

SECTION A									
<b>QUALIFICATION DEVELOPER</b>	<b>GABORONE UNIVERSITY COLLEGE OF LAW AND PROFESSIONAL STUDIES</b>								
<b>TITLE</b>	<b>CERTIFICATE V PLUMBING AND PIPE FITTING</b>					<b>NCQF LEVEL</b>		<b>5</b>	
<b>FIELD</b>	<b>PHYSICAL PLANNING AND BUILDING</b>				<b>SUB-FIELD</b>		<b>BUILDING AND CONSTRUCTION</b>		
New qualification			✓		Review of existing qualification				
<b>SUB-FRAMEWORK</b>			General Education		TVET		✓		Higher Education
<b>QUALIFICATION TYPE</b>			Certificate		✓		Diploma		Bachelor
			Bachelor Honours		Master		Doctor		
<b>CREDIT VALUE</b>								<b>131</b>	
RATIONALE AND PURPOSE OF THE QUALIFICATION									
<p><b>RATIONALE</b></p> <p>Botswana is shifting its reliance from natural resources-based economy to a more diverse and knowledge lead economy with a human capital that is globally competitive.</p> <p>This will be achieved by among other initiatives, developing and offering qualifications that provide learners with sound knowledge base and requisite practical competencies. Furthermore, the National Development plan 11 of Botswana and Vision 2016 mandate has aspirations of prosperity for all Batswana, Educated and Informed Nation is also seen as an important foundation and basis for enhancement of national productivity, innovation, and competitiveness.</p> <p>The qualification of the Certificate in Plumbing and Pipe fitting is therefore intended to assist learners/trainees to develop knowledge, skills, attitudes and values that will enable them to become eligible for entry-level employment in the field of plumbing and pipe fitting; Develop sensitivity to the issues, problems and challenges encountered in a working environment; Benefit from the group activity and team work needed for personal development and development as workers; and make themselves available for opportunities for lifelong learning through exposure to bridging programs in the field of plumbing and pipe fitting.</p> <p>Human Resource Development Council (HRDC) is the main authority in Botswana for determining priority skills needed by the economy for now and for the future. They do this in close collaboration with respective industries, both public and private sector, and there is no better authority than HRDC to guide qualifications and programmes development to address needs of the economy. In their (HRDC) December 2016</p>									

document titled “**Top Occupations in High Demand**” and their subsequent March 2019 document titled “**Priority Skills (Current and Future)**” it is clear that construction related skills, which include plumbing and pipefitting are in high demand and will continue to be required for the foreseeable future, or at least up to the year 2028. Some of the technical skills required under Plumbing and Pipefitting include “Demonstrate knowledge of various states of water, pipe measurements, drainage system, environmental management”

## **PURPOSE**

The purpose of this qualification is to produce graduates with knowledge, skills and competence to:

- Apply insulation methods and materials for pipes and pipe systems and use plumbing trade licensing processes and procedure plumbing profession.
- Demonstrate practical skills in operating basic plumbing hand tools and plumbing equipment
- Apply basic drawing techniques and methods of projections in the production of Engineering drawings.
- Fitting of taps, valves, and pipes in public and domestic supply. Moreover, remedy faults and defects in water supply system. of domestic hot water supply.
- Install sanitary appliances and test the system for leakages.
- Apply basic knowledge and skills in communication and information technology as well as entrepreneurship in plumbing and pipe fitting industry.
- apply safety practices and procedures in plumbing and pipe fitting industry.

The proposed qualification possesses both technical skills and soft skills that make graduates function competently and confidently as artisans in specialised area of plumbing maintenance, reticulation, as well as in attending to drainages.

## **ENTRY REQUIREMENTS**

Minimum entry requirements:

- Certificate IV NCQF Level 4 (BGCSE) or equivalent.
- Recognition of Prior Learning (RPL) and Credit Accumulation and Transfer (CAT) will be considered for access and inclusion of prospective candidates.

## QUALIFICATION SPECIFICATION: SECTION B

GRADUATE PROFILE (LEARNING OUTCOMES)	ASSESSMENT CRITERIA
<ul style="list-style-type: none"> <li>Demonstrate knowledge of communication, IT and entrepreneurial skills in the welding and fabrication environment.</li> </ul>	1.1 Apply written, verbal and non-verbal aspects of communication within the plumbing and pipe fitting industry 1.2 Use technology to produce reports and communicate accordingly within the plumbing and pipe fitting industry 1.3 Interpret information effectively to implement instruction in the plumbing and pipe fitting industry. 1.4 Prepare formal and informal business communiqués. 1.5 Plan and conduct appointments with clients 1.6 Plan and deliver business presentations.
<ul style="list-style-type: none"> <li>Apply safety practices and procedures in plumbing and pipe fitting industry</li> </ul>	2.1 Demonstrate knowledge of occupational health and safety policies and procedures plumbing and pipe fitting industry 2.2 Identify and report basic plumbing and pipe fitting related problems and hazards according to workplace standards. 2.3 Identify and check personnel protective equipment needed for welding and fabrication to ensure that they are safe to use in accordance with work policies and procedures 2.4 Care and maintain first aid kit
<ul style="list-style-type: none"> <li>Apply basic drawing techniques and methods of projections in the production of Engineering drawings</li> </ul>	3.1 Demonstrate an understanding of basic terminology in graphics. 3.2 Interpret different scales used in engineering drawing 3.3 Apply free hand drawing techniques and perspective drawing intersections 3.4 Draw in three dimension and two dimensions 3.5 Apply, orthogonal, axonometric, and Isometric projections to 3D and 2D diagram
<ul style="list-style-type: none"> <li>Demonstrate knowledge of installing and maintaining basic plumbing components</li> </ul>	4.1 Demonstrate knowledge of basic plumbing and pipe fitting principles 4.2 Identify and use plumbing components, tools and materials accordingly 4.3 Identify and describe different types of pipes based on material, size, and use.

	<p>4.4 Read and interpret water supply blueprints and drawings based on knowledge of water supply principles</p> <p>4.5 Demonstrate understanding of direct and indirect domestic water supply</p> <p>4.6 Cut and bend pipes to desired specification.</p> <p>4.7 Install a direct or indirect domestic cold-water supply</p> <p>4.8 Apply all safety precautions to be observed in the installation and use of domestic hot water supply</p> <p>4.9 Read and interpret blueprint of public and domestic hot water system layout.</p> <p>4.10 Adopt procedures for insulation of components of the hot water installation</p> <p>Install other plumbing appliances (taps, valves, geysers, washing machines, and pipes for public and domestic supply).</p>
<ul style="list-style-type: none"> <li>• Install sanitary appliances and test the system for leakages</li> </ul>	<p>5.1 Demonstrate understanding of appliances and properties of materials used in sitting appliances in the building</p> <p>5.2 Install sanitary appliances and test the system for leakages</p> <p>5.3 Use sanitary appliances and fix traps in sanitary system</p> <p>5.4 Use techniques of installing waste and soil pipes above ground level</p> <p>5.5 Interpret the layout of simple drainage system and the properties of materials used.</p> <p>5.6 Construct a cesspool and apply maintenance techniques</p> <p>5.7 Demonstrate knowledge of the purpose of cesspool and their construction</p> <p>5.8 Care and maintain water storage tanks and devices related in water and wastewater systems.</p>

QUALIFICATION STRUCTURE: SECTION C			
FUNDAMENTAL COMPONENT Subjects / Units / Modules / Courses	Title	Level	Credits
	Communication and Information Technology	5	10
	Entrepreneurial Skills	5	10
	Technical Drawing	5	12
CORE COMPONENT Subjects / Units / Modules / Courses	Health, Safety and Occupation	5	12
	Tools and Equipment	5	15
	Plumbing and Pipe Fitting	5	15
	Water Supply System	5	15
	Sanitation and Drainage	5	12
	Installation and Maintenance of Plumbing Appliances	5	10
	Industrial Attachment	5	20
ELECTIVE COMPONENT Subjects / Units / Modules / Courses	n/a		
TOTAL CREDITS TO GRADUATE=131			
Rules of combinations, Credit distribution:			
FUNDAMENTAL COMPONENT 32 credits			
CORE COMPONENT 99 credits			
Total 131 credits			

ASSESSMENT AND MODERATION ARRANGEMENTS
<p><b>Assessment</b></p> <p>Assessment shall be conducted by BQA accredited assessors.</p> <p>The assessment for this qualification shall comprise of both formative and summary assessments weighted according to institutional guidelines and policies. Both formative and summative assessment processes are accounted for to monitor progress during the qualification and to determine competence of the learners at the end of the qualification.</p> <p>The formative assessment shall consist of contribute 60%.</p> <p>Summative assessment shall make up the remaining 40%.</p> <p><b>Moderation</b></p> <p>Moderation shall be conducted by BQA accredited moderators.</p>

<b>RECOGNITION OF PRIOR LEARNING</b>
There will be provision of RPL for award of the qualification using ETP RPL Policy in line with the National RPL Policy
<b>PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)</b>
<p><b><i>Learning Pathways</i></b></p> <p><b>This qualification articulates vertically with:</b></p> <ul style="list-style-type: none"> <li>• Diploma in Building and Construction Engineering (NCQF Level 6)</li> <li>• Diploma in Civil Engineering (NCQF Level 6)</li> </ul> <p><b>Horizontally with:</b></p> <ul style="list-style-type: none"> <li>• Certificate V in Project Management (NCQF Level 5)</li> <li>• Certificate V in Building Construction (NCQF Level 5)</li> </ul> <p><b><i>Employment Pathways</i></b></p> <p>Upon successful completion of a certificate in Plumbing and Pipefitting, the graduate can be absorbed in the following disciplines at entry level</p> <ul style="list-style-type: none"> <li>• Maintenance officer</li> <li>• Site Foreman</li> <li>• Plumber</li> <li>• Materials technician</li> <li>• Pipe fitter</li> <li>• Inventory Taker</li> </ul>
<b>QUALIFICATION AWARD AND CERTIFICATION</b>
<p>Upon successful completion of 131 credits the candidate will be awarded a Certificate V in Plumbing and Pipe Fitting qualification.</p> <p>The graduate will be given a transcript and a certificate.</p>
<b>REGIONAL AND INTERNATIONAL COMPARABILITY</b>
<p>To establish comparability, benchmarking was conducted on two identified similar qualifications; one regionally and one internationally. There were no other similar qualifications or at an equivalent level to benchmark against, regionally or internationally. Most qualifications were either at higher level or lower like SAQA's National Certificate: Construction Plumbing at NQF level (equivalent to NCQF level 3). Some did not even specify or indicate the important information needed for benchmarking purposes. Therefore, the Developer could not compare against them. The benchmarking was looking at title of the qualification, entry requirements, credits allocation, NQF level at country of origin and either exit level outcomes or modules. The table below shows how the proposed qualification compares to the ones benchmarked against.</p>

*Mutare Polytechnic College (Zimbabwe)* **National Certificate in Plumbing and Drain Laying**

This qualification's credits and NQF level were not indicated. However, the entry requirement of this qualification (O Level) equates to the proposed qualification's entry requirement which is NCQF level 4. Though the exit level outcomes of this qualification were not indicated, it offers similar generic modules to those of the proposed qualification such as Construction drawing, Introduction to computers and Entrepreneurial skills development. It also has core modules centred around plumbing like Plumbing theory Drain laying and Workshop practice. The qualification does not have the component of pipe fitting like the proposed qualification.

*City & Guilds (UK)* **Level 3 NVQF Diploma in Mechanical Engineering (Pipe fitting and Assembly)**

It serves as a competence qualification, in the Engineering Apprenticeship framework. It does not specify entry requirements to the qualification. However, some of its modules are centered around the core of pipefitting. Such include Pipe Bending and Forming by Hand Methods, Assembling Screwed Pipework, Assembling Small-Bore Non-Ferrous Pipework, Assembling Non-Metallic Pipework, and Pipe Bending and Forming using Bending Machines.

**REVIEW PERIOD**

The qualification will be reviewed every 5 years.