



**ENGINEERING COUNCIL  
OF SOUTH AFRICA (ECSA)**

# **IDENTIFICATION OF ENGINEERING WORK**

Presented to

**AMRE SAFETY CONFERENCE**

**EAST DRIEFONTEIN**

by

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# **ENGINEERING COUNCIL of SOUTH AFRICA (ECSA)**



# ECSA

- **STATUTORY BODY:**  
**Engineering Profession Act, No 43 of 2000**
- **ACADEMIC STANDARDS: Accreditation**
- **PROFESSIONAL DEVELOPMENT, pre- and post REGISTRATION**
- **PROFESSIONAL CONDUCT**
- **RECOGNITION of and SUPPORT from VOLUNTARY ASSOCIATIONS such as AMRE**
- **GOVERNMENT and PUBLIC LIAISON**
- **INTERNATIONAL RECOGNITION**
- **IDENTIFICATION of ENGINEERING WORK**



# PROFESSIONAL REGISTRATION WITH ECSA

# CATEGORIES AND REQUIREMENTS

	CANDIDATE	PROFESSIONAL
CATEGORY	ACADEMIC QUALIFICATION	EXPERIENCE
PROFESSIONAL ENGINEER	BEng / BSc(Eng)	+3 Years
PROFESSIONAL CERTIFICATED ENGINEER	One of Seven (7) GCC	+3 Yrs responsible experience incl <b>1 yr legal appointment</b>
PROFESSIONAL ENGINEERING TECHNOLOGIST	BTech (Eng)	+3 Years
PROFESSIONAL ENGINEERING TECHNICIAN	N Dip (3 years)	+ 3 Years



# IDENTIFICATION OF ENGINEERING WORK (IDoEW)



# IDENTIFICATION OF ENGINEERING WORK

- **GENERIC ENGINEERING WORK**
- **PRACTICE IN A CATEGORY**
- **BASED ON COMPETENCY**
- **CONSULT WIDELY**
- **DEVELOP REGULATIONS**



# PROHIBITIONS

- **SECTION 18(2)**  
**PROHIBITS UNREGISTERED PERSONS**  
**from PRACTICING IN A CATEGORY**
- **SECTION 18(3)**  
**PERMITS CONSULTING**
- **SECTION 20(4)**  
**EXEMPTION**
- **SECTION 26(3)**  
**PROHIBITS UNREGISTERED PERSONS**  
**from PERFORMING IDENTIFIED ENG WORK**



# WHAT IS “IDENTIFIED ENGINEERING WORK”?

- **REQUIRES** for its **PERFORMANCE COMPENTENCIES** listed  
and
- **FALLS WITHIN** any **LISTED TYPES ENGINEERING WORK**  
and
- **REQUIRES** for its **PERFORMANCE MINIMUM LEVELS of COMPETENCE**  
specified for that **CATEGORY**



# **ENGINEERING COMPETENCIES 1**

- 1. DEFINE, INVESTIGATE, ANALYSE**
- 2. DESIGN or DEVELOP SOLUTIONS**
- 3. APPLY KNOWLEDGE OF  
ENGINEERING SCIENCE**
- 4. MANAGE ENGINEERING ACTIVITIES**
- 5. ADDRESS SOCIAL, CULTURAL,  
ECONOMIC, HEALTH, SAFETY and  
ENVIRONMENTAL EFFECTS and  
MITIGATE RISKS**



# **ENGINEERING COMPETENCIES 2**

- 6. MEET LEGAL and REGULATORY REQUIREMENTS to PROTECT HEALTH, SAFETY and ENVIRONMENT**
- 7. CONDUCT ACTIVITIES ETHICALLY**
- 8. EXERCISE SOUND JUDGEMENT**
- 9. TAKE RESPONSIBILITY FOR DECISIONS**
- 10. COMMUNICATE CLEARLY**



# TYPES OF ENGINEERING WORK BY DISCIPLINE 1

1. AERONAUTICAL ENGINEERING
2. AGRICULTURAL ENGINEERING
3. CHEMICAL ENGINEERING
4. CIVIL ENGINEERING
5. ELECTRICAL ENGINEERING



# TYPES OF ENGINEERING WORK BY DISCIPLINE 2

**6. MECHANICAL ENGINEERING**

**7. INDUSTRIAL ENGINEERING**

**8. METALLURGICAL AND MATERIALS ENGINEERING**

- **PHYSICAL METALLURGY**
- **EXTRACTIVE METALLURGY**

**9. MINING ENGINEERING**

**10. COMBINATIONS OF TWO OR MORE**



# **TYPES OF ENGINEERING WORK BY APPLICATION 1**

- 1. MEASURES TO IMPROVE AIR, WATER  
and LAND RESOURCES**
- 2. APPLICATION OF DISCIPLINES in  
other AREAS**
- 3. TRANSPORTATION SYSTEMS**
- 4. SYSTEMS for HARNESSING ENERGY**
- 5. PROCESS SYSTEMS**



# TYPES OF ENGINEERING WORK BY APPLICATION 2

**6. TREATMENT OF SUBSTANCES**

**7. BUILDING SERVICES**

**8. APPLICATION of RESEARCH**

**9. EDUCATION**

**5. MENTORING**



# TYPES OF ENGINEERING WORK BY RISK PROFILE 1

1. EXPLOITATION OF NATURAL RESOURCES
2. PROTECTION AGAINST NATURAL RESOURCES
3. SUPPORTING LOADS
4. STORING ENERGY
5. MATERIALS WITH HARMFUL PROPERTIES



# TYPES OF ENGINEERING WORK BY RISK PROFILE 2

**6. USE OF MACHINERY**

**7. USE OF SUBSTANCES AT HIGH OR LOW TEMPERATURES AND/OR PRESSURES**

**8. SYSTEMS WITH DYNAMIC BEHAVIOUR**

**9. TRANSFER, STORAGE OR PROCESSING OF CRITICAL INFORMATION**



# DISTINCTION BETWEEN CATEGORIES

- **ENGINEER** – ACTIVITIES and PROBLEM SOLVING are DESCRIBED as COMPLEX
- **ENGINEERING TECHNOLOGIST** - ACTIVITIES and PROBLEM SOLVING are DESCRIBED as BROADLY DEFINED
- **CERTIFICATED ENGINEER** - ACTIVITIES and PROBLEM SOLVING are DESCRIBED as BROADLY DEFINED with SOME SPECIFIC LEGAL ASPECTS
- **ENGINEERING TECHNICIAN** - ACTIVITIES and PROBLEM SOLVING are DESCRIBED as WELL DEFINED



# Characteristic Level of Competencies for Professional Categories(1)

The minimum level of performance for the categories shown are characterized by one or more of the attributes under (a), (b), (c) or (d):-

(1) Professional Engineer	(2) Professional Engineering Technologist <b>(3) Professional Certificated Engineer</b>	(4) Professional Engineering Technician
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**(a) For the analysis and solution of engineering problems, problems:-**

<ul style="list-style-type: none"> <li>i. are ill-posed or over-determined</li> <li>ii. encompass entire systems or subsystems within a system or project</li> <li>iii. requires a fundamentals-based analysis and the use of modelling</li> <li>iv. rely on information from multiple sources that may be abstract or incomplete</li> <li>v. have no obvious solution and require original analysis</li> <li>vi. involve diverse, seldom encountered or conflicting technical and other issues</li> <li>vii. may be outside the compass of standards and codes</li> </ul>	<ul style="list-style-type: none"> <li>i. are ill-posed or over-determined</li> <li>ii. are located within an engineering system or project</li> <li>iii. belong to families of problems amenable to solution by established technologies</li> <li>iv. rely on information from sources that interface with the practice area which may be incomplete</li> <li>v. are amenable to solution by structured analysis</li> <li>vi. involve a number of factors that may impose conflicting constraints</li> <li>vii. may be partly outside standards and codes</li> </ul>	<ul style="list-style-type: none"> <li>i. are defined in detail</li> <li>ii. are well defined tasks, within an engineering operation or project</li> <li>iii. can be addressed by established techniques or prescribed procedures</li> <li>iv. rely on information that is largely complete and concrete</li> <li>v. can be solved by established methods</li> <li>vi. are routine and frequently encountered, possibly in unfamiliar contexts</li> <li>vii. solutions are constrained by 20 standards, codes or defined procedures</li> </ul>
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## Characteristic Level of Competencies for Professional Categories (2)

(1) Professional Engineer	(2) Professional Engineering Technologist <b>(3) Professional Certificated Engineer</b>	(4) Professional Engineering Technician
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### (b) Knowledge to be applied has the following characteristics:-

<ul style="list-style-type: none"> <li>i. advanced knowledge of widely-applied engineering principles underpinning good practice and knowledge specific to the jurisdiction;</li> <li>ii. in-depth fundamental and specialist knowledge in practice area that allows a fundamentals-based, first-principles analytical, approach building models as required;</li> <li>iii. as required for practice area, a selection of: law of contract, Health and Safety, Environmental, IPR, contract administration, quality management, risk management maintenance management, regulation, project &amp; construction management</li> <li>iv. have a working knowledge of interacting disciplines (engineering and other)</li> </ul>	<ul style="list-style-type: none"> <li>i. <b>embodied in widely accepted procedures, processes, systems or methodologies and knowledge that is specific to the jurisdiction;</b></li> <li>ii. <b>in-depth knowledge of technologies applied and the engineering sciences underlying these technologies</b></li> <li>iii. <b>as required for practice area, have a selection of: law of contract, Health and Safety, intellectual property, Environmental, contract administration, quality management, hazard &amp; operability study, project management, maintenance management, project &amp; construction management.</b></li> <li>iv. <b>have a working knowledge of interacting disciplines/technologies</b></li> </ul>	<ul style="list-style-type: none"> <li>i. knowledge embodied in established engineering practices and knowledge specific to the jurisdiction;</li> <li>ii. knowledge of the application of principles underlying the methods used;</li> <li>iii. practical knowledge in applicable law, regulation, codes, quality systems, project management procedures, construction management, maintenance procedures, maintenance management.</li> <li>iv. have a working knowledge in disciplines immediately related to the practice area</li> </ul>
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## Characteristic Level of Competencies for Professional Categories (3)

(1) Professional Engineer	(2) Professional Engineering Technologist (3) Professional Certificated Engineer	(4) Professional Engineering Technician
<b>(c) For the assessment of impact and risks and compliance with legislation and ethical behaviour</b>		
<ul style="list-style-type: none"> <li>i. wide range of interested and affected parties with widely varying need;</li> <li>ii. have significant potential consequences in a range of contexts;</li> <li>iii. judgment in decision making requires diverse factors and missing information to be taken into account.</li> </ul>	<ul style="list-style-type: none"> <li>i. several groups of interested and affected parties with differing and occasionally conflicting needs;</li> <li>ii. have significant consequences which are important in practice, but may extend more widely;</li> <li>iii. judgment in decision making, in practice area, considering interactions other areas.</li> </ul>	<ul style="list-style-type: none"> <li>i. limited range of interested and affected parties with differing needs;</li> <li>ii. consequences of are locally important but not far reaching.</li> <li>iii. judgement on the validity of solutions produced by the techniques used</li> </ul>

# Characteristic Level of Competencies for Professional Categories (4)

(1) Professional Engineer

(2) Professional Engineering Technologist  
 (3) Professional Certificated Engineer

(4) Professional Engineering Technician

## (D) Work is subject to legislation outside the Eng Professions Act

i. Any statutory duty that is defined for a Professional Engineer in other legislation

i. Any statutory duty that is defined for a Professional Engineering Technologist in other legislation.  
 ii. **For the case of the Professional Certificated Engineer: Any work that is subject to the Occupational Health and Safety Act 1993, the Mine Health and Safety Act 1996, and the Merchant Shipping Act, 1951**

i. Any statutory duty that is defined for a Professional Engineering Technician in other legislation.

# ***THE ENGINEERING TEAM***

## **INTERNATIONAL COMPARISON**

**Engineer**

**Technologist**

**Technician**

**(Visionary/Innovator)**

**(Doer/Achiever)**

**(Operator/Fixer)**

**Analyse, Innovate  
Create, Develop**

**Apply, Implement  
Develop**

**Install, Commission,  
Maintain, Operate**

<b>WORLD</b>	<b>1</b>	<b>5</b>	<b>5</b>
<b>SA</b>	<b>5</b>	<b>1</b>	<b>1</b>
<b>UK (Ideal)</b>	<b>1</b>	<b>10</b>	<b>100</b>
<b>Research</b>	<b>1</b>	<b>-</b>	<b>4</b>
<b>Maintenance</b>	<b>1</b>	<b>10</b>	<b>100</b>

**Different education and training but of equal value in the team**



# EXEMPTIONS

- **ARTISANS and OTHER SEMI-SKILLED WORKERS**
- **PERSONS REGISTERED with OTHER BUILT ENVIRONMENT PROFESIONS - LIMITED**



# TRANSITION

- **ANY PERSON WHO is NOT REGISTERED and WISHES to PERFORM IDENTIFIED ENGINEERING WORK MUST REGISTER in one of the PROFESSIONAL CATEGORIES within 12 MONTHS of the DATE the REGULATIONS COMMENCE**
- **PERSONS WHO HOLD a STATUTORY APPOINTMENT for WHICH a GCC is REQUIRED or WHO HOLD a GCC and WISH to PERFORM IDENTIFIED ENGINEERING WORK MUST REGISTER as a PR CERT ENGINEER WITHIN 24 MONTHS**



# APPLICATION OF IDoEW

**THIS REGULATION APPLIES in RESPECT of**

- **ANY ENGINEERING WORK PERFORMED WITHIN the BORDERS of the RSA**
- **ANY PERSON WHO is NOT ORDINARILY a RESIDENT of the RSA BUT WHO PERFORMS WORK within the BORDERS of the RSA.**
- **ANY ENGINEERING SYSTEM, etc. WHICH is DESIGNED etc. OUTSIDE the BORDERS of the RSA and will be USED in the RSA**



# THE PROCESS

- Draft Regulations were submitted to the CBE in 2006
- The CBE is continuously jeopardising ECSCA's efforts to have these Regulations promulgated
- Unfortunately ECSCA is not empowered to promulgate the Regulations on its own since the CBE alone has the power in terms of Section 20 of the CBE Act
- Also, in terms of Section 20 of the CBE Act, only the CBE has the power to consult with the Competitions Commission; this consultation has not yet taken place
- ECSCA and the CBE are however continuing negotiation with each other to take this process to conclusion



# CONTACT DETAILS

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