



**NATIONAL COMPETENCY STANDARDS  
FOR  
ASPHALT DRUM MIX PLANT OPERATOR  
(NC2)**

**Department of Occupational Standards  
Ministry of Labour and Human Resources  
Thimphu, Bhutan.  
(July 2021)**



**NATIONAL COMPETENCY STANDARDS  
FOR  
ASPHALT DRUM MIX PLANT OPERATOR  
(NC2)**

**Department of Occupational Standards  
Ministry of Labour and Human Resources  
Thimphu, Bhutan.  
(July 2021)**

First Publication 2021

© Department of Occupational Standards (DOS)

## FOREWORD

The Department of Occupational Standards of the Ministry of Labour and Human Resources is pleased to present the National Competency Standards (NCSs) for Asphalt Drum Mix Plant Operator. The standards represent the fruits of hard work and invaluable experiences gained by the department since its establishment in the latter half of 2003. The main aim of developing NCS is to set up a well-defined nationally recognized Vocational Qualification System that will help set a benchmark for the Technical Vocational Education and Training (TVET) System in our country aligned to international best practices.

NCS is one of the base pillars in the Bhutan Vocational Qualification Framework (BVQF) and is the first step in its implementation. The NCS are developed and revised to ensure that employees or vocational graduates possess and acquire the desired competencies required by industries and employers. In order to ensure this close match in supply and demand of competencies, NCS have been developed and revised in close consultation and partnership with industry experts and validated by the Technical Advisory Committees of the concerned economic sectors.

A vocational education and training system based on NCS shall ensure that delivered training is of a high quality and relevant to the needs of the labour market. As a result, future TVET graduates will be better equipped to meet the need and expectations of industries and employers. This positive impact on the employability of TVET graduates will enhance the reputation of vocational education and training and make it attractive to school leavers.

I gratefully acknowledge collaboration and the valuable contributions made by experts from industries during the consultation and validation processes of the standards. I look forward for continued engagement and participation of the industry and employers in the development of a quality assured demand driven TVET system and to build competent and productive national workforce that will contribute to the continued socio-economic progress of our country.

Director  
Department of Occupational Standards  
Ministry of Labour and Human Resources

## **ACKNOWLEDGEMENT**

**Validation date** : 19/07/2021

**Date of Review** : 19/07/2023 (Max. 3 years).

**Subject experts involved during the consultation workshop:**

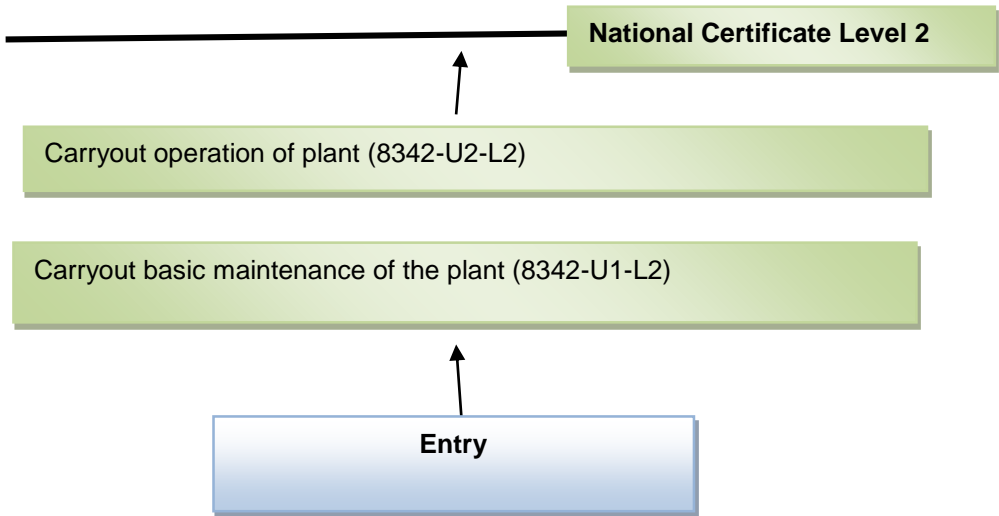
**First group of experts:**

1. Tashi Dendup, Manager, CDCL
2. Karma Khandu, CDCL
3. Narayan Kumar Rai, CDCL
4. Tshering Penjor, CDCL
5. Karma Wangchuk, CDCL

**Facilitators:**

1. Karma Loday, Specialist, SQD, DOS, MoLHR
2. Chogay Lhendup, Sr. Program Officer, SQD, DOS, MoLHR
3. Prem Kumar, Asst. Program Officer, SQD, DOS, MoLHR

## PACKAGING OF QUALIFICATIONS



### Overview of National Competency Standards

UNIT TITLE	ELEMENTS OF COMPETENCE
1. Carryout basic maintenance of the plant	<ol style="list-style-type: none"><li>1. Perform periodic maintenance</li><li>2. Perform minor maintenance</li></ol>
2. Carryout operation of plant	<ol style="list-style-type: none"><li>1. Perform pre-operation checks</li><li>2. Perform plant operation</li></ol>

**UNIT TITLE** : Carryout basic maintenance of the plant

**DESCRIPTOR** : This unit covers the competencies required to maintain plant following safety procedures

**CODE** : 8342-U1-L2

ELEMENTS OF COMPETENCE	PERFORMANCE CRITERIA
1. Perform periodic maintenance	1.1 Use <b>Personal Protective Equipment (PPE)</b> as per the job requirement 1.2 Change <b>oils</b> as per the service manual following standard procedures 1.3 Replace <b>conveyer belt</b> following standard procedures 1.4 Replace motor belts following standard procedures 1.5 Change the phase of motor connections as per the job requirement following standard procedures 1.6 Change burner nozzle as per the job requirement following standard procedures 1.7 Maintain records of periodic maintenance as per the standard procedures
2. Perform minor maintenance	2.1 Check for current leakage and rectify as per the job requirement following standard procedures 2.2 Change the electrical fuses as per the job requirement following standard procedures 2.3 Perform greasing of plant parts (bearings) as per the service manual 2.4 Check and tighten the nuts and bolts as per the job requirement following standard procedures



<b>RANGE STATEMENT</b>	
<b>Personal protective equipment (PPE) may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>● Mask</li> <li>● Gloves</li> <li>● Goggles</li> </ul>	<ul style="list-style-type: none"> <li>● Safety shoes</li> <li>● Working dress</li> </ul>
<b>Oils may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>● Gear oil</li> </ul>	<ul style="list-style-type: none"> <li>● Hydraulic oil</li> </ul>
<b>Conveyer belt may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>● Gathering belt</li> <li>● Charger belt</li> </ul>	<ul style="list-style-type: none"> <li>● Load out hot belt</li> </ul>
<b>Critical Aspects:</b>	
<ul style="list-style-type: none"> <li>● Demonstrating compliance with safety regulation applicable to work site operation.</li> <li>●</li> </ul>	

<b>UNDERPINNING KNOWLEDGE</b>	<b>UNDERPINNING SKILLS</b>
<ul style="list-style-type: none"> <li>● Ethics and Integrity</li> <li>● Occupational Health and Safety (OHS) Regulations</li> <li>● Basic First Aid</li> <li>● Reading and interpretation of service manual</li> <li>● Record keeping</li> <li>● Types of maintenance</li> <li>● Basic functioning of plant</li> <li>● Grades of oils and lubricants</li> </ul>	<ul style="list-style-type: none"> <li>● Team Work</li> <li>● Communication</li> <li>● Interpersonal relationship</li> <li>● Problem solving</li> <li>● Time management</li> </ul>

**UNIT TITLE** : Carryout operation of plant

**DESCRIPTOR** : This unit covers the competencies required to operate the plant following standard procedures.

**CODE** : **8342-U2-L2**

<b>ELEMENTS OF COMPETENCE</b>	<b>PERFORMANCE CRITERIA</b>
1. Perform pre-operation checks	1.1 Use personal protective equipment as per the job requirement 1.2 Conduct walk around inspection following standard procedures 1.3 Check the level of fuel and top up as per the job requirement following standard procedures 1.4 Check for leakages and damages following standard procedures 1.5 Lubricate the chain with oil following standard procedures 1.6 Report to the concerned personnel in case of major leakages and damages following standard procedures
2. Perform plant operation	2.1 Heat the bitumen to the required temperature following standard procedures 2.2 Check the materials to the required <b>recipe</b> and set in the mother board following standard procedures 2.3 Start the water pump and exhaust fan following standard procedures 2.4 Start the <b>belts</b> following standard procedures 2.5 Check and adjust the alignment of belts while running following standard procedures

	<p>2.6 Start the burner and heat the dryer drum following standard procedures</p> <p>2.7 Release the <b>materials</b> from hoppers to dryer following standard procedures</p> <p>2.8 Run the bitumen pump in forward direction to release bitumen to dryer drum following standard procedures</p> <p>2.9 Control the plant load speed based on the temperature following standard procedures</p> <p>2.10 Check and control the temperature and mixing ratio following standard procedures</p> <p>2.11 Release the load to the job hopper following standard procedures</p> <p>2.12 Load the asphalt mix on to the truck from job hopper following standard procedures</p> <p>2.13 Shut down the plant following standard procedures</p> <p>2.14 Maintain <b>records</b> of the work following standard procedures</p>
--	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

RANGE STATEMENT	
<b>Recipe may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>● Ratio</li> </ul>	<ul style="list-style-type: none"> <li>● Size</li> </ul>
<b>Belts may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>● Gathering belt</li> <li>● Load out belt</li> </ul>	<ul style="list-style-type: none"> <li>● Charger belt</li> <li>● Dryer drum</li> </ul>
<b>Materials may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>● Sand</li> <li>● Bitumen</li> </ul>	<ul style="list-style-type: none"> <li>● Aggregate</li> </ul>
<b>Records may include but not limited to:</b>	
<ul style="list-style-type: none"> <li>● Raw materials,</li> </ul>	<ul style="list-style-type: none"> <li>● Final asphalt mix</li> </ul>

**Critical Aspects:**

- Demonstrating compliance with safety regulation applicable to work site operation.
- Operate plant following standard procedures

<b>UNDERPINNING KNOWLEDGE</b>	<b>UNDERPINNING SKILLS</b>
<ul style="list-style-type: none"><li>● Ethics and Integrity</li><li>● Occupational Health and Safety (OHS) Regulations</li><li>● Basic First Aid</li><li>● Safety signs and symbols</li><li>● Materials Mixing ratios</li><li>● Quality of asphalt mix</li><li>● Pollution control measures</li><li>● Basic electrical connections</li></ul>	<ul style="list-style-type: none"><li>● Team Work</li><li>● Communication</li><li>● Interpersonal relationship</li><li>● Problem solving</li><li>● Time management</li></ul>

**ANNEXURE****A. 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.

**Purpose of National Competency Standards**

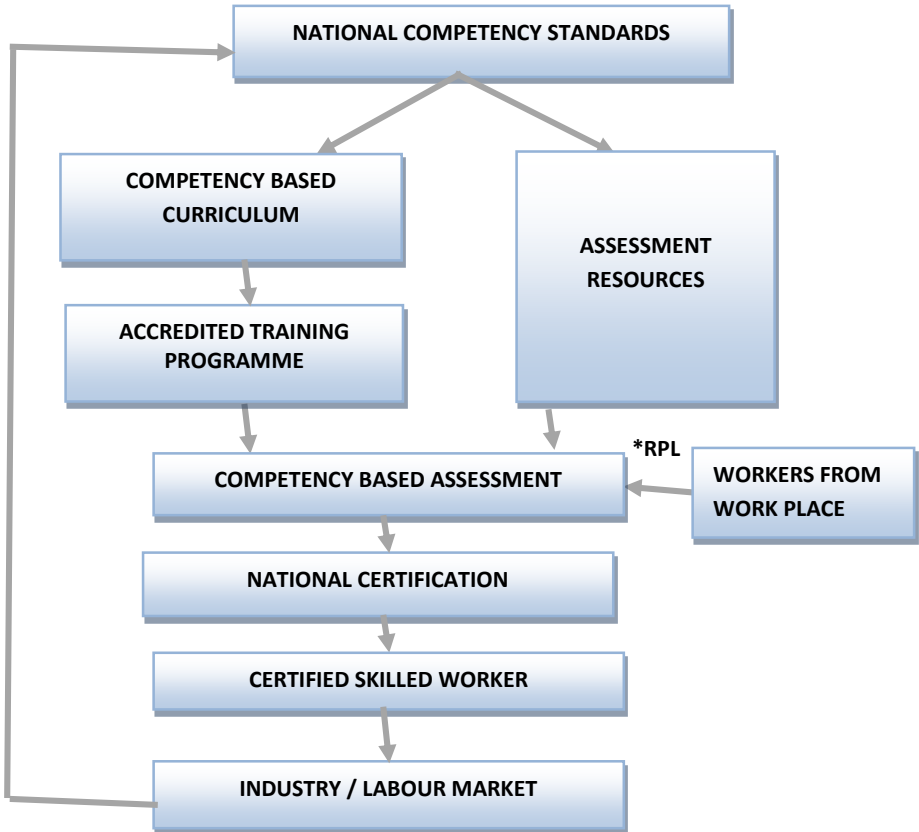
National Competency Standards serve a number of purposes including:

- Providing advice to curriculum developers about the competencies to be included in 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.

## B. Bhutan Vocational Qualifications Framework (BVQF)

Bhutan Vocational Qualifications Framework is an agreed system of Assessing, Certifying and Monitoring nationally recognized qualifications for all learning in the TVET sector against national competency standards, in training institutions, in the workplace, in schools or anywhere where learning takes place.

### Components of the Bhutan Vocational Qualifications Framework (BVQF)



\* RPL = Recognition of Prior Learning

## BVQF Levels

The Bhutan Vocational Qualifications Framework has three levels classified based on the competency of the skilled workers. The three levels are:

- National Certificate Level 3 (NC III)
- National Certificate Level 2 (NC II)
- National Certificate Level 1 (NC I)

## BVQF Level Descriptors

The qualification levels are decided based on level descriptors. The detail of the qualification level descriptor is as follows:

### National Certificate Level 1

Carry out processes that:	Learning demand:	Responsibilities which are applied:
<ul style="list-style-type: none"><li>● Are narrow in range.</li><li>● Are established and familiar.</li><li>● Offer a clear choice of routine responses.</li><li>● Involve some prioritizing of tasks from known solutions.</li></ul>	<ul style="list-style-type: none"><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>● In directed activity.</li><li>● Under general supervision and quality control.</li><li>● With some responsibility for quantity and quality.</li><li>● With no responsibility for guiding others.</li></ul>

## National Certificate Level 2

Carry out processes that:	Learning demand:	Responsibilities which are applied:
<ul style="list-style-type: none"> <li>● Require a range of well-developed skills.</li> <li>● Offer a significant choice of procedures requiring prioritization.</li> <li>● Are employed within a range of familiar context.</li> </ul>	<ul style="list-style-type: none"> <li>● Some relevant theoretical knowledge.</li> <li>● Interpretation of available information.</li> <li>● Discretion and judgments.</li> <li>● A range of known responses to familiar problems</li> </ul>	<ul style="list-style-type: none"> <li>● In directed activity with some autonomy.</li> <li>● Under general supervision and quality checking.</li> <li>● With significant responsibility for the quantity and quality of output.</li> <li>● With some possible responsibility for the output of others.</li> </ul>

## National Certificate Level 3

Carry out processes that:	Learning demand:	Responsibilities which are applied:
<ul style="list-style-type: none"> <li>● Requires a wide range of technical or scholastic skills.</li> <li>● Offer a considerable choice of procedures requiring prioritization to achieve optimum outcomes.</li> <li>● Are employed in a variety of familiar and unfamiliar contexts.</li> </ul>	<ul style="list-style-type: none"> <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>● In self-directed activity.</li> <li>● Under broad guidance and evaluation.</li> <li>● With complete responsibility for quantity and quality of output.</li> <li>● With possible responsibility for the output of others.</li> </ul>



## **CODING USED FOR NATIONAL COMPETENCY STANDARDS**

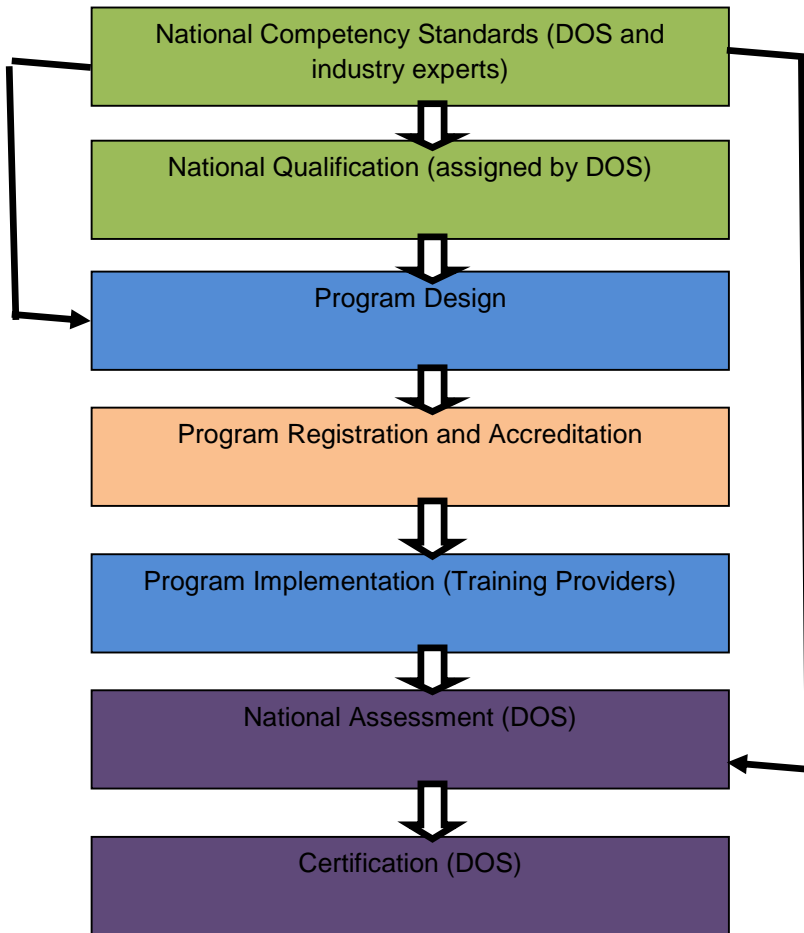
The coding and classification system developed in Bhutan is logical, easy to use, and also aligned with international best practises. The Bhutanese coding and classification system is based on the International Standard Classification of Occupations, 2008 (ISCO-08) developed by the International Labour 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.

Coding the individual units of the competency standard is to identify the level in qualification packages to which it belongs.

While packaging, in order to follow a logical order, only 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 qualification packages.

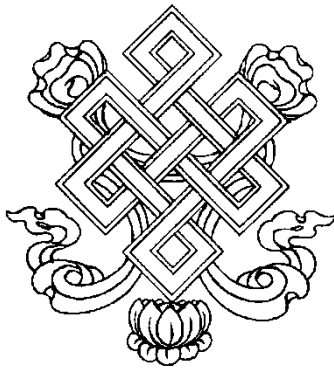
## Implementation and Operational Procedures for National Competency Standards



### Key:

MoLHR – Ministry of Labour and Human Resources

DOS – Department of Occupational Standards



Department of Occupational Standards

Ministry of Labour & Human Resources

Thongsel Lam, Lower Motithang

P.O. Box 1036, Thimphu.