Quality Council for Trades & Occupations
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OCCUPATIONAL SKILLS PROGRAMME DOCUMENT

IN LINE WITH OQSF POLICY (2021) OCCUPATIONAL QUALIFICATION TYPE (NOMENCLATURE)

SKILLS PROGRAMME	TYPE (NOMENCLATURE)	TITLE (DESCRIPTOR)	NQF LEVEL	CREDITS
	SP-250819	Solar Photovoltaic (PV) Installation Practitioner	4	60

START DATE	END DATE	LAST DATE FOR ENROLMENT	LAST DATE FOR ACHIEVEMENT
13 Aug 2025	13 Aug 2030	13 Aug 2031	13 Aug 2034

CURRICULUM CODE	900281-000-00-00

PARTNER DETAILS	ORGANISATION NAME	WEBSITE ADDRESS	TELEPHONE NUMBER	LOGO
QUALITY PARTNER - DEVELOPMENT	EWSETA	www.ewseta.org.za	011 2744700	EW SETA

Contents

1. SKILLS PROGRAMME DETAILS

1.1 Sub-Framework: Occupational Qualifications Sub-Framework

Occupational Qualification Sub Framework (OQSF)

1.2 Type (Nomenclature):

1.2.1 Specify if this is a Qualification/Part-Qualification/Skills Programme

Skills Programme

1.2.2 Type: (Nomenclature) e.g. Advanced Occupational Certificate)

Skills Programme

1.3 Title Descriptor:

Solar Photovoltaic (PV) Installation Practitioner

1.4 NQF Level:

NQF Level 4

1.5 Credits:

60

1.6 QCTO Curriculum Code:

900281-000-00-00

1.7 Originator/Quality Partner (QP) – Development

1.7.1 Quality Partner (Qualifications Development):

EWSETA

1.8 Replacement ***This qualification replaces:***

SAQA QUAL/US/LP ID OR QCTO/SETA APPROVAL ID	QUALIFICATION TITLE	Pre-2009 NQF Level	CURRICULUM CODE *(if Occupational)*	NQF LEVEL	MIN. CREDITS
None					

2. RATIONALE

2.1 The need for the Skills Programme

The growing demand for renewable energy solutions such as solar energy is rapidly growing in the energy environment and the society as it is viewed as an alternative power source. The need for the development of the skills programme for Solar Photovoltaic Installation Practitioner has been identified by the energy industry to promote skills development as one of the priority outcomes the priority of the South African National Development Plan (NDP) 2030.

This skills programme is needed to add value to the country's initiative as it strives towards sustainable development to achieve a cleaner environment, reduce pollution, providing energy security and social empowerment contributing to the country's economic growth.

2.2 Similar Qualification(s), Part-Qualifications/Skills Programmes

- Higher Occupational Certificate: Solar Photovoltaic Standalone Service Technician, NQF Level 5, 133 Credits (SAQA ID 120863)
- National Occupational Certificate: Solar Photovoltaic Standalone Systems Installer, NQF Level 4, 211 Credits (SAQA ID 120883)
- National Occupational Certificate: Solar Photovoltaic Standalone System Mounter, NQF Level 4, 84 Credits (SAQA ID 120885)
- Skills Programme: Solar Photovoltaic (PV) Installation Planner, NQF Level 5, Credits 60
- Skills Programme: Solar Photovoltaic (PV) Installation Tester, NQF Level 5, Credits 60
- Skills Programme: Solar Photovoltaic (PV) Modules Manufacturing, NQF Level 5, Credits 60

2.3 Benefit to the sector, society and the economy:

The skills programme will contribute to the Integrated Resource (IRP) objectives incorporating solar energy into South African energy supply mix, addressing the inequalities and to grow the economy by providing employable skills to individual in

the society benefiting the energy sector, the society and the economy. This will create employment opportunities as qualified Solar Photovoltaic (PV) Practitioners will gain employment opportunities in established companies or become self-employed as Solar PV Installation Practitioners creating further employment for others in solar PV installations projects.

In addition, qualified Solar Photovoltaic (PV) Installations Practitioners will utilise their knowledge and skills to benefit the society at residential and businesses or industries, including farms that do not have access to grid power that require stable supply of alternative energy. The qualifying learners will acquire knowledge and skills in the functioning and operating requirements for solar PV installations, selecting and using appropriate equipment, tools and measuring instruments to install Solar PV systems.

2.4 Typical learners:

- New entrants who wish to join the energy sector.
- Those already working in the sector without formal recognition of their training.
- Unemployed
- Individuals who require re-skilling or upskilling to improve performance.

2.5 Relation to Occupation(s) and/or Profession(s)

2.5.1 Occupation(s) related:

2.5.1.1 Collaboration with relevant stakeholders:

Stakeholders which participated include:

- Skills Development Providers (both public and private)
- Employers and employer organisations
- Higher Education Institution
- Curriculum/Assessment Experts

2.5.1.2 List typical occupations in which the qualifying learner will operate (if relevant)

- Solar Photovoltaic (PV) Installation Practitioner

2.5.2 Profession(s) related:

2.5.2.1 Collaboration with relevant stakeholders:

N/A

2.5.2.2 List typical professions in which the qualifying learner will operate (if relevant)

N/A

3. PURPOSE

3.1 Benefit the learners:

The skills programme will benefit learners as it will provide them with the relevant technical, electrical, communication and problem-solving skills required for effective and efficient installation of solar systems. Potential learners will gain knowledge, skills and expertise in solar PV installation systems such as solar array, solar array base, solar array cables, solar array support frame and secondary batteries.

The skills programme will also unlock learners' potential in line with modern realities in the energy sector providing them with competencies related to solar PV installations in a shorter period thus receiving recognition as qualified individuals to provide a service in solar PV system installation. It will also provide qualified learners with opportunities to be employed in established companies or become self-employed creating jobs for others in solar installation projects.

3.2 What the skills programme intends to achieve:

The purpose of this skills programme is to prepare a learner to operate as a Solar Photovoltaic (PV) Installation Practitioner.

A Solar Photovoltaic (PV) Installation Practitioner liaises with clients, plans for photovoltaic system installation, analyses and interprets the PV design specifications, identifies and selects the appropriate components, equipment, tools and materials, perform solar PV installation work up to 15kW solar PV in residential settings, performs functionality checks, and maintains a PV system functionality and hands-over to the client adhering to all statutory requirements under supervision of a registered person.

A qualified learner will be able to:

- Plan for the installation of a solar photovoltaic system
- Install a solar photovoltaic system
- Test and verify the functionality of installed PV components under supervision
- Perform safe routine maintenance and fault-finding on the installed solar PV system

3.3 Typical Graduate attributes

- Good communication.
- Analytical and critical thinking
- Problem solving
- Attention to details
- Teamwork spirit
- Ethical, professionalism and responsibility

4. ENTRY REQUIREMENTS

- NQF level 3 qualification with Mathematics

5. RECOGNITION OF PRIOR LEARNING (RPL)

5.1 RPL for Access to Training/Exemption:

Learners may use the RPL process to gain access to training opportunities for a skills programme if they do not meet the formal, minimum entry requirements for admission. RPL assessment provides an alternative access route into a skills programme.

Such an RPL assessment may be developed, moderated, and conducted by the accredited Skills Development Provider which offers that specific skills programme. Such an assessment must ensure that the learner is able to display the equivalent level of competencies required for access, based on the NQF level descriptors.

For exemption from modules through RPL, learners who have gained the stipulated competencies of the modules of a skills programme through any means of formal,

informal, or non-formal learning and/or work experience, may be awarded credits towards relevant modules, and gaps identified for training, which is then concluded.

5.2 RPL for Access to the Final Integrated Supervised Assessment (FISA):

Learners who have gained the stipulated competencies of the modules of a skills programme through any means of formal, informal, or non-formal learning and/or work experience, may be awarded credits towards relevant modules, and gaps identified for training, which is then concluded.

For a Skills Programme, the accredited Skills Development Provider (SDP) must ensure all modular competency requirements are met prior to the FISA and keep record of such evidence.

Upon successful completion of the FISA, RPL learners will be issued a QCTO certificate for the skills programme. Quality Partners are responsible for ensuring the RPL mechanism and process for skills programme is approved by the QCTO.

6. RULES OF COMBINATION

6.1 Components:

KNOWLEDGE/THEORY COMPONENT

MODULE CODE	MODULE TITLE	NQF LEVEL	CREDITS	MODE OF DELIVERY
313109-001-00-KM-08	Components of PV systems	4	20	Blended

***Total Credits* = 20**

APPLICATION COMPONENT

PRACTICAL SKILLS MODULE(S)

MODULE CODE	MODULE TITLE	NQF LEVEL	CREDITS	MODE OF DELIVERY

313109-001-00-PM-03	Use tools, measuring instruments and equipment	4	7	Face-to-Face
313109-001-00-PM-06	Install the mechanical components of a PV system	4	10	Face-to-Face
313109-001-00-PM-07	Install the electrical components of a PV system and inter-connect the system	4	15	Face-to-Face
121905-000-00-PM-10	Conduct and control project communication and stakeholder interaction	5	8	Face-to-Face

Total Credits = 40

6.2 Soft Skills Included:

Soft skill(s) is/are included in:

121905-000-00-PM-10, Conduct and control project communication and stakeholder interaction, NQF Level 5, Credits 8.

6.3. Foundational Learning:

Required and applicable foundational learning competencies for learning in this skills programme are included in the module specifications.

7. EXIT LEVEL OUTCOMES (ELO) AND ASSOCIATED ASSESSMENT CRITERIA (AAC)

7.1 Exit Level Outcomes (ELO) 1:

Apply planning and preparation methods and procedures for solar PV system installation.

Associated Assessment Criteria (AAC) for ELO 1:

- Hazards are identified, risks assessed and control measures are implemented
- Appropriate tools (hand and power tools) and equipment used to install the Solar PV are identified and selected
- Shading analysis for efficient positioning of Solar PV system is conducted

- Manufacturer's instructions to set-up and assemble the components of solar PV system are understood and applied
- Planning and preparation methods and techniques including safe working practices for the installation of mechanical and electrical components are understood and applied

7.2 Exit Level Outcome (ELO) 2:

Apply procedures for the installation of mechanical and electrical components of solar PV system in different settings

Associated Assessment Criteria (AAC) for ELO 2:

- Appropriate tools, equipment, materials and relevant technology(ies) for the installation of electrical and mechanical components of solar PV system are identified, selected and used properly
- Shading analysis and safe positioning of a solar PV system is performed
- All applicable regulations, operating procedures, safety measures and manufacturer's instructions relevant to the installation of electrical and mechanical components for solar PV installation are understood and applied
- Mounting system is installed correctly using the technical drawings of the designed PV system in accordance with the manufacturer's requirements
- Grounding system to protect the solar PV system is correctly installed
- Suitable environment is selected, and standard operating procedures for the installation of wire-ways, wiring system and conduits are applied
- Electrical inter-connections and system instrumentation are installed correctly
- Housekeeping activities and appropriate measures to restore site or roof to its original condition are implemented

7.3 Exit Level Outcome (ELO) 3:

Apply testing and verification methods and techniques to ensure the functionality of general mechanical and electrical solar PV systems installations

Associated Assessment Criteria (AAC) for ELO 3:

- Tests and verification methods and techniques to determine functionality of general mechanical components of solar PV installations are understood and applied in line manufacturer's instructions and specifications
- Electrical testing methods to check for open circuits, short circuits, and ground faults in the DC and AC wiring as well as the inverter using the relevant measuring instrument such as a multimeter understood and applied
- Monitoring tools to monitor the photovoltaic system's output and performance are understood and utilised

7.4 Exit Level Outcome (ELO) 4:

Apply fault-finding steps and safe maintenance practices to ensure efficient solar photovoltaic system performance

Associated Assessment Criteria (AAC) for ELO 4

- Requirements and processes for installed Solar PV system configuration are understood and applied
- Regular cleaning activities such as dirt removal, debris build-up, and obstructions from solar panels to maintain solar photovoltaic system efficiency are understood and performed
- Fault-finding steps that involves diagnoses, locating and rectification of issues that can affect the performance and longevity of solar photovoltaic system are understood and applied
- Relevant documentation is completed correctly in accordance with standard operating procedures
- Basic customer education on the PV system components for effective monitoring and basic troubleshooting in the event of a faulty system is provided

8. INTEGRATED ASSESSMENT

8.1 Formative Assessments conducted internally

Formative assessments are conducted throughout the training of learners. A range of formal, non-formal, and informal ongoing assessment activities are used to focus on teaching and learning outcomes to improve learner attainment.

Formative assessments are conducted continuously by the facilitator to feed into further learning, to identify strengths and weakness, and to ensure the learner's ability to apply knowledge, skills and workplace experience gained.

Formative Assessments are conducted by the accredited Skills Development Provider (SDP), and a variety of ongoing assessment methods may be used, for example, quizzes, assignments, tests, scenarios, role play, interviews. Continuous feedback must be provided.

8.2 Integrated Summative Assessments conducted Internally

Integrated Assessment involves all the different types of assessment tasks required for a particular occupational skills programme, such as written assessment of theory and practical demonstration of competence. To achieve this, the Internal Assessment Criteria (IAC) for all modules as found in the QCTO curriculum document must be followed.
An accredited SDP should implement a well-designed, formal, relevant, final internal Summative Assessment strategy for all modules to prepare learners for the FISA. These assessments evaluate learning achievements relating to the achievement of each module of the relevant components of the skills programme.

Internal Summative Assessments are developed, moderated, and conducted by the SDP at the end of each module or after integration of relevant modules, e.g., communication methods (written, verbal and non-verbal) knowledge tests, practical demonstrations as integrated in the ELOs.

8.3 De-centralised Final Integrated Supervised Assessment (FISA) for Skills Programmes

The FISA is de-centralised, and the assessment standards set by the QCTO must be implemented by the accredited SDP in the development, moderation, and implementation of all FISA for Skills Programmes.

The accredited SDP manages and conducts the FISA and submits learner results for QCTO approval for certification, according to QCTO required compliance standards.

For entrance into the FISA, the learner must have completed the Skills Programme successfully and be found competent in all modules, recorded internally by the SDP. All learners gain entrance to the Final Integrated Supervised Assessment by successfully completing all formal summative assessments conducted by the SDP.

Format of FISA: A **integrating the relevant Exit Level outcomes, with simultaneous verbal assessment of embedded knowledge by the assessor before, during or after the FISA. All FISAs must be supervised, and virtual FISAs must be recorded throughout the assessment.**

All Exit Level Outcomes must be covered in the FISA. In the FISA, the learner must demonstrate applied knowledge and skills to prove that the competencies of the Skills Programme have been achieved. The FISA may not contain any assessments used in the "Continuous Assessment" process (thus no re-assessment). Special considerations should be made for candidates with special learning needs

Standards for Final Integrated Supervised Assessment (FISA):

The FISA instrument must be developed and moderated by the SDP and conducted in a supervised environment. It is assessed by means of an **INSTRUMENT** and a **RUBRIC** developed by the SDP for this purpose.

The learner should be provided with a brief/job card/task to demonstrate what the learner should show, know or produce in a product, relevant to the Exit Level Outcomes and the purpose of the Skills Programme. This is the section where the

learner must show applied competency (what the learner must be able to do, and to what expected standard).

The learner will be given a simulated training roof/worksite, a range of brief tasks/job cards for the installation of Solar PV system in different settings. Candidates must be provided with complete and appropriate equipment, tools, materials and measuring instruments and components of solar modules/panels and as provided in the practical skills modules as condition of performance for the task. Candidates must be able to:

- Assess the conditions of the site to ensure that it is suitable and safe for solar panels installation.
- Communicate with the clients and relevant stakeholders.
- Perform shading analysis and determine positioning of the PV system.
- Install the grounding system and structures.
- Install mechanical components of solar PV system (stand-alone) using the appropriate equipment, tools, materials and measuring instruments applying the correct procedures and manufacturer's instructions.
- Install electrical components of solar PV system (stand-alone) using the appropriate equipment, tools, materials and measuring instruments applying the correct procedures and manufacturer's instructions adhering to strict health and safety guidelines.
- Install lightning and voltage protection systems adhering to strict health and safety guidelines.
- Test, diagnose and troubleshoot faults on the installed solar PV system for functionality under supervision.
- Replace faulty components of the solar PV system.
- Clean-up and restore the site to its original status.
- Perform routine maintenance on the installed solar PV system.
- Provide basic customer education on the solar PV system components and its functions including basic troubleshooting techniques.
- Perform hand-over activity in line with standard operating requirements.
- Record and report on solar PV installation activities.

Please take note of the following:

a. Candidates must be provided with clear guidelines and instructions on how to complete the assessment tasks/job, including the assessment criteria and expected outcomes.
b. The duration of the assessment is a maximum of 4 hours.
c. No FISA instrument is allowed to be used verbatim for re-assessment or for a different cohort of learners.

NOTE: Should a learner be found to be competent in all of the above areas, they should be declared “Competent”. If not yet competent in any of the above areas, they should be declared “NYC”, re-trained and then be reassessed with different applicable tasks/scenarios.

Whilst conducting the above, strategic, well-timed questions should be asked of the learner to assess embedded knowledge gained during the skills programme, as well as critical thinking and problem-solving skills: for e.g.

- "Why.....?”
- "What would happen if …?”
- "When …. is done, what would the result be?”
- "How would you deal with …...?”

The marking rubric/compliance checklist used to assess these competencies must include a section for the assessor used in this session to make a note of competencies shown, (or not shown), as well as the questions that were asked, and a summary of the learner's answers, and state whether these are of the acceptable standard or not.

The marking rubric/compliance checklist compiled should contain specific areas marked with an asterisk (*) as compulsory sections for the learner to be declared C (Competent). Compulsory sections include but are not limited to when the candidate's or others' safety would be affected if incorrectly completed. [e.g., what to do in an emergency].

Learners who complete this skills programme will accumulate credits towards the relevant full or part qualification. The Credit Accumulation and Transfer (CAT) Policy may apply to these learners.

Submission of final results

Final results must be submitted to the QCTO in the required format, within 21 days of the date of the FISA, together with the following:

- Completed QA Verification Report on the FISA (QCTO template: various sections).
- Learner results spreadsheet
- A copy of the final Assessment Instrument used, as well as the marking guideline/rubric.

9. ARTICULATION

9.1 Articulation for Skills programmes

9.1.1 Work Opportunities:

There are several work opportunities for a person who has successfully completed a Solar Photovoltaic Installation Practitioner skills programme, they may access employment opportunities in public and private organisations, become self-employed and may also work as instructors/coach in education and training organisations.

9.1.2 Learning Opportunities:

An individual who has successfully completed a Solar PV Installation Practitioner skills programme may access several further learning opportunities available in the energy or engineering fields.

10. NOTES

10.1 Additional Legal or Physical Entry Requirements

- Functional limbs
- Functional eyesight

10.2 Criteria for Accreditation

Accreditation requirements, against which Skills Development Providers (SDP) will be accredited, is found in the Curriculum Document, as listed below.

Curriculum Code:

900281-000-00-00

10.3 Encompassed Trades (where applicable)

This is not a trade

11. ASSOCIATED QUALIFICATION(S)/PART-QUALIFICATION(S):

SAQA QUAL ID	QUALIFICATION TYPE	QUALIFICATION DESCRIPTOR	NQF LEVEL	CREDITS
N/A	N/A	N/A	N/A	N/A