



ECOSA

ENGINEERING COUNCIL OF SOUTH AFRICA



An Effective Regulator Assuring Engineering Excellence

Sub Discipline-specific Training Guide for Civil Laboratory Technical Controller

R-05-CLTC-SC

REVISION 1: 06 August 2025

ENGINEERING COUNCIL OF SOUTH AFRICA

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DEFINITIONS

Alternative Route: Refers/applies to an applicant who does not have the accredited or recognised qualification(s) to be registered in a Professional Category but who proposes to meet the educational requirement through assessment.

Benchmark Route: The normal process to attain registration, which consists of the completion of an accredited, recognised or evaluated substantially equivalent qualification and a well-structured and effectively executed programme of training and experience for the category of registration.

Competency area: The performance area where all the outcomes can be demonstrated in an integrated manner at the level prescribed in a specific technology.

Engineering problem: A problematic situation that is amenable to analysis and solution using engineering sciences and methods.

Engineering science: A body of knowledge based on the natural sciences and using mathematical formulation where necessary that extends knowledge and develops models and methods to support its application, to solve problems and to provide the knowledge base for engineering specialisations.

Ill-posed problem: Problems whose requirements are not fully defined or may be defined erroneously by the requesting party.

Integrated performance: An overall satisfactory outcome of an activity requires several outcomes to be satisfactorily attained. For example, a design will require analysis, synthesis, analysis of impacts, checking of regulatory conformance and judgement in decisions.


Level descriptor: A measure of performance demands at which outcomes must be demonstrated.

Management of engineering works or activities: The coordinated activities required to

- (i) direct and control everything that is constructed or results from construction or manufacturing operations;
- (ii) operate engineering works safely and in the manner intended;
- (iii) return engineering works, plants and equipment to an acceptable condition by the renewal, replacement or mending of worn, damaged or decayed parts;

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- (iv) direct and control engineering processes, systems, commissioning, operation and decommissioning of equipment; and
- (v) maintain engineering works or equipment in a state in which it can perform its required function.

Over-determined problem: A problem whose requirements are defined in excessive detail, making the required solution impossible to attain in all of its aspects.

Outcome: A statement of the performance that a person must demonstrate in order to be judged competent at the *specified category* level.

Practice area: A generally recognised or distinctive area of knowledge and expertise developed by an Engineering Practitioner by virtue of the path of education, training and experience followed.


Range statement: The required extent of or limitations on expected performance stated in terms of situations and circumstances in which outcomes are to be demonstrated in a particular competency area.

Specified Category: A category of registration for persons who must be registered through the Engineering Profession Act or a combination of the Engineering Profession Act and external legislation as having specific engineering competencies normally at NQF Level 5 and relating to an identified need to protect public safety, health and interest or the environment in relation to an engineering activity.

Sustainable development: Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

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BACKGROUND

Figure 1 below defines the documents that comprise the Engineering Council of South Africa (ECSA) system for registration in specified categories. The illustration also locates the current document.

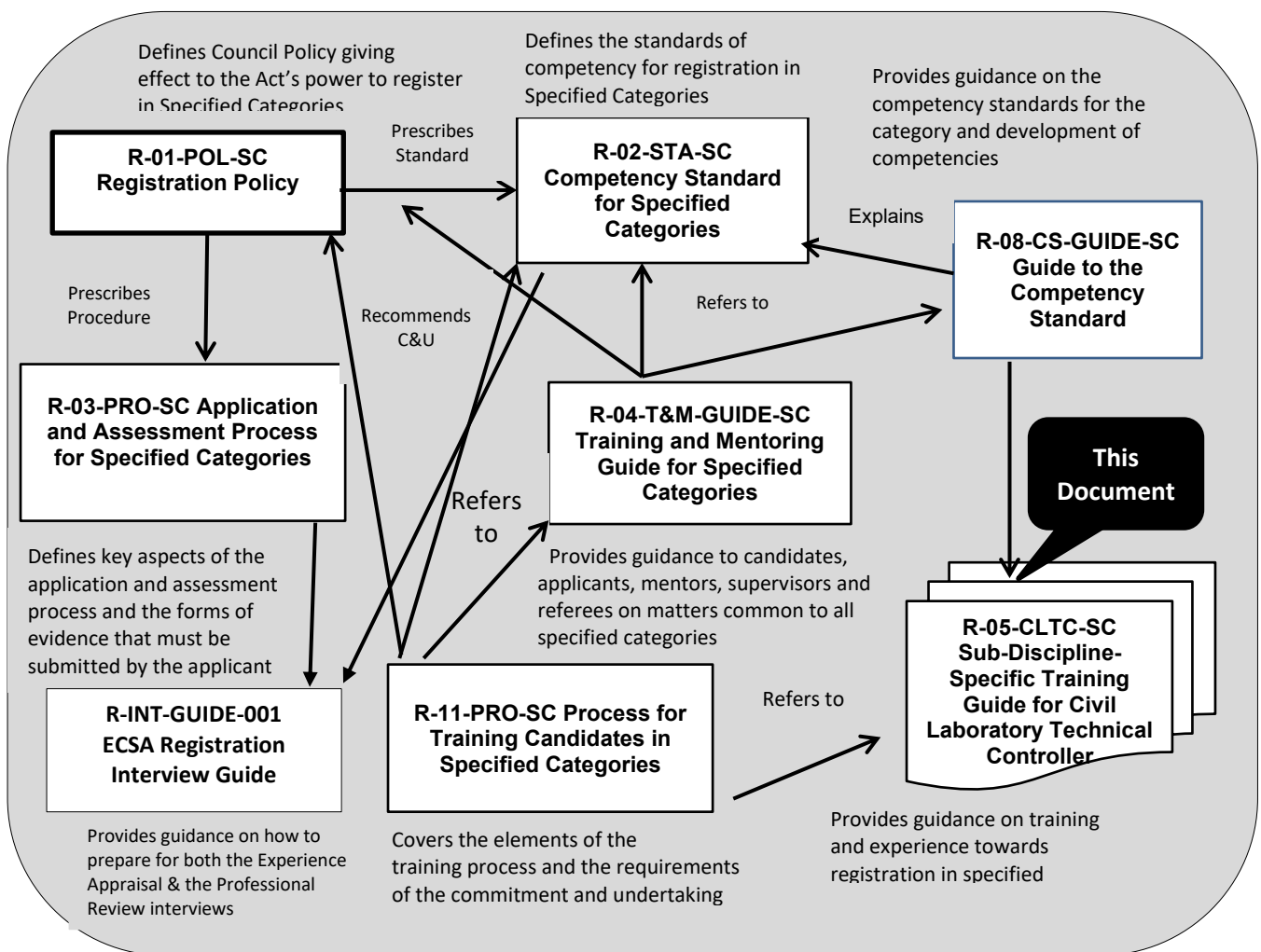



Figure 1: Documents defining the ECSA Registration System for Specified Categories

1. PURPOSE OF THIS DOCUMENT

All persons applying for registration in the Specified Category for Civil Laboratory Technical Controller (CLTC) are expected to demonstrate the competencies specified in document **R-02-STa-SC** through work performed at the prescribed level of responsibility, irrespective of the

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type of materials that are applicable.

This document supplements the generic *Training and Mentoring Guide* (document **R-04-T&M-GUIDE-SC**) and *the Guide to the Competency Standards for Registered Specified Category Practitioners* (document **R-08-CS-GUIDE-SC**).

In document **R-04-T&M-GUIDE-SC**, attention is drawn to the following sections:

Duration of training and period working at level required for registration

Principles of planning training and experience

Progression of training programme

Documenting training and experience

Demonstrating responsibility

Document **R-08-CS-GUIDE-SC** provides both a high-level and an outcome-by-outcome understanding of the competency standards that form an essential basis for this discipline-specific guide.

This guide, and documents **R-04-T&M-GUIDE-SC** and **R-08-CS-GUIDE-SC** are subordinate to the Policy on Registration (document **R-01-POL-SC**), the Competency Standard (document **R-02-STA-SC**) and the definition of the application process (document **R-03-PRO-SC**).

2. AUDIENCE


This guide is directed towards candidates and their supervisors and mentors in the discipline of Civil Engineering and Civil Engineering Materials Testing Laboratories. The guide is intended to support a programme of training and experience incorporating good practice elements.

This guide applies to persons who have

1. completed the education requirements by obtaining at least an accredited NQF Level 5 Higher Certificate (Engineering) type qualification or through evaluation/assessment;
2. registered as a Candidate Specified Category Practitioner;

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3. embarked on a process of acceptable training under a registered Commitment and Undertaking (C&U) with a Mentor guiding the professional development process at each stage; or
4. not completed the benchmark academic qualification (HCert or equivalent or a Completed Apprenticeship). This application will be considered through the alternative route. The difference must be compensated by extended periods of engineering experience.

3. PERSONS NOT REGISTERED AS A CANDIDATE OR NOT TRAINING UNDER A COMMITMENT AND UNDERTAKING

All applicants for registration must present the same evidence of competence and be assessed against the same standards irrespective of the development path followed. Application for registration as a Specified Category Practitioner is permitted without being registered as a Candidate Specified Category or without training under a C&U. Mentorship and adequate supervision are, however, key factors in effective development to the level required for registration. A C&U indicates that the company is committed to mentorship and supervision.

If the trainee's employer has not signed a C&U, the trainee should establish the level of mentorship and supervision that the employer is able to provide. In the absence of an internal mentor, the services of an external mentor should be secured. The recognised Voluntary Association (VA) for the sub-discipline should be consulted for assistance in locating an external mentor.

A mentor should be in place at all stages of the development process.


This guide is written for the recent graduate who is training and gaining experience towards registration. Mature applicants for registration may apply the guide retrospectively to identify possible gaps in their development.

Applicants who have not enjoyed mentorship are advised to request an experienced mentor (internal or external) to act as an application adviser while they prepare their application for registration.

The guide may be applied in the case of a person moving into a candidacy programme at a later stage that is at a level below that required for registration (see document **R-04-T&M-GUIDE-SC**).

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4. TESTING AND ANALYSIS OF CIVIL ENGINEERING MATERIALS

Registered *Civil Laboratory Technical Controllers (CLTCs)* conduct tests on civil engineering construction materials and interpret, analyse and ensure the validity of test results.

Examples of materials tested in the Civil Engineering Materials Laboratory are Soils and Gravels, Aggregates, Bitumen, Concrete, Asphalt, Cement and Geotechnical samples.

Each material type has a range of properties that is determined in a laboratory through various tests. The interrelations between the various properties and the manifestation thereof on the results from various tests need to be evaluated and analysed. The Registered CLTC will evaluate and analyse the accuracy and relevance of the test results relative to the actual materials tested.

Some of the obvious advantages are as follows:

- The Registered CLTC proactively investigates test reports and ensures correctness of results used by engineering professionals.
- A registered CLTC offers trustworthy constructive advice or service to the industry within his/her field of competence.
- The registered CLTC must remain abreast of new developments through Continuing Professional Development (CPD).
- Easy access to the CLTCs via known details could involve them in assisting with the development of standards and regulations.
- Registered CLTCs will receive recognition from the industry.


5. MANAGER ABILITY AND COMPETENCES

Registered CLTCs will be able to perform Laboratory Management through production planning, progress monitoring, implementing a quality control system, liaising with clients, reviewing and signing reports before issuing the results.

6. TRAINING IMPLICATIONS OF THE NATURE AND ORGANISATION OF THE

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INDUSTRY

Civil Laboratory Technical Controllers may be employed in both the private and public sector. In the private sector, they are typically involved in laboratories that provide services and material testing for contractors and consulting engineering organisations. Civil Engineering Consultancies are generally appointed to develop and design civil works for which material investigations are conducted by laboratories. The CLTCs will conduct the investigation on site and carry out field testing. The Civil Engineering Contractor constructs the civil works according to prescribed designs and the standards of the materials. The laboratory issues test results to which engineering professionals verify that the materials used in the construction meet the specifications. The CLTC issues the process control and acceptance control results for the materials tested.

The public sector is responsible for service delivery and is usually the client although in some departments, construction is also performed. Civil Laboratory Technical Controllers are required at all levels of the public sector, including national, provincial and local government level and levels within state-owned enterprises and public utilities. In the public sector, CLTCs generally handle the overseeing of the implementation, operations and maintenance of infrastructure in state-owned laboratories.

An extension of the public sector includes tertiary academic institutions and research organisations.

6.1 Interrelations of Specific Material Types Recognised for Registration as a Civil Laboratory Technical Controller


Depending on the nature of the business of each employer, Candidate CLTCs will select one or more material types for the purpose of registration as a CLTC. The material types and a number of interrelated properties for each type are given in **Appendix A**.

6.2 Ability to Provide Complete Training for Civil Laboratory Technical Controllers

Depending on where the candidate is employed, there may be situations in which the in-house opportunities are not sufficiently diverse to develop all the competencies required in all the groups noted in document **R-02-STA-SC** and in **Appendix B**. For example, the opportunities for developing

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problem-solving competence (including design or developing solutions) and for managing engineering activities (including implementing or constructing solutions) may not both be available to the candidate. In such cases, employers are encouraged to put a secondment system in place.

It is fairly common practice that in situations where an organisation is not able to provide training in certain areas, secondments are arranged with other organisations so that the candidate is able to develop all the competencies required for registration. These secondments are usually of a reciprocal nature so both the employers and their respective employees mutually benefit. Secondments between commercial and suppliers' laboratories and between the public and private sector should be possible.

Problem-solving is the essence of engineering. It is a logical thinking process that requires CLTCs to apply their minds diligently in bringing solutions to technically and specifically defined problems.

This process involves the analysis of the material results and the integration of various elements in civil (materials) engineering as applied to the investigation of materials and construction control testing through the application of basic and engineering sciences.

6.3 Work Categories to Obtain Problem-Solving Experience

6.3.1 Design or Development

Examples of acceptable design or development include the following:


- Development of concrete mix designs with materials evaluated and analysed
- Development of asphalt mix designs with materials evaluated and analysed
- Development of soil stabilisation or modification mix designs with materials evaluated and analysed
- Development of spray seal and slurry mix designs with materials evaluated and analysed

6.3.2 Operations

Operations deal with both the investigating and the testing of materials in existing civil structures and various sources of construction. The process and acceptance/quality control testing on material in

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the construction industry also forms part of the operations in which the Candidate CLTC will partake.

In performing the abovementioned work, the CLTCs apply engineering judgement to all the work they do in the management of operations. This may include the ability to assess material designs against set criteria.

6.3.3 Research and Development

This type of work may be performed in research and product development centres of business organisations or within academic institutions. Candidate CLTCs must participate in research and development work that is predominantly of a civil engineering nature and this work must include the application of the various aspects of Materials Engineering, including product or system testing under controlled experimental conditions.

7. DEVELOPING COMPETENCY: ELABORATING ON SECTIONS IN THE GUIDE TO THE COMPETENCY STANDARD (R-08-CS-GUIDE-SC)

Applicants are required to demonstrate insight and the ability to use and interface various aspects through verifiable performance in providing engineered solutions to practical specifically defined problems experienced in their operating work environment. In addition, applicants must develop the skills required to demonstrate the use of applicable engineering knowledge in optimising the efficiency of operations.

Candidate CLTCs must be able to demonstrate that they have been actively involved in a Civil Engineering Materials Testing Laboratory environment and have participated in the execution of practical work to the extent that they have learnt sufficient details on basic Materials Engineering to be able to exercise judgement in the workplace.


What is a sufficiently specifically defined engineering problem?

The definition of a specifically defined engineering problem can be summarised as follows:

Composed of *inter-related conditions*; requiring *underpinning methods, procedures and technique judgement* to create a solution within a set of *specifically defined conditions*.

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Design or development is a logical thinking process that requires CLTCs to apply their minds carefully in bringing solutions to specifically defined problems. This process involves the analysis of various material components and the integration of various elements in engineering through the application of basic and engineering sciences.

Simple, straightforward calculation exercises and graphical representations from computer-generated data are considered sufficiently specifically defined engineering design or development.

As part of demonstrating the application of theoretical knowledge, applicants must incorporate calculations with clearly defined inputs to the formulae used and detailed interpretation of the results obtained. They must demonstrate how the calculated results were used to provide the solution to the problem at hand and indicate the economic benefit to the project or the operating work environment.

Candidate CLTCs must obtain experience in solving a variety of problems in their work environment, and the solution to these problems should involve the use of fundamental engineering knowledge obtained through an accredited engineering programme. The problems that require a scientific and engineering approach to solve may be encountered in the work that is required to be done in Civil Engineering Materials Testing Laboratories. From their early training years, candidates must actively seek opportunities to obtain experience in the area of synthesising solutions to real-life engineering problems encountered in the workplace of Civil Engineering Materials Testing Laboratories.


A suitable period of time and degree of practical participation should be sought in the laboratory environment to learn the basic practices that are the essence of the civil (materials) discipline so that the Candidate CLTC is capable of judging the efficacies of such practices in the general workplace thereafter.

7.1 Contextual Knowledge

Candidates are expected to be aware of the requirements of the engineering profession. Among the functions and services of the recognised VA's applicable to the CLTC is the provision of a broad range of contextual knowledge not only for the Candidate CLTC but also through the full career path of the Registered CLTC.

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The practice area of the CLTC identifies specific contextual activities that are considered essential in the competence development of the CLTC. These include awareness of basic laboratory and construction activities and the competencies required of the Engineer, Technologist, Technician, CLTC and Materials Tester. Exposure to practice in these areas will be identified in each programme within the employer environment.

The Registration Committee of the ECSA with its discipline-specific assessing team on Civil Engineering Materials Testing Laboratories performs the review of the portfolio of evidence of the Candidate CLTC at the completion of the training period.

7.2 Functions Performed

Special considerations in the Civil Engineering Materials Testing Laboratories group must be given to the competencies specified in the following groups:

- A: Knowledge-based problem-solving
- B: Management and communication
- C: Identifying and mitigating the impacts of engineering activity
- D: Judgement and responsibility
- E: Independent learning
- F: Materials Testing Sub-Discipline-Specific Requirements


It is very useful to measure the progression of the candidate's competency by making use of the Degree of Responsibility scales as specified in document **R-04-T&M-GUIDE-SC**.

Appendix B was developed to align the progression of the CLTC with the Degree of Responsibility Scale.

It should be noted that the Candidate CLTC working at Responsibility Level E carries a responsibility for work performed that is appropriate to that of a registered person except that the supervisor of the Candidate CLTC is accountable for the Candidate's recommendations and decisions.

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7.3 Industry-Related Statutory and Other Requirements

Candidates are expected to have a working knowledge of the following regulations, Acts and standards, and how they affect their working environment:

- OHS Act – Occupation Health and Safety Act, 1993 (Act No. 85 of 1993), as amended by Act No. 181 of 1993
- Environment Conservation Act, 1989 (Act No. 73 of 1989), as amended by Act No. 52 of 1994 and Act No. 50 of 2003
- Labour Relations Act, 1995 (Act No. 66 of 1995) as amended
- Industry-specific work instructions
- SANS and other international standards such as ISO, EN, DIN or US Federal Standards. (refer to **Appendix A**)

Many other Acts not listed here may also be pertinent to the work environment of a Candidate CLTC. The Candidate CLTC will be expected to have a basic knowledge of the applicable Acts and to investigate whether any Acts are applicable to a particular work environment.


7.4 Recommended Formal Learning Activities

The following is a list of some useful course types for formal learning:

- CPD courses on specific disciplines and equipment types
- Elementary Project Management
- Negotiation Skills
- Risk Analysis
- Quality Systems
- Occupation Health and Safety
- Maintenance Engineering
- Environmental Impacts
- Report Writing and Communication
- Planning Methods

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8. PROGRAMME STRUCTURE AND SEQUENCING

8.1 Best Practice

There is no ideal training programme structure or unique sequencing that constitutes best practice. The training programme for each Candidate CLTC will depend on the work opportunities that are available at the time for the employer to assign to the candidate.

It is suggested that Candidate CLTCs work with their mentors to select appropriate equipment for gaining exposure to the eventual responsibility of inspection and testing of materials.

The training programme should be such that the Candidate CLTC progresses through the levels of work capability described in document **R-04-T&M-GUIDE-SC** so that by the end of the training period, the Candidate CLTC is able to perform individually and as a team member, meeting the engineering outcomes and the discipline-specific requirements at the level required for registration and exhibiting the Degree of Responsibility E.


The nature of work and the degrees of responsibility defined in document **R-04-T&M-GUIDE-SC** are presented here and in **Appendix B**.

A: Being Exposed	B: Assisting	C: Participating	D: Contributing	E: Performing
Undergoes induction; observes processes; work of competent practitioner	Performs specific processes under close supervision	Performs specific processes as directed with limited supervision	Performs specific work with detailed approval of work outputs	Works in team without supervision; recommends work outputs; responsible but not accountable
Responsible to supervisor	Limited responsibility for work output	Full responsibility for supervised work	Full responsibility to supervisor for immediate quality of work	Level of responsibility to supervisor is appropriate to that of a registered person; supervisor is accountable for applicant's decisions

The Mentor and the Candidate CLTC must identify the level of responsibility at which an activity is compliant with and demonstrates the various outcomes. Evidence of the candidate's activities is

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recorded on the appropriate system such that it meets the requirements of the Training Elements indicated in **Appendix B**. The ECSA will specify the applicable recording system on the Application for Registration form (usually an Engineering Report with the associated Inspection and Test Report).

8.2 Orientation Requirements

The following list presents examples of orientation requirements:

- Introduction to Company
- Company Safety Regulations
- Company Code of Conduct
- Company Staff Code and Regulations
- Company records and record keeping
- Typical functions and activities
- Quality Management System

8.3 Realities

It is unlikely that the period of training will be only three years, which is the minimum time required by the ECSA irrespective of the materials type(s). Typically, it will be longer and is determined by the availability of functions in the actual work situation and other requirements.


Each candidate will effectively undertake a unique programme in which the various activities carried out at the discipline-specific level are linked to the generic competency requirements stipulated in document **R-08-CS-GUIDE-SC** and the **Compulsory Discipline-Specific Requirements to be met during the Candidacy Programme**.

8.4 Considerations for generalists, specialists, researchers and academics

The document **R-08-CS-GUIDE-SC** adequately describes what would be expected of persons

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whose formative development has not followed a conventional path, for example, academics, researchers, specialists and those who have not followed a candidate training programme.

The overriding consideration is that, irrespective of the route followed, the applicant must provide evidence of competence against the standard and the **Discipline-Specific Requirements**.

8.5 Moving Into or Changing Candidacy Programmes

This guide assumes that the Candidate CLTC enters a programme after graduation and continues with the programme until ready to submit an application for registration. It also assumes that the Candidate CLTC is supervised and mentored by persons who meet the requirements stipulated in document **R-04-T&M-GUIDE-SC**.

In the case of a person changing from one candidacy programme to another or moving into a candidacy programme from a less structured environment, it is essential that the following steps are completed:


- The Candidate CLTC must complete the Training and Experience Summary (TES) and Training and Experience Reports (TER) for the previous programme or unstructured experience. In the latter case, it is important to reconstruct the experience as accurately as possible. The TERs must be signed off.
- On entering the new programme, the Mentor and Supervisor should review the development of the Candidate CLTC, accounting for past experience and the opportunities and requirements of the new programme and plan at least the next phase of the candidate's programme.
- The Candidate CLTC must complete the Discipline-Specific Requirements Report (DSRR) on elements already covered during the first part of the candidacy.

8.6 Compulsory Discipline-Specific Requirements to be met during the Candidacy

During candidacy, candidates, assisted by Mentors and Supervisors, must ensure that they are conversant with the practical knowledge set out in **Form R-05-DSRR-CLTC** and submit evidence as such in the DSRR that forms part of the Application for Registration form.


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REVISION HISTORY

Revision Number	Revision Date	Revision Details	Approved By
Concept A	19 Feb 2016	Needs input from CLTC Registration Committee and CRC Specified Category Working Group	CRC Working Group
Concept B	20 Oct 2016	Input from industry incorporated	COTO MTC & NLA-SA public participation
Concept B	30 Jan 2017	Approved subject to name change from CLM to CLTC	PDSGC
Concept B	6 Feb 2017	Noted and approved	CRC
Concept B	16 Mar 2017	Approved	Council
Rev. 0 Draft A	07 May 2021	Routine review by the Division	Executive RPS
Rev. 0	20 May 2021	Approval	RPSC
Rev. 1 Draft A	28 March 2025	The document has been updated to ensure alignment with the Policy and Standards Framework on ECSA Policies.	RIDR Business Unit
Rev. 1 Draft B	16 May 2025	Reviewed and checked	Acting Executive: RSIR
Rev. 1	06 Aug 2025	Approval	RPSC

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The Sub-Discipline-Specific Training Guide for:
Civil Laboratory Technical Controller

Revision 1 dated 06 August 2025 and consisting of 36 pages has been developed for adequacy by the Business Unit Assistant Manager and is approved by the Acting Executive: Regulatory Services & International Relations (**RSIR**).

.....
Business Unit Assistant Manager

08 October 2025
.....
Date


.....
Acting Executive: **RSIR**

08 October 2025
.....
Date

This definitive version of this policy is available on our website.

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Discipline-Specific Requirements Report


Form R-05-DSRR-CLTC

Surname and Initials:

DISCIPLINE-SPECIFIC KNOWLEDGE REQUIREMENTS	
There is a critical need in the industry to identify people who are able to conduct the essential operations associated with the 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 since learners will understand how the work they do fits into the greater engineering industry.	
1.	Communicate at work
1.1	Oral communication is maintained and adapted as required to promote effective interaction in a work context.
1.2	Where required, information appropriate to the context is accessed from standing instructions, visual information and a range of other workplace texts and responses.
1.3	Written communication is clear, unambiguous and at an appropriate level for designated target audiences.
2.	Use Mathematics and Statistics in real-life situations
2.1	Mathematical functions are used correctly to solve routine workplace problems and tasks.
2.2	Life related problems are interrogated in terms of their cause and solution.
2.3	Mathematical techniques are effectively and accurately applied in real-life situations.
3.	Interpolate Materials Properties from Test Result
3.1	Establish the requirement for retesting certain properties.
3.2	Issue and sign valid results.
3.3	Provide an estimation of the values of the Materials Properties based on related test results.
4.	Take responsibility for the Implementation of Quality Assurance for a Test Result
4.1	Inspections comply with laboratory best-practice requirements.
4.2	Understanding of the relevant OHS and SANS requirements is demonstrated.
4.3	Unsafe conditions are identified and corrective actions are taken.
4.4	Access to workplace is limited to involved personnel only.
4.5	Test results are linked to established Quality Assurance (QA) procedures and test methods.
5.	Produce and maintain administrative reports
5.1	Reports are generated, stored and retrieved.
5.2	Different paths are used for obtaining information for schedules.
5.4	Corrective action is implemented to improve quality of project work.
5.5	Reports are used in providing administrative and financial control of the business.
6.	Manage Laboratory output
6.1	Tasks are prioritised to meet testing timeframes and specific requirements.
6.2	Analyses of work requirements are compared with relevant business plans and the microenvironment.
6.3	Potential risks that may affect laboratory performance are recognised and appropriate actions are taken.

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EXAMPLES OF INTERRELATIONSHIPS BETWEEN SPECIFIC MATERIAL TYPES RECOGNISED FOR REGISTRATION AS A CIVIL LABORATORY TECHNICAL CONTROLLER

No.	Description of Interrelationship	Material Type
1.	Plasticity Index & Swell	Soils & Gravels
2.	Compressive Strength & Force & Sample Area	Concrete
3.	Compressive Strength & Curing Time & Curing Temperature	Concrete
4.	Aggregate Grading & Aggregate Flakiness	Aggregate
5.	Density & Saturation & Bearing Strength	Soils & Gravels
6.	Bitumen Content & Grading & Voids in Mix	Asphalt
7.	Viscosity & Temperature	Bitumen
8.	Compressive Strength & Stabilised Content & Sample Density	Soils & Gravels
9.	Grading & Grading Modulus & Fineness Modulus	Aggregate, Soils & Gravels
10.	Density & Moisture & Nuclear Density Gauge Correction	Asphalt, Soils & Gravels
6.4	Legislation that may affect the work environment is identified and actions are taken to direct work activities to comply with the legislation.	
6.5	Requirements are ordered and procured before being required.	

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APPENDIX A

Training Elements


This guide is written for the recent graduate who is training and gaining experience towards registration (Benchmark Route). Mature applicants for registration (Alternative Route) may apply the guide retrospectively to identify possible gaps in their development.

Synopsis: A Candidate Specified Category Practitioner should achieve specific competencies at the prescribed level during his/her development towards registration and at the same time, accept more and more responsibility as experience is gained. The outcomes achieved and established during the candidacy phase should form the template to all engineering work performed after registration, regardless of the level of responsibility at any particular stage of an engineering career:

1. Confirm understanding of instructions received and clarify if necessary
2. Use theoretical training to develop possible approaches to do the work; select the best and present to the recipient
3. Apply theoretical knowledge to justify decisions taken and processes used
4. Understand role in the work team and plan and schedule work accordingly
5. Issue complete and clear instructions and report comprehensively on work completed
6. Be sensitive about the impact of the engineering activity and take action to mitigate this impact
7. Consider and adhere to the legislation that is applicable to the task and the associated risk identification and management
8. Adhere strictly to high ethical behavioural standards and the ECSA Code of Conduct
9. Display sound judgement by considering all factors, their interrelationships, the consequences and their evaluation when all evidence is not available
10. Accept responsibility for own work by using theory to support decisions, seeking advice when uncertain and evaluating shortcomings
11. Become conversant with the employer's training and development programme and develop one's own lifelong development programme within this framework

Specifically defined engineering work is usually restricted to applying standard procedures, codes and systems (i.e. work that was done before within the narrow field of application).


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Responsibility Levels: A = Being Exposed; B = Assisting; C = Participating; D = Contributing; E = Performing

Competency Standards for Registration as a Specified Category Practitioner	Explanation and Responsibility Level
<p>1. Purpose</p> <p>This standard defines the competence required for registration as a Specified Category Practitioner. Definitions of terms having particular meaning within this standard are given in text at the end of this appendix and in document R-01-POL-SC.</p>	<p>Discipline-Specific Training Guides (DSTGs) gives context to the purpose of the Competency Standards. The Registered Specified Category Practitioner operates within the nine disciplines recognised by the ECSA. Each discipline can be further divided into sub-disciplines and finally into specific workplaces or competency areas. <u>The DSTGs are used to facilitate experiential development towards ECSA registration and assist in compiling the required portfolio of evidence (specifically the Engineering Report in the application form).</u></p> <p><u>NOTE:</u> The training period must be used to develop the competence of the trainee towards achieving the standards indicated below at a Responsibility Level E (i.e. Performing) (Refer to document R-04-T&M-GUIDE-SC).</p>

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2. Demonstration of Competence

Competence must be demonstrated within ***specifically defined engineering activities*** (defined hereunder) by integrated performance of the outcomes defined in Section 3 below at the level stipulated for each outcome. Required contexts and functions may be specified in the applicable DSTG.

Level Descriptor: *Specifically defined engineering activities* have several of the following characteristics:

- Scope of specific practice area is defined by the specific techniques applied and change is by adopting new specific techniques into current practice.
- Practice area is located within a wider, complex *context*, with specifically defined working relationships with other parties and disciplines.
- Work involves specific familiar *resources*, including people, money, equipment, materials and technologies.
- Resolution of *interactions* manifested between specific technical factors with limited impact on wider issues is required.
- Activities are *constrained* by operational context, defined work package, time, finance, infrastructure, resources, facilities, standards and codes, and applicable laws.
- Activities have *risks* and *consequences* that are locally important but are specifically defined.

Activities include planning; investigation and problem resolution; improvement of materials, components, systems or processes, engineering operations, maintenance, project management, development and commercialisation.

Engineering activities can be divided approximately into the following:

- 5% Complex (Professional Engineer)
- 5% Broadly Defined (Professional Engineering Technologist)
- 10% Well-defined (Professional Engineering Technician)
- 15% Specifically defined (Registered Specified Categories)
- 20% Skilled Workman (Engineering Artisan)
- 45% Unskilled Workman (Artisan Assistant)


The activities can be in-house or contracted out; evidence of integrated performance can be submitted irrespective of the situation.

Level Descriptor: *Specifically defined engineering activities* in the specific discipline is characterised by several or all of the following:

- Scope* of practice area does not cover the entire field of the specific discipline (exposure limited to the relevant components of the specific discipline and specific workplace). Techniques applied are largely well established, and change by adopting new specific techniques into current practice is the exception.
- Practice area varies substantially with unlimited location possibilities and the additional responsibility to identify the need for *complex, broadly defined and/or well-defined* advice to be included in the specifically defined working relationships with other parties and disciplines.
- The bulk of the work involves a familiar, defined range of *resources*, including people, money, equipment, materials and technologies.
- Most of the impacts in the specific discipline are on wider issues, and although occurring frequently, are *specifically defined* and can be resolved by following established procedures.
- The work packages and associated parameters are *constrained* by operational context, with variations limited to different locations only (cannot be covered by laws, standards and codes only).
- Even locally important minor risks can have far-reaching consequences.


Activities include design; planning; investigation and problem resolution; improvement of materials, components, systems or processes; engineering operations; maintenance; project management and general management. For Specific Category Practitioners, research, development and commercialisation happen more frequently in some disciplines and are seldom encountered in others.

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3. Outcomes to be satisfied:	Explanation and Responsibility Level
Group A: Engineering Problem-Solving	
Outcome 1: Define, investigate and analyse specifically defined engineering problems (tasks)	Responsibility Level E Analysis of an engineering problem means the “separation into parts possibly with comment and judgement”.
Level Descriptor: <u>Specifically defined engineering problems</u> have the following characteristics: (a) can be solved mainly by specific practical engineering knowledge that is underpinned by related theory; and one or more of: (b) are fully defined but require feedback; (c) are discrete, specifically focused tasks within engineering systems; (d) are routine, are frequently encountered and are in familiar specified context; and one or more of: (e) can be solved in standardised or prescribed ways; (f) are encompassed by specific standards, codes and documented procedures and require authorisation to work outside limits; (g) information is concrete, specific and largely complete but requires checking and possible supplementation; (h) involve specific issues but few of these impose conflicting constraints and a specific range of interested and affected parties; and one or both of: (i) require practical judgement in specific practice area in evaluating solutions while considering interfaces to other role-players; and (j) have consequences that are locally important but within a specified category (wider impacts are dealt with by others).	(a) Practical problems for Specified Category Practitioners means the problem encountered cannot be solved by artisans because theoretical calculations and engineering decisions are necessary to substantiate the proposed solution. (b) Further investigation to identify the nature of the problem is seldom necessary. (c) Discrete means <i>individually distinct</i> : The problem is easily recognised as part of the larger engineering task, project or operation. (d) It is recognised that the problem is within the specific scope and occurred in the past or the work to be done is a standard operation – seldom something new. (e) Solving the problem does not require the development of a new solution – find out how it was solved before. (f) Encompassed means <i>encircled</i> : The standards, codes and documented procedures must be obtained to solve the problem and authorisation from the Professionals responsible must be obtained to waive the stipulations. (g) The responsibility lies with the Specified Category Practitioner to check that the information received as part of the instruction is correct and is added to as necessary to ensure the correct and complete execution of the work. (h) The problem handled by a Specified Category Practitioner must be limited to well-known specific matters that need standardised solutions without possible complications. (i) Practical solutions to problems include knowledge of the skills displayed by Practical Specialists and Engineering Artisans without sacrificing theoretical engineering principles and/or economising to satisfy the involved parties. (j) Specified Category Practitioners must realise that their engineering actions may appear to be of local importance only but may develop into further problems where support from Engineering Professionals might be needed to deal with the consequences.


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<p>Competency Indicators: A structured analysis of specifically defined problems typified by the following performances within the competency area is expected:</p> <p>1.1 State how <u>you</u> interpreted the received work instruction, checking with your client or supervisor if your interpretation is correct.</p> <p>1.2 Describe how <u>you</u> analysed, obtained and evaluated further clarifying information and if the instruction was revised as a result.</p>	<p>To perform an engineering task, a Specified Category Practitioner will typically receive an instruction from a senior person (customer) to do this task and must conduct the following:</p> <p>1.1 Make very sure that the instruction is complete, clear and within his/her capability and that the person who issued the instruction agrees with his/her interpretation.</p> <p>1.2 Ensure that the instruction and information to do the work is fully understood and is complete, including the engineering theory that is needed to understand the task and to carry out and/or to check the calculations and the acceptance criteria. If needed, supplementary information must be gathered, studied and understood.</p>
<p>Range Statement: The problem (task) may be part of a larger engineering activity or may stand alone. The design (planning) of the problem is amenable to solution by specific techniques that are practised regularly. This outcome is concerned with the understanding of the problem; Outcome 2 is concerned with the solution.</p>	<p>Please refer to clauses 4 to 7 of the applicable Discipline-Specific Training Guide, document R-05-nnn-SC</p>


<p>Outcome 2: Design or develop (plan) sustainable solutions to specifically defined engineering problems (tasks).</p>	<p>Responsibility Level C Design means “drawing or outline from which something can be made”. Develop means “come or bring into a state in which it is active or visible”.</p>
<p>Competency Indicators: This outcome is normally demonstrated after the problem analysis as defined in Outcome 1. Working systematically to synthesise a solution to a well-defined problem typified by the following performances is expected:</p> <p>2.1 Describe how <u>you</u> designed or developed and analysed alternative approaches to do the work. Impacts and sustainability checked. Calculations attached.</p> <p>2.2 State the final solution to perform the work, with the client or your supervisor in agreement.</p>	<p>The task given must be fully understood and interpreted; solutions must be developed (designed) to execute. To synthesise a solution means “the combination of separate parts, elements, substances, etc. into a whole or into a system” by:</p> <p>2.1 The development (design) of more than one way to do an engineering task or to solve a problem should always be done, and the costing and impact assessment for each alternative must be included. All the alternatives must meet the requirements set out in the instruction received, and <u>the theoretical calculations to support each alternative must be done and submitted as an attachment</u>. The alternatives must be within the imposed legal boundaries.</p> <p>2.2 In some cases, the Specified Category Practitioner will not be able to support proposals with the complete theoretical calculation to substantiate every aspect and in these cases, must refer his/her alternatives to a Professional for scrutiny and support. The alternatives and the recommended alternative must be convincingly detailed to win customer support for the recommended alternative. The selection of alternatives might be based on submitted tenders, with the submitted alternatives deviating from those specified.</p>

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<p>Range Statement: The solution conforms to specific and established methods, techniques or procedures within the specifically defined competency area. Engineering should not only look to decrease impacts but also to restore and regenerate through design.</p>	<p>Applying theory to <i>specifically defined engineering</i> work is done in a way that has been used before, probably developed by Professionals in the past and documented in written procedures, specifications, drawings, models, examples, etc. Specified Category Practitioners must seek approval and engineering verification for any deviation from these established methods.</p>
<p>Outcome 3: Comprehend and apply knowledge embodied in established specific engineering practices and knowledge that is specific to the field in which he/she practises.</p>	<p>Responsibility Level E Comprehend means “to understand fully”. The jurisdiction in which a Specified Category Practitioner practises is given in clauses 4 to 7 of the applicable Discipline-Specific Training Guide, document R-05-nnn-SC.</p>
<p>Competency Indicators: This outcome is normally demonstrated in the course of design, investigation or operations and is confined to the competency area.</p> <p>3.1 State the HCert level of the <u>engineering standard procedures and systems that you</u> used to execute the work and indicate how HCert level theory was applied to understand and/or verify these procedures.</p> <p>3.2 Give <u>your</u> own HCert-level theoretical calculations and/or reasoning on why the application of this theory is considered correct (Actual examples).</p>	<p>Design (development) work for Specified Category Practitioners mainly involves utilising, configuring, certifying, testing, verifying, etc. manufactured components or proven engineering or management systems in addition to repetitive design (development) work using an existing design (development) as an example. Specified Category Practitioners apply existing codes, policies and procedures in their design (development) work. Investigations into specifically defined incidents and condition monitoring and operations are mainly concerned with controlling, maintaining and improving engineering systems and operations.</p> <p>3.1 The understanding of specifically defined procedures and techniques must be based on fundamental mathematical, scientific and engineering knowledge. The specific procedures and techniques that were applied to do the work together with the underpinning theory must be given.</p> <p>3.2 Calculations confirming the correct application and use of equipment and/or systems listed in the Discipline-Specific Training Guide (document R-05-nnn-SC) must be done on practical <i>specifically defined</i> activities. Reference must be made to the standards and procedures that were used and how they were derived from HCert-level theory.</p>


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<p>Range Statement: Applicable knowledge includes the following:</p> <p>(a) Technical knowledge that is applicable to the practice area irrespective of location and supplemented by locally relevant knowledge, for example, established properties of local materials.</p> <p>(b) A working knowledge of interacting disciplines confined to the competency area. Codified knowledge in related areas: financial, statutory, safety, management and sustainability.</p> <p>(c) Jurisdictional knowledge includes legal and regulatory requirements and prescribed codes of practice.</p>	<p>(a) The specific location of the task to be executed is the most important determining factor in the layout design and the use of equipment and/or systems. A combination of educational knowledge and practical experience must be used to substantiate the decisions taken and a comprehensive study of laws, policies, procedures, standards, environment, manpower, materials, components and projected customer requirements and expectations must be included.</p> <p>(b) Despite having a working knowledge of interacting disciplines, Specified Category Practitioners must appreciate the importance of working with specialists such as Civil Engineers on structures and roads, Mechanical Engineers on fire protection equipment, Architects on buildings and Electrical Engineers on communication equipment. The codified knowledge in the related areas means working to and understanding the requirements set out by the specialists in the areas mentioned.</p> <p>(c) Jurisdictional in this instance means “having the authority”, and Specified Category Practitioners must adhere to the terms and conditions associated with each task that is undertaken. Specified Category Practitioners may even be appointed as the “responsible person” for specific duties in terms of the OHS Act.</p>
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Group B: Managing Engineering Activities	Explanation and Responsibility Level
<p>Outcome 4: Manage part or all of one or more <i>specifically defined</i> engineering activities.</p>	<p>Responsibility Level E Manage means “control”.</p>
<p>Competency Indicators: The display of personal and work-process management abilities within the competency area is expected:</p> <p>4.1 State how <u>you</u> managed yourself and the priorities, processes and resources in doing the work (e.g. bar chart).</p> <p>4.2 Describe <u>your</u> role and contribution in the work team.</p>	<p>In engineering operations and projects, Specified Category Practitioners will typically be given the responsibility to carry out specific tasks and/or to complete projects.</p> <p>4.1 Resources are usually subdivided based on availability and are controlled by a work breakdown structure and scheduling to meet deadlines. Quality, safety and environment management are important aspects.</p> <p>4.2 Depending on the task, Specified Category Practitioners can be the manager, team leader, a team member or the supervisor of appointed contractors..</p>

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Outcome 5: Communicate clearly with others in the course of his/her specifically defined engineering activities.	Responsibility Level E
Competency Indicators: Effective communication is demonstrated: 5.1 State how <u>you</u> presented your point of view and compiled reports after completion of the work. 5.2 State how <u>you</u> compiled and issued instructions to entities working on the same task.	5.1 Refer to Range Statement for Outcomes 4 and 5 below. Presentation of point of view mainly occurs in meetings and discussions with the immediate supervisor. 5.2 Refer to Range Statement for outcomes 4 and 5 below.
Range Statement for outcomes 4 and 5: Management and communication in <i>specifically defined engineering</i> involves the following: (a) Planning activities (b) Organising activities (c) Leading activities (d) Implementing activities (e) Controlling activities Communication relates to technical aspects and wider impacts of professional work. Audiences include peers, other disciplines, clients and stakeholders. Appropriate modes of communication must be selected. The Specified Category Practitioner is expected to perform the communication functions reliably and repeatedly within the competency area.	(a) Planning means “the arrangement for doing or using something, considered in advance”. (b) Organising means “put into working order; arrange in a system; make preparations for”. (c) Leading means to “guide the actions and opinions of; influence; persuade”. (d) Implementing means to “carry an undertaking, agreement or promise into effect”. (e) Controlling means the “means of regulating, restraining, keeping in order; checking”. Specified Category Practitioners participate in writing, adhering to specifications for the purchase of materials and/or work to be done, make recommendations regarding tenders received, place orders and variation orders, write work instructions, report back on work done, draw, correct and revise drawings, compile test reports, use operation and maintenance manuals to write or apply work procedures, write inspection and audit reports, write commissioning reports, prepare and present motivations for new projects, compile budgets, report on studies done and calculations carried out, report on customer requirements, report on safety incidents and risk analysis, report on equipment failure, report on proposed system improvement and new techniques, report back on cost control, report on environmental impact and sustainability, etc.

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Group C: Impacts of Engineering Activity	Explanation and Responsibility Level
<p>Outcome 6: Recognise the general foreseeable social, cultural, environmental and sustainability effects of <i>specifically defined</i> engineering activities.</p>	<p>Responsibility Level D Social means “people living in communities; of relations between persons and communities”. Cultural means” all the arts, beliefs, social institutions, etc.; characteristic of a community”. Environmental means “surroundings, circumstances, influences”. Sustainable is defined in the definitions below.</p>
<p>Competency Indicators: This outcome is typically displayed in the course of analysis and solution of problems within the competency area by the following:</p> <p>6.1 Describe the social, cultural and environmental impacts and long-term sustainability of this engineering activity.</p> <p>6.2 State how you communicated mitigating measures to affected parties and acquired stakeholder engagement.</p>	<p>6.1 Engineering significantly affects the environment (e.g. servitudes, expropriation of land, excavation of trenches with associated inconvenience, borrow pits, dust and obstruction, street and other crossings, power dips and interruptions, visual and noise pollution, malfunctions, oil and other leaks, electrocution of human beings, detrimental effect on animals and wild life, rotating and other dangerous machines and demolishing of structures).</p> <p>6.2 Mitigating measures taken may include environmental impact studies, environmental impact management, community involvement and communication, barricading and warning signs, temporary crossings, alternative supplies (ring feeders and bypass roads), press releases and compensation paid.</p>
<p>Outcome 7: Meet all legal and regulatory requirements, protect the health and safety of persons and adhere to sustainable practices in the course of his/her specifically defined engineering activities.</p>	<p>Responsibility Level E</p>
<p>Competency Indicators:</p> <p>7.1 List the major laws and regulations applicable to this particular activity and how sustainability practices and health and safety matters were handled.</p> <p>7.2 State how <u>you</u> obtained advice in conducting risk management for the work and elaborate on the risk management system applied.</p>	<p>7.1 The OHS Act is supplemented by a variety of parliamentary Acts, regulations, local authority by-laws, standards and codes of practice. Places of work may have standard procedures, instructions, drawings, and operation and maintenance manuals available. Depending on the situation (emergency, breakdown, etc.), these documents are consulted before work is commenced and during the activity.</p> <p>7.2 It is advisable to attend a Risk Management (Assessment) course and to investigate and study the materials, components and systems used in the workplace. The Specified Category Practitioner seeks advice from knowledgeable and experienced specialists if any doubt exists that safety and sustainability cannot be guaranteed.</p>

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Range Statement for outcomes 6 and 7: Impacts and regulatory requirements include the following:

- (a) Impacts to be considered are generally those identified within the established methods, techniques or procedures used in the specific practice area.
- (b) Regulatory requirements are prescribed.


- (c) Prescribed risk management strategies are applied.

- (d) Effects to be considered and methods used are defined.

- (e) Safe and sustainable materials, components and systems are prescribed.
- (f) Maintenance protocols are prescribed.
- (g) Persons whose health and safety are to be protected are both inside and outside the workplace.


- (a) The impacts will vary substantially with the location of the task (e.g. the impact of laying a cable or pipe in the main street of a town will be entirely different to construction in a rural area). The methods, techniques or procedures will differ accordingly, and these are identified and studied by the Specified Category Practitioners before starting the work.
- (b) The Safety Officer and/or the Responsible Person appointed according to the OHS Act usually confirms or checks that the instructions are in line with regulations. The Specified Category Practitioner is responsible for ensuring that this is done and if not, must establish which regulations apply and ensure their adherence. Usually the people working on site are strictly controlled w.r.t. health and safety, but the Specified Category Practitioner checks that this is done. Tasks and projects are mostly carried out where contact with the public cannot be avoided, and safety measures such as barricading and warning signs must be used and maintained.
- (c) Risks are mainly associated with elevated structures, subsidence of soil, electrocution of human beings, moving parts on machinery, fraud and corruption, and theft. Risk management strategies are usually implemented by more senior staff but are understood and applied by the Specified Category Practitioner.
- (d) Effects associated with risk management are generally well known if not obvious and methods used to address these effects are clearly defined.
- (e) Usually, the safe and sustainable materials, components and systems are prescribed by Professionals or other specialists. It is the responsibility of the Specified Category Practitioner to use his/her knowledge and experience to check and interpret what is prescribed and report anything with which he/she is not satisfied.
- (f) Maintenance systems and procedures from Codes of Practice and Manufacturer's Instructions are drawn up.
- (g) Staff working on the task or project and persons affected by the engineering work being carried out are to be protected.

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Group D: Exercise judgement, take responsibility and act ethically	Explanation and Responsibility Level
Outcome 8: Conduct engineering activities ethically.	Responsibility Level E Ethically means “science of morals; moral soundness”. Moral means “moral habits; standards of behaviour; principles of right and wrong”.
Competency Indicators: Sensitivity to ethical issues and the adoption of a systematic approach to resolving these issues is expected: 8.1 State how <u>you</u> identified ethical issues and affected parties and their interests and the actions you took when a problem arose. 8.2 Confirm that <u>you</u> are conversant and in compliance with the ECSA Code of Conduct and why this is important in your work.	Systematic means “methodical; based on a system”. 8.1 Ethical problems that can occur include tender fraud, payment bribery, alcohol abuse, sexual harassment, absenteeism, favouritism, defamation, fraudulent overtime claims, fraudulent expenses claimed, fraudulent qualifications, misrepresentation of facts. 8.2 The ECSA Code of Conduct, as per ECSA’s website, is known and adhered to. Applicable examples are given.
Outcome 9: Exercise sound judgement in the course of <i>specifically defined</i> engineering activities.	Responsibility Level E Judgement means “good sense: ability to judge”.
Competency Indicators: Exhibition of judgement is expected: 9.1 State the factors applicable to the work, their interrelationships and how <u>you</u> applied the most important factors. 9.2 Describe how <u>you</u> foresaw work consequences and evaluated situations in the absence of full evidence.	9.1 The extent of a project or task given to a junior Specified Category Practitioner is characterised by the limited number of factors and their resulting interdependence. The Specified Category Practitioner will seek advice if educational and/or experiential limitations are exceeded. Examples of the main engineering factors applied must be given. 9.2 Taking risky decisions will lead to equipment failure, excessive installation and maintenance. cost, damage to persons and property, bankruptcy, poor service delivery, etc. Give examples.


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<p>Range Statement for outcomes 8 and 9: Judgement is expected both within the application of the candidate's category-specific methods, techniques and specific procedures and in assessing their immediate impacts. Judgement in decision-making involves</p> <p>(a) accounting for limited risk factors, some of which may be ill-defined; or</p> <p>(b) accounting for the consequences in the immediate work contexts; or</p> <p>(c) accounting for the defined needs of the identified set of interested and affected parties.</p>	<p>In Engineering, about 15% of the activities can be classified as <i>specifically defined</i> where the Specified Category Practitioner uses standard procedures, codes of practice, specifications, etc. Judgement must be displayed to identify any activity falling outside the <i>specifically defined</i> range defined above:</p> <p>(a) Advice is sought when risk factors exceed his/her capability.</p> <p>(b) Consequences outside the immediate work contexts (e.g. long-term) are not normally handled.</p> <p>(c) Interested and affected parties with defined needs outside the <i>specifically defined</i> parameters are taken into account.</p>
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<p>Outcome 10: Be responsible for making decisions on part or all of one or more <i>specifically defined</i> engineering activities.</p>	<p>Responsibility Level E Responsible means "legally or morally liable for carrying out a duty; for the care of something or somebody in a position where one may be blamed for loss, failure, etc."</p>
<p>Competency Indicators: Responsibility is displayed by the following performance:</p> <p>10.1 Show how <u>you</u> used HCert-level theoretical calculations to justify decisions taken in doing engineering work. Attach actual calculations.</p> <p>10.2 State how <u>you</u> took responsible advice on any matter falling outside your own education and experience.</p> <p>10.3 Describe how <u>you</u> took responsibility for your own work and evaluated any shortcoming in <u>your</u> output.</p>	<p>10.1 The calculations, for example, fault levels, load calculations, losses and return on investment are done to ensure that the correct material and components are used.</p> <p>10.2 The Specified Category Practitioner does not operate on tasks at a higher level than <i>specifically defined</i> and consults professionals if elements of the tasks to be done are beyond his/her education and experience (e.g. power system stability, legal actions).</p> <p>10.3 In the first instance, this is continuous self-evaluation to ascertain that the task given is done correctly, on time and within budget. Continuous feedback to the originator of the task instruction and corrective action if necessary form important elements.</p>
<p>Range Statement: Responsibility must be discharged for significant parts of one or more <i>specifically defined</i> engineering activities.</p>	<p>The responsibility is mainly allocated within a team environment with increasing designation as experience is gathered.</p>
<p>Note 1: Responsibility for the evaluation of work in a supervisory capacity</p>	

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Group E: Initial Professional Development (IPD)	Explanation and Responsibility Level
Outcome 11: Undertake independent learning activities sufficient to maintain and extend his/her competence.	Responsibility Level D
Competency Indicators: Self-development is typically managed: 11.1 Provide the strategy <u>you</u> adopted independently to enhance professional development (IPD report). 11.2 Be aware of the philosophy of the employer in regard to professional development.	11.1 If possible, a specific field of the sub-discipline is chosen, available developmental alternatives are established, a programme is drawn up (in consultation with employer if costs are involved), and options open to expand knowledge into additional fields are investigated. 11.2 Record-keeping must not be left to the employer or anybody else. The trainee must manage his/her own training independently, taking the initiative and being in charge of experiential development towards Specified Category Practitioner registration level. Knowledge of the employer's policy and the procedures on training is essential.
Range Statement: Professional development involves the following: (a) Taking ownership of own professional development. (b) Planning own professional development strategy. (c) Selecting appropriate professional development activities. (d) Recording professional development strategy and activities while displaying independent learning ability.	(a) This is <u>your</u> professional development, not that of the organisation for which you are working. (b) In most places of work, training is seldom organised by a training department. It is up to the Specified Category Practitioner to manage his/her own experiential development. Specified Category Practitioners frequently end up in a 'dead-end street', being left behind doing repetitive work. If self-development is not self-driven, success is unlikely. (c) Preference must be given to engineering development rather than the development of soft skills. (d) Developing a learning culture in the workplace environment of the Specified Category Practitioner is vital to his/her success. Information is readily available, and most senior personnel in the workplace are willing to mentor if approached.

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