



ECOSA

ENGINEERING COUNCIL OF SOUTH AFRICA



**An Effective Regulator Assuring Engineering
Excellence**

**Competency Standard for Registration in a
Specified Category**

R-02-STA-SC

REVISION No. 4: 25 June 2024

ENGINEERING COUNCIL OF SOUTH AFRICA

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Document No.: R-02-STA-SC	Revision No.: 4	Effective Date: 25/06/2024	 ECSA <small>ENGINEERING COUNCIL OF SOUTH AFRICA</small>
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DEFINITIONS

Competency area means the performance area where all the outcomes can be demonstrated at the level prescribed in a specific technology in an integrated manner. Meeting the requirement as defined by Specified Category Registration within the scope.

Competency indicators mean the typifying guide to evidence indicating competence and is not normative.

Continuing Professional Development means the systematic, accountable maintenance, improvement and broadening of knowledge and skills, and the development of personal qualities necessary for the execution of professional and technical duties throughout an engineering practitioner's career.

Engineering science means 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, solve problems and provide the knowledge base for engineering specialisations.

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

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


Integrated performance means that 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 means a measure of performance demands at which outcomes must be demonstrated.

Management of engineering works or activities means co-ordinated activities required to:

- (a) direct and control everything that is constructed or results from construction or manufacturing operations;

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- (b) operate engineering works safely and in the manner intended;
- (c) return engineering works, plant and equipment to an acceptable condition by the renewal, replacement or mending of worn, damaged or decayed parts;
- (d) direct and control engineering processes, systems, commissioning, operation and decommissioning of equipment;
- (e) maintaining engineering works or equipment in a state in which it can perform its required function.

Outcome at the specified category practitioner level means a statement of the performance that a person must demonstrate in order to be judged competent to operate in a competency area.

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


Practice area means a generally recognised or distinctive area of knowledge and expertise developed by an engineering practitioner by virtue of the path of education, training, experience and RPL followed.

Range statement means 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 means a category of registration created 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 a minimum of NQF 5, trade test within the required scope of registration or better, related to an identified need to protect the public safety, health and interest of the environment, in relation to an engineering activity, including RPL for the specific scope or category.

Sustainable development means development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Engineering should look not only to decrease impacts, but also to restore and regenerate through design.

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ACRONYMS

nnn	Next specified category to be introduced, e.g., bi for building inspectors
R	Registration
SC	Specified category
SC RPL	Special category RPL registration as defined by the standards prescribed by the category and scope requirements.
RPL 2	RPL for specific category Lifting Machine Inspectors under the category of scope 1. Lifting tackle.
RPL 3	RPL for specific category Lifting Machinery Inspectors under the category of scope 2. Chain Blocks and Lever Hoists.
RPL 4	RPL for specific categories not listed could apply under condition prevailing specified for each category.

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BACKGROUND

The documents that define the Engineering Council of South Africa (ECSA) system for registration in specified categories are shown in Figure 1, which also locates the current document.

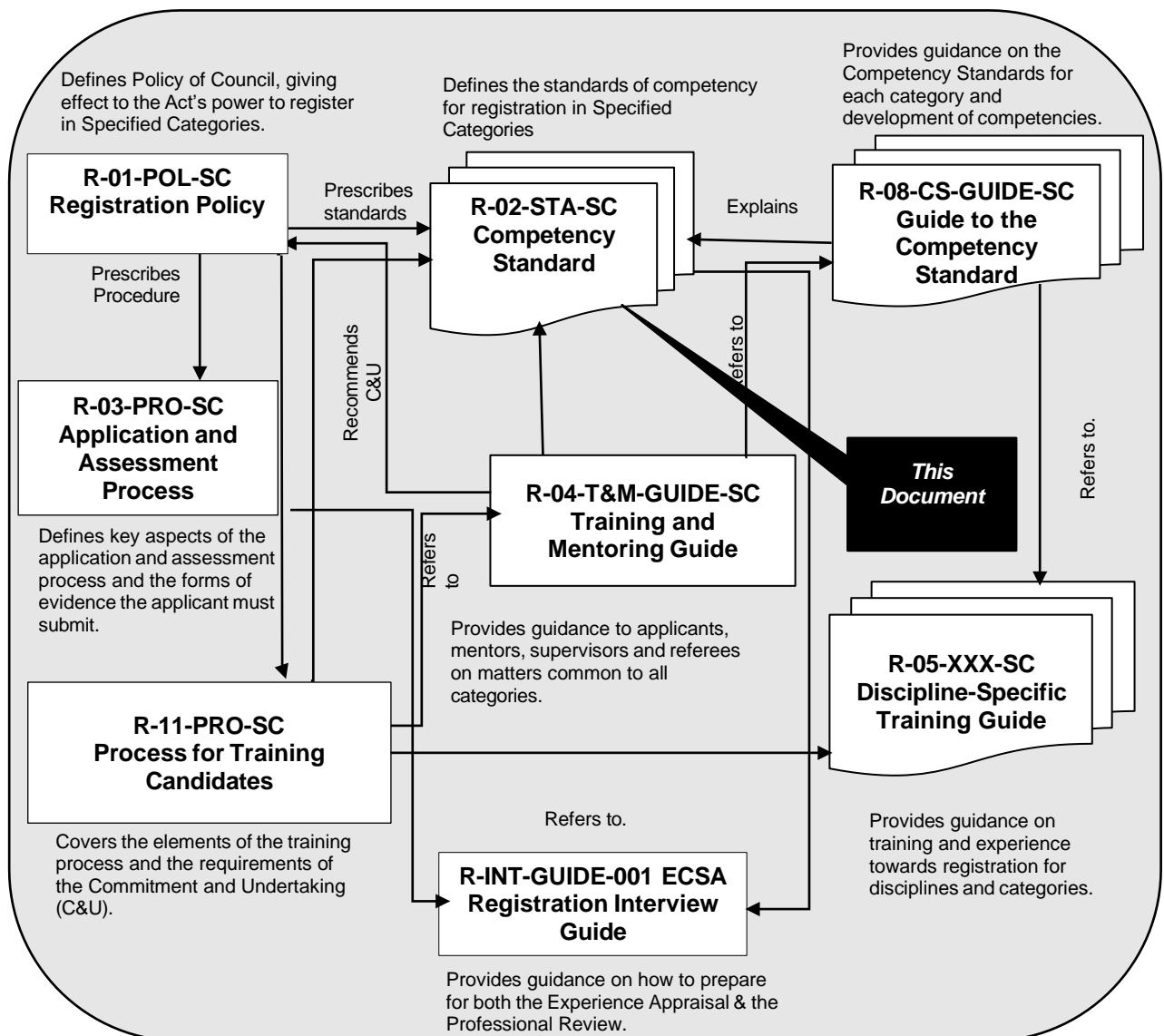



Figure 1: Documents defining the ECSA Registration System for Specified Categories

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1. PURPOSE OF THIS DOCUMENT

This standard defines the competence required for registration in a Specified Category. The term specifically defined engineering below may be interchanged with the specific category designation, i.e. Lift Inspector, Lifting Machinery Inspector, Medical Equipment Maintainer, Fire Protection Systems Inspector, Civil Laboratory Technical Controller or any future specified category prescribed by the Council.

2. POLICY STATEMENT

The Engineering Profession Act directs ECSA to establish Specified Categories. Section 19(2) stipulates that the council must register the applicant in the relevant category and issue a registration certificate to the successful applicant in the prescribed form if, after consideration of an application, the Council is satisfied that the applicant –


(b) in the case of a person applying for registration as a candidate or a candidate in a specified category, has satisfied the relevant educational outcomes determined by the council for this purpose, by –

- (i) having passed accredited or recognised examinations at any educational institution offering educational programmes in engineering; and*
- (ii) having passed any other examination that may be determined by the council; or*
- (iii) presenting evidence of prior learning in engineering.*
- (iv) The qualifications and experience must be in line with the scope and category of registration.*

Section 21(2) states that a registered person may use a title prescribed by the Council for that specified category.

This competency standard therefore defines required competence in persons wishing to register in the specified category and scope.

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3. APPLICABLE LEGISLATIVE FRAMEWORK

- Engineering Profession Act, 46 of 2000
- Council of Built Environment Act, 43 of 2000.

4. NATIONAL COMPLIANCE

This competency standard augments Engineering Professions Act, 46 of 2000 and the Council of Built Environment Act, 43 of 2000.

5. POLICY PROVISIONS


5.1 Demonstration of competence

Competence must be demonstrated within specifically defined engineering activities of categories and scope, defined below, by integrated performance of the outcomes defined in Section 5.3 at the level defined for each outcome. Required contexts and functions may be referred to as guidelines and as mandatory requirements the applicable Discipline-specific Training Requirements (e.g., **R-05-LMI-SC**, etc.).

Level descriptor: Specifically defined engineering activities are characterised by several or all the following:

- Scope of specific practice area is defined by specific techniques applied; change 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, technologies.
- Require resolution of *interactions* manifested between specific technical factors with limited impact on wider issues.
- Are *constrained* by operational context, defined work package, time, finance, infrastructure, resources, facilities, standards and codes, applicable laws.
- Have *risks* and *consequences* that are locally important but are specifically defined.

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Activities include but are not limited to planning, investigation and problem resolution, improvement of materials, components, systems or processes, engineering operations, maintenance, project management, development and commercialisation.

5.2 Degree of responsibility


The Degree of responsibility (DoR) at which a Candidate operates under the direct supervision of the mentor, needs to be given specific consideration in conjunction with the demonstration of competence. While the aspect of DoR is detailed elsewhere, such as in the relevant Training and Mentoring Guide, emphasis is placed on the importance of DoR; as such, Table 1 summarises the degrees of responsibilities from A to E.

Together with the educational and experiential requirements set out in this document, emphasis should be placed on the achievement of the “performing” degree of responsibility “E”, which is a requirement for each category of registration.

Table 1: Summary of degree of responsibility

DoR	Nature of work	Responsibility	Level of support
A Being exposed	Undergoes induction, observes processes and work of competent practitioners.	No responsibility, except to pay attention.	Mentor explains challenges and forms of solution.
B Assisting	Performs specific processes under close direct supervision of the mentor.	Limited responsibility for work output, but mentor is accountable.	Supervisor/Mentor coaches, offers feedback.
C Participating	Performs specific processes as directed with limited supervision by the mentor but under close direct observation of the mentor.	Full responsibility for supervised work, but the mentor accountable.	Supervisor progressively reduces support but remains under the close direct supervision of the mentor.
D Contributing	Performs specific work with detailed approval of work outputs under the close direct observation of the mentor.	Full responsibility to supervisor for quality of work, but mentor is accountable.	Candidate articulates own reasoning and compares it with that of supervisor and mentor.

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DoR	Nature of work	Responsibility	Level of support
E Performing	Works in a team without supervision, under the direct observation of the mentor.	Level of responsibility to supervisor is appropriate to a registered person, i.e., they are responsible but not accountable.	Candidate takes on problem solving with support; at most limited guidance under the close direct observation of the mentor.

5.3 Competency standards

5.3.1 Group A: Outcomes: Engineering Problem Solving

Outcome 1:

Define, investigate and analyse specifically defined engineering problems (tasks)

Level Descriptor: Specifically defined engineering problems have the following characteristics:

(a) Can be solved mainly by specific practical engineering knowledge, 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, frequently encountered and in familiar specified and sustainable context;

and one or more of:


(e) can be solved by standardised or prescribed ways;

(f) are encompassed by specific standards, codes, legislation and documented procedures; requires 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 imposing conflicting constraints and a specific range of interested and affected parties;

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and one or both of:

- (i) requires practical judgement in specific practice area in evaluating solutions, considering interfaces to other role-players;
- (j) have consequences which are locally important but within a specified category (wider impact are dealt with by others).

Range Statement: The problem (task) may be part of a larger engineering activity or may be stand-alone. The design (planning) problem is amenable to solution by established specific techniques practised regularly. This outcome is concerned with the understanding of a problem: Outcome 2 is concerned with the solution.

Outcome 2:

Design, develop, plan or practice solutions to **specifically defined** engineering problems (tasks).

Range Statement: The solution conforms to specific established methods, techniques or procedures within the **specifically defined** competence area.


Outcome 3:

Comprehend and apply knowledge embodied in established specific engineering practices and knowledge specific to the field and scope in which he/she practises.

Range Statement: Applicable knowledge includes the following:

- (a) Technical knowledge that is applicable to the specific practice area of scope, irrespective of location, supplemented by locally relevant knowledge, for example established properties of local materials.
- (b) A working knowledge of interacting disciplines of scope confined to the competence area. Codified knowledge in related areas: financial, statutory, safety, management and sustainability.
- (c) Jurisdictional knowledge includes legal and regulatory requirements as well as prescribed codes of practice.

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5.3.2 Group B: Outcomes: Managing Engineering Activities

Outcome 4:

Manage part or all of one or more **specifically defined** engineering activities.

Outcome 5:

Communicate clearly with others in the course of **specifically defined** engineering activities.

Range Statement for Outcomes 4 and 5: Management and communication in **specifically defined** engineering involves:

- (a) planning activities;
- (b) organising activities;
- (c) leading activities;
- (d) implementing and managing activities
- (e) controlling activities.

Communication relates to technical aspects and wider impacts of professional work. Audience includes peers, other disciplines, clients and stakeholder's audiences. Appropriate modes of communication must be selected. The Specified Category practitioner is expected to perform communication functions reliably, repeatedly, and within his or her competency area.

5.3.3 Group C: Impacts of Engineering Activity.


Outcome 6:

Recognise the foreseeable social, cultural, environmental and sustainability effects of **specifically defined** engineering activities generally.

Outcome 7:

Meet all legal and regulatory requirements, protect the health and safety of persons and adhere to sustainable practices in the course of **specifically defined** engineering activities.

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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) Apply prescribed risk management strategies.
- (d) Effects to be considered and methods used are defined.
- (e) Prescribed safe and sustainable materials, components and systems.
- (f) Prescribed maintenance protocols.
- (g) Persons whose health and safety are to be protected are both inside and outside the workplace.

5.3.4 Group D: Outcomes: Exercise judgment, take responsibility and act ethically

Outcome 8:

Conduct engineering activities ethically.

Range Statement: Ethical behaviour is at least that defined by the Code of Conduct.


Outcome 9:

Exercise sound judgement in the course of **specifically defined** engineering activities.

Range Statement: 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:

- (a) taking specific category risk factors into account;
- (b) consequences in the immediate work contexts;
- (c) identifying a set of interested and affected parties with defined needs to be taken into account, including needs for sustainability.

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Outcome 10:

Be responsible for making decisions on part or all of one or more **specifically defined** engineering activities.

Range Statement: Responsibility must be discharged for significant parts of one or more **specifically defined** engineering activity.

Note 1: Responsible for the evaluation of work output in a supervisory capacity.

5.3.5 Group E Outcomes: Continuing Professional Development.


Outcome 11:

Undertake independent learning activities sufficient to maintain and extend his or her competence.

Range Statement: Professional development involves:

- (a) taking ownership of own professional development;
- (b) planning own professional development strategy;
- (c) selecting appropriate professional development activities; and
- (d) recording professional development strategy and activities while displaying independent learning ability.

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REVISION HISTORY

Revision Number	Revision Date	Revision Details	Approved By
Rev 0 Concept A	28 July 2012	First Draft	Technician Registration Committee
Rev 0 Concept B	23 July 2013	Revisions as per SGG meeting of 19 July 2013.	SGG Specified Categories
Rev 0 Concept C	12 September 2013	Input from JIC and CRC Incorporated. Approved by SGG Specified Categories.	SGG Specified Categories
Rev 0 Concept D	17 September 2013	Rev 0 Concept C approved by ESGB	ESGB
Rev 0 Concept E	20 September 2013	Typing mistakes corrected	ESGB
Rev 1	22 November 2013		Approved by Council
Rev 2 Concept A	28 December 2014	Figure 1 added. Sustainability Incorporated in wording.	SGG Specified Categories
Rev 2 Concept B	9 April 2015	"Assessment Criteria" re-designated "Competency Indicators". The term "Competency Area" added to Competency Indicators and Range Statement.	SGG Specified Categories
Rev 2 Concept C	29 May 2015	Logical improvements recommended by the SGG implemented. Consensus on the inclusion of Competency Indicators could not be reached	SGG draft for submission to the ESGB
Rev 2 Concept D	29 July 2015	Minor editing – final version for submission to parties involved & Council.	Amended and approved by the ESGB
Rev 2 Concept D	26 November 2015		Approved by Council
Rev 3	05 November 2019	Routine review	RPSC

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Rev 3	24 January 2020	Alignment with the Policy & Standards Development Framework on ECSA Policies Recommendation for submission to the RPSC for approval	EI Nxumalo
Rev 3	09 June 2020	Round robin approval	RPSC Members
Rev 3	18 June 2020	Final Approval	RPSC
Rev 3	20 August 2020	Ratification	Council
Rev. 4 Draft A	26 May 2024	The document has been reviewed to include that the candidate's qualifications and experience must be in line with the scope and category of registration. The Working Group further added the DoR at which a Candidate operates under the direct supervision of the mentor, needs to be given specific consideration in conjunction with the demonstration of competence Table 1 and made provision for RPL for specific categories could apply under the condition prevailing specified for each category.	Working Group Members
Rev. 4 Draft B	03 June 2024	Document reviewed with WG and RI BU	RI BU and WG
Rev. 4 Draft C	05 June 2024	Document sent to Registration BU for inputs and comments.	Registration BU
Rev. 4 Draft D	11 June 2024	Reviewed and checked	Executive: RSIR
Rev. 4	25 June 2024	Approval	RPSC

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The Competency Standard for:

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Revision 4 dated 25 June 2024 and consisting of 17 pages has been reviewed for adequacy by the Business Unit Manager and is approved by the Executive: Regulatory Services & International Relations (ERSIR).



Business Unit Manager

16 July 2024

Date




Executive: RSIR

2024/07/16

Date

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APPENDIX A: Exemplified Associated Competency Indicators

The competency indicators presented here are typifying, not normative.

Outcome 1:

A definition, investigation into and analysis of specifically defined engineering problems (tasks) within the competence area, typified by the following performances, is expected:

- 1.1 Understand the activity as agreed with the client.
- 1.2 Analyse and clarify information, drawings, codes, procedures, etc.

Outcome 2:

This outcome is normally demonstrated after a problem (task) analysis as defined in the outcome. Working systematically to reach a solution to a **specifically defined** problem (task), typified by the following performances is expected:

- 2.1 Develop and analyse alternative approaches to do the work. Check impacts and sustainability.
- 2.2 Final solution to perform the work stated client or your supervisor in agreement.

Outcome 3:


This outcome is normally demonstrated in the course of planning, investigation or operations confined to the competence area by using:

- 3.1 At least Higher Certificate level engineering standard procedures and systems to execute the work, and at least Higher Certificate level theory applied to understand and/or verify these procedures.
- 3.2 At least Higher Certificate level theoretical calculations and/or reasoning on why the application of this theory is considered to be correct.

Outcome 4:

The display of personal and work process management abilities is expected to be confined to the competence area as follows:

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4.1 Managed self, priorities, processes and resources in doing the work.

4.2 Role and contribution in the work team evident.

Outcome 5:

Demonstrates effective communication by providing evidence of:

5.1 presenting your point of view and compiling reports after completion of the work;

5.2 compiling and issuing instructions to subordinates working on the same task.

Outcome 6:

This outcome is normally displayed in the course of evaluating and planning tasks within the competence area, typically by:

6.1 identifying affected parties, environmental impacts and the long-term sustainability of the engineering activity;

6.2 proposing mitigating measures and communicate on measures to stakeholders.

Outcome 7:

7.1 Identify applicable legal, regulatory, health and safety requirements and standards and sustainable practices for the **specifically defined** engineering activity.

7.2 Managing risks and use safe and sustainable materials, components and systems, seeking advice when necessary.


Outcome 8:

Sensitivity to ethical issues and the adoption of a systematic approach to resolving these issues is expected, typified by:

8.1 identifying ethical issues and affected parties and their interest and action taken when a problem arose;

8.2 confirming conversance and compliance with ECSA's Code of Conduct and why this is important in doing work.

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Outcome 9:

Exhibition of judgement is demonstrated by:

- 9.1 considering specific factors applicable to the category and how they are interrelated;
- 9.2 foreseeing consequences of actions, evaluating a situation in the absence of full evidence.

Outcome 10:

Responsibility is displayed by the following performance carried out within the competency area:

- 10.1 Use of at least Higher Certificate level theoretical calculations to justify decisions taken in doing engineering work, with actual calculations attached.
- 10.2 Taking responsible advice on any matter falling outside own education and experience.
- 10.3 Taking responsibility for own work and evaluate any shortcoming in output.

Outcome 11:

Self-development is typically managed by the following:

- 11.1 Strategy independently adopted to enhance own development.
- 11.2 Philosophy of employer in regard to development realised.

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