



COMPETENCY BASED CURRICULUM
MASONRY BQF CERTIFICATE-3

Technical Trainers Training and Resource Center
Department of Workforce Planning and Skills Development
Ministry of Education and Skills Development



Competency Based Curriculum
Masonry BQF Certificate-3

Technical Trainers Training and Resource Center
Department of Workforce Planning and Skills Development
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Thimphu

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FOREWORD

Bhutan has seen a gradual increase in the requirement of skilled workers in recent years due to growth of industries. However, supply of skilled workforce that are responsive to the needs of the industry has not been able to keep in pace with the industry demand. Since the skilled workers are crucial ingredient for socio-economic development of the country, it is important to have adequate number of trained and certified workers. With growing industries, the “Mason” is not only the most significant occupation but also have high demand in the labour market. In an effort to meet the skilled human resources requirement in the area of power sector, it is imperative to deliver training based on Competency Based Training system in Masonry BQF Certificate-3 to ensure quality and adequate number of work force in this sector.

To this end, the Department of Workforce Planning and Skills Development (DWPSD) is pleased to present revised Competency Based Curriculum for Masonry BQF Certificate-3 course developed based on national competency standard. Since it is an outcome of a more participatory process of curriculum development, it is expected to provide training delivery with reformed approaches having its content being directly related to labour market needs, focusing on imparting of skills and assessment based on industry work standards. We believe that the Competency Based Curriculum will help in bridging the skill gap between industry’s needs and training institutes thereby enhance the employability of the technical graduates.

The Department acknowledges the valuable contributions made by institutes, officials, and experts from relevant industries who were involved in the design and development of this curriculum. As it is a dynamic document which may require revision based on the needs of the changing labour market, the Department look forward to receiving valuable feedbacks from the institutes and the industries to further improve and refine the curriculum

The Department hope that this document will help advance Competency Based Learning in most of the TVET Institutions.



(Norbu Wangchuk)

Director

Department of Workforce Planning and Skills Development

ACKNOWLEDGEMENT

Technical Trainers Training and Resource Center, Department of Workforce Planning and Skills Development under MoESD would like to express our appreciation to the following subject experts and facilitators who have participated in the revision of curriculum for Masonry BQF Certificate-3

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Competency Profile
Trade: Masonry BQF Certificate-3

Competency Area	Sub-Competency Area	Competencies/Tasks 			
A Carry out marble/granite and epoxy flooring	A1 Prepare for marble/granite works	A1.01 Prepare layout	A1.02 Prepare concrete mix	A1.03 Prepare mortar mix	
	A2 Perform marble/ granite works	A2.01 Cut marble/granite	A2.02 Mold edges	A2.03 Lay marble/ granite	A2.04 Lay skirting
	A3 Perform finishing work	A3.01 Prepare grout	A3.02 Apply grout	A3.03 Perform polishing	A3.04 Rectify marble/granite defects
	A4 Perform epoxy flooring	A4.01 Prepare surface	A4.02 Prepare epoxy mixture	A4.03 Lay epoxy mixture	
B Carry out High Order Plaster	B1 Carry out plastering	B1.01 Estimate materials	B1.02 Prepare mortar mix	B1.03 Perform plastering	
	B2 Perform POP/wall putty works	B2.01 Prepare background surface	B2.02 Prepare POP/wall putty mixture	B2.03 Apply POP/wall putty	B2.04 Rectify POP/wall putty surface
	B3 Perform texture/pebble dash	B3.01 Prepare surface	B3.02 Prepare layout/design	B3.03 Apply texture/pebble dash	B3.04 Rectify pebble dash/texture
C Carry out approach road works	C1 Construct side drainage	C1.01 Prepare drainage alignment	C1.02 Lay Plain Cement Concrete (PCC)	C1.03 Perform plastering	C1.04 Apply neat finishing
	C2 Construct permanent structure	C2.01 Construct causeway	C2.02 Construct Gabion wall	C2.03 Construct retaining wall	

Competency Area	Sub-Competency Area	Competencies/Tasks —————→			
	C3 Construct approach road	C3.01 Prepare sub grade	C3.02 Lay edge stones	C3.03 Lay Granular Sub Base (GSB)	C3.04 Lay Wet Mix Macadam (WMM)
		C3.05 Lay Dense Bituminous Macadam (DBM)	C3.06 Lay Asphalt Concrete (AC)		

COURSE INFORMATION

COURSE TITLE	Masonry
LEVEL	BQF Certificate Level 3
COURSE OBJECTIVE	Upon completion of this training program, the trainees will be able to: • Carry out marble/granite flooring • Carry out higher order plaster • Carry out approach road works
COURSE DESCRIPTION	This course is designed to provide trainees with the knowledge, skills and attitudes required to be competent in Masonry work. This course will prepare the trainees to exhibit professionalism, teamwork, adaptability, and safety practices as per the requirement of workplace. To obtain certification of this course, all learning outcomes prescribed must be achieved.
COURSE DURATION	700 Hours
TRAINER AND TRAINEE RATIO	1:12 (Practical) 1:20 (Theory)
ENTRY REQUIREMENT	Completed Masonry BQF Certificate-2
TVET TRAINER REQUIREMENTS	• Must have a minimum qualification of Diploma in civil engineering or Masonry BQF C-3 with five years of working experience in relevant field; • Must have undergone Training of Trainers-Technical Instruction and Pedagogy; • Must¹ have at least 5 years job/industry experience
SKILLED SUPERVISOR REQUIREMENTS	• Must have undergone ToT in Skilled Supervisor; • Must be Supervisor/Foreman of industry with minimum three years of related field experience

¹ Applicable only if institutes hire instructor or guest lecturer from industry

COURSE OUTLINE

Sl. No	Subject /Module	Duration (Hours)	Content Competencies (Mapped)
1.	Core modules	420	CC
2.	OJT	280	CC
3.	Applied Dzongkha	42	SS
4.	ICT	48	SS
5.	Applied Mathematics	53	SS
6.	Technical English	51	SS
7.	Assessment	70	
	Total Course Duration	964	

Note: (*) This curriculum contains core modules which cover main competencies of Masonry BQF Certificate-3 and OJT component. There are separate curricula for subjects/modules for delivery of soft skills, professional development & values and environmental concern & safety. In order to achieve the qualification of Masonry BQF Certificate-3, the subjects and modules listed must be accomplished as per the credit hours provided.

Content Competencies:

CC-Core Competencies

SS-Soft Skills

PD-Professional Development and Values

ES-Environmental concern and Safety

COURSE STRUCTURE FOR CORE COMPETENCIES

Training Modality	Module Title	Learning outcomes	Nominal Duration (Hour)
1. Institute Training	A. Carrying out marble/granite flooring	A1. Prepare for marble/granite works A2. Perform marble/granite work A3. Perform finishing work A4. Perform epoxy flooring	192
	B. Carrying out high order plaster	B1. Carryout plastering B2. Perform POP works B3. Perform texture/pebble dash	84
	C. Carrying out approach road works	C1. Construct side drainage C2. Construct permanent structure C3. Construct approach road	144
2. On the Job Training	A. Carrying out marble/granite flooring	A1. Prepare for marble/granite works A2. Perform marble/granite work A3. Perform finishing work A4. Perform epoxy flooring	280
	B. Carrying out high order plaster	B1. Carryout plastering B2. Perform POP works B3. Perform texture/pebble dash	
	D. Carrying out approach road works	C1. Construct side drainage C2. Construct permanent structure C3. Construct approach road	
Total CC Duration:			700

ASSESSMENT AND CERTIFICATION SYSTEM

ASSESSMENT

Formative assessment for every module and learning outcome will be conducted through assignments, project works, continuous assessment, demonstration of practical skills/observations, oral questioning and written test.

Summative assessment after completion of each national certificate level will be conducted by TVET Quality Council, Bhutan Qualifications and professional certification authority, MoESD as per the National Competency Standards and Guidelines for National Assessment and Certification System, provided the course is accredited with TVET Quality Council, Bhutan Qualifications and professional certification authority, MoESD.

CERTIFICATION

On successful completion of every module, the institute will award a certificate of achievement to the trainees. The TVET Quality Council, Bhutan Qualifications and professional certification authority, MoESD will award a National Certificate to the trainees upon the successful completion of NC level assessment.

COURSE DELIVERY

1. Modular
2. Demonstration
3. Lecture
4. Industrial training/attachment
5. Project work
6. Problem-based learning
7. Project-based learning

RESOURCES

Materials

- A4 size paper, book, scale, pencil, pen, eraser, manuals and catalogue civil drawings, BSR, LMC, SBRW, BOQ format, fine aggregate, cement, mason thread, water, brick, batten, marker, marble, granite, sand, cement, broom, white cement, POP powder, pebbles, timber, paints, lime, ply wood, nails, marker, sand paper, rag, sponge, broom, polishing stones, cotton cloth, grout materials, shuttering, MS sheet and stone, coarse aggregate, emulsion, bitumen, kerosene, soils, boulder, Hume-pipe, gabion mesh, lacing wire, re-bar, binding wire, geo-textile and timber batten

Tools

- Shovel, spade, water-can, bucket, chipping hammer, chisel, flexible pipe, mortar pan, trowel, float, wheel barrow, measuring tape, gauge box, water level pipe, spirit level, wire brush, cutting blade, extension cable, hammer, trowel, spirit level, steel float, water level pipe, mortar pan, wooden mallet, chipping hammer, wooden edge, wooden float, grout float, mortar pan, brush, utility knife, putty plate, mortar pan, hawk, try square, wheel barrow, plumb bob, gauge box, rammer, asphalt lute, asphalt rack, cautionary signage, stone hammer, sledge hammer, pick axe, crow bar, hacksaw, handsaw, wooden edge, water level pipe, pliers, gauge box, vibrator and binding hook

Instruments

- Dumpy level, calculator and laser leveller and bitumen thermometer

Equipment

- Computer, mixture machine, marble/granite cutting machine, angle grinder, marble polishing machine, jigsaw, circular saw, hand mixer machine, excavator, mixture machine, compacter machines, re-bar bender, asphalt plant, road paver, tripper truck, backhoe loader, road roller, tandem vibrating roller, air compressor, bitumen sprayer and water tanker

PPE

- Safety gloves, safety helmet, safety goggles, ear muff, dust mask, ear plugs, hair net, apron safety boots, workshop dress and respiratory mask

Learning Materials

- Competency Based Learning Materials (CBLM)
- Reference books
- Hand-outs
- Audio visuals

Infrastructure and training facilities

- *Theory classroom size:* Minimum of 1 m² per trainee;
- *Practical Workshop size:* Minimum of 2.25 m² per trainee. Variables must be considered depending upon type of skills being taught and the number of trainees participating at a time.

MODULE INFORMATION:
MASONRY BQF CERTIFICATE-III

MODULE 1
ON
CARRYING OUT MARBLE/GRANITE AND EPOXY FLOORING

MODULE INFORMATION

Occupation	Masonry
Competency Area	Carry out marble/granite and epoxy flooring
Module Title	Carrying out marble/granite and epoxy flooring
Module Code	7112-L3-M1
Module Description	This module is structured to provide learners with the knowledge, skills and right attitude required to prepare for marble/granite works, perform marble/granite works, perform finishing works and perform epoxy flooring.
Nominal Duration	192 Hours
Certificate Level	BQF Certificate Level 3
Pre-requisite	Masonry BQF Certificate Level 2
Learning Outcome	1. Prepare for marble/ granite works 2. Perform marble/granite works 3. Perform finishing works 4. Perform epoxy flooring

Module Title	Carrying out marble/granite flooring		
Module Code	7112- L3-M1		
Learning Outcome 1	Prepare for marble/granite works		
Duration	Theory: 12 hours	Practical:12 hours	Total: 24 hours
Assessment Criteria	• Material estimate is prepared as per the job requirement following standard procedure • Layout is prepared as per the job requirement following standard procedure • Mortar mix is prepared as per the job requirement following standard procedure		
Content	A1.00 Introductory knowledge • Scope and market trends of masonry • Roles and responsibilities of mason A1.01 Preparing layout Knowledge • Introduction to marble/granite flooring • Definition of estimation • Purpose of estimation • Types of estimation • Types of construction materials and its specifications • Process of filling up BOQ • Purpose of layout • Types of instruments used for layout • Purpose of surface preparation • Purpose of mortar patches Skills • Using Bhutan Schedule of Rates document • Interpreting Labor Material coefficient (LMC) • Using Specification for building and road works (SBRW) • Drawing interpretation skills • Using chipping tools • Using levelling tools • Drawing interpretation skills • Observation skills • Analytical skills • Numeracy skills • Planning skills • Negotiating skills Attitude, safety and environmental concern • Effective time management • Having integrity and work ethics • Efficient use of materials		

	• Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste A1.02 Preparing Concrete mix Knowledge • Types of cement, sand and aggregates • Properties of cement, sand and aggregates • Definition of concrete • Types of concrete • Requirements of good concrete • Requirement of surface preparation • Mix proportion and concrete grade • Servicing of the mixer machine • Water cement ratio Skills • Mixer machine operating skills • Observation skills • Analytical skills • Numeracy skills • Planning skills • Negotiating skills Attitude, safety and environmental concern • Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste A1.03 Preparing mortar mix Knowledge • Types of cement and sand • Properties of cement and sand • Definition of mortar • Types of mortar • Requirements of good mortar • Requirement of surface preparation • Mix ratio Skills • Mixture machine operating skills • Observation skills • Analytical skills
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	• Numeracy skills • Planning skills • Negotiating skills Attitude, safety and environmental concern • Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste
Learning Conditions	Learning Materials • Competency Based Learning Materials (CBLM) • Hand-outs • Audio Visuals • Reference books • Manuals • LMS Learning facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Workshop Materials • A4 size paper, scale, pencil, pen, eraser, guide book, civil drawings, BSR, LMC, SBRW, BOQ format, fine aggregate, cement, mason thread and water Tools • Shovel, spade, water-can, bucket, chipping hammer, chisel, flexible pipe, mortar pan, trowel, float, wheel barrow, measuring tape, gauge box, water level pipe, spirit level and wire brush Instruments • Dumpy level and laser leveller Equipment • Computer, calculator and mixture machine PPE • Safety gloves, safety helmet, safety goggles, ear muff, dust mask, ear plugs, hair net, apron, safety boots, workshop dress and respiratory mask

Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work • Rubrics

Module Title	Carrying out marble/granite flooring		
Module Code	7112-L3-M1		
Learning Outcome 2	Perform marble/granite works		
Duration	Theory: 12 hours	Practical: 60 hours	Total: 72 hours
Assessment Criteria	- Marble/granite is cut as per the job requirement following standard procedure - Edges are molded as per the job requirement following standard procedure - Marble/granite is laid per the job requirement following standard procedure - Skirting is laid per the job requirement following standard procedure		
Content	A2.01 Cutting marble/granite Knowledge - Definition of marble and granite - Physical properties of marble and granites - Difference between marble & granite - Components of cutting machines - Purpose of pouring water while cutting marble/granite Skills - Using marble/granite cutting machine - Observation skills - Analytical skills - Numeracy skills - Planning skills - Negotiating skills Attitude, safety and environmental concern - Effective time management - Having integrity and work ethics - Efficient use of materials - Proper handling and storage of tools, materials and equipment - Ensuring appropriate use of PPE - Ensuring to follow OHS rules and regulations - Ensuring proper disposal of waste A2.02 Molding edges Knowledge - Types of molds and its application - Importance of molding edge - Importance of preparing working platform - Types of grit grinding wheel Skills - Angle grinder operating skills - Observation skills		

	- Analytical skills - Numeracy skills - Planning skills - Negotiating skills <i>Attitude, safety and environmental concern</i> - Effective time management - Having integrity and work ethics - Efficient use of materials - Proper handling and storage of tools, materials and equipment - Ensuring appropriate use of PPE - Ensuring to follow OHS rules and regulations - Ensuring proper disposal of waste A2.03 Laying marble/granite <i>Knowledge</i> - Application of marbles/granite - Purpose of applying cement slurry <i>Skills</i> - Using levelling tools - Observation skills - Analytical skills - Numeracy skills - Planning skills - Negotiating skills <i>Attitude, safety and environmental concern</i> - Effective time management - Having integrity and work ethics - Efficient use of materials - Proper handling and storage of tools, materials and equipment - Ensuring appropriate use of PPE - Ensuring to follow OHS rules and regulations - Ensuring proper disposal of waste A2.04 Laying skirting <i>Knowledge</i> - Definition of skirting and its purpose - Types of skirting - Specification of skirting <i>Skills</i> - Using marble/granite cutting machine - Observation skills - Analytical skills - Numeracy skills - Planning skills
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	- Negotiating skills Attitude, safety and environmental concern - Effective time management - Having integrity and work ethics - Efficient use of materials - Proper handling and storage of tools, materials and equipment - Ensuring appropriate use of PPE - Ensuring to follow OHS rules and regulations - Ensuring proper disposal of waste
Learning Conditions	Learning Materials - CBLM - Hand-outs - Audio Visuals - Reference books - Manuals - LMS Learning Facilities and infrastructure - Classroom with adequate facilities - Information Technology (IT) lab - Library - Workshop Materials - Brick, water, batten, marker, marble, granite, sand, cement, mason thread, grit grinding wheel, adhesive and white cement Tools - Measuring tape, cutting blade, extension cable, flexible pipe, GI bucket, hammer, trowel, notch trowel, spirit level, steel float, water level pipe, spade, shovel, wheel barrow, mortar pan, wooden mallet, chipping hammer, wooden edge, wooden float, try square, vacuum lifter, hole marker, folding ruler, plumb bob, straight edge and chisel Equipment - Marble/granite cutting machine, self levelling laser, tile vibrator, molding machine and angle grinder PPE - Safety gloves, safety helmet, safety goggles, ear muff, dust mask, ear plugs, hair net, apron, safety boots, workshop dress and respiratory mask

Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work • Rubrics

Module Title	Carrying out marble/granite flooring		
Module Code	7112-L3-M1		
Learning Outcome 3	Perform finishing work		
Duration	Theory: 6 hours	Practical: 24 hours	Total: 30 hours
Assessment Criteria	- Grout is prepared as per the job requirement following standard procedure - Grout is applied as per the job requirement following standard procedure - Polishing is performed as per the job requirement following standard procedure - Defects of marble/granite is rectified as per the job requirement following standard procedure		
Content	A3.01 Preparing Grout Knowledge - Definition of grout - Types of grouts - Mixing ratio for grouts - Types of additives Skills - Using paint mixer - Observation skills - Analytical skills - Numeracy skills - Planning skills - Negotiating skills Attitude, safety and environmental concern - Effective time management - Having integrity and work ethics - Efficient use of materials - Proper handling and storage of tools, materials and equipment - Ensuring appropriate use of PPE - Ensuring to follow OHS rules and regulations - Ensuring proper disposal of waste A3.02 Applying grout Knowledge - Methods of applying grout - Purpose of grout - Application of grout - Types of tools used for grouting Skills - Using grout float - Observation skills - Analytical skills		

	• Numeracy skills • Planning skills • Negotiating skills <i>Attitude, safety and environmental concern</i> • Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste A3.03 Performing polishing <i>Knowledge</i> • Purpose of applying polish • Grades of polishing stone • Method of floor polishing <i>Skills</i> • Using grinding/polishing machine • Observation skills • Analytical skills • Numeracy skills • Planning skills • Negotiating skills <i>Attitude, safety and environmental concern</i> • Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste A3.04 Rectifying marble/granite defects <i>Knowledge</i> • Causes of defect • Defects of marble and granite floors • Techniques of removing defective marble and granite floor <i>Skills</i> • Observation skills • Analytical skills • Numeracy skills • Planning skills • Negotiating skills
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	• Coaching skills • Problem solving skills Attitude, safety and environmental concern • Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste
Learning Conditions	Learning Materials • CBLM • Hand-outs • Audio Visuals • Reference books • Manuals • LMS Learning Facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Workshop Materials • White cement, rag, water, sponge, broom, polishing stones, marble, granite, cement, grout materials and sand Tools • Grout float, trowel, notch trowel, mortar pan, brush, bucket, measuring tape, spirit level, chisel, mason hammer, vacuum lifter and utility knife Equipment • Marble polishing machine, marble grinding machine and marble cutting machine PPE • Safety gloves, safety helmet, safety goggles, ear muff, dust mask, ear plugs, hair net, apron, safety boots, workshop dress and respiratory mask

Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work • Rubrics

Module Title	Carrying out marble/granite flooring		
Module Code	7112-L3-M1		
Learning Outcome 4	Perform epoxy flooring		
Duration	Theory: 6 hours	Practical: 60 hours	Total: 66 hours
Assessment Criteria	• Surface is prepared as per the job requirement following standard procedure • Epoxy material is prepared as per the job requirement following standard procedure • Epoxy material is laid as per the job requirement following standard procedure		
Content	A4.01 Preparing surface Knowledge • Introduction to epoxy • Purpose of surface preparation • Types of Primer • Purpose of applying primer Skills • Observation skills • Analytical skills • Numeracy skills • Planning skills • Negotiating skills Attitude, safety and environmental concern • Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste A4.02 Preparing epoxy mixture Knowledge • Introduction to epoxy • Types of epoxy • Mixing ratio • Mixing time • Techniques of checking the validity of epoxy Skills • Observation skills • Analytical skills • Numeracy skills • Planning skills • Problem solving skills Attitude, safety and environmental concern		

	• Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste A4.03 Laying epoxy mixture Knowledge • Precautions before and while laying epoxy • Methods of laying epoxy mixture • Types of epoxy (External and Internal) • Advantages and limitations of epoxy flooring Skills • Observation skills • Analytical skills • Numeracy skills • Planning skills • Negotiating skills • Problem solving skills Attitude, safety and environmental concern • Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste
Learning Conditions	Learning Materials • CBLM • Hand-outs • Audio Visuals • Reference books • Manuals • LMS Learning Facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Workshop Materials • Epoxy (SLE), pigment, screed layer (CS60) and primer (CS24) Tools

	• Plastic float, spike roller, bucket and epoxy roller Equipment • Paint mixer, digital weighing machine and vacuum cleaner PPE • Safety gloves, Safety Helmet, Safety Goggles, Ear muff, Dust mask, Ear plugs, Hair net, Apron, workshop dress, epoxy spike shoes, reflector vest and respiratory mask
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work • Rubrics

MODULE 2
ON
CARRYING OUT HIGH ORDER PLASTER

MODULE INFORMATION

Occupation	Masonry
Competency Area	Carry out high order plaster
Module Title	Carrying out high order plaster
Module Code	7112- L3-M2
Module Description	This module is structured to provide the learners with knowledge, skills and right attitude to perform POP works, putty works and texture/pebble dash
Nominal Duration	84 Hours
Qualification Level	BQF Certificate Level 3
Pre-requisite	Completed Module: 7112-L3-M1
Learning Outcome	1. Carryout plastering 2. Perform POP/wall putty works 3. Perform texture/pebble dash

Module Title	Carrying out high order plaster		
Module Code	7112- L3-M2		
Learning Outcome 1	Carry out plastering		
Duration	Theory: 5 hours	Practical: 13 hours	Total: 18 hours
Assessment Criteria	- Materials are estimated as per job requirement following standard procedure - Mortar mix is prepared as per job requirement following standard procedure - Plastering is performed as per job requirement following standard procedure		
Contents	B1.01 Estimate materials Knowledge - Calculation on quantity of materials - Water cement ratio Skills - Interpreting BSR - Observation skills - Analytical skills - Numeracy skills - Planning skills - Negotiating skills Attitude, safety and environmental concern - Effective time management - Having integrity and work ethics - Efficient use of materials - Proper handling and storage of tools, materials and equipment - Ensuring appropriate use of PPE - Ensuring to follow OHS rules and regulations - Ensuring proper disposal of waste - Ensuring to follow LMC while calculating B1.02 Preparing mortar mix Knowledge - Chemical properties of cement - Physical properties of cement and sand - Hydration of cement - Requirements of good mortar - Requirement of surface preparation - Mix ratio Skills - Using mixer machine - Observation skills - Analytical skills - Numeracy skills - Planning skills		

	<i>Attitude, safety and environmental concern</i> • Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste B1.03 Performing plastering <i>Knowledge</i> • Introduction to plastering • Defects in plastering <i>Skills</i> • Observation skills • Analytical skills • Numeracy skills • Planning skills <i>Attitude, safety and environmental concern</i> • Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste
Learning Conditions	Learning Materials • CBLM • Hand outs • Audio-visuals • Reference books • Manuals • LMS Learning Facilities and Infrastructure • Classroom with adequate facilities • Library • IT lab • Workshop Materials • Book, manuals and catalogue, BSR, LMC, pen, pencil, eraser, paper, water, cement, sand and broom Tools • Calculator, ruler, measuring tape, drawing, chipping hammer, trowel, bucket, wooden/steel float, straight edge, spirit level, wire brush,

	cotton cloth, brush, measuring jar/container, mortar pan, plumb bob and hawk Equipment • Computer, paint mixer, plastering machine and mixer machine PPE • Safety gloves, safety helmet, safety goggles, ear muff, dust mask, ear plugs, hair net, apron safety boots, workshop dress and respiratory mask
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work • Rubrics

Module Title	Carrying out high order plaster		
Module Code	7112- L3-M2		
Learning Outcome 2	Perform POP/wall putty works		
Duration	Theory: 6 hours	Practical: 30 hours	Total: 36hours
Assessment Criteria	- Background surface is prepared as per job requirement following standard procedure - POP mixture is prepared as per job requirement following standard procedure - POP is applied as per job requirement following standard procedure - POP surface is rectified as per job requirement following standard procedure		
Contents	B2.01 Preparing background surface Knowledge - Types of background surface - Stages of preparing background surface - Estimation of POP Skills - Observation skills - Analytical skills - Numeracy skills - Planning skills Attitude, safety and environmental concern - Effective time management - Having integrity and work ethics - Efficient use of materials - Proper handling and storage of tools, materials and equipment - Ensuring appropriate use of PPE - Ensuring to follow OHS rules and regulations - Ensuring proper disposal of waste B2.02 Preparing POP/wall putty mixture Knowledge - Definition of Plaster of Paris (POP) - Purpose of Plaster of Paris (POP) - Setting time of POP - Mixing ratio of POP - Properties of POP - Difference between POP and wall putty Skills - Observation skills - Analytical skills - Numeracy skills - Planning skills - Negotiating skills Attitude, safety and environmental concern		

	• Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste B2.03 Applying POP/wall putty <i>Knowledge</i> • Application of POP • Advantages and disadvantages of POP <i>Skills</i> • Using putty plate • Observation skills • Analytical skills • Planning skills • Negotiating skills <i>Attitude, safety and environmental concern</i> • Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste B2.04 Rectifying/Repairing POP/wall putty surface <i>Knowledge</i> • Causes of defects • Remedies for POP defects <i>Skills</i> • Using putty plate • Observation skills • Analytical skills • Planning skills • Negotiating skills • Problem solving skills <i>Attitude, safety and environmental concern</i> • Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations
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	• Ensuring proper disposal of waste
Learning Conditions	Learning Materials • CBLM • Hand outs • Audio-visuals • Reference books • Manuals • LMS Learning Facilities and Infrastructure • Classroom with adequate facilities • Library • IT lab • Workshop Materials • Book, manuals and catalogue, BSR, LMC, SBRW, pen, pencil, eraser, paper, water, cement, sand, broom, POP/wall putty powder, sand paper and brush Tools • Calculator, ruler, measuring tape, drawing, chipping hammer, trowel, bucket, wooden/steel float, wooden edge, spirit level, wire brush, cotton cloth, brush, measuring jar/container, putty plate, mortar pan and hawk Equipment • Computer, sanding machine, blower, wall putty sprayer and paint mixer machine PPE • Safety gloves, safety helmet, safety goggles, ear muff, dust mask, ear plugs, hair net, apron safety boots, workshop dress and respiratory mask
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning

Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work • Rubrics
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Module Title	Carrying out Higher order plaster		
Module Code	7112- L3-M2		
Learning Outcome 3	Perform texture/pebble dash		
Duration	Theory: 6 hours	Practical: 24 hours	Total: 30 hours
Assessment Criteria	• Surface is prepared as per job requirement following standard procedure • Layout/design is prepared as per job requirement following standard procedure • Texture/pebble dash is applied as per job requirement following standard procedure • Pebble dash/texture is rectified as per job requirement following standard procedure		
Contents	B3.01 Preparing surface Knowledge • Definition of texture and pebble dash • Stages of surface preparation and its purposes • Estimation of materials Skills • Using chipping tools • Observation skills • Analytical skills • Numeracy skills • Planning skills Attitude, safety and environmental concern • Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste B3.02 Preparing layout/design Knowledge • Introduction to basic design/art work • Purpose of layout and template Skills • Jigsaw operating skills • Observation skills • Analytical skills • Numeracy skills • Planning skills • Negotiating skills Attitude, safety and environmental concern • Effective time management • Having integrity and work ethics		

	• Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste B3.03 Applying texture/pebble dash <i>Knowledge</i> • Types of texture • Application of texture and pebble dash • Difference between texture and pebble dash • Methods of laying texture <i>Skills</i> • Operating rendering machine • Observation skills • Analytical skills • Planning skills • Negotiating skills <i>Attitude, safety and environmental concern</i> • Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste B3.04 Rectifying texture/pebble dash <i>Knowledge</i> • Types of defects • Causes and remedies of defects <i>Skills</i> • Operating rendering machine • Observation skills • Analytical skills • Numeracy skills • Planning skills • Negotiating skills • Problem solving skills <i>Attitude, safety and environmental concern</i> • Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE
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	• Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste
Learning Conditions	Learning Materials • CBLM • Hand outs • Audio-visuals • Reference books • Manuals • LMS Learning Facilities and Infrastructure • Classroom with adequate facilities • Library • IT lab • Workshop Materials • Ply wood, nails, marker/ pencil, water, broom, pebbles, cement, sand, timber, lime and paints Tools • Mason hammer, mason chisel, bucket, water pipe, wire brush, trowel, measuring tape, hand saw, try square, cotton cloth, mortar pan, floats, sponge float, scarifier, notched trowel and texture brush Equipment • Jigsaw, circular saw, paddle mixer machine, mixer machine and rendering spray PPE • Safety gloves, safety helmet, safety goggles, ear muff, dust mask, ear plugs, hair net, apron safety boots, workshop dress and respiratory mask
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment

	• Project work • Rubrics
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MODULE 3
ON
CARRYING OUT APPROACH ROAD WORKS

MODULE INFORMATION

Occupation	Masonry
Competency Area	Carry out approach road works
Module Title	Carrying out approach road works
Module Code	7112- L3-M3
Module Description	This module is structured to provide the learners with knowledge, skills and right attitude required to construct side drain, permanent structure and approach road
Nominal Duration	144 Hours
Qualification Level	BQF Certificate Level 3
Pre-requisite	Completed Module 7112-L3-M2
Learning Outcome	1. Construct side drainage 2. Construct permanent structure 3. Construct approach road

Module Title	Carrying out approach road works		
Module Code	7112- L3-M3		
Learning Outcome 1	Construct side drainage		
Duration	Theory: 6 hours	Practical: 12 hours	Total: 18 hours
Assessment Criteria	• Drainage alignment is prepared as per the job requirement following the standard procedure • Plain Cement Concrete is laid as per the job requirement following the standard procedure • Plastering is performed as per the job requirement following the standard procedure • Neat finishing is applied as per the job requirement following the standard procedure		
Contents	C1.01 Preparing drainage alignment Knowledge • Definition and purpose of providing drain • Types of drain • Requirement of good drainage system • Reason for compacting the bed Skills • Observation skills • Analytical skills • Numeracy skills • Planning skills • Negotiating skills Attitude, safety and environmental concern • Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste C1.02 Laying Plain Cement Concrete (PCC) Knowledge • Reason for compaction of concrete • Purpose of keeping rough joint • Process of installing form work Skills • Observation skills • Analytical skills • Planning skills • Negotiating skills • Problem solving skills		

	<i>Attitude, safety and environmental concern</i> • Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste C1.03 Performing plastering <i>Knowledge</i> • Purpose of plastering • Mixing ratio <i>Skills</i> • Float handling skills • Observation skills • Analytical skills • Numeracy skills • Planning skills • Negotiating skills <i>Attitude, safety and environmental concern</i> • Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste C1.04 Applying neat finishing <i>Knowledge</i> • Definition of neat finishing • Purpose of applying neat finishing <i>Skills</i> • Using Steel float • Observation skills • Analytical skills • Planning skills • Negotiating skills <i>Attitude, safety and environmental concern</i> • Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations
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	• Ensuring proper disposal of waste
Learning Conditions	Learning Materials • CBLM • Hand-outs • Audio-visuals • Reference books • Manuals • LMS Learning Facilities and Infrastructure • Classroom with adequate facilities • Library • IT lab • Workshop Materials • Mason thread, shuttering, MS sheet, cement, sand, aggregate, water and stone Tools • Pickaxe, spade, shovel, wheel barrow, hammer, spirit level, measuring tape, trowel, mortar pan, plumb bob, gauge box, chisel, bucket, water level pipe and float Equipment • Excavator, dumpy level and mixer machine PPE • Safety gloves, safety helmet, safety goggles, ear muff, dust mask, ear plugs, hair net, apron safety boots, workshop dress and respiratory mask
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work • Rubrics

Module Title	Carrying out approach road works		
Module Code	7112- L3-M3		
Learning Outcome 2	Construct permanent structure		
Duration	Theory: 6 hours	Practical: 30 hours	Total: 36 hours
Assessment Criteria	• Causeway is constructed as per the job requirement following standard procedure • Gabion Wall is constructed as per the job requirement following standard procedure • Retaining wall is constructed as per the job requirement following standard procedure		
Contents	C2.01 Constructing causeway Knowledge • Definition and purpose of causeway • Types of causeway • Technical specification of causeway Skills • Using compacter machine • Using dumpy level • Using mixer machine • Observation skills • Analytical skills • Numeracy skills • Planning skills • Negotiating skills • Problem solving skills Attitude, safety and environmental concern • Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste C2.02 Constructing Gabion Wall Knowledge • Definition of gabion wall and Geo-textile • Purpose of gabion wall • Purpose of providing Geo-textile • Types of gabion mesh • Requirements while laying stones in gabion wall Skills • Lacing of gabion mesh • Observation skills		

	- Analytical skills - Numeracy skills - Planning skills - Negotiating skills <i>Attitude, safety and environmental concern</i> - Effective time management - Having integrity and work ethics - Efficient use of materials - Proper handling and storage of tools, materials and equipment - Ensuring appropriate use of PPE - Ensuring to follow OHS rules and regulations - Ensuring proper disposal of waste C2.03 Constructing retaining wall <i>Knowledge</i> - Definition of retaining wall - Process of preparing layout profile - Purpose of Retaining wall - Types of retaining wall and their applications - Purpose of weep holes and filtering materials - Difference between gravity retaining wall and RCC retaining wall - Thumb rule for calculation of base width - Difference between retaining wall and breast wall - Estimation on quantity of materials and labor cost <i>Skills</i> - Using aligning tools - Creating weep hole - Interpreting drawing - Observation skills - Analytical skills - Numeracy skills - Planning skills - Negotiating skills <i>Attitude, safety and environmental concern</i> - Effective time management - Having integrity and work ethics - Efficient use of materials - Proper handling and storage of tools, materials and equipment - Ensuring appropriate use of PPE - Ensuring to follow OHS rules and regulations - Ensuring proper disposal of waste
Learning Conditions	Learning Materials - CBLM - Hand-outs

	• Audio-visuals • Reference books • Manuals • LMS Learning Facilities and Infrastructure • Classroom with adequate facilities • Library • IT lab • Workshop Materials • Cement, sand, boulder, aggregate, nails, Hume-pipe, mason thread, gabion mesh, lacing wire, re-bar, binding wire, geo-textile, PVC pipe, HDPE pipe, bamboo, coconut rope and timber Tools • Trowel, spade, shovel, pick axe, crow bar, mason hammer, mason chisel, spirit level, plumb bob, mortar pan, measuring tape, steel float, wooden float, hacksaw, handsaw, wooden edge, wheel barrow, bucket, water level pipe, pliers, gauge box, try square, vibrator, sledge hammer, bar bending die and binding hook Equipment • Mixer machine, excavator, compacter machines, re-bar bender, demolition hammer/stone breaker and dumpy level PPE • Safety gloves, safety helmet, safety goggles, ear muff, dust mask, ear plugs, hair net, apron safety boots, workshop dress and respiratory mask
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work • Rubrics

Module Title	Carrying out approach road works		
Module Code	7112- L3-M3		
Learning Outcome 3	Construct approach road		
Duration	Theory: 18 hours	Practical: 72 hours	Total: 90 hours
Assessment Criteria	• Subgrade is prepared as per job requirement following standard procedure • Edge stone is laid as per job requirement following standard procedure • Granular sub base is laid as per job requirement following standard procedure • Wet mix macadam is laid as per job requirement following standard procedure • Dense Bituminous Macadam is laid as per job requirement following standard procedure • Asphalt Concrete is laid as per job requirement following standard procedure		
Contents	C3.01 Preparing subgrade Knowledge • Types of roads • Classification of roads in Bhutan • Types of road cross section • Road design guidelines of Bhutan • Importance of maintaining horizontal, vertical and transition curves • Definition of subgrade • Purpose of subgrade • Characteristic of sub grade soil • Types of gradients • Types of failing (wave, corrugation, rutting, shoving, cracking and pumping) • Importance of consolidation/compaction • Factor affecting subgrade soil strength • Types of compacting equipment Skills • Observation skills • Analytical skills • Numeracy skills • Planning skills • Negotiating skills Attitude, safety and environmental concern • Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste		

	C3.02 Laying kerbs <i>Knowledge</i> • Introduction to kerb • Purpose of kerb • Types of kerb • Requirements for foundation and joints • Quarter method for kerb layout <i>Skills</i> • Observation skills • Analytical skills • Numeracy skills • Planning skills • Negotiating skills <i>Attitude, safety and environmental concern</i> • Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste C3.03 Laying Granular Sub Base (GSB) <i>Knowledge</i> • Definition of GSB • Importance of GSB • Specification of GSB • Mix proportion of GSB • Properties of aggregates and filler materials • Moisture content in GSB mix • Reduction factor/compaction factor • Purpose of maintaining super elevation and camber <i>Skills</i> • Observation skills • Analytical skills • Numeracy skills • Planning skills • Negotiating skills <i>Attitude, safety and environmental concern</i> • Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations
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	• Ensuring proper disposal of waste C3.04 Laying Wet Mix Macadam (WMM) Knowledge • Types of base course • Purpose of WMM • Mixing proportion of WMM • Difference between WMM and WBM • Purpose of spraying water over WMM • Difference between GSB and WMM Skills • Observation skills • Analytical skills • Numeracy skills • Planning skills • Negotiating skills Attitude, safety and environmental concern • Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste C3.05 Laying Dense Bituminous Macadam (DBM) Knowledge • Definition of DBM • Types of interface coat and its purposes • Grades of bitumen • Types and properties of binding materials • Requirement of surface preparation • Specification for laying and compaction • Properties of paving mix • Temperature range for compaction Skills • Using Asphalt lute rack • Using bitumen thermometer • Observation skills • Analytical skills • Numeracy skills • Planning skills • Negotiating skills Attitude, safety and environmental concern • Effective time management
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	• Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste C3.06 Lay Asphalt Concrete (AC) Knowledge • Definition of Asphalt Concrete • Characteristics of pavement surface • Importance of maintaining accurate cross slope • Parts of road and its function (Eg. Kerb, median, right of way....) • Introduction to road marking • Methods of mixing bituminous mixture • Difference between Asphalt concrete and Dense Bituminous Macadam Skills • Using Asphalt lute rack • Using bitumen thermometer • Observation skills • Analytical skills • Numeracy skills • Planning skills • Negotiating skills Attitude, safety and environmental concern • Effective time management • Having integrity and work ethics • Efficient use of materials • Proper handling and storage of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulations • Ensuring proper disposal of waste
Learning Conditions	Learning Materials • CBLM • Hand-outs • Audio-visuals • Reference books • Manuals Learning Facilities and Infrastructure • Classroom with adequate facilities • Library • IT lab • Workshop Materials

	• Fine aggregate, coarse aggregate, cement, emulsion, bitumen, drawing, kerosene, stones, mason thread, soil and water Tools • Shovel, spade, bucket, hammer, chisel, tin, rammer, measuring tape, trowel, brush, broom, asphalt lute rack, wheelbarrow, levelling screed, cautionary signage, flexible pipe, stone hammer and sledge hammer Instrument • Bitumen thermometer Equipment • Asphalt plant, road paver, tripper truck, backhoe loader, road roller Tandem vibrating roller, air compressor, bitumen sprayer, dumpy level, demolishing hammer and water tanker PPE • Safety gloves, safety helmet, safety goggles, ear muff, dust mask, ear plugs, hair net, apron safety boots, workshop dress and respiratory mask
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work • Rubrics

ANNEXURE

Annex I: Time Distribution

Time Distribution (Regular)					
Masonry BQF CERTIFICATE-3					
Module Title	Learning outcomes	Tasks	Theory (hours)	Practical (hours)	Total (hours)
A: Carrying out marble/granite flooring	A1: Prepare for marble/granite works	A1.01 Introductory knowledge	2	0	2
		A1.01 Prepare layout	4	4	8
		A1.02 Prepare concrete mix	4	4	8
		A1.03 Prepare mortar mix	2	4	6
	Sub total		12	12	24
	A2: Perform marble/granite work	A2.01 Cut marble/granite	3	15	18
		A2.02 Mold edges	2	16	18
		A2.03 Lay marble/granite	4	18	22
		A2.04 Lay skirting	3	11	14
	Sub total		12	60	72
	A3: Perform finishing work	A3.01 Prepare grout	1	2	3
		A3.02 Apply grout	1	2	3
		A3.03 Perform polishing	1	6	7
		A3.04 Rectify marble/granite defects	3	14	17
	Sub total		6	24	30
	A4: Perform epoxy flooring	A4.01 Prepare surface	1	11	12
		A4.02 Prepare epoxy mixture	1	5	6
		A4.03 Lay epoxy mixture	4	44	48
	Sub total		6	60	66
	Total Duration (A)		36	156	192
B: Carrying out high order plaster	B1: Carry out plastering	B1.01 Estimate materials	3	4	7
		B1.02 Prepare mortar mix	1	3	4
		B1.03 Perform plastering	1	6	7
	Sub total		5	13	18
	B2: Perform POP works	B2.01 Prepare background surface	1	2	3
		B2.02 Prepare POP/wall putty mixture	1	4	5

		B2.03 Apply POP/wall putty	2	16	18
		B2.04 Rectify POP/wall putty surface	2	8	10
	Sub total		6	30	36
	B3: Perform texture/pebble dash	B3.01 Prepare surface	2	2	4
		B3.02 Prepare layout/design	1	6	7
		B3.03 Apply texture/pebble dash	2	10	12
		B3.04 Rectify pebble dash/texture	1	6	7
	Sub total		6	24	30
	Total Duration (B)		17	67	84
C: Carrying out approach road works	C1: Construct side drainage	C1.01 Prepare drainage alignment	2	2	4
		C1.02 Lay PCC	2	2	4
		C1.03 Perform plastering	1	3	4
		C1.04 Apply neat finishing	1	5	6
	Sub total		6	12	18
	C2: Construct permanent structure	C2.01 Construct cause way	2	10	12
		C2.02 Construct Gabion wall	2	16	18
		C2.03 Construct retaining wall	2	4	6
	Sub total		6	30	36
	C3: Construct approach road	C3.01 Prepare sub grade	4	14	18
		C3.02 Lay kerbs	2	10	12
		C3.03 Lay GSB	2	10	12
		C3.04 Lay WMM	3	15	18
		C3.05 Lay Dense Bituminous Macadam (DBM)	4	14	18
		C3.06 Lay Asphalt Concrete (AC)	3	9	12
	Sub total		18	72	90
	Total Duration (C)		30	114	144
	Total Duration (hours)		83	337	420

Annex II: Assessment Sample

Unit of competency	Drive Light Vehicle
Unit Code	8322-U4-L2
Module Title	Driving Light Vehicle
Module Code	8322-U4-L2-M1
Time Duration	45 min *
Problem or Project: Drive Light Vehicle	
Introduction: Perform pre-operating procedures before starting the vehicle. Drive light vehicle under different environment conditions following standard traffic rules and defensive driving techniques. Perform post operating procedures after parking the vehicle.	
Observation: (How will you be assessed as Competent?) Your performance will be assessed based on the following criteria: • Performance of pre and post operating procedures as per standard practices; • Application of standard procedures while starting the LMV; • Demonstrating the driving skills in different road condition using the system of vehicle control (SOVC); • Demonstrating your adherence to RSTA Rules, Defensive Driving; • The final outcome of your driving skills	
Note: For Assessor/Institute for preparation for assessment. Materials and Equipment for 1 candidate • LMV in good running condition with all necessary vehicle documents Roles and responsibilities of assessors (before/during and after assessment) • Identify in advance the different road environment (rough road, town, simulated night and poor light condition, highway) • During assessment let the candidate demonstrate moving off, reversing, overtaking, and parking.	

Assessor/ Observation Check List

Unit of competency	Drive Light Vehicle		
Unit Code	8322-U4-L2		
Module Title	Driving Light Vehicle		
Module Code	8322-U4-L2-M1		
Problem/Project: Drive Light Vehicle	Psychomotor (Practical) domain level: P2		
Candidate's Name:			
Place of Assessment:		Date of Assessment:	
A. During the demonstration of skills did the candidate do following:	Marks allocated	Marks received	Remarks
1. Check mirror settings, fluid level, tire pressure and required documents.	4		
2. Start LMV according to the procedure of standard starting procedure (Cockpit Drill)	2		
3. Move off and steer LMV wearing seat belts and without stalling the engine*	3		
4. Reverse LMV safely without stalling the engine*	3		
5. Park LMV safely in the centre of given parking area following standard parking procedure	2		
6. Drive LMV on the highway according to the road conditions following the road safety signs.	2		
7. Drive LMV in towns according to the traffic signs and signals.	2		
8. Drive LMV on 4WD safely (if necessary and available)	1		
9. Giving pass and overtake the vehicle safely according to the road and weather condition *	3		
10. Stop LMV safely in a given area according to standard stopping procedure	1		
B. Is the job outcome correct in the following areas?			
Caused no accidents and damages to the vehicle.*	5		
Total marks obtained	28		
The Candidate's performance	Satisfactory:		
	Not Satisfactory:		

Note: The questions marked with * are the critical questions which the trainees must be able to answer. Otherwise, they will be rated unsuccessful even if they perform well in the practical exam. The mark P is for the psychomotor domain level (P1- Simple Routine Assignment; P2- Questions related to Simple Routine Assignment and P3- Questions not related to Simple Routine Assignment)

Oral Questions checklist:

Unit of competency		Drive Light Vehicle		
Unit Code		8322-U4-L2		
Module Title		Driving Light Vehicle		
Module Code		8322-U4-L2-M1		
Problem/Project: Drive Light Vehicle				
Candidate's Name:				
Place of Assessment:		Date of Assessment:		
Questions (and its domain level) to be answered by the trainee / candidate:	Key Answer	Marks allocated	Marks obtained	Remarks
Why do you keep the vehicle in start mode for a few minutes before moving? (Verifying observations) (C1)				
In case of accidents who will you contact first? (contingency questions) (C2)				
While entering intersection, before how many seconds do you have to give signal? (verifying observations) (C3)				
Total Marks Obtained				
The candidate's performance was:		Satisfactory:		
		Not Satisfactory:		
Assessor's Name:		Signature:		

Note: The questions marked with C describes the cognitive level of the questions. C1- Remembering; C2- Functional Understanding and C3- Problem Solving.

Written questions checklist:

Unit of competency		Drive Light Vehicle	
Unit Code		8322-U4-L2	
Module Title		Driving Light Vehicle	
Module Code		8322-U4-L2-M1	
Problem/Project: Drive Light Vehicle			
Candidate's Name:			
Place of Assessment:		Date of Assessment:	
Questions (and its domain level) to be answered by the trainee/ candidate:	Key Answer	Marks Allocated	Marks Obtained
1. List down three types of parking. (Short Answer Question) (C1)	Angle, Straight and	1	

Annex III: Module Recognition

This is to verify that

Mr/Ms.....

has completed module on

.....

Covering following learning outcomes:

1.
2.
3.

Instructor:

Head of the Department:

.....

.....

Signature:

Signature:

Date: / / (dd/mm/yyyy)
.....(dd/mm/yyyy)

Date: / /

Head of the Institute:

Trained Assessor (Institute)/Exam OC:

.....

.....

Signature:

Signature:

Date: / ... / (dd/mm/yyyy)

Date: / /(dd/mm/yyyy)

Annex IV: Lesson Plan

Lesson Plan

Course Title:				NC Level:
Module Code:				Duration:
Module Title:				
Learning Outcome:				
Skill/Task/Topic:				
Terminal Performance Objective:				
<i>(Note: Write narrative statement extracted from TPO of Task Sheet)</i>				
Enabling Objectives (Related knowledge):				
<i>By the end of the lesson learners will be able to:</i>				
i) ii) iii)				
What (Content/Activity)	Who (T/L)	How (Methods/ Media)	Duration (Min.)	Questions
<i>Introduction:</i> <i>Main body</i> <i>Conclusion</i>				
Projects/Problems:				

Instructional Resources Plan				
Skills/Task/Topic:				
No. of Trainees:				
Sl. No.:	Instructional materials/resources	Specifications	Qty.	Remarks
Prepared by :		Signature	Date:	
Revised by:		Signature	Date:	
Approved by:		Signature	Date:	

Task sheet

TS-1/4: Practical Plan			
Course Title:		N C Level:	
Module code:		Duration:	
Module Title			
Learning outcome			
Skills/Task Title:		Task no:	
Terminal Performance Objective: <i>Given:</i> <i>Cue:</i> <i>Who:</i> <i>What:</i> <i>Within:</i> <i>How well:</i> - - -			
Enabling Objectives (Related Skills): <i>By the end of a lesson, the learners will be able to:</i> i) ii) iii) iv)			
Activities	Who (T/L)	How (methods/ media)	Duration
Project/Assignment: 			

TS-2/4: Tool and Equipment required:							
<i>Sl no.</i>	<i>Particulars</i>	<i>Specifications</i>	<i>Qty.</i>	<i>Remarks</i>			
Training Materials required:							
<i>Sl no.</i>	<i>Particulars</i>	<i>Specifications</i>	<i>Qty.</i>	<i>Rate</i>	<i>Amount</i>	<i>Remarks</i>	
TS-3/4: Performance Guide							
Skill/Task:					Date:		
Directions: Use the following performances criteria to rate the learner. Check YES/NO to indicate whether the learner performed each step as indicated or not?							
Sl. No:	Steps					Yes	No
Note: Critical steps: All * marked steps should be carried out very carefully. For a quality performance guide, all items should be checked "YES"							

TS-4/4: Instruction and Drawing

General Instructions for Trainees

- i)
- ii)
- iii)
- iv)

Drawing (if any)

Safety Precaution

- i)
- ii)
- iii)

Prepared by:

Signature

Date:

Revised By:

Signature

Date:

Approved by:

Signature

Date:

Annex V: Course Plan
Institutes letter head and Logo

(Trade)YEAR PLAN- _____ Semester_____ (Year)

Trade: NC Level:			Schedule																																								Total Hours																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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Prepared by:

Verified & Approved by:

Date:

Monthly/Weekly Plan

Month:

Trade:

Trainer:

Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Week 01							
Week 02							
Week 03							
Week 04							
Week 05							

Developed by:

Approved by:

Date



For more information please contact:

Technical Trainers Training and Resource Center (TTTRC), DWPSD

P.O. Box153; Gelephu

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