



**NATIONAL COMPETENCY STANDARDS
FOR
ROAD MAINTENANCE WORKER
(NC1)**

**Department of Occupational Standards
Ministry of Labour and Human Resources
Thimphu, Bhutan.
(February, 2016)**



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FOREWORD

The Department of Occupational Standards of the Ministry of Labour and Human Resources is pleased to present the National Competency Standards (NCSs) for road maintenance worker. 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

INTRODUCTION

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

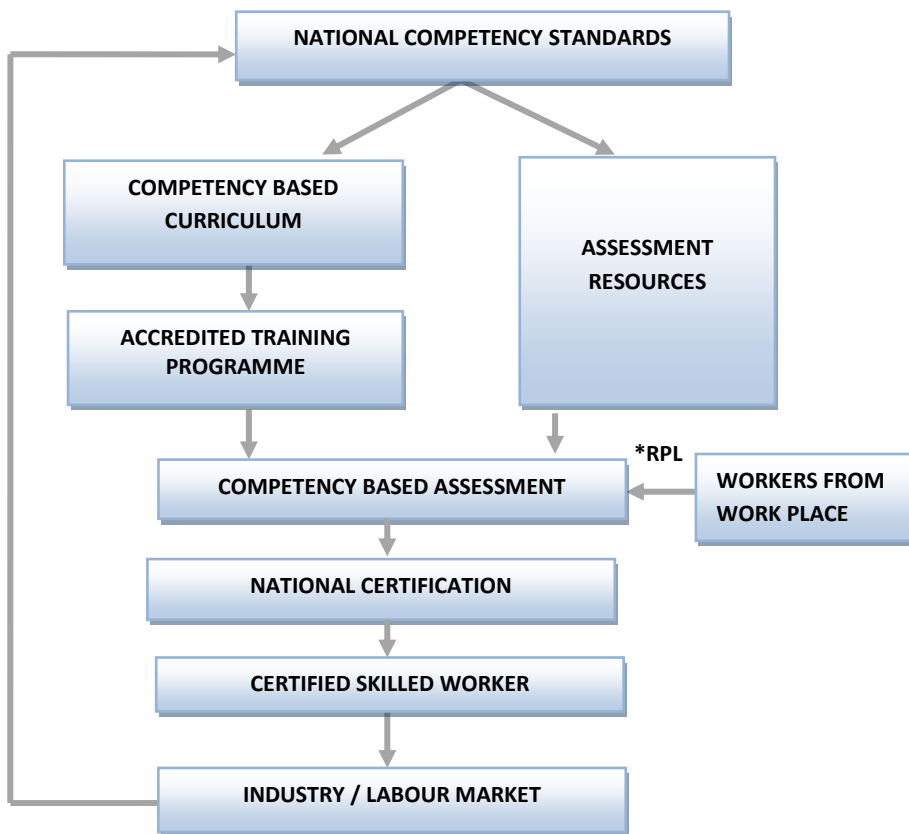
National Competency Standards serve a number of purposes including:

- 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">• Are narrow in range.• Are established and familiar.• Offer a clear choice of routine responses.• Involve some prioritizing of tasks from known solutions.	<ul style="list-style-type: none">• Basic operational knowledge and skill.• Utilization of basic available information.• Known solutions to familiar problems.• Little generation of new ideas.	<ul style="list-style-type: none">• In directed activity.• Under general supervision and quality control.• With some responsibility for quantity and quality.• With no responsibility for guiding others.

National Certificate Level 2

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

National Certificate Level 3

Carry out processes that:	Learning demand:	Responsibilities which are applied:
<ul style="list-style-type: none"> • Requires a wide range of technical or scholastic skills. • Offer a considerable choice of procedures requiring prioritization to achieve optimum outcomes. • Are employed in a variety of familiar and unfamiliar contexts. 	<ul style="list-style-type: none"> • A broad knowledge base which incorporates some theoretical concepts. • Analytical interpretation of information. • Informed judgment. • A range of sometimes innovative responses to concrete but often unfamiliar problems. 	<ul style="list-style-type: none"> • In self-directed activity. • Under broad guidance and evaluation. • With complete responsibility for quantity and quality of output. • With possible responsibility for the output of others.

PURPOSE

This suite of qualification is designed for people interested in a career as a road maintenance worker.

The first and only is the National Certificate Level 1 road maintenance worker. The Level 2 qualification recognizes the skills and knowledge required for people working as a skilled road maintenance worker.

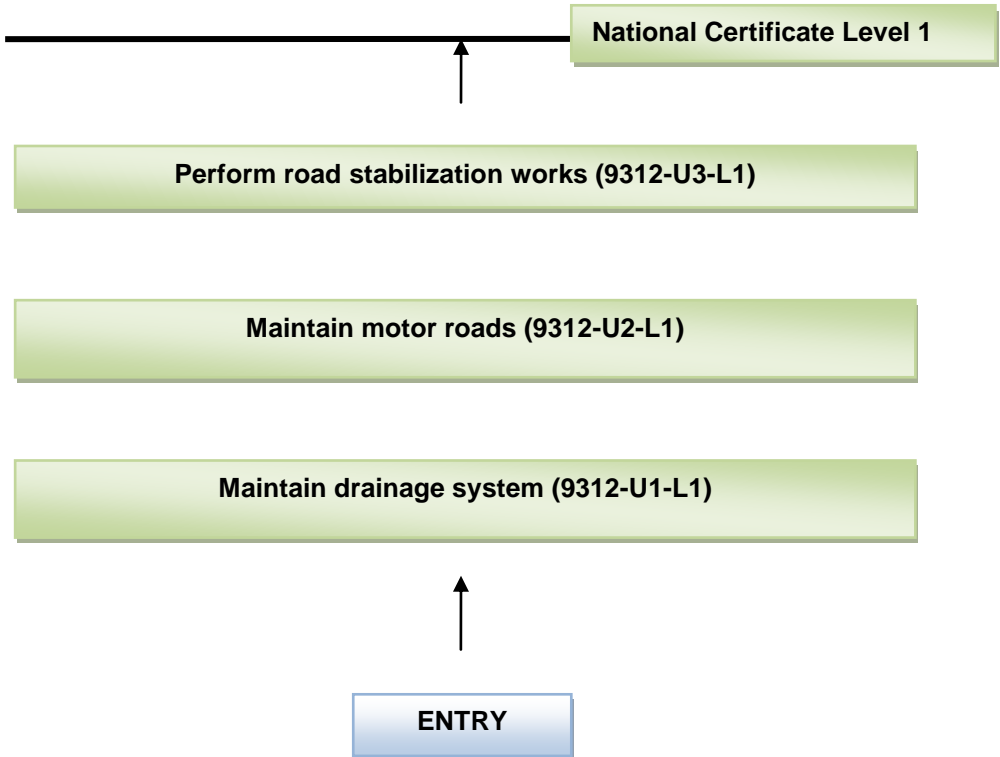
The qualification comprises of two units of Competency Standards that cover the essential knowledge and skills required in maintaining drainage system, maintaining motor roads and performing road stabilization works.

The National Certificate Level 1 in road maintenance worker prepares for entry into further qualifications and is a prerequisite for entry into the National Certificate Level 2 for Mason.

A diagram of the qualification pathway provided by this National Certificate is as follows.

PACKAGING OF QUALIFICATION FOR ROAD MAINTENANCE WORKER

The National competency standard for the road maintenance worker comprises of three units of competencies, which are clustered into one qualification levels as shown below:



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).

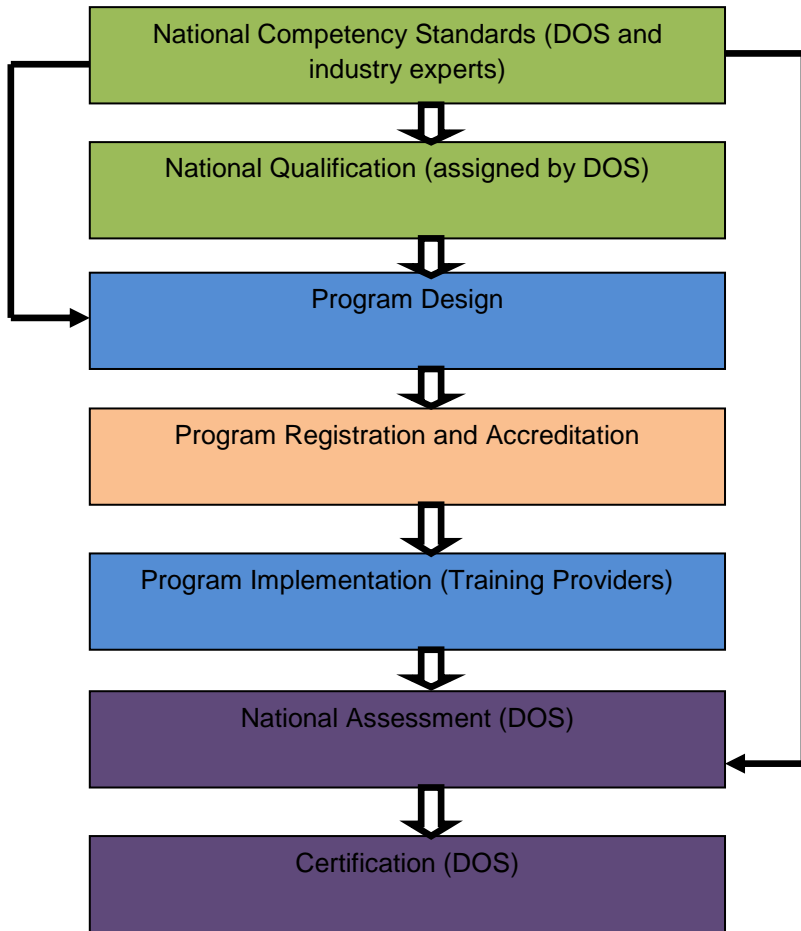
The coding of the national competency standards forms the basis of the identification code for the Vocational Education and Training Management Information System (VET – MIS) both in terms of economic sector identification and that of the individual standard.

Coding the individual units of 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 a qualification packages.

The ILO assigns the code 9312 to the occupation of Construction and maintenance labourers. Therefore, in the Bhutan context, the occupation road maintenance worker has been assigned the code 9312 in the National Coding System. The first unit is assigned the code U1, the first Unit of Competency Standard clustered into the first qualification is designated the code 9312-U1. Levels are assigned the code L and follow a logical progression from the National Certificate Level 1 (NC I) to the National Certificate Level 3 (NC 3). Therefore the National Certificate Level 1 is assigned the code L1. The complete unit code will be 9312-U1-L1.

Implementation and Operational Procedures for National Competency Standards (MoLHR)



Key:

MoLHR – Ministry of Labour and Human Resources
DOS – Department of Occupational Standards

NATIONAL COMPETENCY STANDARDS FOR ROAD MAINTENANCE WORKER

Validation date : 4th February 2016.

Endorsement date : 8th February 2016.

Date of Review : 8th February 2019 (Max. 3 years).

Technical Advisory Committee (TAC) members for the Construction Sector involved in the validation of the NCS:

1. Tshering Wangdi 'B' (**TAC Chairperson**) Chief Engineer, Department of Roads, MoWHS, Thimphu.
2. T. R. Gurung, Executive Engineer, Construction Development Board, MoWHS, Thimphu.
3. Jamba Gyeltshen, Sr. PO, Construction Development Corporation Limited, Thimphu.
4. Karma Tshetrim, Deputy Executive Engineer, Bhutan Standards Bureau, Thimphu.
5. Ram Bdr. Rai, Info Officer, Construction Association of Bhutan, Thimphu.
6. Kinley Gyeltshen, Sr. Programme Officer, Training and Professional Services Division, Department of Human Resources, MoLHR, Thimphu.
7. Tshewang (**TAC Member Secretary**), Dy. Chief Programme Officer, Standards and Qualification Division, Department of Occupational Standards, MoLHR, Thimphu.

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5. Hasta Bahadur Gurung, DoR, Tala
6. Bhim Kumar Rai, DoR, Samtse
7. Ugyen Dorji, DoR, Samtse
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10. Buddhi Man Tamang, DoR, Tendu
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MAINTENANCE WORKER**

NATIONAL CERTIFICATE – LEVEL 1

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Maintain motor roads	<ol style="list-style-type: none">1. Repair potholes2. Repair protective / safety provisions3. Clean roads	4
Perform road stabilization works	<ol style="list-style-type: none">1. Clear bushes2. Plant / trim trees	7

**ROAD MAINTENANCE WORKDER
COMPETENCY STANDARDS
FOR
NATIONAL CERTIFICATE LEVEL 1 (NC 1)**

UNIT TITLE	ELEMENTS OF COMPETENCE
Maintain drainage system	<ol style="list-style-type: none">1. Clean drainage system2. Repair minor damages
Maintain motor roads	<ol style="list-style-type: none">1. Repair potholes2. Repair protective / safety provisions3. Clean roads
Perform road stabilization works	<ol style="list-style-type: none">1. Clear bushes2. Plant / trim trees

UNIT TITLE : **Maintain drainage system**

DESCRIPTOR : This unit covers the competencies required to clean drainage system and to carry out minor repair on the drainage system following safety practices at all times of work operation.

CODE : **9312-U1-L1**

ELEMENTS OF COMPETENCE	PERFORMANCE CRITERIA
1. Clean drainage system	1.1 Select and use cleaning tools as per the job requirement. 1.2 Select and use Personal protective equipment (PPE) as per the job requirement. 1.3 Inspect the drains as per the job requirement following standard procedures. 1.4 Remove / clear debris / litters as per the job requirement following standard procedures. 1.5 Remove weeds / grass from the drains as per the job requirement following standard procedures.
2. Repair minor damages	2.1 Select and use materials as per the job requirement following standard procedures. 2.2 Prepare mixtures as per the job requirement following standard procedures. 2.3 Repair minor damages as per the job requirement following standard procedures. 2.4 Report major damages to concerned personnel as per establishment procedures.

RANGE STATEMENT

Cleaning tools may include but not limited to:

- Spade
- Hammer
- Shovel
- Ladder

Personal protective equipment (PPE) may include but not limited to:

- Gloves
- Safety shoes
- Company dress
- Mask

Materials may include but not limited to:

- Cement
- Sand
- Aggregate
- Stone

Minor damages for may include but not limited to:

- Cracks
- Broken parts

Concerned personnel may include but not limited to:

- Site in charge
- Site supervisor
- Engineer

ASSESSMENT GUIDE

Form of assessment

- Continuous assessment together with collected evidence of performance will be used.
- Evidence of the performance shall be based on practical demonstration.
- Knowledge can be accessed through diagrams, in writing or orally (viva-voce).

Assessment context

- Competency may be assessed in the actual work place or in a simulated workplace setting.

Assessment condition

- The candidate shall have access to all required tools, equipment, materials and documents.
- The candidate must complete the assessment in industry accepted time frame.

Critical aspects

- Demonstrate compliance with safety regulation applicable to work site operation.
- Preparing mixtures as per the job requirement following standard procedures

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none">• Occupational Health and Safety (OHS) Regulations• First aid,• Economic use of material• Basic mixing ratios• Masonry works• Positive work values	<ul style="list-style-type: none">• Safe use of tools and equipment• Team Work• Communication• Interpersonal relationship• Problem solving• Working at height

UNIT TITLE : Maintain motor roads

DESCRIPTOR : This unit covers the competencies required to clean roads, repair potholes and protective / safety provisions on the roads following safety practices at all times of work operation.

CODE : 9312-U2-L1

ELEMENTS OF COMPETENCE	PERFORMANCE CRITERIA
1. Repair potholes	1.1 Select and use tools and equipment as per the job requirements 1.2 Select and use materials as per the job requirement 1.3 Select and use personal protective equipment (PPE) as per the job requirements 1.4 Place safety signs as per the job requirements following standard procedures 1.5 Prepare / remove defective section as per the job requirement following standard procedures 1.6 Prepare mixtures / premix as per the job requirement following standard procedures. 1.7 Lay course as per the job requirement following standard procedures. 1.8 Compact and level the section following standard procedures. 1.9 Sand the repaired section following standard procedures.
2. Repair protective / safety provisions	2.1 Inspect protective / safety provisions as per the job requirements. 2.2 Erect / repair minor defects in protective / safety provisions as per the job requirement following standard procedures. 2.3 White wash road structures as per the job

	<p>requirement following standard procedures.</p> <p>2.4 Report the major defects to concerned personnel as per the establishment procedures.</p>
3. Clean roads	<p>3.1 Select and use cleaning tools as per the job requirements</p> <p>3.2 Remove snows and ice as per the job requirement following standard procedures</p> <p>3.3 Remove weeds / grass as per the job requirement following standard procedures</p> <p>3.4 Sweep road as per the job requirement following standard procedures.</p>

RANGE STATEMENT	
Tools and equipment may include but not limited to:	
<ul style="list-style-type: none"> • Shovel • Spade • Crow bar • Sickle 	<ul style="list-style-type: none"> • Brushes • Mini roller • Pick axe
Personal protective equipment (PPE) may include but not limited to:	
<ul style="list-style-type: none"> • Hand gloves • Company dress 	<ul style="list-style-type: none"> • Safety shoes
Materials may include but not limited to:	
<ul style="list-style-type: none"> • Aggregate • Sand 	<ul style="list-style-type: none"> • Bitumen • Boulders
Protective / safety provisions may include but not limited to:	
<ul style="list-style-type: none"> • Sign boards • Cones • Railings • Snow fences 	<ul style="list-style-type: none"> • Road markers • Lane markers • Warning signals • Reflective jackets
Concerned personnel may include but not limited to:	
<ul style="list-style-type: none"> • Site in charge 	<ul style="list-style-type: none"> • Engineers
Cleaning tools may include but not limited to:	
<ul style="list-style-type: none"> • Broom • Brush 	<ul style="list-style-type: none"> • Spade

ASSESSMENT GUIDE

Form of assessment

- Continuous assessment together with collected evidence of performance will be used.
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- Knowledge can be accessed through diagrams, in writing or orally (viva-voce).

Assessment context

- Competency may be assessed in the actual work place or in a simulated workplace setting.

Assessment condition

- The candidate shall have access to all required tools, equipment, materials and documents.
- The candidate must complete the assessment in industry accepted time frame.

Critical aspects

- Following health and safety practices at workplace
- Preparing of mixtures / premix as per the job requirement following standard procedures

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none">• Occupational health and safety practices• Tools and equipment• Basic first aid• Economic use of materials• Basic knowledge on road works• Mixture preparations	<ul style="list-style-type: none">• Team work• Communication• Negotiation• Handling of tools and equipment• Problem solving• Ability to work in harsh weather conditions• Basic painting

UNIT TITLE : Perform road stabilization works

DESCRIPTOR : This unit covers the competencies required to clear the bushes and to perform land stabilization work around the motor roads following safety practices at all times of work operation.

CODE : 9312-U3-L1

ELEMENTS OF COMPETENCE	PERFORMANCE CRITERIA
1. Clear bushes	1.1 Select and use personal protective equipment (PPE) as per the job requirements 1.2 Inspect road sides as per the job requirement following standard procedures 1.3 Select and use cutting tools as per the job requirement 1.4 Place precautionary signs as per the job requirement following standard procedures 1.5 Cut and clear bushes as per the job requirement following standard procedures
2. Plant / trim trees	2.1 Identify the location to plant as per the instructions following standard procedures 2.2 Plant the saplings following standard procedures 2.3 Protect the saplings as per the job requirements following standard procedures 2.4 Cut / trim trees as per the job requirement following standard procedures

RANGE STATEMENT
Personal protective equipment (PPE) may include but not limited to: <ul style="list-style-type: none">• Gloves• Company dress• Safety shoes

Cutting tools may include but not limited to:

- Sickle
- Knife
- Axe
- Power chain
- Ladder

ASSESSMENT GUIDE**Form of assessment**

- Continuous assessment together with collected evidence of performance will be used.
- Evidence of the performance shall be based on practical demonstration.
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Assessment context

- Competency may be assessed in the actual work place or in a simulated workplace setting.

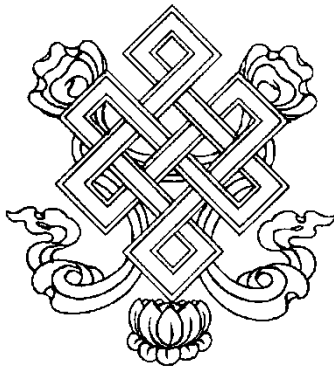
Assessment condition

- The candidate shall have access to all required tools, equipment, materials and documents.
- The candidate must complete the assessment in industry accepted time frame.

Critical aspects

- Demonstrate compliance with safety regulation applicable to work site operation.
- Cutting and clearing bushes as per the job requirement following standard procedures

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none"> • Occupational Health & Safety • Basic First Aid • Types and uses of personal protective equipment • Tree planting procedures 	<ul style="list-style-type: none"> • Safe use of tools • Team Work • Communication • Interpersonal relationship • Problem solving • Working at height • Climbing ladder



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