QUALIFICATION SPECIFICATION								SECTION A
QUALIFICATION DEVELOPER	MINISTRY OF EMPLOYMENT, LABOUR PRODUCTIVITY AND SKILLS DEVELOPMENT							
TITLE	Certificate III in Borehole Mechanics					**NCQF LEVEL**	3	
FIELD	Manufacturing Engineering and Technology		**SUB-FIELD**	Borehole Mechanics				
New qualification			Review of existing qualification					
SUB-FRAMEWORK	General Education		TVET	√	Higher Education			
QUALIFICATION TYPE	Certificate	√	Diploma		Bachelor			
	Bachelor Honours		Master		Doctorate/ PhD			
CREDIT VALUE					40			

RATIONALE AND PURPOSE OF THE QUALIFICATION

RATIONALE

The Botswana Vision 2036 states that development of the human capital, the informal sector, the micro and small enterprises (MSES) are essential in achieving the VISION 2036 pillars, in particular Sustainable Economic Development Human and Social Development. Although Botswana has been fortunate to experience unprecedented economic growth since independence, this has not generated enough jobs to reduce unemployment. The most severely hit group amongst the unemployed is the youth, who account for about 51.7 % of the total unemployed, with the 15-19 age group most affected.

The Botswana Education and Training Sector Strategic Plan (ETSSP 2015-2020) marks a significant milestone in our collective efforts as a nation to bring about a more diversified, knowledge-based economy. Through a planned and careful development of human capital, the ETSSP seeks to refocus our education and training towards fulfillment of social and economic aspirations identified in our Revised National Policy on Education (RNPE) 1994, the National Development Plan, Vision 2036 and as well as the Millennium Development Goals. In particular, the ETSSP is intended to strengthen the match between qualifications and labour market requirements, thereby ensuring that education and training outputs are more closely aligned to socio economic development needs of the country. In line with this strategic goal, the Human Resource Development Council (HRDC 2016) report on top occupations of 2016, has identified mechanical and civil engineering inclusive of water abstraction and distribution, hydraulics, diesel mechanics, farm machinery operators and some of the priority skills for Research, Innovation, science and Technology and Mining mineral energy and water resources Sectors.

Basing on the above-mentioned reports, and the continuous shortage of water form water distribution system to supply the community/nation. The government together with education sectors and water sector industries has found it fit to develop borehole mechanics programme that will assist in training learner towards archiving skills in water resources since our country is more dependent on ground water

PURPOSE

The purpose of this qualification is to produce semi-skilled workers with knowledge, skills and competences to perform a range of functions including:

- Business Communication skills,
- Information communication technology,
- Use of engineering material,
- Perform basic metal work,
- Interpret basic engineering drawing, and
- Introduction to borehole equipment.

People holding this qualification should be able to perform routine work under supervision and take some responsibility for own learning and completion of work.

ENTRY REQUIREMENTS (including access and inclusion)

- **Minimum Entry Requirements**

NCQF Level II or equivalent shall be required for candidates to be accepted into Certificate III in Borehole Mechanics.

- **CAT and RPL**

Applicants who do not meet the above criterion but possess relevant industry experience may be considered using RPL and CATS policies for access.

QUALIFICATION SECTION B	**SPECIFICATION**
GRADUATE PROFILE (LEARNING OUTCOMES)	**ASSESSMENT CRITERIA**
Communicate with clients, colleagues and others using appropriate forms of communication techniques.	• Use written, verbal, non-verbal communication appropriate to the target audience. • Interpret stipulated instructions or requirements. • Apply information acquired in the performance of tasks or discussions with other people. • Apply relevant definitions, terminology, abbreviations and language. • Present information using appropriate language and formats. • Construct clear sentences to produce a written logical and coherent piece of writing. • Use appropriate presentation formats and styles of writing to produce error free business documents.
Use ICT for information retrieval and processing as well as communication and collaboration	• Use ICT responsibly and ethically. • Manage information using ICT. • Organise and synthesise information using ICT.

with others	• Implement data loss prevention strategies using ICT. • Present information in a variety of formats using ICT.
Select and use appropriate tools and equipment for an engineering application in accordance with job specification.	• Examine job specification to determine the tools and equipment to be used in relation to occupation safety code. • Select appropriate tools and equipment to be used in line with the job requirements. • Carry out the tasks in line with job specification. adhering to health, safety and quality standard • Service and maintain tools and equipment in accordance with Original Manufacturers Specification (OMS) where applicable. • Perform quality checks on work done and make improvements where needed. • Clean tools and equipment and store them in appropriate place after use. • Clean or tidy up the work area in accordance with organizational requirements
Perform measurements on engineering components according to job specifications in line with adopted International System Organization (ISO).	• Examine job specification to determine the tools and equipment to be used. • Plan and prepare for work in accordance with job specifications and organizational requirements. • Select appropriate measuring instruments according to specified limits, fits and tolerance on the job. • Measure all dimensions in accordance with standard specifications and tolerances by using various precision measuring instruments adhering to health, safety and quality standard • Record, compare and confirm measurements results in line with standard specifications. • Clean tools and equipment and store them in appropriate place after use. • Clean or tidy up the work area in accordance with organizational requirements
Apply knowledge of metallic and non-metallic materials and their properties in the selection of materials for specific projects.	• Examine the nature of work to be carried out to determine types of materials to be used. • Carry out tests to distinguish between metallic and non-metallic materials where applicable adhering to health, safety and quality standard • Apply knowledge of characteristics / properties of metallic and non-metallic materials to select materials for specified projects • Perform quality checks on the job done until specification is met. • Clean tools and equipment, and store them in appropriate place after use • Clean or tidy up the work area in accordance with organizational requirements
Perform basic metal removal	• Examine the nature of work to be done inclusive of material to be

processes in a specified job. .	worked on to determine tools and measuring instruments to be used. • Select and use tools and equipment in line with job specification. • Carry out tasks as per job specification, adhering to health, safety and quality standard • Perform quality checks on the job done and make improvement where needed • Clean tools and equipment, and store them in appropriate place after use • Clean or tidy up the work area in accordance with organizational requirements
Perform basic fastening and joining techniques in a specified job.	• Examine the nature of work to be done inclusive of material to be worked on to determine fasteners, tools, equipment to be used and joining techniques to be applied. • Select and use appropriate fasteners and joining techniques for specific purposes. • Carry out tasks as per job specification, adhering to health, safety and quality standard • Perform quality checks on the job done and make improvement where needed • Clean tools and equipment, and store them in appropriate place after use • Clean or tidy up the work area in accordance with organizational requirements
Carry out simple forming techniques in fabricating of projects	• Examine the job specification to determine materials, forming techniques, tools and equipment to be used. • Select appropriate materials, forming techniques, tools and equipment in line with the job specification. • Carry fabrication of the project in accordance with established codes of practice and job specification. • Perform quality checks on work done and make improvements where needed. • Clean tools and equipment and store them in appropriate places after use. • Clean/tidy up the work area in accordance with organizational requirements.
Apply basic knowledge of dismantling and assembling of equipment and machinery	• Identify of parts of machinery and equipment to be dismantled and assembled. • Examine the nature of work to be done to determine tools and equipment to be used in dismantling and assembling. • Select appropriate tools and equipment to carry out the task. • Perform tasks as per job specification, adhering to health, safety and quality standard. • Perform quality checks on the job done • Clean tools and equipment and store them in an appropriate

	place after use. • Clean or tidy up the work area in accordance with organizational requirements
Implement a maintenance schedule in accordance with organizational requirements.	• Examine the nature of maintenance work to be carried out to determine the materials, tools and equipment to be used. • Obtain the required materials, tools and equipment in line with the job requirements. • Prepare and carry out maintenance work in accordance with job specifications adhering to health, safety and quality standard. • Perform quality checks on the job done and make improvements where needed. • Clean tools and equipment and store them in an appropriate place after use. • Keep records and report to immediate supervisor as needed.
Build and maintain basic electrical circuits.	• Examine the job specification to determine tools and materials to be used. • Select appropriate materials, tools to be used to in line with the job requirements • Carry out repairs an electric circuit in accordance to established codes of practice adhering to health, safety and quality standard. • Perform quality checks on the job done and make improvements where needed • Clean tools and equipment and store them in an appropriate place after use. • Clean or tidy up the work area in accordance with organizational requirements
Remove, fit and align bearings and pulleys on machinery and equipment	• Examine the nature of maintenance work to be carried out to determine the tools and equipment to be used • Select appropriate tools and equipment to carry out the task. • Perform tasks as per job specification, adhering to health, safety and quality standard. • Perform quality checks on the job done • Clean tools and equipment and store them in an appropriate place after use. • Clean or tidy up the work area in accordance with organizational requirements
Read, interpret and draw Engineering Drawings for specific purpose.	• Analyze the drawings to be done to determine appropriate drawing equipment to be used • Select the appropriate drawing equipment to be used. • Produce drawings according to task specification; adhere to health, safety and quality standard. • Perform quality checks on the job done and make improvements where needed. • Clean tools and equipment and store them in appropriate places after use. • Clean or tidy up the work area in accordance with organizational

	requirements
Apply basic knowledge of spray painting in accordance with the job specification.	• Examine the job specification to determine the tools and equipment. • Select appropriate materials, tools and equipment for the job. • Carry out tasks as per job specification, adhering to SHER and quality standards. • Perform quality checks on the job done for adherence to quality standards and job specification. • Clean tools and equipment and store them in an appropriate place after use. • Clean and tidy up the work area in accordance with organizational requirements

QUALIFICATION STRUCTURE

SECTION C

	Title	**Level**	**Credits**
FUNDAMENTAL COMPONENT Subjects / Units / Modules /Courses	Communication Skills	3	3
	Information and Communication Technology I	3	3
CORE COMPONENT Subjects / Units / Modules /Courses	Engineering Materials	3	6
	Basic Metal Work	3	12
	Introduction to Borehole Equipment	3	10
	Engineering Drawing I	3	6
ELECTIVE COMPONENT Subjects / Units / Modules /Courses	**N/A**		

RULES OF COMBINATIONS, CREDIT DISTRIBUTION (where applicable):

To be awarded the qualification learners are required to obtain a minimum of 40 credits inclusive of 6 credits for fundamental and 34 credits for core. The candidate is also required to complete the required period of work placement/ work experience and associated portfolio of evidence in line with the stipulated exit outcomes and associated assessment criteria to be eligible for the award of the qualification.

ASSESSMENT AND MODERATION ARRANGEMENTS

ASSESSMENT ARRANGEMENTS

All assessments, formative and summative, leading/contributing to the award of credits or a qualification should be based on learning outcomes and/or sub-outcomes.

Formative assessment

Formative assessment or continuous assessment contributing towards the award of credits should be based on course outcomes. This can include tests, assignments and projects as well as simulated and real clinical practice or care settings. The contribution of formative assessment to the final grade shall be **60%**.

Summative assessment
Learners may undergo assessment including written and practical and simulated projects. The final examination for each course contributes **40 %** of the final mark for that course. All summative practical assessments must be conducted in simulated or real work settings.

MODERATION ARRANGEMENTS

There will be internal and external moderation undertaken by moderators registered and accredited by BQA. All processes and procedures will be in line with NCQF requirements. This will be conducted in reference to the institution's moderation policy and procedures.

RECOGNITION OF PRIOR LEARNING (if applicable)

Recognition of prior learning (RPL)

Candidates may submit evidence of prior learning and current competence and/or undergo appropriate forms of RPL assessment for the award of credits towards the qualification in accordance with the ETP RPL policy, BQA RPL policy and the legislative framework. Implementation of RPL shall also be consistent with requirements. If any prescribed for the field or sub-field of study by relevant national, regional or international professional bodies.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Horizontal Articulation
The candidate of this qualification can either specialize in the following: -

- Auto mechanics and Auto electrics
- Heavy plant Mechanics
- Panel beating
- Welding and fabrication
- Maintenance fitting
- Fitting and Machining

Vertical Articulation

The holder of this qualification may progress to Intermediate Certificate at NCQF level 4 or equivalent on the following fields.

- Auto mechanic & Auto electrics
- Heavy plant Mechanics
- Auto body repair and refinishing
- Welding and fabrication
- Fitting and machining
- Maintenance fitting
- Air conditioning and Refrigeration

EMPLOYMENT PATHWAYS
On completion of the course the candidates can either get employed or become a self-employed Entrepreneur in any one of the following fields;

a) Wage Employment

- Spare Parts Sales Assistant
- Manufacturers' Representative
- Private Fleets and Garages
- Workshop Storekeeper
- Water Supply Operator

b) Self Employment

- Spare Parts Dealer
- Spare Parts Salesman

QUALIFICATION AWARD AND CERTIFICATION

Minimum standards of achievement for the award of the qualification

A candidate is required to achieve the stipulated total of 40 credits inclusive 6 credits for the fundamental and 34 credits for the core to be awarded the qualification.

Certification

Learners meeting prescribed requirements will be awarded the qualification in accordance with standards prescribed for the award of the qualification and applicable policies.

REGIONAL AND INTERNATIONAL COMPARABILITY

1. **Kenya Water Institute** (KEWI) certificate in Water Engineering (NQF level 4 worth 190 credits). This qualification is intended to develop knowledge, skills and competencies in:
    - problem solving,
    - collection and analysis of data
    - management of environment and water resources,
    - groundwater assessment survey planning and design of water supply, wastewater and irrigation,
    - sinking and equipping boreholes for groundwater abstraction,
    - construction and installation of water supply wastewater and drainage system,
    - maintenance of power sources and water abstraction equipment,
    - Communication in the workplace.
2. UK awarding body for water industry qualification (**CBWAI) Diploma in Water engineering** (NQF level 4 worth 37credits). This qualification is intended to develop knowledge, skills and competencies to
    - Employment rights and responsibilities in the energy and utilities sector
    - Oral communication with customers
    - Customer service performance
    - Inspection of domestic customer's water supply.
    - Water pressure and flow measurement
    - Data logging for water pressure and flow measurements

- Water mains and services tracing and surveying
- Water leakage detection using acoustic listening techniques.
- Operate sluice valves, gate valves and hydrants
- Carry out and record meter reading
- Water supply, hygiene, health, safety and risk management

Although assessment for this qualification has not been clearly stated, the learning qualifications reflect only the total credit without indication of credits for fundamentals, core and electives. Pathways for this qualification has not been clearly defined

These qualifications noted above are slightly comparable in terms of structure and exit outcomes. The differences noted includes but not limited to the fact that the CABWI qualifications is more into water distribution system and it does not indicate credit for fundamentals, core and electives and the duration of the qualification is not stated. While KENYA qualification is about water engineering and covers a lot on practical issues of abstracting groundwater and the distribution system.it has also indicated that the duration of the qualification is two years.

This qualification that is designed for Botswana commonly known as Borehole Mechanic does not appear in other countries, but since it has got something to do with water issues, that is why I had to compare it with water engineering.

Therefore, this qualification designed for Botswana compares very well with KENYA qualifications as it emphasizes the same or similar competencies and the altitude that it follows a structure typical of similar types and levels of qualifications. What sets this qualification apart from the ones studied is that it offers mostly the engineering workshop processes and maintenance of borehole equipment including technical drawing.

REVIEW PERIOD

This qualification shall be reviewed every 5 years.