SECTION A:	***QUALIFICATION DETAILS***																	
QUALIFICATION DEVELOPER (S)	Construction Industry Trust Fund																	
TITLE	Certificate IV in Multi Process Coded Welding															***NCQF LEVEL***	***4***	
FIELD	Manufacturing, Engineering & Technology		***SUB-FIELD***		Welding & Fabrication											***CREDIT VALUE***	***66***	
New Qualification		✓	*Review of Existing Qualification*															
SUB-FRAMEWORK	*General Education*		*TVET*											✓	*Higher Education*			
QUALIFICATION TYPE	*Certificate*	*I*		*II*		*III*		*IV*	✓	*V*		*Diploma*		*Bachelor*				
	Bachelor Honours			*Post Graduate Certificate*								*Post Graduate Diploma*						
	Masters							*Doctorate/ PhD*										

RATIONALE AND PURPOSE OF THE QUALIFICATION

RATIONALE:

Government has identified high unemployment and poverty amongst youth as a national security risk, hence the need to train this section of the population in productive and income generating skills.

The government, through National Development Plan 11 (NDP 11), has identified areas of potential high employment uptake such as manufacturing, agriculture, and services, and has made a commitment to give these sectors extensive support with a view to making meaningful contribution the growth of the economy.

Another policy document that makes mention of skills development as a vehicle towards inclusivity and provision of opportunities for all, is the Vision 2036 document under the of Human and Social Development

(Pillar 2) which states that" Botswana society will be knowledgeable with relevant quality education that is outcome based, with emphasis on technical and vocational skills as well as academic competencies."

A study conducted by the Human Resource Development Council in 2016 has identified Coded Welding as a priority area that is in high demand. The purpose of this qualification is to produce artisans with competencies in fillet, plate and pipe welding.

The HRDC study state that occupations identified as being in high demand will inform decision making and planning in a wide range of issues which includes, but not limited to: Human resource development planning ,Skills development , Institutional planning at Tertiary level and Technical and Vocational Education and Curriculum review and programme development as well as Promotion of linkages between job seekers and employers and finally Informing tertiary education investors on priority skills needed by employers.

PURPOSE:

The Certificate IV in Multi Process Coded Welding aims at helping learners advance their knowledge and skills in welding thereby creating opportunities for gainful employment and self-employment.

Learners would be expected to develop skills and knowledge to include more complex welding processes

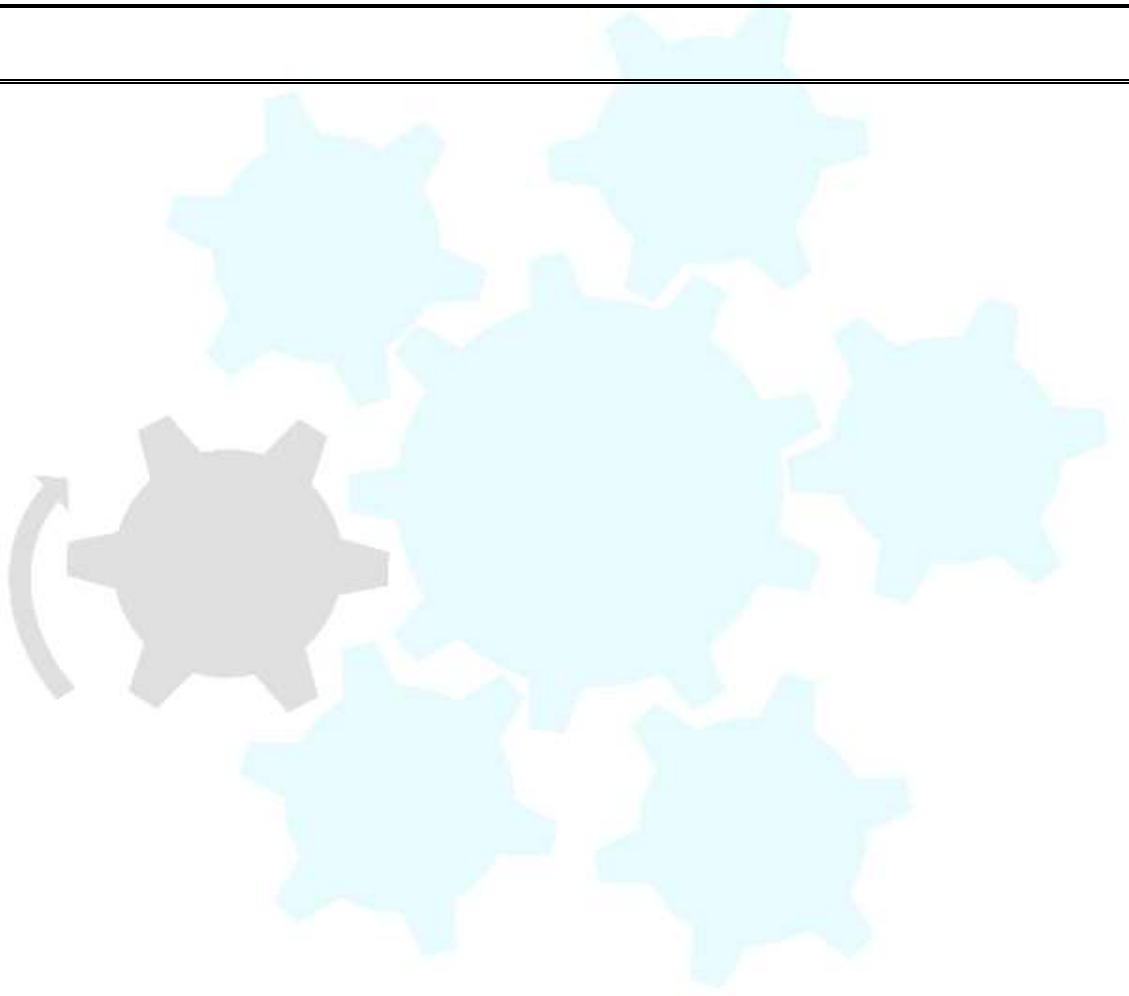
Graduates from this qualification will have broad knowledge, skills and competences to be able to:

- Perform welding processes in a safe and environmentally friendly manner.
- Use and interpret engineering drawings
- Apply welding principles and processes in accordance with WPS.
- Meet American Society of Mechanical Engineering ASME IX or equivalent international welding codes.

ENTRY REQUIREMENTS (including access and inclusion)

Entry Requirements:

- NCQF level 4 or equivalent qualification.
- Access through Recognition of Prior Learning (RPL) and Credit Accumulation and Transfer (CAT) shall be permissible in accordance with ETP and national policies on RPL and CAT.



SECTION B	***QUALIFICATION SPECIFICATION***
At the end of six months, learners undertaking this qualification should have completed the Learning Objectives below and been declared competent in their associated Assessment Criteria	
GRADUATE PROFILE (LEARNING OUTCOMES)	***ASSESSMENT CRITERIA***
1. Demonstrate knowledge on the preparation of metal plates and pipes for welding	1.1 Mark out workpieces for cutting 1.2 Cut workpieces to size safely using an oxy-acetylene plant 1.3 Use power saw to cut pipes to be welded to size *1.4* Bevel plate and pipes using angle grinders
2. Apply acquired skills to weld metals using Arc Shielded Metal Arc Welding according to ASME IX or equivalent international welding codes.	2.1 Identify shielded metal arc welding techniques and explain their application. 2.2 Weld metal pieces together using different welding positions including flat, horizontal, vertical and overhead according to industry standards. 2.3 Perform fillet welds using the shielded metal arc welding process according to ASME IX or equivalent international welding codes. 2.4 Carry out butt welds on plates are carried using the shielded metal arc welding process according to ASME IX or equivalent international welding codes. 2.5 Use shielded metal arc welding process to produce pipe welds according to ASME IX or equivalent international welding codes.

3. Perform Gas Tungsten Arc (GTAW) welds on metals according to ASME IX or equivalent international welding codes.	3.1 Identify Gas Tungsten Arc Welding (GTAW) or Tungsten Inert Gas (TIG) Welding processes and explain their application 3.2 Identify Different Gas Tungsten Arc Welding techniques and explain their application. 3.3 Weld materials by the manual TIG and plasma arc welding process according to industry standards. 3.4 Use Gas Tungsten Arc Welding process to weld Mild steel according to ASME IX or equivalent international welding codes. 3.5 Weld aluminium and stainless steel using GTAW according to specifications and industry standards. 3.6 Produce Fillet welds using the Gas Tungsten Arc Welding process according to ASME IX or equivalent international welding codes. 3.7 Perform butt welds on plates and pipes using the Gas Tungsten Arc Welding according to ASME IX or equivalent international welding codes. 3.8 Use the Gas Tungsten Arc Welding process to weld pipes according to ASME IX or equivalent international welding codes.
4. Apply the principles of Occupational Health and Safety in the Work Environment	4.1 Identify hazards in the Workplace. 4.2 Assess possible risks in the workplace 4.3 Practice good housekeeping. 4.4 Wear Appropriate Personal Protective Equipment.

5. Demonstrate knowledge of Entrepreneurial principles in the workplace	5.1 Plan for given work assignments. 5.2 Solve problems creatively in the workplace. 5.3 Mobilise people and resources to execute tasks. 5.4 Create value through implementation of innovative ideas.

SECTION C	***QUALIFICATION STRUCTURE***				
COMPONENT	***TITLE***	***Credits Per Relevant NCQF Level***			***Total*** ***(Per** Subject/ Course/ Module/ Units)*
		Level [3]	***Level [4]***	***Level [ ]***	
FUNDAMENTAL COMPONENT *Subjects/ Courses/ Modules/Units*	Safety, Health and Environmental Protection	*3*			*3*
	Engineering Drawings and Specifications.		*3*		*3*
	Entrepreneurial Principles	*3*			*3*
	Working At Heights	*3*			*3*
	TOTAL	*9*	*3*		*12*
CORE COMPONENT *Subjects/Courses/ Modules/Units*	Welding Technology		*4*		*4*
	Engineering Materials and Treatments		*4*		*4*
	Shielded Metal Arc Welding-ASME IX		*7*		*7*
	MIG Welding -ASME IX		*7*		*7*
	TIG Welding -ASME IX		*8*		*8*
	Plasma Arc Welding -ASME IX		*7*		*7*

	Non-Destructive Testing (NDT)		4		4
	Erect, Assemble and Repair Metal Structures		4		4
	Use, Care and Maintenance of Tools and Equipment	4			4
	TOTAL	4	45		49
ELECTIVE/ OPTIONAL COMPONENT *Subjects/Courses/ Modules/Units* (Choose one)	Pattern Development for Fabrication		5		5
	Gas Welding Brazing Process		5		
	Pipe And Tube Fabrication		5		
	Welding Inspection		5		
	TOTAL				66

SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL	
TOTAL CREDITS PER NCQF LEVEL	
NCQF Level	***Credit Value***
3	13
4	53
TOTAL CREDITS	66

Rules of Combination:

(Please Indicate combinations for the different constituent components of the qualification)

Qualification consists of fundamental, core and elective components.

To be awarded the Qualification learners are required to obtain a minimum of 66 credits as detailed below.

Fundamental Component = 12 credits
Core Component = 49 credits
Elective Component = 5 credits

ASSESSMENT ARRANGEMENTS

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

Formative assessment

Formative or continuous assessment would be conducted to inform teaching and learning and establish the learner's level of readiness for progression to the next learning unit or module.

Formative assessment shall constitute 60% of the Final Mark

Summative assessment

Summative assessments shall be carried out in accordance with all applicable ETP policies, and the weighting of the assessment shall constitute 40% of the Final Mark

All assessment shall be carried out by BQA registered and accredited Assessors.

MODERATION ARRANGEMENTS

There shall be internal and external moderation carried out by BQA registered and accredited Moderators

RECOGNITION OF PRIOR LEARNING

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 applicable RPL policies and relevant national-level policy and legislative framework.

CREDIT ACCUMULATION AND TRANSFER

Candidates would be allowed to accumulate enough credits that would warrant them the award of the qualification in accordance with applicable ETP and national policies on CAT. This would include transfers of credits from previous learnings.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Articulation and Education Pathways

Horizontal Articulation: Graduates of this qualification may consider pursuing related qualifications at NCQF Level 4:

- Certificate IV in Fabrication
- Certificate IV in Rigging
- Certificate IV in Plant Maintenance

Vertical Articulation: Learners may progress to Level 5 qualifications in the same field such as:

- Certificate V in Coded Welding
- Certificate V in Welding Inspection
- Certificate V in Non-Destructive Testing (NDT)

Diagonal Articulation: Learners may progress to the next upper level in a different Sub Framework such as:

- Certificate V in Sales Management
- Certificate V In Workshop Management
- Certificate V in Preventative Maintenance

Employment Pathways

Learners who attain this qualification will have competencies and attributes to work as:

- Double Coded Welder
- Maintenance Welder
- Boilermaker

QUALIFICATION AWARD AND CERTIFICATION

To be awarded Certificate IV in Multi-Process Coded Welding, the candidate must have attain a minimum of **66** credits.

Upon successful completion of the qualification the candidate will be awarded a certificate for the Certificate IV in MULTI-PROCESS Coded Welding

REGIONAL AND INTERNATIONAL COMPARABILITY

Benchmarking has been done against qualifications registered in South Africa, Kenya, New Zealand and the United Kingdom in terms of graduate profiling, scope and depth of content, to ascertain regional and international comparability and articulation of the proposed qualification.

The following Similarities and Differences of the qualifications examined were observed.

Similarities

The exit level outcomes of the 4 qualifications examined are similar and their scope covers the production of various types of welding on plates and pipes using different types welding processes. The welding of non-ferrous metals such as aluminium and stainless steel are also covered

Since the qualification is skills based, assessment is integrated, and competencies are achieved through the design and development of assessment activities that make use of a variety of assessment methods and tools that measure not only the learner's knowledge and ability to perform practical tasks and activities within a familiar context, but which also challenge learners to demonstrate their ability to deal with problem situations that might or can arise in the workplace from time to time and which require learners' to demonstrate their ability to adapt their performance to meet the requirements of changed circumstances and to reflect on what they are doing and why.

Differences

The main difference of the qualifications studied is the disparity in the credit weighting and duration. Whilst Certificate IV in Multi-Process Coded Welding has 66 credits, the Samsons School of Welding qualification in South Africa has 158 Credits, while the one at the Auckland Welding School in New Zealand has only 60 credits, and no credits or specific duration has been stated for the other two qualifications from Kenya and the

United Kingdom. The Kenyan qualification is offered at Diploma level for 12 weeks even though it compares well with Certificate IV in Multi-Process Coded Welding in terms of exit outcomes and some modules.

The qualifications, except for the one from South Africa, have no fundamental modules such as communications, mathematical literacy, and leadership.

Comparability and Articulation

The proposed qualification generally compares well with the qualifications benchmarked with since the exit outcomes cover similar scope and depth and are aligned to exit-level descriptors typical of this level and as done within the region and beyond as well as competencies required for certification against welding standards such as ASME IX and British Standards (BS).

The qualifications examined bear great similarities with this qualification in terms of content, but it should be hastened to mention that variance in levels in the qualifications' frameworks presented a challenge in the comparability exercise

However, what really sets it apart from the qualifications examined is that there is provision for development of attributes such as effective communication and entrepreneurship fundamentals, which are critical for venturing into entrepreneurship or self-employment.

Learning pathways for the four qualifications have not been stated.

REVIEW PERIOD

The qualifications shall be reviewed after 5 years or when the need arise.