MM/YY)

