



**education**

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Department:  
Education  
**REPUBLIC OF SOUTH AFRICA**

# **ENGINEERING GRAPHICS AND DESIGN**

## **GUIDELINES FOR PRACTICAL ASSESSMENT TASKS**

**2009**

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## **PAT 2009 FORMATIVE ASSESSMENT**

### **INTRODUCTION**

The seventeen National Curriculum Statement subjects which contain a practical component all include a Practical Assessment Task (PAT), i.e. a Practical or Performance Assessment Task. 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 the subject. In the two Art subjects Design and Visual Arts, the PAT counts 37, 5% (i.e. 150 marks) of the total promotion/certification mark out of 400 for the subject.

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 provides guidelines to teachers and SECTION B should be given to learners at the beginning of the year.

## SECTION A (Teacher Guidelines)

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

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 LO 2 in the National Curriculum Statement. The learner is given an opportunity to complete the PAT in an environment which is more relaxed than a formal examination setting and which is more conducive to the creative processes. This environment should provide the learner with easier access to, and a wider variety of, resource material than in a formal examination.

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

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

Part I: The Design Process

Part II: Presentation drawings

Part I of both PAT 1 and PAT 2 focuses on LO 2, with integration of LO 1, 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
- Develop lists of specifications and constraints
- Conduct relevant external research and generate a number of ideas/concepts/solutions analytically and graphically
- Develop the preferred solution that meets the specifications and constraints of the design brief
- Provide clear evidence that each stage of the design process was evaluated

Part II of both PAT 1 and PAT 2 focuses on LO 3 and LO 4 and requires that the learner demonstrates and provides evidence that a high level of competency and skill has been attained in all the required drawing methods:

- Freehand drawing
- Instrument drawing, and
- Using a CAD (Computer-Aided Design) system in presenting a comprehensive working drawing of the preferred solution.

Should time and the facilities at the school permit, the learner may make a model of the solution for presentation with the PAT.

**NOTE:**

**As CAD is a compulsory component of Engineering Graphics and Design, all schools that offer the subject must ensure that they acquire the necessary computer hardware and software. Where schools do not have CAD facilities, all CAD work must be completed using instruments.**

Two Performance Assessment Tasks (PATs) are included in this document.

- PAT 1 is a design task focusing on LO 2 (The Design Process) in the context of a civil drawing containing electrical features.
- PAT 2 is a design task focusing on LO 2 (The Design Process) in the context of a mechanical drawing.

Each learner should, with the guidance of the teacher, select which ONE of the two tasks to complete. The learner may however complete both the tasks but only ONE must be submitted for final formal assessment and promotion purposes.

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

**Elements that make up the PAT mark**

1. The **design process** and the meeting of **deadlines** will contribute **25 marks** to the final PAT mark.
2. The **correctness** of the presentation drawings will contribute **50 marks** to the final PAT mark.
3. The drawing **presentation, drawing methods, quality of line work, printing and dimensioning** will contribute **25 marks** to the final PAT mark.

ELEMENTS OF THE PRACTICAL ASSESSMENT TASK MARK	
ELEMENT	MARKS
The <b>design process</b> and meeting of <b>deadlines</b> .	<b>25</b>
The <b>correctness</b> of the presentation drawings.	<b>50</b>
The drawing <b>presentation, drawing methods, quality of line work, printing and dimensioning</b> .	<b>25</b>
<b>TOTAL</b>	<b>100</b>

**2. Administration of the PAT**

At the beginning of the year teachers must ensure that every Grade 12 learner receives a copy of the complete SECTION B (PAT 1 and PAT 2) of the PAT document together with all the assessment criteria annexures, the 2009 formative assessment form and the declaration of authenticity form.

The selected Grade 12 PAT should be completed during the first three terms. However, the completed PAT (part I and part II) must be submitted in time for formative assessment to be done before the commencement of provincial moderation.

It is therefore essential that teachers should draw up a ***pace setter*** for the learners at the beginning of the year and attach target dates for the completion of the different stages of the PAT. In this manner learners can assess their progress and the teachers can set-up an intervention programme should they see that the learners are falling behind with their work.

**The PAT must be completed at school under controlled conditions with guidance and supervision from the teacher who must observe the learners' progress at all times. All the completed stages 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 the responsibility of the teacher to administer assessment and record progress in instances where formal assessment is required.

#### 3.1 Assessment

Frequent developmental feedback is needed to guide and give support to the learner to ensure that the 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 should always conduct the formal assessment and the results must be recorded on the official formative assessment form for promotion and moderation purposes.

The completed PAT must be submitted in time for final formative 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 externally moderated. All the PATs must also be retained at the school for the period of time as subscribed by the department of education.

#### 3.2 Moderation

Moderation of the PAT can take place at any time throughout 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, the teacher must supply the moderator with a completed mark sheet(s) and a merit list(s).

During the moderation process of the PAT, learners may also be called upon by the moderator 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.

**Only the official PAT 2009 *FORMATIVE ASSESSMENT* form (page 18) and the completed DECLARATION OF AUTHENTICITY form (page 19) of this document must be included in the front of the learner's PAT file / portfolio.**

**SECTION B (The Learner Tasks)****Practical Assessment Task 1**  
***A Civil Design Project***

**This PAT covers LO 1, LO 2, LO 3 and LO 4.**

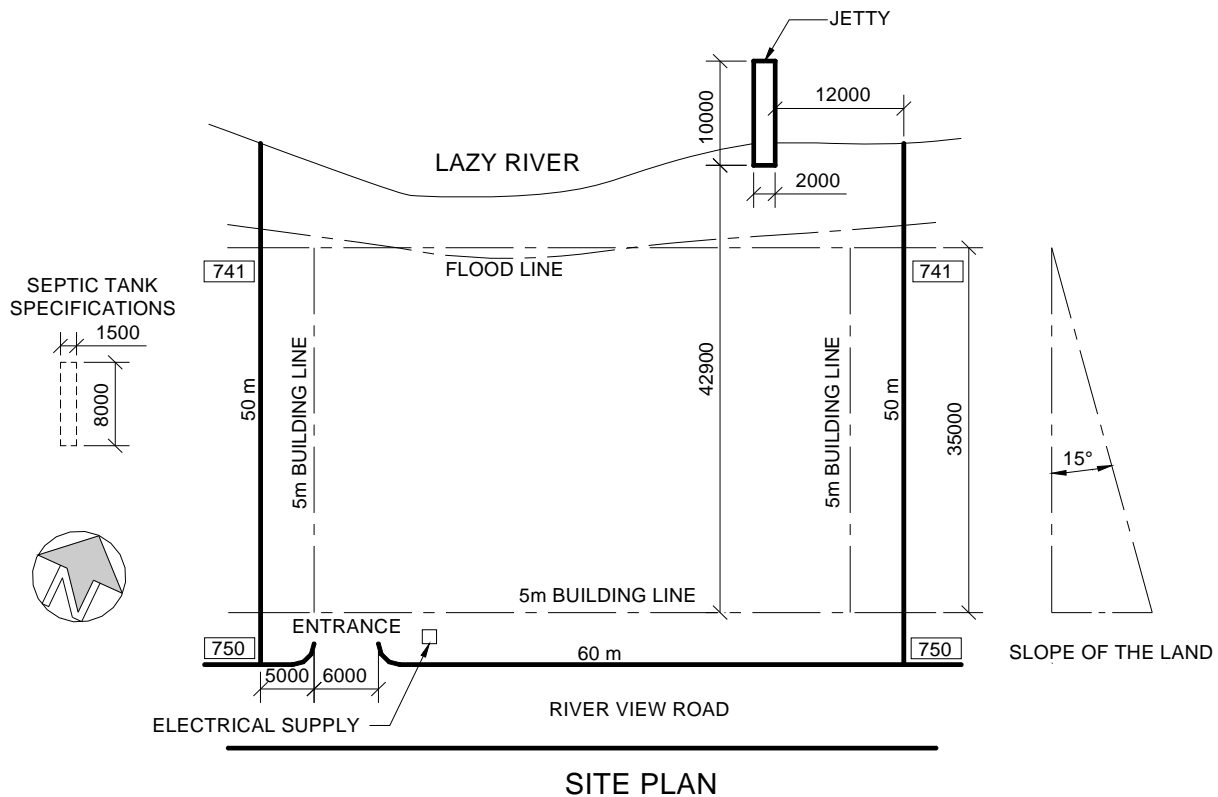
**Scenario**

The council of a small town on a popular tourist route in South Africa prides itself on the success it has had over the past few years in eradicating all alien plants and restoring the natural and indigenous vegetation to the area. The clean, crystal clear rivers have become popular for its fresh-water fishing and the wide variety of bird life attracts many visitors to the town. Most of the year experiences pleasant weather and spectacular sunsets. The area is also well known for its large plantations that provide wood for the building industry at very affordable prices.

The municipality has identified a plot of land that it intends to develop as a resort with five identical, affordable holiday cottages, with each cottage sleeping a maximum of six people. These cottages will also help to accommodate the influx of tourists that provide valuable income and job opportunities to the residents of the town.

The plot is on a piece of land that slopes gently towards a river. There is no infrastructure for sewerage removal so the resort must make use of a septic tank for the disposal of waste water.

The municipality has called for the submission of designs for the five similar cottages and the lay-out of the plot. Each submission must include an appropriate name for the resort.



### Specifications for each cottage:

Size of each cottage:

- The floor area of the cottage must be between 45 m<sup>2</sup> and 50 m<sup>2</sup>.

Features:

- An open-plan living and kitchen area. The kitchen must contain a sink, stove, refrigerator and sufficient kitchen units.
- 1 bathroom with a shower, wash basin and a WC.
- 1 bedroom with built-in cupboards. (To sleep maximum 6 persons)
- A timber deck (large porch) must be constructed for each cottage.

Window frames and door frames:

- All window and door frames must be of timber.
- Internal doors must be hollow core.
- A timber framed external sliding door onto the deck.

Roof:

- Pitched roof.
- Gutters and rainwater down-pipes

**Presentation requirements:**

Create a PAT file / portfolio containing:

- A complete cover page
- An index
- The PAT 2009 *FORMATIVE ASSESSMENT* form ( Page 18 of this document)
- The completed *DECLARATION OF AUTHENTICITY* (Page 19 of this document)

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

1. A design brief.
2. A list of the specifications and constraints.
3. Research showing proof of resource material.
4. Detailed freehand drawings used during the design process.
5. The **minimum** drawing requirements as stipulated below.
6. Clear evidence of continuous evaluation of all the stages.
7. A list of all reference material used (Bibliography).

**Include the following on each required presentation:**

- Clear numbering in accordance with the numbers of the presentation and minimum drawing requirements of the PAT.
- The date of completion and submission.

NOTE: A scale model may be submitted, time and facilities at school permitting.

**Minimum drawing requirements:**

8. A **layout drawing** (working drawing) of **ONE** cottage only, showing a **minimum** of **four** orthographic views drawn to a suitable scale. The views must include:
  - 8.1 A **floor plan** clearly showing the positions of the windows, doors, fixtures and all the electrical components.
  - 8.2 **Elevations** showing the **front view** and a **side view** of the cottage.
  - 8.3 A **sectional elevation** of the foundation to the roof.

**The following should be included on the views of the layout drawing:**

- Dimensions
  - Scale(s)
  - Labels, notes and fixture codes
  - Cutting plane(s)
  - All hatching detail (colour should be used in accordance with standard drawing practice)
9. A **detailed drawing** at a suitable scale of either:
    - a) The timber deck detail; or
    - b) The wooden sliding door and roofing detail.**The following should be included on the detail drawing:**
    - Dimensions
    - Scale
    - Labels and notes
    - Hatching detail

10. A **site plan** drawn to a suitable scale.

**The following must be shown on the site plan:**

- The position of all five cottages
- A parking area
- Access roads and walkways
- Sewerage connections and the septic tank
- Electrical supply to the cottages

11. A scale **2-point perspective** drawing of ONE cottage only, with the wooden deck clearly visible.

**Evidence of the following should be included with the perspective drawing:**

- All necessary constructions
- All necessary views
- Relevant labels and notes

Note: The perspective drawing may contain artistic features and be rendered.

All the drawings must be presented on appropriately sized drawing sheets, correctly set-up with borders, name blocks and title strips.

Penalties will be accrued for untidy and messy work as well as for the late submission of the PAT.

**NOTE:** All drawing must comply with the guidelines contained in the *SANS 0143 Code of Practice for Building Drawing*.

## 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 drawings and diagrams produced during the design process.
- **CAD (Computer-Aided Design) drawing:** All layout drawings (working drawings) and the site plan. Either the detailed drawing(s) or the 2-point perspective drawing may also be drawn with CAD.
- **Instrument drawing:** The detailed drawing and/or the 2-point perspective drawing.

Schools that do not have CAD facilities must use instruments.

**Assessment Criteria**

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

1. The rubric displayed 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 displayed 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 displayed 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 LO 1, LO 2, LO 3 and LO 4.**

#### **Scenario**

A local company that collects waste products has developed a non-hazardous liquid that when combined with combustible waste products, improve their burning properties. The mixture of the waste and liquid produces a thick compound that when compressed into briquettes and dried, produces high heat with low CO emissions.

The company does not have the capacity to manufacture the briquettes and has offered to supply the compound to the community at cost price as a business opportunity to be managed by the community development forum.

The company has commissioned you to design a briquette-making machine to supply to the development forum for the manufacturing of the briquettes.

#### **Specifications for the briquette-making machine:**

- It must be light enough so that one person can carry it.
- It must have shaped containers where the briquettes are formed.
- A minimum of two briquettes must be manufactured by a single machine at a time.
- The briquettes may be any shape but dimensions may not exceed 140 x 70 x 70 mm.
- It must contain a mechanism that can exert high pressure to expel any excess liquid.
- Provision must be made for the excess liquid to be collected.
- It may only be operated by hand with no electrical or hydraulic assistance.
- It must be able to lock in place for 10 minutes while the briquettes set.

**Presentation requirements:**

Create a PAT file / portfolio containing:

- A complete cover page
- An index
- The PAT 2009 *FORMATIVE ASSESSMENT* form ( Page 18 of this document)
- The completed *DECLARATION OF AUTHENTICITY* form (Page 19 of this document)

The following must be neatly presented in the PAT file / portfolio after the *DECLARATION*.

1. A design brief.
2. A list of the specifications and constraints.
3. Research showing proof of resource material.
4. Detailed freehand drawings used during the design process.
5. The **minimum** drawing requirements as stipulated below.
6. Clear evidence of continuous evaluation of all the stages.
7. A list of all reference material used (Bibliography).

**Include the following on each required presentation:**

- Clear numbering in accordance with the numbers of the presentation and minimum drawing requirements of the PAT.
- The date of completion and submission.

NOTE: A scale model may be submitted, time and facilities at school permitting.

**Minimum drawing requirements:**

8. A **layout drawing** (working drawing) of the briquette-making machine showing a **minimum** of **three** orthographic views, drawn to a suitable scale. The views must include:
  - 8.1 The **front view** of all the assembled parts.
  - 8.2 The **top view** of all the assembled parts.
  - 8.3 A **side view** of all the assembled parts.

**NOTE: ONE of the views must be sectioned.****The following should be included on the views of the layout drawings:**

- Dimensions
  - Scale(s)
  - Labels and notes
  - Cutting plane(s)
  - All hatching detail
9. **Detailed drawing(s)** of each of the separated parts of the briquette press.  
**The following should be included on the detail drawings:**
    - Dimensions
    - Scale(s)
    - Labels and notes
    - Hatching detail
    - Welding and machining symbols (If applicable)

10. A **schematic diagram** showing the path (loci) of all the extreme points on the moving parts of the mechanism (briquette-making machine). (**Application of loci on mechanisms**)

**The following must be shown on the schematic diagram:**

- All the moving parts shown as a schematic diagram
- Labels and notes
- All necessary constructions.

11. A detailed **isometric** drawing of at least ONE of the **complex main parts** of the assembly.

**The following should be included on the isometric drawing:**

- All necessary constructions
- Relevant labels and notes

Note: The isometric drawing may be artistically rendered

All the drawings must be presented on appropriately sized drawing sheets, correctly set-up with borders, name blocks and title strips.

Penalties will be accrued for untidy and messy work as well as for the late submission of the PAT.

**NOTE:** All drawing must comply with the guidelines contained in the *SANS 0111 Code of Practice for Engineering Drawing*.

### 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 drawings and diagrams produced during the design process.
- **CAD (Computer-Aided Design) drawing:** All working drawings (layout drawings). Either the detailed drawing(s) or the isometric drawing may also be drawn with CAD.
- **Instrument drawing:** The schematic drawing with either the detailed drawing(s) or the isometric drawing.

### Assessment Criteria

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

1. The rubric displayed 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 displayed 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 displayed 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.

**ANNEXURE A**

**A RUBRIC FOR ASSESSING THE DESIGN PROCESS**

LEVELS OF PERFORMANCE							
CRITERIA	7	6	5	4	3	2	1
	80 –100%	70 - 79%	60 - 69%	50 - 59%	40 - 49%	30 - 39%	0 - 29%
1. Create a <b>design brief</b> demonstrating a clear understanding of the scenario.	The design brief demonstrates an <b>in-depth</b> and comprehensive understanding of the scenario.	The design brief demonstrates a <b>thorough</b> understanding of the scenario.	The design brief demonstrates a <b>substantial</b> understanding of the scenario.	The design brief demonstrates a <b>satisfactory</b> understanding of the scenario.	The design brief demonstrates a <b>moderate</b> understanding of the scenario.	The design brief demonstrates an <b>elementary</b> understanding of the scenario.	The design brief demonstrates <b>little or no</b> understanding of the scenario.
2. A list of the <b>specifications</b> and <b>constraints</b> .	A <b>thorough</b> list with attention to detail of <b>specifications</b> and <b>constraints</b> is presented.		A <b>complete</b> list of <b>specifications</b> and <b>constraints</b> is presented.		A <b>brief</b> and <b>incomplete</b> list of <b>specifications</b> and <b>constraints</b> is presented.		No list or a vague list of <b>specifications</b> and or <b>constraints</b> is presented.
3. Evidence of <b>appropriate</b> 'external' <b>research</b> .	Shows evidence of <b>in-depth</b> and <b>thorough appropriate</b> 'external' <b>research</b> .		Shows evidence of <b>adequate</b> and <b>appropriate</b> 'external' <b>research</b> .		Shows evidence of <b>limited</b> 'external' <b>research</b> .		Shows <b>little to no</b> evidence of any 'external' <b>research</b> .
4. A record of <b>possible solutions</b> . (Freehand drawings)	A <b>wide range</b> of possible solutions, which are clearly, logically and comprehensively recorded.		A <b>substantial number</b> of possible solutions, which are clearly recorded.		A <b>limited number</b> of possible solutions, which are recorded.		Research is <b>irrelevant</b> to the solution.
5. <b>Selection of final solution</b> demonstrating full <b>understanding</b> of the <b>design brief</b> . (correctness / functionality / practicality of design)	The final solution shows an <b>in-depth</b> and <b>comprehensive</b> understanding of and complies fully with the design brief.	The final solution shows <b>thorough</b> understanding of, and complies fully with the design brief.	The final solution shows a <b>substantial</b> understanding of the design brief.	The final solution shows a <b>satisfactory</b> understanding of the design brief.	The final solution shows <b>some</b> understanding of the design brief.	The final solution shows <b>limited</b> understanding of the design brief.	The final solution is <b>incomplete</b> showing little understanding of the design brief.
6. <b>Clear evidence</b> of <b>evaluation</b> .	Clear evidence of <b>comprehensive</b> evaluation at all stages of the design process is shown.		Clear evidence of <b>substantial</b> evaluation at most stages of the design process is shown.		Evidence of <b>limited</b> evaluation at <b>some stages</b> of the design process is shown.		<b>Little or no</b> evidence of any evaluation.
The <b>meeting of deadlines</b> of <b>ALL the stages</b> of the PAT.	<b>All stages</b> handed in <b>on due dates</b> .		<b>Most</b> deadlines were <b>met</b> and <b>all stages</b> handed in <b>by extension date</b> .		<b>Few</b> deadlines were <b>met</b> . <b>Extension date missed</b> but <b>most stages</b> handed in <b>late</b> .		<b>Few to no stages</b> handed in.
7. The <b>presentation</b> of the <b>complete PAT</b> according to the prescribed requirements.	<b>All the documents</b> and <b>drawings</b> are complete and presented in a <b>neat PAT file / portfolio</b> in a <b>logical</b> and <b>orderly sequence</b> according to the prescribed requirements.		<b>All the documents</b> and <b>drawings</b> are complete and are presented in a <b>PAT file/ portfolio</b> according to the prescribed requirements.		Most of the documents and drawings are complete and are <b>presented</b> according to some of the prescribed requirements.		The documents and drawings are <b>incomplete</b> .

## ANNEXURE B

## RUBRIC FOR ASSESSING CORRECTNESS OF THE PRESENTATION DRAWING

			LEVELS OF PERFORMANCE						
CRITERIA			7	6	5	4	3	2	1
			More than minimum requirements		Meets minimum requirements		Less than minimum requirements		No drawing presented
			80 –100%	70 - 79%	60 - 69%	50 - 59%	40 - 49%	30 - 39%	0 - 29%
The page is set-up with a border, complete name block and title strip			All pages set-up contain more than minimum requirements.		The page set-up contains the minimum requirements.		The page set-up contains less than minimum requirements.		Little or no page set-up is evident.
Orthographic drawings	Layout drawings (working drawings)	8.1 Required View(s) 1	The view(s) meets <b>more than</b> the <b>minimum requirements</b> and is <b>error free</b> .		The view(s) <b>meets</b> the <b>minimum requirements</b> but contains <b>some errors</b> .		The view(s) contains <b>less than</b> the <b>minimum requirements</b> and contains <b>many errors</b> .		<b>Little or no</b> evidence of the required view(s)
		8.2 Required View(s) 2	The view(s) meets <b>more than</b> the <b>minimum requirements</b> and is <b>error free</b> .		The view(s) <b>meets</b> the <b>minimum requirements</b> but contains <b>some errors</b> .		The view(s) contains <b>less than</b> the <b>minimum requirements</b> and contains <b>many errors</b> .		<b>Little or no</b> evidence of the required view(s)
		8.3 Required View(s) 3	The view(s) meets <b>more than</b> the <b>minimum requirements</b> and is <b>error free</b> .		The view(s) <b>meets</b> the <b>minimum requirements</b> but contains <b>some errors</b> .		The view(s) contains <b>less than</b> the <b>minimum requirements</b> and contains <b>many errors</b> .		<b>Little or no</b> evidence of the required view(s)
	9. There is a <b>detail drawing</b> that is labelled and fully dimensioned and has notes.	The detail drawing contains more than the minimum requirements regarding labels, dimensions and notes and is <b>error free</b> .		The detail drawing meets the <b>minimum requirements</b> but contains <b>some errors</b> .		The detail drawing contains <b>less than</b> the <b>minimum requirements</b> and contains <b>many errors</b> .		<b>Little or no</b> evidence of required detail drawing	
	10. The presentation contains a <b>site plan/ schematic diagram</b> .	The site plan / schematic diagram meets <b>more than minimum</b> requirements and is <b>error free</b> .		The site plan / schematic diagram <b>meets the minimum</b> requirements or contains <b>some errors</b> .		The site plan / schematic diagram meets <b>less than minimum</b> requirements or contains <b>many errors</b> .		<b>Little or no</b> evidence of required site plan / schematic diagram	
11. Pictorial drawing	The correct pictorial <b>drawing method</b> has been used and the drawing is <b>correctly orientated</b> .		<b>Thorough</b> knowledge of the correct 3D pictorial <b>drawing method</b> and correct <b>orientation</b> of drawing has been shown.		<b>Satisfactory</b> knowledge of the correct 3D pictorial <b>drawing method</b> and correct <b>orientation</b> of drawing has been shown.		<b>Some</b> knowledge of the correct 3D pictorial <b>drawing method</b> and <b>incorrect orientation</b> of drawing has been shown.		<b>Little or no</b> evidence of required 3D pictorial drawing
	The <b>requirements</b> and <b>correctness</b> of the 3D pictorial drawing.		The 3D drawing meets more than the requirements and reflects the correct <b>size and proportion</b> of all the features and is <b>error free</b> .		The drawing meets the requirements and reflects the correct <b>size and proportion</b> of all the features and contains <b>some errors</b> .		The drawing reflects poor or incorrect <b>size and proportion</b> of some to most of the features and contains <b>many errors</b> .		<b>Little or no</b> evidence of required 3D pictorial drawing

## ANNEXURE C

## RUBRIC FOR ASSESSING DRAWING METHOD, SKILLS AND PRESENTATION

CRITERIA		LEVELS OF PERFORMANCE					
		7 80 –100%	6 70 - 79%	5 60 - 69%	4 50 – 59%	3 40 - 49%	2 30 - 39%
Freehand drawings	The <b>proportion</b> and <b>size</b> of the <b>features</b> in the drawing	The features show <b>outstanding</b> proportion and size.	The features show <b>satisfactory</b> proportion and size.	The application of proportion and size of features is <b>bad</b> .	The features show <b>very little or no</b> proportion or size.		
	<b>Neatness</b> and consistency of <b>line work / line quality</b> in the drawings	Drawings <b>very neat</b> and all line work is <b>outstanding</b> and <b>consistent</b>	Drawings <b>neat</b> and line work / line quality is <b>good</b> and <b>consistent</b>	Drawings <b>not neat</b> and line work is <b>inconsistent</b>	Line work is <b>unacceptable</b>		
Instrument drawings	The correct use of <b>instruments, line types, printing and dimensioning</b> in the drawing.	The correct use of drawing instruments, line types, printing and dimensioning in the drawing is <b>outstanding</b> and <b>consistent</b> .	The correct use of drawing instruments, line types, printing and dimensioning in the drawing is <b>satisfactory</b> and <b>mostly consistent</b> .	The correct use of drawing instruments, line types, printing and dimensioning in the drawing is <b>poor</b> and <b>inconsistent</b> .	The use of drawing instruments, line types, printing and dimensioning in the drawing is <b>unacceptable</b>		
	The consistency of <b>line work / line quality</b> and <b>neatness</b> in the drawing	Drawings <b>very neat</b> and is <b>outstanding</b> and <b>consistent</b> .	Drawings <b>neat</b> and line work / line quality is <b>satisfactory</b> and <b>mostly consistent</b> .	Drawings <b>not neat</b> and line work / line quality is <b>poor</b> and <b>inconsistent</b> .	Line work / line quality is <b>unacceptable</b>		
CAD drawing	The level of competence displayed in using a CAD system.	Use the 'RUBRIC FOR ASSESSING CAD DRAWING SKILLS' (Annexure D) to assess the competence displayed in using a CAD system.					
	The correct use of line types in the final drawing.	The correct line types are used for <b>all</b> aspects in the final drawing.	The correct line types are used for <b>most of the</b> aspects in the final drawing.	The correct line types are used for <b>some</b> aspects in the final drawing.	<b>No</b> knowledge of line types is shown		
	Final drawing presentation and layout.	The final drawing presentation and layout shows an <b>outstanding</b> display of competence.	The final drawing presentation and layout shows a <b>substantial</b> display of competence.	The final drawing presentation and layout shows a <b>satisfactory</b> display of competence.	The drawing was not completed.		

## ANNEXURE D

### A RUBRIC FOR ASSESSING CAD DRAWING SKILLS

LEVELS OF PERFORMANCE							
CRITERIA	7	6	5	4	3	2	1
	80 –100%	70 - 79%	60 - 69%	50 - 59%	40 - 49%	30 - 39%	0 - 29%
Set-up a drawing interface	Shows an in-depth and comprehensive understanding of setting up a drawing interface	Shows a thorough understanding of setting up a drawing interface	Shows a substantial understanding of setting up a drawing interface	Shows a satisfactory understanding of setting up a drawing interface	Shows a moderate understanding of setting up a drawing interface.	Shows an elementary understanding of setting up a drawing interface	Shows little to no understanding of setting up a drawing interface
Set-up a 2D /3D drawing environment	Shows an in-depth and comprehensive understanding of setting up a 2D /3D drawing environment	Shows a thorough understanding of setting up a 2D /3D drawing environment	Shows a substantial understanding of setting up a 2D /3D drawing environment	Shows a satisfactory understanding of setting up a 2D /3D drawing environment.	Shows a moderate understanding of setting up a 2D /3D drawing environment.	Shows an elementary understanding of setting up a 2D /3D drawing environment	Shows little to no understanding of setting up a 2D /3D drawing environment
Set-up drawing layers with properties assigned to each layer	Shows evidence of in-depth ability to set-up drawing layers and assign properties to each layer	Shows evidence of thorough ability to set-up drawing layers and assign properties to each layer	Shows evidence of sound ability to set-up drawing layers and assign properties to each layer	Shows evidence of adequate ability to set-up drawing layers and assign properties to each layer.	Shows evidence of moderate ability to set-up drawing layers and assign properties to each layer.	Shows evidence of limited ability to set-up drawing layers and assign properties to each layer	Shows little to no ability to set-up drawing layers and assign properties to each layer
Set-up of an AA drawing sheet with a border and a title block	Shows evidence of in-depth ability to set-up an AA drawing sheet with a border and a title block	Shows evidence of thorough ability to set-up an AA drawing sheet with a border and a title block	Shows evidence of sound ability to set-up an AA drawing sheet with a border and a title block	Shows evidence of adequate ability to set-up an AA drawing sheet with a border and a title block.	Shows evidence of moderate ability to set-up an AA drawing sheet with a border and a title block.	Shows evidence of limited ability to set-up an AA drawing sheet with a border and a title block	Shows little to no ability to set-up an AA drawing sheet with a border and a title block
Show evidence of the correct use of the drawing tools	Comprehensive and detailed evidence is shown of using the drawing tools correctly	Thorough evidence is shown of using the drawing tools correctly	Substantial evidence is shown of using the drawing tools correctly	Satisfactory evidence is shown of using the drawing tools correctly.	Some evidence is shown of using the drawing tools correctly.	Limited evidence is shown of using the drawing tools correctly	No evidence is shown of using the drawing tools correctly
Show ability to save and retrieve work	Shows evidence of in-depth ability to save/retrieve work	Shows evidence of thorough ability to save/retrieve work	Shows evidence of sound ability to save/retrieve work	Shows evidence of adequate ability to save/retrieve work.	Shows evidence of moderate ability to save/retrieve work.	Shows evidence of limited ability to save/retrieve work	Shows little to no ability to save/retrieve work
Show ability to plot work.	Shows evidence of in-depth ability to plot work.	Shows evidence of thorough ability to plot work.	Shows evidence of sound ability to plot work.	Shows evidence of adequate ability to plot work.	Shows evidence of moderate ability to plot work.	Shows evidence of limited ability to plot work.	Shows little to no ability to plot work.
Correctness of the 2D and 3D drawings as a mark	80 – 100%	70 – 79%	60 – 69%	50 – 59%	40 – 49%	30 – 39%	0 – 29%

The mark for the presentation of the drawing is a percentage mark obtained via formal assessment.

**PAT 2009 FORMATIVE ASSESSMENT**  
**PAT 1 or PAT 2**

SCHOOL: .....

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

EXAMINATION NUMBER: .....

PART 1: Design Process			PART 2: Presentation Drawings							
CRITERIA		MARKS	CRITERIA			MARKS	CRITERIA		MARKS	
1	A <b>design brief</b> demonstrating a clear understanding of the scenario		All pages are set-up with a border, relevant name block/ title block				Freehand drawing (Nr 4)	The <b>proportion</b> and <b>size</b> of the <b>features</b> in the drawing		
2	A list of the <b>specifications</b> and <b>constraints</b>		Orthographic drawing: Also assess the correctness of the drawings	Working drawings	8.1	View/s 1			<b>Neatness</b> / consistency of <b>line work / line quality</b> in the drawing	
3	Evidence of <b>appropriate</b> 'external' <b>research</b> .				8.2	View/s 2				
4	A record of <b>possible solutions</b> . (Freehand drawings)				8.3	View/s 3		Instrument drawing (Nr 8 - 11)	The correct use of <b>drawing instruments, line types, printing</b> and <b>dimensioning</b> in the drawing	
5	<b>Selection of final solution</b> demonstrating <b>understanding</b> of the <b>design brief</b> (correctness / functionality / practicality of design)		9	<b>Detail drawing(s)/ View</b>		<b>Neatness</b> / consistency of <b>line work / line quality</b> and neatness in drawings				
6	Clear evidence of <b>evaluation</b>		10	<b>Site plan / schematic diagram</b>						
	The <b>meeting of deadlines</b> of all the stages of the PAT		3D pictorial drawing	11	The correct 3D pictorial <b>drawing method</b> has been used and the drawing is correctly <b>orientated</b>		CAD drawing	Mark from ANNEXURE D		
4.	<b>Presentation</b> of the <b>complete PAT</b> according to the prescribed requirements.				The <b>requirements</b> and <b>correctness</b> of the 3D pictorial drawing				The correct use of line types in the final drawing	
						+				
						÷				
						2				
								<b>TOTAL</b> without 'CAD'		
			<b>OPTIONAL MODEL:</b> Add the mark to Criteria Total					<b>TOTAL</b> with 'CAD'		
Criteria Total			Criteria Total				CALCULATION without 'CAD'			
CALCULATION			CALCULATION				CALCULATION with 'CAD'			
<b>TOTAL</b>		<b>/ 25</b>	<b>TOTAL</b>			<b>/ 50</b>	<b>TOTAL</b>		<b>/ 25</b>	
Moderated TOTAL			Moderated TOTALS							
<b>TOTAL</b>		<b>/ 25</b>	<b>TOTAL</b>			<b>/ 50</b>	<b>TOTAL</b>		<b>/ 25</b>	
<b>TEACHER'S TOTAL: 25 + 50 + 25 =</b>						<b>/ 100</b>	MODERATED BY			
<b>MODERATED TOTAL: 25 + 50 + 25 =</b>						<b>/ 100</b>				

## DECLARATION OF AUTHENTICITY

To be submitted with every Practical Assessment Task

NAME OF THE SCHOOL: .....

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

EXAMINATION NUMBER: .....

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

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

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

\_\_\_ / \_\_\_ / 20 \_\_\_  
DATE (DD / MM / YY)

**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

\_\_\_ / \_\_\_ / 20 \_\_\_  
DATE (DD / MM / YY)

