



**NATIONAL COMPETENCY STANDARDS  
FOR  
PLUMBER  
(CERTIFICATE 2&3)**

**TVET QUALITY COUNCIL  
BHUTAN QUALIFICATIONS AND PROFESSIONALS  
CERTIFICATION AUTHORITY  
THIMPHU, BHUTAN: SEP 2023**

First Publication 2009  
First Revision 2012  
Second Revision 2016  
Third revision 2020  
Fourth Revision 2023  
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## **FOREWORD**

The TVET Quality Council, BQPCA is pleased to present the National Competency Standards (NCS) for Plumber, BQF Certificate 2 and 3, which is developed in consultation with the field experts and trainers. The main objective of developing National Competency Standards is to set up a well-defined nationally recognized TVET Qualifications that will help in setting a benchmark for the TVET Qualifications in our country aligned to the international best practices.

The standards are developed to ensure that the TVET trainees possess the desired Skills, Knowledge and Attitude required by the industries. In order to ensure the relevancy of the competencies, the standards are developed in close consultation and partnership with industry experts and trainers from training institutes.

A training system based on National Competency Standards shall ensure that the training is relevant to the needs of the labour market. As a result, future TVET trainees will be better skilled to meet the needs and expectations of industries and employers. Such a positive impact on the employability of TVET graduates will enhance the reputation of the TVET system and make it attractive to the youths.

While acknowledging the existing level of cooperation and collaboration, the Council earnestly requests employers and training providers to extend the fullest support and cooperation in development and implementation of the National Competency Standards. The ultimate objective is to build a competent and productive national workforce that will contribute to the socio-economic development of our country. We gratefully acknowledge the valuable contributions made by experts from industries and trainers during the consultation and validation processes of the NCS development. We further look forward to improved industry engagement and active participation of trainers in the development of a quality-assured demand driven TVET system.

**Director  
BQPCA**

## ACKNOWLEDGEMENT

**Date of Review:** 14th September 2023

**Date of Next Review:** 13 September 2026

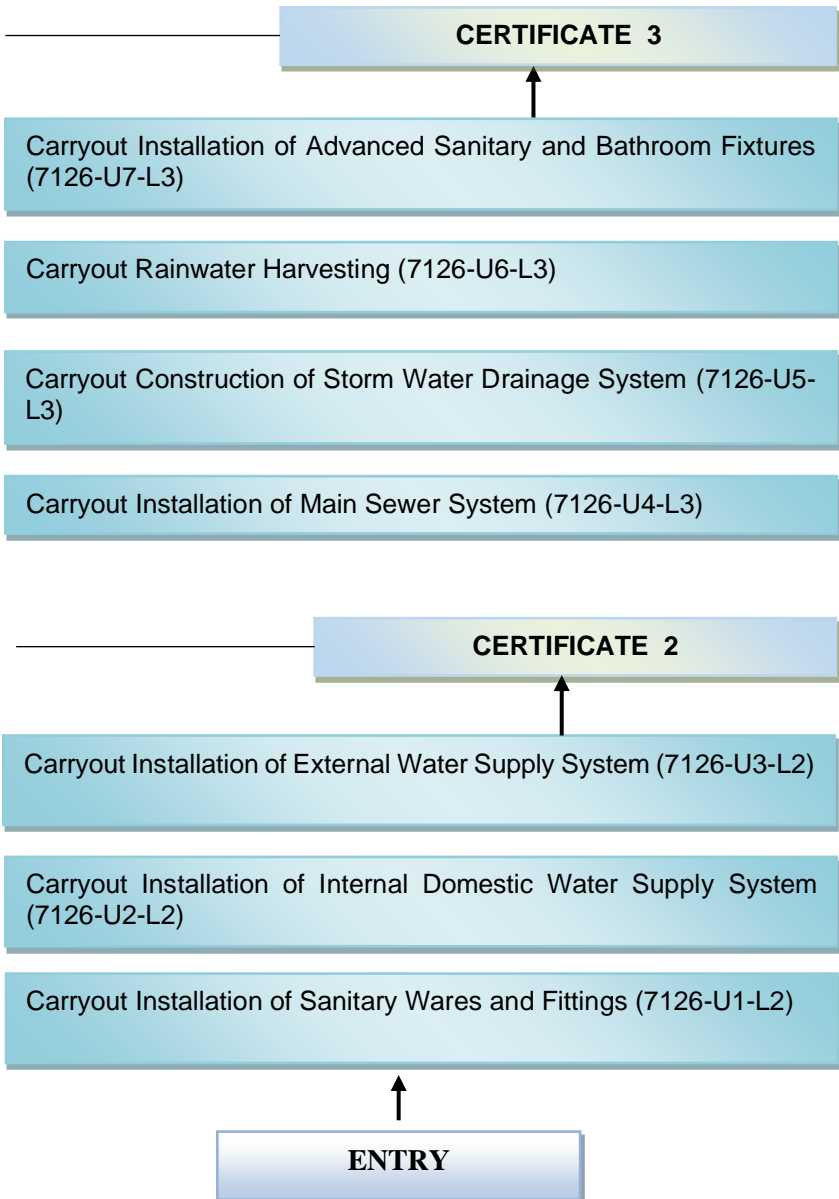
### Subject Experts Involved During the Revision of NCS for Plumber

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## PACKAGING OF QUALIFICATIONS



## OVERVIEW OF NATIONAL COMPETENCY STANDARDS

Unit Title	Element of Competence
1. Carryout Installation of Sanitary Wares and Fittings	1.1 Perform Installation of Water Pipes and Chrome Plated (CP) Fittings 1.2 Perform Laying of Soil and Waste Pipe with Fittings 1.3 Perform Installation of sanitary Fixtures 1.4 Perform Installation of Floor Heating System 1.5 Perform Repair and Maintenance
2. Carryout Installation of Internal Domestic Water Supply System	2.1 Perform Installation of Water Tanks and Pumps 2.2 Perform Repair and Maintenance
3. Carryout Installation of External Water Supply System	3.1 Perform Laying of External Pipelines and Valves 3.2 Perform Operation and Maintenance of Water Intake and Treatment Plant 3.3 Perform Repair and Maintenance
4. Carryout Installation of Main Sewer System	4.1 Perform Installation of Sewer Lines 4.2 Perform Installation of Chambers and Man holes 4.3 Perform Operation and Maintenance of Sewerage Treatment Plant 4.4 Perform Repair and Maintenance
5. Carryout Construction of Storm Water Drainage System	5.1 Perform Installation of Gutter 5.2 Perform Installation of Pipeline 5.3 Perform Trenching and Bedding 5.4 Perform Repair and Maintenance
6. Carry out Rainwater Harvesting System	6.1 Perform Installation of Gutter 6.2 Perform Installation of Pipeline 6.3 Perform Installation of Filtration

	6.4 Perform Repair and Maintenance
7. Carryout Installation of Advanced Sanitary and Bathroom Fixtures	7.1 Perform Installation of Advanced Sanitary Fixtures 7.2 Perform Installation of Cubicle Shower 7.3 Perform Installation of Advanced Sanitary Fixtures with Sensors 7.4 Perform Repair and Maintenance



<b>UNIT TITLE</b>	<b>Carryout Installation of Sanitary Wares and Fittings</b>
<b>DESCRIPTOR</b>	This unit covers the competencies required to carry out installation of water pipes and chrome plated fittings; lay soil and water fittings; install sanitary fittings; install floor heating system and perform repair and maintenance following health and safety procedures
<b>CODE</b>	<b>7126-U1-L2</b>
<b>ELEMENTS OF COMPETENCE</b>	<b>PERFORMANCE CRITERIA</b>
1. Perform Installation of Water Pipes and Chrome Plated (CP) fittings	1.1 Interpret drawing and specifications as per the job requirement 1.2 Select and use <b>tools and equipment</b> as per the job requirement 1.3 Select and use required <b>PPE</b> as per the job requirement 1.4 Select <b>materials</b> as per the job requirement following standard procedures 1.5 Perform <b>pipe joint</b> as per the job requirement following standard procedures 1.6 Lay pipes and fittings as per the job requirement following standard procedures 1.7 Install <b>CP fittings</b> as per the job requirement following standard procedures

	<p>1.8 Conduct leakage pressure test of the installation following standard procedures</p>
<p>2. Perform Laying of Soil &amp; Waste Pipe with Fittings</p>	<p>2.1 Interpret drawing and specifications as per the job requirement</p> <p>2.2 Select and use <b>tools and equipment</b> as per the job requirement.</p> <p>2.3 Select and use required <b>PPE</b> as per the job requirement</p> <p>2.4 Select materials as per the job requirement following standard procedures</p> <p>2.5 Perform <b>soil and waste pipe joint</b> as per the job requirement following standard procedures</p> <p>2.6 Lay soil and waste pipes and <b>fittings</b> as per the job requirement following standard procedures</p> <p>2.7 Conduct <b>leakage test</b> of the installation following standard procedures</p>
<p>3. Perform Installation of Sanitary Fixtures</p>	<p>3.1 Interpret drawing and specifications as per the job requirement</p> <p>3.2 Select and use tools and equipment as per the job requirement</p> <p>3.3 Select <b>materials</b> as per the job requirement following standard procedures</p>

	<p>3.4 Inspect sanitary wares prior to installation following standard procedures</p> <p>3.5 Install sanitary fixtures as per the job requirement following standard procedures</p> <p>3.6 Conduct test of installation following standard procedures</p>
<p>4. Perform Installation of Floor Heating System</p>	<p>4.1 Interpret drawing and specifications as per the job requirement</p> <p>4.2 Select and use <b>tools and equipment</b> as per the job requirement</p> <p>4.3 Select <b>materials</b> as per the job requirement following standard procedures</p> <p>4.4 Install hot water pressure pumps following standard procedures</p> <p>4.5 Install water-based floor heating system following standard procedures</p> <p>4.6 Conduct test of installation following standard procedures</p>

<p>5. Perform Repair and Maintenance</p>	<p>5.1 Diagnose the <b>faults</b> following standard procedures</p> <p>5.2 Select and use required tools and equipment according to job requirements</p> <p>5.3 Select and use required PPE as per the job requirement</p> <p>5.4 Select materials as per the job requirement following standard procedures</p> <p>5.5 Perform maintenance (replace and repair) of plumbing system following standard procedures</p> <p>5.6 Conduct functionality test of repaired plumbing system following standard procedures</p>
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RANGE STATEMENT	
<b>Tools and Equipment may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Measuring Tape</li> <li>• Monkey Wrench</li> <li>• Pipe Wrench</li> <li>• Chain Wrench</li> <li>• Reamer</li> <li>• Blow Lamp</li> <li>• Heating Plate</li> <li>• Chalk</li> <li>• Pipe</li> <li>• Pressure Testing Equipment</li> </ul>	<ul style="list-style-type: none"> <li>• Cutter or Hacksaw</li> <li>• Hammer</li> <li>• Spirit Level or Water Level</li> <li>• Adjustable Wrench</li> <li>• Plumb Bob</li> <li>• Die set or Ratchet</li> <li>• Chisel</li> <li>• Files</li> <li>• Screw Driver</li> </ul>

<ul style="list-style-type: none"> <li>• Drilling Machine</li> <li>• Pipe Vice</li> </ul>	
<b>PPE may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Gloves</li> <li>• Helmet</li> <li>• Safety Shoes</li> <li>• Goggles</li> </ul>	<ul style="list-style-type: none"> <li>• Ear Muff</li> <li>• Dust Mask</li> <li>• Safety Belt</li> </ul>
<b>Materials may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• G.I pipe</li> <li>• CPVC</li> <li>• PPR</li> </ul>	<ul style="list-style-type: none"> <li>• Pex Pipe</li> <li>• HDPE</li> </ul>
<b>Pipe Joint may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Cutting</li> <li>• Reaming</li> </ul>	<ul style="list-style-type: none"> <li>• Threading</li> <li>• Jointing</li> </ul>
<b>CP fittings may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Diverter</li> <li>• Sink mixture</li> <li>• Angle valve</li> </ul>	<ul style="list-style-type: none"> <li>• Shower Head</li> <li>• Concealed stop cock</li> <li>• Wall Mixture</li> </ul>
<b>Soil and Waste pipe joint may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Cutting</li> <li>• Reaming</li> </ul>	<ul style="list-style-type: none"> <li>• Jointing</li> </ul>
<b>Fittings may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Multi-floor-Trap</li> <li>• Bottle Trap</li> <li>• Nahani Trap</li> </ul>	<ul style="list-style-type: none"> <li>• P-trap</li> <li>• S-Trap</li> <li>• Q-Trap</li> </ul>

<ul style="list-style-type: none"> <li>• Sink</li> </ul>	
<b>Leakage Test may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Smoke test</li> <li>• Water test</li> </ul>	<ul style="list-style-type: none"> <li>• Air test</li> </ul>
<b>Materials for sanitary fixtures may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Wash Basin</li> <li>• WC Pan</li> <li>• Urinal</li> <li>• Bathtub</li> <li>• Geyser</li> <li>• Fire Water Sprinkle</li> </ul>	<ul style="list-style-type: none"> <li>• Sink</li> <li>• Bidet</li> <li>• P-trap</li> <li>• S-Trap</li> <li>• Q-Trap</li> </ul>
<b>Material for floor heating system may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Stainless steel</li> <li>• CPVC</li> </ul>	<ul style="list-style-type: none"> <li>• Pex Pipe</li> <li>• PPR</li> </ul>
<b>Soil and Waste pipe joint may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Cutting</li> <li>• Reaming</li> </ul>	<ul style="list-style-type: none"> <li>• Jointing</li> </ul>
<b>Faults may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Leakage</li> </ul>	<ul style="list-style-type: none"> <li>• Blockage</li> </ul>
<b>Critical Aspects</b>	
<ul style="list-style-type: none"> <li>• Demonstrate compliance with safety regulations applicable to work site operations</li> <li>• Carryout installation of internal domestic water supply system and sanitary fixtures following safety procedures</li> </ul>	

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none"> <li>• Ethics and Integrity</li> <li>• Estimation and Costing</li> <li>• Pipe Sizes</li> <li>• Plumbing Code of Practice</li> <li>• Type of Water Distribution System</li> <li>• Pipe Fitting and Valve Catalogues</li> <li>• Types of Valves and Pumps</li> <li>• Causes and Remedies of Maintenance</li> <li>• Types of Tools and Equipment</li> <li>• Basic technical calculations</li> <li>• Basic hydraulics (flow of water through pipes)</li> <li>• Different types of water tanks</li> <li>• Water based radiant floor heating system</li> <li>• Jointing compounds</li> <li>• Plumbing signs and symbols</li> <li>• Report Writing</li> <li>• Inventory and Record Keeping (stock register, site order book)</li> </ul>	<ul style="list-style-type: none"> <li>• Team Work</li> <li>• Communication</li> <li>• Problem Solving</li> <li>• Interpersonal Relationship</li> <li>• Creativity</li> <li>• Time Management</li> </ul>

<b>UNIT TITLE</b>	<b>Carryout Installation of Internal Domestic Water Supply System</b>
<b>DESCRIPTOR</b>	This unit covers the competencies required to carry out installation of domestic water supply following health and safety procedures
<b>CODE</b>	<b>7126-U2-L2</b>
<b>ELEMENTS OF COMPETENCE</b>	<b>PERFORMANCE CRITERIA</b>
1. Perform Installation of the Tank and Pumps	1.1 Interpret drawing and specifications as per the job requirement 1.2 Select and use required <b>tools and equipment</b> according to job requirements 1.3 Select and use required <b>PPE</b> as per the job requirement 1.4 Select the location for installation of water tank as per the job requirement 1.5 Prepare the base for tank as per the job requirement following standard procedures 1.6 Fix the tank components as per the job requirement following standard procedures 1.7 Perform installation of <b>water tank</b> as per the drawing following standard procedures 1.8 Select the size of <b>water pump</b> as per the job requirement



	<p>1.9 Install water pump as per the specifications and manufacturers' manual following standard procedures</p> <p>1.10 Commission the pump and tank following standard procedures</p>
<p>2. Perform Repair and Maintenance</p>	<p>2.1 Diagnose the <b>faults</b> following standard procedures</p> <p>2.2 Select and use required tools and equipment according to job requirements</p> <p>2.3 Select and use required PPE as per the job requirement</p> <p>2.4 Select materials as per the job requirement following standard procedures</p> <p>2.5 Perform maintenance (replace and repair) of plumbing system following standard procedures</p> <p>2.6 Conduct functionality test of repaired plumbing system as per the standard procedures</p>

<b>RANGE STATEMENT</b>	
<b>Tools and Equipment may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Measuring Tape</li> <li>• Monkey Wrench</li> <li>• Pipe Wrench</li> <li>• Chain Wrench</li> <li>• Reamer</li> <li>• Blow Lamp</li> <li>• Heating Plate</li> <li>• Chalk</li> <li>• Pipe</li> <li>• Pressure Testing Equipment</li> <li>• Drilling Machine</li> <li>• Pipe Vice</li> </ul>	<ul style="list-style-type: none"> <li>• Cutter or Hacksaw</li> <li>• Hammer</li> <li>• Spirit Level or Water Level</li> <li>• Adjustable Wrench</li> <li>• Plumb Bob</li> <li>• Die set or Ratchet</li> <li>• Chisel</li> <li>• Files</li> <li>• Screw Driver</li> </ul>
<b>PPE may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Gloves</li> <li>• Helmet</li> <li>• Safety Shoes</li> <li>• Goggles</li> </ul>	<ul style="list-style-type: none"> <li>• Ear Muff</li> <li>• Dust Mask</li> <li>• Safety Belt</li> </ul>
<b>Water tank may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• SS tank</li> <li>• PVC</li> </ul>	<ul style="list-style-type: none"> <li>• Zincalume</li> </ul>
<b>Water pump may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Submersible</li> <li>• Rotary</li> </ul>	<ul style="list-style-type: none"> <li>• Centrifugal</li> </ul>
<b>Faults may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Leakage</li> </ul>	<ul style="list-style-type: none"> <li>• Blockage</li> </ul>

**Critical Aspects**

- Demonstrate compliance with safety regulations applicable to work site operations
- Carryout installation of internal domestic water supply system and sanitary fixtures following safety procedures

**UNDERPINNING KNOWLEDGE**

- Ethics and Integrity
- Estimation and Costing
- Pipe Sizes
- Plumbing Code of Practice
- Type of Water Distribution System
- Pipe Fitting and Valve Catalogues
- Types of Valves and Pumps
- Causes and Remedies of Maintenance
- Types of Tools and Equipment
- Basic technical calculations
- Basic hydraulics (flow of water through pipes)
- Different types of water tanks
- Jointing compounds
- Plumbing signs and symbols
- Report Writing
- Inventory and Record Keeping (stock register, site order book)

**UNDERPINNING SKILLS**

- Team Work
- Communication
- Problem Solving
- Interpersonal Relationship
- Creativity
- Time Management

<b>UNIT TITLE</b>	<b>Carryout Installation of External Water Supply System</b>
<b>DESCRIPTOR</b>	This unit covers the competencies required to perform laying of external pipeline sand valves and perform repair and maintenance to successfully install external water supply system following standard procedures
<b>CODE</b>	<b>7126-U3-L2</b>
<b>ELEMENTS OF COMPETENCE</b>	<b>PERFORMANCE CRITERIA</b>
1. Perform Laying of External Pipelines and Valves	<p>1.1 Interpret drawing and specifications as per the job requirement</p> <p>1.2 Select and use required <b>tools and equipment</b> as per the job requirements</p> <p>1.3 Select and use required <b>PPE</b> as per the job requirements</p> <p>1.4 Prepare trenches and bedding to the required sizes as per the job requirement following standard procedures</p> <p>1.5 Lay pipes and fittings for main and distribution lines as per the job specification and design layout following standard procedures</p> <p>1.6 Join the pipes and fittings as per the standard procedures</p>

	<p>1.7 Perform connection to reservoir and break-pressure tank as per the standard procedures</p> <p>1.8 Backfill the trenches as per the job requirement following standard procedures.</p> <p>1.9 Fix <b>valves</b> and water meter as per the standard procedures</p> <p>1.10 Conduct pressure test and take necessary action as per the job requirement following standard procedures</p>
<p>2. Perform Operation and Maintenance of Water Intake and Treatment Plant</p>	<p>2.1 Interpret drawing and specifications as per the job requirement</p> <p>2.2 Select and use tools and equipment as per the job requirements</p> <p>2.3 Select and use required PPE as per the job requirements</p> <p>2.4 Clean and remove <b>foreign materials</b> from the treatment plant as per the job requirement following standard procedures</p> <p>2.5 Back wash the water filter as per the treatment plant manual following standard procedures</p>

	<p>2.6 Service <b>water treatment units</b> as per the job requirement following standard procedures</p> <p>2.7 Perform water quality test and add alum following standard procedures</p> <p>2.8 Disinfect the water as per the treatment plant manual</p> <p>2.9 Record the data and regulate the raw water flow and treated water flow following standard procedures</p>
<p>3. Perform Repair and Maintenance</p>	<p>3.1 Diagnose <b>faults</b> as per the job requirement following standard procedures</p> <p>3.2 Repair the defective pipe and fittings as per the job requirement following standard procedures</p> <p>3.3 Replace the defective pipe and fittings as per the job requirement following standard procedures</p> <p>3.4 Conduct functional test of the repaired plumbing system as per the job requirement</p>

<b>RANGE STATEMENT</b>	
<b>Tools and Equipment may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Measuring Tape</li> <li>• Monkey Wrench</li> <li>• Pipe Wrench</li> <li>• Chain Wrench</li> <li>• Reamer</li> <li>• Blow Lamp</li> <li>• Heating Plate and Chalk</li> <li>• Pipe cutter or Hacksaw</li> <li>• Hammer</li> <li>• Spirit level</li> </ul>	<ul style="list-style-type: none"> <li>• Dumpy Level</li> <li>• Electric Drill</li> <li>• Pipe vice</li> <li>• Adjustable wrench</li> <li>• Plumb Bob</li> <li>• Die set</li> <li>• Chisel</li> <li>• File</li> <li>• Screw Driver</li> </ul>
<b>PPE may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Gloves</li> <li>• Helmet</li> <li>• Safety Shoes</li> <li>• Goggles</li> </ul>	<ul style="list-style-type: none"> <li>• Ear Muff</li> <li>• Dust Musk</li> <li>• Safety Belt</li> </ul>
<b>Valves may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Gate Valve</li> <li>• Pressure Release Valve</li> <li>• Scour Valve</li> <li>• Float Valve</li> </ul>	<ul style="list-style-type: none"> <li>• Globe Valve</li> <li>• Non-return Valve</li> <li>• Butterfly Valve</li> </ul>
<b>Foreign materials may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Leaves</li> <li>• Stick</li> </ul>	<ul style="list-style-type: none"> <li>• Debris</li> </ul>
<b>Water treatment units may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Mixing Chamber</li> </ul>	<ul style="list-style-type: none"> <li>• Filter tank</li> </ul>

<ul style="list-style-type: none"> <li>• Sedimentation tank</li> </ul>	<ul style="list-style-type: none"> <li>• Coagulation Tank</li> </ul>
<b>Faults may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Leakage</li> </ul>	<ul style="list-style-type: none"> <li>• Blockage</li> </ul>
<b>Critical Aspects</b>	
<ul style="list-style-type: none"> <li>• Demonstrate compliance to hygiene and safety regulations applicable to work operations at all times</li> <li>• Conduct pressure test and take necessary action as per the job requirement following standard procedures</li> <li>• Diagnose faults as per the job requirement following standard procedures</li> </ul>	

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none"> <li>• Ethics and Integrity</li> <li>• Basic V-notch Calculation</li> <li>• Type of Water Distribution System</li> <li>• Pipe fitting and Valves Catalogues</li> <li>• Working Principle of Water Treatment Plant</li> <li>• Estimation and Costing</li> <li>• Types of Water treatment solutions</li> <li>• Ratio of Chemicals to water</li> <li>• Public Decorum</li> <li>• Waste Management</li> <li>• Report Writing</li> <li>• Inventory and Record Keeping (stock register, site order book)</li> </ul>	<ul style="list-style-type: none"> <li>• Team Work</li> <li>• Communication</li> <li>• Problem Solving</li> <li>• Interpersonal Relationship</li> <li>• Creativity</li> <li>• Time Management</li> </ul>



<b>UNIT TITLE</b>	<b>Carryout Installation of Main Sewer System</b>
<b>DESCRIPTOR</b>	This unit covers the competencies required to carry out installation of main sewer system following standard procedures
<b>CODE</b>	<b>7126-U4-L3</b>
<b>ELEMENTS OF COMPETENCE</b>	<b>PERFORMANCE CRITERIA</b>
1. Perform Installation of Sewer lines	1.1 Interpret drawing and specifications as per the job requirement 1.2 Select and use <b>tools and equipment</b> as per the job requirements 1.3 Select and use required <b>PPE</b> as per the job requirements 1.4 Select <b>materials</b> as per the job requirement following standard procedures 1.5 Install sewer lines following standard procedures 1.6 Conduct test of sewer lines following standard procedures

<p>2. Perform Installation of Chamber and Manholes</p>	<p>2.1 Interpret drawing and specifications as per the job requirement.</p> <p>2.2 Select and use <b>tools and equipment</b> as per the job requirements</p> <p>2.3 Select and use required <b>PPE</b> as per the job requirements</p> <p>2.4 Select <b>materials</b> as per the job requirement following standard procedures</p> <p>2.5 Install chambers and manholes as per the drawing following standard procedures</p> <p>2.6 Conduct test of chambers and manholes following standard procedures</p>
<p>3. Perform Operation and Maintenance of Sewerage Treatment Plant</p>	<p>3.1 Select and use <b>tools and equipment</b> as per the job requirements</p> <p>3.2 Select and use required <b>PPE</b> as per the job requirements</p> <p>3.3 Perform operation of sewerage treatment plant following standard procedures</p> <p>3.4 Perform maintenance of sewerage treatment plant as per the job requirement following standard procedures</p>
<p>4. Perform Repair and Maintenance</p>	<p>4.1 Diagnose <b>faults</b> as per the job requirement following standard procedures</p>

	<p>4.2 Repair the defective pipe and fittings as per the job requirement following standard procedures</p> <p>4.3 Replace the defective pipe and fittings as per the job requirement following standard procedures</p> <p>4.4 Conduct functional test of the repaired plumbing system as per the job requirement</p>
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<b>RANGE STATEMENT</b>	
<b>Tools and Equipment may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Measuring Tape</li> <li>• Monkey Wrench</li> <li>• Pipe Wrench</li> <li>• Chain Wrench</li> <li>• Reamer</li> <li>• Blow lamp</li> <li>• Heating Plate</li> <li>• Chalk</li> <li>• Pipe</li> <li>• Cutter or Hacksaw</li> </ul>	<ul style="list-style-type: none"> <li>• Hammer</li> <li>• Spirit level or water level</li> <li>• Drilling Machine</li> <li>• Pipe vice</li> <li>• Adjustable wrench</li> <li>• Plumb bob</li> <li>• Die set or Ratchet</li> <li>• Chisel</li> <li>• Files</li> <li>• Screw Driver</li> </ul>
<b>PPE may include but not limited to</b>	
<ul style="list-style-type: none"> <li>• Gloves</li> <li>• Helmet</li> <li>• Safety Shoes</li> <li>• Goggles</li> </ul>	<ul style="list-style-type: none"> <li>• Ear Muff</li> <li>• Dust Musk</li> <li>• Safety Belt</li> </ul>
<b>Sewer Materials may include but not limited to:</b>	

<ul style="list-style-type: none"> <li>• Pipes and fittings</li> <li>• PVC</li> </ul>	<ul style="list-style-type: none"> <li>• HDPE</li> <li>• Concrete Pipe</li> </ul>
<b>Chambers and manhole materials may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• PVC chamber</li> <li>• Pre-cast RCC</li> </ul>	<ul style="list-style-type: none"> <li>• Hume Pipes</li> <li>• Cast Iron</li> </ul>
<b>Faults may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Leakage</li> </ul>	<ul style="list-style-type: none"> <li>• Blockage</li> </ul>
<b>Critical Aspects</b>	
<ul style="list-style-type: none"> <li>• Demonstrate compliance with safety regulations applicable to work site operations</li> <li>• Interpret drawing and specifications as per the job requirement</li> <li>• Conduct test of sewer lines following standard procedures</li> </ul>	

<b>UNDERPINNING KNOWLEDGE</b>	<b>UNDERPINNING SKILLS</b>
<ul style="list-style-type: none"> <li>• Ethics and Integrity</li> <li>• Types of Sewerage Treatment Plant</li> <li>• Functions of Septic Tank</li> <li>• Estimation and Costing</li> <li>• Types of septic Tank</li> <li>• Functions of Soak Pit</li> <li>• Functions of Chambers and manholes</li> <li>• Benching of Chambers and Manholes</li> <li>• Importance of Gradient in Sewer line</li> </ul>	<ul style="list-style-type: none"> <li>• Team Work</li> <li>• Communication</li> <li>• Problem Solving</li> <li>• Interpersonal Relationship</li> <li>• Creativity</li> <li>• Time Management</li> </ul>

<ul style="list-style-type: none"><li>• Importance of Bedding and Back filling</li><li>• Working Principles of Sewerage treatment plant</li><li>• Reporting Writing</li><li>• Inventory and Record Keeping (stock register, site order book)</li></ul>	
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<b>UNIT TITLE</b>	<b>Carryout Construction of Storm Water Drainage System</b>
<b>DESCRIPTOR</b>	This unit deals with installation of gutter, installation of pipelines, performing trenching & bedding and conduct repair and maintenance
<b>CODE</b>	<b>7126-U5-L3</b>
<b>ELEMENTS OF COMPETENCE</b>	<b>PERFORMANCE CRITERIA</b>
1. Perform Installation of Gutter	<p>1.1 Interpret drawing and specifications as per the job requirement</p> <p>1.2 Select and use <b>tools and equipment</b> as per the job requirement</p> <p>1.3 Select and use required <b>PPE</b> as per the job requirement</p> <p>1.4 Select <b>materials</b> as per the job requirement following standard procedures</p> <p>1.5 Layout gutter pipeline following standard procedures</p> <p>1.6 Fix gutter clamp as per the requirement</p> <p>1.7 Perform <b>gutter joint</b> as per invert level following standard procedures</p> <p>1.8 Conduct leakage test of the installation following standard procedures</p> <p>1.9 Backfill the trenches as per the job requirement following standard procedures</p>

<p>2. Perform Installation of Pipeline</p>	<p>2.1 Interpret drawing and specifications as per the job requirement</p> <p>2.2 Select and use <b>tools and equipment</b> as per the job requirement</p> <p>2.3 Select and use required <b>PPE</b> as per the job requirement</p> <p>2.4 Select <b>materials</b> as per the job requirement following standard procedures</p> <p>2.5 Perform <b>pipe joint</b> as per invert level following standard procedures</p> <p>2.6 Lay pipes and fittings as per the job requirement following standard procedures</p> <p>2.7 Conduct leakage test of the installation following standard procedures</p>
<p>3. Perform Trenching and Bedding</p>	<p>3.1 Interpret drawing and specifications as per the job requirement</p> <p>3.2 Select and use <b>tools and equipment</b> as per the job requirement.</p> <p>3.3 Select and use required <b>PPE</b> as per the job requirement</p> <p>3.4 Select materials as per the job requirement following standard procedures</p> <p>3.5 Perform <b>pipe joint</b> as per the job requirement following standard procedures</p>

	<p>3.6 Lay pipeline as per the given gradient following standard procedures</p> <p>3.7 Check and inspect the gradient of the trench and pipeline as per the drawing</p>
4. Perform Repair and Maintenance	<p>4.1 Diagnose the <b>faults</b> following standard procedures</p> <p>4.2 Select and use required tools and equipment according to job requirements</p> <p>4.3 Select and use required PPE as per the job requirement</p> <p>4.4 Select materials as per the job requirement following standard procedures</p> <p>4.5 Perform maintenance (replace and repair) of plumbing system following standard procedures</p> <p>4.6 Conduct functionality test of repaired plumbing system as per the standard procedures</p>

RANGE STATEMENT	
<b>Tools and Equipment may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Measuring Tape</li> <li>• Monkey Wrench</li> <li>• Pipe Wrench</li> </ul>	<ul style="list-style-type: none"> <li>• Electric Drill</li> <li>• Pipe Vice</li> <li>• Adjustable Wrench</li> </ul>



<ul style="list-style-type: none"> <li>• Chain Wrench</li> <li>• Reamer</li> <li>• Blow Lamp</li> <li>• Heating Plate and Chalk</li> <li>• Pipe cutter or Hacksaw</li> <li>• Hammer</li> <li>• Spirit Level</li> </ul>	<ul style="list-style-type: none"> <li>• Plumb bob</li> <li>• Die Set</li> <li>• Chisel</li> <li>• File</li> <li>• Screw Driver</li> <li>• Laser Leveling Machine</li> </ul>
<b>PPE may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Gloves</li> <li>• Helmet</li> <li>• Safety Shoes</li> <li>• Goggles</li> </ul>	<ul style="list-style-type: none"> <li>• Ear Muff</li> <li>• Dust Mask</li> <li>• Safety Belt</li> </ul>
<b>Critical Aspects</b>	
<ul style="list-style-type: none"> <li>• Demonstrate compliance to hygiene and safety regulations applicable to work operations at all times</li> <li>• Interpret drawing and specifications as per the job requirement</li> <li>• Check and inspect the gradient of the trench and pipeline as per the drawing</li> </ul>	

<b>UNDERPINNING KNOWLEDGE</b>	<b>UNDERPINNING SKILLS</b>
<ul style="list-style-type: none"> <li>• Ethics and Integrity</li> <li>• Calculation of Gradient</li> <li>• Excavation processes and procedures</li> <li>• Process of installing stormwater and sub- soil drainage systems</li> <li>• Waste Management</li> <li>• Reporting Writing</li> </ul>	<ul style="list-style-type: none"> <li>• Team Work</li> <li>• Communication</li> <li>• Problem Solving</li> <li>• Interpersonal Relationship</li> <li>• Creativity</li> <li>• Time Management</li> </ul>

<ul style="list-style-type: none"> <li>Inventory and Record Keeping (stock register, site order book)</li> </ul>	
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<b>UNIT TITLE</b>	<b>Carryout Rain Water Harvesting</b>
<b>DESCRIPTOR</b>	This unit covers the competencies required to carry out installation of main sewer system following standard procedures
<b>CODE</b>	<b>7126-U6-L3</b>
<b>ELEMENTS OF COMPETENCE</b>	<b>PERFORMANCE CRITERIA</b>
1. Perform Installation of Gutter	1.1 Interpret drawing and specifications as per the job requirement 1.2 Select and use <b>tools and equipment</b> as per the job requirement 1.3 Select and use required <b>PPE</b> as per the job requirement 1.4 Select <b>materials</b> as per the job requirement following standard procedures 1.5 Layout gutter pipeline following standard procedures 1.6 Fix gutter clamp as per the requirement 1.7 Perform <b>gutter joint</b> as per invert level following standard procedures

	<p>1.8 Conduct leakage test of the installation following standard procedures</p>
<p>2. Perform Installation of Pipeline</p>	<p>2.1 Interpret drawing and specifications as per the job requirement</p> <p>2.2 Select and use <b>tools and equipment</b> as per the job requirement</p> <p>2.3 Select and use required <b>PPE</b> as per the job requirement</p> <p>2.4 Select <b>materials</b> as per the job requirement following standard procedures</p> <p>2.5 Perform <b>pipe joint</b> as per invert level following standard procedures</p> <p>2.6 Lay pipes and fittings as per the job requirement following standard procedures</p> <p>2.7 Conduct leakage test of the installation following standard procedures</p>

<p>3. Perform Installation of Filtration</p>	<p>3.1 Interpret drawing and specifications as per the job requirement</p> <p>3.2 Select and use <b>tools and equipment</b> as per the job requirements</p> <p>3.3 Select and use required <b>PPE</b> as per the job requirements</p> <p>3.4 Install pipeline as per the given drawing following standard procedures</p> <p>3.5 Install pipeline for selected filter media and necessary connection to the tank following standard procedures</p>
<p>4. Perform Repair and Maintenance</p>	<p>4.1 Diagnose the faults following standard procedures</p> <p>4.2 Select and use required tools and equipment according to job requirements</p> <p>4.3 Select and use required PPE as per the job requirement</p> <p>4.4 Select materials as per the job requirement following standard procedures</p> <p>4.5 Perform maintenance (replace and repair) of plumbing system following standard procedures</p> <p>4.6 Conduct functionality test of repaired plumbing system as per the standard procedures</p>

<b>RANGE STATEMENT</b>	
<b>Tools and Equipment may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Measuring Tape</li> <li>• Monkey Wrench</li> <li>• Pipe Wrench</li> <li>• Chain Wrench</li> <li>• Reamer</li> <li>• Blow Lamp</li> <li>• Heating Plate and Chalk</li> <li>• Pipe Cutter or Hacksaw</li> <li>• Hammer</li> <li>• Spirit Level</li> </ul>	<ul style="list-style-type: none"> <li>• Dumpy Level</li> <li>• Electric Drill</li> <li>• Pipe Vice</li> <li>• Adjustable wrench</li> <li>• Plumb Bob</li> <li>• Die Set</li> <li>• Chisel</li> <li>• File</li> <li>• Screw Driver</li> </ul>
<b>PPE may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Gloves</li> <li>• Helmet</li> <li>• Safety Shoes</li> <li>• Goggles</li> </ul>	<ul style="list-style-type: none"> <li>• Ear Muff</li> <li>• Dust Musk</li> <li>• Safety Belt</li> </ul>
<b>Critical Aspects</b>	
<ul style="list-style-type: none"> <li>• Demonstrate compliance to hygiene and safety regulations applicable to work operations at all times</li> <li>• Interpret drawing and specifications as per the job requirement</li> <li>• Fix gutter clamp as per the requirement</li> <li>• Perform pipe joint as per invert level following standard procedures</li> <li>• Install pipeline for selected filter media and necessary connection to the tank following standard procedures</li> </ul>	

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none"> <li>• Ethics and Integrity</li> <li>• Types of Sewerage Treatment Plant</li> <li>• Functions of Septic tank</li> <li>• Types of Septic Tank</li> <li>• Functions of Soak Pit</li> <li>• Functions of Chambers and Manholes</li> <li>• Benching of Chambers and Manholes</li> <li>• Importance of Gradient in Sewer Line</li> <li>• Importance of bedding and back filling</li> <li>• Working principles of sewerage treatment plant</li> <li>• Reporting Writing on daily activities</li> <li>• Inventory and Record Keeping (stock register, site order book)</li> </ul>	<ul style="list-style-type: none"> <li>• Team Work</li> <li>• Communication</li> <li>• Problem Solving</li> <li>• Interpersonal Relationship</li> <li>• Creativity</li> <li>• Time Management</li> </ul>

<b>UNIT TITLE</b>	<b>Carryout Installation of Advanced Sanitary and Bathroom Fixtures</b>
<b>DESCRIPTOR</b>	This unit covers the competencies required to carry out installation of advanced sanitary and bathroom fixtures following safety procedures at all times
<b>CODE</b>	<b>7126-U7-L3</b>
<b>ELEMENTS OF COMPETENCE</b>	<b>PERFORMANCE CRITERIA</b>
1. Perform Installation of Advanced Sanitary Fixtures	1.1 Interpret drawing and specifications as per the job requirement 1.2 Select and use required tools and equipment as per the job requirements 1.3 Select and use required PPE as per the job requirements 1.4 Install Jacuzzi as per the installation manual 1.5 Install bathtub following as per installation manual following standard procedures 1.6 Install sanitary accessories for differently-abled users following standard procedures
2. Perform Installation of Cubicle Shower	2.1 Interpret drawing and specifications as per the job requirement 2.2 Select and use required tools and equipment as per the job requirements

	<p>2.3 Select and use required PPE as per the job requirements</p> <p>2.4 Perform installation of cubicle shower as per installation manual</p> <p>2.5 Conduct leakage test of the cubicle shower following standard procedures</p>
<p>3. Perform Installation of Advanced Sanitary Fixtures with Sensor</p>	<p>3.1 Interpret drawing and specifications as per the job requirement</p> <p>3.2 Select and use required tools and equipment as per the job requirements</p> <p>3.3 Select and use required PPE as per the job requirement</p> <p>3.4 Install advanced <b>sanitary fixtures with sensors</b> as per the standard procedures</p> <p>3.5 Conduct leakage test of the sanitary fixtures with sensors following standard procedures</p>



<p>4. Perform Repair and Maintenance</p>	<p>4.1 Diagnose the faults following standard procedures</p> <p>4.2 Select and use required tools and equipment according to job requirements</p> <p>4.3 Select and use required PPE as per the job requirement</p> <p>4.4 Select materials as per the job requirement following standard procedures</p> <p>4.5 Perform maintenance (replace and repair) of plumbing system following standard procedures</p> <p>4.6 Conduct functionality test of repaired plumbing system as per the standard procedures</p>
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<b>RANGE STATEMENT</b>	
<b>Sanitary fixtures with sensors may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Urinal</li> <li>• Wash Basin</li> </ul>	<ul style="list-style-type: none"> <li>• WC</li> <li>• Health Faucet</li> </ul>
<b>Tools and Equipment may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>• Measuring Tape</li> <li>• Monkey Wrench</li> <li>• Pipe Wrench</li> <li>• Chain Wrench</li> <li>• Reamer</li> <li>• Blow Lamp</li> <li>• Heating plate and Chalk</li> </ul>	<ul style="list-style-type: none"> <li>• Dumpy Level</li> <li>• Electric Drill</li> <li>• Pipe Vice</li> <li>• Adjustable Wrench</li> <li>• Plumb Bob</li> <li>• Die Set</li> <li>• Chisel</li> </ul>

<ul style="list-style-type: none"> <li>• Pipe Cutter or Hacksaw</li> <li>• Hammer</li> <li>• Spirit Level</li> </ul>	<ul style="list-style-type: none"> <li>• File</li> <li>• Screw Driver</li> </ul>
<b>PPE may include but not limited to</b>	
<ul style="list-style-type: none"> <li>• Gloves</li> <li>• Helmet</li> <li>• Safety Shoes</li> <li>• Goggles</li> </ul>	<ul style="list-style-type: none"> <li>• Ear Muff</li> <li>• Dust Musk</li> <li>• Safety Belt</li> </ul>
<b>Critical Aspects</b>	
<ul style="list-style-type: none"> <li>• Demonstrate compliance with safety regulations applicable to work site operations</li> <li>• Interpret drawing and specifications as per the job requirement</li> <li>• Carryout installation of advanced sanitary and bathroom fixtures as per the standard procedures</li> <li>• Perform maintenance (replace and repair) of plumbing system following standard procedures</li> </ul>	

<b>UNDERPINNING KNOWLEDGE</b>	<b>UNDERPINNING SKILLS</b>
<ul style="list-style-type: none"> <li>• Ethics and Integrity</li> <li>• Types of Sensors</li> <li>• Interpretation of catalogues/manual of advanced sanitary fixtures</li> <li>• Reporting Writing</li> <li>• Inventory and Record Keeping (stock register, site order book)</li> </ul>	<ul style="list-style-type: none"> <li>• Team Work</li> <li>• Communication</li> <li>• Problem Solving</li> <li>• Interpersonal Relationship</li> <li>• Creativity</li> <li>• Time Management</li> </ul>



## **ANNEXURE**

### **1.1. National Competency Standards (NCS)**

The National Competency Standards specify the skill, knowledge and attitudes applied to a particular occupation. Standards also specify the standards or criteria of performance of a competent worker and the various contexts in which work may take place. Standards provide explicit advice to assessors regarding the skill and knowledge to be demonstrated by candidates seeking formal recognition either following training or through work experience.

### **1.2. Purpose of National Competency Standards**

National Competency Standards serve a number of purposes including:

- Providing advice to curriculum developers about the competencies to be included in the curriculum.
- Providing specifications to assessment resource developers about the competencies within an occupation to be demonstrated by candidates.
- Providing advice to industry/employers about job functions, which in turn can be used for the development of job descriptions, performance appraisal systems and work flow analysis.

### **1.3. Bhutan Qualifications Framework (BQF)**

Bhutan Qualifications Framework is an integrated national framework that outlines all types of qualification in Bhutan. As an established and nationally accepted instrument, the BQF has been benchmarked against international practices in terms of standards. The BQF aims to recognize all forms of learning systems, including formal, non-formal, and informal learning. It acknowledges technological advancements and recognizes contemporary

modes of delivery. It covers a broad range of education systems including the TVET education.

#### 1.4 Implementation of TVET Qualifications



\* RPL = Recognition of Prior Learning

#### 1.5 TVET Qualifications Levels

TVET Qualifications has six levels as per the BQF. The six levels are:

- Applied Degree: Level 6
- Advanced Diploma: Level 5
- Diploma: Level 4
- Certificate 3
- Certificate 2
- Certificate 1

### 1.6. Level Descriptors

The TVET Qualification levels are set based on the level descriptors, as defined in the BQF. The detail of the qualification level descriptor is as follow:

#### Certificate 1

Skills	Knowledge:	Application
<ul style="list-style-type: none"> <li>Applying operational literacy, numeracy skills required to carry out simple tasks</li> <li>Applying simple solutions to solve simple and straightforward everyday issues</li> <li>Communicating using everyday expressions and simple phrases</li> </ul>	<ul style="list-style-type: none"> <li>Foundations, every day and general:</li> <li>Basic operational knowledge and skill</li> <li>Utilization of basic available information</li> <li>Known solutions to familiar problems</li> <li>Little generation of new ideas</li> </ul>	<ul style="list-style-type: none"> <li>Highly structured tasks with close support and supervision</li> <li>Minimal discretion and judgement</li> <li>Readiness to work together and share knowledge with others</li> </ul>

#### Certificate level 2

Skills	Knowledge	Application
<ul style="list-style-type: none"> <li>Applying standard processes relevant to carry out known tasks</li> <li>Applying a set of known solutions to solve simple and straightforward issues</li> <li>Using simple and direct exchange of</li> </ul>	<ul style="list-style-type: none"> <li>Basic, factual and conceptual</li> <li>Some relevant theoretical knowledge</li> <li>Interpretation of available information</li> </ul>	<ul style="list-style-type: none"> <li>Structured and stable tasks</li> <li>General support and supervision that require some discretion and judgement</li> </ul>

information on familiar and routine matters	<ul style="list-style-type: none"> <li>● Discretion and judgments</li> <li>● A range of known responses to familiar problems</li> </ul>	<ul style="list-style-type: none"> <li>● Collaborati on with others to achieve goals</li> </ul>
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### Certificate 3

Skills	Knowledge:	Application:
<ul style="list-style-type: none"> <li>● Applying a range of standard processes to known but varied tasks</li> <li>● Selecting and applying a range of solutions to familiar and unfamiliar problems</li> </ul>	<ul style="list-style-type: none"> <li>● Theoretical with some technical and operational processes:</li> <li>● A broad knowledge base which incorporates some theoretical concepts</li> <li>● Analytical interpretation of information</li> <li>● Informed judgment</li> <li>● A range of sometimes innovative responses to concrete but often unfamiliar problems</li> </ul>	<ul style="list-style-type: none"> <li>● Stable tasks with some aspects of change</li> <li>● General guidance and supervision that require discretion and judgement</li> <li>● Adapting to own behaviours to work with others</li> </ul>

## Diploma

Skills:	Knowledge	Application
<ul style="list-style-type: none"> <li>● Selecting and applying a range of standard processes relevant to varied and sometimes unpredictable tasks</li> <li>● Selecting and applying a range of solutions involving formulation of solutions to resolve complex issues</li> <li>● Demonstrating a high level of proficiency in English and Dzongkha</li> </ul>	<ul style="list-style-type: none"> <li>● Broad theoretical, technical and operational</li> <li>● Specialist knowledge with depth in more than one area</li> <li>● Analysis reformatting and evaluation of a wide range of information</li> <li>● Formulation of appropriate responses to resolve both concrete and abstract problems</li> </ul>	<ul style="list-style-type: none"> <li>● Stable tasks with predictable changes</li> <li>● Broad guidance with some selfdirection that require sound judgement</li> <li>● Taking some responsibility for planning and coordination with others</li> </ul>

### 1.6 CODING USED FOR NATIONAL COMPETENCY STANDARDS

The coding and classification system developed in Bhutan is logical, easy to use, and also aligned with international best practices. The Bhutanese coding and classification system is based on the International Standard Classification of Occupations, 2008 (ISCO-08) developed by the International Labour Organisation (ILO). The coding of the National competency standards forms the basis of the identification code for the Vocational Education and Training Management Information System (VET – MIS) both in terms of economic sector identification and that of the individual standard.



## **1.7. Coding the individual national competency standards**

Coding the individual skills standard has a multiple purpose:

- to identify the level,
- to identify to which module the standard belongs,
- to identify in which order the standard is clustered within that module.

A job can include a number of competencies described in the national competency standards.

However, in

order to follow a logical order, only national competency standards related to each other and following a logical sequence in terms of training delivery, from the simple to the complex, are clustered into a module. Some standards are so complex that they need to stand alone.

Implementation and operational procedures for National Competency Standards (NCS).

