

Road Pavement Forum  
November 2019

South Africa

**COTO**

Committee of Transport  
Officials

# Materials Tester & Laboratory Controller: Certification & Registration

**SANRAL**

SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LTD



Reg.No. 1998/009584/30

BUILDING SOUTH AFRICA  
THROUGH BETTER ROADS

Sean Strydom

# Overview

A scenic landscape featuring a dirt road in the foreground, a large tree on the left, and a rocky cliff in the background. The scene is set in a natural, outdoor environment with green foliage and a clear sky.

- **Materials Tester Certification**
- **Laboratory Controller Registration**

# Qualification

- **Materials Tester – NQF 4**
- **Laboratory Controller – NQF 5**



# Material Tester Certification



**Competence  
Based**



# Material Tester Certification

ISO 17024

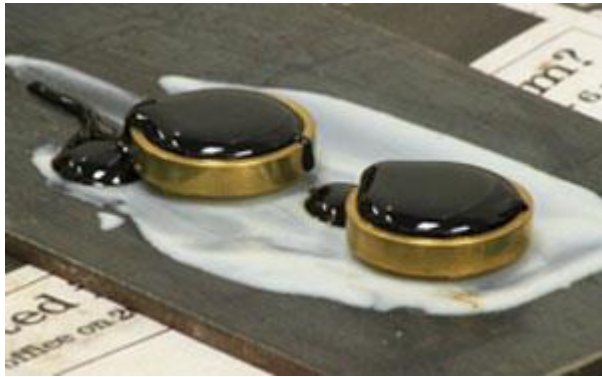
NLA-SA

Competence  
Based

SABITA  
sponsored  
Curriculum

SANAS

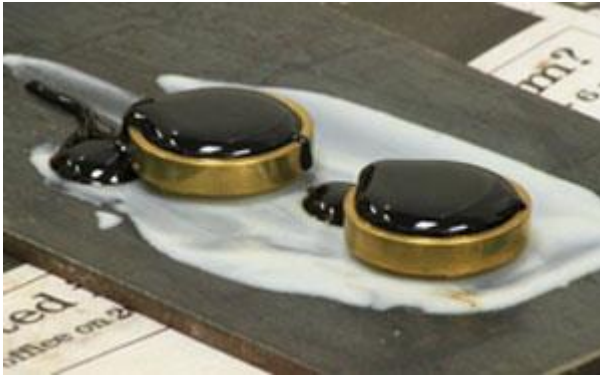
# Material Tester Certification



## Specialisations



# Material Tester Certification



- Draw from storage and assemble testing apparatus for the relevant test,
- Check compliance of apparatus to specifications of test method,
- Execute laboratory and housekeeping activities,
- Organise samples, data information and documentation,
- Conduct sampling and field testing of bituminous binders,
- Extract a representative and sized test sample,
- Determine the properties of bituminous base binders,
- Determine the properties of modified bituminous binders,

## Bitumen Tester

Ball penetration; texture depth; sampling of base bituminous binders, cut-backs and emulsions; sampling of modified bituminous binders; divide a sample using the riffler; by quartering; softening point; penetration; viscosity; sample and prepare modified binders samples & the elastic recovery of modified bituminous binder

# Material Tester Certification

- Draw from storage and assemble testing apparatus for the relevant test,
- Check compliance of apparatus to specifications of test method,
- Execute laboratory and housekeeping activities,
- Organise samples, data information and documentation,
- Conduct sampling and field testing of fresh and hardened concrete,
- Extract a representative and sized test sample,
- Determine the properties of fresh and hardened concrete,



## Concrete tester

Sample of fresh concrete; divide a sample using the riffler; by quartering; density of compacted freshly mixed concrete; compressive strength of hardened concrete, incl making and curing of specimen



# Material Tester Certification

## Asphalt Tester

- Draw from storage and assemble testing apparatus for the relevant test
- Check compliance of apparatus to specifications of test method
- Execute laboratory and housekeeping activities,
- Organise samples, data information and documentation,
- Conduct sampling and field testing of asphalt,
- Extract a representative and sized test sample,
- Determine the properties of asphalt

Sampling of Previously Blended (ready mixed) Asphalt; sampling of Asphalt from completed layer; handle and maintain a nuclear density gauge; in-situ density of compacted asphaltic materials; divide a sample using the riffler; by quartering; produce asphalt briquettes; Marshall stability, flow and quotient; indirect tensile strength of asphalt; bulk density and void content of compacted asphalt; maximum void-less density of asphalt mixes and the quantity of binder absorbed by the aggregate; soluble binder content and particle size distribution



# Material Tester Certification

- Draw from storage and assemble testing apparatus for the relevant test,
- Check compliance of apparatus to specifications of test method,
- Execute laboratory and housekeeping activities,
- Organise samples, data information and documentation,
- Conduct sampling of aggregates,
- Extract a representative and sized test sample,
- Determine particle distribution and particle shape of aggregates,
- Determine the density and strength of aggregates

Sampling from Stockpiles; from Conveyor Belts; divide a sample using the riffler; by quartering; particle size distribution; average least dimension; flakiness index; bulk density, apparent density and water absorption retained on the 5 mm sieve; passing the 5 mm sieve; bulk density of aggregates; aggregate crushing value (ACV) and 10 % FACT



## Aggregate tester

# Material Tester Certification

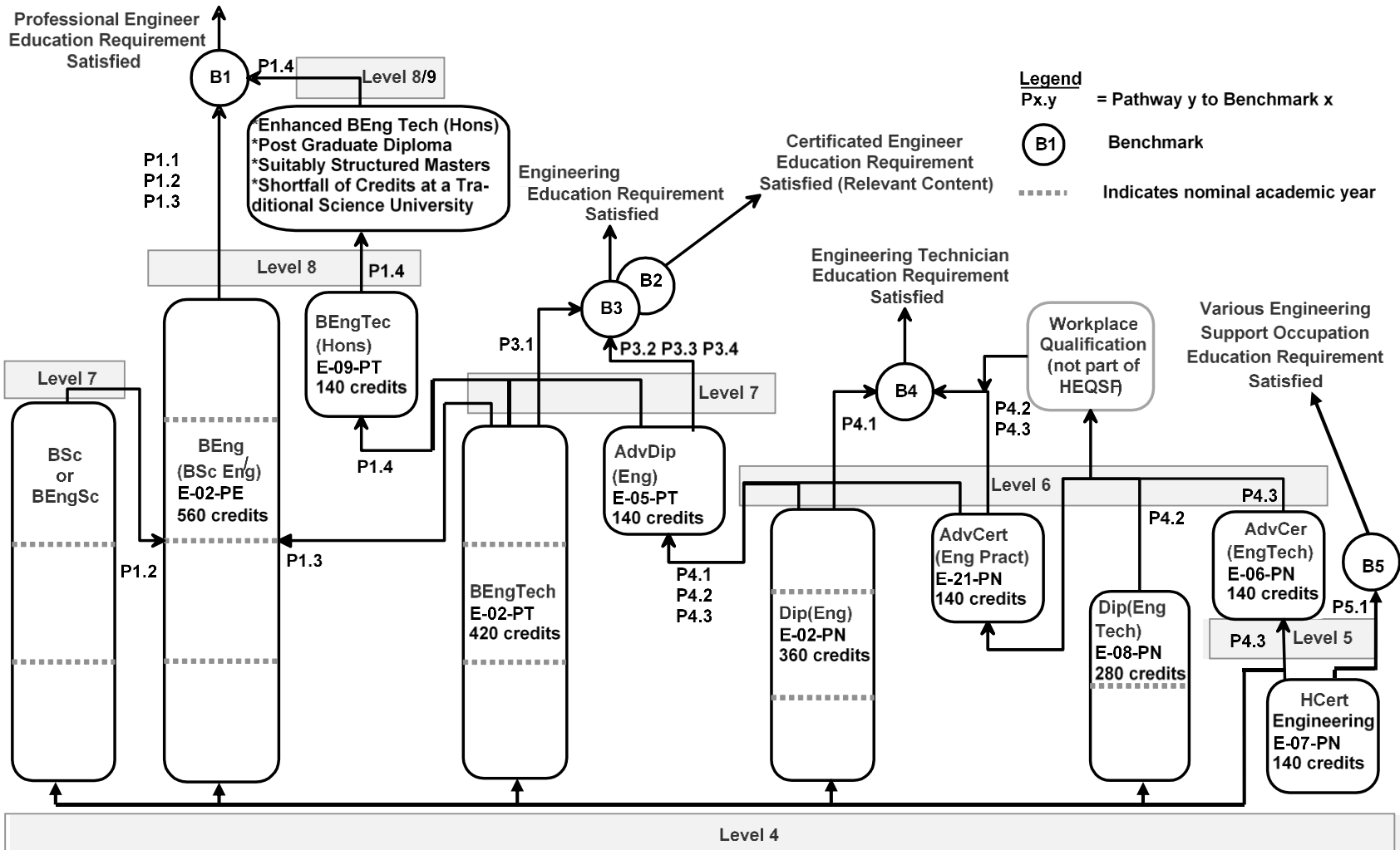
- Draw from storage and assemble testing apparatus for the relevant test,
- Check compliance of apparatus to specifications of test method,
- Execute laboratory and housekeeping activities,
- Organise samples, data information and documentation
- Conduct sampling of soils, gravels and crushed stone materials,
- Conduct field testing of compacted and uncompacted fill and pavement layers,
- Extract a representative and sized test sample,
- Determine particle size distribution and Atterberg Limits of soils, gravels and crushed stone materials,
- Determine the density of soils, gravels and crushed stone materials,
- Determine compaction and strength characteristics of untreated soils, gravels and crushed stone materials

Sampling of soils, gravels and crushed stone of treated pavement layers; of untreated road pavement layers; and from stockpiles; handle and maintain a nuclear density gauge; in-situ density; divide a sample using the riffler; by quartering; particle size distribution; hydrometer; two-point liquid limit, plastic limit, plasticity index and linear shrinkage; soil-mortar %, coarse sand ratio, GM & FM; handling sieves; moisture content; maximum dry density & optimum moisture content; California Bearing Ratio; unconfined compressive strength; indirect tensile strength

## Soils, gravel and Base Course Materials Tester



# Civil Laboratory Technical Controller Registration



# New Engineering Qualifications

NQF Level 10

PhD

NQF Level 9

M Eng

NQF Level 8

B Eng

B Eng Tech Hons

NQF Level 7

B Eng Tech

Adv Dip

NQF Level 6

Dip Eng

Dip Eng Tech

Adv Cert

NQF Level 5

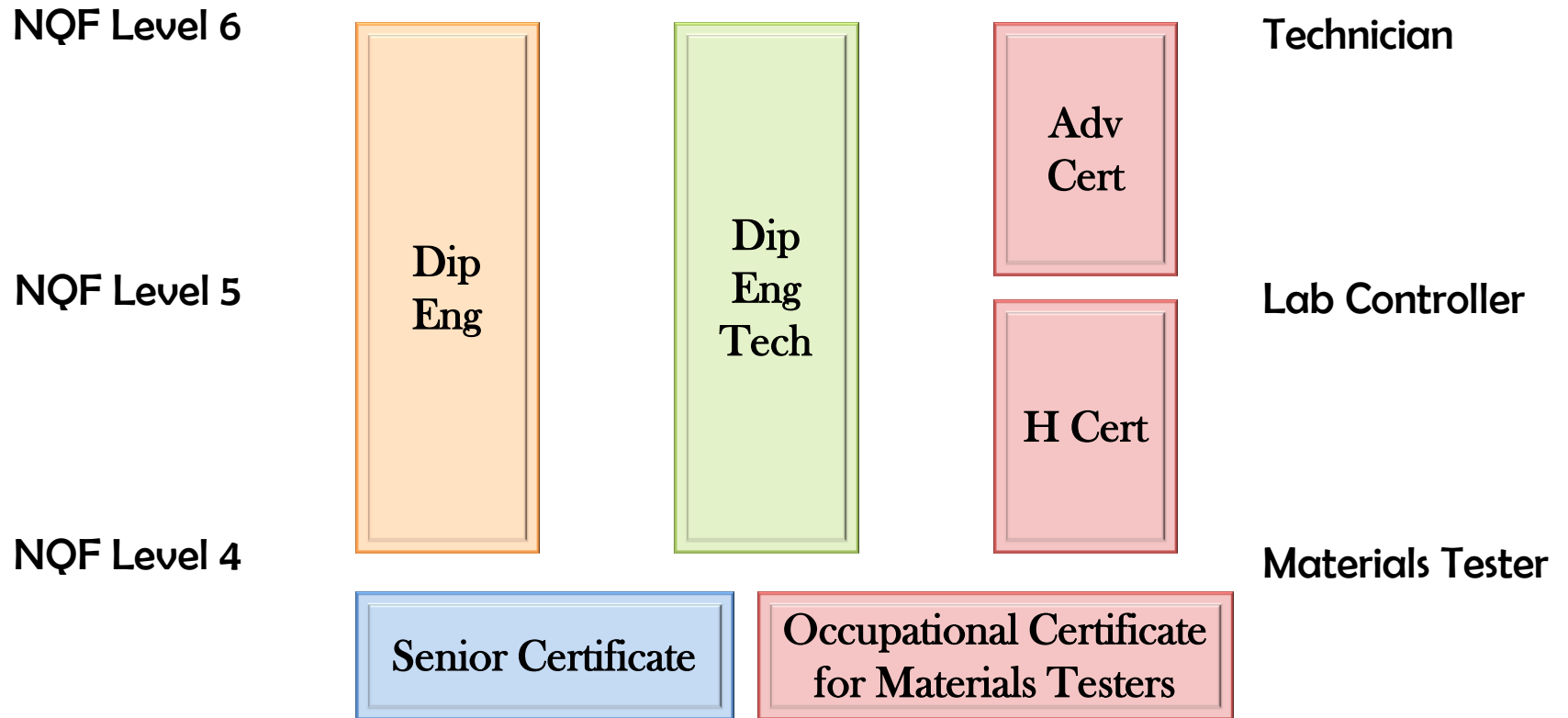
H Cert

NQF Level 4

Senior Certificate

Occupational Certificate for Materials Testers

# Materials Testers to Materials Technicians



# Civil Laboratory Technical Controller Registration

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## Events Calendar

The Engineering Council of South Africa will be participating in a number of events from November – December 2019. See the calendar.

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## International Register

The Engineering Council of South Africa (ECSA) is a member of the IEA and maintains international registers for Engineers, Technologists and Technicians. For more information...

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## ECSA E-Bulletin

The year is drawing to an end and this is sadly the last edition for 2019. However, a special edition on the Annual ECSA Engineering Awards will be produced and distributed during November. This edition places focus on two conferences, workshops held dur

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# Civil Laboratory Technical Controller Registration



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# Civil Laboratory Technical Controller Registration

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    - Registered Medical Equipment Maintainer
    - Fire Protection Systems Inspector
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# Civil Laboratory Technical Controller Registration

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- Policy Statement R2/1I: Acceptable Engineering Work for Registration as a Registered Lift Inspector
- Application Form: Lift Inspector
- Re-Registration: Lift Inspector

### 3.7.2 Lifting Machinery Inspectors

- Policy Statement R2/1J: Acceptable Engineering Work for Registration as a Registered Lifting Machinery Inspector (RLMI) and Candidate Lifting Machinery Inspector (CLMI)
- Lifting Machinery Inspector Practitioner Application Form
- Application Form: Lifting Machinery Inspector - Additional Equipment Types
- Re-Registration: Lifting Machinery Inspector
- R-05-LMI-SC Sub Discipline-specific Training Requirements for Candidate Lifting Machinery Inspectors
- Lifting Machinery Inspector Candidate Application Form

### 3.7.3 Medical Equipment Maintainer

- Policy Statement R2/1H: Acceptable Engineering Work for Registration as a Medical Equipment Maintainer and Candidate Medical Equipment Maintainer
- Application Form: Medical Equipment Maintainer

### 3.7.4 Fire Protection Systems Inspector

- Policy Statement R2/1N: Acceptable Engineering Work for Registration as a Fire Protection Systems Inspector and Candidate Fire Protection Systems Inspector
- Application Form: Fire Protection Systems Inspector

### 3.7.5 Fire Protection Systems Practitioners

- R-05-FPSP: Sub Discipline-specific Training Requirements for Candidate Fire Protection System Practitioners
- ECSA Specified Category Practitioner Application Form Fire Protection Systems Practitioner Fire Detection Registration application form
- ECSA Specified Category Practitioner Application Form Fire Protection Systems Practitioner Fixed Gaseous Systems Registration application form
- ECSA Specified Category Practitioner Application Form Fire Protection Systems Practitioner Water Based Systems Registration application form

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### 3.7.6 Civil Laboratory Technical Controller

- R-05-CLTC-SC Sub Discipline-Specific Training Guideline for Civil Laboratory Controller
- APP-REG FORM CLTC-SC\_SPECIFIED Category Practitioner as a Registered Civil Laboratory Technical Controller

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4. Professional Practice  
4.1 Professional Conduct

Page 1 of 14 <sup>a</sup>	<b>SPECIFIED-CATEGORY- PRACTITIONER-A S-A<sup>1</sup></b> <b>REGISTERED-CIVIL- LABORATORY-TECHNICAL- CONTROLLER<sup>a</sup></b>	
Form-No.: <sup>1</sup> APP-REG-FORM-CLTC-3C <sup>a</sup>		
Effective-Date: <sup>1</sup> 1-April-2018 <sup>a</sup>		
Rev-no:-0 <sup>a</sup>		

Form-3C1<sup>1</sup>

Office-Use <sup>1</sup>
Ret.: <sup>1</sup>

**NB:** → Please consult the enclosed information sheet (Sheet-A) before completing this Application.

1. → General-Information:<sup>1</sup>

Surname: <sup>1</sup>		Title-and-First-Name: <sup>1</sup>		PHOTOGRAPH <sup>1</sup> (Passport-type. <sup>1</sup> Please-glass-do not-clip! <sup>1</sup> Alternatively, insert electronically in JPEG or similar format. <sup>1</sup>
Date-of-Birth: <sup>1</sup>		Identity-No. →: <sup>1</sup> Or-Passport-No: <sup>1</sup> Country-(passport):- <sup>a</sup>		
*Race-Group: <sup>1</sup> Please-tick-the applicable-block <sup>1</sup>	Indian <sup>a</sup>	Black <sup>a</sup>	*Gender:- (Please-tick- the-applicable- block) <sup>a</sup>	Country-of-normal-residence: <sup>1</sup>
	Coloured <sup>a</sup>	White <sup>a</sup>	Male <sup>a</sup>	
			Female <sup>a</sup>	
Home-Address: <sup>1</sup>		Postal-Address: <sup>1</sup>		Name-&-Address-of-present- Employer: <sup>1</sup>
Tel.No.-(Home): <sup>1</sup>		Title-of-Position-held: <sup>1</sup>		Tel.No.-(Employer):- <sup>1</sup>
Tel.No.-(Work) <sup>1</sup> (include area codes) <sup>1</sup>				Fax-No.:(include area codes) <sup>1</sup>
Cell-No.:- <sup>1</sup>				E-mail: <sup>1</sup>
E-mail:- <sup>a</sup>				

<sup>a</sup>Completion of this section is necessary in order to accurately reflect equity statistics in terms of Government Policy.


2. → Qualifications: (All qualifications at tertiary level) (List of subjects to be provided on Form R-05-AR-3C)<sup>1</sup>

Educational Institution <sup>a</sup>	Qualification <sup>a</sup>	Attendance <sup>a</sup> from	Date of final examination <sup>a</sup>	Office <sup>a</sup> use <sup>a</sup>

**NB:** → Kindly initial this page in the presence of a Commissioner of Oaths/ Justice of Peace.<sup>1</sup>

Applicant:.....	Commissioner of Oaths/ Justice of Peace: .....
-----------------	---

<sup>a</sup>It is the responsibility of the user to ensure that the latest version is used. The latest version will be published on our website.

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Rev-no:-0 <sup>a</sup>		

Form-3C1.2<sup>1</sup>

3. → Did you complete a Learnership:..... Yes  No

Training:- <sup>a</sup>	Date-from:- <sup>a</sup>	Date-to:- <sup>a</sup>
-------------------------	--------------------------	------------------------

4. → Previous/Current-Registration-or-Application-Details-with-EC SA: (eg. Professional Engineering Technician)<sup>1</sup>

Type <sup>a</sup>	Category <sup>a</sup>	Number <sup>a</sup>	Date <sup>a</sup>
Previous-Registration#			
Current-Registration#			
Previous-Registration#			

5. → Membership-of-Voluntary-Associations-recognized-in-terms-of-Act-No-46-of-2000 (or other): (If more space is needed, please supply information separately.)<sup>1</sup>

Name-of-Association-(Institute)-(Society)- <sup>a</sup>	Membership-grade-and-date-of-admission <sup>a</sup>

6. → Application-Fee: (Fees are available on ECSA website or [feca](#))<sup>1</sup>

<sup>a</sup>Acceptable: Only cheques, credit card payments or proof of electronic payment. Do not pay with cash or with postal orders.<sup>1</sup>

My-Application-fee-of-R-.....	+ (cheque) is transferred electronically. =
-------------------------------	---

7. → Referees: (At least one ECSA registered person)<sup>1</sup>

(1) <sup>1</sup>	(2) <sup>1</sup>	(3) <sup>1</sup>
E-mail: <sup>1</sup>	E-mail: <sup>1</sup>	E-mail: <sup>1</sup>
Tel-no: <sup>a</sup>	Tel-no: <sup>a</sup>	Tel-no: <sup>a</sup>

**NB:** → Kindly initial this page in the presence of a Commissioner of Oaths/ Justice of Peace.<sup>1</sup>

Applicant:.....	Commissioner of Oaths/ Justice of Peace: .....
-----------------	---

Application-fee-→ R-.....	Office-Use-Only <sup>1</sup>
Received-by: → .....	Date: → .....
	(Council's stamp) <sup>1</sup>

**NB:** Voluntary Associations List is available on the ECSA or [feca](#)<sup>1</sup>

<sup>a</sup>It is the responsibility of the user to ensure that the latest version is used. The latest version will be published on our website.



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Effective-Date: 1-April-2018		
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Form-R-03-TE-8C

On-line and paper-based. In the on-line form, the information will be held containing the elements shown and providing links to the Training and Experience Reports and/or the Training and Experience Outline.

### Training and Experience Summary-TE S

Surname and Initials:

First complete a Training and Experience Report Form-R-03-TER-SC, or a Training and Experience Outline Form-R-03-TEO-SC for each period.

No	From	To	Weeks	Work Details	Disciplinary Ability A-E	TER or TEO
1				Employed by:    Type of Work: 		Link TER1 or TEO1
2				Employed by:    Type of Work: 		Link TER2 or TEO2
3				Employed by:    Type of Work: 		Link TER3 or TEO3
4				Employed by:    Type of Work: 		Link TER4 or TEO4
5				Employed by:    Type of Work: 		Link TER5 or TEO5
6				Employed by:    Type of Work: 		Link TER6 or TEO6
n				Employed by:    Type of Work: 		Link TERn or TEOn

When an applicant is not engaged in training and experience towards registration, the period must be reflected as follows:

x	From	To	Weeks	Work Details	Disciplinary Ability A-E	TER or TEO
				Employed by: Not active Type of Work: Insert reason here		Link TERx or TEOx
Total years, months:						

Signature of Applicant:

Date:

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Effective-Date: 1-April-2018		
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Form-R-03-TER-8C

This form must be used for applicants who have completed and are submitting a report for each phase of training and work experience from the time of meeting the education requirements to application for registration. Consult the Information Sheet (Sheet SC2) before completing this report.

### Training and Experience Report

Applicant's Name	Applicant's Signature			Date
Period No.	Start date	End date	No of weeks	Position held
Employer's Name and Address for this period: (This is the employer and site at which the work took place, e.g. the site the applicant has been seconded to)				Did the applicant train under a Commitment and Undertaking (C&U)? If yes, provide number of C&U
Supervisor's Name and Address				Supervisor's Signature
EC SA Registration No. (If not registered, quality)				Date
Discipline of Engineering (Aeronautical, Agricultural, Chemical, Civil, Electrical, Industrial, Mechanical, Metallurgical, Mining)				
Discipline Specific Field (e.g. CLM, Lift Inspector, Clinical Technician, Laboratory Technician, Engineering Manager, etc.)				
Organogram showing supervisor (person signing this report), co-workers and the applicant supervised (if any). Show two levels above and below, if these exist. Give names, positions, qualification and registration (if any). Please do not colour in blocks.				
Report: (Write in proper paragraphs in the first person singular in less than 250 words in the blocks below)				
Nature of training or experience (stated in 15-25 words)*				
Nature of problem(s) addressed in this period; method of analysis, developing solution and evaluation (stated in 100-120 words)*				
Interaction with clients, stakeholders and other disciplines (stated in 30-40 words)				
Describe role and responsibility (in 30-40 words)*				Degree of responsibility
				Tick one only
				A. Being exposed, under full supervision
				B. Assisting, responsibility limited
				C. Participating, supervision limited
				D. Contributing, performs work, detailed approval
				E. Performing, limited guidance

\*Mandatory fields

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Form-No.: <sup>¶</sup> APP-REG-FORM-CLTC-SC <sup>o</sup>		
Effective-Date: <sup>¶</sup> 1-April-2018 <sup>o</sup>		
Rev-no.: <sup>o</sup>		


Form R-03-TEO-8C<sup>¶</sup>

This form must be used for an applicant who has at least ten years training and experience after completing the educational requirement and reports a total duration of at least three years at a degree of engineering responsibility E (Performing) in detail TER format. For the remaining periods or groups of related periods the report can be in this TEO format. Consult the Information Sheet (Sheet-3C2) before completing this report.<sup>¶</sup>

Training and Experience Outline <sup>o</sup>				
Applicant's Name <sup>o</sup>		Applicant's Signature <sup>o</sup>		Date <sup>o</sup>
Period-No. <sup>o</sup>	Start date <sup>o</sup>	End date <sup>o</sup>	No of weeks <sup>o</sup>	Position(s) held <sup>o</sup>
Employer's and Supervisor Name and Address: <sup>¶</sup>	Did the applicant train under a Commitment and Undertaking (CSU)? <sup>o</sup>		Yes <sup>¶</sup>	No <sup>o</sup>
EC SA Registration No. (If not registered, qualify): <sup>¶</sup>	If yes, provide number of CSU <sup>o</sup>		No: <sup>¶</sup>	
Discipline of Engineering: <sup>¶</sup> (Aeronautical, Agricultural, Chemical, Civil, Electrical, Industrial, Mechanical, Metallurgical, Mining) <sup>¶</sup>				
Sub-Discipline-Specific Field: <sup>¶</sup> (e.g. CLM, Lift Inspector, Clinical Technician, Laboratory Technician, Engineering Manager, etc.) <sup>¶</sup>				
Organogram identifying the applicant, supervisor and persons supervised. Please do not colour in blocks. <sup>¶</sup>				
<b>Outline Report: (Use bulleted form, using 7-9 bullets in the blocks below)<sup>o</sup></b>				
Nature of training or experience in the period(s) stated in bulleted format: <sup>¶</sup>				
Nature of problem(s) addressed in this period; method of analysis, developing solution and evaluation (stated in bulleted format): <sup>¶</sup>				
Management responsibilities (stated in bulleted format): <sup>¶</sup>				
Interaction with clients, stakeholders and other disciplines (stated in bulleted format): <sup>¶</sup>				
Describe role and responsibility (stated in bulleted format): <sup>¶</sup>		Degree of responsibility <sup>o</sup>		Tick one only <sup>o</sup>
		A. Being exposed, under full supervision <sup>o</sup>		<input type="checkbox"/>
		B. Assisting, responsibility limited <sup>o</sup>		<input type="checkbox"/>
		C. Participating, supervision limited <sup>o</sup>		<input type="checkbox"/>
		D. Contributing, performs work, detailed approval <sup>o</sup>		<input type="checkbox"/>
		E. Performing, limited guidance <sup>o</sup>		<input type="checkbox"/>

<sup>¶</sup>Mandatory fields

<sup>o</sup> It is the responsibility of the user to ensure that the latest version is used. The latest version will be published on our website.<sup>¶</sup>

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Form-No.: <sup>¶</sup> APP-REG-FORM-CLTC-SC <sup>o</sup>		
Effective-Date: <sup>¶</sup> 1-April-2018 <sup>o</sup>		
Rev-no.: <sup>o</sup>		

Form R-03-ER-8C<sup>¶</sup>

### Engineering Report (ER)<sup>¶</sup>

<sup>¶</sup> Use this form to report in about 100 words per criterion under Outcomes 1 to 11 below on a recent engineering task, part of a project or complete project to which the applicant has made a significant contribution. The report may cover conceptualization, design and analysis, specification, tendering and adjudication, manufacturing, project and construction management, commissioning, maintenance, measurement and testing or planning at a specifically defined level. Please also provide a sample network calculations, drawings, etc. as an addendum which is limited to two A4 pages.<sup>¶</sup>

<sup>¶</sup> Use Appendix A of the Discipline Specific Training Guide R-05-CLTC-SC to assist in the interpretation of the criteria<sup>¶</sup>

Name of Applicant: → <input type="text"/>	
Detail of Equipment Applicable and/or Work Responsibility: (<30 words) <sup>o</sup>	<input type="text"/>
Date of Work Done: <sup>o</sup>	<input type="text"/>
Engineering brief and objective: (<30 words) <sup>o</sup>	<input type="text"/>
Environment: Industry; Laboratory; Theory; Simulation, etc. in <15 words) <sup>o</sup>	<input type="text"/>
Short Summary: <sup>¶</sup> (State engineering/management problems; solutions in <30 words) <sup>o</sup>	<input type="text"/>
Budget: (<10 words) <sup>o</sup>	<input type="text"/>

..... Section Break (Not Page) .....

<sup>o</sup> It is the responsibility of the user to ensure that the latest version is used. The latest version will be published on our website.<sup>¶</sup>

Page 13 of 28 <sup>a</sup>	<p style="text-align: center;"><b>SPECIFIED-CATEGORY- PRACTITIONER-A-S-A- REGISTERED-CIVIL- LABORATORY-TECHNICAL- CONTROLLER<sup>a</sup></b></p> 
Form-No.: APP-REG-FORM-CLTC-SC <sup>a</sup>	
Effective-Date: 1-April-2018 <sup>a</sup>	
Rev-no.: 0 <sup>a</sup>	

**Specifically-defined-engineering-problems** have the following characteristics:<sup>†</sup>

a) → can be solved mainly by specific practical engineering knowledge, underpinned by related theory;<sup>†</sup>  
 → and one or more of:<sup>†</sup>

b) → are largely defined but may require feedback;<sup>†</sup>

c) → are discrete, specifically-focused tasks within engineering systems;<sup>†</sup>

d) → are routine, frequently-encountered and in familiar specified and sustainable context;<sup>†</sup>  
 → and one or more of:<sup>†</sup>

e) → can be solved by standardised or prescribed ways;<sup>†</sup>

f) → are encompassed by specific standards, codes, legislation and documented procedures; requires authorisation to work outside limits;<sup>†</sup>

g) → information is concrete specific and largely complete, but requires checking and possible supplementation;<sup>†</sup>

h) → involve specific issues but few of these imposing conflicting constraints and a specific range of interested and affected parties;<sup>†</sup>  
 → and one or both of:<sup>†</sup>

i) → requires practical judgement in specific practice area in evaluating solutions, considering interfaces to other role-players;<sup>†</sup>

j) → have consequences which are locally important but within a specified category (wider impact you dealt with by others).<sup>†</sup>

**Specifically-defined-engineering-activities** have several of the following characteristics:<sup>†</sup>

a) → Scope of specific practice area is defined by specific techniques applied; change by adopting new specific techniques into current practice;<sup>†</sup>

b) → Practice area is located within a wider, complex context with specifically-defined working relationships with other parties and disciplines;<sup>†</sup>

c) → Work involves specific familiar resources, including people, money, equipment, materials, technologies;<sup>†</sup>


d) → Require resolution of interactions manifested between specific technical factors with limited impact on wider issues;<sup>†</sup>

e) → Are constrained by operational context, defined work package, time, finance, infrastructure, resources, facilities, standards and codes, applicable laws;<sup>†</sup>

f) → Have risks and consequences that are locally important but are generally not far reaching.<sup>†</sup>

<b>Outcomes and Criteria<sup>a</sup></b>	
<b>Outcome-1: Define, investigate and analyse specifically-defined engineering problems encountered in the applicant's work:<sup>a</sup></b>	
1.1 State how you understood the activity as agreed to with the client (or your supervisor). <sup>†</sup>	"
1.2 Describe how you analysed and clarified information, drawings, codes, procedures, etc. <sup>†</sup>	"
<b>Outcome-2: Design, develop, plan or practise solutions to specifically-defined engineering problems (tasks) encountered in the applicant's work:<sup>a</sup></b>	
2.1 Describe how you developed and analysed alternative approaches to do the work, impacts and sustainability checked. (Calculations attached). <sup>†</sup>	"
2.2 State what the final solution to perform the work was, client or the applicant's supervisor in agreement. <sup>†</sup>	"
<b>Outcome-3: Comprehend and apply knowledge embodied in established specific engineering practices and knowledge specific to the field in which the applicant practice:<sup>a</sup></b>	
3.1 State what Higher Certificate level <u>you</u> identified <u>procedures and systems</u> you used to execute the work, and how Higher	"

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Certificate level theory was applied to understand and/or verify these procedures. <sup>†</sup>	"
3.2 Give <u>you</u> own Higher Certificate level theoretical calculations and/or reasoning on why the application of this theory <u>is correct</u> (Actual examples attached). <sup>†</sup>	"
<b>Outcome-4: Manage part or all of one or more specifically-defined engineering activities embodied in the applicant's work:<sup>a</sup></b>	
4.1 State how you managed yourself, priorities, processes and resources in doing the work (e.g. bar chart). <sup>†</sup>	"
4.2 Describe your role and contribution in the work team. <sup>†</sup>	"
<b>Outcome-5: Communicate clearly with others in the course of the applicant's engineering activities (specifically-defined engineering work):<sup>a</sup></b>	
5.1 State how you presented your point of view and compiled reports after completion of the work. <sup>†</sup>	"
5.2 State how you compiled and issued instructions to subordinates working on the same task. <sup>†</sup>	"
<b>Outcome-6: Recognise the reasonably foreseeable social, cultural, environmental and sustainability effects of the applicant's specifically-defined engineering activities generally:<sup>a</sup></b>	
6.1 Describe the social, cultural, long term sustainability and environmental impact of this engineering activity. <sup>†</sup>	"
6.2 State how you communicated mitigating measures to affected parties and acquired stakeholder engagement. <sup>†</sup>	"
<b>Outcome-7: Meet all legal and regulatory requirements, protect the health and safety of persons and adhere to sustainable practices in the course of the applicant's engineering activities:<sup>a</sup></b>	
7.1 List the major laws and regulations, safety requirements, standards and sustainability practices applicable to the <u>particular activity</u> . <sup>†</sup>	"
7.2 State how you did risk management and used safe and sustainable materials, components and systems, obtaining advice if necessary. <sup>†</sup>	"
<b>Outcome-8: Conduct engineering activities ethically in executing the applicant's work:<sup>a</sup></b>	
8.1 State how you identified ethical issues and affected parties and their interest and what you did about it when a problem arose. <sup>†</sup>	"
8.2 Confirm that you are conscient and in compliance with ECSA's Code of Conduct and why this is important in your work. <sup>†</sup>	"
<b>Outcome-9: Exercise sound judgement in the course of specifically-defined engineering activities encountered in the applicant's work:<sup>a</sup></b>	
9.1 State the factors applicable to the work, their interrelationship and how you applied the most important factors. <sup>†</sup>	"

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Form-No.: <sup>o</sup> APP-REG-FORM-CLTC-SC <sup>o</sup>		
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9.2 Describe how you foresee work consequences and evaluated situations in the absence of full evidence.#	#
<b>Outcome-10: Be responsible for making decisions on part or all of one or more specifically defined engineering activities included in the applicant's work.</b>	
10.1 Show how you used Higher Certificate level theoretical calculations to justify decisions taken in doing engineering work. (Attach actual calculations).#	#
10.2 State how you took responsible advice on any matter falling outside your own education and experience.#	#
10.3 Describe how you took responsibility for your own work and evaluated any shortcoming in it or her output.#	#
<b>Outcome-11: Undertake independent learning activities sufficient to maintain and extend the applicant's competence.</b>	
11.1 State what strategy you have independently adopted to enhance his or her own development.#	#
11.2 State the philosophy of your employer to <del>assist</del> <b>assist</b> your development.#	#
Evidence of the applicant's competency development plan and independent learning ability must be given in the Initial Professional Development Report, Form R-03-IPD-SC.#	

Signature of Applicant: \_\_\_\_\_ Date: \_\_\_\_\_

Signature of Mentor/Supervisor: \_\_\_\_\_

Name of Mentor/Supervisor printed: \_\_\_\_\_ Tel.No.: \_\_\_\_\_


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Rev-no.: <sup>o</sup> 0 <sup>o</sup>		

Form: R-06-8D3RR-CLTC<sup>o</sup>

### Sub-Discipline-Specific Requirements Report (SDSRR)

Use this form to report in about 100 words per statement under Requirements 1 to 6 below on the applicant's personal knowledge about the requirements.

Surname and Initials: <sup>o</sup>	
<b>DISCIPLINE-SPECIFIC-COMPETENCE-REQUIREMENT 5: <sup>o</sup></b>	
There is a critical need in the industry to identify people who are able to conduct the essential operations associated with analysis and issuing of Civil Laboratory Test Results. This will lead to competence in the field of work and thereby add value to the industry and improve the economy of the country. It will also lead to a balanced society in that learners will understand how the work they do fits into the greater engineering industry.	
<b>Requirement 1: Communicate at work: <sup>o</sup></b>	
1.1 State how you maintained and adapted your oral communication as required to promote effective interaction in a work context.#	#
1.2 State how you accessed information from reading instructions, visual information and a range of other workplace tools and how you responded appropriately within the context.#	#
1.3 State how you complied written communication that was clear and unambiguous and at an appropriate level for designated target audiences.#	#
<b>Requirement 2: Use mathematics and statistics in real-life situations: <sup>o</sup></b>	
2.1 Describe how you used mathematical functions correctly to solve routine workplace problems and tasks.#	#
2.2 Describe how you interrogated findings on life-related problems in terms of their cause and solution.#	#
2.3 State how you effectively and accurately applied mathematical techniques in real life situations.#	#
<b>Requirement 3: Interpolate Materials Properties from Test Result: <sup>o</sup></b>	
3.1 Describe how you established the requirement for 'test of certain properties' tests. (Actual examples attached).#	#
3.2 State how you validate results before you sign and issue test results.#	#
3.3 Give your estimation of Materials Properties values based on related test results. (Actual examples attached).#	#
<b>Requirement 4: Take responsibility for the implementation of Quality Assurance for a Test Result: <sup>o</sup></b>	
4.1 Describe how you made sure your inspections comply with laboratory test practice requirements.#	#
4.2 State how you understood the relevance of SANS and SANS.	#

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Form No.: <sup>1</sup> APP-REG-FORM-CLTC-SC <sup>o</sup>		
Effective Date: <sup>1</sup> 1-April-2018 <sup>o</sup>		
Rev-no:-0 <sup>o</sup>		

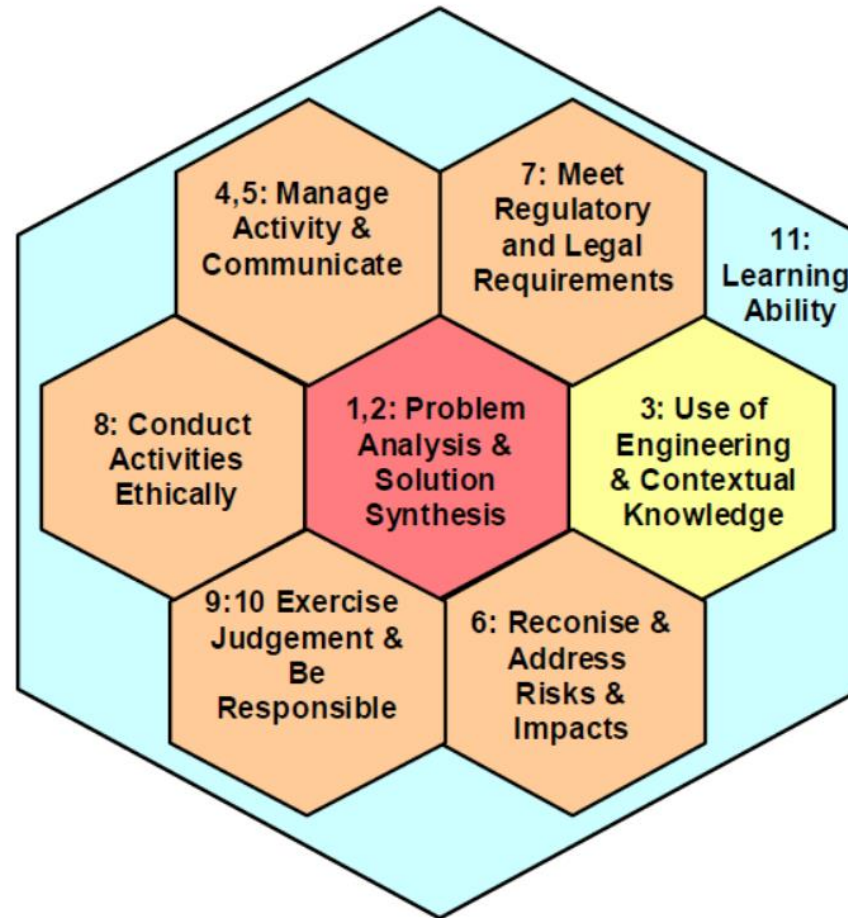
requirements should be met in the laboratory.#	
4.3 Describe how you identified unsafe working conditions and how you took corrective actions.#	<input type="checkbox"/>
4.4 State how you limited access to the workplace to involved personnel only.#	<input type="checkbox"/>
4.5 Describe how you linked test results to established QA procedures and test methods. (Actual examples attached)#	<input type="checkbox"/>
<b>Requirement 5: Produce and maintain administrative reports.<sup>o</sup></b>	
5.1 Describe how you generate, store and review reports.#	<input type="checkbox"/>
5.2 Describe how you have used different paths for obtaining information for schedules.#	<input type="checkbox"/>
5.3 State how you implemented corrective action to improve quality of work conducted in the laboratory.#	<input type="checkbox"/>
5.4 State how you used administrative reports in providing administrative and financial control of the laboratory.#	<input type="checkbox"/>
<b>Requirement 6: Manage Laboratory output.<sup>o</sup></b>	
6.1 State how you prioritised tasks to meet testing timelines and specific requirements.#	<input type="checkbox"/>
6.2 State how you used an analysis of work requirements to <u>assess</u> with relevant business plans and microenvironment.#	<input type="checkbox"/>
6.3 State how you identified potential risks that may affect laboratory performance and what appropriate actions you took.#	No entry required. Assessment will be done against evidence submitted in item 7.2 of the Engineering Report.(Form R-03-ER-SC).#
6.4 List the legislation that may impact on your work environment.#	No entry required. Assessment will be done against evidence submitted in item 7.1 of the Engineering Report.(Form R-03-ER-SC).#
6.5 Describe how you ordered and procured laboratory requirements in advance of being required.#	<input type="checkbox"/>

Signature of Appliant:- \_\_\_\_\_ Date:- → → → →

Signature of Mentor/Supervisor:- \_\_\_\_\_

Name of Mentor/Supervisor printed:- → → → → Tel.No:- → → → →

# Engineering Competence



**Figure 3: Visualising the interconnectedness of the outcomes that are evidence of engineering competence.**

# Sub-Discipline-Specific Requirements

1	Communicate at Work
2	Use mathematics and statistics in real life situations
3	Interpolate Materials Properties from Test Result
4	Take responsibility for the Implementation of Quality Assurance for a Test Result
5	Produce and maintain administrative reports
6	Manage Laboratory Output

Progress made



Progress made



Thank you